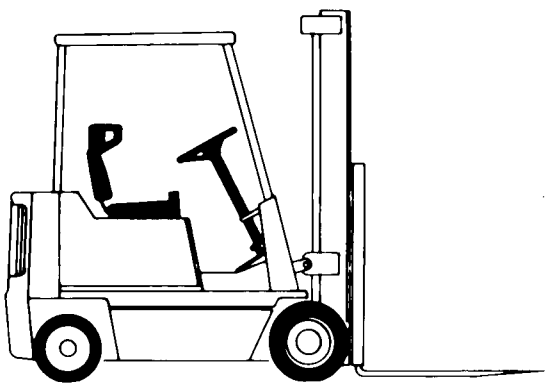
Operator's Manual

Do not remove this manual from the truck.



GCS/GPS 17 thru 30
GCX/GPX 20 thru 30

CLARK

Book No. 2779027
OM-520 3rd Rev.

Record the following information pertaining to your truck.

Model No. _____

Serial No. _____

Customer Truck Identification No. _____

Truck Weight, Empty _____

Truck Rated Capacity _____

Truck Gross Weight, Loaded w / Rated Load _____

Special Equipment _____

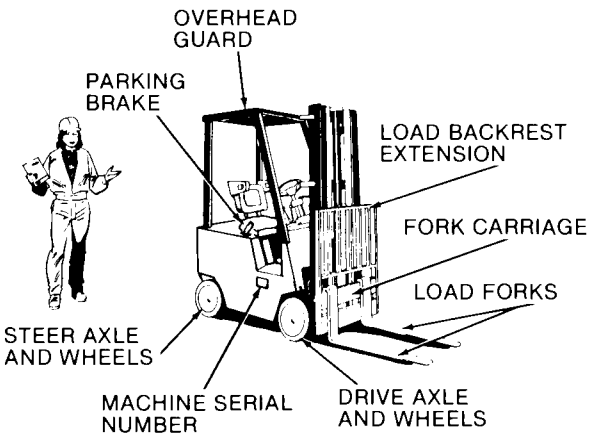
IMPORTANT
Do not expose this manual to hot water or steam.

Operator's Manual

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

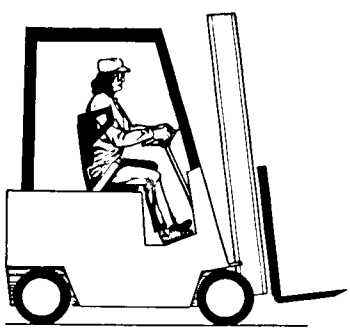
Follow these rules:

Read and understand your Operator's Manual.

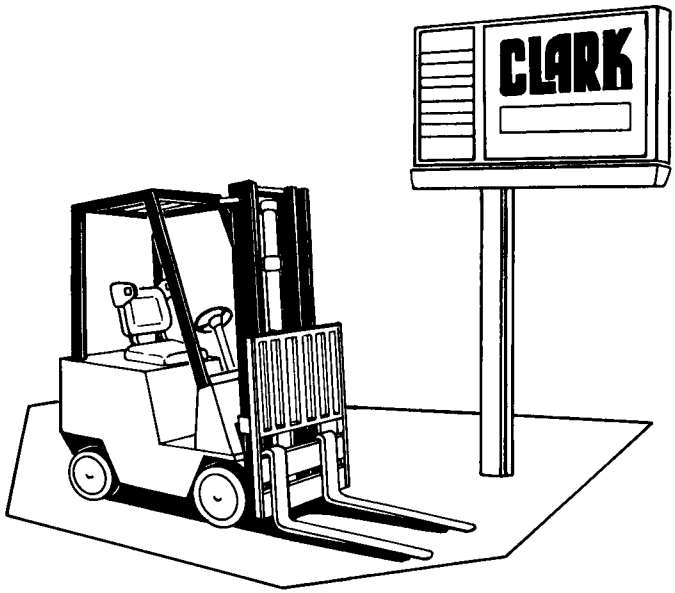


Know your truck.

Learn safe operating rules and practice operating your truck.



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



CONTENTS

This manual covers trucks with capacities from 3,000 pounds through 6,000 pounds.

A Message To CLARK Lift Truck Operators

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

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

1. OPERATOR NOT PROPERLY TRAINED
2. OPERATOR NOT EXPERIENCED WITH LIFT TRUCK OPERATION
3. BASIC SAFETY RULES NOT FOLLOWED
4. LIFT TRUCK WAS NOT MAINTAINED IN A SAFE OPERATING CONDITION

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

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

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

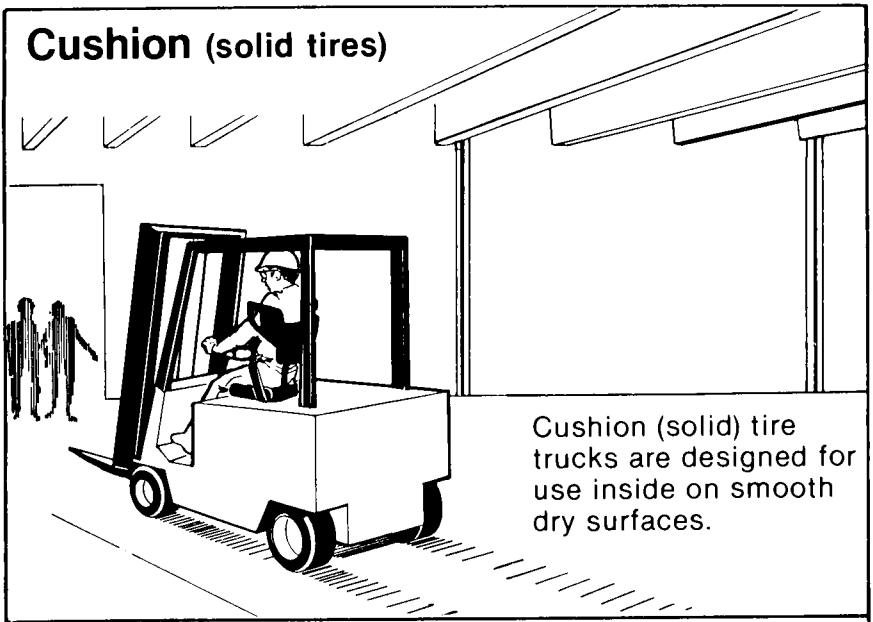
Remember, before you start operating this lift truck, be sure that you understand all driving procedures. It is your responsibility, and it is important to you and your family, to operate your lift truck safely and efficiently. And be aware that the Federal Occupational Safety and Health Act and state laws require that operators be completely trained in the safe operation of lift trucks.

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

Truck Application

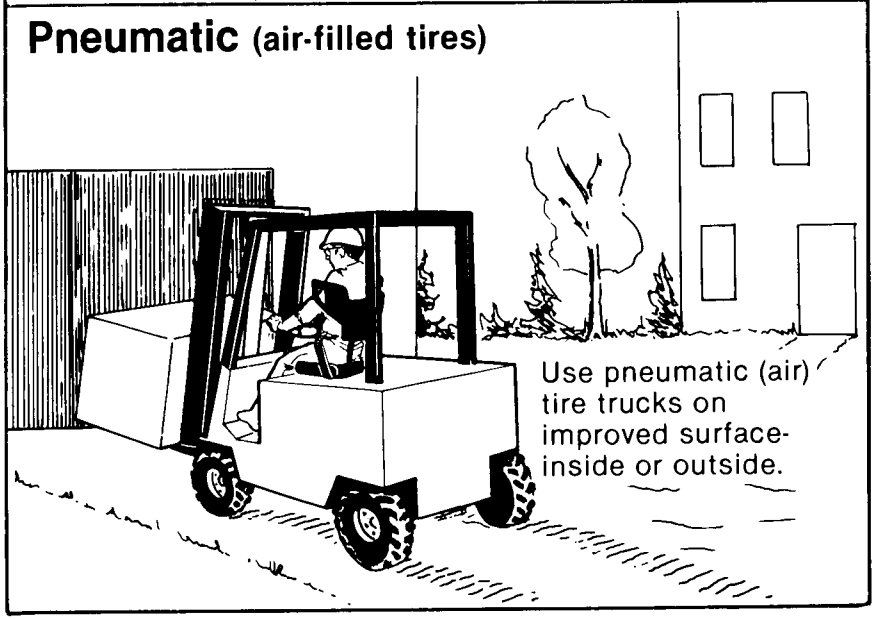
Each truck is designed for a specific application. Make sure you are using the correct truck for the job.

Cushion (solid tires)



Cushion (solid) tire trucks are designed for use inside on smooth dry surfaces.

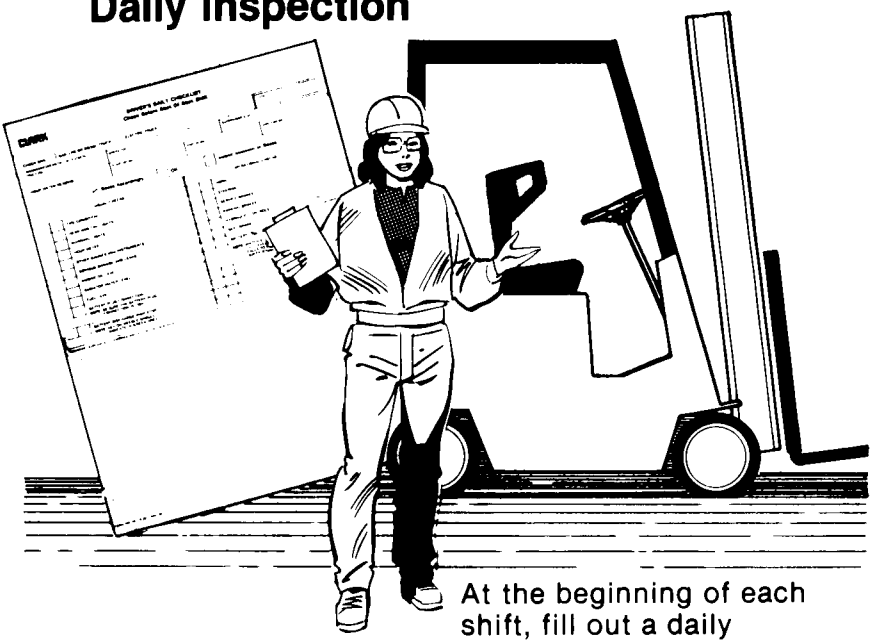
Pneumatic (air-filled tires)



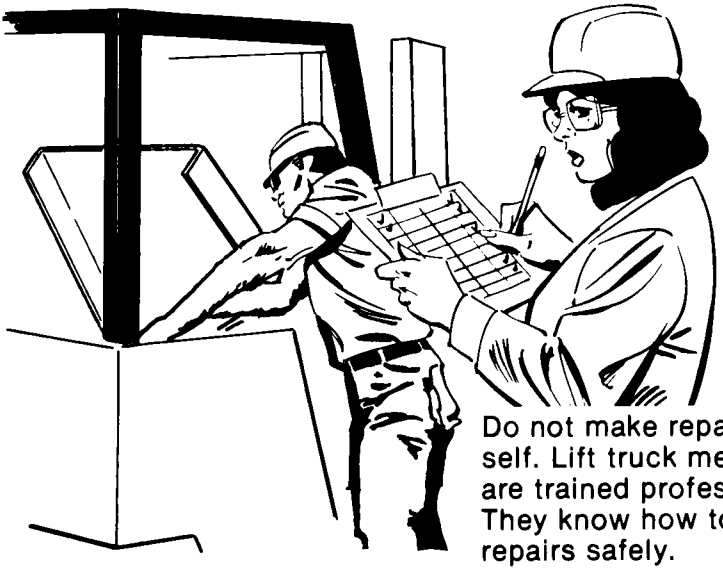
Use pneumatic (air) tire trucks on improved surface-inside or outside.

1 Operator Maintenance

Daily Inspection



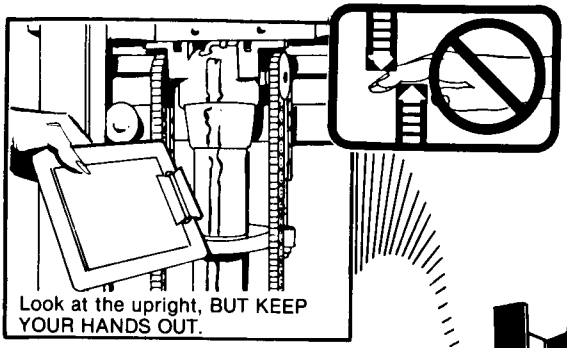
At the beginning of each shift, fill out a daily inspection sheet.



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

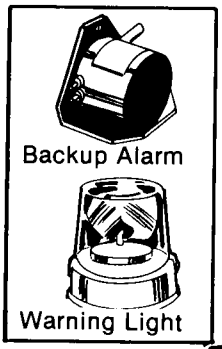
Operator Maintenance

Safety inspection



Look at the upright, BUT KEEP YOUR HANDS OUT.

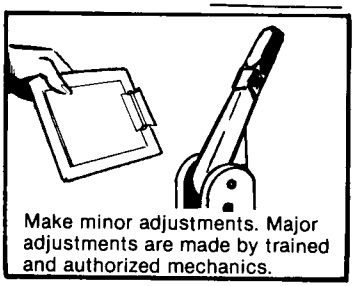
Check safety equipment — the overhead guard, load backrest extension, horn, and if present, backup alarms, and rotary lights.



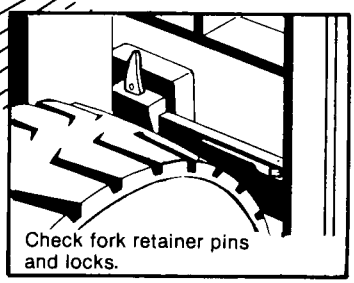
Backup Alarm

Warning Light

Other safety devices are available from your Clark dealer.



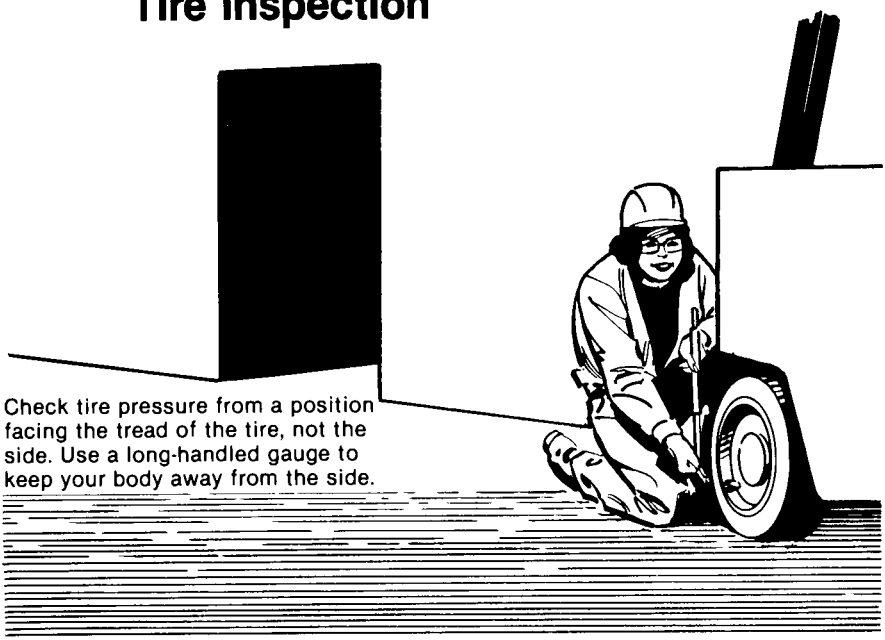
Make minor adjustments. Major adjustments are made by trained and authorized mechanics.



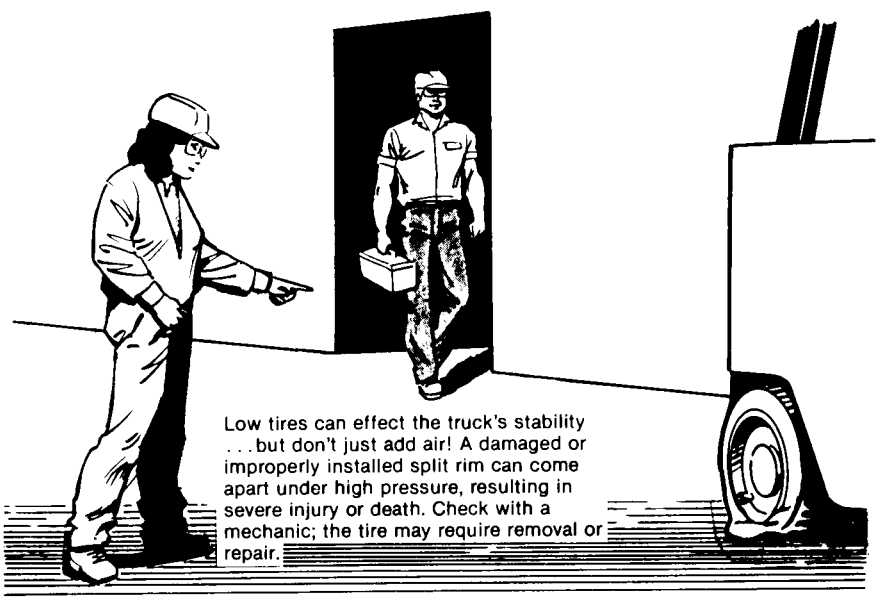
Check fork retainer pins and locks.

Operator Maintenance

Tire inspection



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.

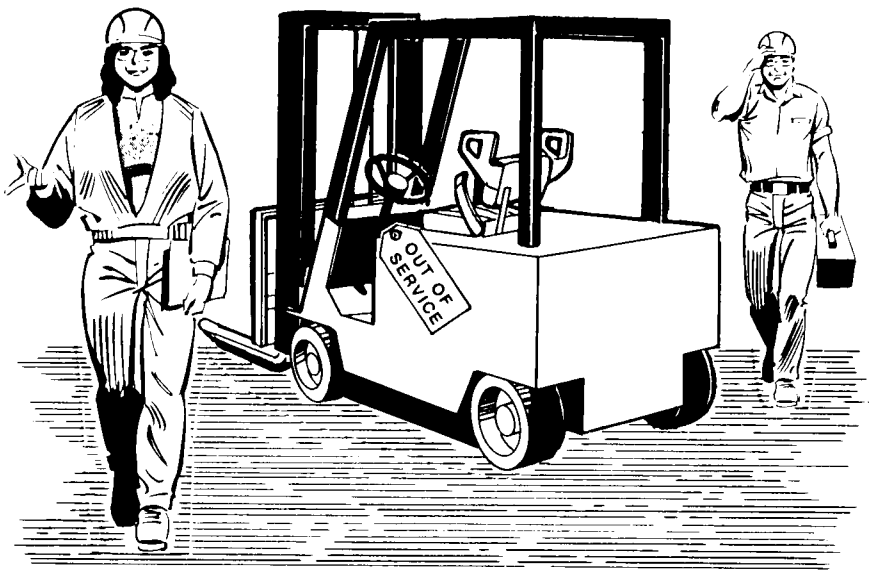


Low tires can effect the truck's stability . . . but don't just add air! A damaged or improperly installed split rim can come apart under high pressure, resulting in severe injury or death. Check with a mechanic; the tire may require removal or repair.

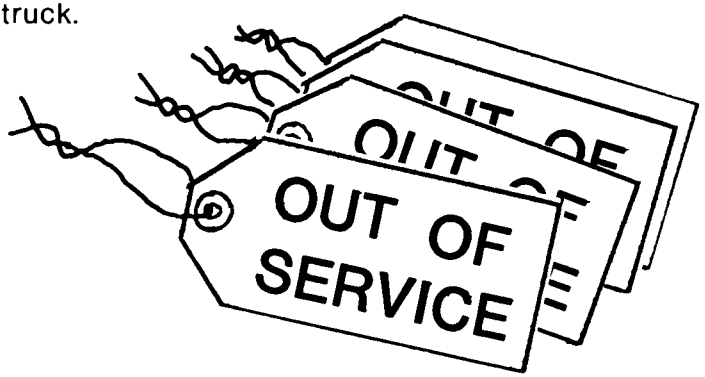
Operator Maintenance

Maintenance problem

DO NOT OPERATE A LIFT TRUCK THAT HAS A MAINTENANCE PROBLEM.

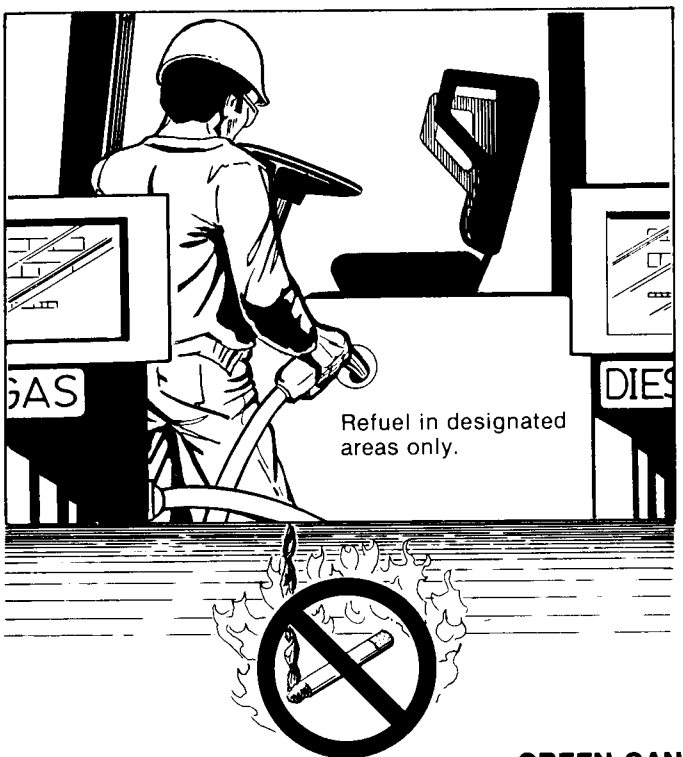


Remove the key and put an "Out of Service" tag on the truck.

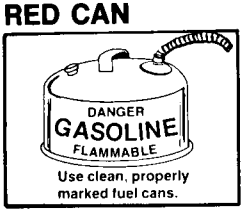


Operator Maintenance

Refuel gas or diesel

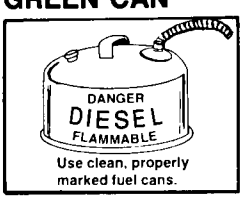


RED CAN



Do not mix gasoline and diesel fuel.

GREEN CAN



Use only clean, water-free diesel fuel. Check and drain fuel bowl daily if water is present.

Operator Maintenance

Refuel LPG tanks

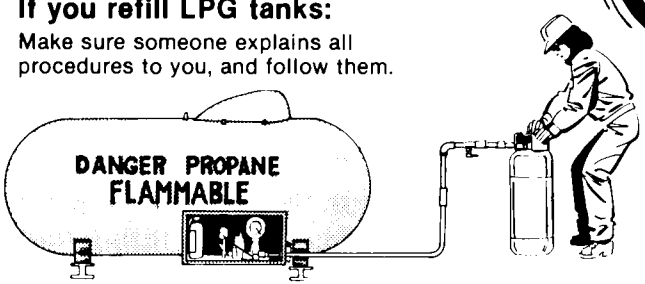
When changing LPG tanks:

Follow these basic rules:

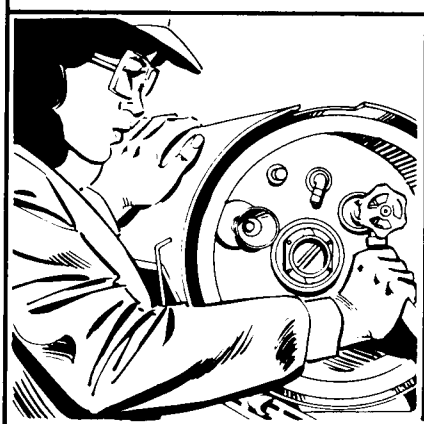
- Change only in well-ventilated areas.
- Turn the ignition off.
- Check for leaks.
- Never allow open flames.
- Store tanks following local fire codes.

