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# ***Operators and Safety Manual***

## ***Models***

### ***522 & 522/4***

### ***622 & 622/4***

### ***824***

**10709977**

(was) P09977

## INTRODUCTION

You are about to operate one of the finest forklifts available on the market today. However, to ensure that your forklift will provide dependable and safe service, the manufacturer must depend on you to read, understand and follow the instructions provided in this manual. Do not operate the forklift until you have read and fully understand these instructions.

Remember to use good safety practices to protect you and those around you.

## WARRANTY

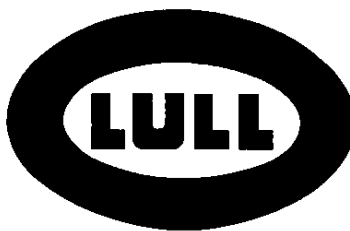
The Lull warranty is a separate document which will be provided along with this manual to the customer.

Proper registration is an important warranty requirement.

This manual provides information on the operation and maintenance necessary to keep your machine in good working order. Should, however, a defect or failure occur to the machine during the warranty period, contact your local dealer. Under no circumstances must the machine continue in service, for safety reasons and because serious damage may result.

## REGISTRATION

The Warranty Registration card must be filled out by the dealer and returned to the Lull Corporation showing the date the machine went into service. And the Pre-Delivery Inspection Form must be signed by the customer when the machine is delivered.



NOTICE: This manual must remain with the machine at all times. Should it become damaged or lost, replace immediately.

# INDEX

SECTION	PAGE NO.
MACHINE FAMILIARITY . . . . .	2 - 6
PRE-OPERATIVE EQUIPMENT CHECKLIST . . . . .	7
PRE-OPERATIVE INSTRUCTIONS . . . . .	7
OPERATOR SAFETY . . . . .	8 - 14
STARTING THE ENGINE . . . . .	15
OPERATING PROCEDURES . . . . .	16 - 17
LOAD CHARTS . . . . .	18 - 21
MAINTENANCE . . . . .	22 - 35
LUBRICATION . . . . .	36 - 42
SPECIFICATIONS . . . . .	43 - 47
FLUID PRESSURES . . . . .	48
OPTIONS . . . . .	49 - 50

## SAFETY ALERT SYMBOL



This Safety Alert Symbol means —

**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

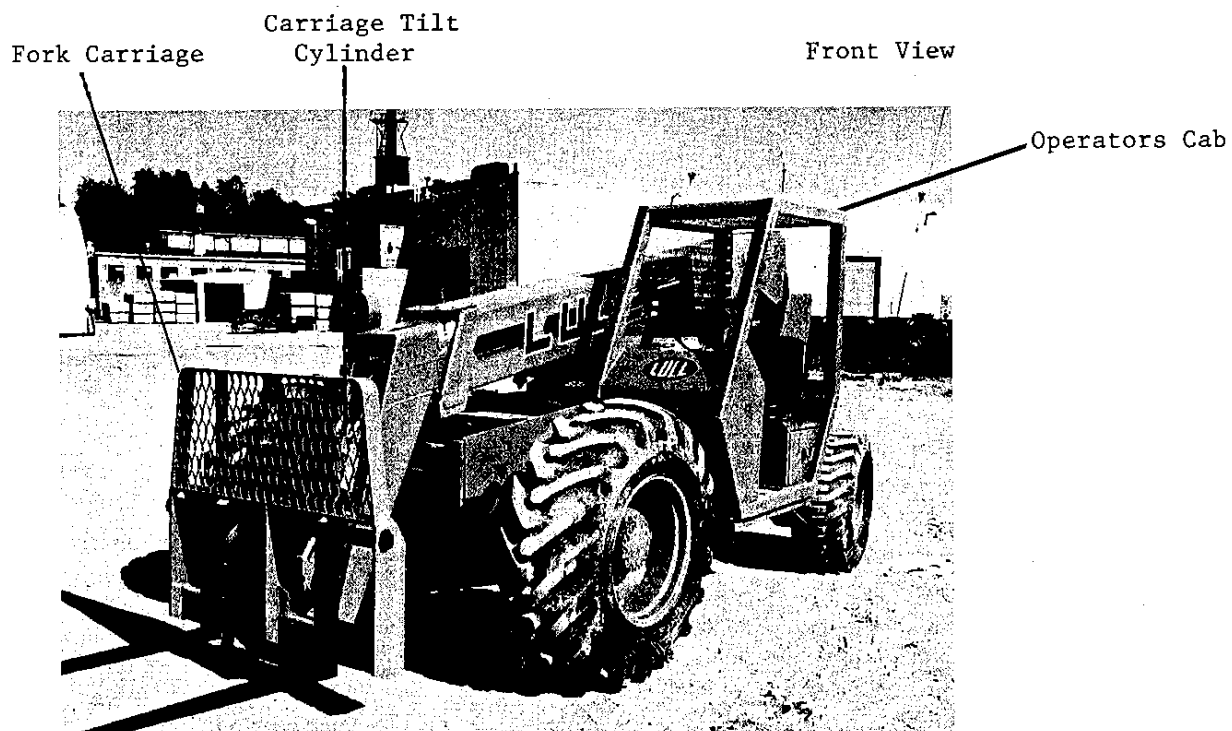
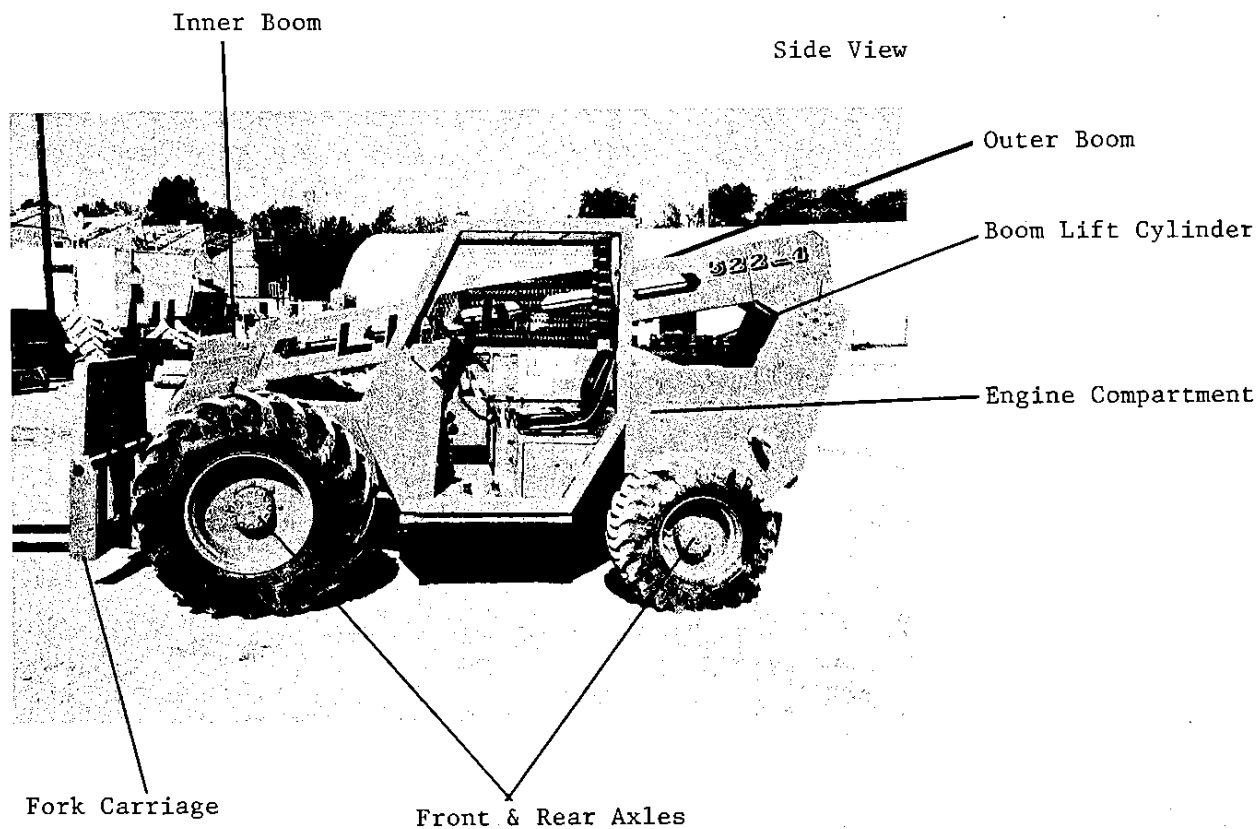
Safety is important to you because:

- \* Accidents disable and kill
- \* Accidents cost
- \* Accidents can be avoided

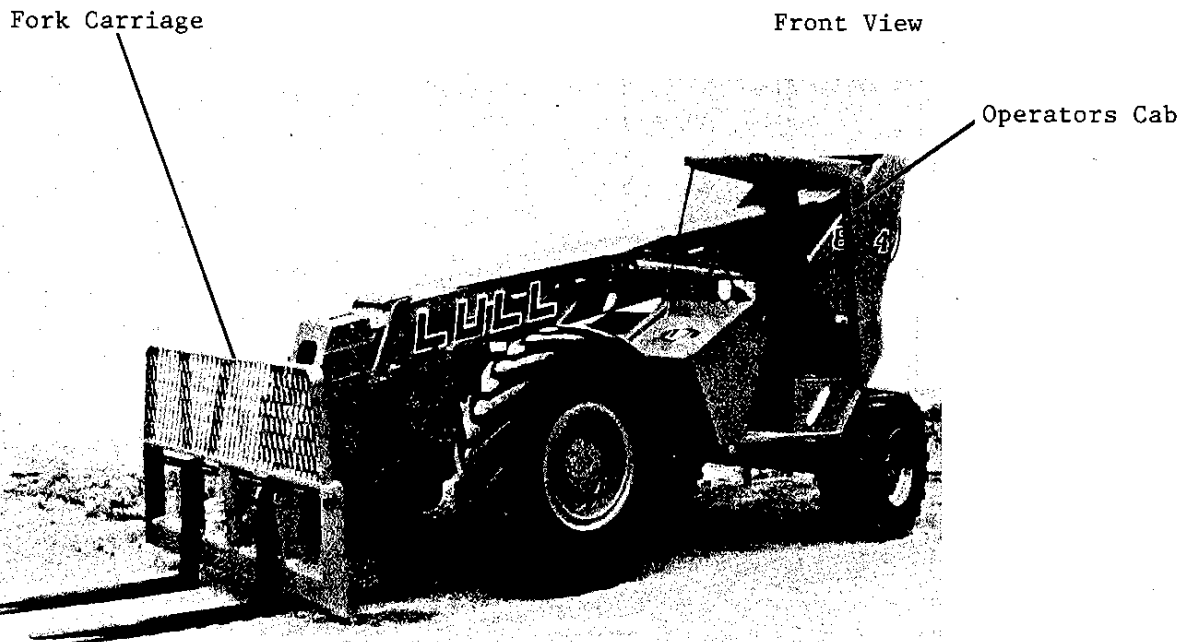
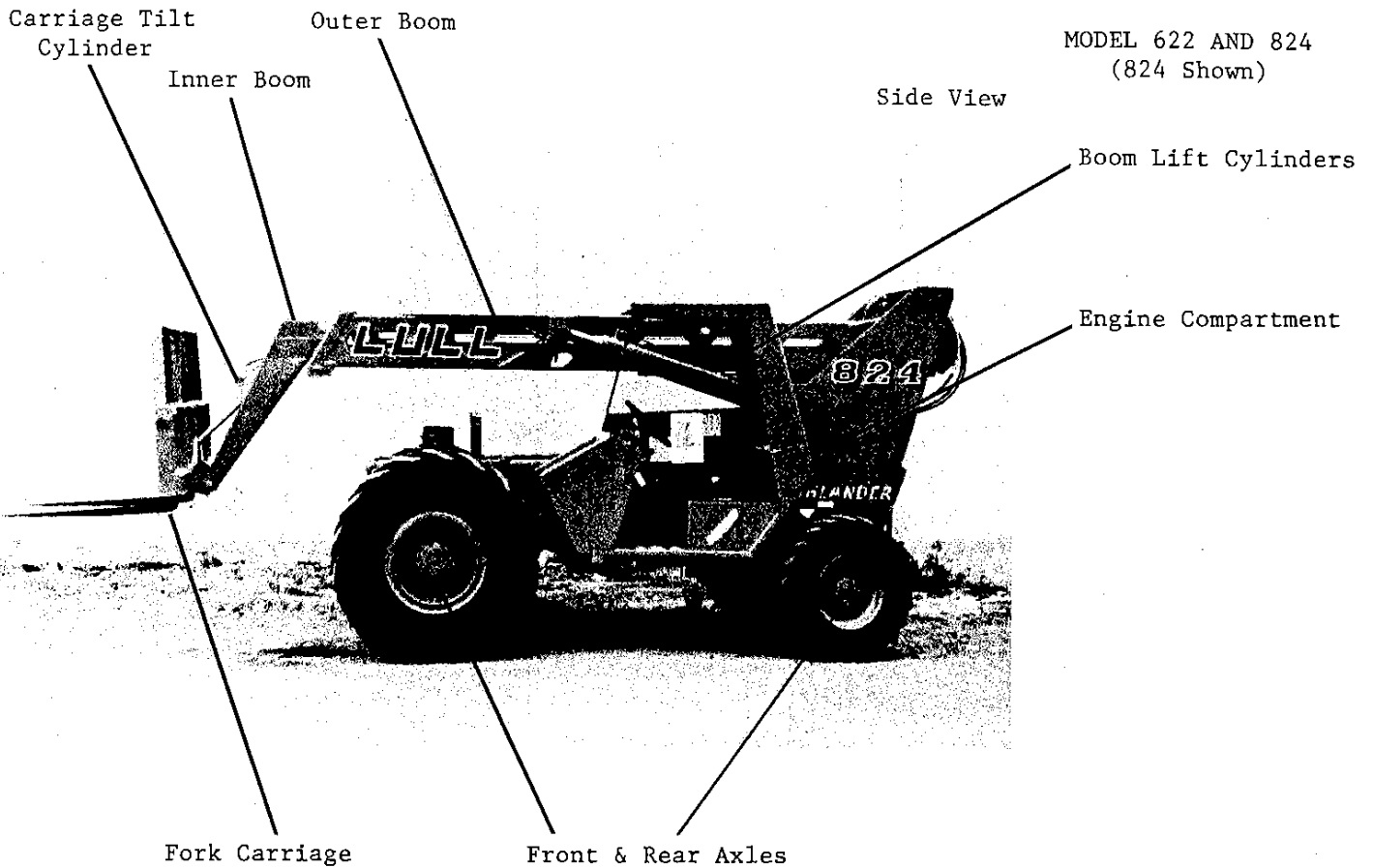
Lull has made every effort to provide information as complete and accurate as possible for its forklifts. However, because of owners requirements, equipment and control variations may exist between machines. Also, because of Lull's policy of continually striving to improve its product, occasional discrepancies may occur between machines and the description contained herein.

# MACHINE FAMILIARITY

MODEL 522

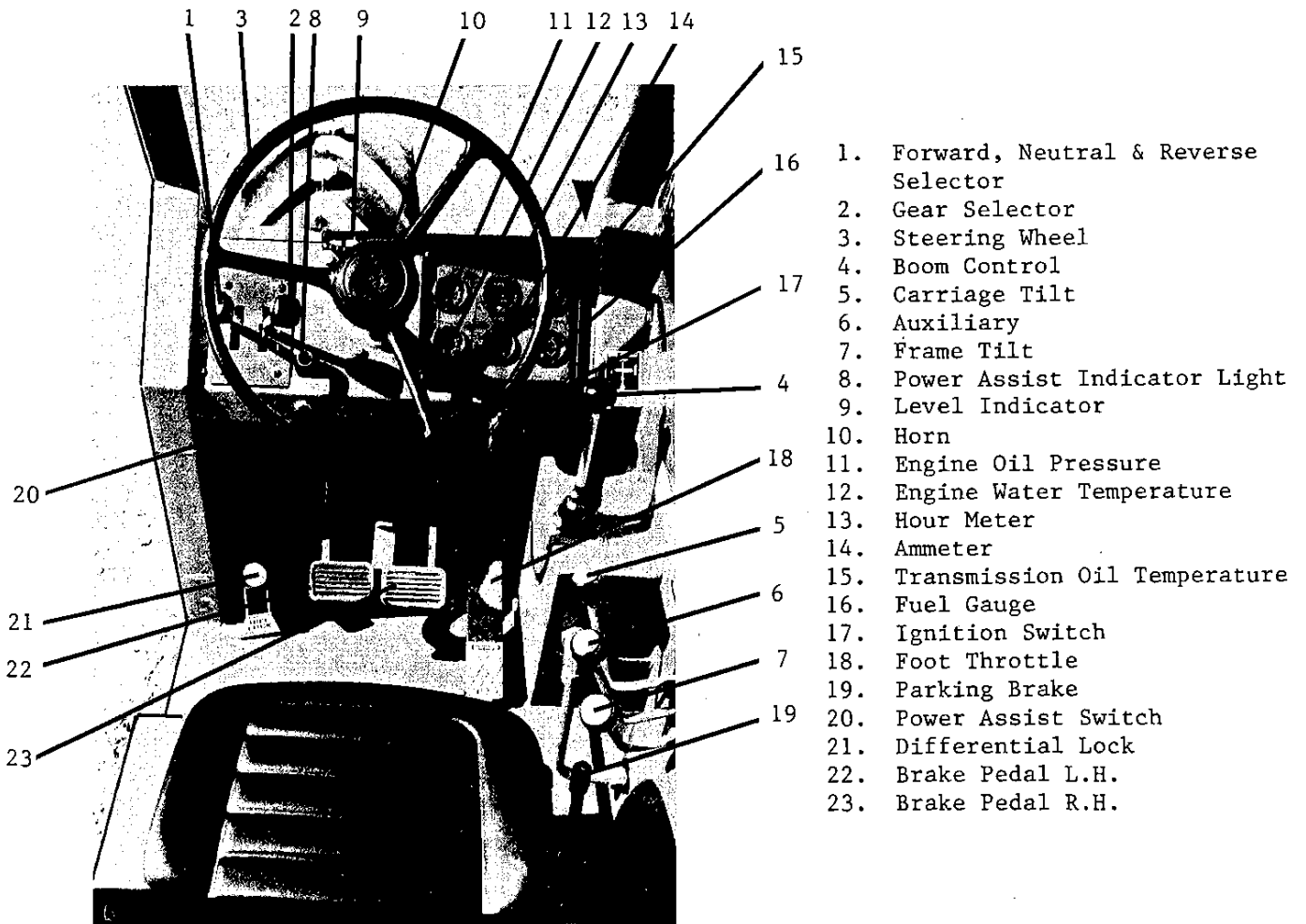
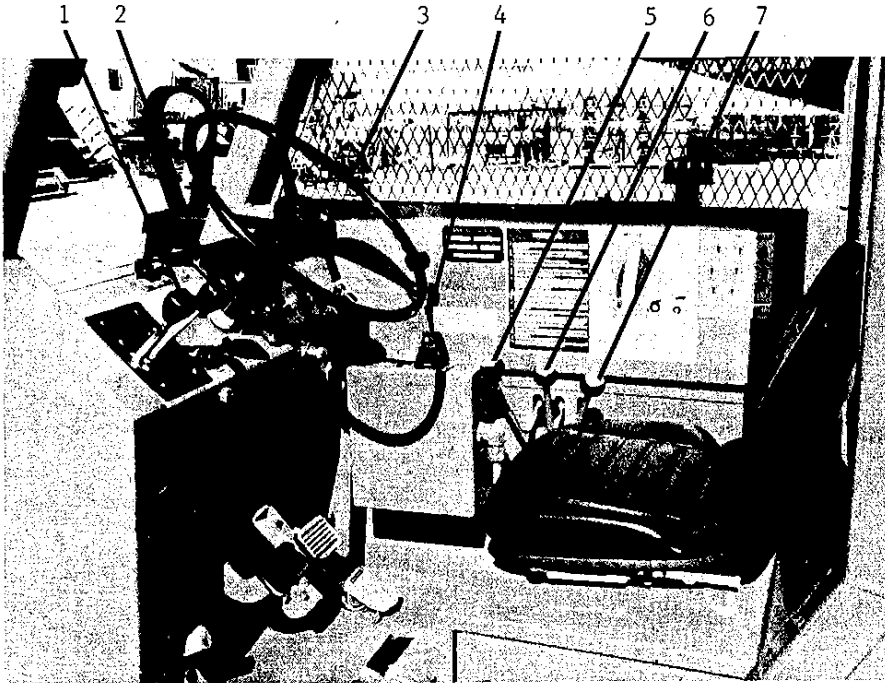


