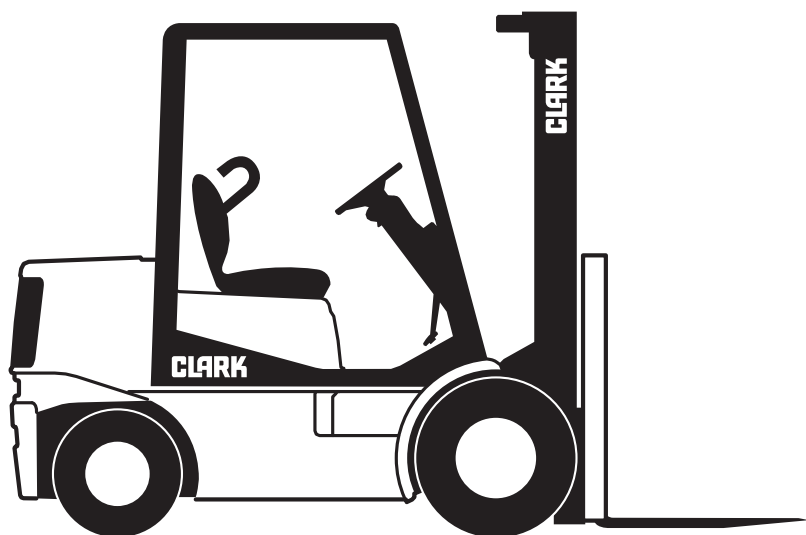


○ **CLARK**®



# Operator's Manual

**INTERNAL COMBUSTION LIFT TRUCKS**

Book No. 2820108  
OM-624 Rev 2

**Do not remove this manual  
from the truck.**

*Record the following information pertaining to your truck.*

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Customer Truck Identification No. \_\_\_\_\_

Truck Weight, Empty \_\_\_\_\_

Truck Rated Capacity \_\_\_\_\_

Truck Gross Weight \_\_\_\_\_

Truck Gross Weight, Loaded w/ Rated Load \_\_\_\_\_

Special Equipment or Attachments \_\_\_\_\_

**IMPORTANT**

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

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

# Operator's Manual

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

## YOU can prevent accidents

First: Learn safe operating rules and your company rules.

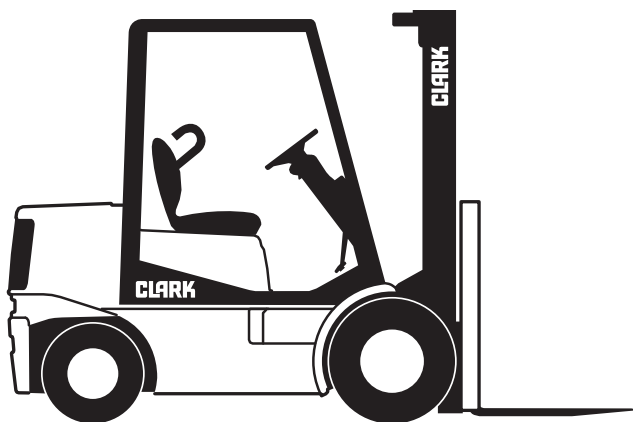
Next: Read your Operator's Manual. If you do not understand it, ask your supervisor for help.

Learn about the unit you operate.

## KNOW YOUR TRUCK

Then: Practice operating your truck safely.

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



**Breaking these rules will cause serious or fatal injury to yourself and others**



# A Message to CLARK Lift Truck Operators

Lift trucks are specialized machines with unique operating characteristics, designed to perform a specific job. Their function and operation is not like a car or ordinary truck. They require specific instructions and rules for safe operation and maintenance.

Safe operation of lift trucks is of primary importance to CLARK. Our experience with lift truck accidents has shown that when accidents happen and people are killed or injured, the causes are:

- **Operator not properly trained**
- **Operator not experienced with lift truck operation**
- **Basic safety rules not followed**
- **Lift truck not maintained in safe operating condition**

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

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



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

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

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





# Contents of this Manual

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# Introduction

CLARK welcomes you to the growing group of professionals who own, operate, and maintain CLARK lift trucks. We take pride in the long tradition of quality products and superior value the CLARK name represents. This manual familiarizes you with safety, operating, and maintenance information about your new lift truck. It has been specially prepared to help you use and maintain your CLARK lift truck in a safe and correct manner.

Your CLARK lift truck has been designed and built to be as safe and efficient as today's technology can make it. As manufactured, it meets all the applicable mandatory requirements of ANSI B56.1 Safety Standard for Powered Industrial Trucks. Each truck is also furnished with equipment to help you operate safely; for example, load back rest, parking brake and horn are standard equipment.

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

## **Routine Servicing and Maintenance**

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





## **Operator Daily Inspection — Safety and Operating Checks**

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

## **Planned Maintenance**

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

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



## How to Use this Manual

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

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

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

**Section 3, Common Truck**, describes the most common operating components, systems, controls, and other features of your truck and tells how they function.

**Section 4, Operator Compartment and Controls**, discusses specific instructions on the safe, efficient operation of your lift truck.

**Section 5, Operator Maintenance and Care**, presents details on how to perform the operator's daily safety inspection and refuel the lift truck.

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

**Section 7, Planned Maintenance**, describes the PM program.

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

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

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

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



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

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

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

Each major Section has its own table of contents, so that you can find the various topics more easily. If you cannot find a topic in the table of contents, check the index at the back of the manual.

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

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

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



## Safety Signs and Safety Messages

Improper operation can cause accidents. Don't take chances with incorrect or damaged equipment. **Read** and **understand** the procedures for safe driving and maintenance outlined in this manual. Don't hesitate to ask for help. **Stay alert!** Follow safety rules, regulations, and procedures. Avoid accidents by recognizing dangerous procedures or situations before they occur. **Drive and work safely** and follow the safety signs and their messages on the truck and in this manual.

**Safety signs and messages** are placed in this manual and on the truck to provide instructions and identify specific areas where potential hazards exist and special precautions should be taken. Know and understand the meaning of these instructions, signs, and messages. Damage to the truck, death, or serious injury to you or other persons may result if these messages are not followed. If warning decals are damaged, they must be replaced. Contact your CLARK dealer for replacements.

### NOTICE

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

### IMPORTANT

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



### CAUTION

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



### WARNING

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



### DANGER

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



# General Safety Rules

## Contents

<b>Daily Inspection</b> .....	<b>1-2</b>
<b>Do's and Don'ts</b> .....	<b>1-3</b>
<b>Seat Belts</b> .....	<b>1-4</b>
<b>No Riders</b> .....	<b>1-5</b>
<b>Pedestrians</b> .....	<b>1-6</b>
<b>Operator Protection</b> .....	<b>1-7</b>
<b>Fork Safety</b> .....	<b>1-8</b>
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<b>Travel</b> .....	<b>1-10</b>
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## Do's and Don'ts



OM0001

**Don't mix drugs or alcohol with your job.**

**Do watch for pedestrians.**



OM0002



OM0003

**Don't block safety or emergency equipment.**

**Do wear safety equipment when required.**



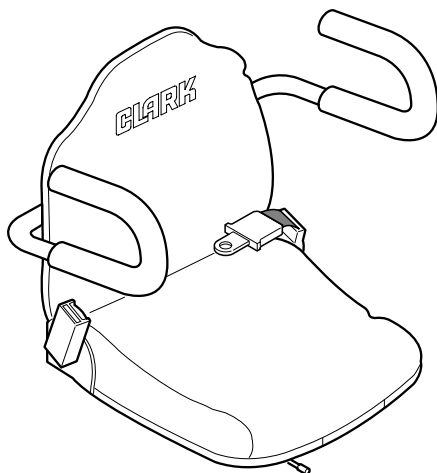
OM0004



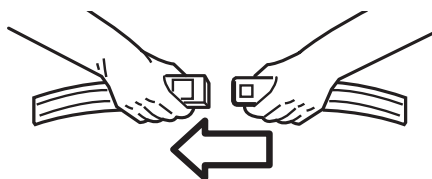
OM0005

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

## Seat Belts



**ALWAYS BUCKLE UP**



**Seat belts can reduce injuries.**



## No Riders

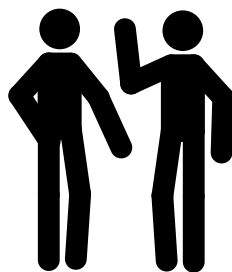


**The operator is the only one who should be on a truck.**

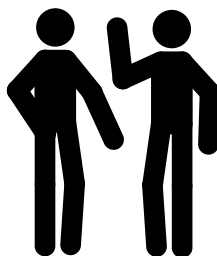


**Never transport personnel on the forks of a lift truck.**

## Pedestrians

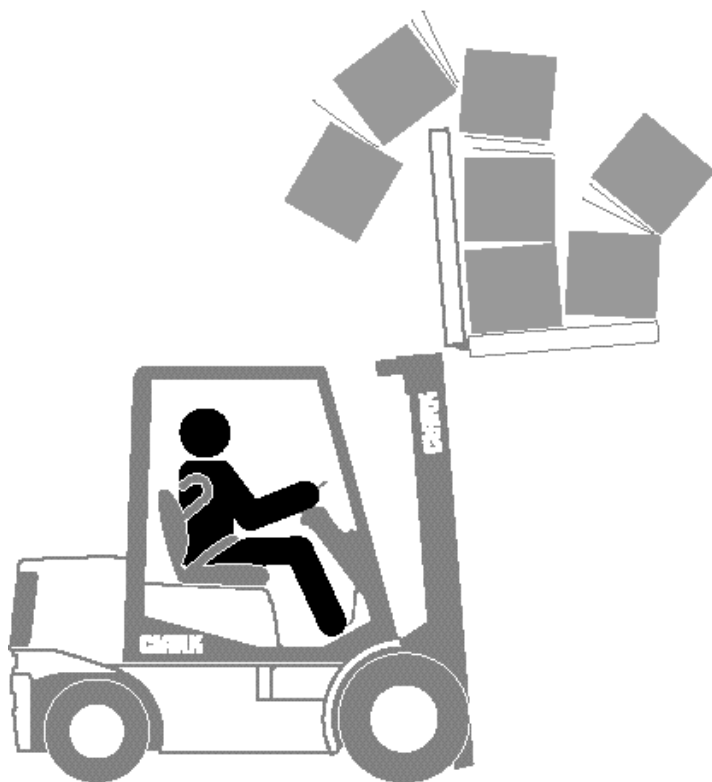


**Watch where you are going. Look in the direction of travel. Pedestrians may use the same roadway you do. Sound your horn at all intersections or blind spots. Watch for people in your work area even if your truck has warning lights or alarms. People may not watch for you.**



**Make people stand back, even when you are parked.**

## Operator Protection

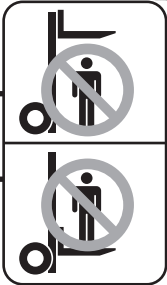


**Keep under the overhead guard.**

**Always keep your body within the confines of the truck.**

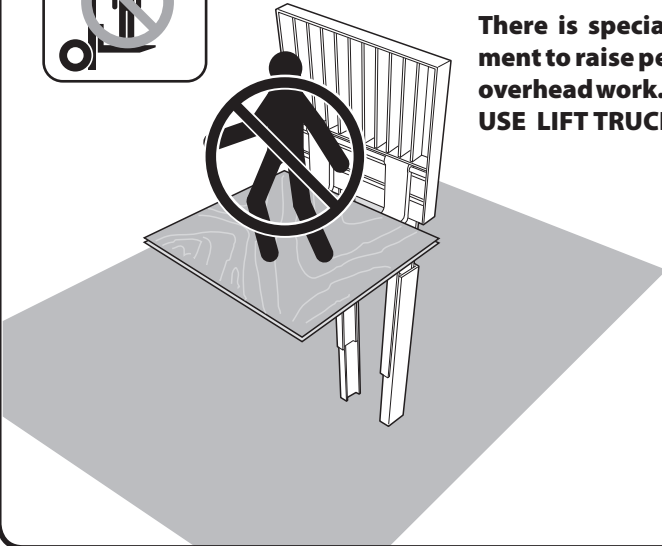
## Fork Safety

**Never allow anyone to walk under raised forks.**



**DANGER**

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



## Pinch Points



### WARNING

Keep hands, feet and legs out of the upright.



### WARNING

Don't use the upright as a ladder.



### CAUTION

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

## Travel

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

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



When handling bulky loads that restrict your vision operate your truck in reverse to improve visibility.

Be sure to pivot in the seat to give maximum visibility.



Unstable loads are a hazard to you and to your fellow workers.

Always make certain that the load is well stacked and evenly positioned across both forks.

Never attempt to lift a load with only one fork.