If you refill LPG tanks:

Make sure someone explains all procedures to you, and follow them.



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

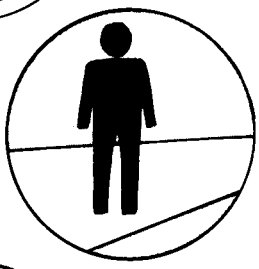


Check all connections

for damage or leaks. If the truck will not start after you change a tank, get a mechanic to check it.

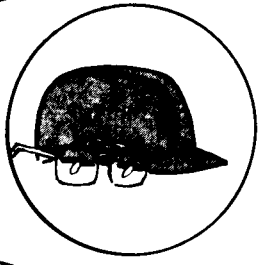
2 General Safety Rules
Follow the rules

Never mix drugs and alcohol with your job.



Watch for pedestrians.

Don't block safety or emergency equipment.

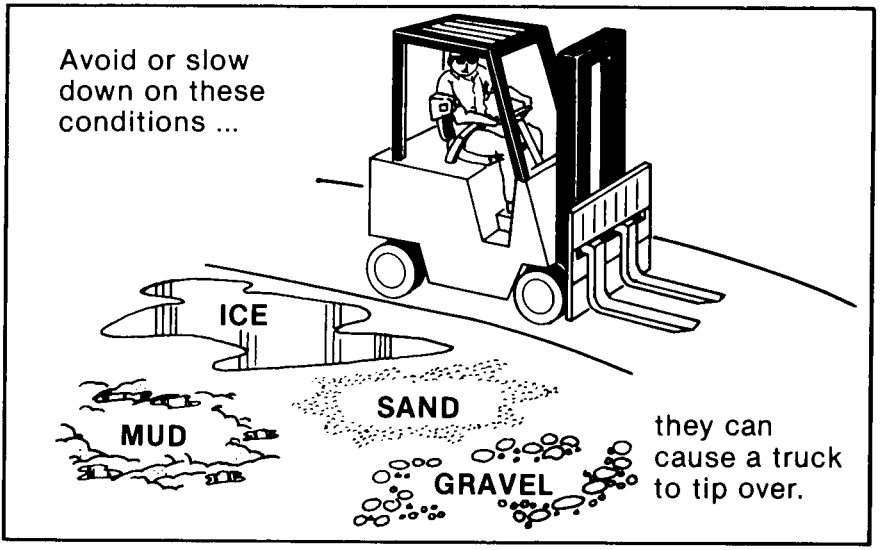


Wear safety equipment when required.

Watch those "No Smoking" areas.

General Safety Rules

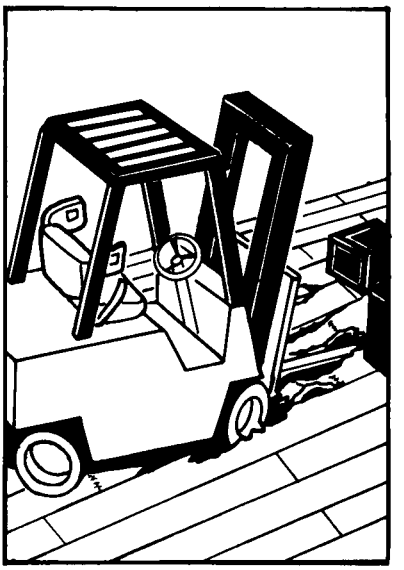
Surface and capacity



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

☐ Elevators

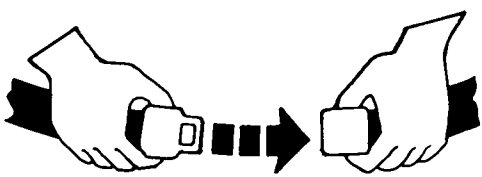
☐ Floors



General Safety Rules

Seat belts

ALWAYS BUCKLE UP



Seat belts and wing seats can reduce injuries.

General Safety Rules

No riders

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

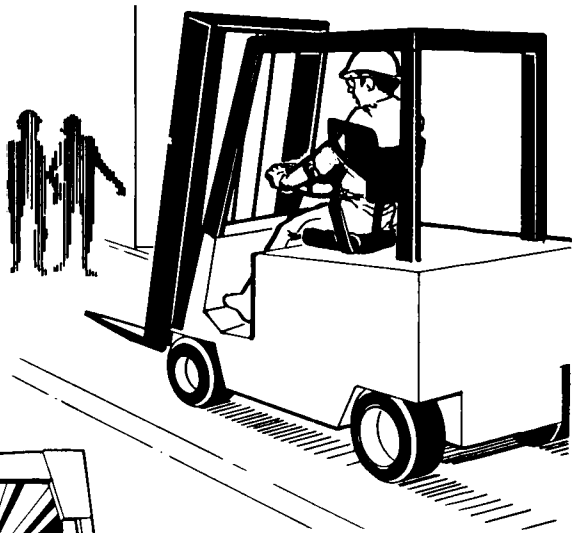
General Safety Rules

Pedestrians

Watch where you are going.

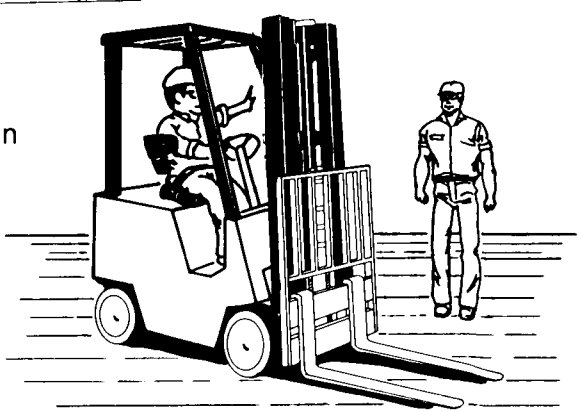
Pedestrians may use the same roadway you do.

Sound your horn at all intersections.



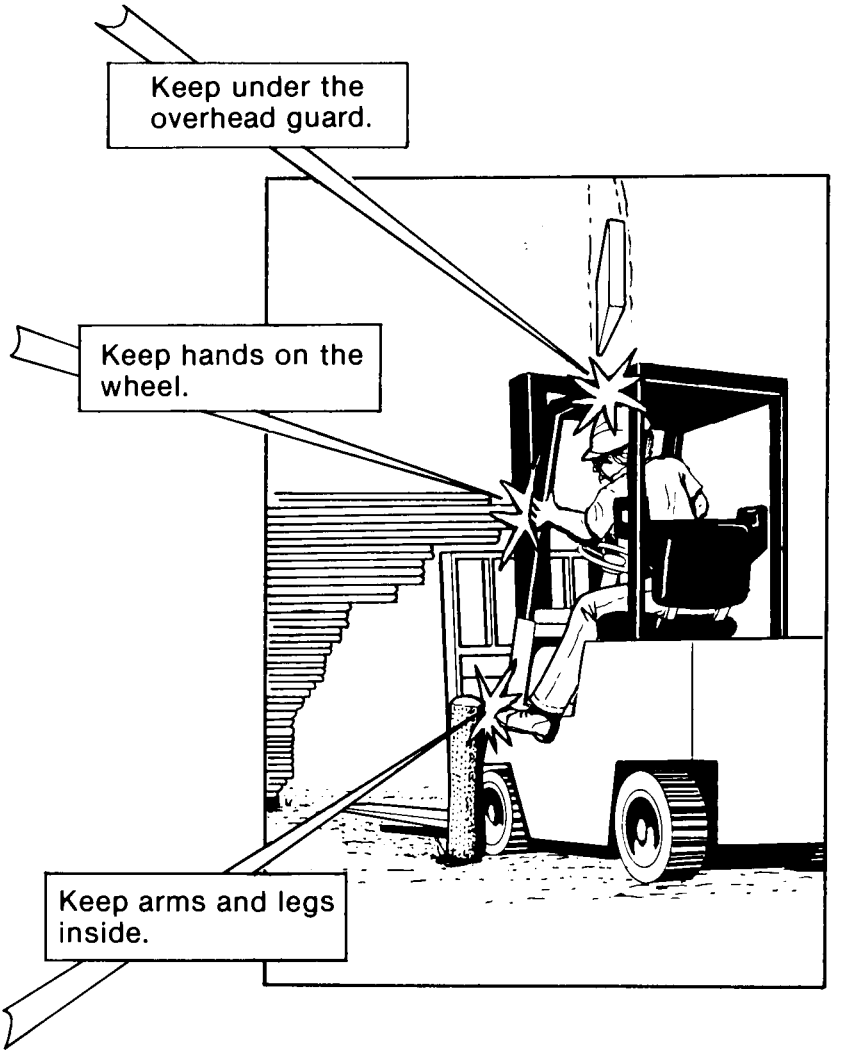
Watch for people in your work area even if your truck has warning lights or alarms. They may not watch for you.

Make people stand back, even when you are parked.



General Safety Rules

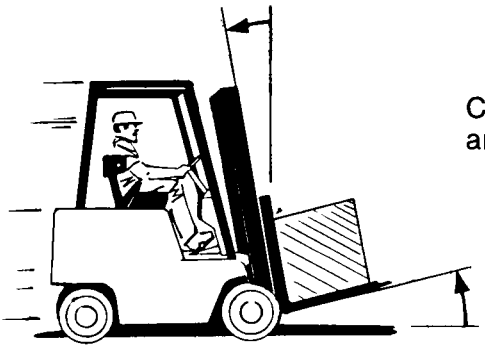
Stay in the confines of the truck



2.6

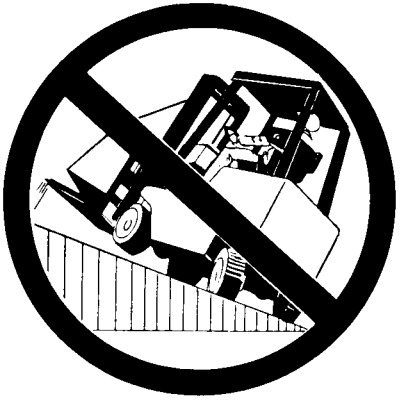
General Safety Rules

Travel



Carry loads low and tilted back.

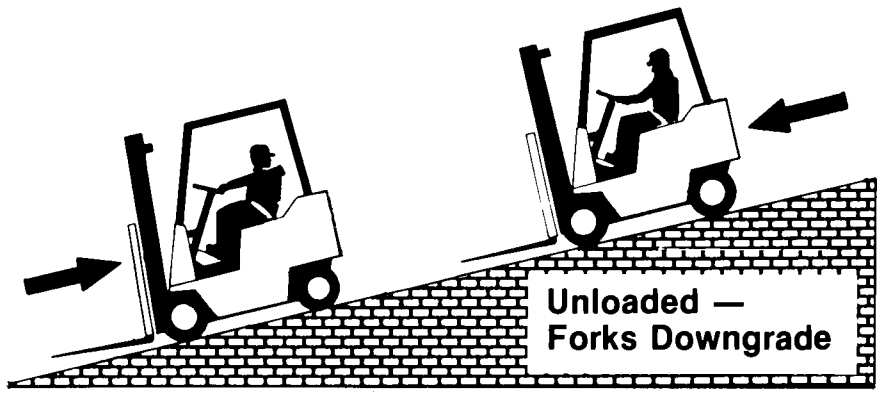
If load blocks your view, travel in reverse.

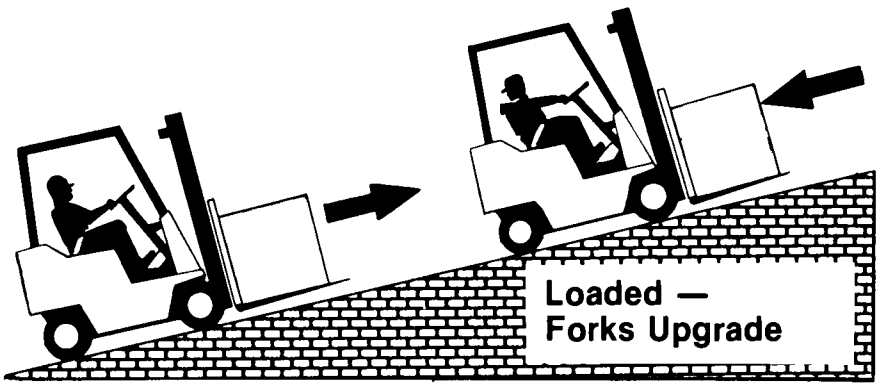


Never turn on a grade.

General Safety Rules

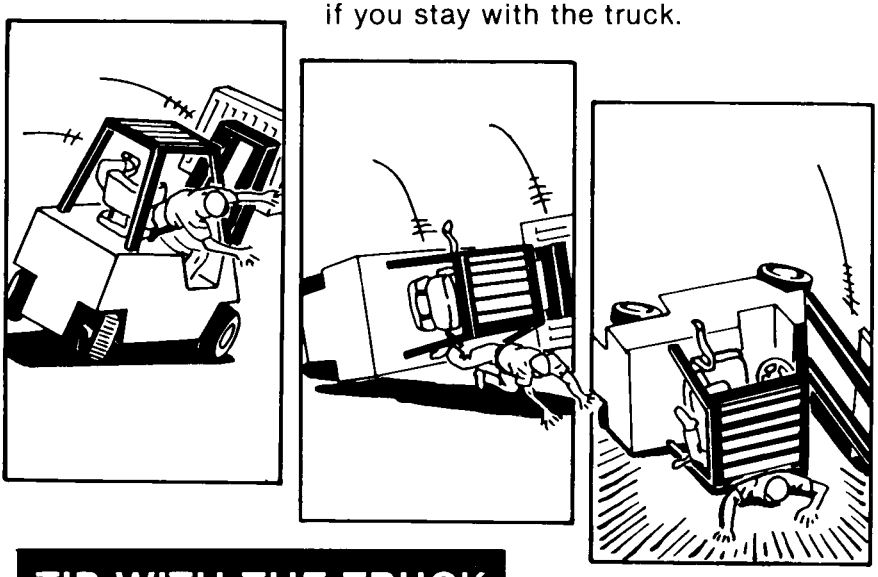
Grades, ramps, slopes and inclines





Don't jump

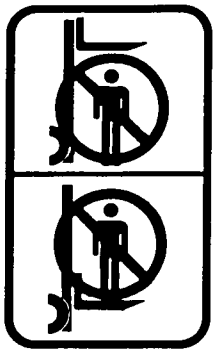
Your chances for survival in a tipover are better if you stay with the truck.



TIP WITH THE TRUCK

General Safety Rules

Fork safety



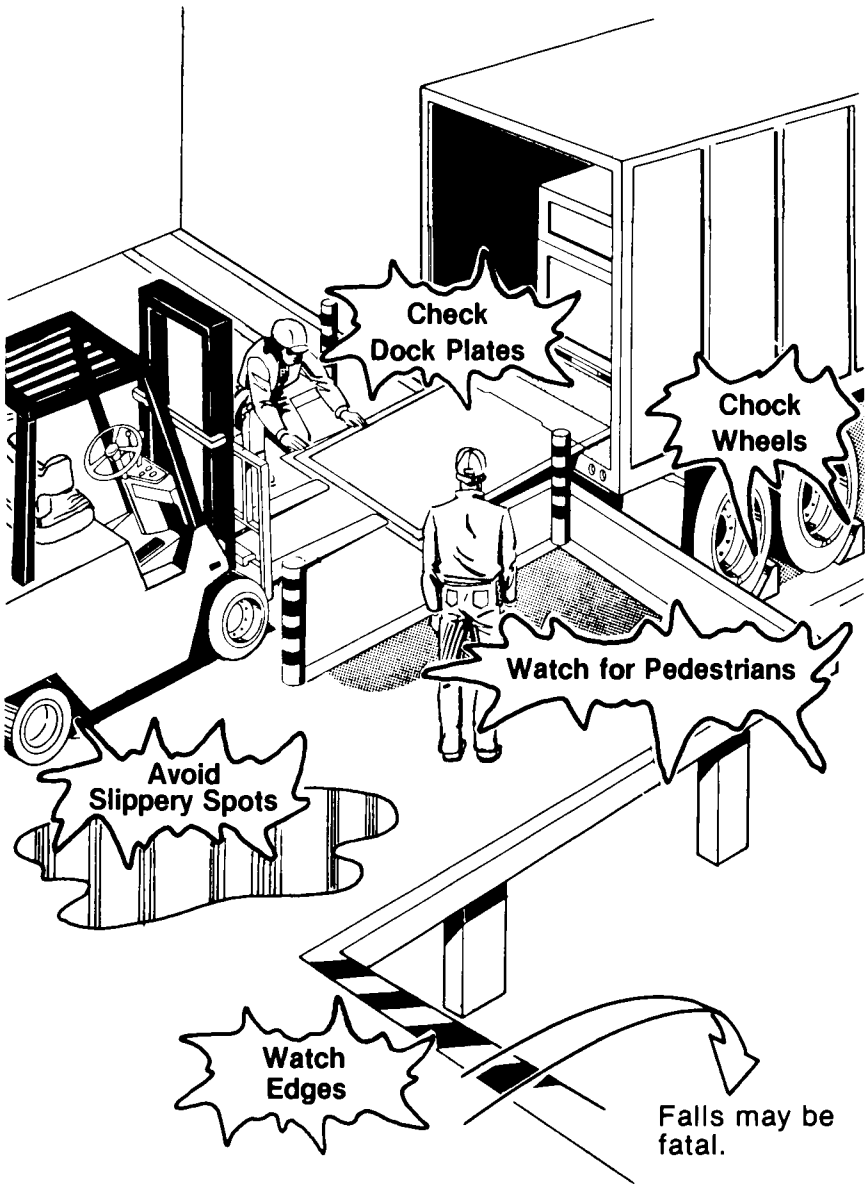
Never allow anyone to walk under raised forks.

There is special equipment to raise people for overhead work.

DO NOT USE LIFT TRUCKS.

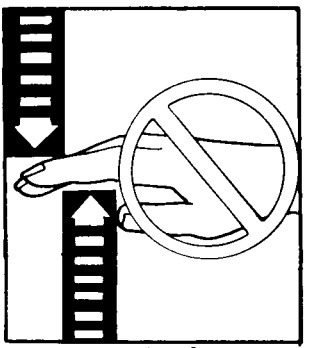
General Safety Rules

Loading Dock



General Safety Rules

Pinch points

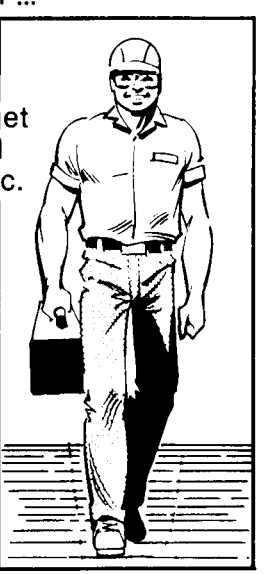


Keep hands, feet and legs out of the upright.

Don't use the upright for a ladder.

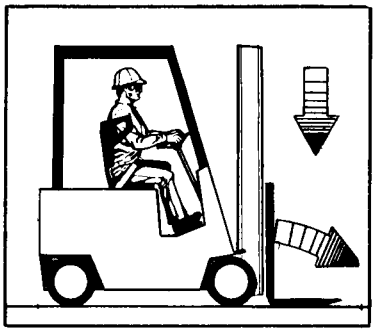
Never try to repair the upright, carriage, chain or attachment yourself ...

always get a trained mechanic.

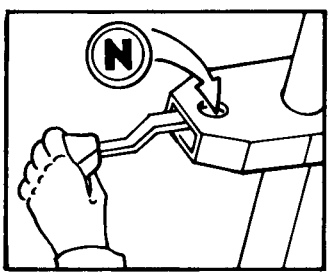


General Safety Rules
Parking

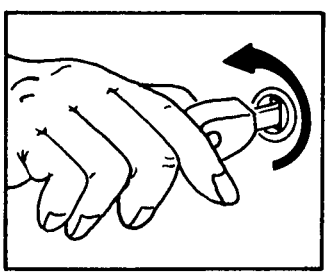
Never park on a grade.



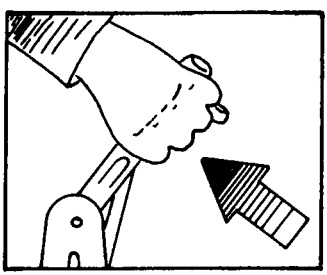
Lower forks fully to floor. Tilt forward until forks are flat.



Put directional lever in neutral.

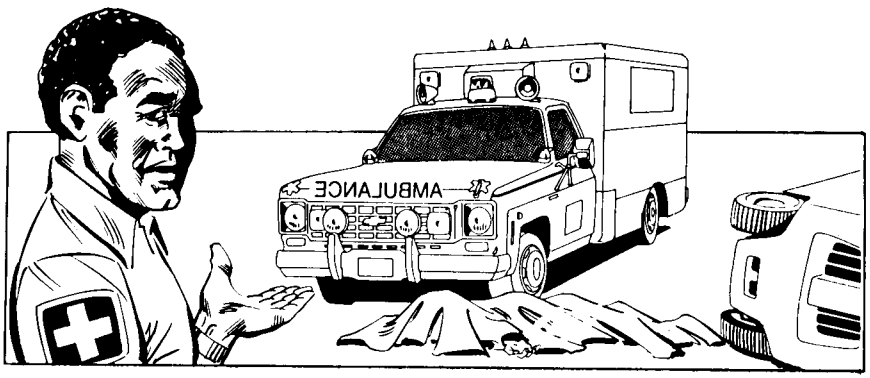


Turn key off.



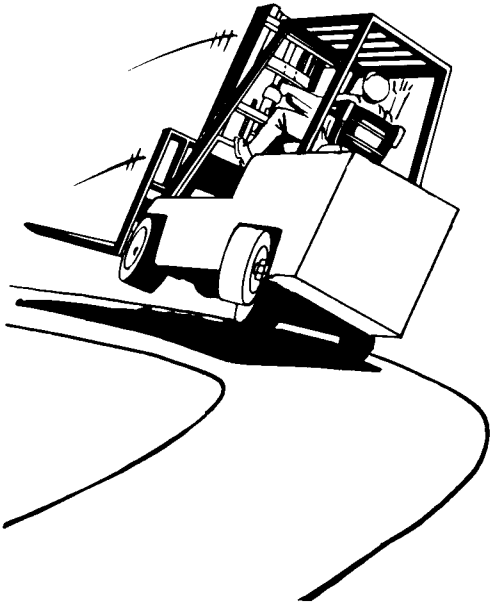
Set parking brake.

3 Operating Hazards



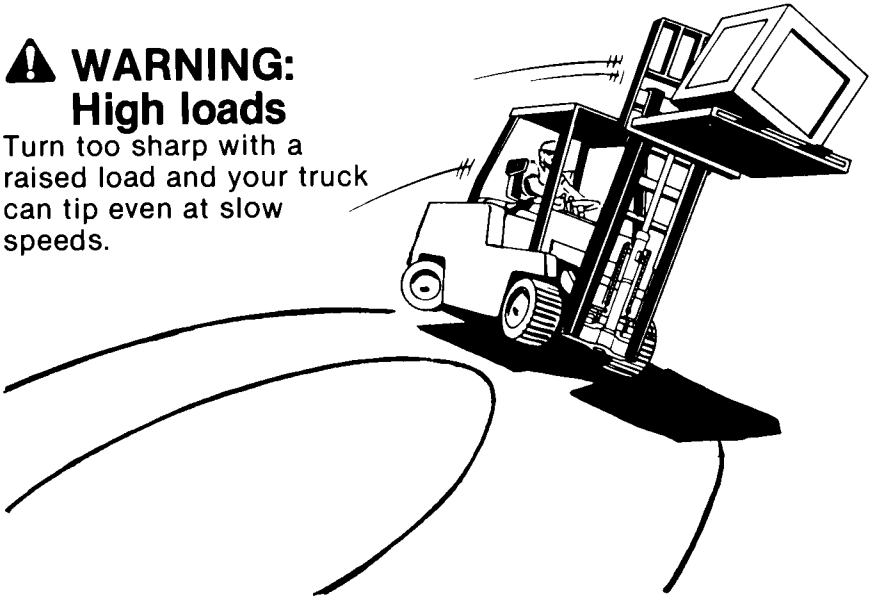
This section shows hazards that may cause you, or someone around you, to be killed or badly hurt. As the operator, you must look for other hazards. Get your boss to help identify and avoid those hazards.