# MACHINE FAMILIARITY



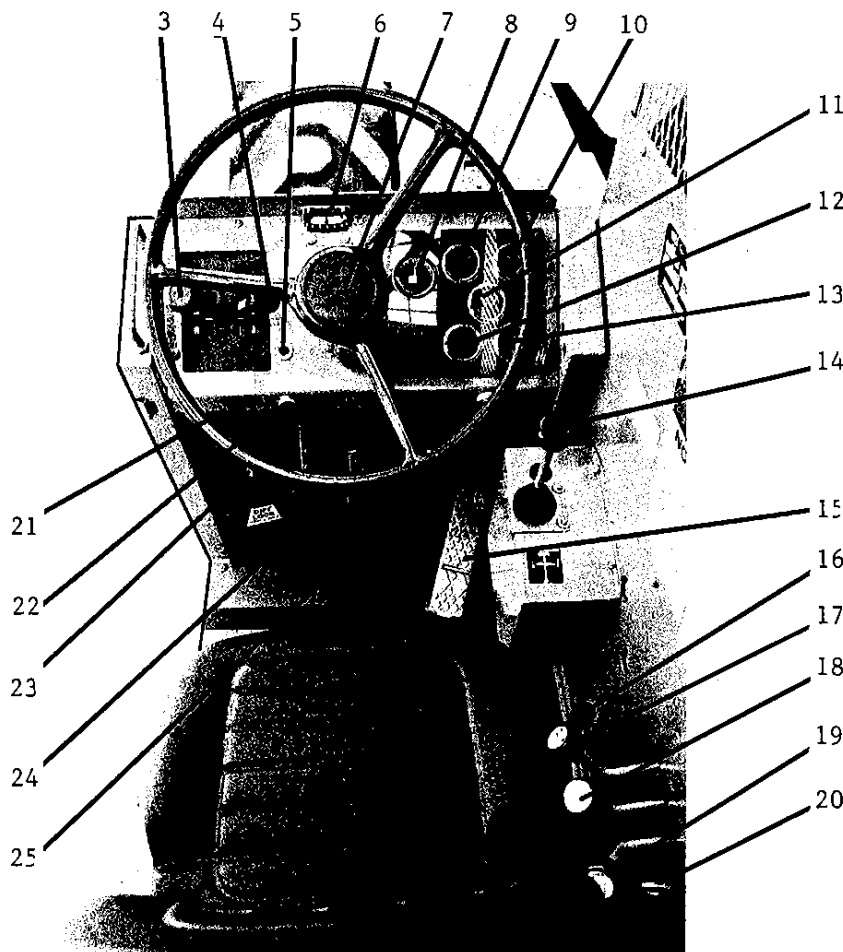
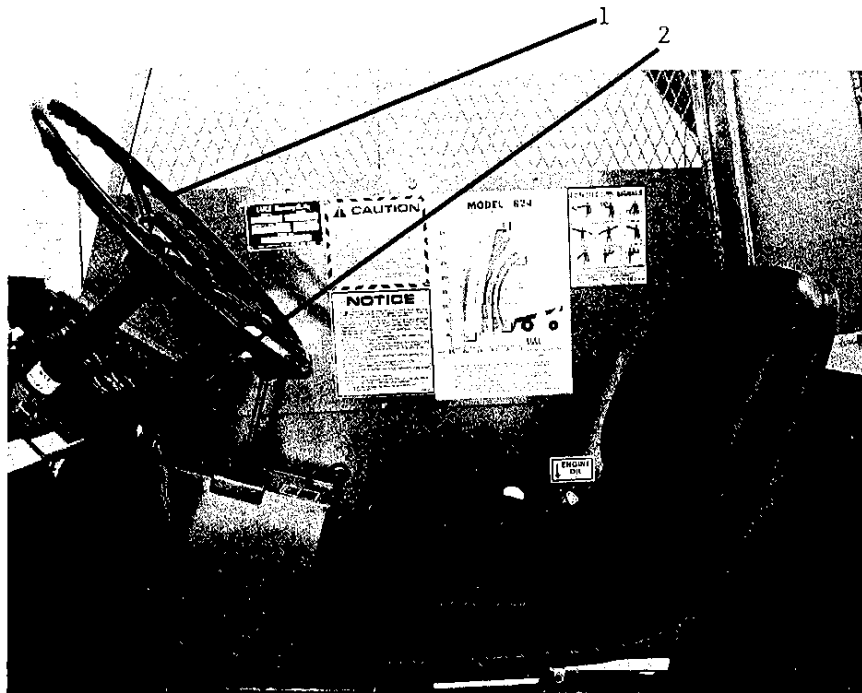
# MACHINE FAMILIARITY

CAB LAYOUT (MODEL 522)



# MACHINE FAMILIARITY

CAB LAYOUT  
(MODEL 622, 824)

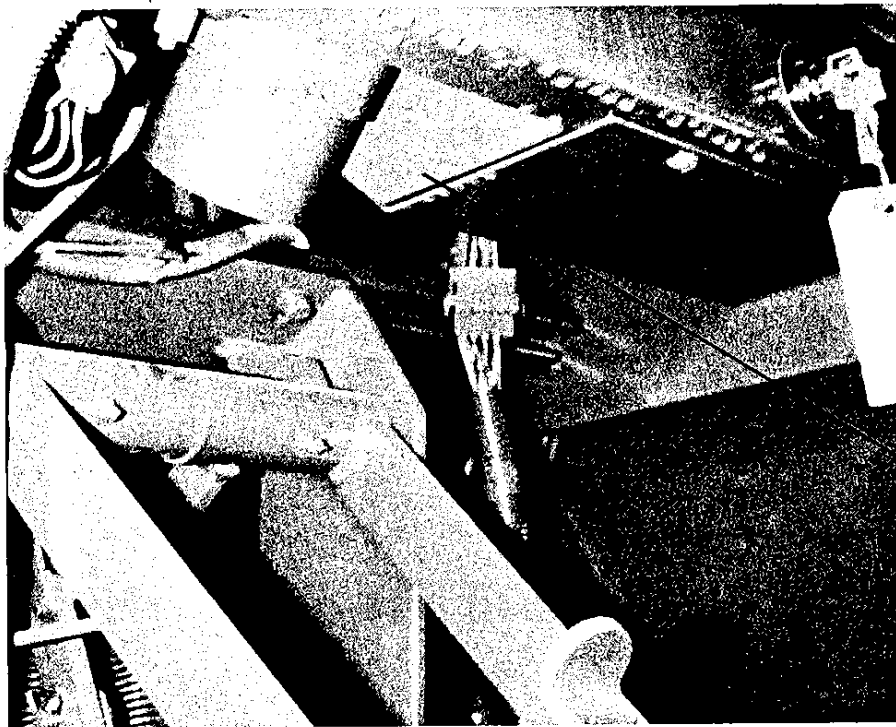


1. Steering Wheel
2. Ignition Switch
3. Forward, Neutral & Reverse Selector
4. Gear Selector
5. Power Assist Indicator Light
6. Level Indicator
7. Horn
8. Hour Meter
9. Engine Oil Pressure
10. Transmission Oil Temp.
11. Ammeter
12. Engine Water Temp.  
(Oil & Fan Lights, Deutz)
13. Fuel Gauge
14. Boom Control
15. Foot Throttle
16. Parking Brake
17. Carriage Tilt
18. Auxiliary
19. Frame Tilt
20. Engine Oil Dipstick
21. Cold Start
22. Power Assist Switch
23. Differential Lock
24. Brake Pedal L.H.
25. Brake Pedal R.H.

# MACHINE FAMILIARITY

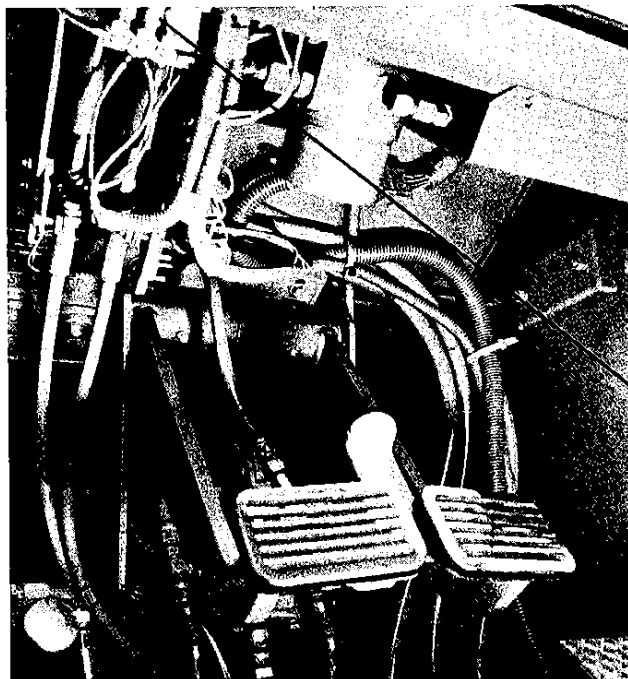
CAB LAYOUT

(522)



Fuses

(622, 824)



Fuses



# PRE-OPERATIVE EQUIPMENT CHECKLIST

## Check The Equipment

- Check the tires for cuts, bulges and correct pressure
- Check service and parking brakes for proper operation
- Check the oil engine system
- Check forks for welds, cracks, wear and misalignment. Have repaired or replaced as necessary.

WARNING: Do not operate a machine whose forks have been repaired by welding.

- Check the hydraulic system
- Check coolant level
- Check wheel lugs
- Check transmission oil cooler and radiator for dirty fins. Radiator not applicable on air cooled Duetz engines.
- Check back-up alarm and horn.

## PRE-OPERATIVE INSTRUCTIONS

### For Safe Operation

For safe operation of this rough terrain forklift you must be a qualified and authorized operator. To be qualified, you must understand the written instructions supplied by the manufacturer, have training (including actual operation of this machine) and know the safety rules and regulations for the jobsite. A self-training course available from the Mason Contractor Association of America is highly recommended.

An operator must not use drugs or alcohol which can affect his alertness and coordination. An operator on prescription or over-the-counter drugs needs medical advice on whether or not he can safely operate these machines.

### Know The Rules (1)

Most employers have rules governing operation and maintenance of equipment. Before you start work at a new location, check with your supervisor or the safety coordinator. Ask about rules you may be expected to obey.

Make sure you understand the rules covering traffic at your jobsite. Make sure you know what all signs, flags, and markings mean. Make sure you understand hand, flag, whistle, siren, or bell signals. Make sure you know when to use lights, turn signals, flashers and horn.

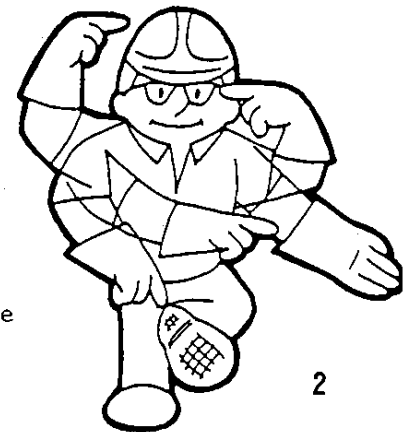
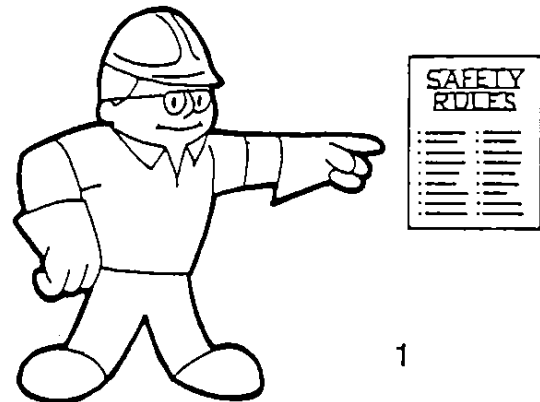
### Protect Yourself (2)

Wear all the protective clothing and personal safety devices issued to you or called for by job conditions.

You may need:

- A hard hat
- Safety shoes
- Safety glasses, goggles, or face shield
- Heavy gloves
- Hearing protection
- Reflective clothing
- Wet weather gear
- Respirator or filter mask

Wear whatever is needed, don't take chances. Learn where fire extinguishers and first-aid or emergency equipment are kept and where to get help in a hurry. Make sure you know how to use this equipment.



### Mount Properly

Always use "three point contact", facing the machine when you enter or leave. ("Three point contact" means that 3 out of 4 arms and legs are in contact with the machine at all times during mount and dismount.)

Clean your shoes and wipe your hands before climbing on. Use handrails, grab-irons, ladders or steps (as provided) when mounting.

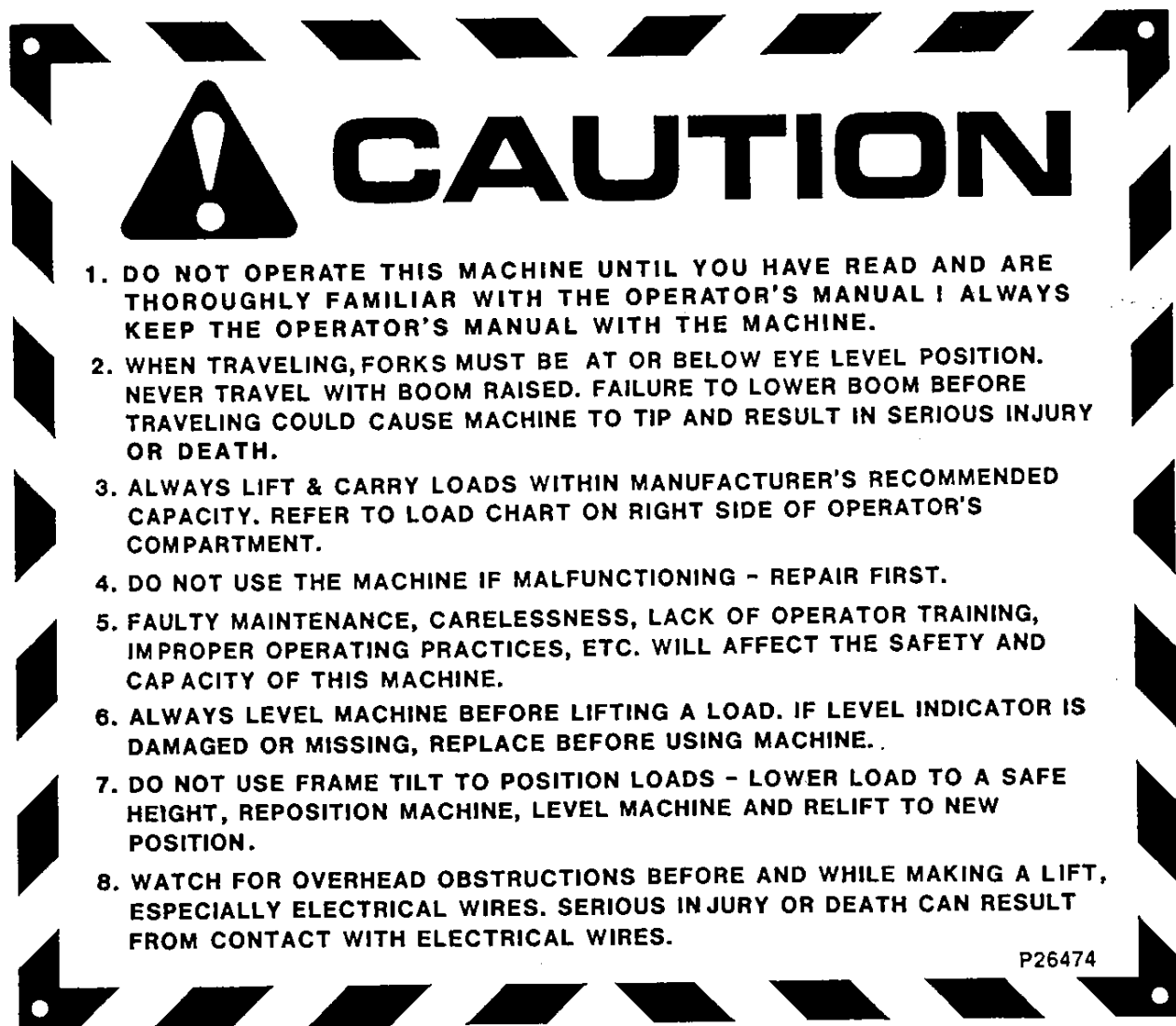
Never use control levers as a hand hold when climbing on or off. Never step on foot controls when mounting or climbing off.

Never enter a moving machine.

# OPERATOR SAFETY

## CAUTION

The following caution must be read and understood before operating the forklift. If there is any question about an item, or any item is not fully understood, see your supervisor for an explanation or contact Lull Corporation.



NOTE: This caution (in plaque form) is permanently attached to the forklift at the cab entrance and on the instrument panel.

# OPERATOR SAFETY

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## NOTICE

The following notice must be read and understood before operating the forklift. If there is any question about an item, or any item is not fully understood, see your supervisor for an explanation or contact Lull Corporation.

# NOTICE


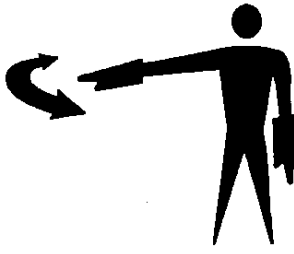








1. DO NOT OPERATE THIS MACHINE UNTIL YOU HAVE READ AND ARE THOROUGHLY FAMILIAR WITH THE OPERATOR'S MANUAL ! ALWAYS KEEP THE OPERATOR'S MANUAL WITH THE MACHINE.
2. WHEN TRAVELING WITH OR WITHOUT LOADS, THE FORKS MUST BE KEPT AT OR BELOW EYE LEVEL POSITION. TRAVELING WITH THE FORKS ABOVE EYE LEVEL MAY CAUSE THE MACHINE TO TIP OVER.
3. THIS MACHINE IS NOT EQUIPPED TO LIFT PERSONNEL. NEVER USE THIS MACHINE AS A WORK PLATFORM.
4. SERVICE THE MACHINE AS RECOMMENDED IN THE OPERATOR'S MANUAL AND THE LUBRICATION SCHEDULE.
5. TWICE DAILY , WITH THE FORKS NEAR GROUND ELEVATION, CYCLE TILT-FRAME CYLINDER AND FORK-CARRIAGE TILT CYLINDER THROUGH FULL STROKE IN EACH DIRECTION TO ELIMINATE AIR FROM THE CYLINDERS.
6. EVALUATE GROUND-BEARING CONDITIONS BEFORE MAKING LIFTS OR MOVING THE MACHINE.
7. DO NOT MODIFY OR ALTER THIS MACHINE WITHOUT THE MANUFACTURER'S PRIOR WRITTEN APPROVAL.
8. OPERATE ONLY WITH GUARDS AND SAFETY EQUIPMENT FUNCTIONING AND IN PLACE.
9. KEEP THE WORK AREA CLEAN OF DEBRIS.
10. NEVER LIFT LOADS HEAVIER THAN THE CAPACITY OF THE FORKS. FIND OUT FORK CAPACITY BEFORE USING MACHINE.
11. TIRES MUST BE CALCIUM CHLORIDE FILLED ! REFER TO LUBRICATION SCHEDULE.

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NOTE: This notice (in decal form) is permanently affixed to the forklift at the cab side panel.

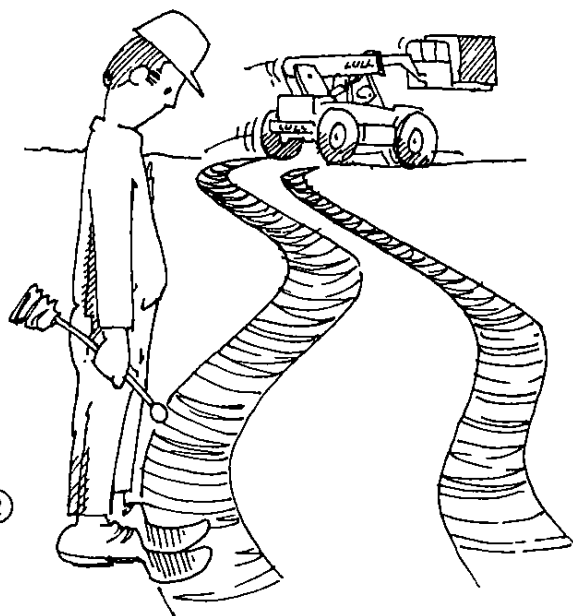
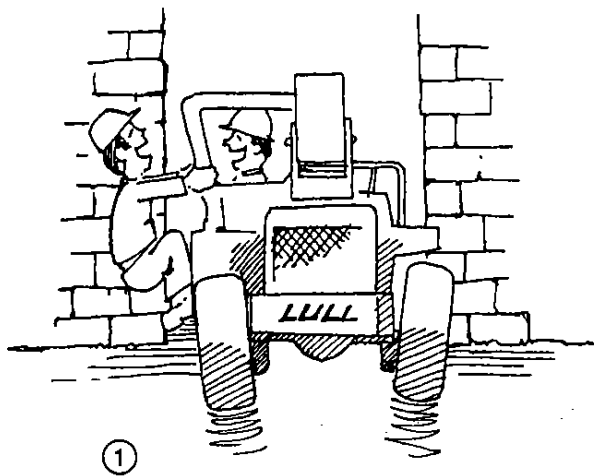
# OPERATOR SAFETY

The following are standard hand signals and instructions for forklift signalmen.

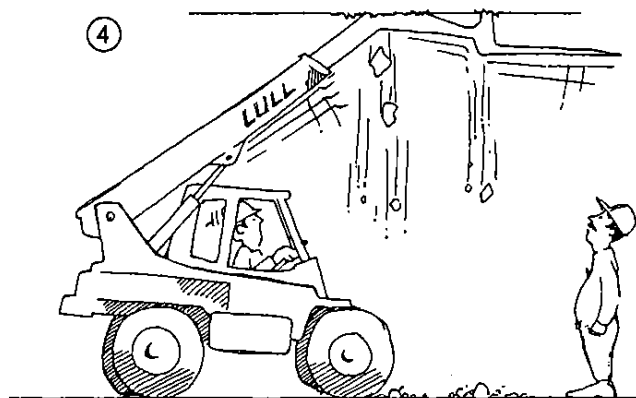
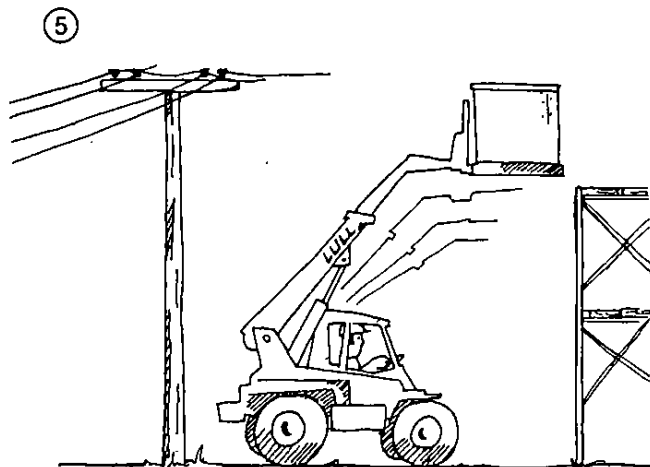
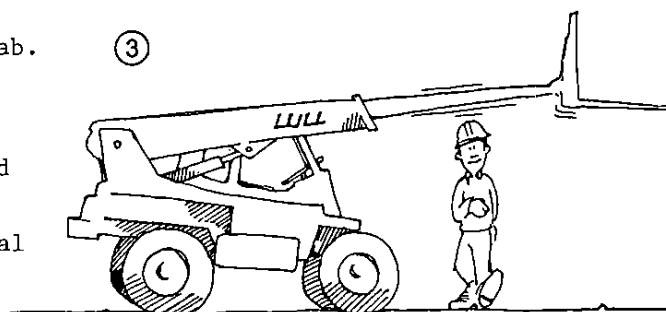
<div style="display: flex; justify-content: space-between; align-items: center;"> <h2 style="margin: 0;">FORKLIFT</h2>  <h2 style="margin: 0;">SIGNALS</h2> </div>		
 <p><b>1. STOP</b></p>	 <p><b>2. RAISE LOAD</b></p>	 <p><b>3. LOWER LOAD</b></p>
 <p><b>4. TILT FORKS RIGHT</b></p>	 <p><b>5. TILT FORKS LEFT</b></p>	 <p><b>6. TILT FORKS UP</b></p>
 <p><b>7. TILT FORKS DOWN</b></p>	 <p><b>8. MOVE LOAD BACKWARD</b></p>	 <p><b>9. MOVE LOAD FORWARD</b></p>
<p><b>INSTRUCTIONS TO SIGNAL MEN</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p>1. Only one person to be signalman</p> <p>2. Make sure the operator can see you and is able to acknowledge the signal given</p> </div> <div style="width: 48%;"> <p>3. Signalman must watch the load—the operator is watching you</p> <p>4. Never raise or lower the load over other workmen, warn them to keep out of the way</p> </div> </div> <p><b>WATCH FOR OVERHEAD LINES OR OTHER OBSTRUCTIONS.</b></p>		

NOTE: This instruction (in decal form) is permanently affixed to the forklift at the cab side panel.