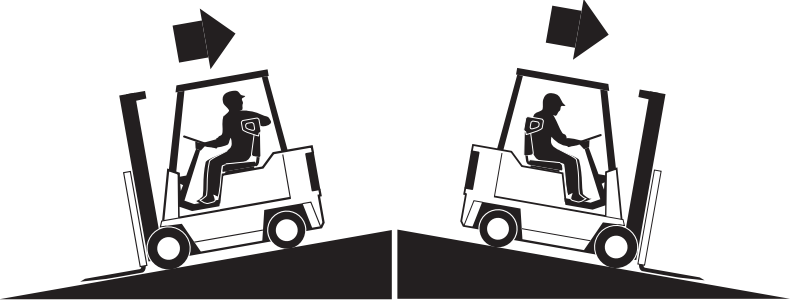


**Right**



**Wrong**

## Grades, Ramps, Slopes, and Inclines

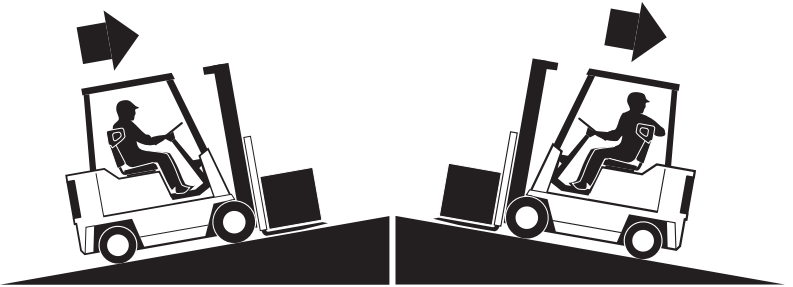


**Unloaded  
Forks Downgrade**



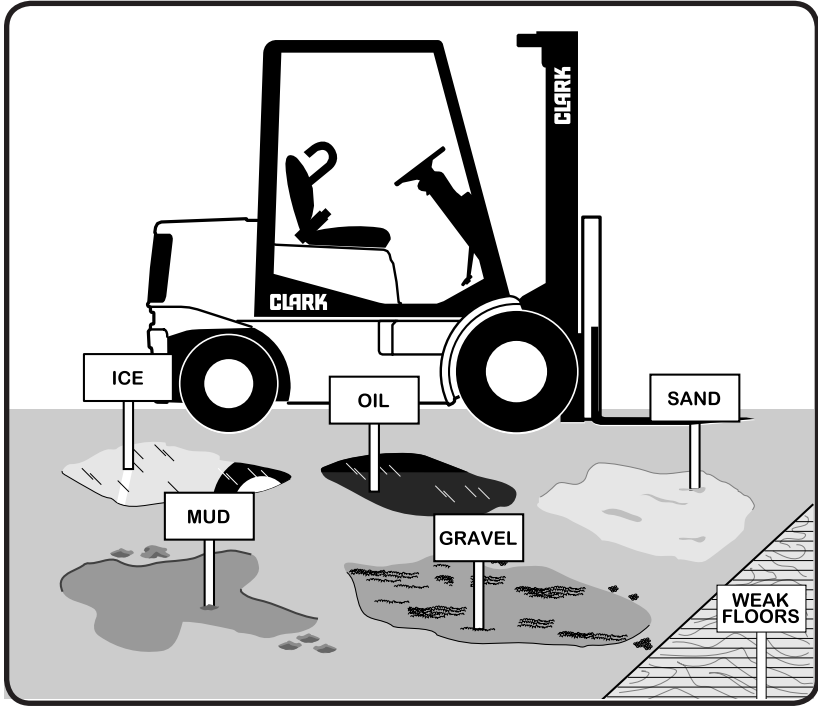
### **WARNING**

**Never turn on a grade, either loaded or unloaded.**



**Loaded  
Forks Upgrade**

## Surface and Capacity



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



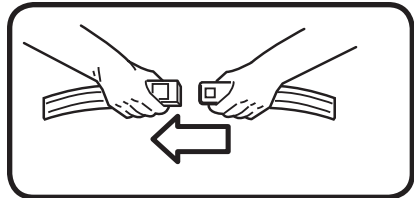
### WARNING

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

### IMPORTANT

**Seat belts can reduce injuries.**

**ALWAYS BUCKLE UP**

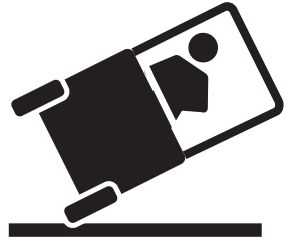




## Tipover

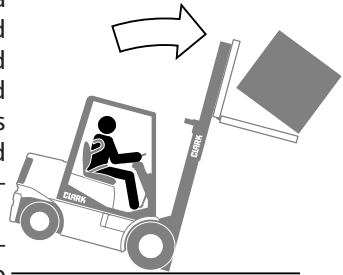
### Lateral Tip-over

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



### Longitudinal Tip-over

- Longitudinal tip-over can occur with a combination of overloading and load elevated also with capacity load and elevated. This combination will exceed the stability of the truck. This condition is even more likely with excessive forward tilt, braking in forward travel or accelerating rearward.
- Longitudinal tip-over can occur by driving with the load down slope on a steep grade.



Lateral and longitudinal tip-over can occur if the truck is driven over objects on the floor or ground, off the edge of improved surfaces, or into potholes in the road surface, or by running into overhead objects or collisions.

An off dock type of tip-over can occur if the truck is steered too close to the dock edge, driven off the edge of the dock or ramp, or if the highway truck or trailer rolls away from the dock or is driven away during loading.



### WARNING

**The conditions listed above can be further aggravated by overloading, excessive tilt, or off center loads.**

### IMPORTANT

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

## What to do in Case of a Tip-over

If your truck starts to tip over,



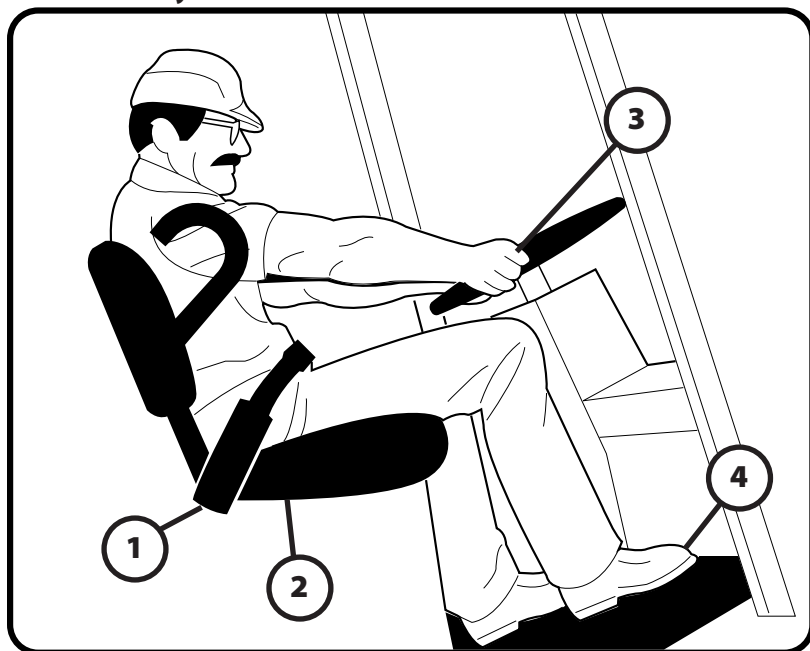
**WARNING**  
**DO NOT JUMP!!!**

### IMPORTANT

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

**Brace yourself as illustrated below!**

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



## Parking

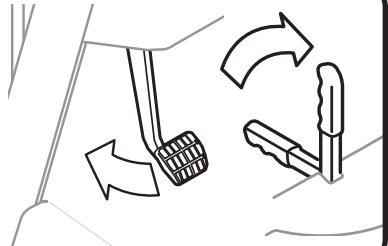
- Never park on a grade.
- Always come to a complete stop before leaving truck.



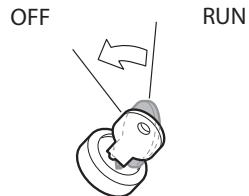
- Be sure travel control is in NEUTRAL.
- Lower forks fully to floor and tilt forward.



- Set parking brake.



- Turn key to OFF position.



## General Tire Maintenance, Inspection, and Repair

1. Park the truck as described on page 1.15 and check for correct tire inflation air pressure. See specifications in this OM for correct tire pressure for your truck.



### CAUTION

**Check tire pressure from a position facing the tread of the tire, not the side. Use a long-handled gauge to keep your body away from the side.**



- If tires are low, do not add air. Have the tire and wheel inspected by a person trained and authorized to do tire and wheel maintenance. The tire may require removal and repair.
- Incorrect (low) tire pressure can reduce the stability of a lift truck and cause it to tip over.

### IMPORTANT

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



### CAUTION

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

# Operating Hazards

## Contents

<b>Loose Loads .....</b>	<b>2-2</b>
<b>Long and Wide Loads .....</b>	<b>2-3</b>
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<b>Low Overhead Clearance .....</b>	<b>2-4</b>
<b>Drop-Offs .....</b>	<b>2-5</b>
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<b>Chain Slack .....</b>	<b>2-7</b>
<b>Pallets and Skids.....</b>	<b>2-8</b>

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



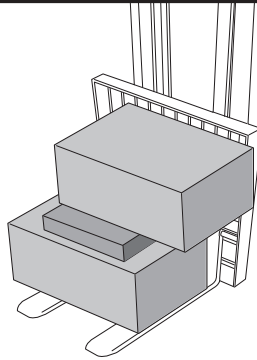
## Loose Loads



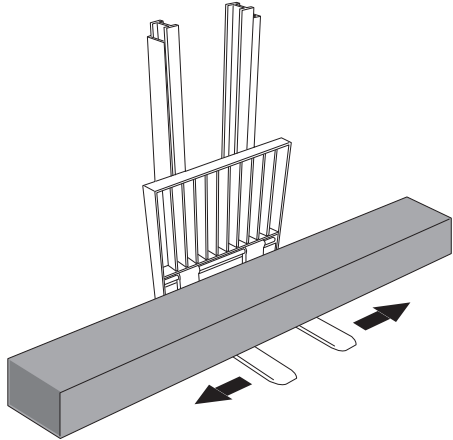
### WARNING

**Loose or unbalanced loads are dangerous. Observe these precautions.**

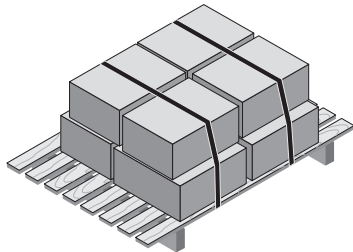
Never carry loose or uneven material.



Center wide loads.



Stack and band loose material.



## Long and Wide Loads / Rear Swing

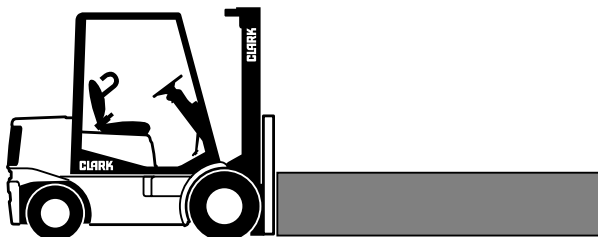


### WARNING

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

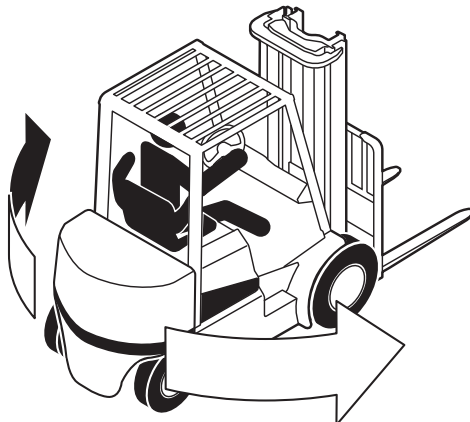
**A long load reduces the capacity of the truck. Know and understand your truck load rating.**

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



### WARNING

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



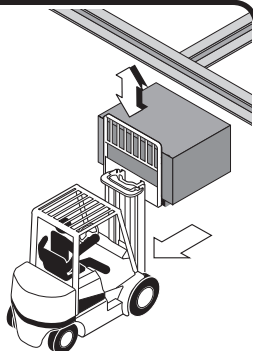
## Low Overhead Clearance Fast Turns and High Loads

### **WARNING**

**Know the height of your truck, with and without a load.**

**Check your clearances.**

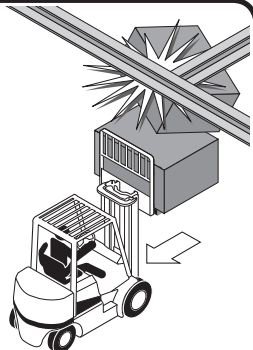
**Keep the load low and tilted back.**



### **WARNING**

**Watch overhead clearance:**

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

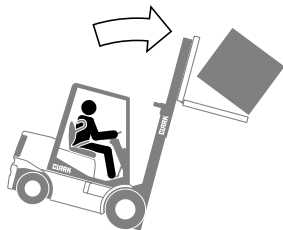


### **WARNING**

**Slow down before turning. The truck can tip over.**

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

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





## Drop Offs



### WARNING

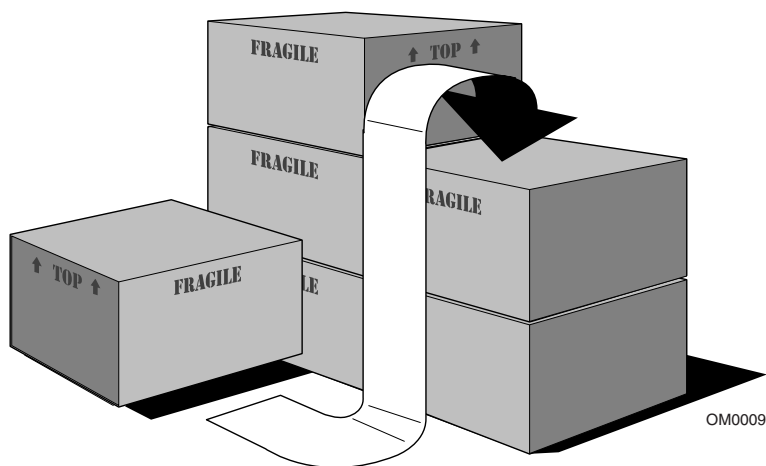
To avoid these hazards, you must:

- **Talk to the truck driver yourself; make sure the driver does not move the trailer until you are done!**
- **Apply trailer brakes.**
- **Use wheel chocks.**
- **Use trailer-to-dock locking system if available.**

**The impact of moving in and out of a trailer may cause the trailer to creep or move.**



## Right-Angle Stacking



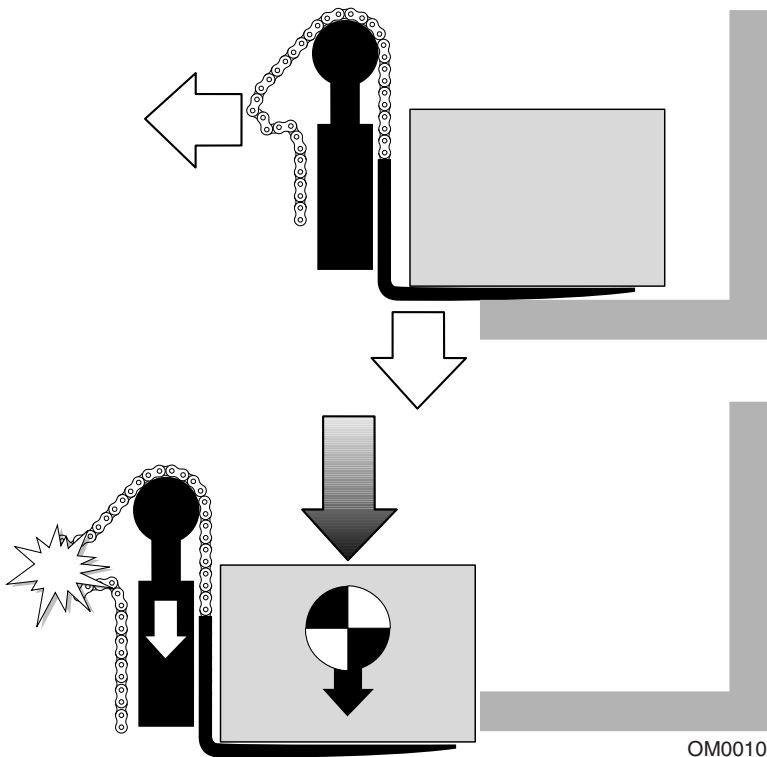
**SLOWLY**



**WARNING**

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

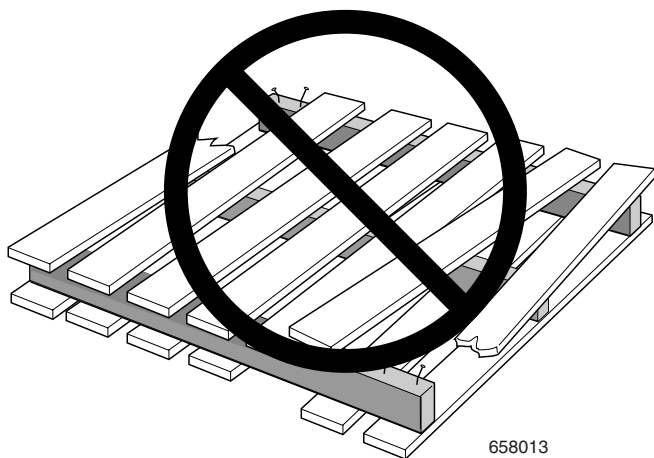
## Chain Slack



### WARNING

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

## Pallets and Skids



### WARNING

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

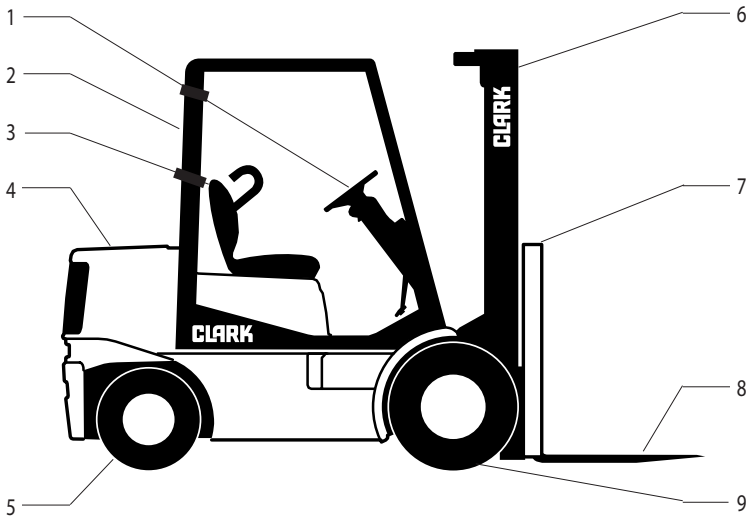
**Be sure the pallet or skid you are using is in good condition and does not have defective or missing components and fasteners.**