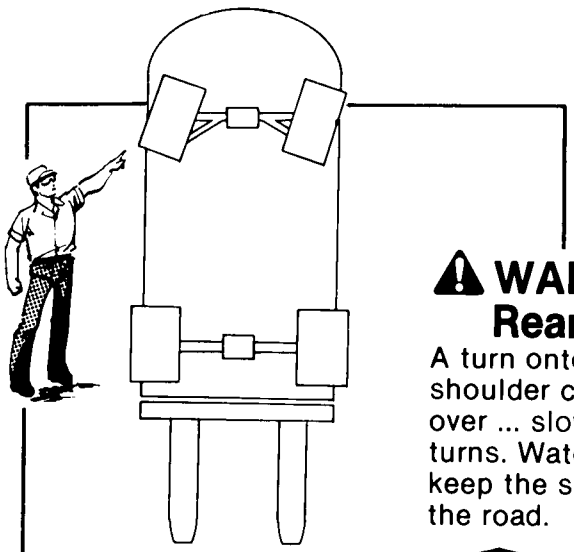
Operating Hazards



⚠WARNING:
Fast turns
An empty truck can tip over easier than a loaded truck because they are rear-end heavy.

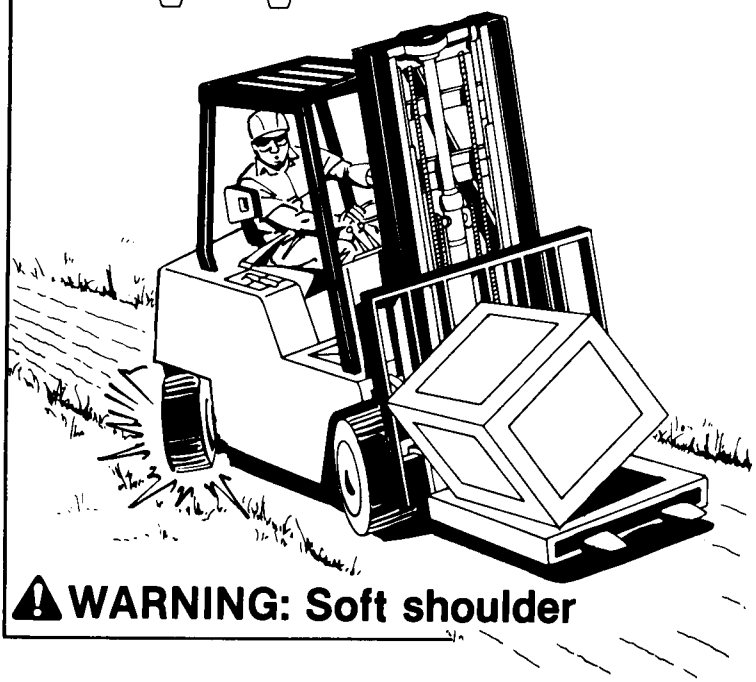
⚠ WARNING:
High loads
Turn too sharp with a raised load and your truck can tip even at slow speeds.





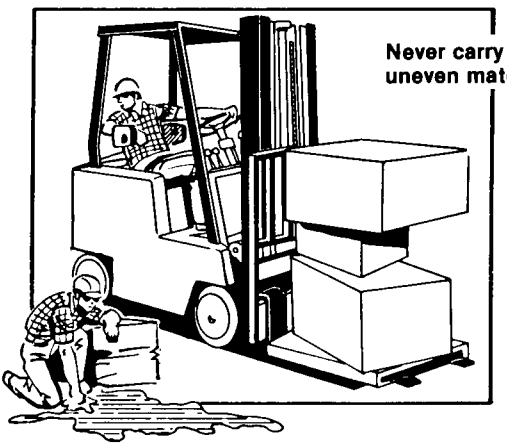
⚠ WARNING:
Rear steering

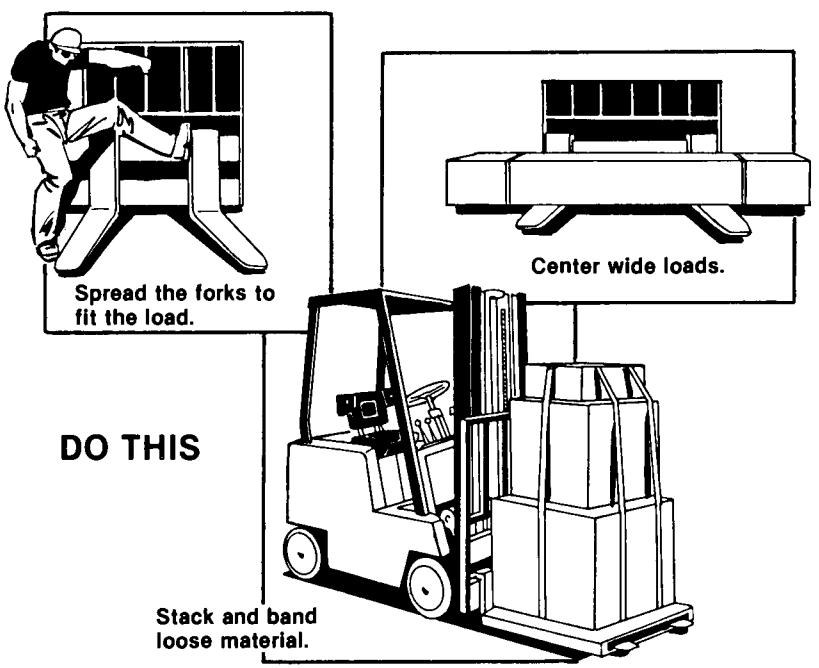
A turn onto a soft shoulder can tip a truck over ... slow down on turns. Watch the rear and keep the steer wheels on the road.



⚠ WARNING: Soft shoulder

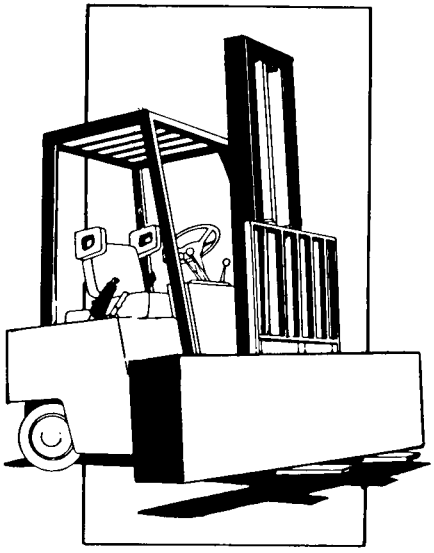
⚠WARNING: Loose loads



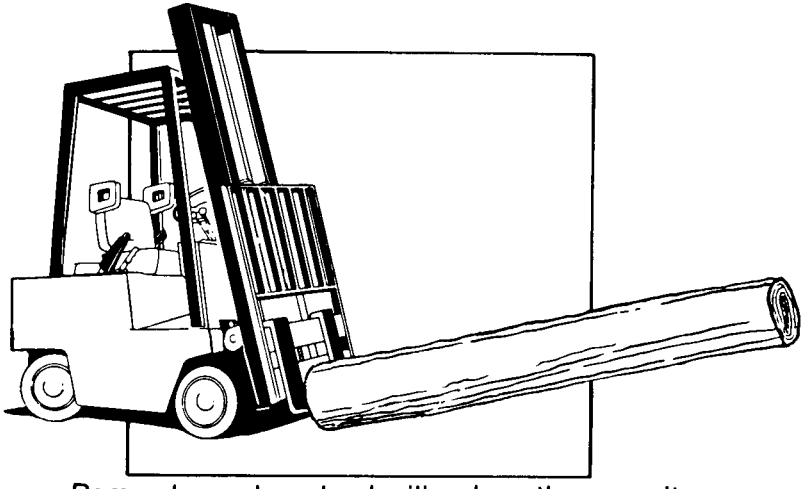


⚠WARNING: Long & wide loads

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

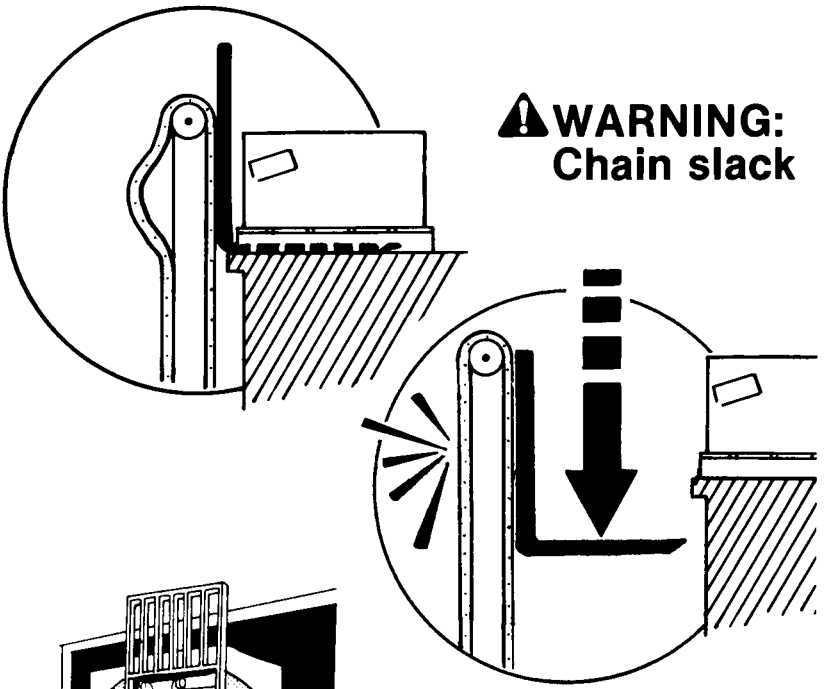


Wide loads ... keep them low and watch your balance.

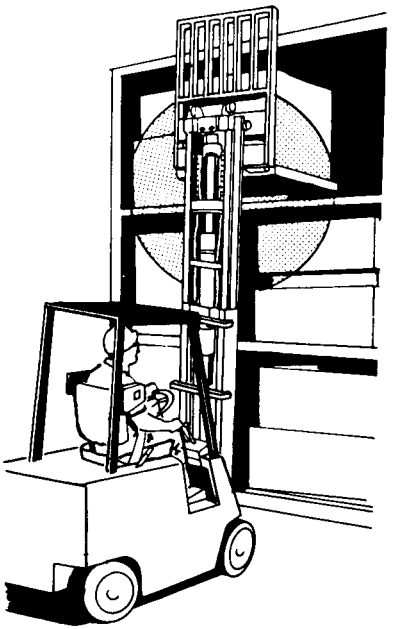


Remember, a long load will reduce the capacity of the truck.

Operating Hazards

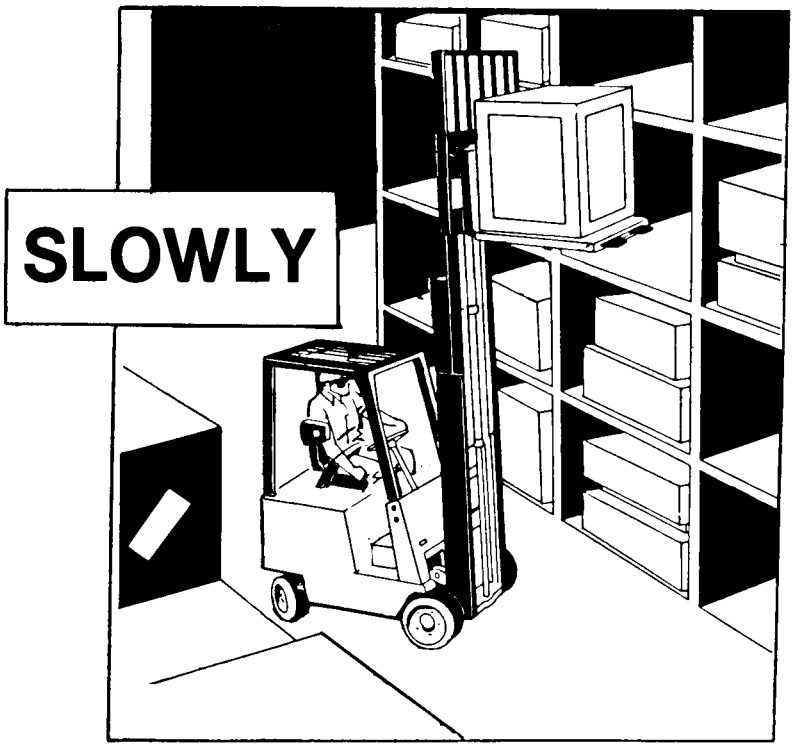


⚠WARNING:
Chain slack



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

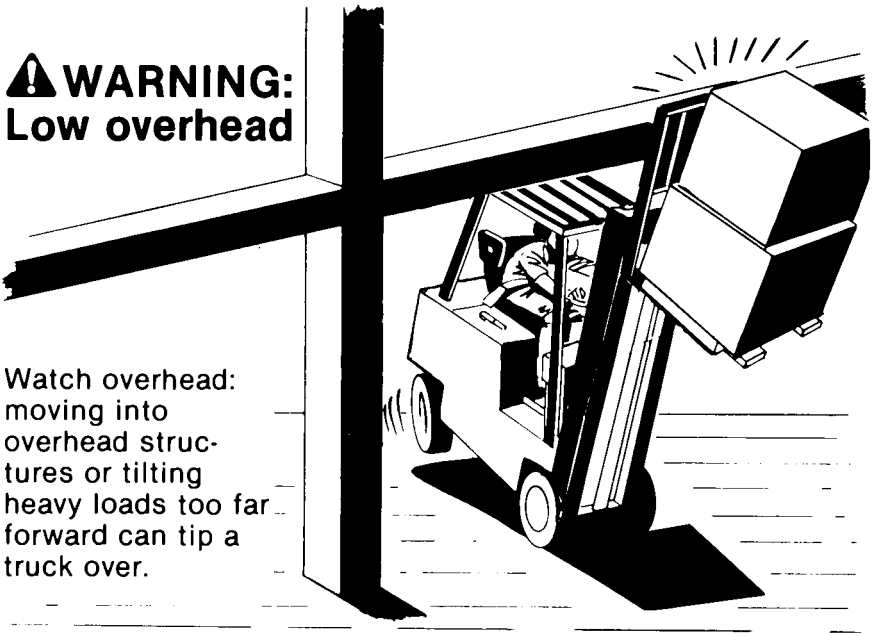
⚠WARNING: Right-angle stacking



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

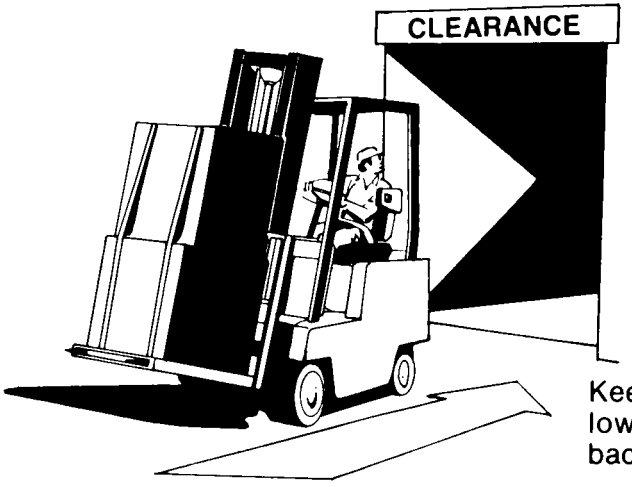
Operating Hazards

⚠WARNING:
Low overhead



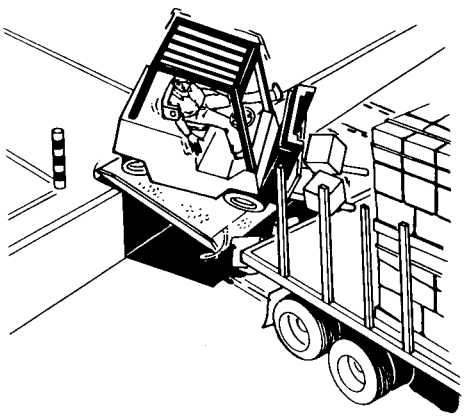
Watch overhead: moving into overhead structures or tilting heavy loads too far forward can tip a truck over.

Know the height of your truck.
Check your clearance.



Keep loads low and tilted back.

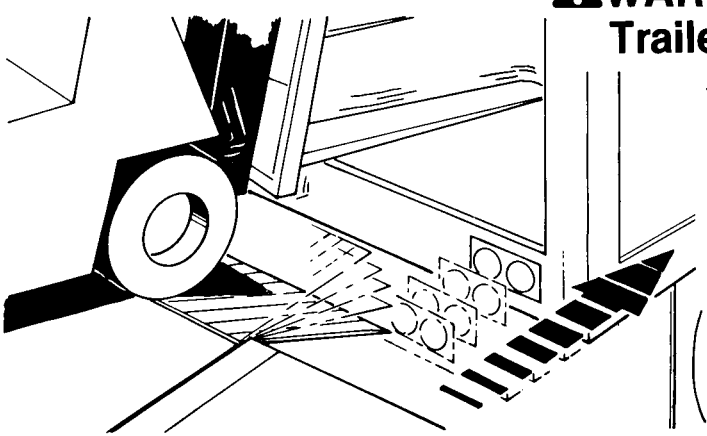
⚠WARNING:
Dock or trailer drop-offs



To avoid these hazards you must:

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

⚠WARNING:
Trailer creep



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

⚠ WARNING:
Carbon monoxide

Internal Combustion engines emit a harmful toxic gas (carbon monoxide) which can cause serious injury or death. To avoid this hazard you must:

- Make sure there is enough ventilation.
- Avoid unnecessary extended idling.
- Never operate your engine in closed areas.
- Do not drive your truck into restricted areas.

4 Know Your Truck

Truck Model Illustrations

Truck Components & Features

Operator's Compartment & Controls

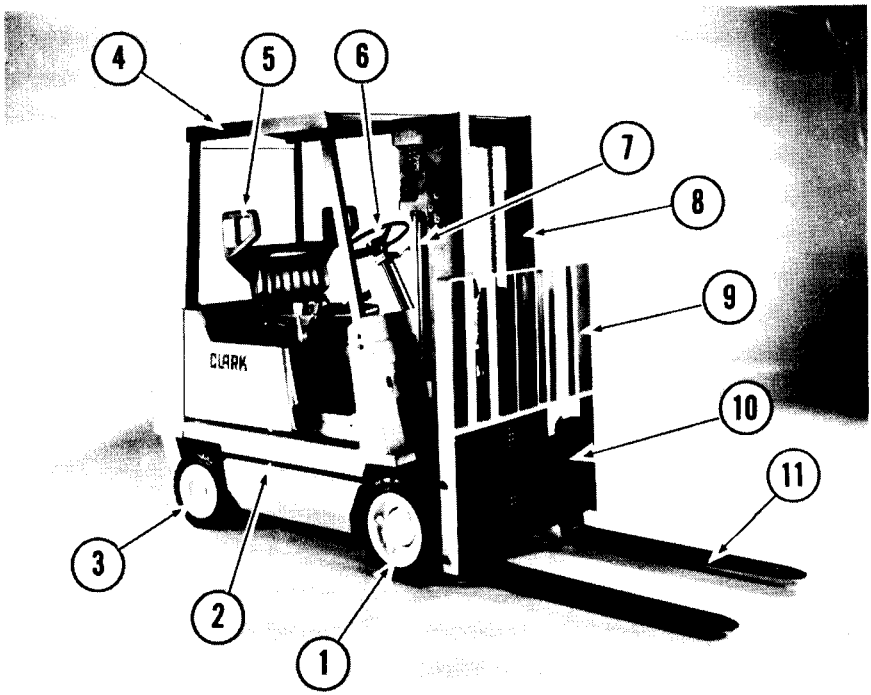
Truck Data and Safety Plates

Safety Decals

How Your Lift Truck Operates

How To Start Your Truck

Truck Model Illustration

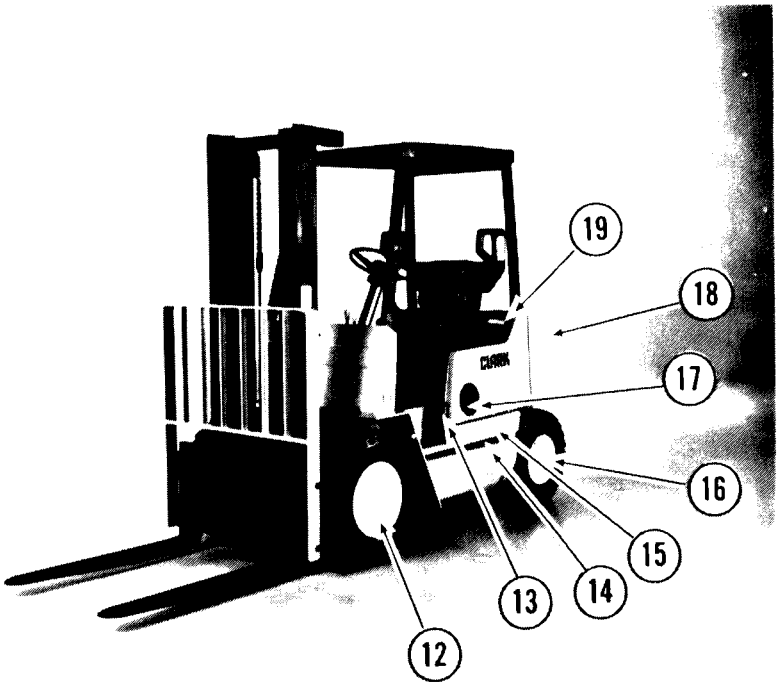


84M411

CLARK

GCS/GCX 17-20-22-25-27-30

1. Cushion Drive Axle and wheels
2. Hydraulic Sump Tank
3. Cushion Steer Axle and Wheels
4. Overhead Guard
5. Safety Seat and Seat Belt
6. Steering Control Handwheel
7. Directional Control Lever
8. Upright
9. Load Back Rest Extension
10. Fork Carriage
11. Load Forks



84M412

CLARK

GPS/GPX 20-22-25-27-30

12. **Pneumatic Drive Axle and wheels**
13. **Side Door Latch (access to engine compartment)**
14. **Fuel Tank Enclosure**
15. **Machine Serial Number (on frame inside door)**
16. **Pneumatic Steer Axle and Wheels**
17. **Fuel Filler Opening**
18. **Counterweight**
19. **Seat Deck Latch**

... See following pages for general description of truck components & features

Things You May Need or Want to Know About the: GCS/GPS 17 thru 30 and the GCX/GPX 20 thru 30 Series Lift Trucks.

Model Designation/Rated Load Capacity

rated load capacity	model designation GCS	GCX	GPS	GPX
17 [1750 kg] 3500 lbs.		X		N/A
20 [2000 kg] 4000 lbs.		X		X
22 [2250 kg] 4500 lbs.		X		X
25 [2500 kg] 5000 lbs.		X		X
27 [2750 kg] 5500 lbs.		X		X
30 [3000 kg] 6000 lbs.		X		X

Available as: Standard models, Custom models, Industrial models, and X Series. Each capacity model has its own counterweight.

Frame & Chassis

- Standardized styling and design
- Stamped and formed, welded construction, 10mm (except cowl 6mm)
- 2 wheel bases each model series (2 GCS, 2 GPS) Std. GCS has long WB only.
- Removable fuel and hydraulic tanks
- Basic design is to metric standard dimensions
- Components and hardware dimensions are combination USA inch and metric.