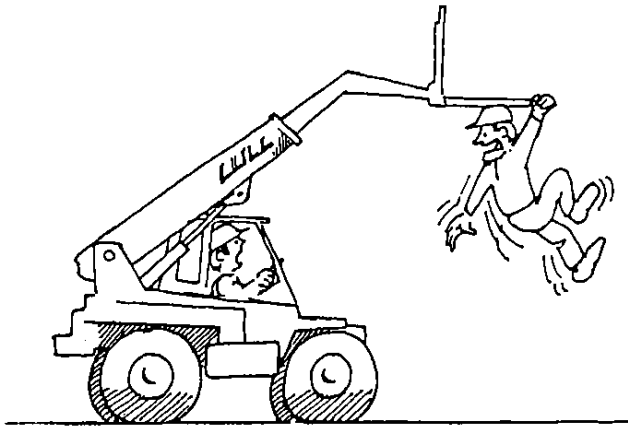
# OPERATOR SAFETY



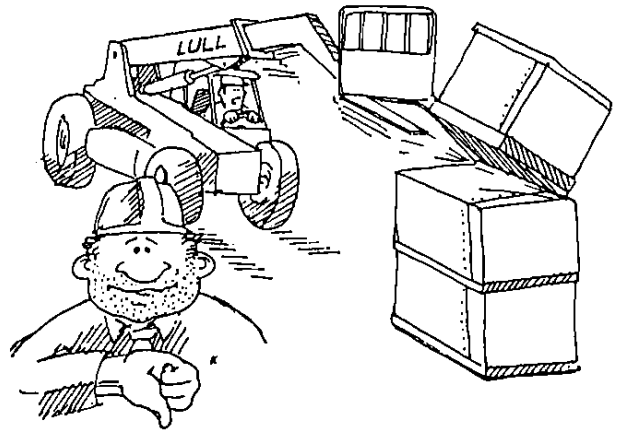
1. Never carry passengers and never allow unqualified people to use your machine.
2. Never operate controls from outside the cab.
3. Never walk, or allow others to walk under raised boom
4. Always ensure there is sufficient overhead clearance for the boom.
5. Never operate in the vicinity of electrical power lines.



## OPERATOR SAFETY

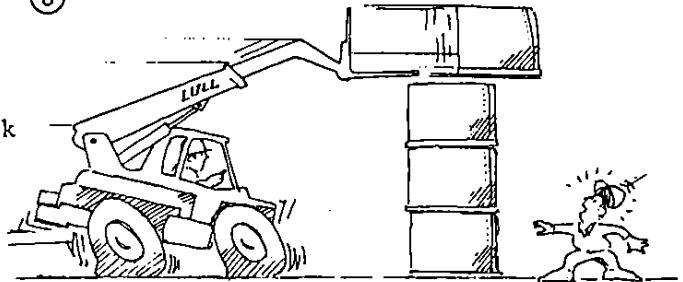


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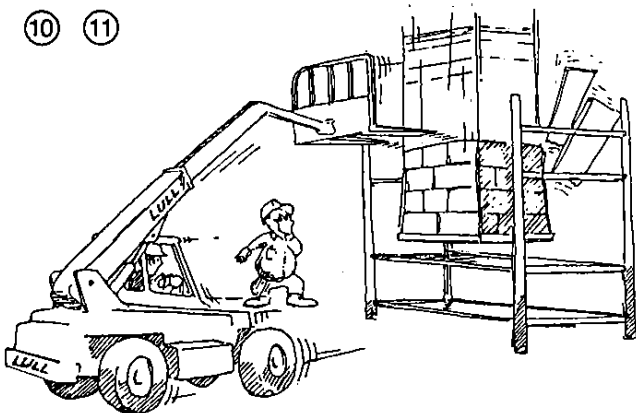
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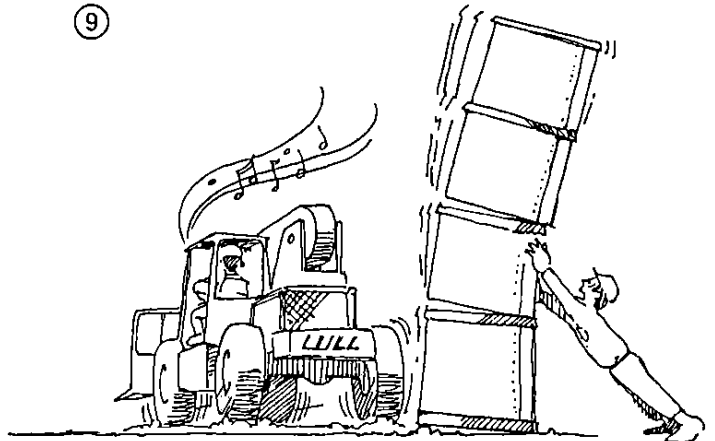


6. Never use the machine as a personnel lift.
7. Never lift a load using one fork.
8. Never attempt to discharge a load off the fork by stopping machine suddenly.
9. Never stack a load on uneven ground.
10. Never place loads that exceed the scaffold capacity.
11. Never subject scaffold to unnecessary "shock" loads.

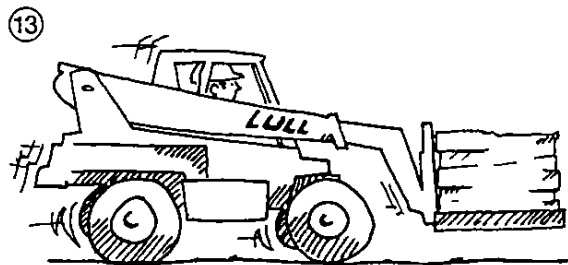
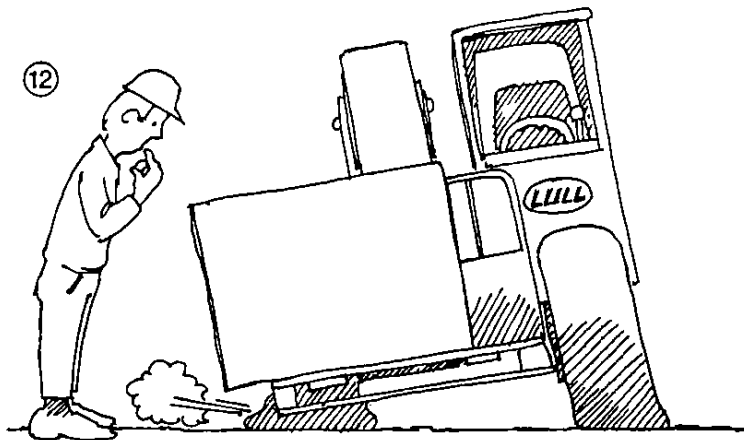
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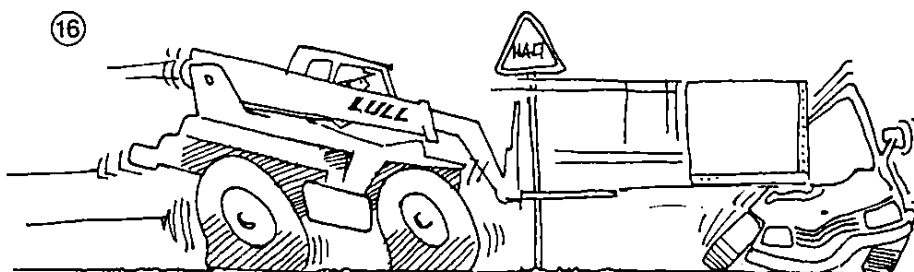
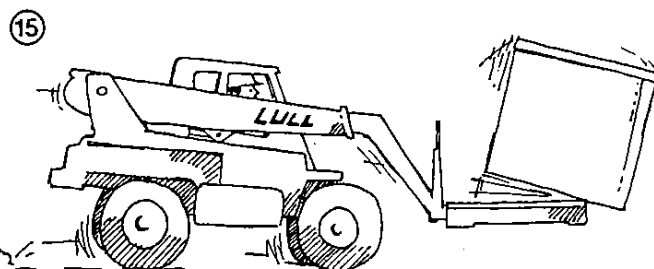
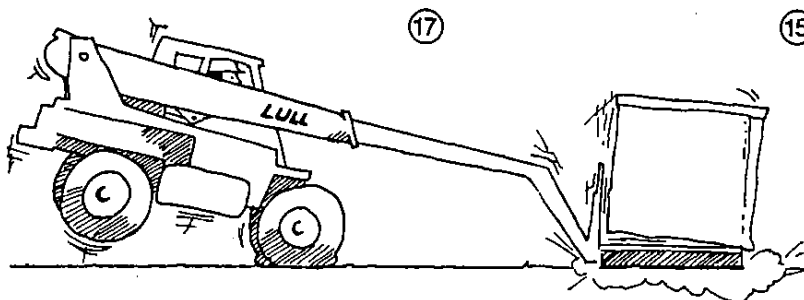
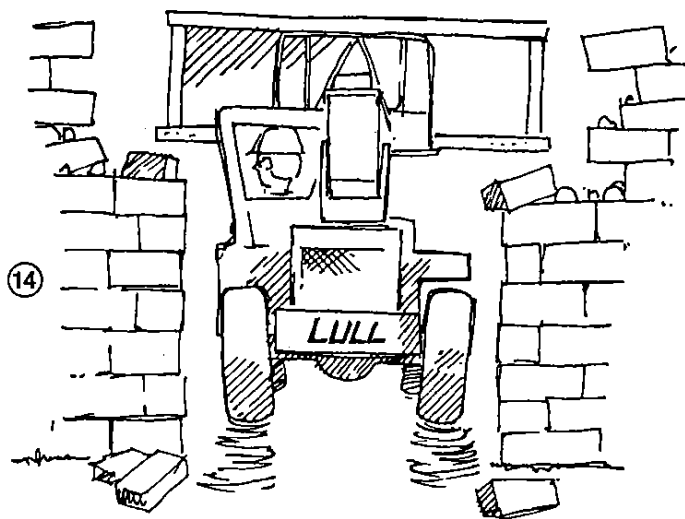
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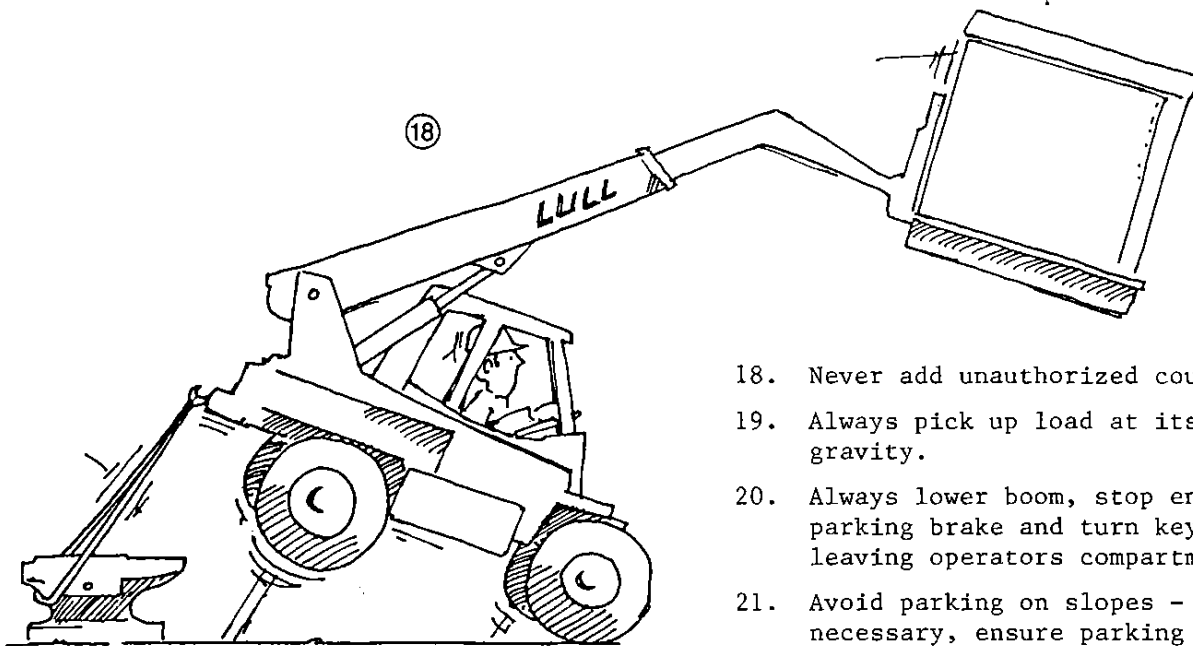
# OPERATOR SAFETY



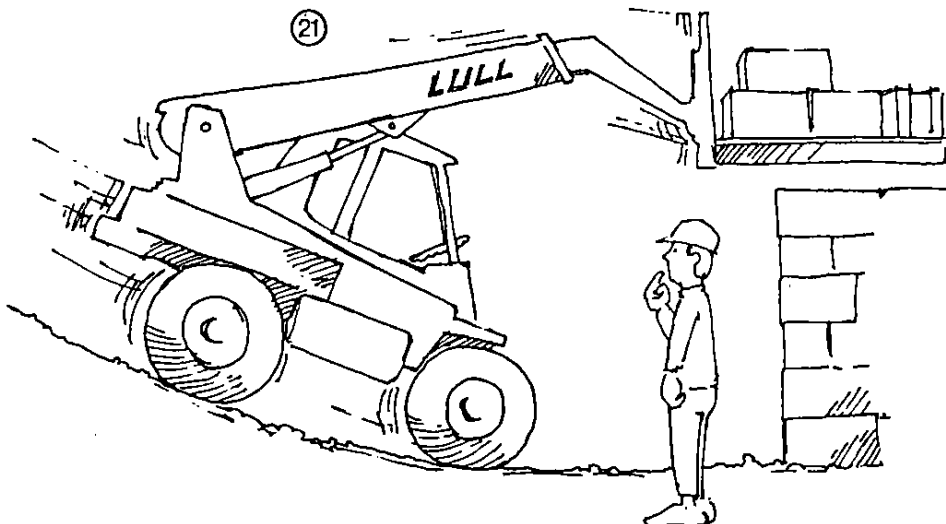
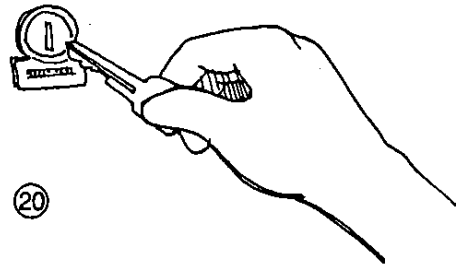
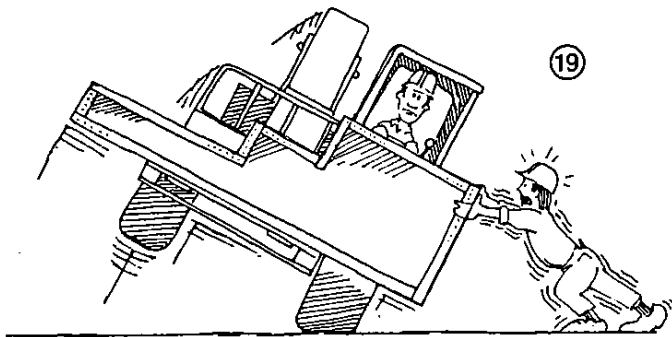
12. Ensure that correct tire pressure and calcium chloride levels are maintained. (See specifications on pages 45 - 47).
13. Drive slow and keep the load as low as possible while maintaining a safe fork clearance with the ground.
14. Always be aware of load width.
15. Ensure that the load is stable and secure. Check to see there are no loose articles which may fall.
16. Drive carefully and avoid any sudden stops and changes of direction.
17. Always check the load charts before picking a load.



# OPERATOR SAFETY



- 18. Never add unauthorized counterweight.
- 19. Always pick up load at its center of gravity.
- 20. Always lower boom, stop engine, set parking brake and turn key off before leaving operators compartment.
- 21. Avoid parking on slopes - if it is necessary, ensure parking brake is on and the wheels are chocked.





# STARTING THE ENGINE



## Look Out For Others

Before starting the engine, walk completely around the machine. Make sure no one is under it, on it or close to it. Let other workmen and bystanders know you are starting up and don't start until everyone is clear of the machine.

## Starting Procedure (Perkins) - 522

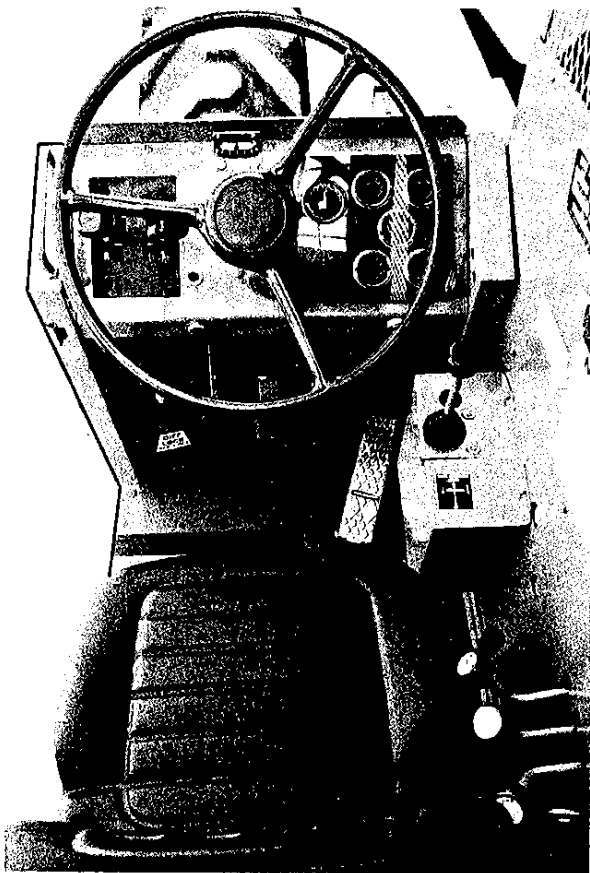
With transmission in neutral turn ignition key clockwise cranking the engine. (Do not crank the engine longer than 20 seconds. Wait 2 minutes before trying again.) NOTE: During cold weather, turn ignition key clockwise to heater (H) and hold for approximately 1-1/2 minutes before proceeding to crank the engine.

## Starting Procedure (John Deere) - 622/824

With transmission in neutral turn ignition key clockwise cranking the engine. (Do not crank the engine longer than 20 seconds. Wait 2 minutes before you try again.) NOTE: During cold weather inject starting fluid ONLY while the engine is cold and cranking.

## Starting Procedure (Deutz) - 622 Option

With transmission in neutral turn ignition key clockwise cranking the engine. When ambient temp is below 40° ether will automatically dispense into intake manifold. (Do not crank the engine longer than 20 seconds. Wait 2 minutes before you try again.)



After engine has been started, and the parking brake is on and transmission is in neutral, operate all hydraulic functions. (NOTE: Cold weather operation, progressively move each function a small distance back and forth until full cycle has been accomplished.) Level machine. Move frame tilt lever right to full cylinder travel then left to full cylinder travel then back to level. Raise boom to full cylinder travel and lower boom to full cylinder travel. Extend boom to full cylinder travel and retract boom to full cylinder travel. Tilt fork carriage down to full cylinder travel and back to full cylinder travel. Shut off engine, move all hydraulic levers. If any machine movement is detected advise your Supervisor.

# OPERATING PROCEDURES

IT IS YOUR RESPONSIBILITY TO EVALUATE WORKING CONDITIONS AND ADJUST YOUR OPERATION ACCORDINGLY.

When traveling over rough terrain, soft ground, or wet/icy surfaces, slow down and shift to a lower gear.

Travel only at speeds that permit stopping in a safe manner.

**! WARNING:** WHEN TRAVELING KEEP THE FORKS AS LOW AS POSSIBLE WHILE MAINTAINING SAFE CLEARANCE WITH THE GROUND.

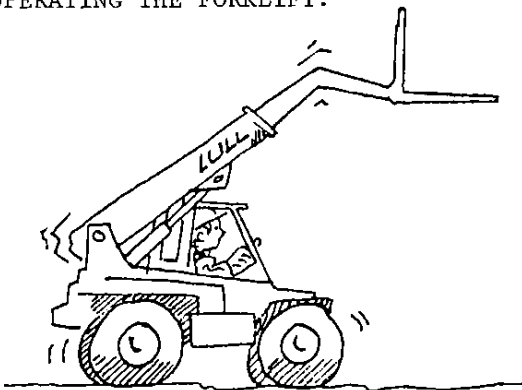
## Traveling

- Start and stop machine to check brakes  
Note: DO NOT add fluid to brake reservoir, contact supervisor.
- Check parking brake by holding on hill.  
Tighten knob on handle to adjust. (See Parking Brake Lever, pg. 34).

## Follow Safe Operating Practices

- Operate the controls smoothly - don't jerk the steering wheel or hydraulic controls.
- Avoid sudden stops, starts, turns or changes in direction.
- Never "cowboy" or play games with a forklift.
- Never attempt to work the controls except from operator's seat.
- Never leave the operator's seat without first lowering the forks to the ground, setting the parking brake, and placing controls in neutral.

**! WARNING:** KEEP ALL PARTS OF YOUR BODY INSIDE THE OPERATOR'S COMPARTMENT WHILE OPERATING THE FORKLIFT.



Do not touch, lean on, or reach through the boom or lift mechanism or permit others to do so. Hands OFF! Never climb on the boom or lift mechanism.