# Common Truck

## Contents

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## Truck Description



- |   |                          |
|---|--------------------------|
| 1 | Steering Handwheel       |
| 2 | Overhead Guard           |
| 3 | Seat and Seat Belt       |
| 4 | Counterweight            |
| 5 | Steer Axle, Wheels/Tires |
| 6 | Upright and Carriage     |
| 7 | Load Backrest            |
| 8 | Forks                    |
| 9 | Drive Axle, Wheels/Tires |

The truck shown above is a typical representation of a Clark internal combustion lift truck. Your model may vary slightly.

## Operator Controls

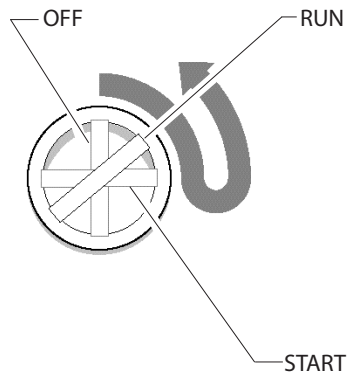
### Key/Start Switch

The Key/Start Switch:

- Turns the truck electrical system on and off.
- Connects and tests the warning indicator lights.
- Connects the starter motor circuit when engine is to be started.

The Key/Start Switch has three positions.

When the key is in the vertical "OFF" position, all truck electrical circuits are off, and the key can be removed. From the "OFF" position, the key can be turned clockwise to the "START" position, where the starter motor is engaged -and part of the truck electrical system is energized. When the key is released from the "START" position, it automatically returns to the "RUN" position, where the starter is disengaged and the entire truck electrical system is on.



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

### Cold Start Preheating (Diesel Only)

With the switch in the "ON" position the warning indicator will light up then the glow plugs are pre-heating automatically. The engine can then be started. To repeat the preheating process turn the key to the "OFF" and then into the "ON" position.

### Engine Stop

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

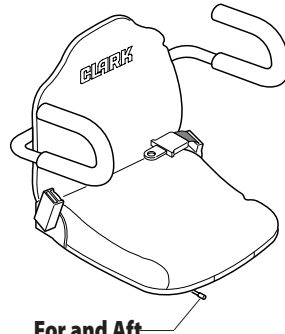
## Seat Adjustment

The fore and aft adjustment lever is located on the right side under the seat. To unlock, push the lever to the left and adjust the seat, release the lever. Be sure that the seat locking mechanism is engaged.



### CAUTION

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



For and Aft  
Adjust

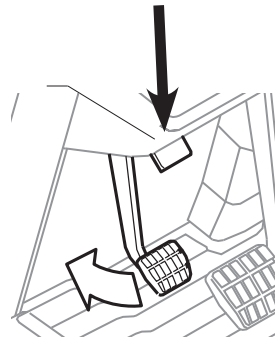
## Parking Brake

The parking brake pedal or lever (*depending on your model*) mechanically operates the parking brake.

### Parking Brake Pedal

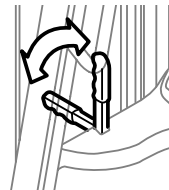
To apply the parking brake push the pedal down with your left foot until pedal stops. The parking brake release is located just above the brake pedal as shown. To release the parking brake pull toward you.

Parking  
Brake  
Release



### Parking Brake Lever

Pull the lever toward the operator to apply the parking brake. The lever should snap-lock easily into applied position, when correctly adjusted. Push the lever forward (away from the operator) to release the parking brake.



### CAUTION

**Always apply parking brake before leaving truck.**



### WARNING

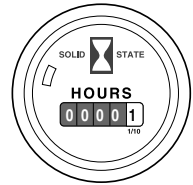
**Never operate your lift truck with a defective parking brake.**





**Hour Meter**

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

**Steering System**

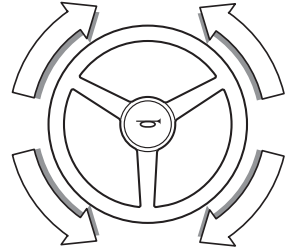
The steering handwheel operates a steering control valve that directs the oil flow to the steering cylinder connected to the steer axle. The steering control valve can also act as a pump to provide manual steering if the hydraulic pump stops.

**Horn Button**

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

**Brake Pedals**

The left hand brake pedal (inching pedal) has two functions in order to improve handling and efficiency. While pressing the inching pedal the first part of its movement interrupts the power from the engine to the transmission. The level of disengagement is dependent on the movement of the pedal. The last part of the travel applies the brake system.



In this way you are able to lift a load rapidly with full engine RPM while controlling slow driving speed with the inching pedal like a clutch. This is very useful in confined level working spaces.

On ramps or inclines the right hand brake pedal only should be used. When using the inching pedal on slopes the lift truck could move backwards or forwards unintentionally.

**Direction Control Lever**

This lever is typically on the left side of the steering column. When changing the direction of travel, make sure that your lift truck has come to a complete stop before moving the lever to the other position.

**IMPORTANT**

**For safety reasons, every CLARK forklift truck is fitted with a neutral start switch. The purpose of this is to prevent the engine from being started while the transmission is in gear. Thus the engine may only start when the direction control lever is in the neutral position.**

**CAUTION**

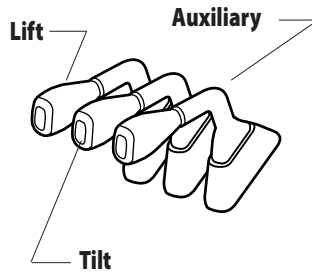
**If the truck will start with the direction control lever in either forward or reverse, there is a problem with the neutral start switch and it must be repaired.**

## Hydraulic Control Levers

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

### IMPORTANT

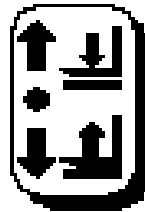
**The hydraulic levers shown are typical representations of a Clark internal combustion lift truck. Your model may vary slightly.**



### Lift Control Function

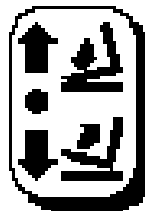
With the lift control lever, you are able to raise and lower the fork carriage on the upright. The lifting and lowering speeds are controlled through the main hydraulic valve by varying the lever position (from the center or neutral positions).

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



### Tilt Control Lever

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



### Auxiliary Control Lever (Optional)

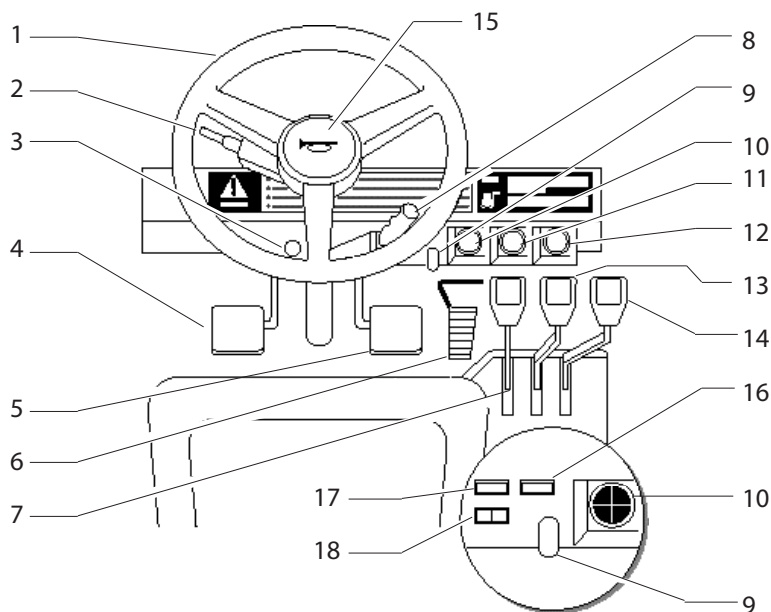
An auxiliary control lever is mounted to the right of the tilt control lever. If your lift truck is equipped with an optional attachment, this lever lets you control the flow and direction of the hydraulic oil to the attachment.

# Operator Compartment and Controls

## Contents

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## GCX Operators Compartment



- |                          |                                 |
|--------------------------|---------------------------------|
| 1. Steering Handwheel    | 10. Warning Indicator           |
| 2. Forward/Reverse Lever | 11. Fuel Gauge                  |
| 3. Choke Control         | 12. Hour Meter                  |
| 4. Inching Pedal         | 13. Tilt Control Lever          |
| 5. Service Brake Pedal   | 14. Auxiliary Control Lever     |
| 6. Accelerator Pedal     | 15. Horn Button                 |
| 7. Lift Control Lever    | 16. Fasten Seat Belt Light      |
| 8. Parking Brake Lever   | 17. Light Switch (Optional)     |
| 9. Key Switch            | 18. Accessory Switch (Optional) |

## GCX Control Functions

### Choke Control (*Gasoline Only*)

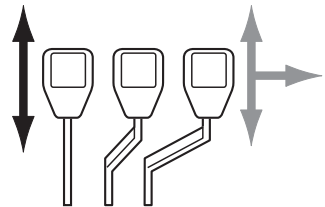
The choke control knob is located near the dash on the steering column support. Pull choke knob out to close the "choke" valve plate in the carburetor. Push in to "open" the choke. When engine has reached normal operating temperature, the choke should be pushed in so that flooding of the carburetor does not occur.

### Directional Control

This lever is on the left side of the steering column. When changing the direction of travel make sure that the lift truck has come to a complete stop before moving the lever to another position.

### Hydraulic Control Lever

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



### Lift Control Function

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

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

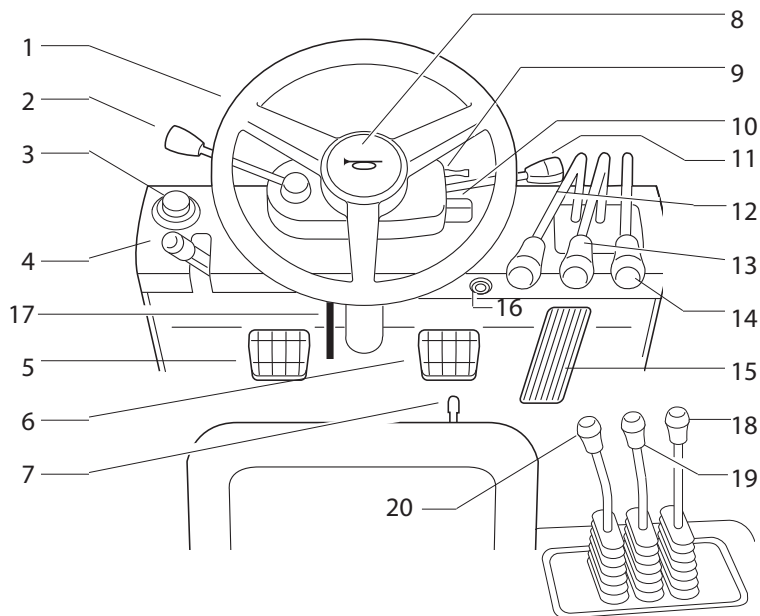
### Tilt Control Lever

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

### Auxiliary Control Lever (Optional)

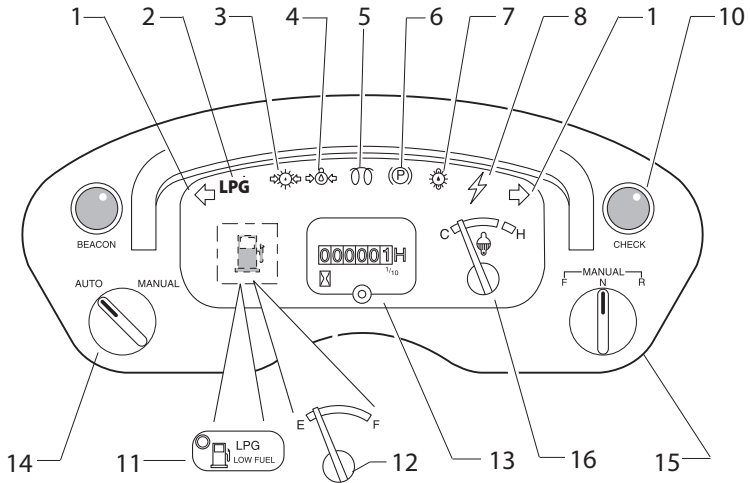
An auxiliary control lever is mounted to the right of the tilt control lever. If your lift truck is equipped with an optional attachment, this lever lets you control the flow and direction of the hydraulic oil to the attachment. The GCX auxiliary lever must be pushed to the right before moving it forward or back to operate the auxiliary function.