Engines

Gasoline and L.P.G.	Mitsubishi 4G54	[2.6L]	156 cu.in.
	Continental TM27 (Begin Lot 6200)	[2.7L]	164 cu.in.
	Waukensha D176 GA (Thru Lot 6086)	[2.9L]	176 cu. in.
Diesel	Continental TMD27 (Begin Lot 6200)	[2.7L]	164 cu.in.

Transaxle

model	over all ratio		truck model
11FHR500	1-spd.	15.710:1	GCS/GPS
11FHR600	1-spd.	13.703:1	GCS
11FHR600	1-spd.	12.727:1	GCS
11FHR600	1-spd.	16.248:1	GPS
11FHR600	2-spd.	26.966:1(1) 13.703:1(2)	GPS
11FHR600	2-spd.	24.600:1(1) 15.185:1(2)	GPS
TA18.01-2	1-spd.	15.875:1	GCX/GPX

Drive Wheels & Tires

Std Cushion (2) 20 × (8)(9) × 16 Opt Cushion (2) 18 × (8)(9) × 12.12
Pneumatic (2) 7.00 × 12 - 14 ply 28 × 9 × 15 - 14 ply

Steer Wheels & Tires

Std Cushion (2) 17 × (5)(6) × 12.12 Opt 16 × (5)(6) × 10.5
Pneumatic 6.50 × 10 - 10 ply

Steer Axle

- Integral power steering cylinder
- Cast body w/attached 3.38-inch double-acting cylinder
- Straight kingpins in tapered roller bearings
- Cushion 1-piece hub/wheel 83-degree turn angle
- Pneumatic 2-piece hub/wheel 75-degree turn angle

Cooling System

- Automotive crossflow radiator
- Transmission oil cooler in radiator side tank
- Tempatrol fan drive (optional model trucks)

Air Intake — Dry-type replaceable-element air filter

Exhaust System — Muffler behind radiator, exhaust into air stream.

Fuel System

- Gasoline/diesel — Metal fuel tank w/gauge sending unit, bolted into LH side frame.
- LPG tank — Standard strap holder for 33.5# tank.
- LPG components — IMPCO

Filters

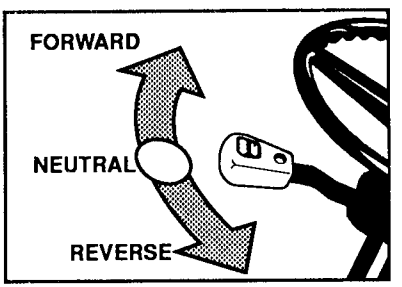
- Fuel — Paper element type
- Engine air — Dry type
- Engine oil — Spin on
- Transaxle oil — Spin on
- Hydraulic oil
  1 tank fill tube screen
  2 tank breather cap
  3 return line — spin on

Truck Components & Features

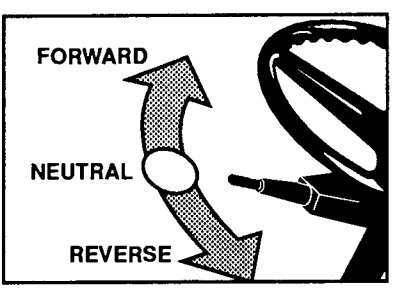
Power Steering System
All GCS/GPS-GCX/GPX 17-30 trucks are equipped with hydrostatic power steering. Oil is supplied from main hydraulic pump through a priority-demand valve to steer gear. Priority demand valve gives correct oil flow for steering. Oil not used for steering is added to lift or tilt system. Steering hand wheel operates a steering control valve which directs oil flow to a 2-way steering cylinder in the steer axle. The steering control valve will act as a pump to provide manual steering if main pump oil flow stops.

Directional Control "Forward"or "Reverse"
Direction of travel is selected with the direction control lever on left side of steering column.

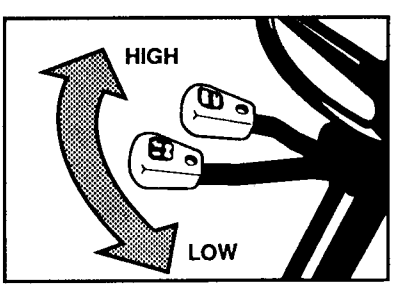
HR500/HR600 direction control lever is linked mechanically to transmission control valve, which engages the "Forward" or "Reverse" clutch pack.



TA18 direction control lever actuates electrical circuits that engage the "Forward" or "Reverse" clutch pack.



Speed Control "High" or "Low"
Some models have a speed control lever below the directional control lever. It is linked mechanically to the transmission control valve, which engages the "High" or "Low" range clutch pack.



Accelerator Control Pedal
Travel speed and lift (pump) speed are controlled by engine speed. Engine speed is controlled with a foot pedal suspended from the cowl and linked to engine fuel system.

HR500 Brake System

Service Brake
Dual foot pedals are connected to a single master cylinder. Service brakes can be applied with both pedals. Trucks have a manual (not powered) brake system. The master cylinder applies pressure, through brake lines, to drum and shoe brakes at drive wheels. Brakes are self adjusting. Service brakes are mechanically actuated for parking. Brake system is a closed circuit using conventional SAE automotive hydraulic brake fluid.

Inching Brake
Normal inching is controlled by both pedals. Pushing gradually on pedal will smoothly disengage transmission. Pushing pedal further will apply service brakes.

HR600 Brake System

Service Brake
Dual foot pedals are connected to a single master cylinder. Service brakes can be applied with both pedals. Trucks have a manual (not powered) brake system. The master cylinder applies pressure, through brake lines, to wet disk brakes inside drive axle. Brakes are self adjusting. Service brakes are mechanically actuated for parking. Brake system is supplied with transmission fluid. Overflow from master cylinder is returned to transmission. Fluid in brake line circuit is transmission fluid. *Do not put brake fluid in master cylinder reservoir.*

Inching Brake
Normal inching is controlled by both pedals. Pushing gradually on pedal will smoothly disengage transmission. Pushing pedal further will apply service brakes.

TA18 Brake System

Service Brake
Dual foot pedals are connected to two master cylinders. Service brakes can be applied with both pedals. Trucks have a manual (not powered) brake system. The master cylinders apply pressure, through brake lines, to drum and shoe brakes at drive wheels. Brakes are self adjusting. Service brakes are mechanically actuated for parking. Brake system is a closed circuit using conventional SAE automotive hydraulic brake fluid supplied from a separate reservoir.

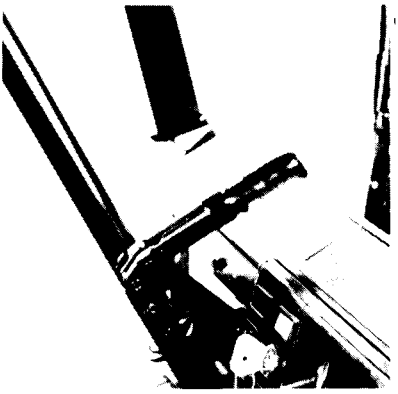
Inching Brake
Left pedal is for normal inching control. Pushing gradually on pedal will smoothly disengage transmission. Pushing pedal further will apply service brakes.

Truck Components & Features

Parking Brake

A parking brake for all truck models is provided by mechanical actuation of the service brakes. On standard trucks, a hand-operated parking brake lever mounted at the dash is connected by cables to the brake assemblies, one to each drive wheel.

On optional model trucks, a similar hand operated parking brake lever mounted at the dash is connected by a cable to an equalizing linkage bar attached across the top of the drive axle between the parking brake actuating arms. These actuating arms, when rotated, use a cam action to force the brake discs together and apply the brakes.



84M280

Main Hydraulic System/Power Steering System

The parts of the main hydraulic system are the hydraulic sump tank, main hydraulic pump, priority demand valve, main control valve, hydraulic oil filter, and associated hydraulic lines and hoses.

The hydraulic sump is a separate, removable tank bolted in the right side compartment of the truck frame where it is protected from damage. It has a large opening at the top with a removable cover which includes the fill tube/breather, oil level dipstick, and oil filter return line. The cover is held on with a V-clamp for positive sealing and ease of servicing. The sump breather is a standard Clark part with a nominal 10 micron @ 98.5% efficiency rating.

Oil from the hydraulic sump tank is fed by a gear pump through the priority demand valve to the main control valve. At the priority demand valve the necessary flow may be diverted to the steering system. From the main control valve the oil is directed to either the lift cylinders or the tilt cylinders. Oil returns to the hydraulic sump tank through the spin-on, full-flow return-line filter.

The main hydraulic pump is mounted to an SAE pad on the transmission driven by a silent chain from the engine.

The main hydraulic control valve features adjustable system pressure relief valves, counterbalance valve in the tilt circuit with pressure compensated flow control valve to control tilt speeds. All ports and connecting lines are on the bottom surface of the valve. When lift attachments are used, single or double auxiliary sections may be added to the outer (RH) side of the standard (lift/tilt only) main valve. The optional aux sections also have an adjustable relief valve and can be assembled with optional flow controls for 2.5, 4.0, 5.5, 7.0, or 10.0 gpm flow level.

The hydraulic system relief pressure level is "tuned" (adjusted) to match the need of each truck rated capacity. Maximum pressure is [20,700 kPa] 3000 psi. A diagnostic fitting (quick-disconnect) at the priority demand valve allows access for checking main hydraulic and steer system pressure.

Tilt Cylinders

The tilt cylinders are mounted with self-aligning bearings at each end. All tilt requirements are satisfied with a choice of two adjustable rod ends and a variety of external tilt limit spacer sleeves.

Driver's Seat

The driver's seat is a new safety seat equipped with seat belt. It has protective wrap-around arms at each side designed to support and hold the operator in the seat if the truck tips.

The seat is bolted to the center top of the engine compartment cover, which is locked in place by the control latch. The seat mounting base allows a 6-inch fore-and-aft adjustment of its slide mechanism.

Electrical Components

- Electrical Wiring — Standard wiring harness is a one-piece assembly with in-line fuse holders. Optional models have two-piece wiring harness.
- Starter — all models: Reduction type, positive engagement drive
- Alternator — all models: Delco 37-amp rating.
- Ignition switch: Key switch, keyed alike.
- Diesel cold start heater: Actuated with a push button.

Instruments

- Fuel gauge (gasoline and diesel trucks only)
- Indicator lights w/International symbols
  1. Engine coolant over-temperature
  2. Transmission oil over-temperature
  3. Engine oil low-pressure
  4. Battery discharge
- Hourmeter — solid-state activated by engine oil pressure switch
- Provision for two optional switches

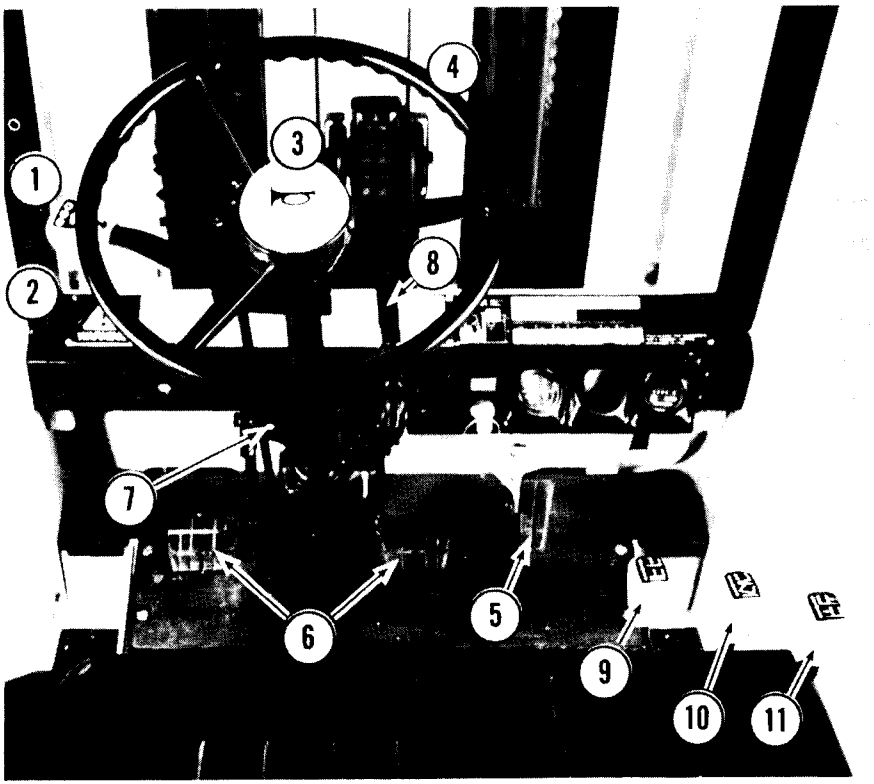
Uprights

- HI-VIS STD w/LOW FREE LIFT (2 cylinders)
- HI-VIS STD w/HIGH FREE LIFT (Optional w/field kit)
- HI-VIS TSU
- HI-VIS HI-LO
- HI-VIS QUAD

Uprights for standard trucks have welded-on mounting trunnion brackets to match either GCS or GPS requirements.

Uprights for optional trucks have separate bolt-on mounting trunnion brackets.

Operator's Compartment & Controls

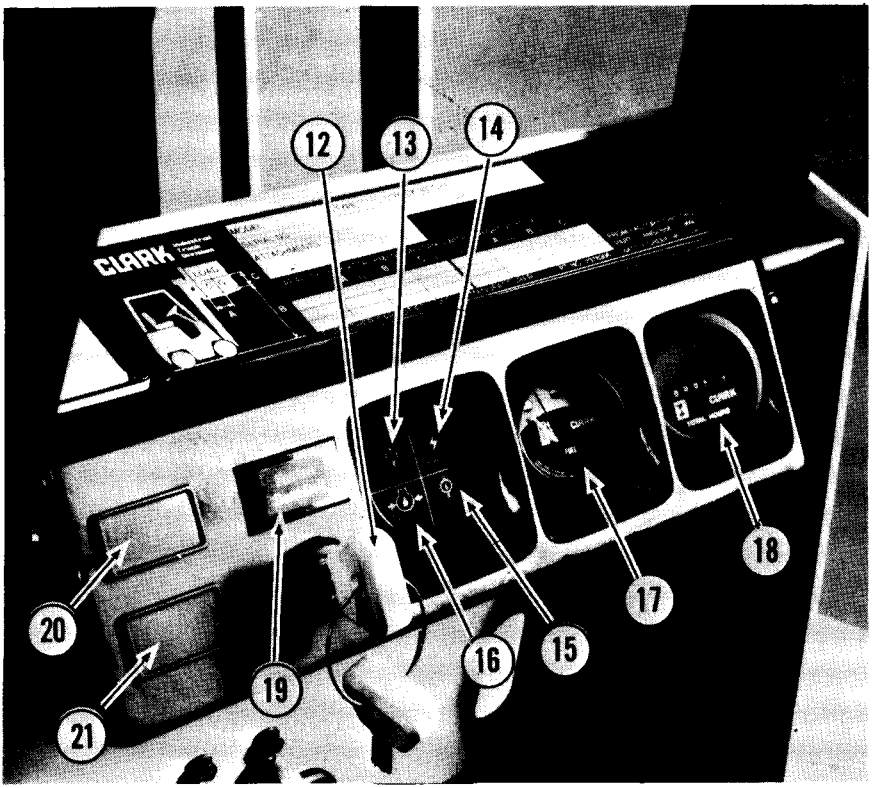


84M413

1. Directional Control Lever
2. Speed Control Lever (Optional Pneumatic Tire Trucks Only)
3. Horn Button
4. Steering Handwheel
5. Accelerator Pedal
6. Service Brake and Inching Pedals
7. Choke Control Knob
8. Parking Brake Lever
9. Lift Control Lever
10. Tilt Control Lever
11. Aux Valve Control Lever

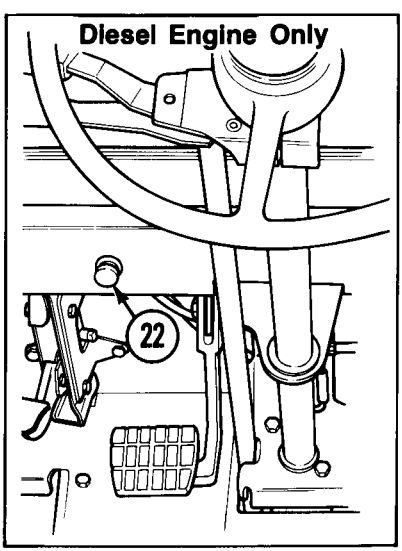
Familiarize yourself with the controls and follow safe operating rules.

Operator's Compartment and Controls

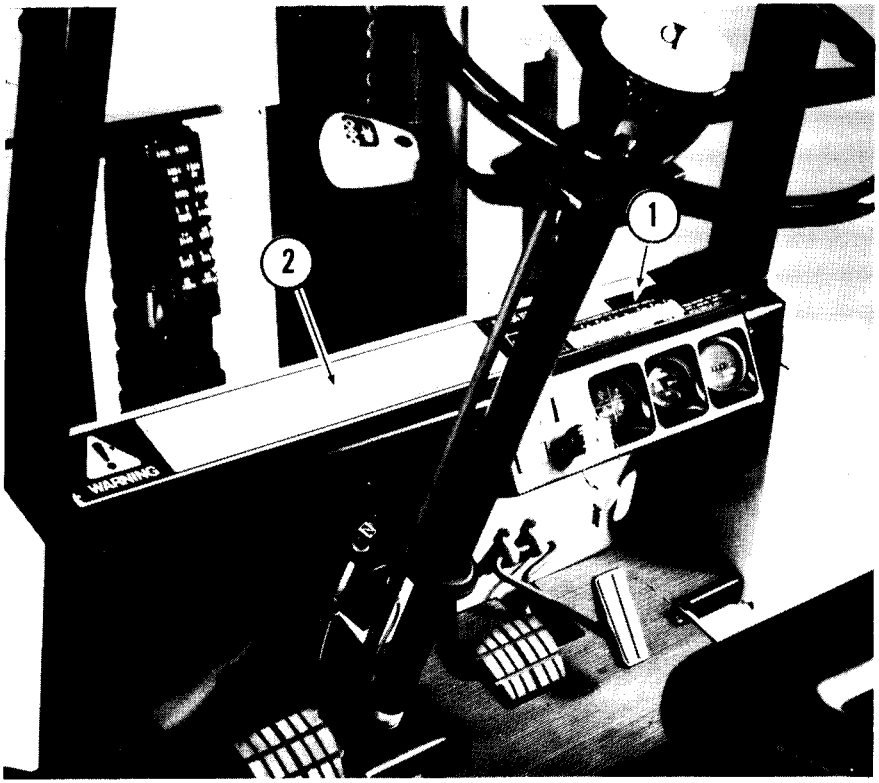


84M414

12. **Ignition Key Switch**
13. **Water Temperature Indicator**
14. **Battery Charge Indicator**
15. **Transmission Oil Temp Indicator**
16. **Engine Oil Pressure Indicator**
17. **Fuel Gauge (Gasoline and diesel only)**
18. **Hourmeter**
19. **Fasten Seat Belt Light**
20. **Light Switch (Optional)**
21. **Accessory Switch (Optional)**
22. **Glow Plug Switch**



Truck Data and Safety Plates



84M415

1. **Truck Data and Capacity Plate (Truck Nameplate)**

2. **Operator Safety Warning Plate**

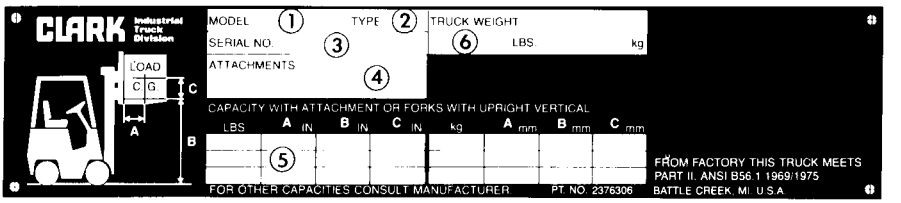
⚠ WARNING

NAMEPLATES & DECALS

DO NOT OPERATE A LIFT TRUCK WITH DAMAGED OR LOST DECALS AND NAMEPLATES. REPLACE THEM IMMEDIATELY. THEY CONTAIN IMPORTANT INFORMATION.

4.12

Truck Data and Capacity Plate

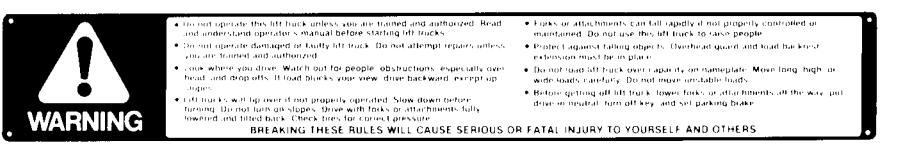


24985

Know the location of your truck's . . .

1. **Model number**
2. **Truck type.** The code letter(s) signifies type of the protection construction. Check with proper authority before entering areas where flammable or explosive material may be present.
3. **Serial number**
4. **Attachment description (If any).**
5. **Capacity.** Capacity, load center, and lifting height data are stamped in these areas. Do not exceed the maximum specified.

   Important: If the truck is modified so as to affect capacity; or, if the plate is damaged or defaced, get a new plate from your Clark dealer.
6. **Truck weight less load.**



24986

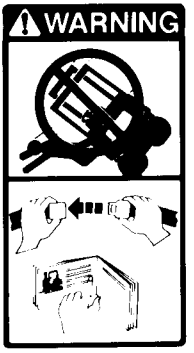
Operator Safety Warning Plate

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

Safety Decals

Seat Belt Warning Decal

This safety decal is placed on each side of the operator's seat arms to remind you to always wear your seat belt when driving a lift truck. To help in calling your attention to this important safety item, a seat belt warning light and a buzzer alarm are connected with the ignition key switch.



24972

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

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

84M419

Seat Deck Opening Decal

This safety decal describes the procedure for unlatching and opening the seat deck. The seat deck must be locked down to make the seat belt effective. Make sure that the seat deck is securely locked in place before operating the truck.

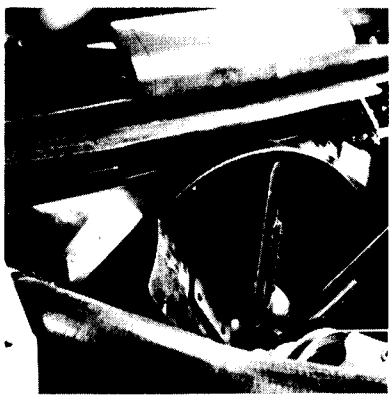
83M404

Fan Warning Decal

This safety decal is displayed on the cooling fan shroud of the radiator to warn of the danger of injury from turning fan blades when the engine is running.

25057

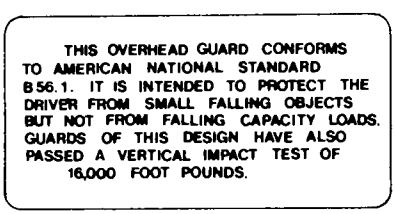
Make sure that you keep your hands, fingers, arms and clothing away from a spinning fan. Don't stand **in line** with a spinning fan. Fan blades can break at high speed and be thrown out of the engine compartment.