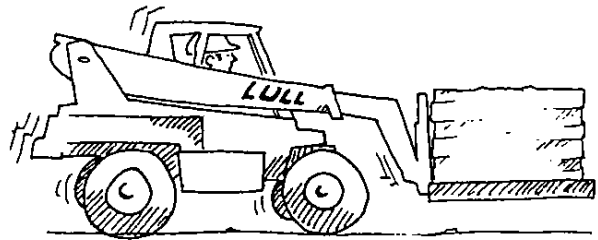
Stay alert! Should something break, come loose, or fail to operate on your machine, stop work, shut off the engine and alert your Supervisor.

## LIFTING THE LOAD

### Lift The Load Safely

If possible, plan to load, unload and turn on flat level ground. If ground is not level, use frame tilt to level machine (level indicator must be centered). If loads are to be rehandled several times, place stacking blocks under loads. For sideshift equipped forklifts, center the forks and carriage before lifting. Inspect load to be lifted. Approach the load slowly and squarely with fork tips straight and level. If necessary, adjust pallet forks. Boom slowly forward and engage load. Position load equally on both forks. Boom forward until load touches the carriage (backrest).

Tilt the forks back to position the load for travel, then lift the load only enough to clear obstacles. Avoid erratic stops. Be sure there is sufficient clearance overhead and all around for lifting and traveling. Watch the machine's rear clearance when turning.



### Transport The Load Safely

When traveling with a load, keep the forks tilted back with boom retracted and the load as close to the ground as possible.

**! WARNING:** WHEN TRAVELING ALWAYS KEEP THE LOAD AS LOW AS POSSIBLE. NEVER CARRY LOAD ABOVE EYE LEVEL.

**! WARNING:** FAILURE TO ABIDE BY THIS PRECAUTION COULD RESULT IN LOSS OF LOAD AND/OR THE FORKLIFT TIPPING OVER.

Avoid excessively steep slopes or unstable surfaces. If you must drive on a slope, Frame Level machine, keep the load low and proceed with extreme caution. Do not drive ACROSS excessively steep slopes under any circumstances.

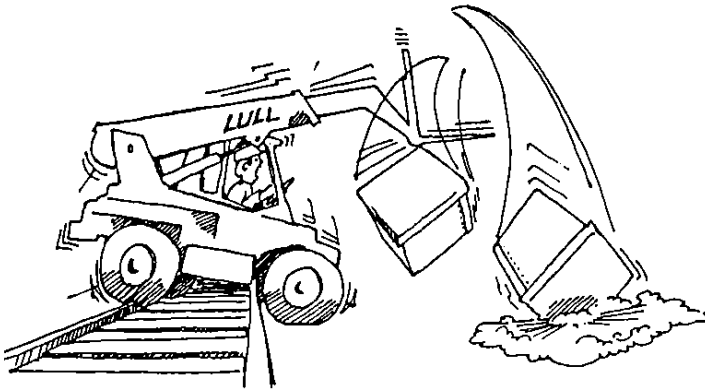
**! WARNING:** Travel on inclines, slopes, ramps and downgrades only as follows:  
LOADED Forklift...with forks (and load) pointed uphill.  
EMPTY Forklift...with forks pointed downhill.

Reduce speed and sound horn at blind intersections, exits and when approaching pedestrians.

# OPERATING PROCEDURES

Slow down for turns, ramps, dips, uneven or slippery surfaces and in congested areas. Avoid driving over loose objects and holes in roadway surfaces to prevent losing the load or tipping the machine.

Avoid crossing ditches, curbs or exposed railroad tracks. If crossing cannot be avoided, keep the load low, travel very slowly, and proceed with caution. Avoid panic braking. Apply brakes smoothly for a controlled stop to prevent toppling the load.



## SAFELY PLACING THE LOAD

### Elevated or Overhead Placement

When stacking or placing a load to a high elevation, use extreme caution because there may be other workmen in the immediate area whom you cannot see. Make sure that bystanders are away from the area where the load can tip or fall.

Bring the forklift as close to the landing point as possible with the load held low - be sure the machine is positioned on firm level ground.

DO NOT raise the load for placement if the forks are tilted to one side. Level machine using frame tilt BEFORE the load is raised (level indicator must be centered).

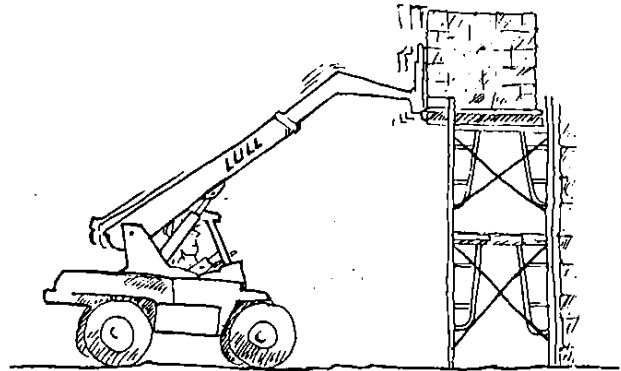
Set the parking brake. Tilt carriage back sufficiently to cradle the load. Slowly and carefully raise the load.

CAUTION: As lift height increases, your depth perception decreases. Placing the load safely to a high elevation may require a signalman to guide you.

If there is any indication of instability during the lift (i.e. movement, leaning, swaying), stop immediately, lower the load, move the forklift to a more stable, level position.

As the load approaches the desired height, slow the lift speed to a minimum. Continue the lift until load is slightly higher than the landing point.

**! WARNING:** DO NOT RAM A HYDRAULIC LIFT CYLINDER TO THE END OF ITS STROKE. THE RESULTING JOLT COULD SPILL THE LOAD.



Once the load is higher than the landing point, slowly and carefully proceed to place the load directly on the landing point.

**! WARNING:** PLACE THE LOAD USING BOOM MOVEMENT ONLY. DO NOT TRAVEL WITH THE FORKLIFT. A FORKLIFT TRAVELING WITH A RAISED BOOM MAY BECOME UNSTABLE - RESULTING IN POSSIBLE LOSS OF LOAD AND/OR THE MACHINE TIPPING OVER.

Forks must be level and parallel to the landing surface before retracting them from under the load. Retract the forks using boom movement only. Immediately lower forks below eye level after clearing the landing point and before traveling with the forklift.

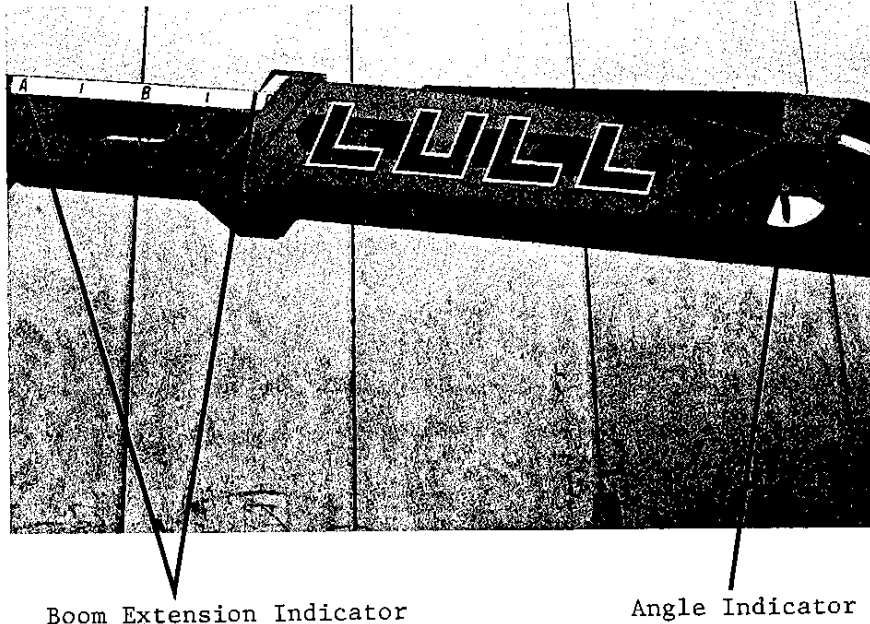
## SAFE SHUTDOWN

Correct shutdown is important to safe operation. Follow these general steps:

- Come to a full stop.
- Set parking brake.
- Lower forks to the ground.
- Place controls in neutral.
- Idle engine for 1-3 minutes for gradual cooling
- Shut off engine.
- Cycle hydraulic controls to eliminate residual pressure.
- Remove ignition key.
- Lock anti-vandalism covers and closures.
- Dismount.
- Block wheels if on a slope or incline.

# LOAD CHARTS

Use angle and extension indicators along with load chart instructions to determine correct boom lifting capacities.

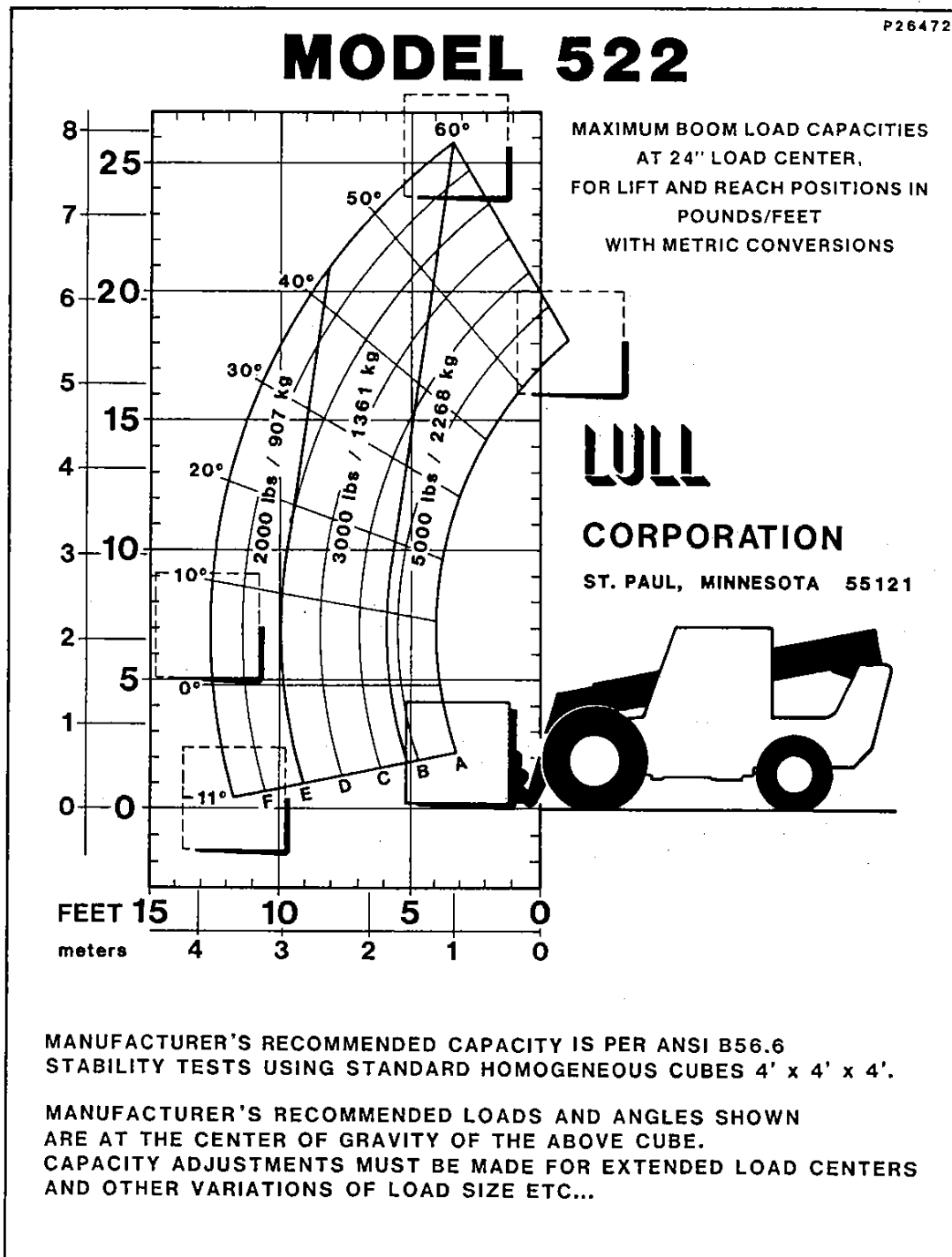


The load chart is displayed on the side panel of the forklift cab and is shown herein on page 19, 20, or 21. Before lifting any load, read and understand the load chart instructions. Know the weight of the load to be lifted. While lifting and placing the load refer to and strictly follow load chart instructions.

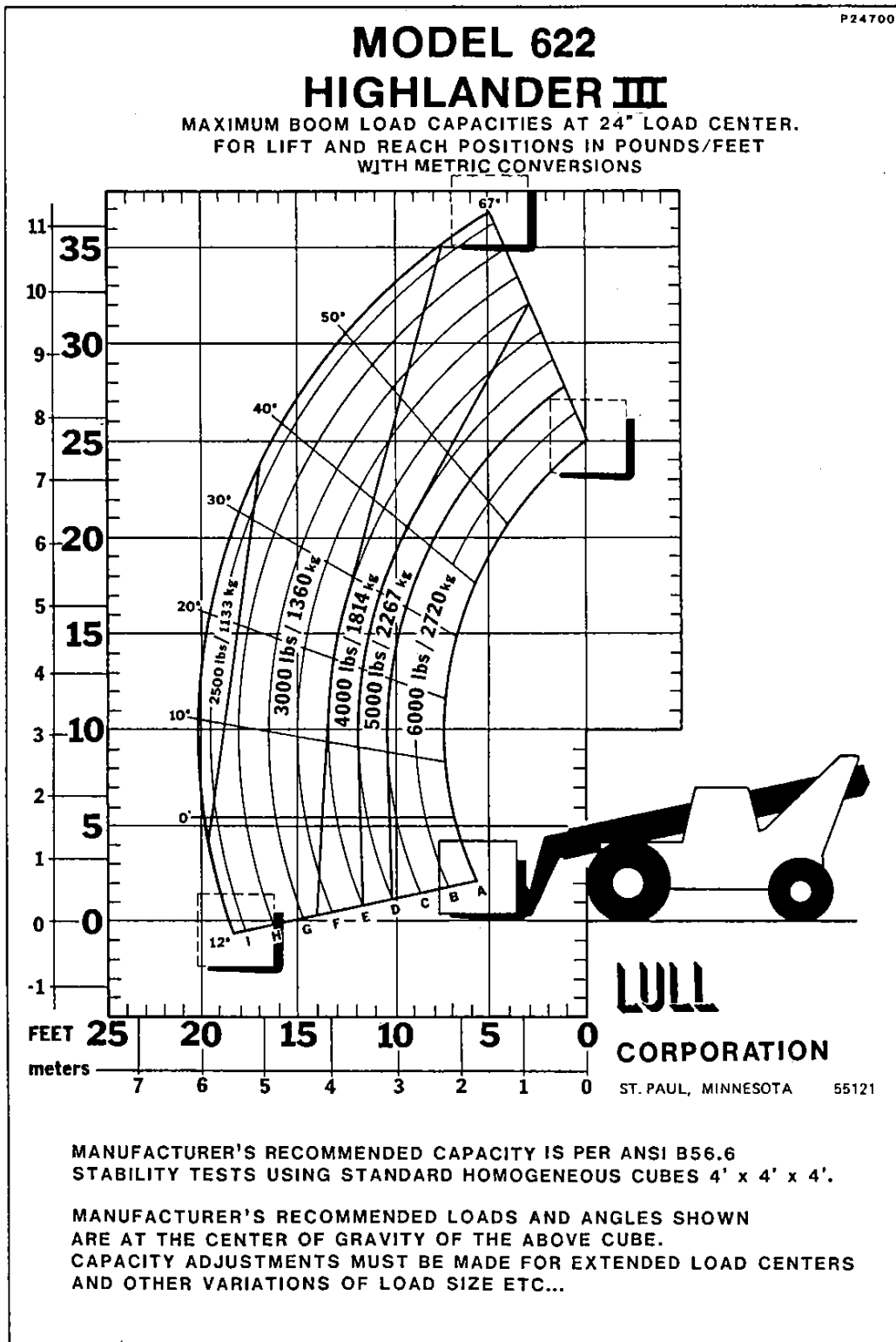


**WARNING:** FAILURE TO STRICTLY FOLLOW LOAD CHART INSTRUCTIONS COULD RESULT IN VEHICLE UPSET AND CAUSE PROPERTY DAMAGE, PERSONAL INJURY OR DEATH.

# LOAD CHARTS



# LOAD CHARTS



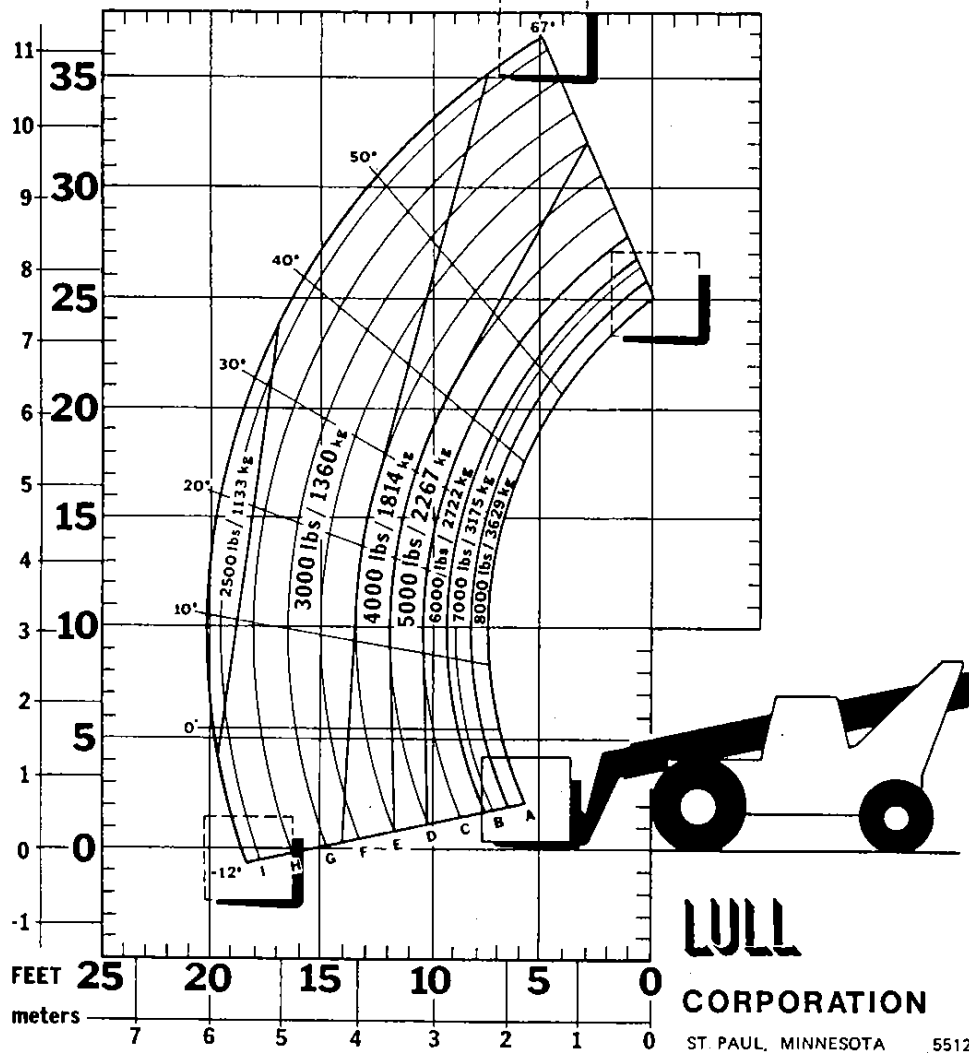
# LOAD CHARTS

P26832

## MODEL 824

MAXIMUM BOOM LOAD CAPACITIES AT 24" LOAD CENTER.  
FOR LIFT AND REACH POSITIONS IN POUNDS/FEET

WITH METRIC CONVERSIONS



MANUFACTURER'S RECOMMENDED CAPACITY IS PER ANSI B56.6  
STABILITY TESTS USING STANDARD HOMOGENEOUS CUBES 4' x 4' x 4'.

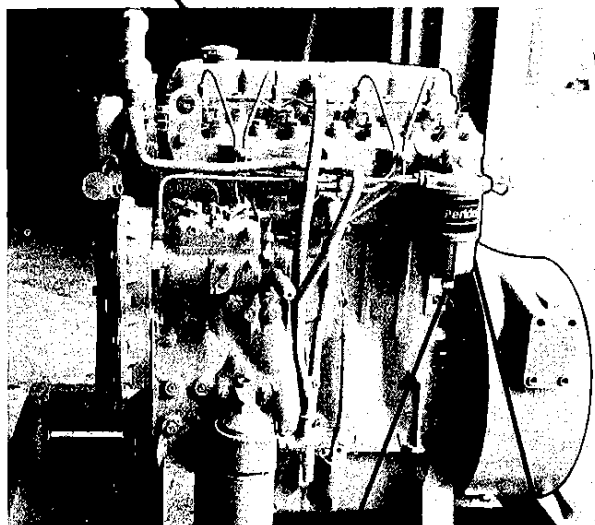
MANUFACTURER'S RECOMMENDED LOADS AND ANGLES SHOWN  
ARE AT THE CENTER OF GRAVITY OF THE ABOVE CUBE.  
CAPACITY ADJUSTMENTS MUST BE MADE FOR EXTENDED LOAD CENTERS  
AND OTHER VARIATIONS OF LOAD SIZE ETC...