## CMC/CMP Operator Compartment



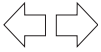
- |                          |  |
|--------------------------|--|
| 1. Steering Handwheel    | 12. Lift Control Lever (CMC15-20S, CMP15-30)         |
| 2. Forward/Reverse Lever | 13. Tilt Control Lever ((CMC15-20S, CMP15-30)        |
| 3. Brake Fluid Reservoir | 14. Side Shifter Control Lever (CMC15-20S, CMP15-30) |
| 4. Parking Brake         | 15. Accelerator Pedal                                |
| 5. Inching Pedal         | 16. Key Switch                                       |
| 6. Service Brake Pedal   | 17. Steer Column Tilt Lever                          |
| 7. Seat Adjustment Lever | <b>Deck Mntd Levers (CMP 40-75S)</b>                 |
| 8. Horn Button           | 18. Side Shifter Lever                               |
| 9. Hazard Light Switch   | 19. Tilt Lever                                       |
| 10. Head Light Switch    | 20. Lift Lever                                       |
| 11. Turn Signal Lever    |  |

## CMC/CMP Instrument Panel



- |  |  |
|--|--|
| 1. Turn Signal Lamps                                       | 8. Battery Discharge Warning Lamp                        |
| 2. LPG Warning Lamp<br>(Dual Fuel option for<br>CMP15-30G) | 10. Panel Check Switch                                   |
| 3. Transmission Oil Pressure<br>Warning Lamp               | 11. LPG Warning Lamp                                     |
| 4. Engine Oil Pressure Warning<br>Lamp                     | 12. Gasoline/Diesel Fuel Gauge                           |
| 5. Preheating Pilot Lamp                                   | 13. Hour Meter   |
| 6. Parking Brake Lamp                                      | 14. Auto/Manual Transmission<br>Switch (CMP 50-75S only) |
| 7. Transmission Oil Tempera-<br>ture Lamp                  | 15. Forward/Neutral/Reverse<br>Switch (CMP 50-75S only)  |
|  | 16. Coolant Temperature Gauge                            |

## CMC/CMP Instrument Panel Symbols



**Turn Signal Lamps:** Blink when the turn signal indicating lever turned to either direction.

### LPG

**LPG Warning Lamp (Dual fuel option for CMP15-30G):**

This symbol displays when the LPG fuel bottle reaches a minimum allowable limit.



**Ammeter:** This symbol displays when the alternator is not charging the battery.



**Engine Oil Pressure:** This symbol displays when the engine oil pressure reaches the minimum allowable limit. The indicator will also display along with the automatic engine shutdown in case of low oil pressure. If this symbol is displayed, **STOP** the truck immediately and check transmission.



**Fuel Level:** This symbol displays when the LPG fuel bottle reaches a minimum allowable limit.



**Glow Plug Preheat:** When the ignition switch is turned to the "ON" position, a timer is set. This symbol displays until the timer cycle is completed. The engine may then be started.



**Parking Brake:** This symbol displays when the parking brake is engaged.



**Transmission Oil Temperature:** During operation, glowing of this symbol indicates when the transmission oil temperature is too high. If this symbol is displayed, **STOP** the truck immediately and check transmission.



**Panel Check Switch:** Turns on all the pilot and warning symbols on the instrument panel. This switch is designed to the operator know that all symbols and switches are working properly.

AUTO      MANUAL



**Auto/Manual Switch:** In normal condition set this switch to "AUTO", and in emergency condition (*AUTO failure*), SET to "MANUAL" to operate.

F — MANUAL — R



**Emergency FWD/REV Switch (for manual):** In emergency condition (*AUTO failure*), while the Auto/Manual switch is set "MANUAL", you can control the forward/reverse operation by use of this switch.



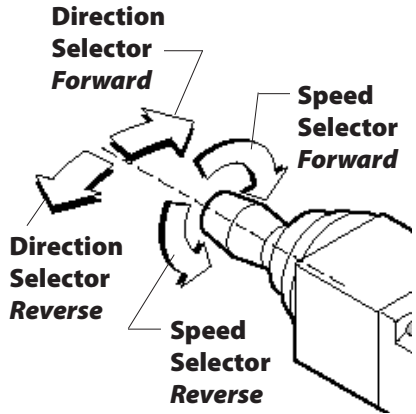


## CMP 50,60,70,75S EGS

### Electronic Gear Shift (E.G.S.)

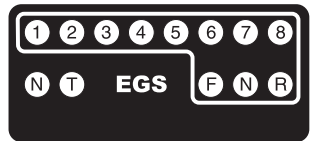
Push the direction control lever forward, center it, or pull it back for FORWARD, NEUTRAL, or REVERSE, respectively. Traction is disabled in NEUTRAL.

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



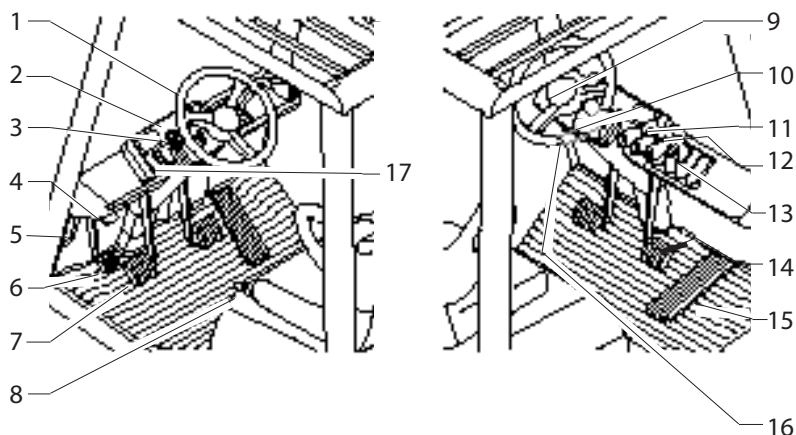
### Display Arrangement

- 1) Lamps 1-3: Indicate the selected lever position/direction (color)  
Indicate the selected transmission gear/direction (color)
- 2) Lamp N: On if the transmission is place in neutral
- 3) Lamp T: Used in self diagnostic modes and or fault signalling.
- 4) Lamp W/7: Blinks red when downshift is inhibited or during a direction change.
- 5) Lamp S/8 Used to indicate "standstill" or a possible speed sensor problem.



After the initial start up both the N and T lamp are ON. However, if the EGS controller is malfunctioning both lamps are ON or blink simultaneously.

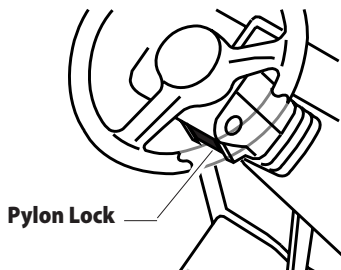
## CGC / CGP Operators Compartment



- |                          |                             |
|--------------------------|-----------------------------|
| 1. Steering Handwheel    | 10. Key Switch              |
| 2. Dash Display          | 11. Lift Control Lever      |
| 3. Forward/Reverse Lever | 12. Tilt Control Lever      |
| 4. Parking Brake Release | 13. Auxiliary Control Lever |
| 5. Hood Release          | 14. Brake Pedal             |
| 6. Parking Brake Pedal   | 15. Accelerator Pedal       |
| 7. Inching Pedal         | 16. Pylon Adjust Button     |
| 8. Seat Adjustment Lever | 17. Hi-Low Switch           |
| 9. Horn Button           |                             |

### Steering Column Pylon

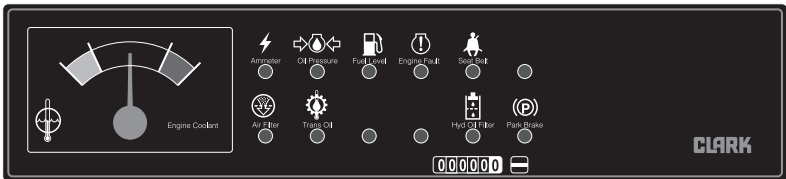
The steering wheel can be tilted forwards and backwards in small discrete movements. Push and hold pylon lock, move the wheel to the desired position and release lock.



## CGC / CGP

**Dash Pod Display**

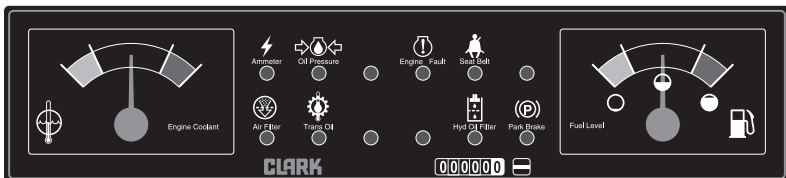
Familiarize yourself with the dash display and its warning indicators. Make viewing the indicators part of your normal operating routine. If any of these indicator lights show an irregularity or when they are not working properly, have them checked immediately.



LPG Truck Dash Display



Diesel Truck Dash Display



Gasoline Truck Dash Display

## CGC/CGP Dash Pod Symbols



**Ammeter:** This symbol displays when the alternator is not charging the battery.



**Engine Oil Pressure:** This symbol displays when the engine oil pressure reaches the minimum allowable limit. The indicator will also display along with the automatic engine shutdown in case of low oil pressure. An alarm will also sound.



**Fuel Filter:** This symbol displays when the restriction level reaches the maximum allowable limit.



**Fuel Level:** This symbol displays when the LPG fuel bottle reaches a minimum allowable limit.



**Glow Plug Preheat:** When the ignition switch is turned to the "ON" position, a timer is set. This symbol displays until the timer cycle is completed. The engine may then be started.



**Engine Diagnostic:** This symbol displays at the start up of the truck. A mechanic should be called if it displays at any other time. A mechanical problem could be present.



**Seat Belt:** At start up this symbol displays along with an audio alarm for 10 seconds. This display reminds you to fasten your seat belt.

### IMPORTANT

**You should always have your seat belt securely fastened when operating your lift truck.**



**Air Filter:** This symbol displays when the restriction level in the air cleaner reaches the maximum allowable limit.



**Transmission Oil Temperature:** This symbol displays when the transmission oil temperature reaches the maximum allowable limit. The indicator will also display together with the automatic engine shutdown in case of high oil temperature. An alarm will also sound.



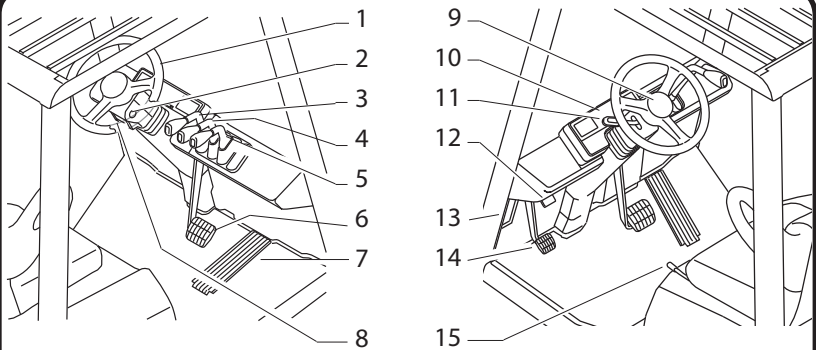
**Hydraulic Oil Filter:** This symbol displays when the hydraulic filter restriction level reaches the maximum allowable limit.



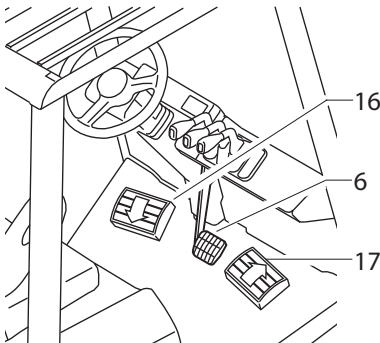
**Parking Brake:** This symbol displays when the parking brake is engaged.



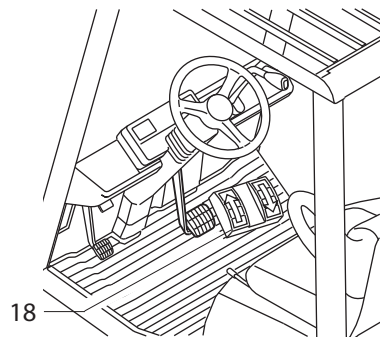
## CGC / CGP Hydrostatic Operators Compartment



**Standard Operating Controls**



**Two Pedal Controls**



**Unitrol Pedal Controls**

- |                            |   |
|----------------------------|---|
| 1. Steering Handwheel      | 11. Direction Control (standard)            |
| 2. Key Switch              | 12. Parking Brake Release                   |
| 3. Lift Control Lever      | 13. Hood Release                            |
| 4. Tilt Control Lever      | 14. Parking Brake Pedal                     |
| 5. Auxiliary Control Lever | 15. Seat Adjustment Lever                   |
| 6. Brake Pedal             | 16. Direction and Speed Control Pedal (REV) |
| 7. Accelerator Pedal       | 17. Direction and Speed Control Pedal (FWD) |
| 8. Pylon Lock              | 18. Unitrol Pedal                           |
| 9. Horn Button             |   |
| 10. Dash Display           |   |

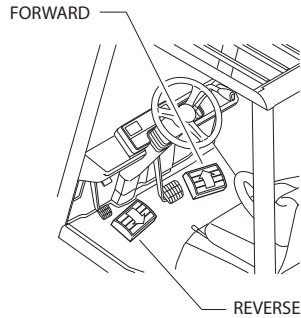
**IMPORTANT**

**Familiarize yourself with the controls and follow safe operating procedures.**

## Two Pedal Control

In the case of two pedal operation there is no forward/reverse lever. The direction of travel and speed of truck is determined by the forward or reverse pedals.

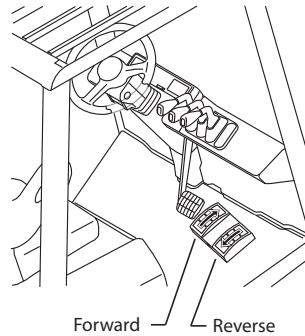
- **Forward:** To move forwards depress the right pedal. The farther you push down on the pedal the faster the truck will move.
- **Reverse:** To move in reverse depress the left pedal. The farther you push down on the pedal the faster the truck will move.
- **Neutral:** Release both pedals and transmission is in "neutral".



## Unitrol Pedal

With the Clark Unitrol, the directional control lever is no longer located on the steering pylon. The direction of travel and speed of truck is determined by the Unitrol pedal.

- **Forward:** To select and move the truck in the forward direction you must push down on the (FWD arrow) left side of the Unitrol pedal. The farther the pedal is depressed the faster the lift truck will go in forward.
- **Reverse:** To select and move the truck in the reverse direction you must push down on the (REV arrow) right side of the Unitrol pedal. The farther the pedal is depressed the faster the lift truck will go in reverse.
- **Neutral:** The unitrol pedal activates only FWD and REV. Neutral is activated only when the parking brake is set.