84M271

Overhead Guard Conformance Plate

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

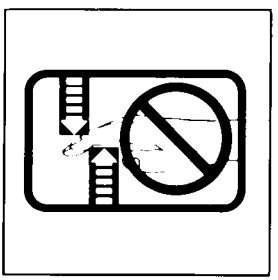


22270

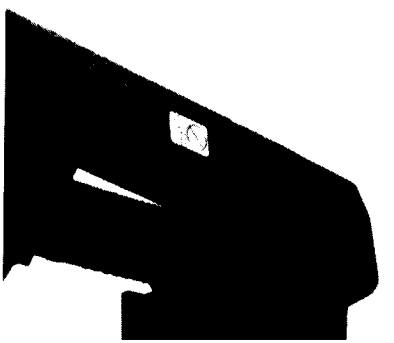
Safety Decals

Upright Warning Decal

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



19341

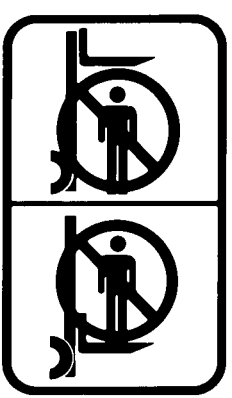


83M408

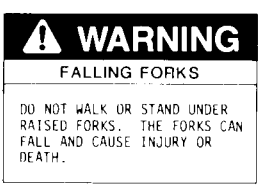
Keep Away From Forks Decal

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

83M407

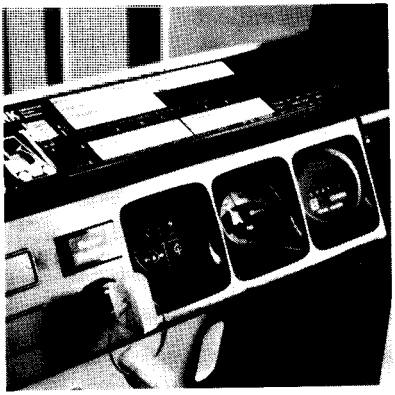


19340



The **Instrument Panel** includes the

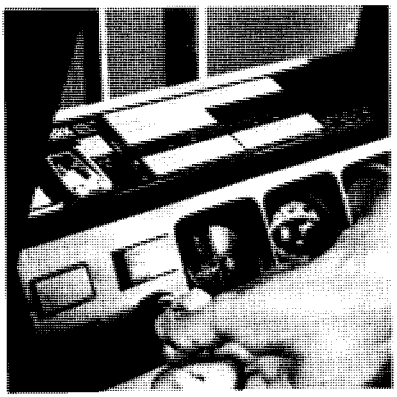
1 ignition key switch
2 warning indicator lights
3 fuel gauge (gasoline and diesel trucks only)
4 hourmeter
5 seat belt warning light
6 provision for optional LPG low fuel warning light and optional light switch
7 glow plug control button



84M276

The **Ignition Key Switch**

- turns the ignition circuit **"on"** and **"off"** for gasoline and LPG engines
- connects and tests the warning indicator lights
- connects the starter motor circuit when engine is to be started



84M277

The key switch has three positions

- **OFF**
- **RUN**
- **START**

When the key is in the vertical **"off"** position all engine and indicator light electrical circuits are disconnected (shut off), and the key can be removed. From the **"off"** position the key can be turned to the right (clockwise) to the **"start"** position, where the engine ignition and the starter motor are engaged. From the **"start"** position, when the key is released it will return automatically back to the left (countclockwise) for a part of its travel, to the **"run"** position where the engine starter is disengaged and only the ignition circuit for gasoline and LPG engines is **"on"**.

The key switch has a mechanical "anti-restart" feature, which prevents the engine starter from being engaged and damaged if the key switch is accidentally turned from the **"run"** position to the **"start"** position when the engine is running. If the engine stops running, the key switch must be turned to the **"off"** position to restart the engine.

How Your Lift Truck Operates

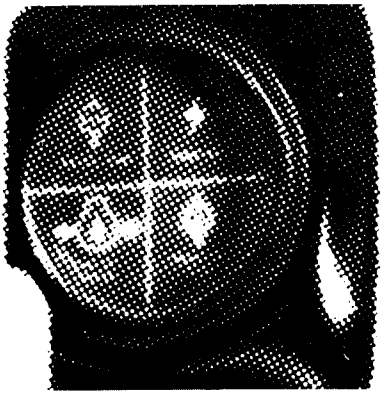
Warning indicator lights are provided for protection of four important systems of your lift truck

1 **Ammeter (Battery charging system)**

2 **Engine oil pressure**

3 **Water temperature (Engine coolant)**

4 **Transmission oil temperature**



84M417

The ammeter warning light indicates when the battery is receiving no charging current. The engine oil pressure light indicates if a problem causes oil pressure to drop below a safe level. The water temperature light indicates that the engine is overheating for some reason. The transmission oil temperature light warns that the transmission oil is too hot and damage can result if operation is not stopped until the reason for high temperature is corrected.

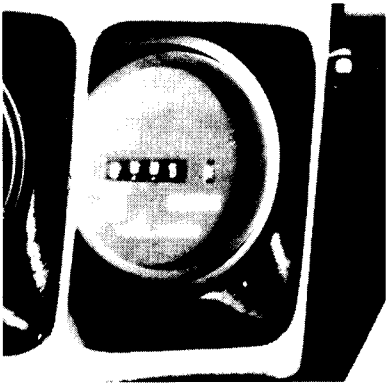
The warning lights can be tested with the key switch.

Turn the key switch clockwise to the **"run"** position. The **ammeter** and **eng oil press** lights should illuminate, and the fuel gauge needle should indicate fuel level.

The **water temp** and **trans oil temp** lights are also illuminated for checking when the key switch is turned to the **"start"** position. Note: If you don't want to start the engine when checking these warning lights, move the directional control lever from **"neutral"** briefly only, while turning the key switch to the **"start"** position.

After checking the lights, turn key switch back to **"off"**.

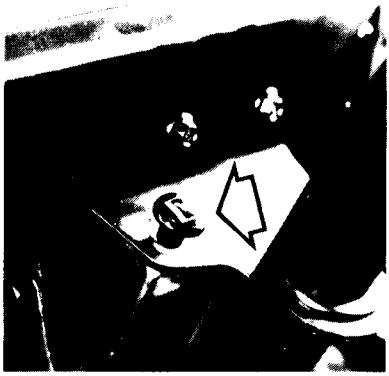
The **hourmeter** is controlled by engine oil pressure. It operates only if the engine is running when the oil pressure has built up (increased) above a level to start the hourmeter. Operation of the hourmeter can be checked by watching for movement of the indicator as it rotates.



84M418

4.18

The **choke control** is located conveniently near the dash on the steering column support. It is required and furnished only with gasoline engines. The choke knob is connected by a wire control to the carburetor on the engine to enrichen the fuel/air mixture to aid in starting when the engine is cold.



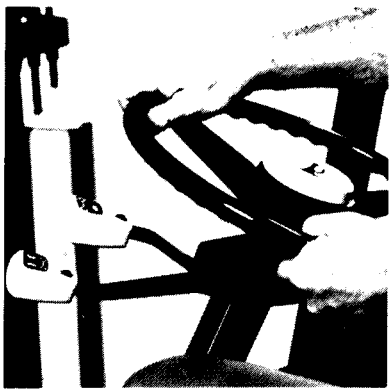
84M278

With the **accelerator pedal** you control the engine to select the required truck travel speed and power, and the correct speed for lifting a load. The accelerator is mechanically connected to the engine carburetor on gasoline and LPG engines or the fuel control on diesel engines.

84M269

The **steering wheel** is connected with a hydrostatic steering gear. Power steering is provided by oil pressure from the main hydraulic pump which flows to the steering gear to be used in the amount required for movement of the steering cylinder on the steer axle.

Never operate a lift truck which has a steering system fault.



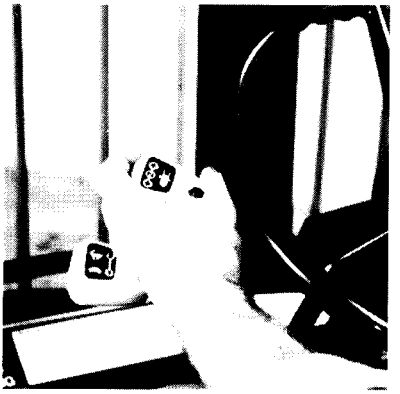
83M409

How Your Lift Truck Operates

Direction of travel is selected with the direction control lever.

- **FORWARD**
- **NEUTRAL**
- **REVERSE**

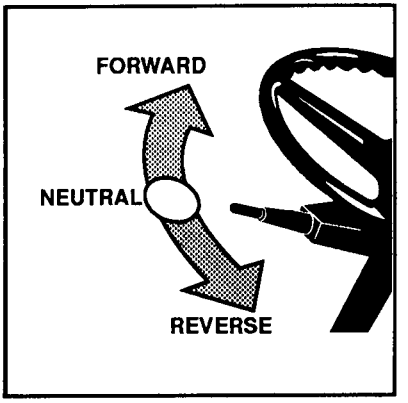
NOTICE - For safety, always bring truck to a complete stop before shifting to opposite direction.



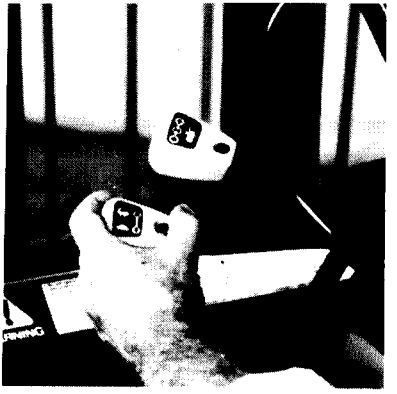
83M417

HR500/HR600 direction control lever is held positively in each position by spring detents in the transmission control cover. Control lever position may be checked by looking through the hole in top of quadrant housing

TA18 direction control lever is held positively in each position by spring detents in the lever assembly. Direction of travel may be noted by visual check of lever position.



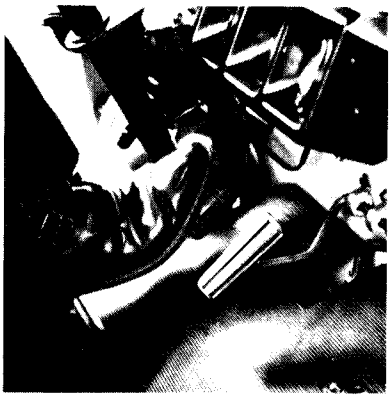
Some models have a **speed control lever**. It is used to select (1) low or (2) high speed for applications where a greater range of performance is required. (1) low range will give you slower travel speed and more power for climbing grades or slow maneuvering, than (2) high speed.



83M421

Service brakes can be applied by pushing on right or left brake pedal.

Never operate your lift truck if the service brakes are not working properly.



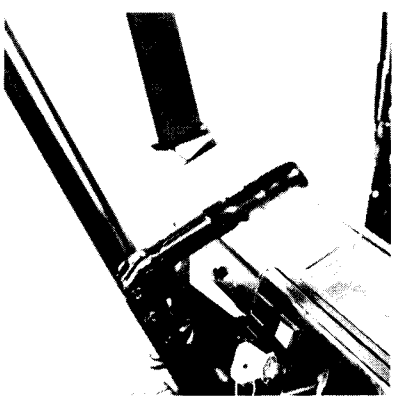
84M244

HR500/HR600 Inching is controlled by using left or right brake pedal. Pedal will smoothly disengage transmission as it is pressed. When the pedal is pushed further the service brakes are applied.

TA18 Inching is controlled by using left brake pedal. Pedal will smoothly disengage transmission as it is pressed. When the pedal is pushed further the service brakes are applied.

84M279

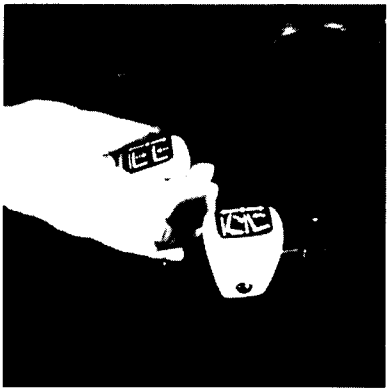
Parking brake lever mounted at right of steering column mechanically applies service brakes. Pull lever fully to vertical upright position to apply parking brake. Push lever forward to release parking brake. (Shown in released position).



84M280

How Your Lift Truck Operates

With the lift control lever, you are able to raise and lower the fork carriage on the upright. The lifting speed is controlled by varying engine speed and lever position.

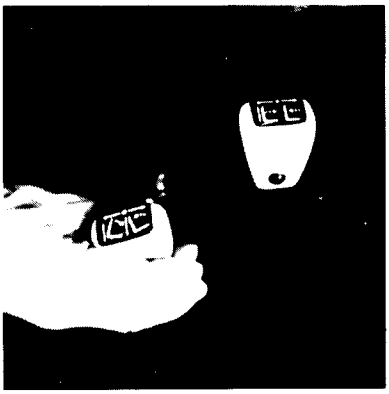


84M236

When the lift control lever is pushed forwards, the fork carriage is lowered. By varying the amount of movement of the lever, you determine the lowering speed. You can also lower the fork carriage when the engine is stopped.

84M237

With the tilt control lever, you are able to control the tilting or vertical positioning of the upright. When the lever is pulled back, the upright also tilts backwards. If the lever is pushed forwards, the upright is tilted forward.



84M239

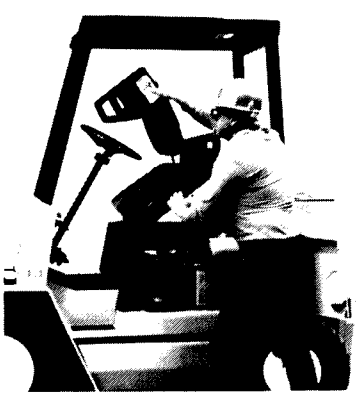
The seat adjustment lever is located on the left side under the seat. To unlock, push the lever to the left and adjust the seat so that all controls may be comfortably reached. Then release the lever. Make sure that the seat locking mechanism is engaged.

84M238

Access to the Engine Compartment

The side doors of the engine compartment are held closed by a spring latch handle. Pull the latch handle towards the outside of the door to unlatch and open the door.

84M288



84M355

How To Start Your Truck

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

Check to see that:

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

84M281

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

84M238

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

83M416

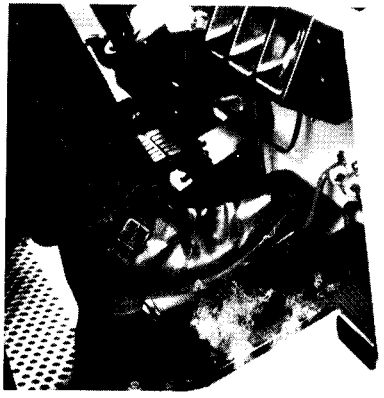
To start a **cold gasoline engine** pull the choke control out half of its total travel.

84M367

NOTICE

Climate conditions and other factors play a large part in how your engine starts. You may have to make adjustments in these procedures to find a combination more suitable for your situation and location.

Push the accelerator pedal down half of its total travel and hold.



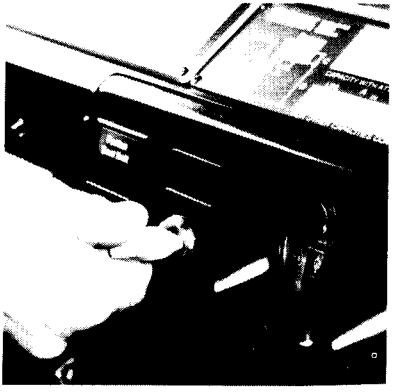
84M269

IMPORTANT

As soon as engine starts, release the key switch from the **"start"** position to avoid starter drive damage.

Turn the ignition key switch from the **"off"** position to the **"start"** position. Release the switch when the engine starts. When the engine runs smoothly, push in the choke control slowly.

If the engine stops running, you must turn the ignition key switch back to the **"off"** position before turning back to the **"start"** position.



84M242

How To Start Your Truck

If the engine fails to start, pull the choke control out fully and repeat the previous starting procedure.

IMPORTANT

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

84M367

To start a **warm gasoline engine** push the accelerator pedal down half of its total travel and hold.

84M269

Turn the ignition key switch to the **"start"** position. Release the switch as soon as the engine starts.

If the engine fails to run, pull the choke control out one-quarter of its total travel. Turn the ignition key switch to **"off"** and repeat the starting procedure. When the engine runs smoothly, push the choke control all the way in (off).

84M242

To start a **flooded gasoline engine,** push the choke control all the way in (off). Push the accelerator pedal down fully. Turn the ignition key switch to the **"off"** position, then to the **"start"** position. Release the key switch when the engine is running.

84M269

Engines Using LPG Fuel

If your lift truck uses LP Gas, the fuel supply is stored in a special tank mounted above the counterweight at the rear of the truck. For safety, there is a check valve and a shut-off valve at the tank. The shut-off valve is operated manually to control the flow of fuel from the tank. This valve must be closed when the engine is not running. Close this valve by hand only to a firm tightness. **Do not overtighten.**

84M258

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

⚠ WARNING

LPG FUEL IS HIGHLY FLAMMABLE. NEVER SMOKE WHEN CHANGING TANKS. NEVER CHANGE TANKS WHEN THE ENGINE IS RUNNING.

84M416

How To Start Your Truck

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

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

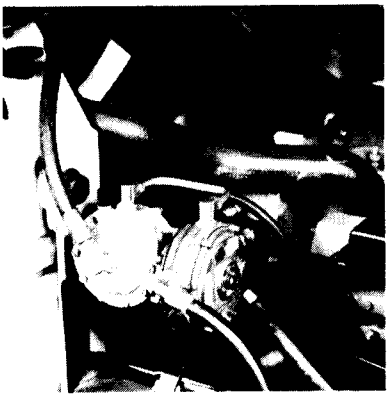
84M258

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

83M430

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

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



84M259

Here are some Starting Tips:

- Turn off all optional equipment while you crank the engine. This will reduce the electrical load on your battery and supply extra power to the starter motor.
- Avoid excessive starter cranking (in excess of 30 seconds) with an intermittently firing or flooded engine. To avoid starter overheat or damage, do not crank the starter continuously for more than 30 seconds at a time. If the engine fails to start within a period of 30 seconds, wait 2 minutes before again attempting to start your lift truck.
- If your battery is "run down" (discharged) or becomes discharged while trying to start your truck, please refer to the "Emergency Starting — How To Use Battery Jumper Cables" section of this manual.

⚠ WARNING

NEVER LEAVE YOUR LIFT TRUCK UNATTENDED WHILE THE ENGINE IS RUNNING.

Starting and Operating Recommendations

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

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

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

⚠ WARNING

EXHAUST GASES, PARTICULARLY CARBON MONOXIDE, ARE HARMFUL AND CAN CAUSE SERIOUS INJURY OR DEATH.

NEVER IDLE YOUR LIFT TRUCK ENGINE IN CLOSED AREAS.

How to start your truck

To start a **diesel engine:**

1. Press pre-heat (glow plug) control button and hold for the number of seconds as shown in the chart.

Temp.	Sec.
70 F. (21 C.)	10
32 F. (0 C.)	20
-4 F. (-20 C.)	25

The glow plug relay in the fast glow control system on the diesel engine must not be bypassed for any reason. Jumping the relay to energize the glow plugs bypasses the internal circuitry that controls the glow plug temperature. This action will cause the glow plugs to prematurely burn out.

▲ Warning

STARTING FLUIDS OR AIDS SUCH AS ETHER OR GASOLINE MUST NOT BE USED IN A DIESEL ENGINE. THE USE OF THESE FLUIDS CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO THE ENGINE.

2. Turn the engine switch to the start position. Release the key as the engine starts, to avoid starter damage.
3. If engine fails to start, turn the key to the "off" position and then repeat the procedure. If the engine re-start is not done within 15-20 seconds, repeat the pre-heat procedure in step one.
4. When the engine starts, make sure there is oil pressure indicated on the oil pressure gauge. (0.5 box) 7-10 psi (idle), (2.8-4.1 box) 40-60 psi (max).
5. Operate engine at fast idle for one to two minutes to circulate and warm the oil before operating the engine at maximum speeds.

To stop a **diesel engine:**

1. Stop the truck with the service brake.
2. Put all controls in the neutral position.
3. Engage the parking brake.
4. If engine is hot, operate at idle speed for 1-2 minutes.
5. Turn ignition switch to the "off" position.

5 Operating Procedures

Before Operation

How To Perform The Daily Inspection

Operation

How To Operate Your Truck

After Operation

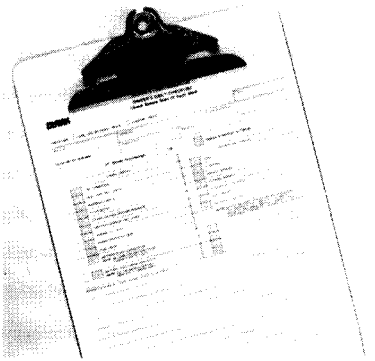
When You Have Finished Using Your Truck

How To Perform The Daily Inspection

Before operating your lift truck you should check its condition. Be sure that your truck is safe to operate.

Lift trucks should always be inspected daily, or at the start of each shift. The following pages point out important areas to check during the daily inspection.

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



84M285

⚠ WARNING

PERSONAL INJURY

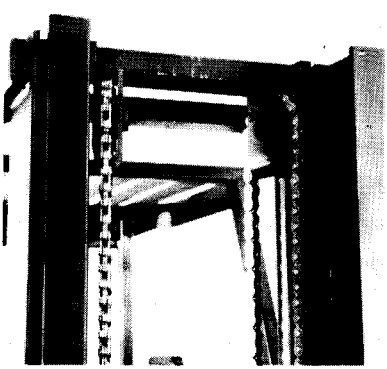
WEAR EYE GLASSES, SAFETY SHOES AND CORRECT FITTING CLOTHING WHEN WORKING ON LIFT TRUCKS. INJURY CAN RESULT IF YOU DO NOT WEAR PROTECTION.

First, perform a visual inspection of the truck and its components. Walk around your lift truck and take note of obvious damage which may have been caused by operation during the last shift. Check for leaks and loose fittings.

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

84M289

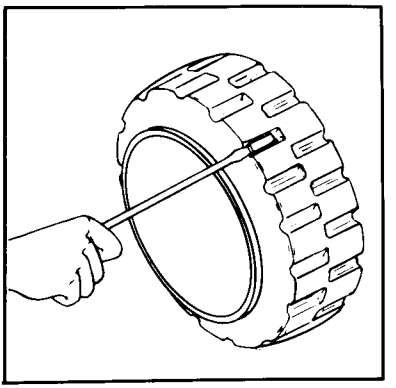
Inspect the upright assembly, rails, rollers, lift chains, and lift cylinders. Look for any loose parts or fittings. The lift and carriage chains must have equal tension. Check the lift chain anchor fasteners.



84M351

How To Perform The Daily Inspection

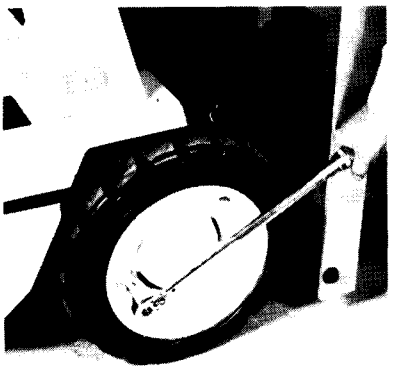
Check the condition of the drive and steer wheels and tires. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or "chunking out".



12917

Check to make sure that all wheel lug nuts or bolts are tight.

Please refer to "Specifications" for torque and tire pressure values.

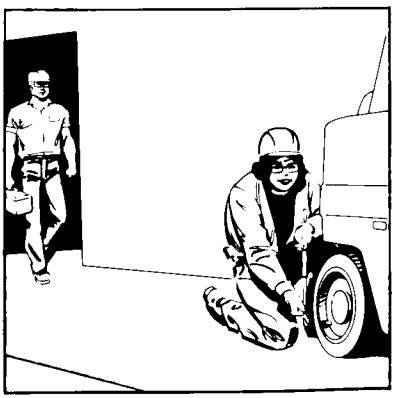


84M263

Check for the correct air pressure on trucks with pneumatic tires.