# MAINTENANCE

## PERKINS ENGINE (522)

Oil Add

Engine Fuel & Oil Filters



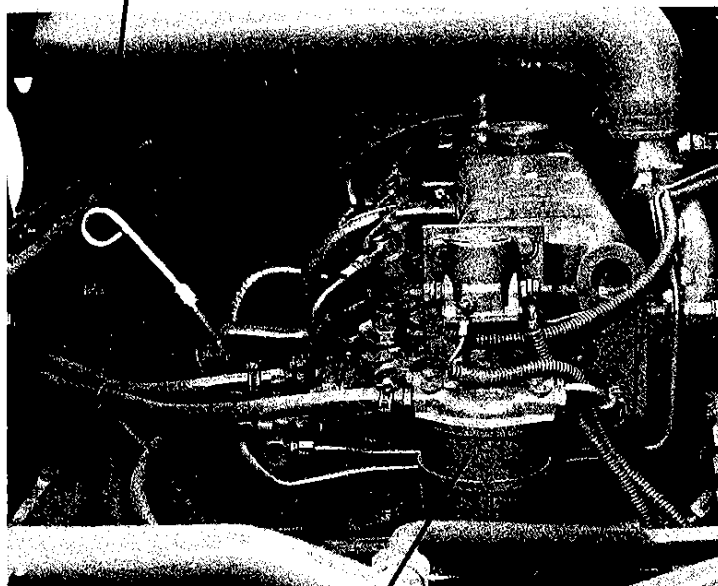
Oil Filter

Fuel Filter  
Drain

Fuel  
Filter

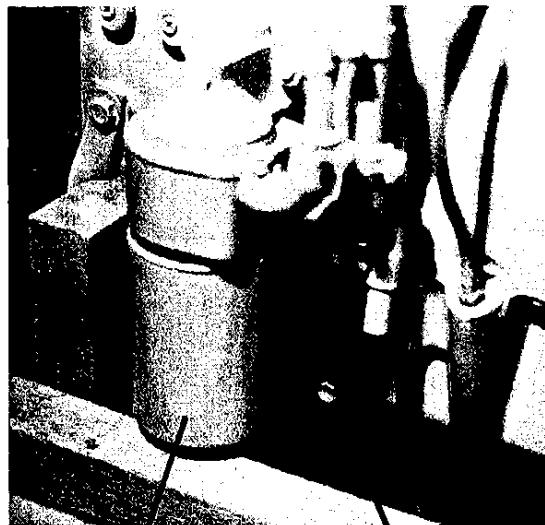
Dipstick  
Check Daily

Fuel Water Trap



Water Trap

Engine Oil Drain



Oil Filter

Oil Drain Plug

Oil Filter

Change the oil and oil filter after first 50 hours of operation and at 100 hour intervals thereafter.

Fuel Filter

1. Change the fuel filter canister at 500 hour intervals or once a year. If the engine is operated under difficult conditions, change the canister more often.
2. The fuel filter is provided with a drain plug. Once a week unscrew and remove the plug until all water has drained and replace plug.

Fuel Water Trap

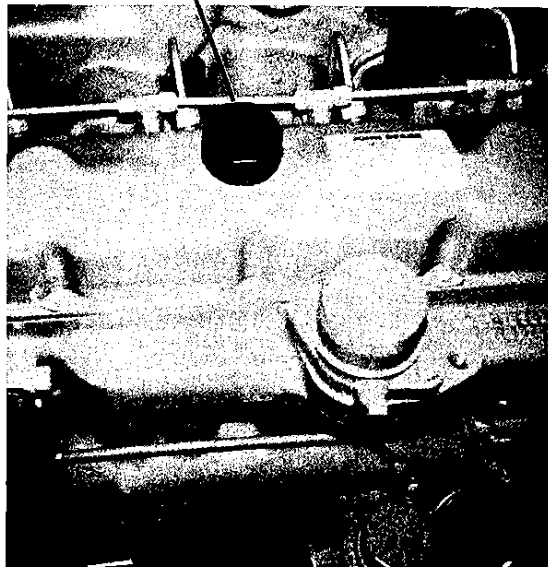
The water trap is provided with a drain plug. Once a week unscrew and remove the plug until all water has drained and replace plug.



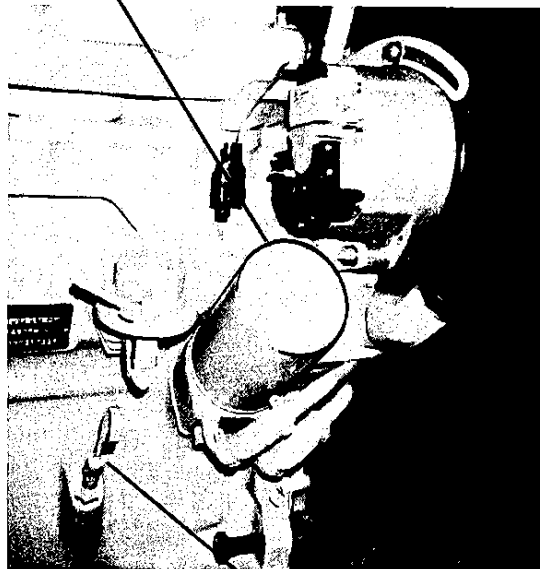
# MAINTENANCE

JOHN DEERE ENGINE (622, 824)

Oil Add



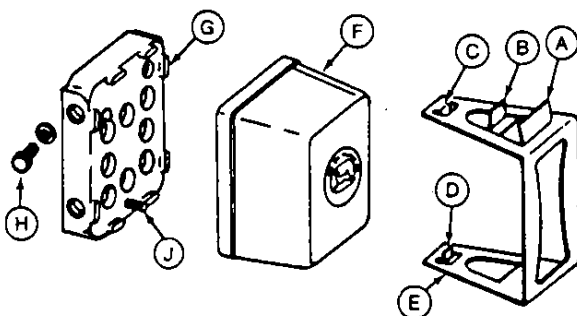
Oil Filter



Dipstick (accessible from cab)  
Check Daily



Drain Plug



## Oil Filter

NOTE: Change the oil and oil filter after first 50 hours of operation and at 100 hour intervals thereafter.

## Fuel Filter

NOTE: Change the element every 500 hours or once a year. If the engine is operated under difficult conditions, change the element more often.

To install a new fuel filter element:

1. Push tab (A) and pull tab (B) to disengage hook (C).
2. Disengage hook (D).
3. Remove spring (E).
4. Remove element (F).
5. Clean the filter body (G) and fuel tube (J).
6. Install new element. Install spring.
7. Loosen bleed screw (H).
8. Pump the primer lever until fuel without bubbles flows from around the bleed screw.
9. Tighten bleed screw.
10. Push primer lever down.

# MAINTENANCE

DEUTZ ENGINE (622)

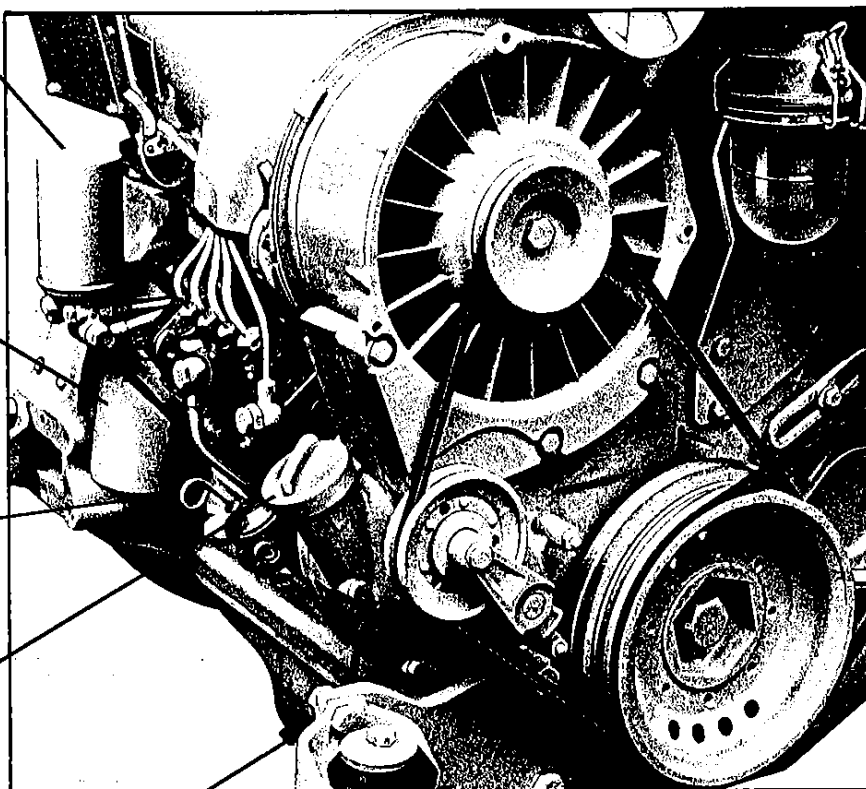
Fuel Filter

Oil Filter

Dipstick  
Check Daily

Oil Add

Oil Drain Plug



## Fuel Filter

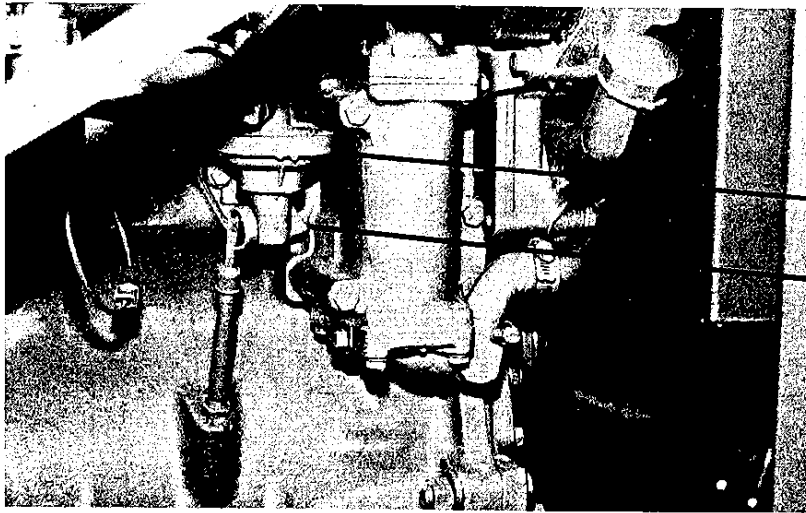
Change the fuel filter canister at 500 hour intervals or once a year. If the engine is operated under difficult conditions, change the canister more often.

## Oil Filter

Change the oil and oil filter after first 50 hours of operation and at 100 hour intervals thereafter.

# MAINTENANCE

Fuel Primer



Fuel Primer

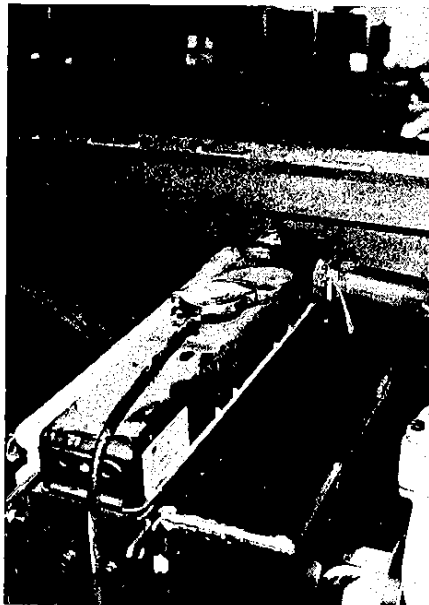
Primer Lever

Should the engine ever be run dry of fuel, or air is in the fuel system, use the Primer to pump fuel to injectors.

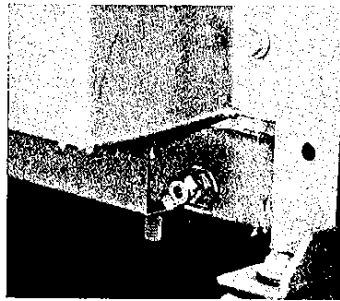
DO NOT CRANK ENGINE UNTIL PRIMING IS COMPLETE.

(See engine handbook for procedure)

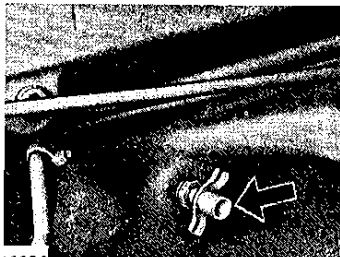
Radiator



Radiator Drain Cock



Engine Block Drain Cock



## EVERY SPRING AND FALL

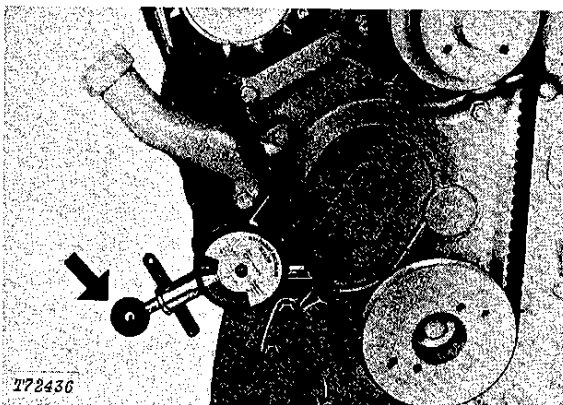
### Engine Coolant

Drain, flush, and fill the cooling system with correct coolant.

CAUTION: Do not remove the radiator cap unless the engine is cool. Then loosen the cap slowly to the stop. Release all pressure before you remove the cap.

To drain the cooling system completely:

1. Open the radiator drain cock.
2. Open the cylinder block drain cock.
3. Remove the coolant drain plug of the engine oil cooler.



Fan Belt

Check and adjust alternator/fan belt tension. Replace belt if worn or damaged.

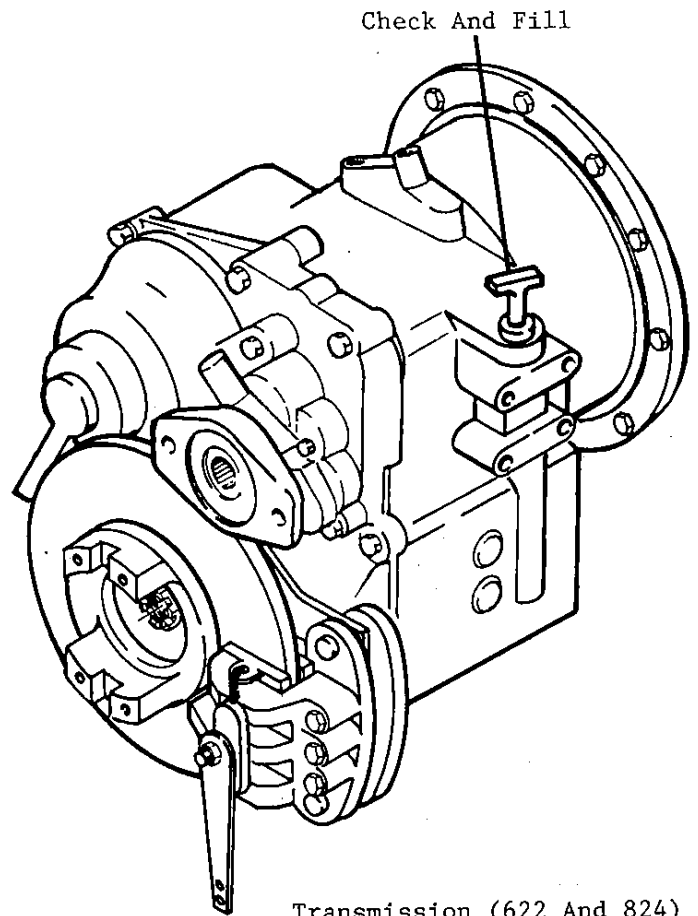
Strand tension gauge: Immediately after the engine stops (run the engine at least 5 minutes), check the belt tension. If tension is less than 50 lb. (223 N), let the engine cool 10 to 15 minutes. Then make tension 90 lb. (400 N).

If a tension gauge is not available: Apply a force of 20 lb. (89 N) halfway between the pulleys and adjust belt so movement is 3/4 in (19 mm).

# MAINTENANCE

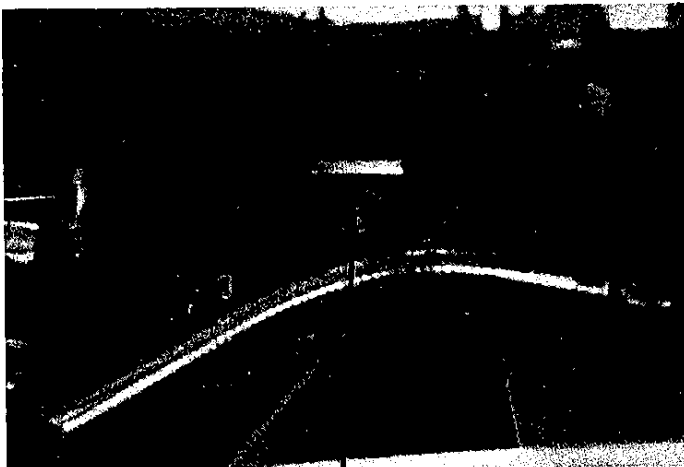
## Transmission

1. The transmission must be in the neutral position before starting the engine, or when the vehicle is parked and the engine is running.
2. If the oil temperature gauge (converter oil out temperature) rises above 250°F (121.1°C) stop the vehicle immediately. Shift to neutral and run the engine at 1000-1200 RPM. The temperature should drop rapidly to normal operating temperature. If the temperature does not drop, trouble is indicated. The trouble should be determined before the vehicle is operated again. Generally overheating is the result of working in too high a gear. Shifting to a lower gear may be necessary.



Transmission (622 And 824)

## Transmission Oil Check And Fill



Dipstick  
(Oil Check And Fill)

## Trans Oil Check and Fill

1. The oil level must be checked daily with the engine running at idle and at operating temperature and the transmission in neutral.
2. When servicing the unit for the first time after vehicle installation and/or after repair, the unit is filled as follows:
  - A. Fill unit with the recommended fluid to LOW mark on dipstick.
  - B. Start engine and run at idle speed for two minutes.
  - C. With the engine at idle speed, add quantity necessary to bring oil level to FULL mark on dipstick.

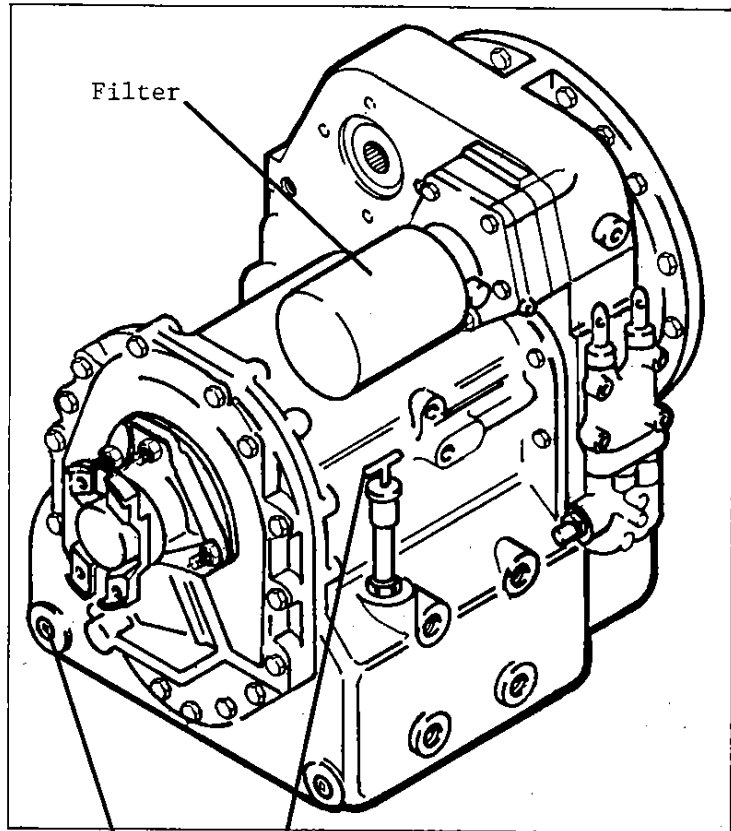
# MAINTENANCE

## Transmission Filter And Drain (522)

### Transmission Filter (622 And 824)



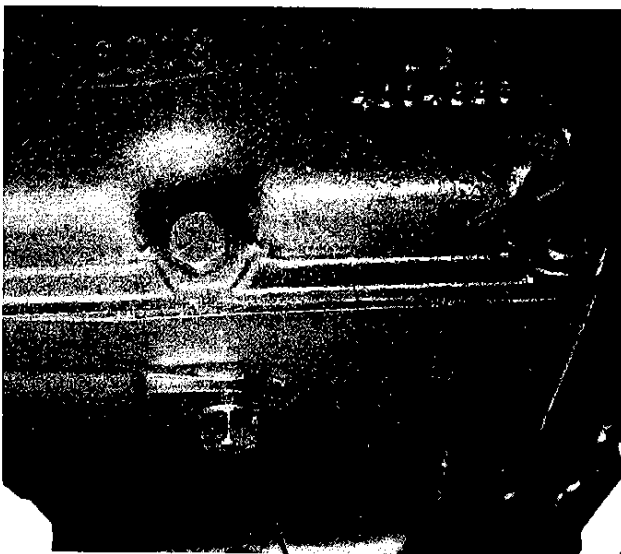
Filter



Drain Plug

Check And Fill

### Transmission Drain (622 And 824)



Drain Plug

## Transmission Oil Filter And Drain

Model 522 - Drain transmission and replace the filter after first 50 hours of operation. Refill with the recommended fluid.

Replace filter again after first 100 hours of operation.

Drain and refill transmission and replace the filter at 500 hour intervals thereafter.

Models 622 and 824 - Drain transmission and replace the filter after first 20 hours of operation. Refill with the recommended fluid. Replace filter again after first 200 hours of operation. Drain and refill transmission and replace the filter at 500 hour intervals thereafter.