## IMPORTANT

**For safety reasons, your CLARK forklift truck is fitted with a neutral start switch. The purpose of this is to prevent the engine from being started while the transmission is in gear. Thus the engine may only start when the direction control lever is in the neutral position.**



## CAUTION

**If the truck will start with the direction control in either forward or reverse, there is a problem with the neutral start switch and it must be repaired.**

## CGC / CGP Hydrostatic Controls

### Brake Pedal/Pedals

The hydrostatic lift truck can be configured three ways:

- Standard, automotive or common lift truck = 2 brake pedals
- Two Pedal, forward and reverse pedals = 1 brake pedal
- Unitrol, one pedal controls FWD and REV = 2 brake pedals



### CAUTION

**On ramps or inclines the brake pedal should be used. The lift truck could move involuntarily backwards or forwards.**

Releasing the travel pedals will cause the truck to decelerate and stop.

The preferred method of braking is to lift your foot from the direction or ground speed pedal, the truck will then come to a stop.

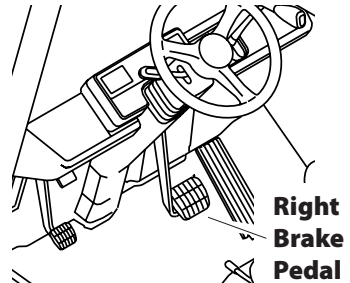
### IMPORTANT

**The Clark Hydrostatic Lift Truck uses the pump for dynamic braking to slow down and stop the trucks direction of travel. The brake pedal can still be used in extreme conditions.**

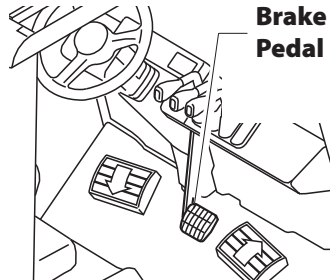


### CAUTION

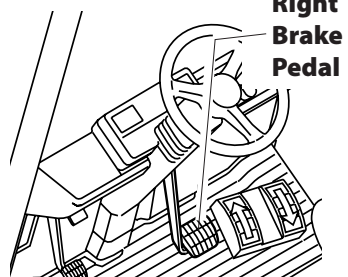
**Stop the lift truck as gradually as practical. Hard braking and wheel sliding are dangerous, increase wear can cause you to lose a load and damage the lift truck. Hard braking can also cause tip-over.**



Standard Control



Two Pedal Control



Unitrol Pedal Control

## Ground Speed Control (acceleration)

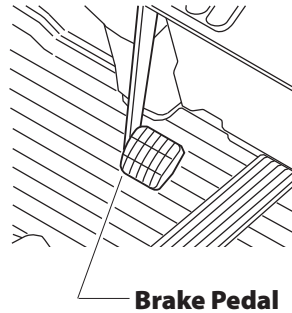
With the parking brake released and the direction control in FWD or REV, put your foot on the pedal (depending on configuration), push down smoothly until the truck is moving at the desired speed.

## Stopping the Truck

### IMPORTANT

**The preferred method of braking is to lift your foot from the direction or ground speed pedal, the truck will then come to a stop.**

The conventional brake pedal can be used to stop the truck if necessary. The brake pedal should be used to hold the truck on a ramp or incline.



## Preferred Method of Inching

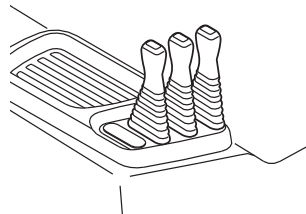
Hydraulic lever functions (lift, tilt and aux.), when actuated, will automatically raise the engine RPM. This feature helps provide increased function or hydraulic speed without the need for "conventional inching". The raised engine speed due to the hydraulics being actuated will not effect the trucks ground speed.

### IMPORTANT

**Ground speed is controlled by the accelerator pedal only.**

## Optional Hydraulic Control Levers (Deck Mounted)

The deck mounted levers are mounted on the seat deck to the right of the operator. The levers of the control valve activate the lift, tilt functions as and any other hydraulic devices which are installed on the truck.





# Operator Maintenance and Care

## Contents

Daily Safety Inspection.....	5-2
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Refueling LPG Tanks .....	5-6
Refueling CNG Tanks.....	5-8

### NOTICE

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



## Daily Safety Inspection

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

Check for damage and maintenance problems; have repairs made before you operate the truck. Unusual noises or problems must be reported immediately to your supervisor or other designated authority.

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



### CAUTION

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

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

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



### WARNING

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

## Visual Checks

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

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



### CAUTION

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

5. Be sure that the driver's overhead guard, load back rest and all other safety devices are in place, securely fastened and undamaged. Inspect for damaged or missing parts, corrosion, cracks, breaks etc.
6. Check all of the critical components that handle or carry the load.
7. 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, rust, corrosion, bent parts, cracks, etc.
8. Carefully inspect the load forks for cracks, breaks, bending, twists, and wear. Be sure that the forks are correctly installed and locked in their proper position.
9. Inspect the wheels and tires for safe mounting, wear condition, and air pressure.
10. Check the hydraulic sump oil level, engine oil level, and fuel level.

## Functional Checks

Check the operation of the truck as follows.

### NOTICE

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

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

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

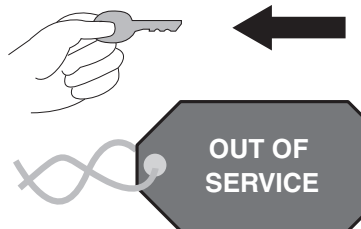
## Concluding the Inspection

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

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

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

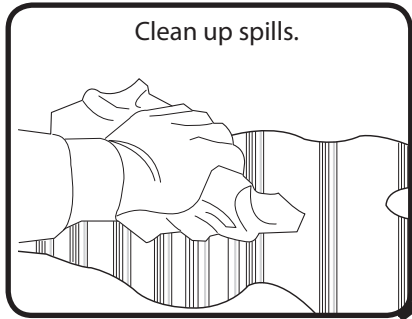
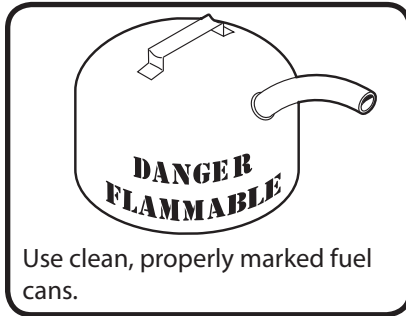
If all of the Daily Inspection checks were normal or satisfactory, the truck can be operated.



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## Fuel Safety Practices

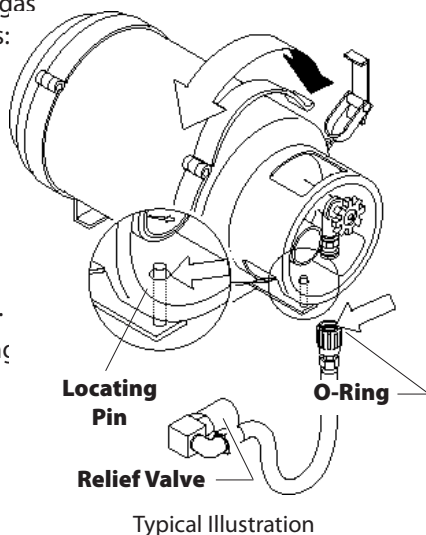
### Refueling Gasoline and Diesel Trucks



## Refueling LPG Tanks

When changing liquefied petroleum gas (LPG), tanks follow these basic rules:

- Change only in well ventilated areas.
- Never allow open flames.
- Turn the ignition switch to the OFF position.
- Check for leaks.
- Check condition of the O-ring.
- Make sure tank is on locating pin.
- Make sure tank latches are securely fastened.
- Store tanks according to local fire codes



If you refill LPG tanks:

- Make sure you know and understand the proper procedure for filling an LPG tank.
- If you have any questions on refilling LPG tanks, please ask your supervisor.



### **DANGER**

**LPG IS HEAVIER THAN AIR. It settles on your clothes and the ground around you, displacing oxygen vital for breathing. Open flame can cause flash fires.**

### **IMPORTANT**

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

## RECOMMENDED SAFETY MAINTENANCE PROCEDURES FOR LPG FUELED LIFT TRUCKS



### WARNING

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

The fuel valve should be turned off when the machine is not in service. Cast fittings should not be used in the LPG system. Use only Underwriters Laboratories or Factory Mutual listed LPG hose assemblies where pressure fuel lines are required. All pipe threaded fittings should be installed using an approved sealing compound. Fuel lines should be supported by clamps to minimize chafing and wear. The LPG solenoid valve should be wired to an automatic shut off switch (oil pressure or vacuum) to prevent leakage of gas in the event the ignition is on without the engine running. Check the LPG solenoid or vacuum shutoff valve for leakage as follows:

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

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

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

**SERVICE WORK SHOULD BE PERFORMED BY  
QUALIFIED PERSONNEL ONLY.**

Refueling LPG



## Refueling CNG Tanks



### WARNING

**Contents of the CNG tank are under extreme pressure. When refueling be very cautious. Make sure there is NO SMOKING, NO OPEN FLAMES. Make sure engine is turned off. CNG IS A HIGHLY FLAMMABLE GAS.**

When refueling a CNG (compressed natural gas) system, follow these basic rules:

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

**Refueling Procedure:** Your truck is equipped with a standard fill block. The fueling station has a standard fuel probe with a shut-off valve. Your truck and fueling station may be equipped with optional fueling adaptors. Make sure that you understand how to use them. If you have any questions, please ask your supervisor. For proper fueling procedures, follow the steps below.

### IMPORTANT

**Before refueling your CNG truck, examine the fueling probe and make sure the O-rings are not damaged or missing.**

Follow these basic steps:

1. Remove the dust cover.
2. Insert the fuel probe into the fuel fill block. Make sure it is inserted all the way.
3. Slowly turn the valve to the full open position.
4. When the tank reaches full, the fueling station automatically shuts off. Your pressure gauge will read about 3600 psi. This is the maximum operating pressure.





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



**CAUTION**

**If leakage should occur, close the valve on the probe and have qualified personnel make repairs.**



# WARNING

**THIS TRUCK RUNS ON COMPRESSED NATURAL GAS (CNG), A COLORLESS GAS STORED UNDER VERY HIGH PRESSURE. CNG IS LIGHTER THAN AIR. IT COLLECTS IN CLOSED PLACES. DO NOT ALLOW GAS TO ESCAPE INDOORS OR INTO CONFINED SPACES. FIRE AND EXPLOSION MAY RESULT CAUSING SEVERE INJURIES.**

- Follow your employer's work rules for refueling, operating, inspecting, and parking trucks.
- To fill tank turn off key switch, lights and all truck accessories. No smoking, sparks or flames allowed.
- If you smell or hear leaks do not start truck. If you think CNG is leaking tell your supervisor immediately.
- If a leak starts at any time, or you see a fire, turn off emergency shut off or tank valve and key switch; tell your supervisor.
- Park only where your supervisor says it is safe. Turn off key switch, tank valve, and set parking brake.
- Fuel tanks must be periodically inspected and pressure tested. Inspect all lines and components for wear, damage, and secure routing.

**ALL SERVICE WORK SHOULD BE PERFORMED BY QUALIFIED PERSONNEL ONLY.**

Clark Material Handling Co., 1992

CNG Warning

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# Emergency Starting and Towing

## Contents

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



## How to Tow a Disabled Truck

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

### IMPORTANT

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



### WARNING

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

1. Be sure to apply the parking brake or block the drive wheels on the disabled truck while working around it.
2. When possible, raise the carriage (forks) on the disabled truck about 12 inches (300 mm) from the floor or ground. Secure the carriage with a chain.
3. Obtain another lift truck of equal or larger size carrying a partial load for traction.
4. Check that the counterweight bolts are in place and properly torqued. (This bolt is made of a special high-tensile steel and is not commercially available. Replace it, when necessary, only with a genuine Clark replacement part).
5. Use an approved, solid metal tow bar with towing couplers that connect to the towing pins in the counterweights.
6. Release the parking brake on the towed vehicle.
7. Transmission control is in neutral.

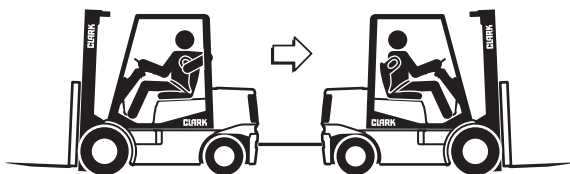
### NOTICE

**DOT approved towing equipment may be available from your Clark dealer.**

8. Tow the disabled truck backward. **An operator must be on the towed truck.**

Tow the truck slowly. Careful towing is necessary to prevent injury to personnel or damage to the truck. The truck should be towed at a speed of less than 5 m.p.h. (8 kph) with a driver in the seat. Do not lift the truck or any wheels off the floor or ground while the truck is being towed.





### CAUTION

**The power steering and brakes will not operate on the disabled truck when the engine is not running. Manual operation of the handwheel and brakes will be difficult to operate. More manual effort will be required to perform these functions.**

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



### WARNING

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

## Towing a Disabled Hydrostatic Truck

Clark does not recommend towing a disabled Hydrostatic lift truck without first consulting your service manual.



### CAUTION

**If the Hydrostatic lift truck can not be moved under its own power you should have a trained and authorized mechanic look at it immediately. If a disabled hydrostatic lift truck is moved or towed by an unauthorized person, the result could be serious damage to the Hydrostatic drive train.**

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



## How to Use Battery Jumper Cables

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

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.



### CAUTION

**USE ONLY A 12-VOLT, NEGATIVE GROUND SYSTEM to jump your truck. You can injure yourself and permanently damage your truck's 12-volt starting motor and ignition system by connecting it to a 24-volt power supply (two 12-volt batteries in series or a 24-volt generating set) or to a positive-ground system.**



### WARNING

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

1. If the discharged battery has filler caps, check the fluid level. Do not use an open flame to check and do not smoke. If low, add distilled water to the correct level. Be sure to install the caps before jump starting.

Do not jump start, charge, or test a sealed-type battery if the test indicator looks illuminated or has a bright color. Install a new battery.



## WARNING

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

**Hydrogen gas is produced during normal battery operation. Hydrogen can explode if flames, sparks, or lighted tobacco are brought near the battery. When charging or using a battery in an enclosed space, always provide ventilation and shield your eyes. Wear safety glasses 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 NEUTRAL position.
  - c. Turn the key/start switch to the OFF position.
  - d. Turn all accessories to the OFF position and leave them off until after the engine has been started and the jumper cables have been removed.