CAUTION

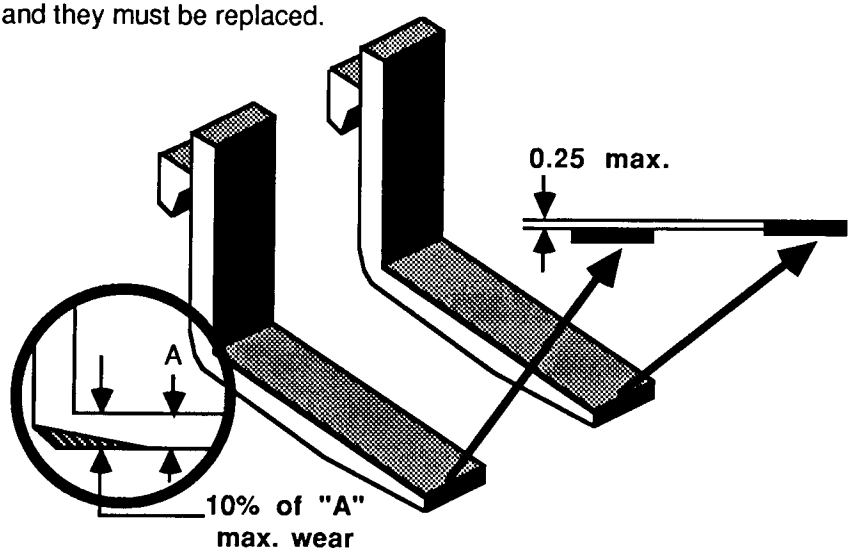
Check tire pressure from a position facing the tread of the tire, not the side. Use a long-handled gauge to keep your body away from the side. If tires are low, don't add air. Check with a mechanic. The tire may require removal and repair. Incorrect (low) tire pressure can reduce the stability of your lift truck and cause it to tip over.



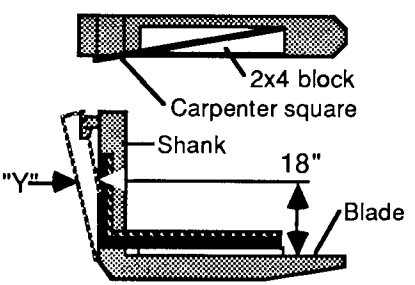
24964

How To Perform The Daily Inspection

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

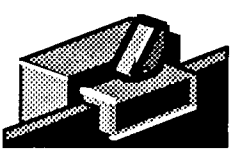


Inspect the forks for twists and bends.Put a 2"x4"x24" block on the blade of the fork with the 4" surface against the blade. Put a carpenters square on the top of the block and against the shank. Check the fork 18" above the blade to make sure it is not bent more than specified in the chart.



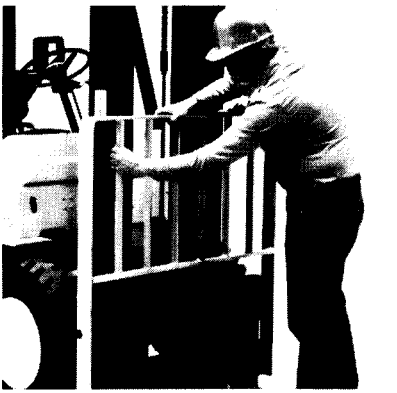
Fork cross - section	Allowable "Y" values for various blade lengths			
	42" blade	48" blade	54" blade	60" blade
1-1/2 x 4	15/16	1-1/4	1-9/16	1-15/16
1-3/4 x 5	1/2	5/8	25/32	31/32

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



How To Perform The Daily Inspection

Check the load back rest for damage. Make sure that the mounting fasteners are all in place and tight.



84M350

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

84M349

Unlatch and open each side door for access to the engine compartment.

Unlatch and lift the seat deck.

Inspect all components within the engine compartment.

83M404

How To Perform The Daily Inspection

Check fluid levels and air filters.

Locate the engine oil dipstick and check the engine oil level.

⚠ WARNING

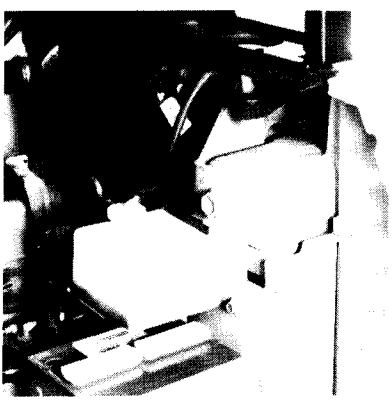
STEAM

DO NOT REMOVE THE RADIATOR CAP WHEN THE RADIATOR IS HOT. STEAM FROM THE RADIATOR WILL CAUSE SEVERE BURNS.

83M426

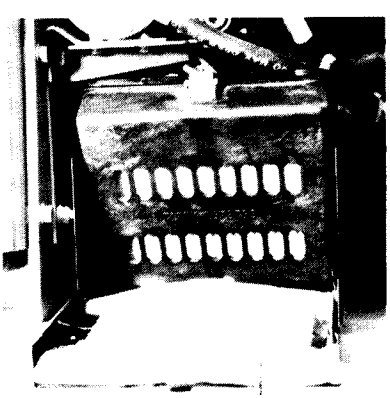
Check the engine coolant level.

Inspect the engine coolant hoses and fan belts.



83M425

Check the engine air filter for contamination (dirt build-up and clogging) and damage.



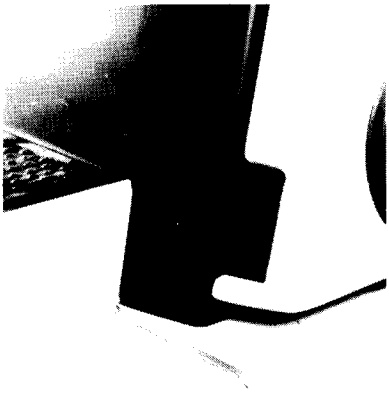
83M428

How To Perform The Daily Inspection

Check the hydraulic sump tank fluid level. Also, check the sump fill cap/breather for contamination and damage.

83M427

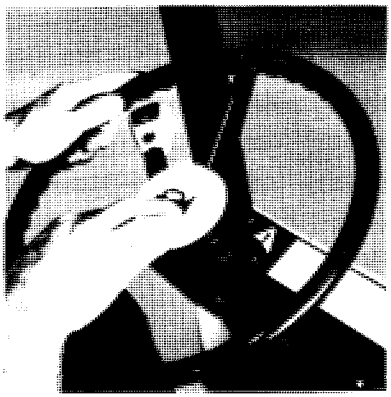
When you know that all of the components within the engine compartment are in satisfactory condition, lower the seat deck and close the side doors.



83M424

Now, make sure that all controls and systems are functioning correctly. If you are unfamiliar with the function of each control or system, please refer to previous descriptions titled under **"Know Your Truck"**, Truck Components and Features, How Your Lift Truck Operates, and How To Start Your Lift Truck.

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



84M243

How To Perform The Daily Inspection

Test the warning indicator lights.

From the **"off"** position, turn the key switch to the **"run"** position to check **ammeter** and **eng oil press** indicator lights. Turn the key switch to the **"start"** position to check the **water temp** and **trans oil temp** indicator lights.

IMPORTANT

DAMAGE TO THE TRUCK CAN RESULT IF ANY OF THE WARNING INDICATORS ILLUMINATE WHEN THE ENGINE IS RUNNING. STOP THE ENGINE. DO NOT OPERATE THE TRUCK.

Report the failure.

84M242

Start the engine and let it warm up until it runs evenly and accelerates smoothly when you push on the accelerator pedal.

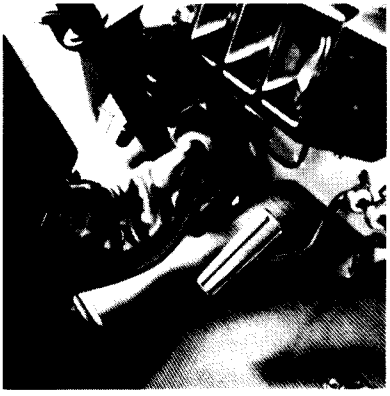
With the engine running, check the hourmeter indicator for operation.

84M276

Check the service brake system. Push down on the brake pedal and hold. Check for a feeling of solid resistance when the pedal stops. The pedal must feel firm and not move down farther after it stops. If the pedal continues to move downwards, report the failure immediately. **DO NOT OPERATE THE TRUCK UNTIL THE BRAKES ARE REPAIRED.**

Note: A low pedal reserve (clearance at floor plate) is normal.

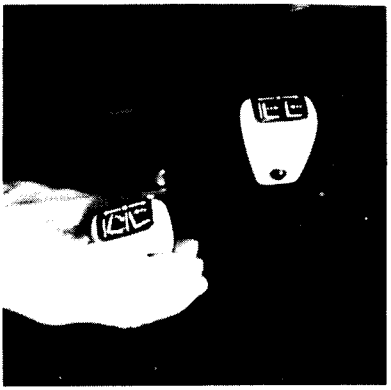
Check the function of the parking brake. Release, then apply the parking brake with the lever.



84M244

Check the function of the hydraulic system with the hydraulic pump (engine) running.

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



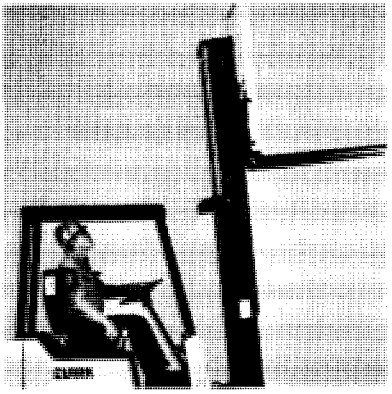
84M239

CAUTION

MAKE SURE THAT THERE IS ADEQUATE OVERHEAD CLEARANCE BEFORE RAISING THE UPRIGHT.

Pull back on the lift control lever and raise the fork carriage to full height. Watch the upright assembly as it rises. All movements of the upright and fork carriage must be even and smooth, without binding or jerking motion. Release the lever.

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



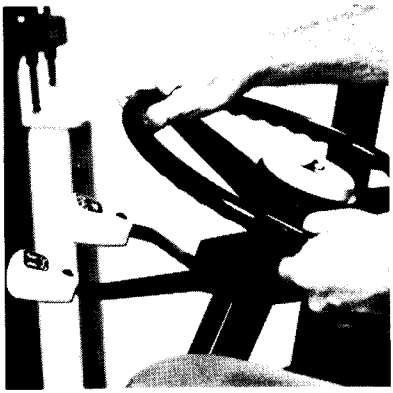
84M377

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

84M237

How To Perform The Daily Inspection

Move the steering handwheel in a full right turn, and then in a full left turn to check the steering. Return the handwheel (steer wheels) to the straight-ahead position.



83M409

WARNING

Fasten your seat belt before driving the truck.

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

Push firmly on brake pedal. Release the parking brake. Move the directional control lever from **"N"** (neutral) to **"forward"** travel position.

Remove your right foot from the brake pedal and put it on the accelerator pedal. Push down until the truck moves slowly forward. Remove your foot from the accelerator pedal and push down on the brake pedal to stop the truck.

84M283

Make sure that the travel area is clear behind the truck.

Put the directional control lever in the **"reverse"** travel position. Push down on the accelerator pedal until the truck moves slowly in the reverse direction. Remove your foot from the accelerator pedal and push down on the brake pedal to stop the truck.

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

Apply the parking brake.

Turn the ignition key switch to the **"off"** position.

84M284

How To Perform The Daily Inspection

Make a record on the **"Driver's Daily Checklist"** of all the operating and truck problems that you find. Review the checklist to make sure it has been completed. Give the checklist to the person responsible for lift truck maintenance.

84M286

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

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

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

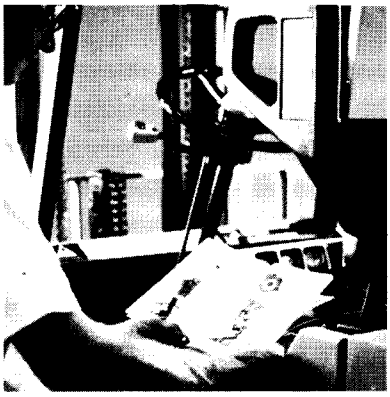
Be sure to put this Operator's Manual back in the holder behind the seat. Read the manual again if you are not sure of all lift truck operating procedures.

83M412

How To Operate Your Truck

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

The Operator's Manual is stored in a holder in the back of the driver's seat.



84M287

Before operating a lift truck each operator must check his truck and complete the **"Driver's Daily Checklist"**. Please refer to the previous section **"Before Operation"** for information on **"How To Perform The Daily Inspection"**.

15197

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

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

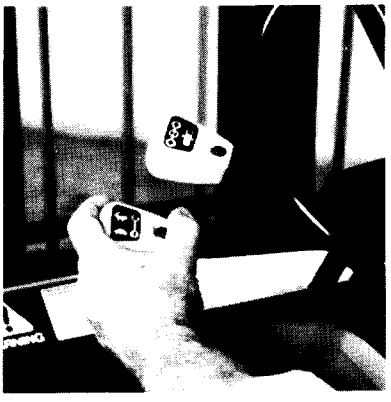
Buckle up. Make sure that you put on the seat belt. Connect and adjust the seat belt strap to a snug, comfortable position.

Always wear your seat belt when operating a lift truck.

83M405

If your truck is equipped with two speeds, put the speed control lever in the correct position for the expected speed and grade operation.

(Provided on optional Industrial Option Package pneumatic tire trucks only)



83M421

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

83M416

How To Operate Your Truck

Start the engine.

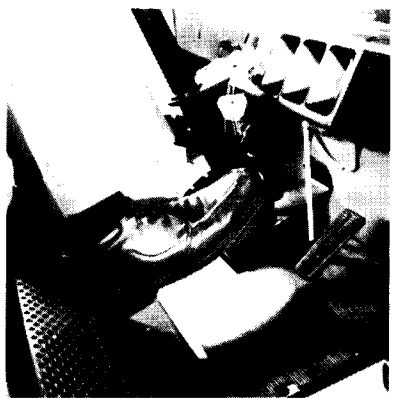
Turn the ignition key switch to the **"start"** position. When engine is running, release the key. The key will return to the **"run"** position.

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

83M430

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

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

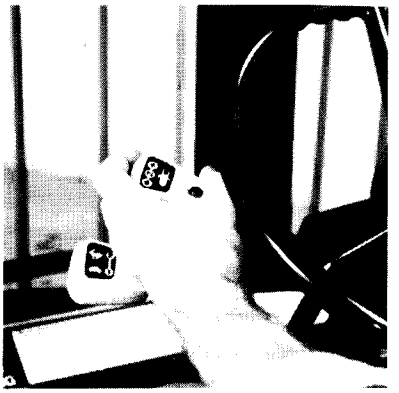


83M410

Release the parking brake.

84M281

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



83M417

Check all around to make sure that your intended path of travel is clear of obstructions and pedestrians.

83M431

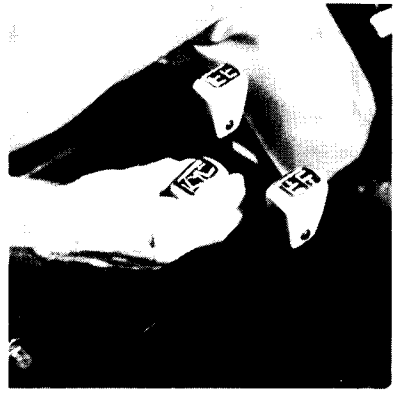
Pull back on the lift control lever and raise the forks approximately [50 mm] 2 inches above the floor.

83M422

How To Operate Your Truck

Using the tilt control, tilt the upright back slightly to raise the fork tips above the floor.

Raising the forks and tilting them back prevents the forks from catching on possible obstructions and reduces the wear on the fork blades if they strike or drag on the floor.

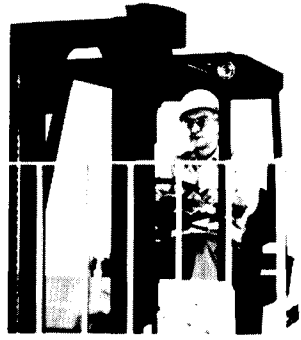


83M420

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

84M269

Be alert for pedestrians, other vehicles or obstructions in your path of travel.



83M432

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

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

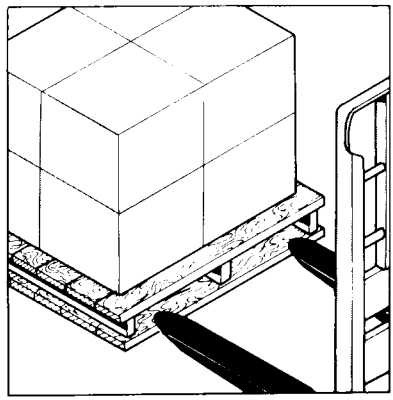
83M418

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

84M244

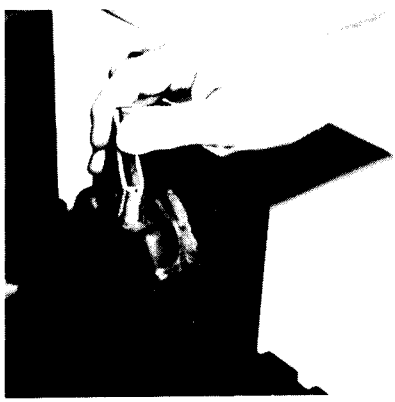
How To Operate Your Truck

When picking up a load, enter the load carefully. The forks must be fully under the load and spread as wide as possible to provide good stability and balance.



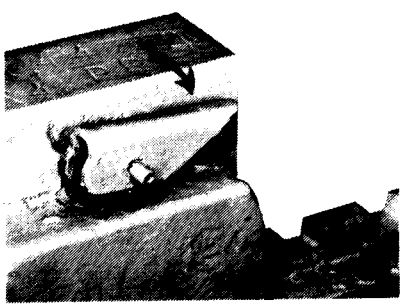
13203

If the forks need adjusting, lift the fork lock lever. Slide the forks on the fork bar of the lift carriage to get the correct width for the load. Make sure the fork lock pin fits into a locking notch on the fork carriage.



84M252

Lower the lever to lock the forks after they are in the correct position.



10759

When driving, always raise the forks slightly [50 - 100 mm] 2-4 inches above the floor and tilt the upright (forks) backward slightly.

83M422

Practice safe operation every time you use your lift truck.

During your work, observe all functions of your lift truck. This will allow you to immediately recognize a problem or irregularity that could affect the safe operation of your truck. **Do not continue to operate a truck that has a malfunction.** Stop and have it fixed.

Operate your lift truck safely. Careful driving and operation is your responsibility. Follow the instructions in this manual to avoid damage to your truck or the possibility of injury to yourself.

84M372

WARNING

ALWAYS WEAR YOUR SEAT BELT WHEN OPERATING YOUR LIFT TRUCK.

83M406

⚠ WARNING

CARBON MONOXIDE

INTERNAL COMBUSTION ENGINES GENERATE TOXIC GASES WHICH CAN CAUSE SERIOUS INJURY OR DEATH WHEN INHALED. BE SURE THERE IS ENOUGH VENTILATION.

When You Have Finished Using Your Truck

Always leave your lift truck in a safe condition.

When you leave your truck, or park it, follow these safety rules:

- Park in a safe area away from normal traffic.
- Never park on a grade.
- Never park in areas which block emergency routes or equipment.

83M396

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

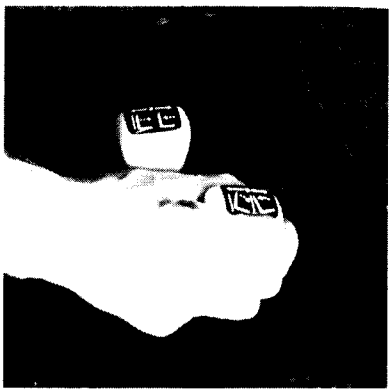
83M416

- Lower the forks or attachment to the floor.

84M237

When You Have Finished Using Your Truck

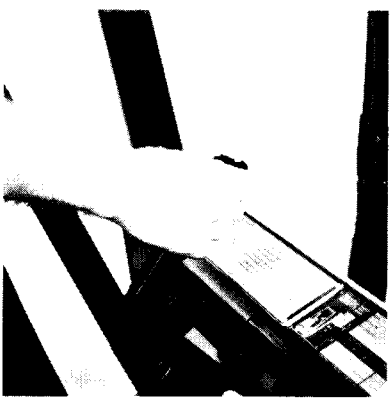
• Tilt the upright forward until the forks are level or flat on the floor.



84M240

• Apply the parking brake.

Block the wheels if you have any doubt about the truck moving from a safe position.



84M281

• Turn the ignition key switch to the **"off"** position and remove the key.

LPG Fuel Engines

1. Close the shut-off valve at the LPG tank.
2. Wait until the engine stops.
3. Turn the ignition key switch to the **"off"** position and remove the key.

84M241

6 Emergency Starting

How To Use Battery Jumper Cables

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

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

1. This truck has a 12-volt battery and a negative ground electrical system. Make sure that the other truck also has a 12-volt battery and negative ground system. If not sure of the voltage, or if the ground is different, do not try to jump start, as personal injury or damage to the electrical system can result.

NOTICE

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.

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

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

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.

IMPORTANT

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

⚠ WARNING

SULFURIC ACID

THE BATTERY CONTAINS CORROSIVE ACID WHICH CAN CAUSE INJURY. IF ACID CONTACTS YOUR EYES OR SKIN, FLUSH IMMEDIATELY WITH WATER AND GET MEDICAL ASSISTANCE.

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

⚠ WARNING

EXPLOSIVE GASES

DO NOT SMOKE OR HAVE OPEN FLAMES OR SPARKS IN BATTERY CHARGING AREAS OR NEAR BATTERIES. AN EXPLOSION CAN RESULT AND CAUSE INJURY OR DEATH.

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

How To Use Battery Jumper Cables

4. On both trucks:
   - Turn all accessories to the **"off"** position and leave them off until after the engine has been started and the jumper cables removed.
   - Turn the ignition key switch to the **"off"** position.
   - Apply the parking brake.
   - Put the directional control lever in the **"N" (neutral)** position.
5. Connect the jumper cables in the following sequence:

   (Also refer to Figure 24871)

   a. Connect the first jumper cable from the positive (+) (Red) terminal on one battery to the positive (+) (Red) terminal on the other battery. **Never** connect (+) (Red) to (−) (Black), or (−) to (+).

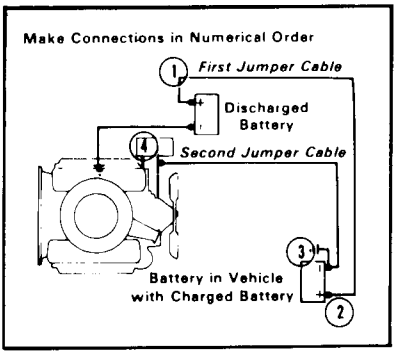
   b. Next, connect one end of the second cable to the grounded (−) (Black) terminal of the booster battery.

   c. Last, connect the other end of the second jumper cable to a stationary solid metallic point on the engine of the truck with the discharged battery. **(Not to negative (−) terminal of the battery.)** Make this connection at a point at least [450 mm] 18 inches away from the battery, if possible. Do not connect it to pulleys, fans, or other parts that move. Be sure not to touch hot manifolds which can cause severe burns.
6. Start the engine on the truck with the booster battery, and run the engine at a moderate speed.

⚠ WARNING

SHORT CIRCUITS

REMOVE ALL JEWELRY. DO NOT PERMIT ANY METAL TOOLS TO MAKE CONTACT WITH THE POSITIVE BATTERY TERMINAL AND OTHER METAL ON THE TRUCK. MAKE SURE WHEN CONNECTING JUMPER CABLE CLAMPS TO THE POSITIVE TERMINALS OF THE BATTERIES THAT NEITHER CLAMP CONTACTS ANY OTHER METAL. INJURY CAN OCCUR FROM ELECTRICAL SHOCK OR EXPLOSION.



24871

7. Start the engine of the truck with the discharged battery. Follow the starting instructions in the **"Know Your Truck"** section of this manual. Make sure that the engine is at idle speed before disconnecting the jumper cables.
8. Remove the jumper cables by reversing the above sequence exactly. Start by removing the last jumper cable, from the truck with the discharged battery, first. Remove the cable end from the engine block first, then the other end of the negative (−) cable.
9. Remove both ends of the positive (+) cable.