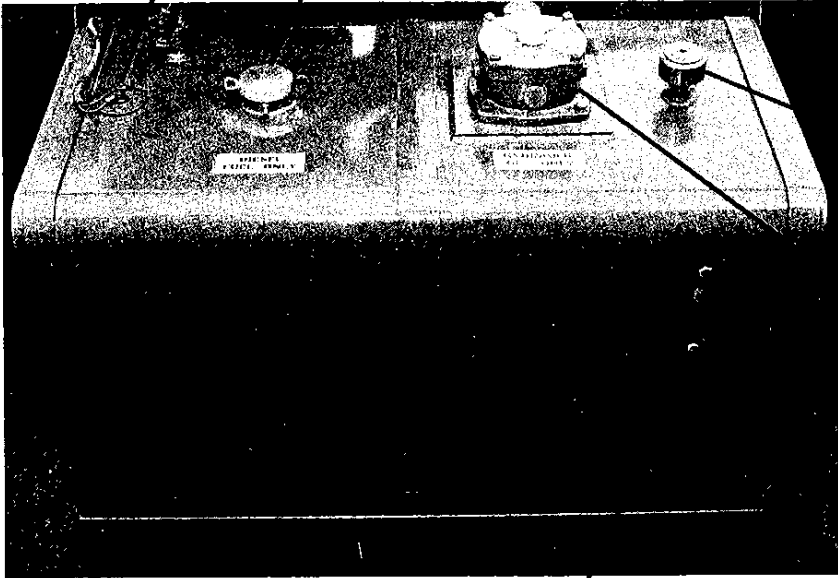
# MAINTENANCE

Fuel Level Sender

HYDRAULIC OIL & FUEL TANK (522)

Fuel Fill

Top



Hydraulic Breather -  
Clean every 200 hours  
Change every 1000 hours

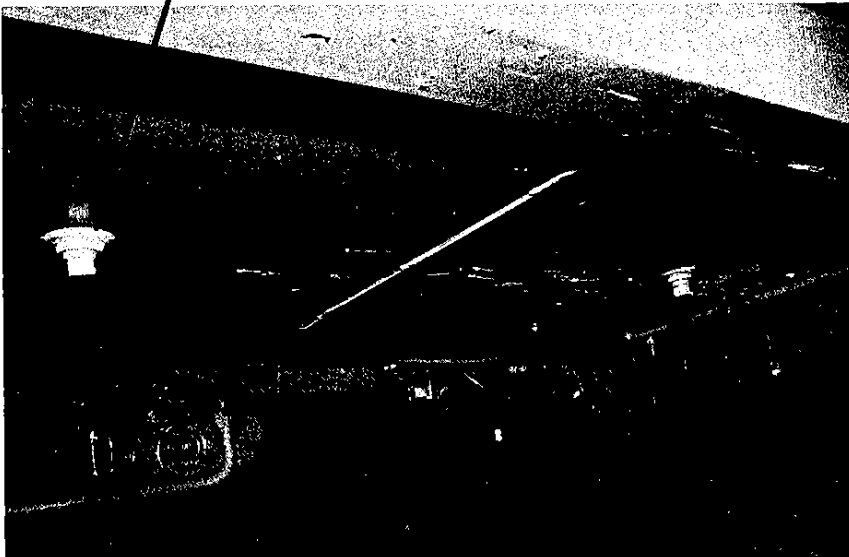
Hydraulic Filter/Fill  
(early production) -  
Remove cover and fill to level.  
Change filter after first 50 hours  
operation.  
Change fluid and filter at 1000  
hour intervals thereafter.

(later production) -  
Remove plug and fill thru opening  
in cover.  
Change filter after first 50 hours  
operation.  
Change fluid and filter at 1000  
hour intervals thereafter.  
Also, monitor filter gauge weekly  
for filter condition. Change  
filter whenever indicator is in  
red zone with fluid warm and  
engine at full RPM.

Fuel Drain

Hydraulic Level -  
Check Daily

Bottom



Hydraulic Drain

# MAINTENANCE

## HYDRAULIC OIL & FUEL TANK (622, 824)

Hydraulic Breather -  
Clean every 200 hours  
Change every 1000 hours

\*Hydraulic Filter/Fill

Fuel Fill

Top

Fuel Level Sender

\*Hydraulic Filter/Fill  
(early production) -  
Remove cover and fill to level.  
Change filter after first 50 hours  
operation.  
Change fluid and filter at 1000  
hour intervals thereafter.

(later production) -  
Remove plug and fill thru opening  
in cover.  
Change filter after first 50 hours  
operation.  
Change fluid and filter at 1000  
hour intervals thereafter.  
Also, monitor filter gauge weekly  
for filter condition. Change  
filter whenever indicator is in  
red zone with fluid warm and  
engine at full RPM.

Hydraulic Level -  
Check Daily

Hydraulic Drain

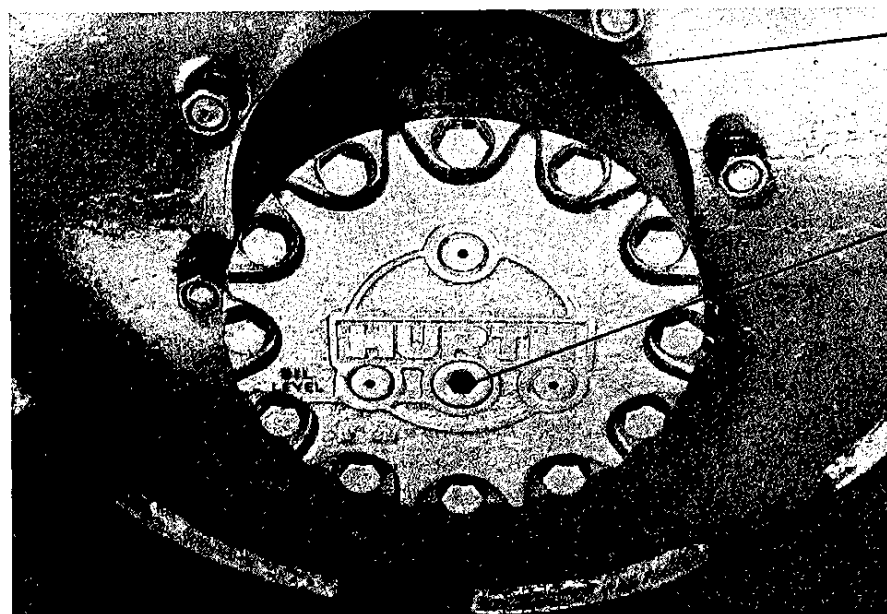
Bottom

Fuel Drain

# MAINTENANCE

## DRIVE AXLE (522)

Planetary Hub



Drain

Fill and Level

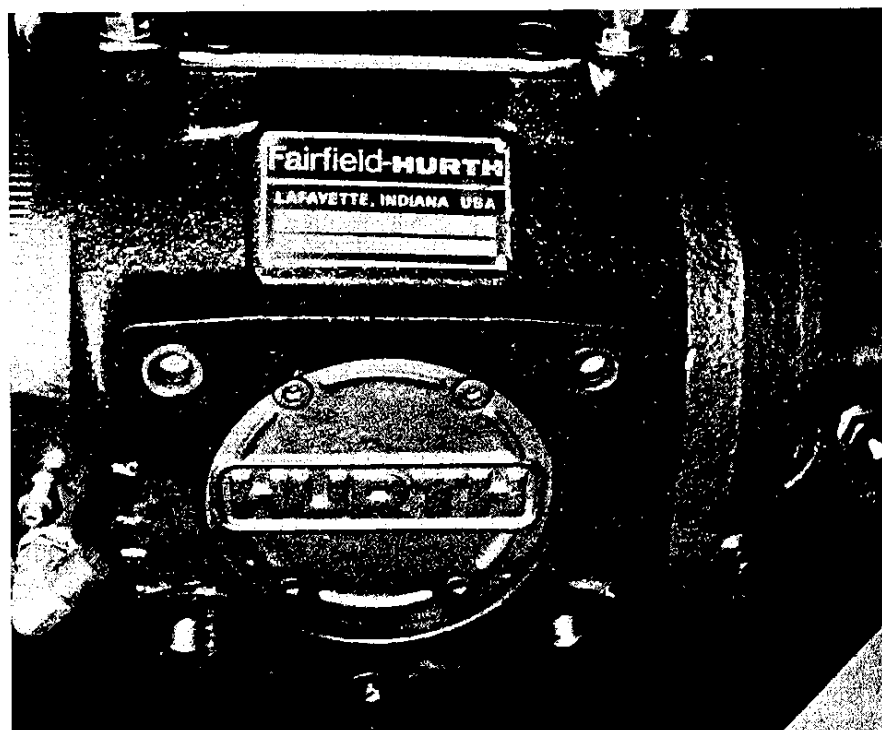
Change after first 50 hours operation and at 1000 hour intervals thereafter.

Check every 200 hours

SAE-90-API-GL5

1-1/2 pints each hub

Differential



Fill

Change after first 50 hours operation and at 1000 hour intervals thereafter.

Check every 200 hours

SAE-90 Mobil Lub 46

9 Quarts (Approx.)

Drain

Level



# MAINTENANCE

## DRIVE AXLE (622, 824)

Planetary Hub



Drain

Fill & Level

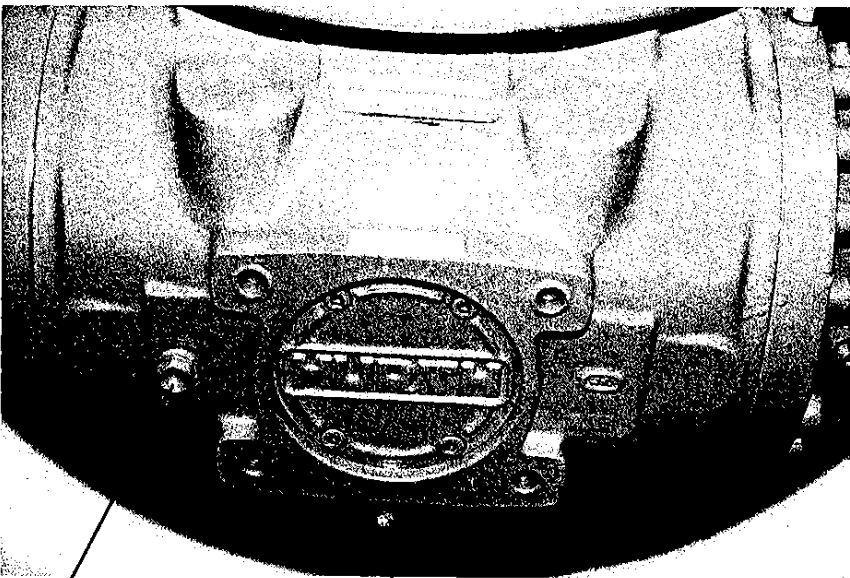
Change after first 50 hours operation and at 1000 hour intervals thereafter.

Check every 200 hours.

SAE-90-API-GL5

1-1/2 pints each hub.

Differential



Fill & Level

Drain

Change after first 50 hours operation and at 1000 hour intervals thereafter.

Check every 200 hours.

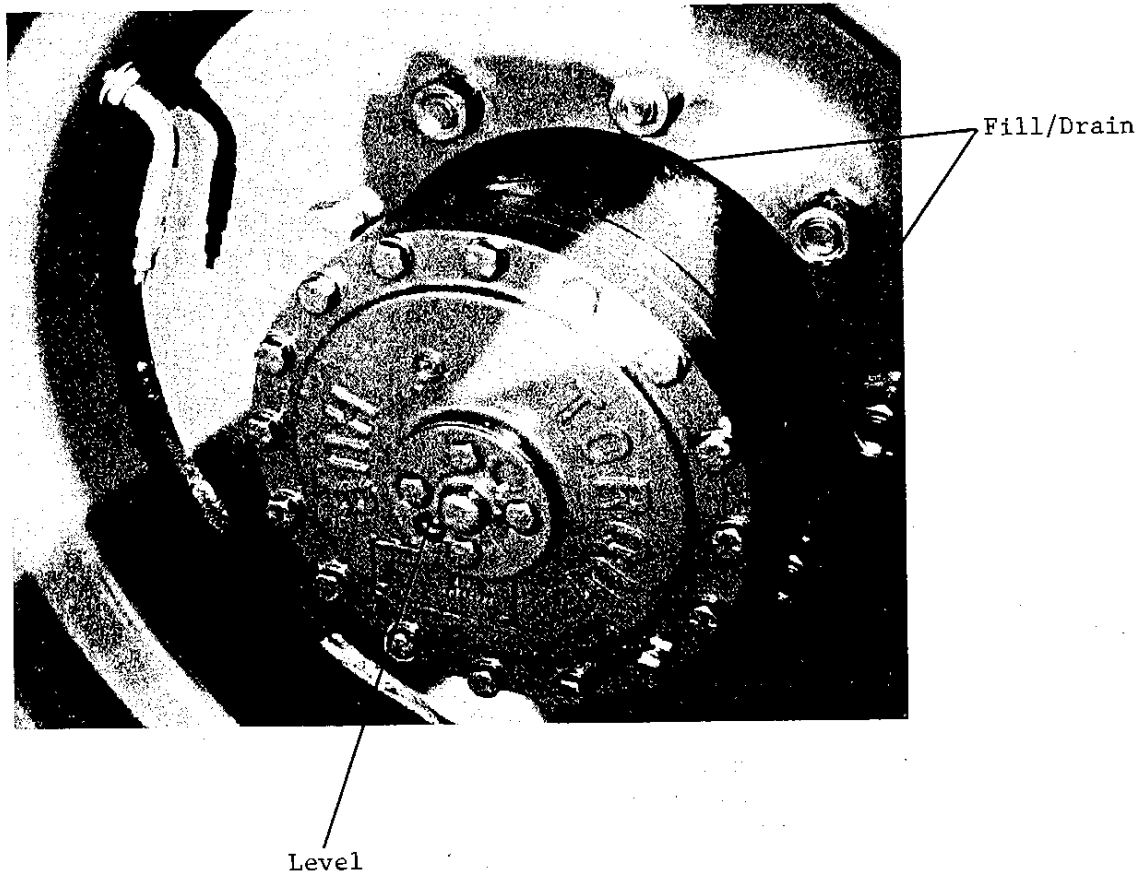
SAE-90-Mobil Lub 46

9 Quarts (Approx.)

# MAINTENANCE

---

Power Assist Planetary Gear Hub  
(522/4, 622/4 and 824)



Change after first 50 hours operation and at 1000 hour intervals thereafter.

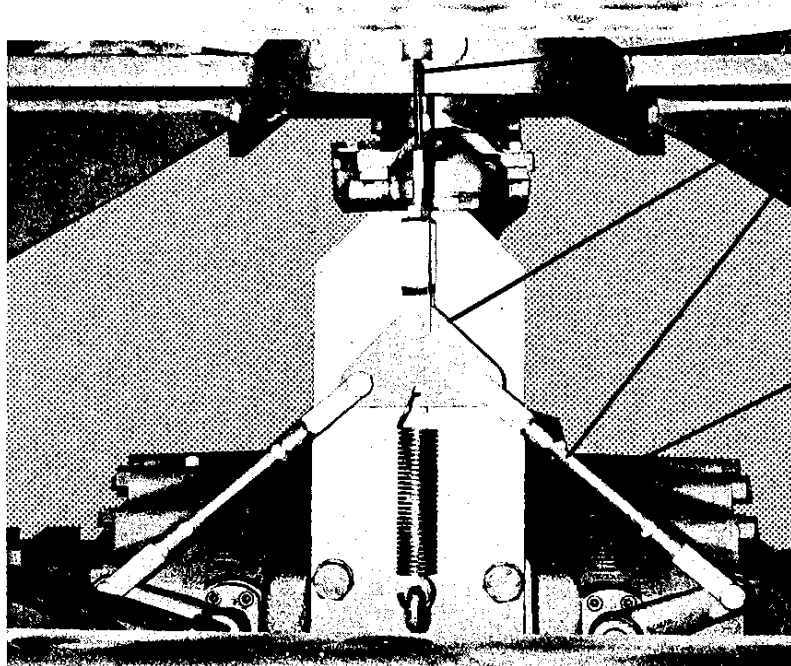
Check every 200 hours.

SAE-90 API GL-5

1 pint each hub

# MAINTENANCE

## Parking Brake-Internal Disc (522)



Cable

Parking Brake Linkage

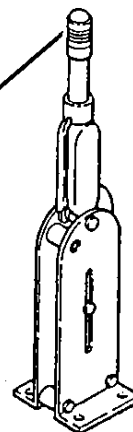
Every 100 hours visually inspect cable and linkage. Adjust or replace as required.

Brake disc replacement requires Axle disassembly (See Hurth service manual).

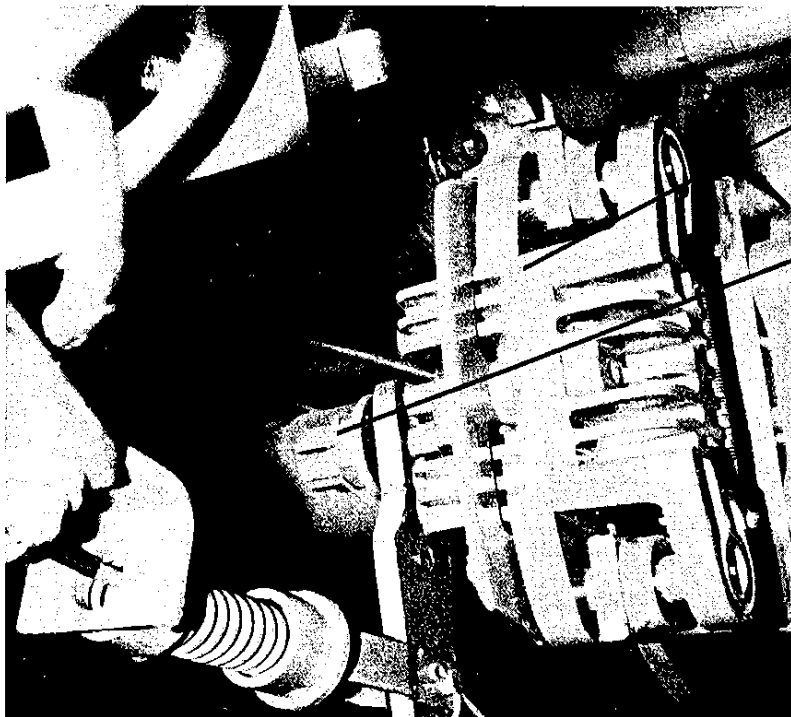
Front Axle

Parking Brake Lever

To adjust parking brake for increased holding power, turn knob on brake lever handle clockwise.



## Parking Brake Disc & Caliper (622, 824)



Brake Caliper

Parking Brake Caliper Adjustment

With brake released adjust caliper till pads contact disc, then back-off nut approx. 1/4 turn.

Replace pads when thickness becomes 1/8" or less.

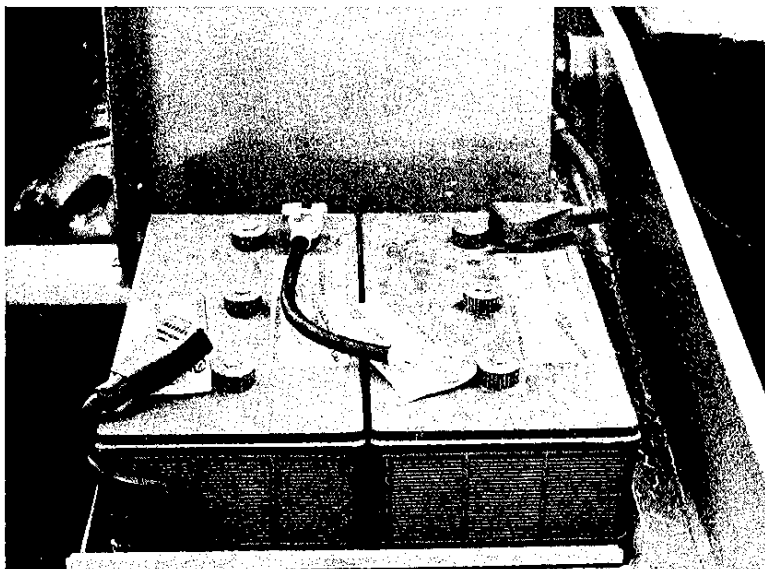
Every 100 hours visually inspect cable, caliper, brake pads and disc. Adjust or replace as required.

Brake Disc

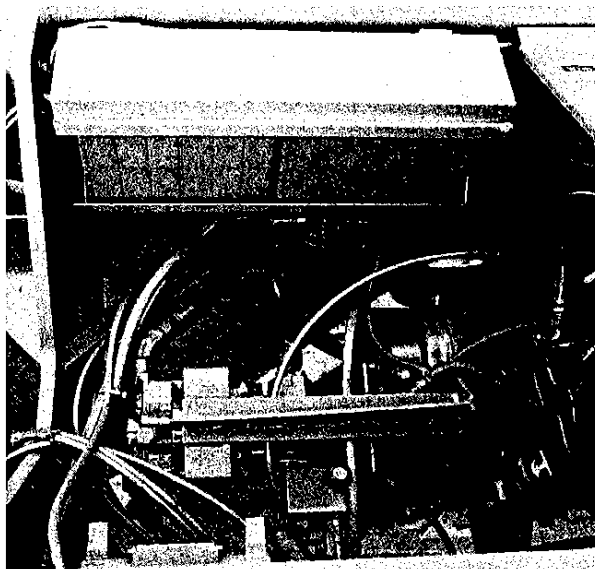
# MAINTENANCE

## Battery Location and Check

(522)



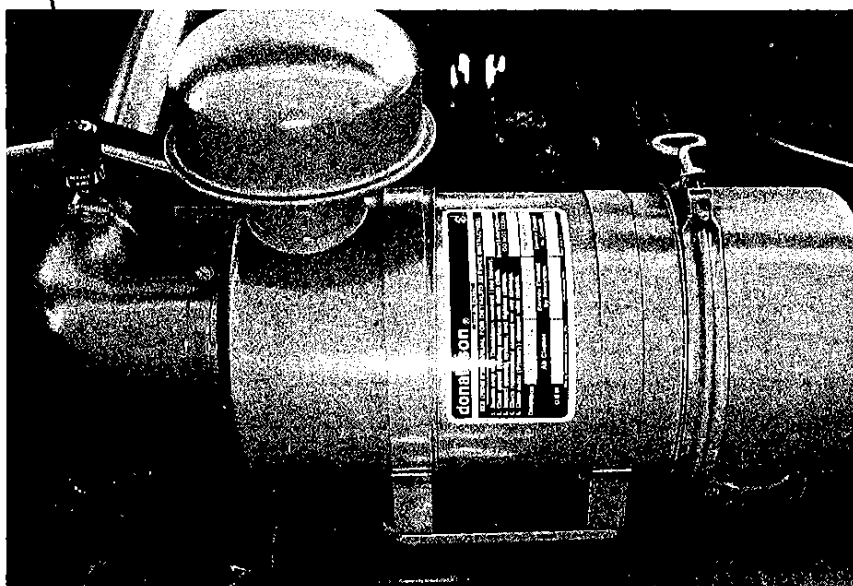
(622, 824)



1. Batteries located in front of engine.
2. Check fluid levels every 200 hours.

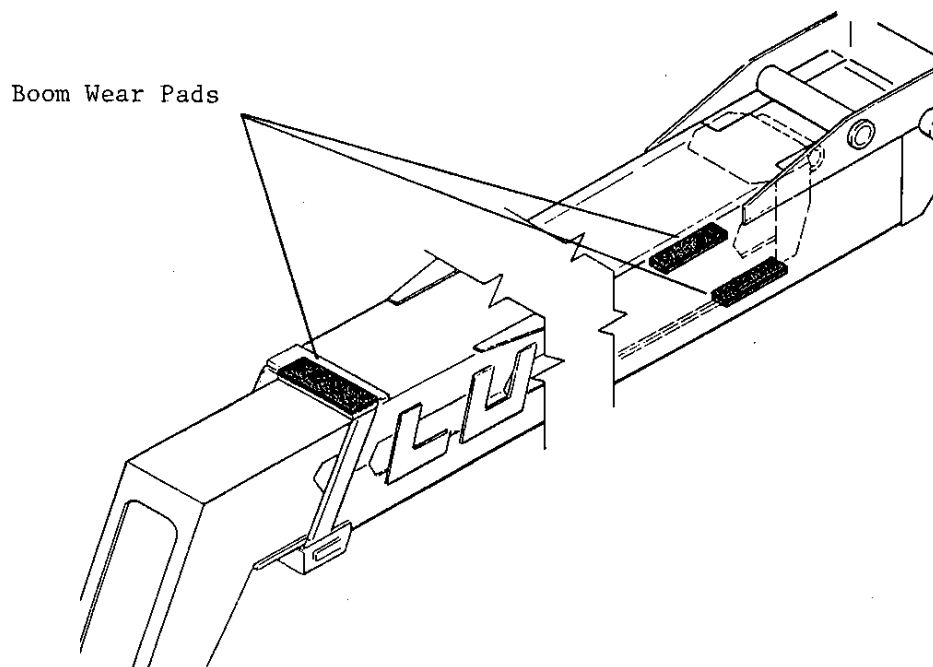
Filter Dirt  
Indicator -  
Change When  
Red Is Showing

Air Cleaner Dirt Indicator  
(522 shown)



# MAINTENANCE

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## Wear Pads

Located on top front of outer boom and bottom rear of inner boom. When inspecting for wear, replace pad when thickness becomes  $\frac{3}{8}$ " or less. If clearance between pad and boom exceeds  $\frac{1}{8}$ ", shim as required to achieve  $\frac{1}{16}$ " to  $\frac{1}{8}$ " clearance.