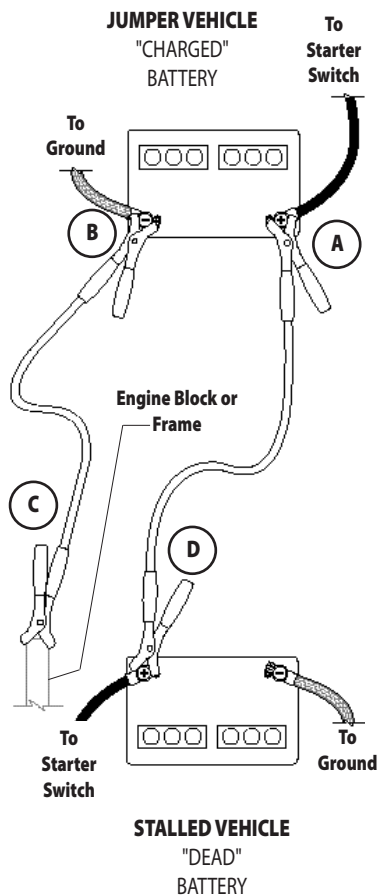


## WARNING

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

5. Connect the jumper cables in the following sequence:

- Connect a jumper cable from the positive (+; red) terminal on one battery to the positive (+; red) terminal on the other battery. Never connect positive (+; red) to negative (-; black), or negative to positive.
- Connect one end of the second cable to the grounded negative (-; black) terminal of the "Jumper Vehicle" battery.
- Connect the other end of the second cable to a stationary, solid metallic point **on the engine** of the "Stalled Vehicle," **not to the negative (+; black) terminal** of its battery. Make this connection at a point at least 18 inches (450 mm) away from the battery, if possible. Do not connect it to pulleys, fans or other parts that move. Do not touch hot manifolds that can cause severe burns.



- Start the engine on the "Jumper Vehicle" and run the engine at a moderate speed for a minimum of five minutes.
- Start the engine on the "Stalled Vehicle." Follow the starting instructions in Section 5, "Starting and Operating Procedures" in this manual. Be sure that the engine is at idle speed before disconnecting the jumper cables.
- Remove the jumper cables by reversing the installation sequence exactly. Start by removing the last jumper cable from the stalled vehicle first. Remove the cable end from the engine block first, then the other end of the negative (-; black) cable.
- Remove both ends of the positive (+; red) cable.



# Planned Maintenance and Lubrication

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### NOTICE

**THIS SECTION IS FOR TRAINED SERVICE PERSONNEL to use as a reference for Planned Maintenance procedures. Complete maintenance information is in the Service Manuals.**



## Introduction

### NOTICE

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



### CAUTION

**Powered industrial trucks may become hazardous if maintenance is neglected.**

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

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

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

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

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



## Safe Maintenance Practices

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

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



## CAUTION

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

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

14. Fuel systems must be checked for leaks and condition of parts. Extra special consideration must be given in the case of a leak in the fuel system. Action must be taken to prevent the use of the truck until the leak has been corrected.
15. All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt and lift cylinders, valves, and other parts must be checked to assure that "drift" or leakage has not developed to the extent that it would create a hazard.
16. When working on the hydraulic system, be sure the engine is turned off, upright is in the fully-lowered position, and hydraulic pressure is relieved in hoses and tubing.



### **WARNING**

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

17. The truck manufacturer's capacity, operation, and maintenance instruction plates, tags, or decals must be maintained in legible condition.
18. Batteries, limit switches, protective devices, electrical conductors, and connections must be maintained in conformance with good practice. Special attention must be paid to the condition of electrical insulation.
19. To avoid injury to personnel or damage to the equipment, consult the manufacturer's procedures in replacing contacts on any battery connection.
20. Industrial trucks must be kept in a clean condition to minimize fire hazards and help in detection of loose or defective parts.
21. Modifications and additions that affect capacity and safe truck operation must not be done without the manufacturer's prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals must be changed accordingly.

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



### **WARNING**

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

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

### **IMPORTANT**

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

## NOTICE

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

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

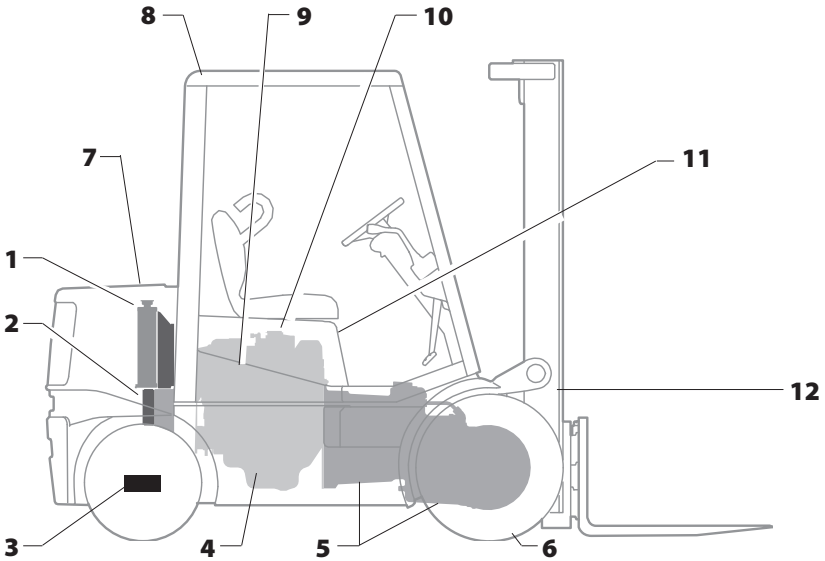
*NFPA 505: Fire Safety Standard for Powered Industrial Trucks: Type Designations, Areas of Use, Maintenance and Operation.* Available from National Fire Protection Association, Inc., Batterymarch Park, Quincy, MA 02269.

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



## Major Component Locations

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



- |                         |                            |
|-------------------------|----------------------------|
| 1. Engine Cooling       | 7. Frame and Counterweight |
| 2. Transmission Cooling | 8. Overhead Guard          |
| 3. Steer Axle           | 9. Exhaust                 |
| 4. Engine               | 10. Carburation            |
| 5. Transaxle            | 11. Sheet Metal            |
| 6. Wheels and Tires     | 12. Upright and Carriage   |

The truck shown above is a typical representation of a Clark internal combustion lift truck. Your model may vary slightly.





## Planned Maintenance Intervals

Time intervals between maintenances are largely determined by operating conditions. For example, operation in sandy, dusty locations requires shorter maintenance intervals than operation in clean warehouses. The indicated intervals are intended for **normal** operation. The operating condition classifications are:

### Normal Operation

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

### Severe Operation

Prolonged operating hours or constant usage.

### Extreme Operation

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

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

### NOTICE

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

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

PM Interval:

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

PERIODIC CHECKS and PLANNED MAINTENANCE (PM)	A	B	C	D	E
Check truck visually and inspect components.	•				
Test drive truck/check functional performance.	•				
Air clean truck and radiator.	•				
Check torque on critical fasteners.	•				
Lubricate truck. (See component)	•				
Drain and replace engine oil.	•				
Replace gas engine oil filter.		•			
Replace diesel engine oil filter.		•			
Clean and replace engine air filter. (*)					•
Change diesel fuel filter (***)		•			
Inspect / adjust fan belts.			•		
Drain / flush radiator coolant.					•
Check engine ignition and timing.			•		
Engine tune-up.					•
Check battery.			•		
Check transaxle fluid level.					•
Change transaxle fluid. (drain and replace)					•
Change (replace) transaxle oil filter.		•			
Clean drive axle air vent.					•
Check brake condition and wear.					•
Check drive axle mounting and fasteners.				•	
Lubricate steer axle linkage.		•			
Check / lubricate steer axle wheel bearings.					•
Change / replace hydraulic sump oil filter and breather. (**)				•	
Change / replace hydraulic sump fluid and oil filter. (**)					•
Lubricate tilt cylinder rod ends.		•			
Check lift chain adjustment and wear.		•			
Check / lubricate lift chains.		•			
Lubricate upright rollers.		•			

NOTES:

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

DAILY MAINTENANCE CHECKS	A	B	C	D	E
Check truck for obvious damage and leaks.	•				
Check fuel system for leaks, etc.	•				
Check capacity, warning plates and decals.	•				
Check condition of tires and wheels. Remove embedded objects. Check air pressure.	•				
Check for missing or loose wheel lugs nuts.	•				
Check engine oil level.	•				
Check engine coolant level (radiator and recovery tank)	•				
Check transaxle fluid level	•				
Check fuel level.	•				
Check hydraulic sump oil level.	•				
Check gauges and instruments.	•				
Check warning lights and hour meter.	•				
Check overhead guard condition and bolts.	•				
Check horn operation and other warning devices.	•				
Check steering operation.	•				
Check service brake operation.	•				
Check parking brake operation.	•				
Check parking brake linkage for damage, broken parts.	•				
Check directional and speed controls operation.	•				
Check accelerator and engine speed operation.	•				
Check lift, tilt and aux. operation.	•				
Check upright, lift chains and fasteners.	•				
Check carriage or attachments and forks.	•				
Check seat deck hold-down latch for correct locking.	•				
Check optional safety equipment. (alarms, lights etc.)	•				

## PM Report Form

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

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

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

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



## How to Perform Planned Maintenance

### Visual Inspection

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

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

### NOTICE

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

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

Check for hydraulic oil leaks and loose fittings.



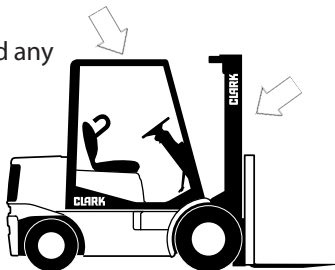
### CAUTION

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

### Overhead Guard

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

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



### Load Handling Components

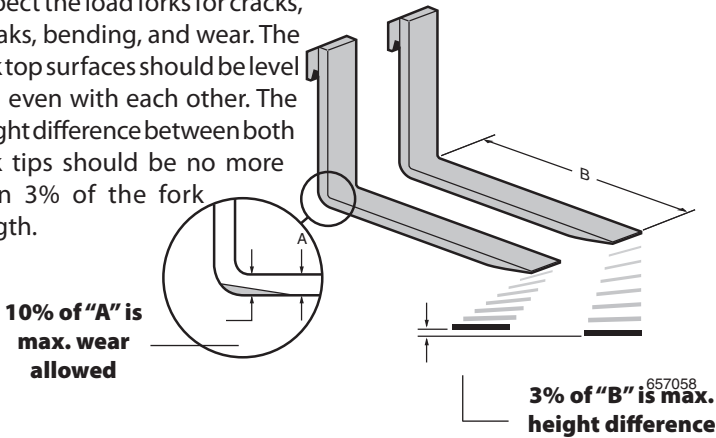
Inspect the upright assembly, load backrest (LBR), rails, carriage rollers, lift chains, and lift and tilt cylinders. Look for obvious wear and maintenance problems and damaged or missing parts. Check for any loose parts or fittings. Check for leaks, damaged or loose rollers, and rail wear (metal flaking).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

### IMPORTANT

**Uprights and lift chains require special attention and maintenance to remain in safe operating condition. Refer to "Lift Chain Maintenance" in this Section for additional information.**

## Forks

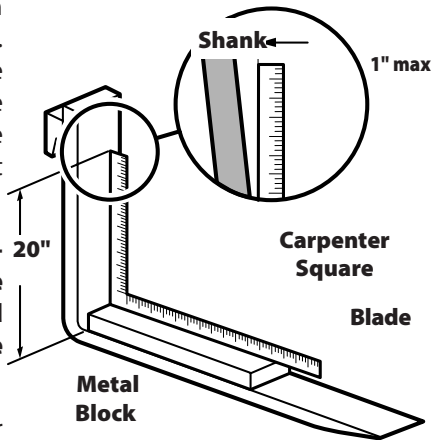
Inspect the load forks for cracks, breaks, bending, and wear. The fork top surfaces should be level and even with each other. The height difference between both fork tips should be no more than 3% of the fork length.



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

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

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

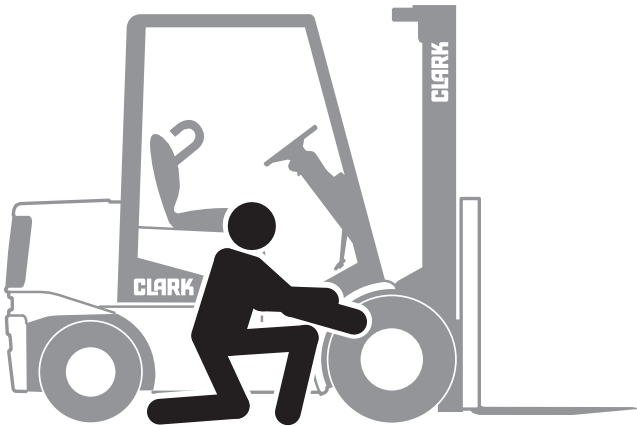
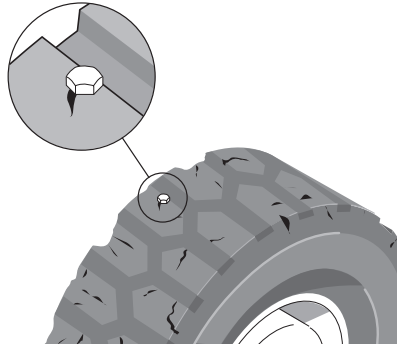


Inspect the fork locking pins for cracks or damage. Reinsert them and note whether they fit properly.

## Wheels and Tires

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

Check all wheel lug nuts or bolts to be sure none are loose or missing. Replace missing bolts or lug nuts. Torque loose or replaced items to specifications.



### WARNING

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

## Functional Tests

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

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

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

### Horn

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

### Neutral Start Switch

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

### Hour Meter

Start the engine and let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal. Check the hour meter for operation with the engine running. **Write the hour meter reading on the PM report form.** Report any malfunction or damage.

### Indicator Lights

Check that all lights are functioning and indicate normal truck operation as described in Section 3, "Know Your Truck," in this manual.

### Service Brakes and Inching Pedal

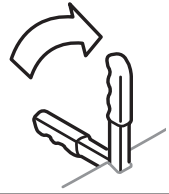
With the direction control in NEUTRAL and the engine running, push the service brake pedal fully down and hold. The brakes should apply before the pedal reaches the floorplate. If the pedal continues to creep downward, report the failure immediately. **Do not operate the truck until the brakes are repaired.**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





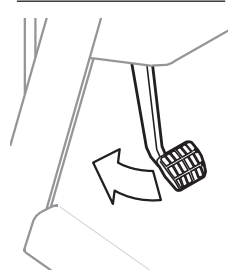
## Parking Brake

Check the function of the parking brake. Release, then reapply. To check parking brake holding capability, park the lift truck on a grade and apply the parking brake. The parking brake should hold a lift truck with rated load on a 15% grade.



### CAUTION

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



## Lift Mechanisms and Controls

Pull back on the tilt control lever and hold until the upright reaches the full back tilt position. Push forward on the lever to return the upright to the vertical position. Release the lever



### CAUTION

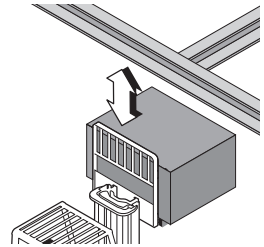
**Be sure that there is adequate overhead clearance before raising the upright.**

Pull back on the lift control lever and raise the fork carriage to full height. Watch the upright assembly as it rises. Release the lever.