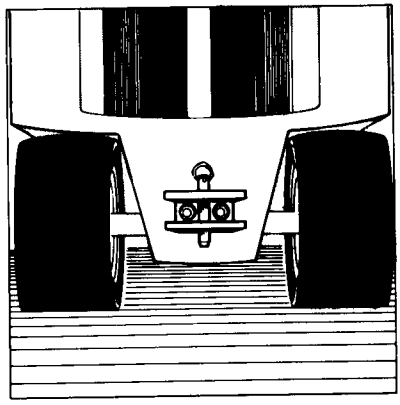
7 Emergency Towing

Emergency Towing

How To Tow a Disabled Truck

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

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



24172

Use an approved towing coupler that bolts to the axle through the counterweight.

Towing equipment is **optional equipment** available from your Clark dealer.

1. Engage the parking brake.
2. Put blocks against the drive wheels.

23057

How To Tow a Disabled Truck

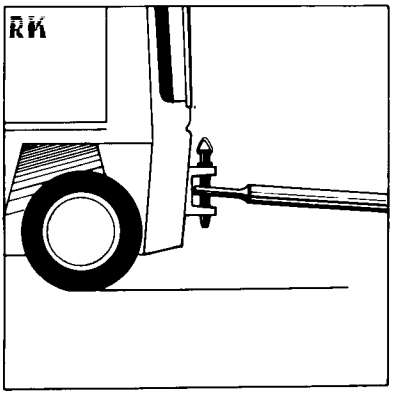
Connect an approved solid metal tow bar to the tow vehicle and to the truck to be towed. With a driver in the seat, push down on the foot brake pedal to prevent the truck from moving. Have the blocks removed from the drive wheels.

83M410

Push forward on the parking brake handle to release the brake.

84M281

Correct towing is necessary to prevent injury to personnel or damage to the truck. The truck is to be towed at a speed of less than [8 kph] 5 mph with a driver in the seat. **Do not lift the truck or any wheels off the floor while the truck is being towed.**

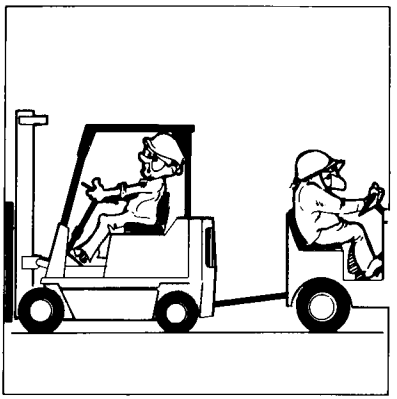


24174

Emergency Towing

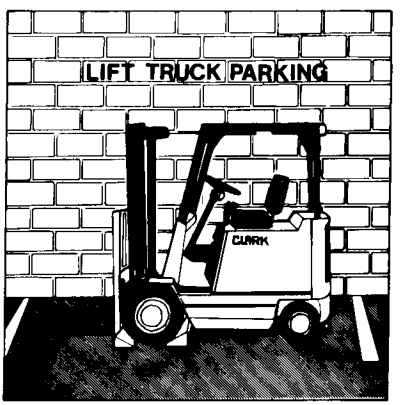
How To Tow a Disabled Truck

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



24175

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



24176

⚠ CAUTION

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

8 Planned Maintenance and Lubrication

⚠ WARNING

LIFT TRUCK MAINTENANCE

DO NOT WORK ON THIS TRUCK UNLESS YOU ARE TRAINED AND AUTHORIZED AND KNOW THE CORRECT MAINTENANCE PROCEDURES.

Planned Maintenance and Lubrication

Regular maintenance and care of your lift truck is essential for economy and utilization reasons, but most important for your safety. A faulty lift truck is a potential source of danger to the operator, and to other personnel working near it.

Lift trucks should be inspected daily, or at the start of each shift. This daily inspection should include a visual check for leaks and any obvious damage which may have been caused by operation during the last shift. Check the tires and wheel bolts. Look the upright and lift chains over. Check the forks and load backrest extension. Look for loose bolts and fittings. Make sure that the overhead guard is in good condition. Check all of the controls. Make sure that all systems are functioning correctly. Check the engine oil, fuel and coolant levels as well as the hydraulic sump oil level. And make sure that all instruments, warning lights and the horn are operating correctly and that your truck is safe to operate. Use the daily inspection sheet as a check list and record of your findings.

In addition, Clark recommends that you set up and follow a planned maintenance and inspection program. Performed on a regular basis, the program will provide the opportunity to make thorough inspections and checks on the safe operating condition of your lift truck. Necessary adjustments and repairs are made as needed. The schedule for these planned maintenance (PM) inspections will depend on the conditions of your particular application and lift truck use. Recommended periodic inspection and maintenance items are listed in the Maintenance and Lubrication section. Also shown is the PM inspection and report form which may be obtained from your local Clark dealer. He is also prepared to help you with your Planned Maintenance and Inspection Program if you want assistance. He has specially trained service personnel who are authorized to check your lift truck according to the respective safety regulations.

Also, in the Maintenance and Lubrication section, you will find a listing of useful specifications for fuel and lubricants, critical bolt torques, refill capacities and settings for your truck.

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

Recommended Planned Maintenance Intervals

Operating conditions

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

NORMAL OPERATION:

Basically, eight-hour material handling, mostly in buildings or in the open air.

SEVERE OPERATION:

Prolonged operating hours or constant usage.

EXTREME OPERATION:

1. In sandy or dusty locations, i.e. cement plant, lumber or flour mills, coal dust or stone crushing sites.
2. High-temperature locations, i.e. steel mills, foundries, etc.
3. Sudden temperature changes (constant trips from buildings into the open air), e.g. refrigeration plant.

If your fork-lift truck is used in extreme operating conditions, you must shorten the maintenance intervals accordingly.

Ensure operational safety

Recommended Planned Maintenance and Lubrication Schedule

For: GCS / GPS / DPS 17-30

PM Interval:
8 = 8 - 10 hours
50-250 = 50 - 250 hours
500 = 450 - 500 hours
1 = 900 - 1000 hours or every 6 months
2 = 2000 hours or every year

*Oil change intervals may be determined by laboratory analysis.

**Air filter change interval may be determined by using air cleaner gauge.

		Lube Chart Find	Nominal Maintenance Interval				
			8	50-250	500	1	2
01 LUBRICATION Air Clean Truck/Radiator		#		•			
Steer axle linkages	(8) fittings	1		•			
Upright trunnion bushings	(2) fittings	2		•			
Tilt cylinder rod ends @ upr	(2) fittings	3		•			
Lift chains		4		•			
Carriage chains		5		•			
00 ENGINE OIL*							
Drain and replace	Gasoline	6		•			
	LPG			•			
	Diesel			•			
Replace filter		7		•			
01 COOLING SYSTEM							
Check coolant condition/protect level		8				•	
Drain/flush radiator		8					•
Inspect/adjust belts		9			•		
02 FUEL SYSTEM							
Replace fuel filter	Gasoline	10					•
	LPG						•
	Diesel				•		
Clean tank / filler screen		11					•
02 AIR INTAKE**							
Replace air filter		12			•		
06 TRANSAXLE							
Clean transmission oil strainer screen		13				•	
Replace transmission oil filter		14			•		
11 IGNITION							
Engine tuneup		15					•
Check engine/ignition timing					•		
Replace spark plugs	Gasoline						•
	LPG						
12 BATTERY							
Clean/check terminals, electrolyte level		16			•		
20 DRIVE AXLE (TRANSAXLE)							
Check fluid level/condition		17		•			
Drain and replace fluid		17				•	
Check brake wear		18					•
Check air vent		19		•			
Lubricate wheel end gearing/bearings		20					•
23 BRAKES							
Check brake fluid level	(Std Only)	21		•			
Replace brake fluid	(Std Only)	21					•
26 STEER AXLE							
Lubricate wheel bearings		22					•
29 HYDRAULIC SUMP & FILTER							
Check fluid level/condition — sample		23		•			
Change fluid		23					•
Replace fluid filter		24					•
Replace tank breather cap		23				•	

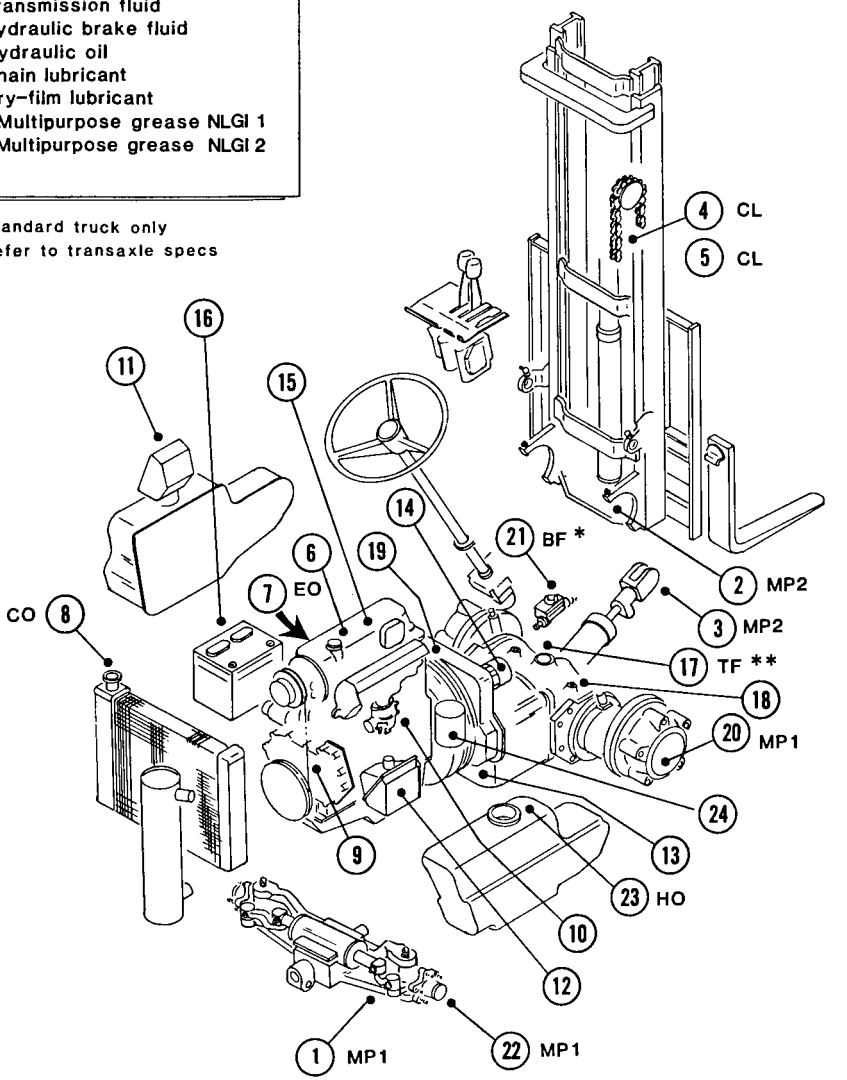
Planned Maintenance and Lubrication Chart

GCS/GPS 17-30

LEGEND:

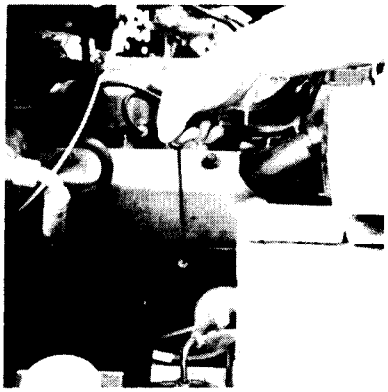
EO Engine oil
CO Engine coolant
TF Transmission fluid
BF Hydraulic brake fluid
HO Hydraulic oil
CL Chain lubricant
DL Dry-film lubricant
MP1 Multipurpose grease NLGI 1
MP2 Multipurpose grease NLGI 2

* Standard truck only
** Refer to transaxle specs



Engine Oil Level Check

Check the engine oil level at left side of engine. Pull the dipstick out, wipe it with a clean wiper and push it back into the dipstick tube. Remove the dipstick again and check the oil level.



84M390

Engine Oil and Filter Change

It is recommended to:

* • Drain and replace the engine crankcase oil every 50 to 250 operating hours.

  • Replace the engine oil filter every oil change.

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

84M392

Engine Air Cleaner

Change the engine air filter every 50 to 250 operating hours, depending upon your application and operating conditions.

• STANDARD MODELS — Remove and replace the complete air filter unit.

• CUSTOM AND INDUSTRIAL OPTION PACKAGE — Remove and replace the filter element (shown).

84M362

Engine Coolant Check

On standard trucks the engine coolant level is checked by removing the radiator cap. Remove the cap only when the engine is cold. Turn the cap slowly to release any pressure that may be in the radiator. Then push the cap fully down and turn to release and remove the cap.

⚠ WARNING

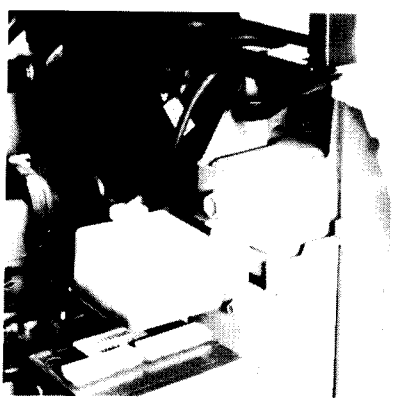
STEAM

DO NOT REMOVE THE RADIATOR CAP WHEN THE RADIATOR IS HOT. STEAM FROM THE RADIATOR WILL CAUSE SEVERE BURNS.

84M395

On custom and industrial option package trucks, inspect the coolant level in the overflow bottle only. **Do not remove the cap.**

The coolant level should be at the **"Cold Level"** line on the coolant recovery bottle.

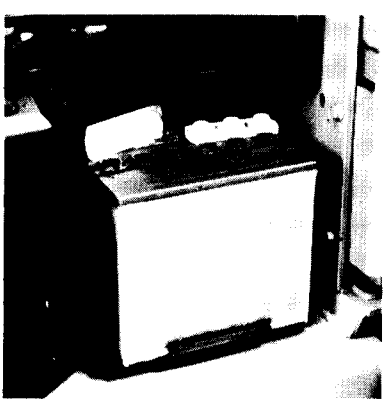


83M425

NOTICE: Your lift truck cooling system is filled with a factory-installed solution of 50% permanent-type anti-freeze and 50% water, containing rust and corrosion inhibitors. You should leave it in the truck year around.

Battery — Water-Fill Type

Check the battery to be sure the cells are all filled. Inspect for cracks. If the terminals are corroded, clean and protect them with Battery Saver.



84M356

Brake Master Cylinder Fluid Level Check
Standard Model w/HR500 Transaxle

1. Remove floorboards

2. Check brake fluid level on standard trucks by opening inspection/fill plug on brake master cylinder top.

IMPORTANT

WITH STANDARD MODEL SERVICE BRAKE SYSTEMS, USE SAE AUTOMOTIVE HYDRAULIC BRAKE FLUID ONLY. D.O.T 3

84M399

3. Replace floorboards.

IMPORTANT

HR600 Transaxle

DO NOT OPEN MASTER CYLINDER TO CHECK FLUID LEVEL. DO NOT PUT STANDARD SAE AUTOMOTIVE BRAKE FLUID IN THIS SYSTEM.

NOTICE

HR600 Transaxle

Service brake system on these models uses transaxle fluid. Brake master cylinder fluid level is supplied (replenished) automatically.

NOTICE

TA18 Transaxle

Has reservoir on dash for D.O.T. 3 brake fluid.

Hydraulic Fluid Level Check

Check the hydraulic sump tank oil level with:

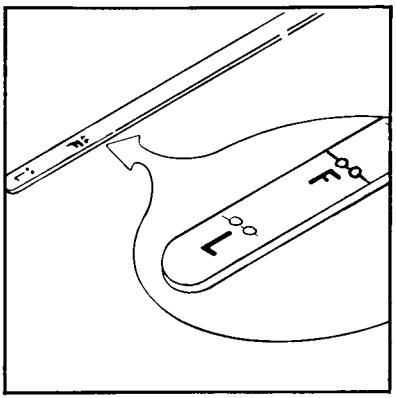
1. Truck on a level surface.
2. Upright in a vertical position.
3. Fork carriage fully down.
4. Oil at operating temperature.

Pull the dipstick out, wipe it with a clean wiper, and push it back into the dipstick tube. Pull the dipstick out again and check the oil level.

84M397

The hydraulic sump tank oil level should be up to the **"F"** (full) mark on the dipstick.

Approximately [3,8 L] 1.0 gal. of hydraulic oil is required to fill the hydraulic tank from the **"L"** (low) mark to the **"F"** (full) mark. **Do not overfill.**



24917

Hydraulic Sump Tank Fluid & Filter Change

It is recommended to:

- Drain and replace the hydraulic fluid every 2000 operating hours.
- Replace the hydraulic oil filter at every oil change.
- Replace the hydraulic sump tank breather/fill cap every 1000 operating hours.

84M398

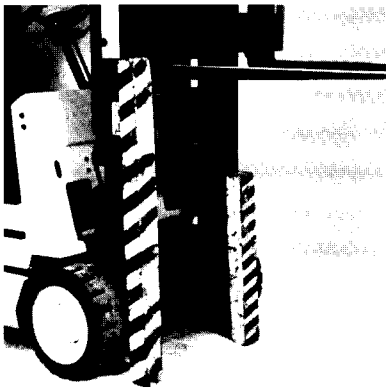
IMPORTANT

Use recommended fluid only
Use genuine Clark parts

Access to the Drive Axle

The best method to use for reaching the drive axle check points (oil level/filler plug and brake inspection plugs) is dependent upon the style of upright, carriage and attachments on your truck. One method is to raise the upright carriage to provide easy access to the drive axle.

- **Apply the parking brake and block the wheels.**
- **Be sure to put blocking under the carriage and upright rails.**



84M255

⚠ WARNING

FALLING FORKS

DO NOT WALK OR STAND UNDER RAISED FORKS. THE FORKS CAN FALL AND CAUSE INJURY OR DEATH.

Transaxle Fluid Level Check

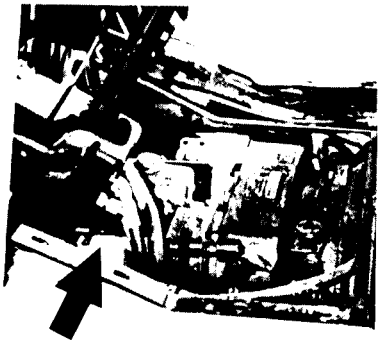
- Check the transaxle fluid level with the:
  1. Truck on a level surface
  2. Transmission in "NEUTRAL"
  3. Engine idling
  4. Oil at operating temperature
- Remove the fluid level inspection plug located in the front surface of the drive axle center housing (all models).
- The oil level is correct (full) when the oil reaches the lower edge of the plug opening, or can be measured on the dipstick portion of the plug.
- After adding oil to the transaxle, wait a few minutes until the oil has distributed evenly throughout the unit, keep the oil level at the lower edge of the inspection opening. **Do not overfill.**
- Be sure to inspect the seal on the inspection plug. Replace as needed.

84M233

Transaxle (Transmission) Oil Filter Change

The transaxle oil filter is located in a horizontal position on the top left front (towards drive axle) side of the transmission, and mounted on the charging pump.

1. Remove the floorboards. You will see the transmission oil filter near the bottom of the steering column.



84M421

2. Remove the oil filter. Take special care when removing this filter to avoid the draining onto the floor of any oil remaining in the filter. It is recommended that you first loosen the filter using a standard filter wrench. Then, remove the filter while holding a pad of shop cloths, or other absorbent material, under the open end of the filter to absorb any excess oil that may drain out of the filter.

3. Install a new filter. Be sure to follow the installation instructions printed on the outside surface of the filter.

IMPORTANT

Always Use Genuine Clark Parts.

4. Inspect and clean the transaxle breather (air vent), located on the top of the converter housing near the charging pump.
5. Install the floorboards.

HR600 Transaxle
HR600 transaxle has four inspection and service plug openings in drive axle section.

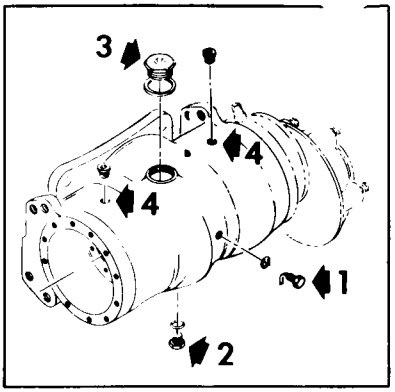
1. Fill/oil level dipstick plug.

2. Drain plug.

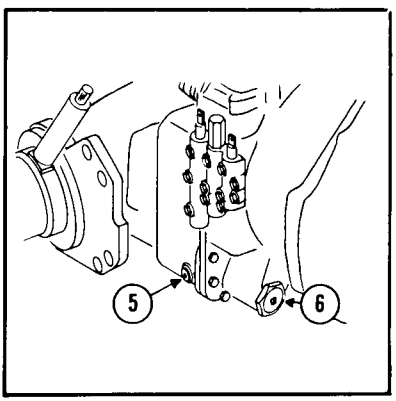
3. Inspection/fill plug

4. Brake inspection plugs

In addition, HR600 transaxle has a transmission housing drain plug (5), located on lower left side from corner of transmission case sump, and a transmission oil strainer screen access plug (6) in lower left rear side corner (towards engine) of housing.



24984



24990

Transaxle Fluid Replacement/Refill
HR600 Transaxle
After drive axle and transmission housing has drained completely,

1. Install drain plug in drive axle.

2. Install drain plug in transmission housing.

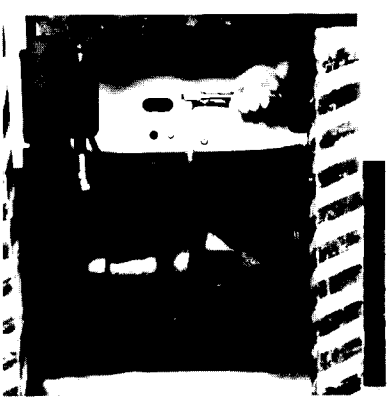
3. Remove large inspection/filter plug in top center of axle.

4. Fill transaxle to bottom edge of fill/oil level plug opening on from of axle with recommended fluid noted below. Please refer to previous instructions on **"Transaxle Fluid Level Check"**.

5. Install fill/level plug.

6. Install inspection/filter plug.

7. Remove drain pan. Remove blocking from under upright (if used) and lower carriage and forks to floor.


84M256

IMPORTANT

HR600 use only Texaco 8570 ATF, or Clark Part No. 962669 in HR600 transaxles.
DO NOT USE A SUBSTITUTE.

Transaxle Fluid & Filter Change
It is recommended to:

- Drain and replace the transaxle fluid every 1000 operating hours.

✱ • Replace the transmission oil filter every 500 operating hours.

*When the transaxle is new or rebuilt, it is recommended to change the oil filter after the first 50 hours and again after 100 operating hours. The reason for this is to be sure that the oil is cleaned of all harmful particles of material which may be loosened or flushed off new parts as they wear in.

To change oil in the transaxle:

1. The oil should be drained when it is warmed to operating temperature.
2. Put the truck in a level position.
3. Apply the parking brake and block the wheels to prevent the truck from moving.

NOTICE: When suitable equipment is available, the truck may be raised or hoisted up and placed in a level position on wheel cradles to allow access under the axle. Otherwise, raise the fork carriage only high enough to provide access to the axle. Please refer to procedure described above in **"Access to the Drive Axle"**.

NOTICE

Frequent changes of lubricant and filters is an inexpensive way to protect and prolong the safe operating life of an essential and relatively more valuable major component such as the transaxle.