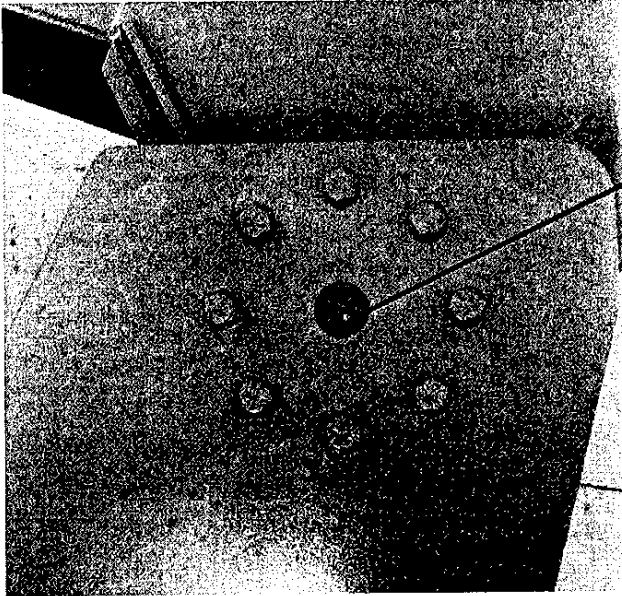
Refer to parts manual for shim sizes available.

# LUBRICATION

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## Main Boom Pivot

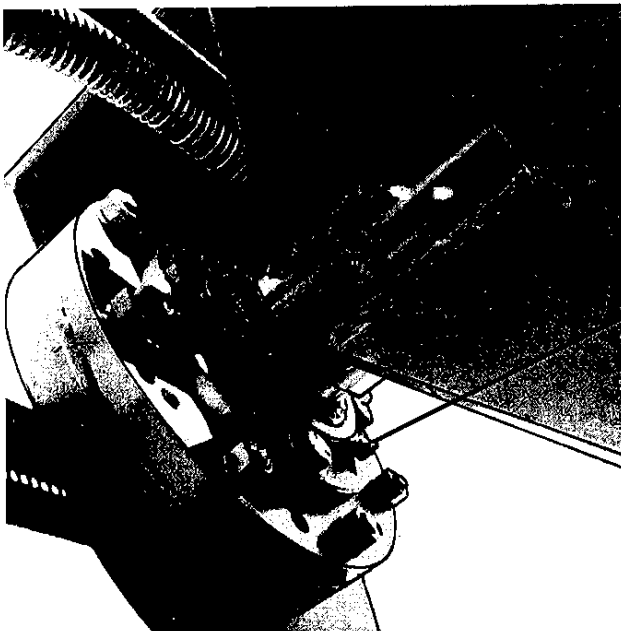
(522)



Grease Fitting  
(Both Sides)

Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

(622, 824)

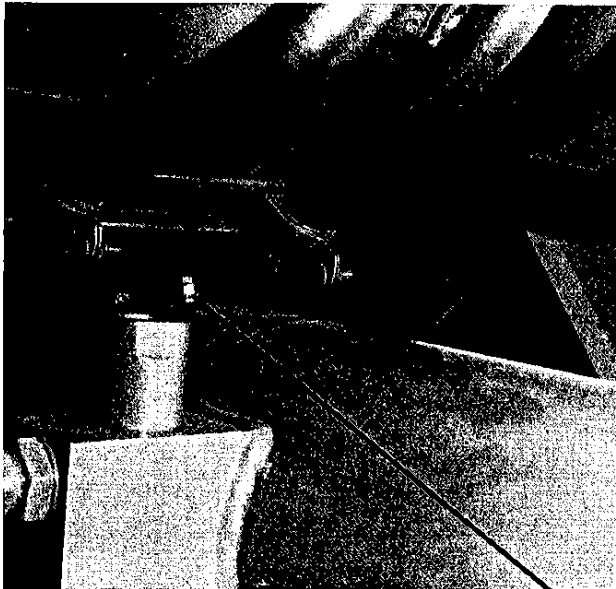


Grease Fitting  
(Both Sides)

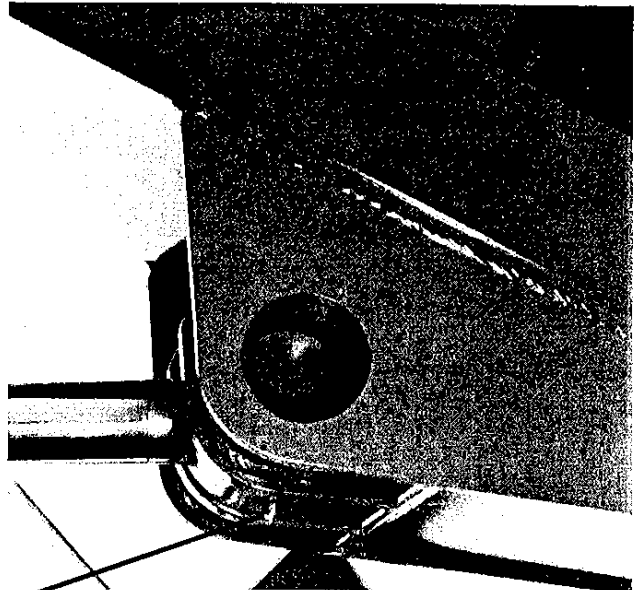
# LUBRICATION

## Hoist Pivots (522)

Lower



Upper

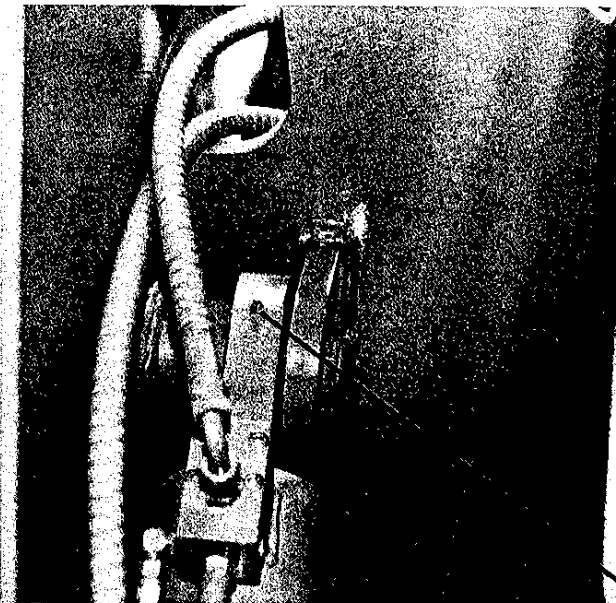


Grease Fittings

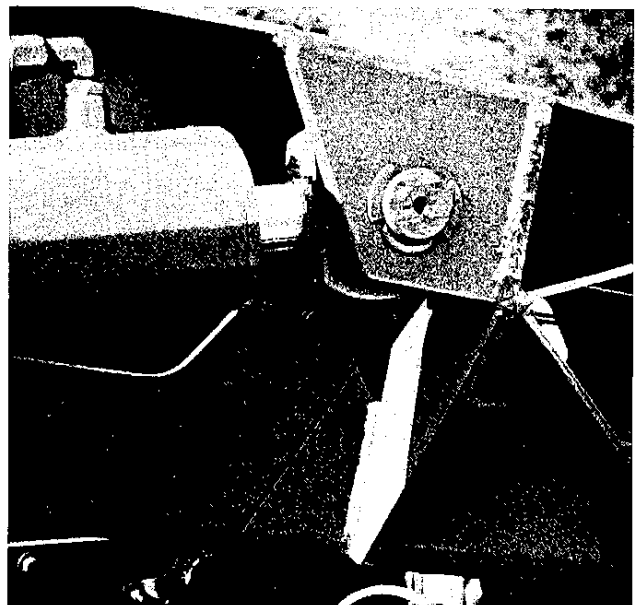
Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

## Hoist Pivots (622, 824)

Lower



Upper

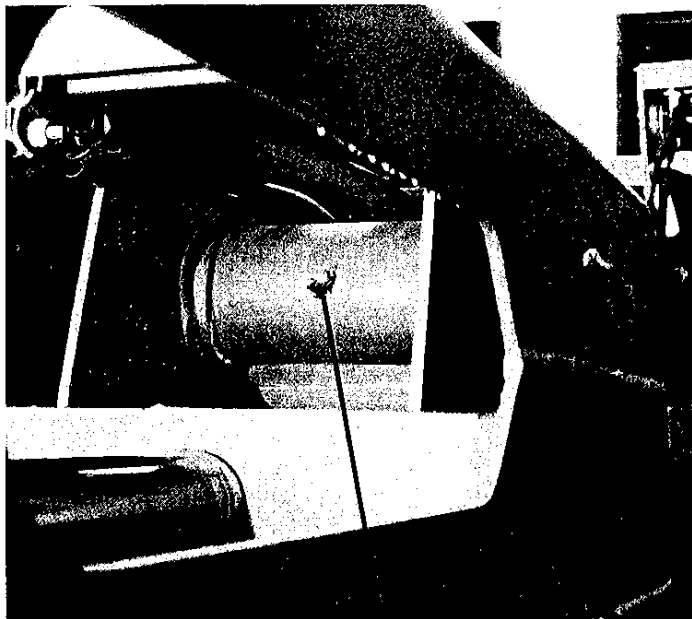


Grease Fittings  
(Both Sides)

# LUBRICATION

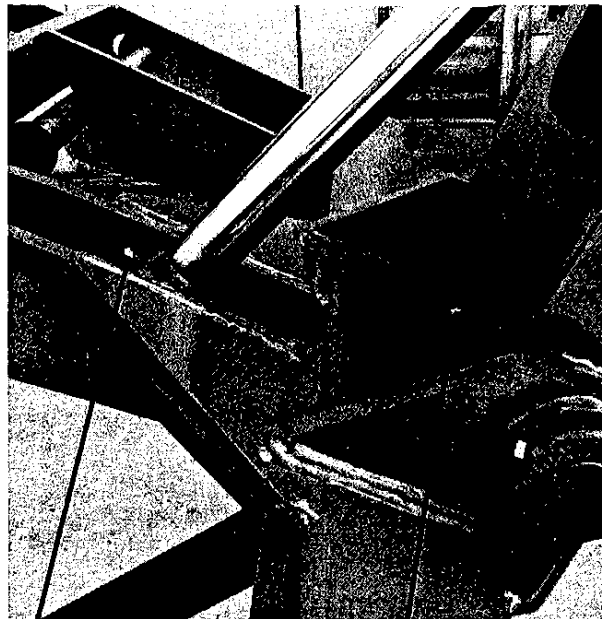
## Carriage Tilt Cylinder

Upper Pivot



Grease Fitting

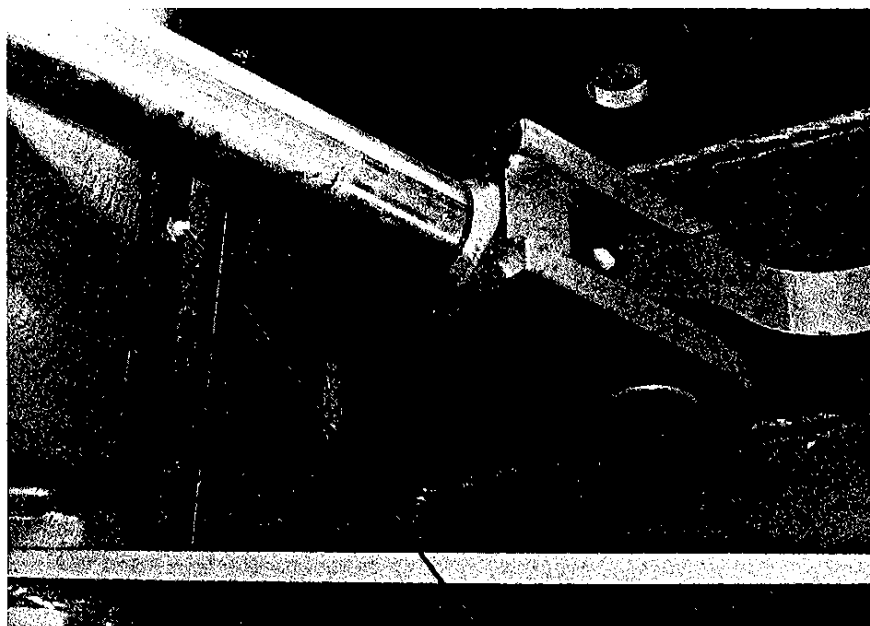
Lower Pivot (824)



Grease Fitting

Grease Fitting  
(Carriage Pivot)

Lower Pivot (522, 622)



Grease Fitting

Grease Fitting  
(Carriage Pivot)

Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

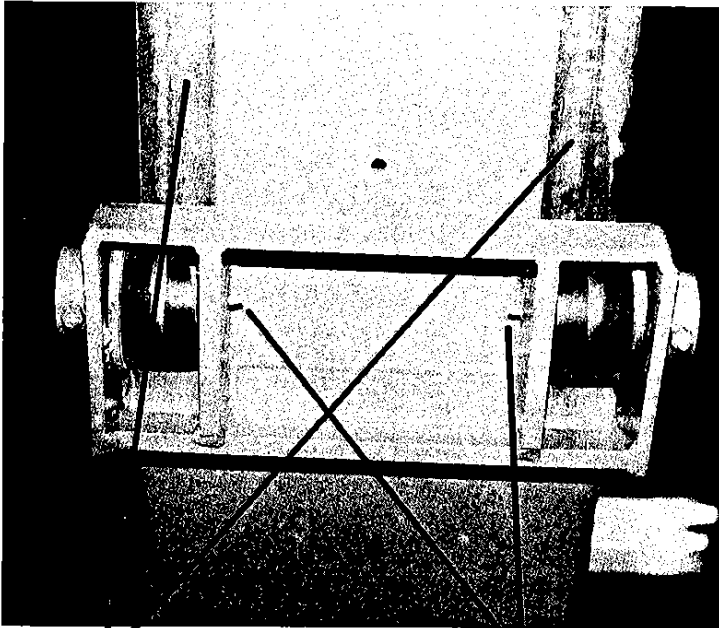


# LUBRICATION

Front

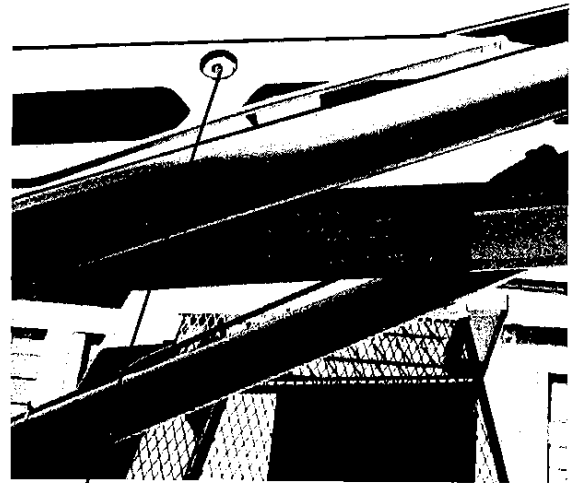
Boom Rollers

Rear



Boom Rails  
DO NOT GREASE

Grease Fittings



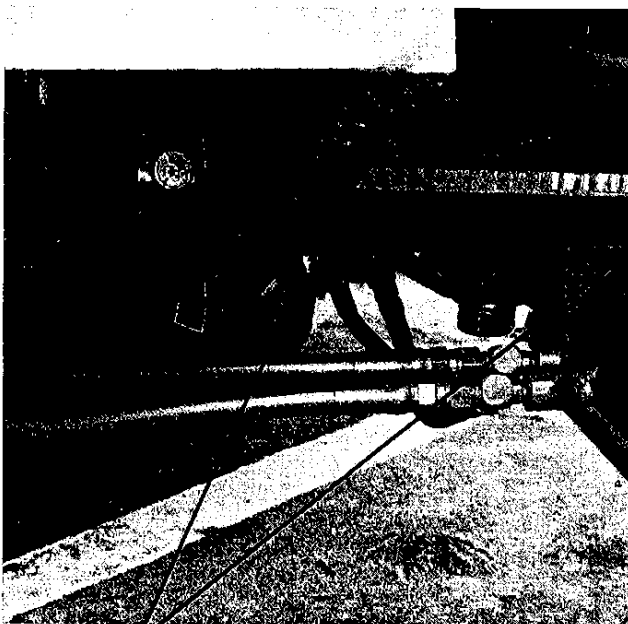
Grease Fitting  
(Both Sides)

Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

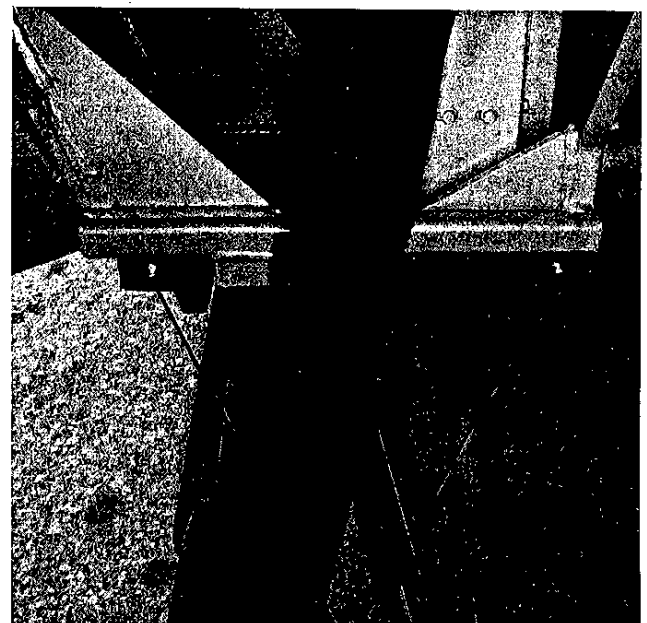
(522)

Steering Axle Pivot

(622, 824)



Grease Fittings

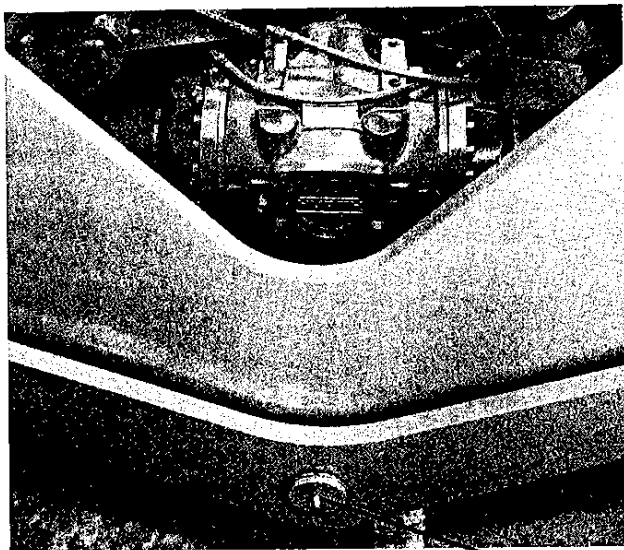


Grease Fittings

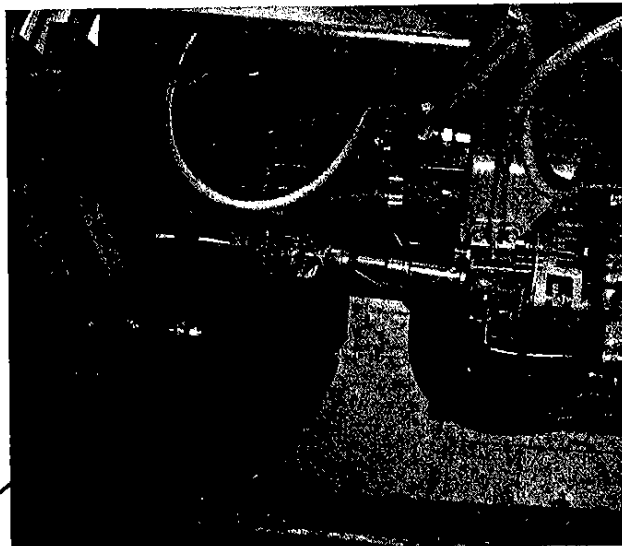
# LUBRICATION

Oscillation Frame Pivots

Outer

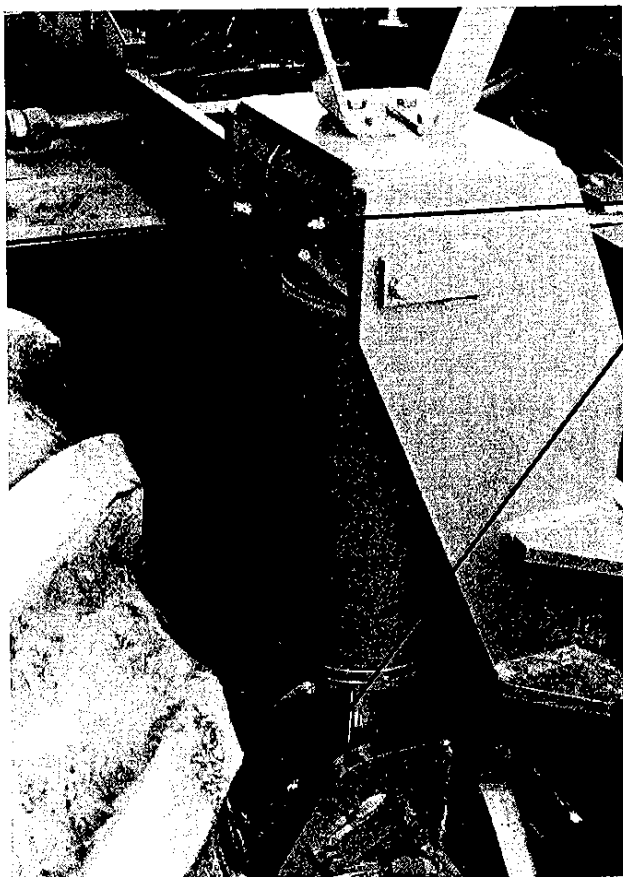


Inner



Grease Fittings

Frame Tilt Cylinder (522 Shown)