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

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

All movements of the upright, fork carriage, and lift chains must be even and smooth, without binding or jerking. Watch for chain wobble or looseness; the chains should have equal tension and move smoothly without noticeable wobble.



## Auxiliary Controls (Option)

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



## Steering System

### NOTICE

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

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



### WARNING

**Fasten your seat belt before driving the truck.**

### Direction Control, Braking, and Inching

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

1. Push firmly on the brake pedal. Release the parking brake. Move the directional control lever from NEUTRAL to FORWARD.
2. Remove your right foot from the service 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 service brake pedal to stop the truck. The brakes should apply smoothly and equally.

Be sure the travel area is clear behind the truck.

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

4. Put the directional control in FORWARD. Press the inching pedal fully down and hold. Depress the accelerator. The truck should not move. Now, with the accelerator still depressed, slowly release the inching pedal until the truck "inches" forward smoothly and slowly.

Report any problems.

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

### Fluids, Filters, and Engine Accessories

To check fluid levels and other components within the engine compartment, unlatch and open the hood to access the engine compartment.



#### CAUTION

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

### Engine Accessories

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

### Engine Air Cleaner

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

Change or service the air cleaner element every 2000 operating hours, depending upon your application. Service intervals may also be determined by the air restriction indicator.

## Battery

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



### WARNING

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

## Engine Cooling System

To check engine coolant level open the hood to the engine compartment. Visually inspect the recovery bottle, locate the "HOT" and "COLD" marks. The "HOT" mark indicates maximum level at operating temperature. The "COLD" mark indicates additional coolant needs to be added to the system.

### IMPORTANT

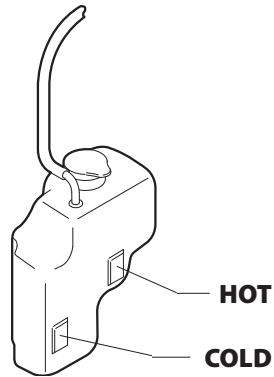
**The recovery bottle shown is a typical illustration of overflow system. Your actual system may vary slightly.**

### IMPORTANT

**A level anywhere between the HOT and COLD marks is normal.**

### IMPORTANT

**Inspect the coolant level in the overflow bottle only.**



### WARNING

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



### WARNING

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

If the level is low, add a 50/50 mixture of specified coolant and water to the correct fill level. If you have to add coolant more than once a month or if you have to add more than one quart at a time, check the coolant system for leaks.

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

#### NOTICE

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

#### Engine Oil and Filter

Locate the engine oil dipstick. Pull the dipstick out, wipe it with a clean wiper, and reinsert it fully into the dipstick tube. Remove the dipstick and check oil level.

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

It is recommended to:

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



#### WARNING

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

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

## NOTICE

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

OIL PERFORMANCE DESIGNATION: To help achieve proper engine performance and durability, use only engine lubricating oils of the proper quality. For gas and diesel engines, CLARK recommends that you use motor oil that meets API Service Classification CD, CC/SG, SF and API CF-4 SAE 15W-40, gas engines can also use API SD SAE 10W-30 oil or better.

### Hydraulic Sump Tank

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

Hydraulic fluid expands as its temperature rises. Therefore, it is preferable to check the fluid level at operating temperature (after approximately 30 minutes of truck operation). To check the fluid level, first park the truck on a level surface and apply the parking brake. Put the upright in a vertical position and lower the fork carriage fully down. Pull the dipstick out, (attached to the sump breather) wipe it with a clean wiper, and reinsert it. Remove dipstick and check oil level. Keep the oil level above the LOW mark on the dipstick by adding recommended hydraulic fluid only, as required.

#### **Do not overfill.**

Check the condition of the hydraulic fluid (age, color or clarity, contamination). Change (replace) the oil as necessary.

### Hydraulic Fluid and Filter Change

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



### Sump Tank Breather Maintenance and Inspection

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

### Transaxle Fluid Check

Before checking, run the engine until the unit is at operating temperature. This is important since transmission oil temperature should be minimum of 150°F to 250°F maximum, the engine should also be at operating temperature. Apply the parking brake.

With the engine operating at idle and the transmission in NEUTRAL, and the parking brake set, check the fluid on the dipstick. Fill, if necessary, to the FULL mark on the dipstick, using CLARK transmission fluid.

#### NOTICE

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

### Lubrication

#### Truck Chassis Inspection and Lubrication

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



#### WARNING

**Do not raise the truck by lifting under the counterweight.**

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

#### Upright and Tilt Cylinder Lubrication

Clean the fittings and lubricate the tilt cylinder rod end bushings (forward end) and both the base rod-end bushings (rear end). Clean and lubricate the upright trunnion bushings.

## Lift Chains

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

### IMPORTANT

**Do not lubricate the carriage roller rails.**

## Air Cleaning

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

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

### IMPORTANT

**Lift trucks should be air cleaned at every PM interval, or more often if necessary.**

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



### CAUTION

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

Air clean the upright assembly, drive axle, radiator—from both counterweight and engine side, engine and accessories, driveline and related components, and steer axle and cylinder.





## Critical Fastener Torque Checks

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

Critical items include:

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

Torque specifications are in your Service Manual.

## Lift Chain Maintenance

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



### WARNING

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

## Lift Chain Inspection and Measurement

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

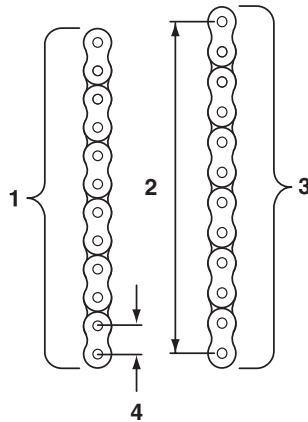
- Rust and corrosion, cracked plates, raised or turned pins, tight joints, wear, and worn pins or holes.
- When the pins or holes become worn, the chain becomes longer. When a section of chain is 3% longer than a section of new chain, the chain is worn and must be discarded.
- Chain wear can be measured by using a chain scale or a steel tape measure. When checking chain wear, be sure to measure a segment of chain that moves over a sheave. Do not repair chains by cutting out the worn section and joining in a new piece. If part of a chain is worn, replace all the chains on a truck.

## Lift Chain Lubrication

Lift chain lubrication is an important part of your maintenance program. The lift chains operate under heavy loadings and function more safely and have longer life if they are regularly and correctly lubricated. CLARK chain lubricant is recommended; it is easily sprayed on and provides superior lubrication. Heavy motor oil may also be used as a lubricant and corrosion inhibitor.

## Lift Chain Wear and Replacement Criteria:

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



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

### NOTICE

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

# Specifications

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# GPX

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

GPX 12E	2,500 lbs	@	24in load center	[1250 kg]	@	[500mm]
GPX 15E	3,000 lbs	@	24in load center	[1500 kg]	@	[500mm]
GPX 17E	3,500 lbs	@	24in load center	[1750 kg]	@	[500mm]

Note: Rated capacity applies when using uprights with maximum MFH up to and including: HVTSD 151 In. [3855mm], HVTSU 152 in. [3875mm]

## Engine Gas/LPG

Model Mitsubishi .....	4G63
Cylinders .....	4
Liters .....	2.0
Ign. Timing (gas) .....	4° BTDC
Ign. Timing (LP) .....	9° BTDC
Firing Order .....	1-3-4-2
Engine Speed +/- 50 @	
High Idle .....	2600
Full Load .....	1800

## Cooling System

Crossflow radiator • Separate transmission oil cooler

Cooling system pressure (radiator cap): 7 kPa nominal, 6.8 psi

Thermostat: [95°C] 203°F, fully open

## Powershift Transmission

CLARK Model TA-12 Transaxle

Overall Ratios .....	13.07:1
Conv. Stall Ratio .....	3.15:1

## Drive Axle

Full floating straight drive axle with self-adjusting drum-and-shoe brakes at drive wheels. Spiral bevel ring and pinion gear set.





# CMC, CMP

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CMC 15	3,000 lbs	@	24in load center	[1500 kg]	@	[500mm]
CMC 18	3,500 lbs	@	24in load center	[1800 kg]	@	[500mm]
CMC 20S	4,000 lbs	@	24in load center	[2000 kg]	@	[500mm]
CMP 20	4,000 lbs	@	24in load center	[2000 kg]	@	[500mm]
CMP 25	5,000 lbs	@	24in load center	[2500 kg]	@	[500mm]
CMP 30	6,000 lbs	@	24in load center	[3000 kg]	@	[500mm]
CMP 40	8,000 lbs	@	24in load center	[4000 kg]	@	[500mm]
CMP 45	9,000 lbs	@	24in load center	[4500 kg]	@	[500mm]
CMP 50S	10,000 lbs	@	24in load center	[5000 kg]	@	[500mm]
CMP 50	11,000 lbs	@	24in load center	[5000 kg]	@	[600mm]
CMP 60	13,500 lbs	@	24in load center	[6000 kg]	@	[600mm]
CMP 70	15,500 lbs	@	24in load center	[7000 kg]	@	[600mm]
CMP 75S	16,500 lbs	@	24in load center	[7500 kg]	@	[600mm]

Note: Rated capacity applies when using standard uprights.

## Engine; Gas/LPG (Models CMC 15,20S, CMP 15-20S)

Model Mitsubishi .....	4G63
Cylinders .....	4
Liters .....	2.0
Engine speed +/- 50 @	
Idle .....	800
No Load .....	2600
Full Load .....	2300

## Engine, Gas/LPG (Models CMP 20, 25, 30)

Model Mitsubishi .....	4G64
Cylinders .....	4
Liters .....	2.4
Engine speed +/- 50 @	
Idle .....	800
No Load .....	2600
Full Load .....	2100

## Engine, LPG (Models CMP 40, 45, 50S, 50, 60, 70, 75S)

Model GM .....	V6
Cylinders .....	6
Liters .....	4.3
Engine speed +/- 50 @	
Idle .....	750
No Load .....	2650
Full Load .....	2000



**Engine, Diesel (Models CMP 20, 25, 30)**

Model Yanmar .....	4TNE 94
Cylinders .....	4
Liters .....	2.8
Engine speed +/- 50 @	
Idle .....	750
No Load .....	2500
Full Load .....	2700

**Engine, Diesel (Models CMP 40, 45, 50S, 50, 60, 70, 75S)**

Model Perkins .....	1004-42
Cylinders .....	4
Liters .....	4.2
Engine speed +/- 50 @	
Idle .....	750
No Load .....	2400
Full Load .....	2200

**Cooling System**

Automotive type crossflow radiator.

*(See Service Manual)*

**Powershift Transmission** *(See Service Manual)*

**Drive Axle** *(See Service Manual)*

## Wheels and Tires

Drive:	CMC 15/18	18 x 7 x 12.125		
	CMC 20S	18 x 7 x 12.125		
	CMP 15/18/20S	6.5 x 10	12 ply rating	
	CMP 20/25	7 x 12	14 ply rating	
	CMP 30	8.15 x 15	14 ply rating	
	CMP 40	(single)	8.25 x 15	14 ply rating
		(duals)	7.5 x 15	12 ply rating
	CMP 45	(single)	8.25 x 15	16 ply rating
		(duals)	7.5 x 15	12 ply rating
	CMP 50S	(single)	300 x 15	18 ply rating
(duals)		7.5 x 15	12 ply rating	
CMP 50/60/70/75S	8.15 x 15	14 ply rating		
Steer:	CMC 15/18/20S	16 x 5 x 10.5		
	CMP 15/18	5 x 8	8 ply rating	
	CMP 20S	5 x 8	10 ply rating	
	CMP 20/25/30	6.5 x 10	12 ply rating	
	CMP 40/45/50S	7 x 12	14 ply rating	
	CMP 50/60/70/75S	8.15 x 15	14 ply rating	

## Standard Electrical System

Type: 12 volt DC, negative ground

Fuses: 15 amps (in-line)

## Fuel Recommendations

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

Gasoline: 87 octane minimum

LPG: HD-5 propane

## Fill Capacities (fluid volumes - gallons, quarts, pints/liters)

	Cooling system	Eng. oil, w/filter	Transaxle	Hydraulic sump
CMC15-20S	2.2G [8.5L]	4.2Q [4.8L]	26P [12L]	6.5G [25L]
CMP15-20S	2.2G [8.5L]	4.2Q [4.8L]	26P [12L]	8G [31L]
CMP20-30	2.2G [8.5L]	4.2Q [4.8L]	33P [16L]	10G [38L]
CMP40-50S (LPG)	4.5G [17L]	6.3Q [6.6L]	40P [19L]	17G [64L]
CMP50-75S	6.6G [25L]	6.3Q [6.6L]	16P [7.5L]	29G [110L]
CMP50-75S (LPG)	6.6G [25L]	6.3Q [6.6L]	16P [7.5L]	29G [110L]





**Truck Weights** (approximate, with cutoff height upright)

	<i>Empty Vehicle Weight (lbs)</i>	<i>Loaded Drive Axle (lbs)</i>	<i>Loaded Steer Axle (lbs)</i>
<b>CMC 15-20S Gas/LPG</b>			
CMC 15	6200 [2810kg]	8100 [3680kg]	1400 [630kg]
CMC 18	6640 [3010kg]	9130 [4140kg]	1475 [670kg]
CMC 20S	7000 [3160kg]	9347 [4240kg]	1600 [720kg]
<b>CMP 15-20S Gas/LPG</b>			
CMP 15	5930 [2690kg]	7950 [3606kg]	980 [445kg]
CMP 18	6210 [2817kg]	8550 [3878kg]	1160 [526kg]
CMP 20S	6755 [3070kg]	9660 [4390kg]	1500 [680kg]
<b>CMP 20-30 Gas/LPG</b>			
CMP 20	7750 [3515kg]	10485 [4755kg]	1075 [760kg]
CMP 25	8255 [3745kg]	12225 [5545kg]	1545 [700kg]
CMP 30	9225 [4185kg]	13900 [6305kg]	1940 [880kg]
<b>CMP 20-30 Diesel</b>			
CMP 20	7850 [3560kg]	10700 [4850kg]	1565 [710kg]
CMP 25	8350 [3790kg]	12300 [5580kg]	1545 [700kg]
CMP 30	9260 [4200kg]	14020 [6360kg]	1851 [840kg]
<b>CMP 40-50S Diesel and LPG</b>			
CMP 40	13205 [5990kg]	18440 [8365kg]	2480 [1125kg]
CMP 45	13890 [6300kg]	20105 [9120kg]	2600 [1180kg]
CMP 50S	15210 [6900kg]	22630 [10265kg]	2500 [1135kg]
<b>CMP 50-75S Diesel and LPG</b>			
CMP 50	18585 [8430kg]	26312 [11935kg]	3295 [1495kg]
CMP 60	19820 [8990kg]	29490 [13375kg]	3560 [1615kg]
CMP 70	21210 [9620kg]	32660 [14815kg]	3980 [1805kg]
CMP 75S	21600 [9800kg]	35190 [15960kg]	3020 [1370kg]