Extending the recommended intervals at which transaxle fluid and filters are changed should be considered only after careful evaluation of your operating conditions and/or analysis of the condition of the oil. Because the oil is heated to very high temperatures when a troque converter and transmission are operated under heavy or sustained working conditions, it will "wear out" (break down) and lose its lubricating ability due to oxidation. When this happens, it will cause rapid wear and damage to seals, bearings, and clutch plates, resulting in the need for a much more costly transmission rebuild.

Transaxle Fluid & Filter Change

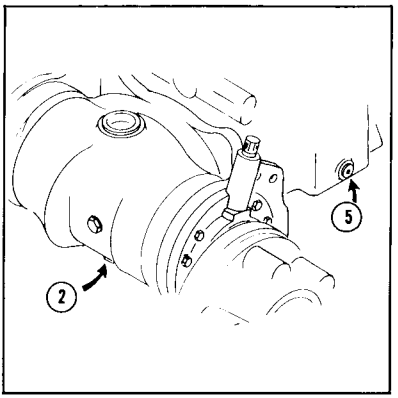
The transaxle oil must be drained from two places (all models),

1. The drive axle drain plug, and
2. The transmission housing drain plug, located at the lower left side (front corner) of the transmission case sump (below the control valve).

Place one flat drain pan of [15 L] 32 pints minimum capacity under both drain openings, or separate drain pans under each opening.

Remove the drain plugs.

NOTICE: Please refer to the description of standard and optional model transaxle features on following pages.



24991

Transmission Sump Oil Strainer Screen

• Remove and clean the transmission sump oil strainer screen each time the transmission fluid is changed.

1. Remove the access cover and the transmission sump strainer screen.
2. Use an approved cleaning solvent to clean the screen. Dry with compressed air.

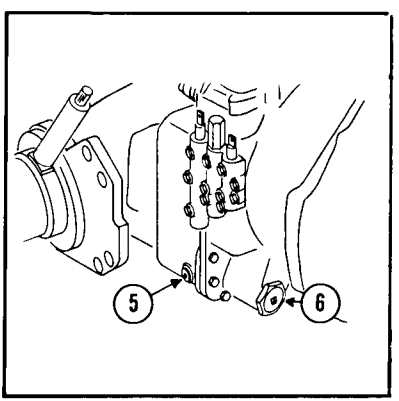
⚠ WARNING

AIR PRESSURE

WEAR EYE PROTECTION & PROTECTIVE CLOTHING WHEN CLEANING OR DRYING WITH AIR PRESSURE. REDUCE PRESSURE TO [207 kPa] 30 PSI. DEBRIS REMOVED WITH AIR PRESSURE CAN CAUSE INJURY.

3. Inspect the screen for damage. Replace as necessary.
4. Install the screen and cover.

12171



24990

HR500 Transaxle
HR500 transaxle has two openings in drive axle section.

1. Fill/oil level dipstick plug.

2. Drain plug, in lower front surface of axle center housing.

In addition, HR500 transaxle has a transmission housing drain plug (3), and a transmission oil strainer screen access plug (4) located similarly to HR600 transaxle.

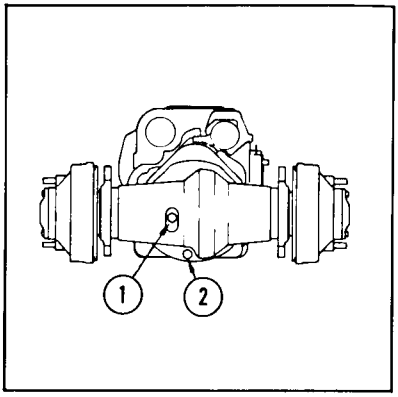


Fig. 24992

Transaxle Fluid Replacement/Refill
HR500 transaxle
After drive axle and transmission housing has drained completely,

1. Install drain plug in drive axle.

2. Install drain plug in transmission housing.

3. Remove inspection/filler plug in from center surface of drive axle housing.

4. Fill transaxle to bottom edge of fill/oil level plug opening with recommended fluid noted below. Please refer to previous instruction on **"Transaxle Fluid Level Check"**.

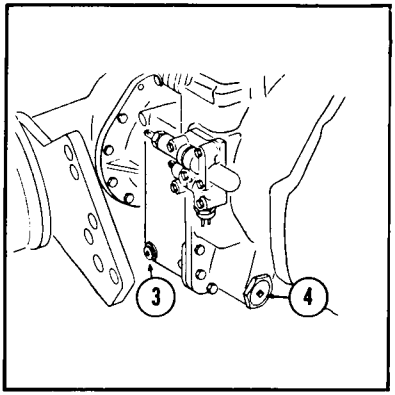


Fig. 24994

5. Install fill/level plug.

6. Remove drain pan. Remove blocking from under upright (if used). Lower carriage and forks to floor.

IMPORTANT
HR500 use only API Class CC,SC, SE, SF Motor Oil
SAE30 @ 32°F-110°F
SAE10 @ 32°F-(-30°F)
DO NOT SUBSTITUTE.

IMPORTANT
TA18 use only AMOCO 1000 or TEXACO 1893 TDH CLARK # 2776236
DO NOT SUBSTITUTE.

HR600 TRANSAXLE — BRAKE DISC WEAR CLEARANCE CHECK

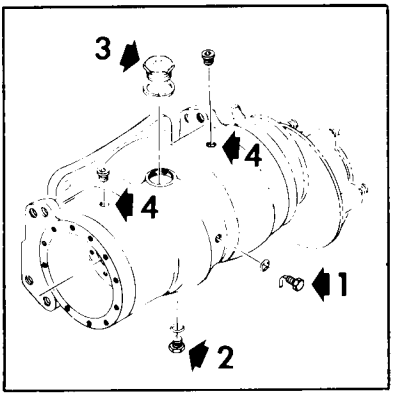
The purpose of this check is to determine the "worn" thickness of the inner (friction) brake discs. The remaining thickness of the inner plates is readily determined by measuring the space (clearance) between two steel outer discs. The minimum allowab'e "worn" thickness of the inner friction discs is [2,6 mm] 0.104 inch. Measurable wear of the steel outer discs is normally not expected. The brakes must be fully applied during this check to make sure that all of the operating running clearance is removed.

Please refer to the procedure described previously in "Access To The Drive Axle".

⚠ WARNING

PUT POSTS UNDER THE UPRIGHT AND CARRIAGE AS SHOWN IN FIGURE 84M255 TO KEEP IT FROM FALLING AND CAUSING PERSONAL INJURY.

3. Remove the brake inspection plugs (4) from top of drive axle housing.



24984

4. Apply parking brake or push down on the brake pedal and maintain [445N] 100 lbf. force on the pedal while checking the brake discs.

84M244

5. Brake disc gauge (6) dimensions are shown by Figure 20716.

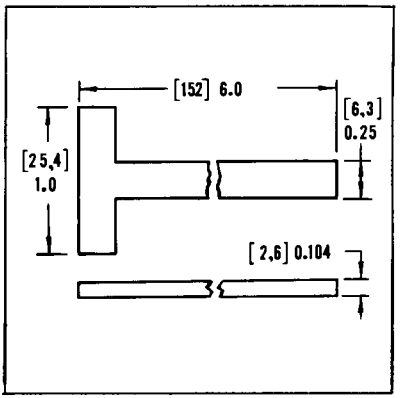


Fig. 20716

6. Insert the gauge into the axle through the brake inspection plug opening (5). Try to put the brake disc clearance gauge (6) between two steel discs (8), Figure 24982. Minimum disc clearance is [2,6 mm] 0.104 inch.

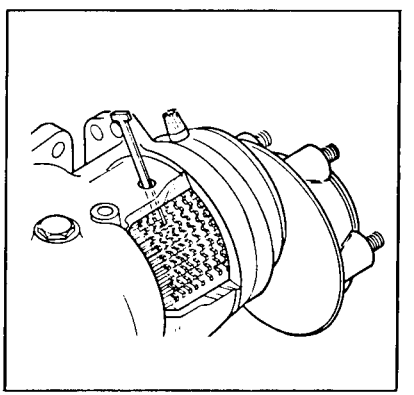


Fig. 21977

7. The gauge (6) should go between the outer discs (8). If it does not, the brake inner (friction) discs (7) are worn and require replacement. Refer to Overhaul Manual OH-522, GROUP 20, for drive axle overhaul.

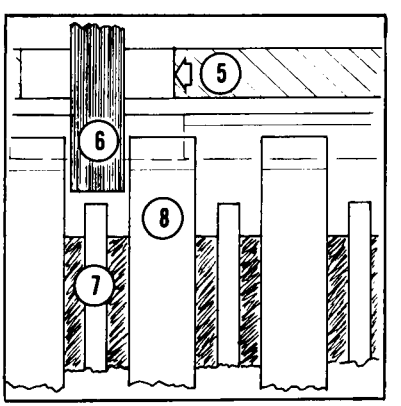
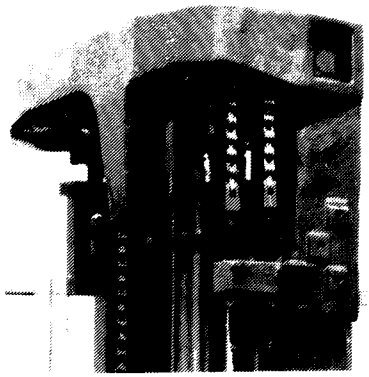


Fig. 24982

Lift Chain Lubrication

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

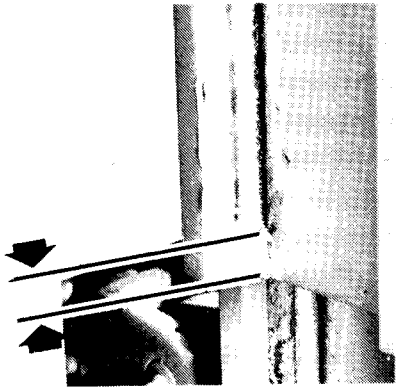


21460

Lift Chain Adjustment Check

The lift chains are correctly adjusted if the lower fork carriage rollers reach their end (lowest) position approximately [13 mm] 0.50 inch from the lower edge of the inner rail. This also positions the bottom of the forks the same (equal) distance above the floor. To check this dimension, raise the carriage to a height that exposes several inches of the inner rail at the roller path. Apply a layer of grease to the roller path on the inner rail. Lower the carriage and pick up a rated capacity load, (tilt the upright back slightly) and raise the load until the carriage rollers have passed over the greased area. Lower the load completely and remove the load from the forks. Raise the carriage again to expose the inner rail. You can now check the roller path pattern in the grease and determine the correct adjustment of the chains.

The lift chains can be adjusted by loosening or tightening of the chain anchor nuts.



17643

NOTICE: It is important to make the lift chain adjustment check with a rated load to make sure that the chains are stretched to their maximum length.

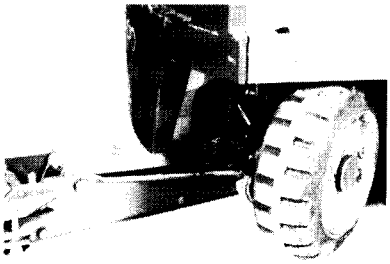
If the chains show slack due to an increase in length they should be measured for wear. When chains have stretched by wear more than 3% of their original length they are not safe and must be replaced.

Truck Lubrication

Raise the rear of the truck and place blocking under the frame for safety.

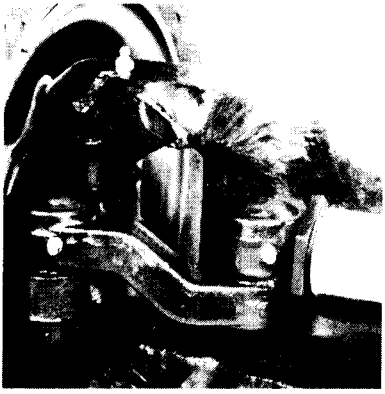
Lubricate the steer axle linkage — tie rod ends and kingpin bearings. Be sure to clean the grease fittings before lubricating and remove the excess grease from all points after lubrication. Inspect the steering cylinder piston rod, seals and fasteners for damage, leaks and looseness.

Remove the blocking and lower the rear of the truck.



83M480

Lubricate the tilt cylinder rod ends (at the forward end) and the upright trunnion bushings.



84M274

Your CLARK Dealer keeps all lubricant available for you

Wheel and Tire Inspection

Federal and State laws require persons to be fully trained and qualified before doing maintenance on wheels and tires. Injury or death can result from the explosive separation of rim components if service procedures are not done correctly.

⚠ DANGER

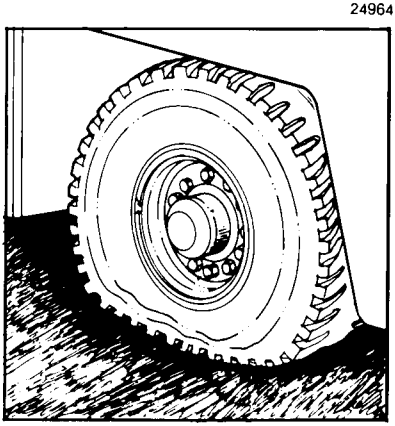
RIM SEPARATION

REMOVE THE AIR FROM TIRES BEFORE DOING ANY WORK ON TIRES OR RIMS. MULTI-PIECE RIMS CAN SEPARATE WITH ENOUGH FORCE TO CAUSE INJURY OR DEATH.

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 trajectory path of multi-piece rims and wheels.

24964

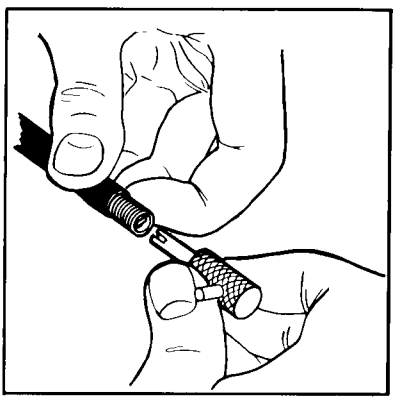
If tires are low, do not add air. Check with a mechanic. The tire may need to be removed and repaired.



24308

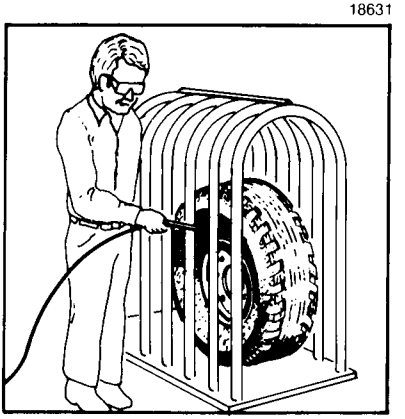
Wheel and Tire Inspection

Remove air from the tire before removing wheel clamping nuts (two piece wheels) or rim locking rings on multi-piece rims.



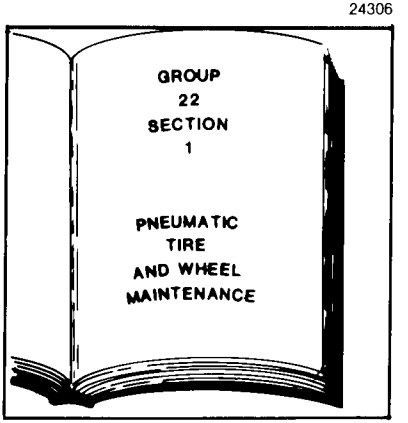
18631

Always use a safety cage to inflate tires after servicing.



24306

Trained and qualified mechanics should refer to information in the Planned Maintenance Manual before working on pneumatic tires and rims.



24309

9 Specifications

NOTICE

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

Truck Specifications

Fuel recommendations:

Gasoline	Regular Grade, 85 Octane Minimum (Motor Method)
LP Gas	HD-5 Propane
Diesel Fuel Oil	ASTM Grade No. 1D and 2D, 45 Cetane Minimum, 50 Cetane Preferred

Engine oil recommendations:

(Gas — LPG) API Service Classification CC, SC, SE, SF, MIL-B Motor Oil, MIL-L-46152
(Diesel) — API Service Classification CD/SE MIL-45199B

Ambient Temperature (Average)	Viscosity
32°F to 110°F [0°C to 43°C]	SAE 30
70°F to 0°F [21°C to −17°C]	SAE 20W
0°F to −30°F [−17°C to −34°C]	SAE 10W

Engine coolant recommendation:

50% water and 50% ethylene glycol permanent-type antifreeze containing rust and corrosion inhibitors. (Antifreeze protection level [−37°C] −34°F)

Tire inflation pressure:

Drive Tires (7.00 x 12 — 14 Ply, 28 x 9 x 15-14 Ply)	[965 kPa] 140 psi
Steer Tires (6.50 x 10 — 10 Ply)	[792 kPa] 115 psi

Truck Specifications

Fill capacities/fluid volumes:

Fuel Tank -- Gasoline/Diesel .....[30,0 L] 8 gal
LPG [ICC Horiz Tank]..... [15 kg] 33.5 lb
Cooling System:
Mitsubishi 2.6L Gasoline/LPG .....[8,5 L] 9 qt
Waukesha 2.9L Gasoline/ LPG .....[10,4 L] 11 qt
Continental 2.7L Gasoline/Diesel .....[8,5 L] 9 qt
Engine Oil, w/Filter
Mitsubishi 2.6L Gasoline/LPG .....[4,5 L] 4.8 qt
Waukesha 2.9L Gasoline/LPG .....[4,7 L] 5.0 qt
Continental 2.7L Gasoline/LPG .....[6.65 L] 7.0 qt
Continental 2.7L Diesel .....[6.65 L] 7.0 qt
Transaxle [Transmission & Drive Axle]
HR500 .....[15,1 L] 32 pints
HR600 .....[12, 8 L] 27 pints
TA18 .....[15,1 L] 32 pints
Hydraulic Sump Tank [Useable Volume] .....[20, 8 L] 5.5 gal

Hydraulic system relief pressure setting:

Lift and Tilt [Adjustable] Model 17,20 .....[16200 kPa] 2350 psi
22,35 .....[18270 kPa] 2650 psi
27,30 .....[20685 kPa]3000 psi

Steering system relief pressure setting: .....[8615 kPa]1250 psi

Engine speed settings: [+] [-] 50 rpm

Engine	2.6 L		2.7 L	2.9 L	2.6 L
Transaxle	HR500	HR600	HR600	HR600	TA18
*Idle Speed, rpm Max. No-Load Governed Speed, rpm	600	600	600	550	600
	2300-2600	2350-2650	2350-2650	2350	2300-2600

Electrical system: .....12 volt DC, Negative Ground
Alternator: .....37 amp

Battery Rating [Cold-Crank]:

Gasoline/LPG -- Water-Fill Type .....12v DC -295 amps @ 0°F
Gasoline/LPG --Maintenance-Free .....12 v DC -- 320 amps @ 0°F
Diesel -- Maintenance-Free .....12 v DC --625 amps @ 0°F

Idle speed must be adjusted so truck has adequate oil supply to steer correctly.

*Idle speed must be adjusted so truck (when empty) does not have excessive creep speed. Creep speed should be limited to 2 ft. per second.

Truck Specifications

Engine crankcase oil	
Gasoline/LPG Engines	API CC/SE Mil-Z104B, MIL-45199B
Transmission fluid	
Powershift Transmission, Torque Converter and Drive Axle	(HR600) - TEXACO 8570 ATF or Clark #962669 (HR500) - AMOCO 300 Motor Oil SAE 20W (TA18) AMOCO 1000 or TEXACO 1893 TDH
Hydraulic fluid	
Hydraulic Sump Normal Application	Clark Specification MS-68
Multi-purpose grease	
Axle Ends, Wheel Bearings, Steer Axle Linkage/Tie Rod Ends, Steer Axle Knuckle Bearings	NLGI Grade No.1 Lithium soap base grease, Clark Specification MS-9B and MS-107B, or equivalent.
Upright Mast Rollers, Trunnion Bushings, Tilt Cylinder Rod Ends	MLGI Grade No.2 Lithium soap base grease, Clark Specification MS-107C, or equivalent.
Chain lube	
Upright Lift Chains	Clark #886399 Chain and Cable Lube, or equivalent.
Dry-Film lubricant	
Side Shifter, Attachments Clamp Slides Bonded Lubricant,	Dow Corning Milykote 321 Graph-O-Kote #220, Molub-Alloy #369 Dry Lube, or equivalent.
Battery	
(Unsealed-type)	Distilled Water.
Filters	
Engine Fuel Engine Oil Engine Air Transmission Oil Hydraulic System Oil Hydraulic Sump Breather	Use Genuine Clark parts. See your Clark dealer.
Brake Fluid	
HR500/TA18 HR600	D.O.T 3 Brake Fluid Trucks Hydraulic System Fluid.

Critical Fastener Torque Specifications

- Drive Wheel Lug Nuts (GCS/GPS) ..... [640 - 720 N·m] 470 - 530 lbf. ft.
- Steer Wheel Lug Nuts (GPS) ..... [359 - 438 N·m] 265 - 323 lbf. ft.
- Steer Wheel Spindle Nut (GCS/GPS) ..... [230 - 244 N·m] 170 - 180 lbf. ft. See Note (2) below
- Steer Axle Mounting Bolts @ Silent Block [570 - 650 N·m] 420 - 480 lbf. ft.
- Drive Axle Mounting Bolts ..... [542 - 596 N·m] 400 - 440 lbf. ft.
- Overhead Guard Mounting Bolts ..... [65 - 75 N·m] 50 - 55 lbf. ft.
- Counterweight Mounting Bolts (Outside Rear) ..... [320 - 360 N·m] 240 - 265 lbf. ft.
- Counterweight Mounting Bolts (Inside Front) ..... [320 - 360 N·m] 240 - 265 lbf. ft.
- Steering Handwheel Retaining Nut ..... (47 - 54 N·m] 35 - 40 lbf. ft.
- Control Lever Knob Mounting Bolts ..... [8 - 10 N·m] 75 - 85 lbf. in.
- Upright Mounting Trunnion-to-Upright Bolts ..... [370 - 410 N·m] 273 - 302 lbf. ft.
- Upright Mounting Trunnion Cap Bolts .... [75 - 80 N·m] 55 - 59 lbf. ft.
- Upright Cylinder Retaining/Holddown Bolts ..... [65 - 75 N·m] 50 - 55 lbf. ft.
- Tilt Cylinder Yoke Clamp Bolts ..... (170 - 190 N·m] 125 - 140 lbf. ft.
- Tilt Cylinder Pin Retainer Bolts - Front ... [9 - 10 N·m] 80 - 90 lbf. in.
- Tilt Cylinder Pin Retainer Bolts - Rear .... [29 - 31 N·m] 260 - 275 lbf. in.
- Load Backrest Extension Mounting Bolts [240 - 270 N·m] 177 - 199 lbf. ft.
- Axle End To Differential Housing Bolts .. [114 - 142 N·m] 84 - 105 lbf. ft.
- Seat Mounting Bolts ..... [18.1 - 20.6 N·m] 160 - 183 lbf. in.
- Steering Column Mounting Bolts
  - Column to Bracket ..... [8 - 10 N·m] 70 - 85 lbf. in.
  - Bracket to Cowl ..... [20 - 25 N·m] 180 - 220 lbf. in.

NOTES: (1) When checking tightness of major fasteners on new trucks, the values may be less than the recommended specification due to metal deformation and fastener stretch. This is a normal occurrence and does not indicate that the fasteners were not correctly tightened during assembly. Tighten to recommended specifications.

(2) Steer Wheel Spindle Nut Bearing Adjustment (For steer axles with castellated nut and cotter pin).
Tighten spindle nut (bearing adjustment nut) until bearings bind slightly when rotated, then back off to nearest slot in nut and lock with cotter pin.

9.5

Record the following information pertaining to your truck:

Model No. ....._____

Serial No. ....._____

Attachments ....._____

Truck Weight — Empty ....._____

Truck Rated Capacity ....._____

Gross Truck Weight (W/Rated Load) ...._____

Customer Truck Identification No. ....._____

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

CLARK® Material Handling Company

Lexington, KY 40507

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