# CGC/CGP/CDP

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## Model Designation — Rated Load Capacity

CGC/CGP/CDP	20 (D)	-4,000 lbs	@ 24in load center	[2000 kg]	@ [500mm]
CGC/CGP/CDP	25 (D)	-5,000 lbs	@ 24in load center	[2500 kg]	@ [500mm]
CGC/CGP/CDP	30 (D)	-6,000 lbs	@ 24in load center	[3000 kg]	@ [500mm]
CGC/CGP/CDP	40 (D)	-8,000 lbs	@ 24in load center	[4000 kg]	@ [500mm]
CGP/CDP	45 (D)	-9,000 lbs	@ 24in load center	[4500 kg]	@ [500mm]
CGC/CGP/CDP	50 (D)	-10,000lbs	@ 24in load center	[5000 kg]	@ [500mm]
CGC/CGP/CDP	55 (D)	-11,000lbs	@ 24in load center	[5500 kg]	@ [500mm]
GCG/CDC	60(D)	-13,500lbs	@ 24in load center	[6000 kg]	@ [500mm]
CGC/CDC	70(D)	-15,500lbs	@ 24in load center	[7000 kg]	@ [500mm]

Note: Rated capacity applies when using uprights with maximum MFH up to and including: 152 Inches [3861mm]

## Engine

### (Models CGC/CGP/CDP 20, 25, 30)

	<i>Diesel</i>	<i>Gas</i>	<i>LPG/CNG</i>
Model Mitsubishi:	S4S	4G64	4G64
Cylinders:	4	4	4
Displacement			
<i>cubic inches:</i>	201	146	146
<i>liters:</i>	3.3	2.4	2.4
Idle RPM:	650-750	650-750	650-750
Governed RPM			
<i>No load @ high idle:</i>	2700	2600	2600
<i>Full load:</i>	2220	1850	1850
			<i>LPG</i>
Model GM:			3.0
Cylinders:			4
Displacement			
<i>cubic inches:</i>			181
<i>liters:</i>			3.0
Idle RPM:			750-800
Governed RPM			
<i>No load @ high idle:</i>			2550-2650
<i>Full load:</i>			2400



**(Models CGC/CGP/CDP 40, 45, 50, 55, 60, 70)**

	<i>Diesel</i>	<i>Gas</i>	<i>LPG/CNG</i>
Model Perkins:	1004		
Model GM:		V6	V6
Cylinders:	4	6	6
Displacement			
<i>cubic inches:</i>	243	262	262
<i>liters:</i>	4.0	4.3	4.3
Idle RPM:	650-750	650-750	650-750
Governed RPM			
<i>No load @ high idle:</i>	2540	2650	2650
<i>Full load:</i>	2400	2500	2500

**Cooling System****(Models CGC/CGP/CDP 20, 25, 30)**

Automotive type crossflow radiator.

Cooling system pressure (radiator cap): 90 kPa nominal, 13psi

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

Gas/CNG/LPG 83°C (182°F), fully open 96°C (205°F)

**(Models CGC/CGP/CDP 40, 45, 50, 55, 60, 70)**

Automotive type crossflow radiator.

Cooling system pressure (radiator cap): 48 kPa nominal, 7 psi

Thermostat: Diesel, 82°C (185°F), fully open 95°C (203°F),

Gas/CNG/LPG 88°C (190°F), fully open 96°C (205°F)

**Powershift Transmission****(Models CGC/CGP/CDP 20, 25, 30)**

CLARK Model TA-30 Transaxle

Speeds: 1 forward /1 reverse

Overall Ratios: FWD/15.76 :1                      REV/11.063:1

Convertor Stall Ratio: 3.24:1

**(Models CGC 40, 50, 55)**

CLARK Model H-200 Transaxle, Single Speed

Speeds: 1 forward/1 reverse

Overall Ratios: FWD/13.188 :1                      REV/12.436 :1

Convertor Stall Ratio: 2.08:1

## (Models CGP/CDP 40, 45, 50, 55)

CLARK Model H-200 Transaxle

Speeds:	2 forward /2 reverse	
Overall Ratios (HIGH):	FWD/15.938 :1	REV/15.026:1
(LOW):	FWD/31.13:1	REV/29.338:1
Convertor Stall Ratio:	2.08:1	

### TA-30 Drive Axle

Full floating straight drive axle. 2 pinion differential w/hydraulic shoe brakes.

### HR-200

2 pinion differential, 3 piston Disc Brakes

### Wheels and Tires for Pneumatic Truck

<i>Drive</i>	CGP/CDP 20/25	Single: 7.00 X 12,	14-ply rating
<i>Tires:</i>		Dual: 7.00 X 12,	14-ply rating
	CGP/CDP 30	Single: 28 X 9 X 15	14-ply rating
		Dual: 7.00 X 12,	14-ply rating
	CGP/CDP 40/45	Single: 250 X 15,	16-ply rating
		Dual: 250 X 15,	16-ply rating
	CGP/CDP 50/55	Single: 300 X 15,	20-ply rating
		Dual: 250 X 15,	16-ply rating
<i>Steer:</i>	CGP/CDP 20/25	6.00 X 9,	10-ply rating
	CGP/CDP 30	6.50 X 10	10-ply rating
	CGP/CDP 40/45	7.00 X 12	12-ply rating
	CGP/CDP 50/55	7.00 X 12	12-ply rating

#### Tire Pressures:

<i>Drive:</i>	CGP/CDP 20/25	Single: 862 kPa	(125psi)
		Dual: 862 kPa	(125psi)
	CGP/CDP 30	Single: 862 kPa	(125psi)
		Dual: 862 kPa	(125psi)
	CGP/CDP 40/55	Single: 931 kPa	(135psi)
		Dual: 931 kPa	(135psi)
<i>Steer:</i>	CGP/CDP 20/25	862 kPa	(125psi)
	CGP/CDP 30		

### Wheels and Tires for Cushion Truck

		<i>Drive:</i>	<i>Steer:</i>
	CGC 20-25	21 X 7 X 15	16 X 5 X 10.5
CGC 30	21 X 8 X 15	16 X 6 X 10.5	
	CGC 40	22 X 9 X 16	18 X 6 X 12.12
	CGC 50-55	22 X 12 X 16	22 X 7 X 16
	CGC 60-70	22 X 14 X 16	22 X 8 X 16



**Standard Electrical System**

Type: 12 volt DC, negative ground

Fuses: 5, 15 amps

**Batteries:***BCI Group 45**BCI Group 31*

Gas, LPG, CNG

Diesel

Cold cranking current

12 volt DC- 420 amps

12 volt DC-625 amps

@ 0°F total

@ 0°F total

**Filters**

Engine air:

Dry type—replaceable element

Engine oil:

Spin-on

Transmission:

Spin-on

Hydraulic system oil:

100 mesh suction screen in sump tank and filter in return line - B10=5.0; (used for steering and brake system)

Hydraulic sump

breather cap:

Replaceable element

*Use genuine CLARK parts. See your CLARK dealer.***Truck Weights** (approximate, with cutoff height upright)

	<i>Gross Vehicle Weight (lbs)</i>	<i>Empty Vehicle Weight (lbs)</i>	<i>Loaded Drive Axle (lbs)</i>	<i>Empty Drive Axle (lbs)</i>
CGC 20	11580	7580	10055	3184
CGC 25	13426	8426	11540	2952
CGC 30	15318	9318	13112	2806
CGC 40	20891	12871	18379	5034
CGC 50	24852	14852	22431	6504
GCC 55	28881	16881	25942	6720
CGC 60	32309	18809	28922	7804
CGC 70	36359	20859	32415	8173
CGP 20	11617	7617	10314	3687
CGP 25	13466	8466	11810	3526
CGP 30	15262	9262	13393	3452
CDC 60	32309	18809	28922	7804
CDC 70	36359	20859	32415	8173
CDP 20	11837	7837	10399	3771
CDP 25	13686	8686	11895	3611
CDP 30	15482	9482	13478	3537
CGP 40	20881	12881	18925	1956
CGP 45	22675	13675	20475	5974
CGP 50	24180	14180	21897	6192
CGP 55	25981	14981	23011	6138

## Fuel Recommendations

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

Gasoline: 87 octane minimum

LPG: HD-5 propane

## Fill Capacities (fluid volumes)

Fuel tank:	20/30	12 US gallons; 45.4 liters	
	40/60	18.7 US Gallons	70.8 liters
Cooling system:	CGC	6.3 quarts;	6 liters
	CGP	8 quarts;	7.5 liters
	CDP	10.6 quarts;	10 liters

### (Mitsubishi)

Engine oil, w/filter (diesel): 10.6 quarts; 10 liters

Engine oil, w/filter (gas): 4.5 quarts 4.3 liters

### (Perkins)

Engine oil, w/filter (diesel): 8.0 quarts; 7.6 liters

### (GM 4.3)

Engine oil, w/filter (gas): 5.0 quarts 4.7 liters

### (GM 3.0)

Engine oil, w/filter (gas): 5.0 quarts 4.7 liters

## Transaxle:

TA-30	15 quarts;	14.2 liters
H-200	15 quarts;	14.2 liters

Hyd Sump:	CGC 20/30	5.1 US gallons; 19.3 liters
(Usable Volume)	CGP 20/30	7.3 US gallons; 27.6 liters
	CGP 40/55	16.9 US gallons; 63.8 liters

## Engine Coolant Recommendation

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

## Transmission Fluid Recommendation

Use CLARK Transmission Fluid.

## Hydraulic Fluid Recommendation

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



## CGC/CGP/CDP Hydrostatic

### Model Designation — Rated Load Capacity

CGC/CGP/CDP 20 (H) -4,000 lbs @ 24in load center [2000 kg] @ [500mm]

CGC/CGP/CDP 25 (H) -5,000 lbs @ 24in load center [2500 kg] @ [500mm]

CGC/CGP/CDP 30 (H) -6,000 lbs @ 24in load center [3000 kg] @ [500mm]

Note: Rated capacity applies when using uprights with maximum MFH up to and including: 152 Inches [3861mm]

<b>Engine</b>	<i>Diesel</i>	<i>Gas</i>	<i>LPG/CNG</i>
Model Mitsubishi:	S4S	4G64	4G64
Cylinders:	4	4	4
Displacement			
<i>cubic inches:</i>	201	146	146
<i>liters:</i>	3.3	2.4	2.4
Idle RPM:	650-700	650-700	650-700
Governed RPM			
<i>No load @ high idle:</i>	2600	2600	2600
<i>Full load:</i>	2220	1850	1850

### Cooling System

Automotive type crossflow radiator.

Cooling system pressure (radiator cap): 90 kPa nominal, 13psi

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

Gas/CNG/LPG 83°C (182°F), fully open 96°C (205°F)

### Hydrostatic Pump

Sauer-Sundstrand Series 90 axial piston, variable displacement unit

Maximum Displacement: 75 cm<sup>3</sup>/rev (4.57 in<sup>3</sup>/rev)

Maximum Pressure: 480 bar (7,000 psi)

Rated Pressure: 420 bar (6,000 psi)

### Drive Axle

Drive axle constructed with integral Rexroth radial piston hydraulic motors and hydraulic shoe brakes.

Motor Displacement: 2 X 565 cm<sup>3</sup>/rev (2 X 34.5 in<sup>3</sup>/rev)

Maximum Pressure: 450 bar (6,500 psi)

Rated Pressure: 450 bar (6,500 psi)

## Truck Weights lbs./kg (approximate, with cutoff height upright)

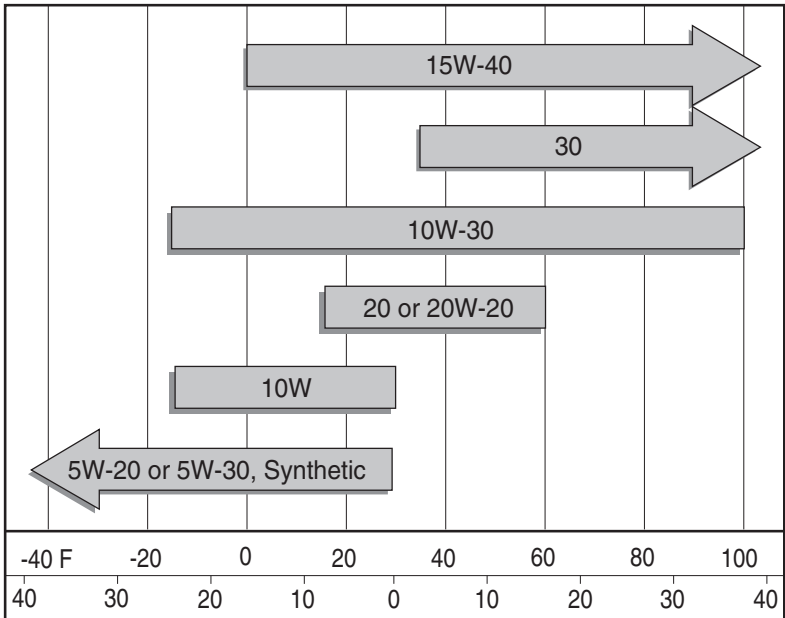
	<i>Gross Vehicle Weight</i>	<i>Empty Vehicle Weight</i>	<i>Loaded Drive Axle</i>	<i>Empty Drive Axle</i>
CGC 20H	11385 [5165]	7385 [3350]	9875 [4480]	3000 [1360]
CGC 25H	13230 [6000]	8230 [3733]	11360 [5152]	2770 [1256]
CGC 30H	15120 [6860]	9120 [4136]	12930 [5865]	2625 [1190]
CGP 20H	11422 [5181]	7422 [3366]	10133 [4600]	3500 [1590]
CGP 25H	13270 [6020]	8270 [3751]	11630 [5275]	3342 [1515]
CGP 30H	15070 [6836]	9068 [4115]	13215 [5995]	3270 [1490]
CDP 20H	11642 [5280]	7640 [3465]	10155 [4605]	3590 [1630]
CDP 25H	13490 [6120]	8490 [3850]	11710 [5310]	3430 [1555]
CDP 30H	15290 [6985]	9290 [4214]	13295 [6030]	3355 [1522]

**Note: All other specifications are the same as the non-hydrostatic CGC/CGP/CDP outlined on previous pages in this section.**



## Engine Oil

Use these SAE viscosity grades.



Temperature Range You Expect Before Next Oil Change

### Engine Oil Recommendations

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

#### IMPORTANT

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

Fill crankcase with correct amount of oil. When adding oil between oil changes, it is preferable to use the same brand as various oils may be incompatible. Refer to the Maintenance and Lubrication Section for recommended oil change intervals.

#### IMPORTANT

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



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