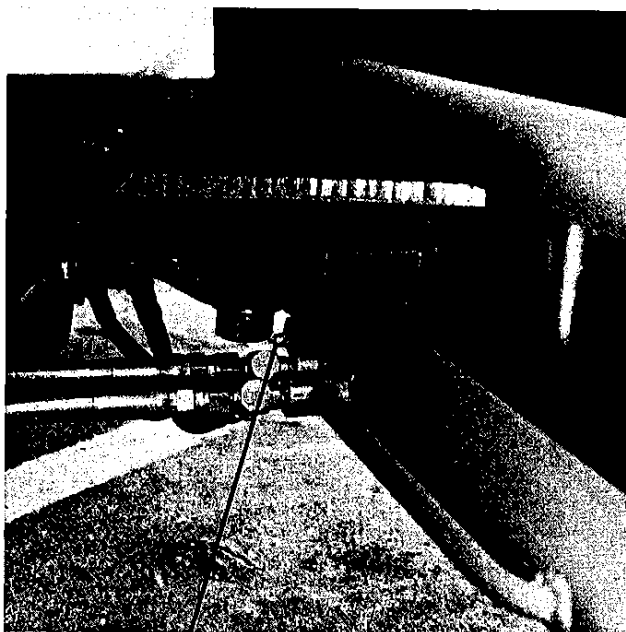
Grease Fittings

Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

# LUBRICATION

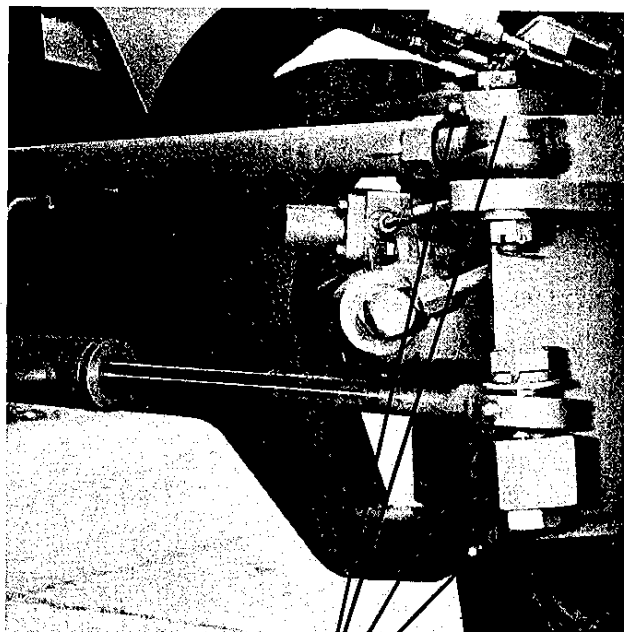
## Steering Cylinder and Spindle Pivots

Inner



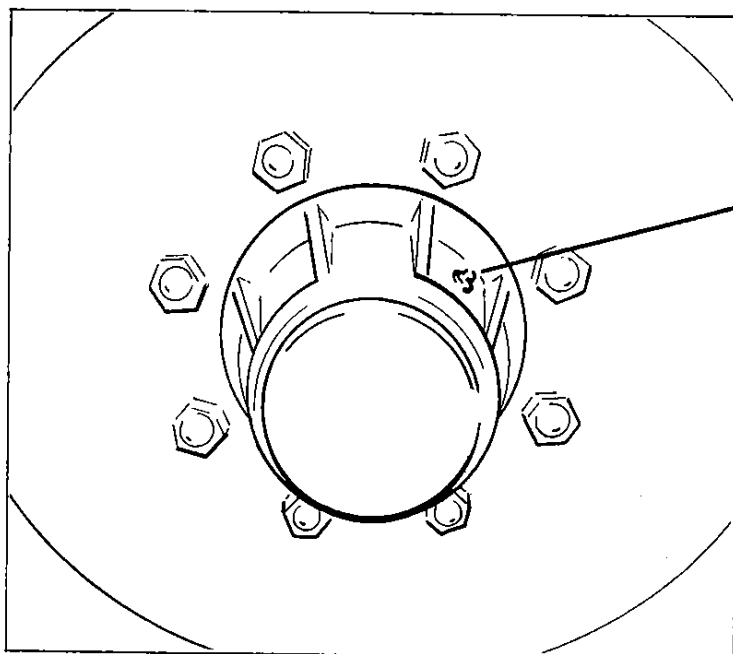
Grease Fitting  
(Both Sides)

Outer



Grease Fittings  
(Both Sides)

## Steering Axle Hub (522, 622)



Grease Fitting  
(Both Sides)

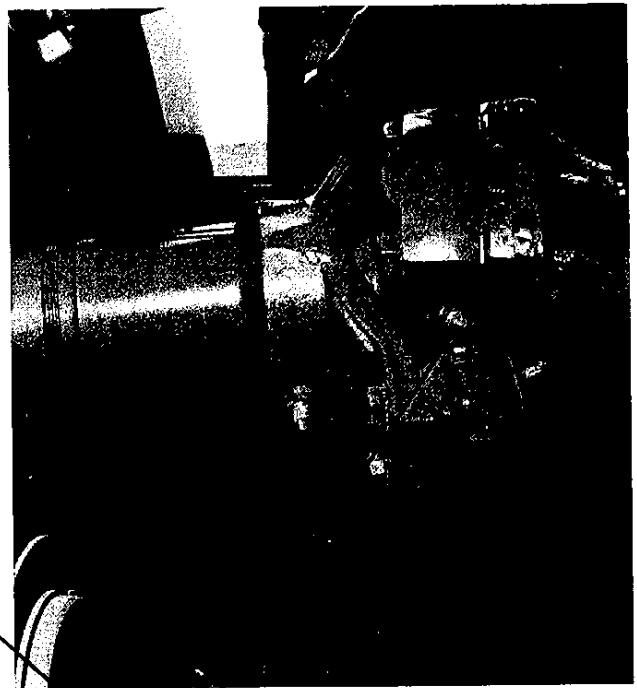
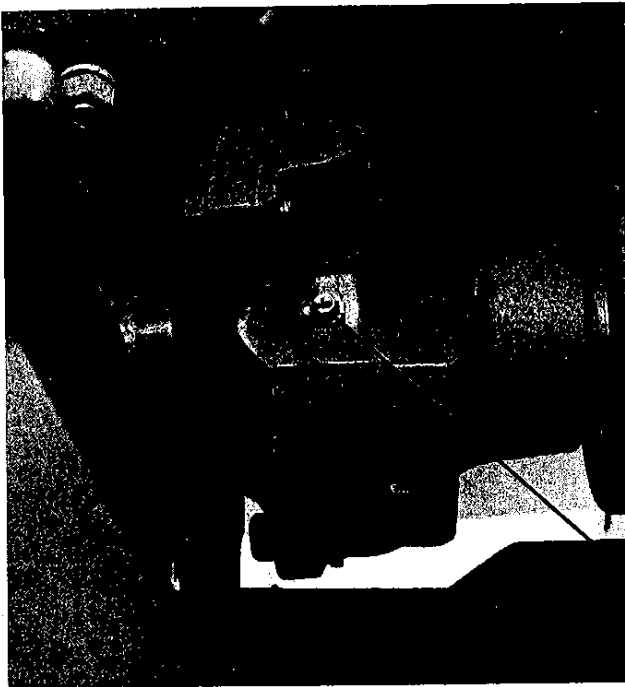
Lubricate these Zerk Fittings Weekly  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

# LUBRICATION

## Drive Shaft and Universals

At Axle

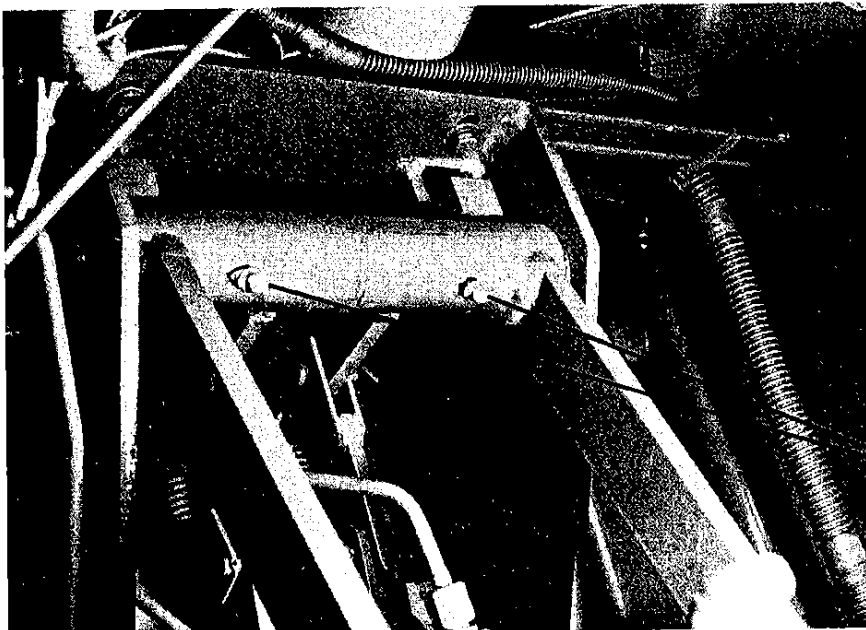
At Transmission



Lubricate these Zerk Fittings Weekly  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

Grease Fittings

## Brake Pedal Pivots



Grease Fittings

# SPECIFICATIONS

MODEL 522

## LUBRICATION SERVICE SCHEDULE

Description	Daily	Weekly	Hours of Operation					
			-	50	100	200	500	1000
Engine Oil	C			*CR	CR			
Engine Oil Filter				*CR	CR			
Fuel Filter							CR	
Transmission Fluid	C			*CR			CR	
Transmission Filter				*CR	*CR		CR	
Hydraulic Reservoir	C							CR
Hydraulic Filter				*CR				CR
Hydraulic Breather						Clean		CR
Air Cleaner Element					Clean			CR
Radiator Coolant					C			CR
Battery						C		
Axle Differential				*CR		C		CR
Planetary Hub				*CR		C		CR
Power Assist Hub				*CR		C		CR
Boom Pivot	Lube							
Hoist Pivot	Lube							
Tilt Cylinder Pivots	Lube							
Carriage Pivot	Lube							
Boom Rollers	Lube							
Steer Axle Pivot	Lube							
Oscillation Pivot	Lube							
Frame Tilt Cyl. Pivots	Lube							
Steer Cylinder Pivots		Lube						
Steer Tie Rod Pivots		Lube						
Steer Spindles		Lube						
Steer Wheel Hubs		Lube						
Brake Pedal Pivots		Lube						
Drive Shaft Universals		Lube						
CR = Change Fluid or Replace Filter C = Check								
						*First Hours of Operation		

The above service intervals are for operation under normal conditions. Under severe conditions service intervals must be shortened accordingly.

## CAPACITIES

Description	Type of Fluid	Capacity
Hydraulic Tank & System	Amoco Rykon MV or Equivalent	42 Gallons
Fuel Tank	Diesel Fuel	37 Gallons
Cooling System	Ethylene Glycol Permanent Coolant	18 Quarts
Transmission	Allison C-3 MIL-L-2104 Grade 10	20 Quarts Drain & Refill 7.5 Quarts
Differential	SAE-90 Mobil Lub 46	9 Quarts
Planetary Hub	SAE-90-API-GL5	1.5 Pints
Power Assist Hub	SAE-90-API-GL5	1 Pint
Engine Crank Case Oil With Filter	See Engine Manual	9 Quarts Min. 11 Quarts Max.

# SPECIFICATIONS

MODEL 622 AND 824

## LUBRICATION SERVICE SCHEDULE

Description	Daily	Weekly	Hours of Operation					
			20	50	100	200	500	1000
Engine Oil	C			*CR	CR			
Engine Oil Filter				*CR	CR			
Fuel Filter							CR	
Transmission Fluid	C		*CR				CR	
Transmission Filter			*CR			*CR	CR	
Hydraulic Reservoir	C							CR
Hydraulic Filter				*CR				CR
Hydraulic Breather						Clean		CR
Air Cleaner Element					Clean			CR
Radiator Coolant					C			CR
Battery						C		
Axle Differential				*CR		C		CR
Planetary Hub				*CR		C		CR
Power Assist Hub				*CR		C		CR
Boom Pivot	Lube							
Hoist Pivot	Lube							
Tilt Cylinder Pivots	Lube							
Carriage Pivot	Lube							
Boom Rollers	Lube							
Steer Axle Pivot	Lube							
Oscillation Pivot	Lube							
Frame Tilt Cyl. Pivots	Lube							
Steer Cylinder Pivots		Lube						
Steer Spindles		Lube						
Steer Tie Rod Pivots		Lube						
Steer Wheel Hubs		Lube						
Brake Pedal Pivots		Lube						
Drive Shaft Universals		Lube						

CR = Change Fluid or Replace Filter  
C = Check

\*First Hours of Operation

The above service intervals are for operation under normal conditions. Under severe conditions service intervals must be shortened accordingly.

## CAPACITIES

Description	Type of Fluid	Capacity
Hydraulic Tank & System	Amoco Rykon MV or Equivalent	45 Gallons
Fuel Tank	Diesel Fuel	40 Gallons
Cooling System	Ethylene Glycol Permanent Coolant	18 Quarts
Transmission	Allison C-3 MIL-L-2104 Grade 10	20 Quarts Drain & Refill 7.5 Quarts
Differential	SAE-90-Mobile Lub 46	9 Quarts
Planetary Hub	SAE-90-API-GL5	1.5 Pints
Power Assist Hub	SAE-90-API-GL5	1 Pint
Engine Crank Case Oil With Filter	See Engine Manual	9 Quarts (622) 15 Quarts (824) 10 Quarts (Deutz)

# SPECIFICATIONS

MODEL 522

TIRE PRESSURE				
TIRES	SIZE	WATER FILL	CALCIUM FILL	PRESSURE
FRONT	16:90 x 24 - 10 Ply	52 GALS.	182 LBS.	28 PSI
REAR	14:00 x 17.5 - 8 Ply	19 GALS.	67 LBS.	60 PSI

ENGINE
Perkins Model 4.236 Inline 4 Cylinder Diesel 236 Cu. In. Displacement 81 H.P. At 2600 RPM High RPM 2600 Low Idle RPM 700

TRANSMISSION
Clark Model HR18000 3 Speed Powershift Transmission With Torque Converter 3 Speeds Forward 3 Speeds Reverse

ELECTRICAL SYSTEM	
Battery 6 Volt - 2 Each Alternator Headlights - 12 Volt Tail/Brake Lights - 12 Volt Front Turn Signals - 12 Volt Rotating Beacon - 12 Volt Work Lights - 12 Volt Fuses	900 AMP (Total) 12 Volt #4913 Seal Beam #1157 Bulb #1156 Bulb #4416 Seal Beam #4913 Seal Beam 30 AMP

# SPECIFICATIONS

MODEL 622

TIRE PRESSURE				
TIRES	SIZE	WATER FILL	CALCIUM FILL	PRESSURE
FRONT	21L x 24 - 12 Ply	74 GALS.	259 LBS.	35 PSI
	18:40 x 24 - 10 Ply	64 GALS.	224 LBS.	35 PSI
REAR	15:00 x 19.5 - 10 Ply	25 GALS.	87 LBS.	70 PSI

ENGINE
John Deere 4239D Inline 4 Cylinder Diesel 239 Cu. In. Displacement 78 H.P. At 2500 RPM High RPM 2500 Low Idle RPM 700

ENGINE
Deutz F4L912 Inline 4 Cylinder Air Cooled Diesel 236 Cu. In. Displacement 70 H.P. At 2400 RPM High RPM 2400 Low Idle RPM 700

TRANSMISSION
Funk Model 4013E4PFA 3 Speed Powershift Transmission With Torque Converter 3 Speeds Forward 3 Speeds Reverse

ELECTRICAL SYSTEM	
Battery 6 Volt - 2 Each Alternator Headlights - 12 Volt Tail/Brake Lights - 12 Volt Front Turn Signals - 12 Volt Rotating Beacon - 12 Volt Work Lights - 12 Volt Fuses	900 AMP (Total) 12 Volt #4913 Seal Beam #1157 Bulb #1156 Bulb #4416 Seal Beam #4913 Seal Beam 30 AMP



# SPECIFICATIONS

## MODEL 824

TIRE PRESSURE				
TIRES	SIZE	WATER FILL	CALCIUM FILL	PRESSURE
FRONT	16:00 x 24 - 12 Ply	59 GALS.	207 LBS.	32 PSI
REAR	15:00 x 19.5 - 10 Ply	25 GALS.	87 LBS.	70 PSI

ENGINE
John Deere 4239T Inline 4 Cylinder Turbocharged Diesel 239 Cu. In. Displacement 109 H.P. At 2500 RPM High RPM 2500 Low Idle RPM 700

TRANSMISSION
Funk Model 4013E4PFA 3 Speed Powershift Transmission With Torque Converter 3 Speeds Forward 3 Speeds Reverse

ELECTRICAL SYSTEM	
Battery 6 Volt - 2 Each Alternator Headlights - 12 Volt Tail/Brake Lights - 12 Volt Front Turn Signals - 12 Volt Rotating Beacon - 12 Volt Work Lights - 12 Volt Fuses	900 AMP (Total) 12 Volt #4913 Seal Beam #1157 Bulb #1156 Bulb #4416 Seal Beam #4913 Seal Beam 30 AMP

# FLUID PRESSURES

## TRANSMISSION PRESSURE

REFER TO TRANSMISSION SERVICE MANUAL

## HYDRAULIC PRESSURE

	522	622	824
BOOM LIFT & EXTEND RELIEF	2600	2900	2900
CARRIAGE TILT VALVE SECTION - UP	2000	2000	2000
CARRIAGE TILT VALVE SECTION - DOWN	2100	2550	2550

## STEERING HYDRAULIC PRESSURE

	522	622	824
AFTER SERIAL NUMBER 101	2000	2000	2000

## BRAKE PRESSURE

	522	622	824
BEFORE SERIAL NUMBER 133		1800	
AFTER SERIAL NUMBER 132		1100	
BEFORE SERIAL NUMBER 348		1100	
AFTER SERIAL NUMBER 347		700	
AFTER SERIAL NUMBER 101	700		800

## DIFFERENTIAL LOCK PRESSURE

	522	622	824
AFTER SERIAL NUMBER 101	275		275
AFTER SERIAL NUMBER 348		275	

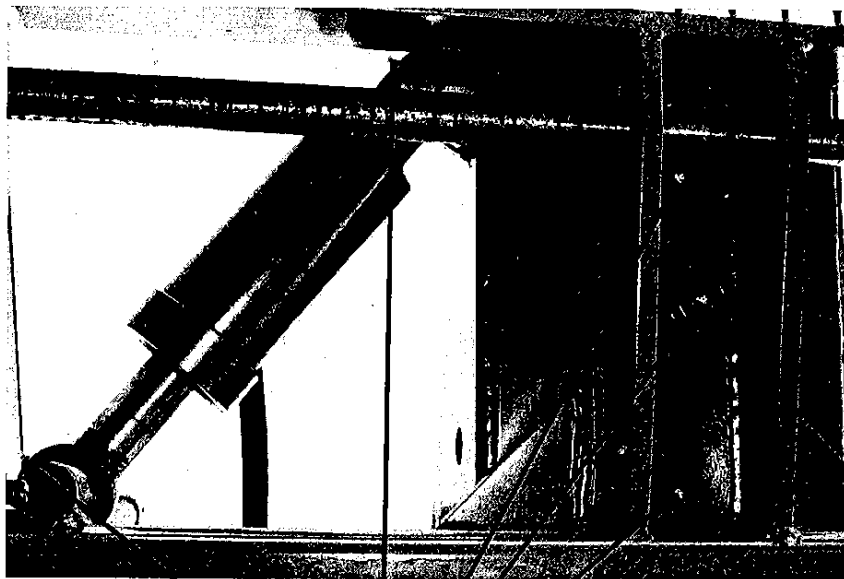
# OPTIONS

## OPTIONAL EQUIPMENT

- |                              |  |
|------------------------------|--|
| 1. 74" Carriage              | 8. Concrete Hopper 1/2 Yd. or 3/4 Yd.  |
| 2. 50" Tilt Carriage         | 9. Utility Bucket                      |
| 3. 74" Tilt Carriage         | 10. Roadway Light Package              |
| 4. Fork Positioning Carriage | 11. Worklights                         |
| 5. Forks                     | 12. Spotlight                          |
| 6. 10 Ft. Truss Boom         | 13. Boom Lights                        |
| 7. Hydraulic Winch           | 14. Rear Drive Power Assist (522, 622) |

The Following Options Require Lubrication

Tilt Carriage



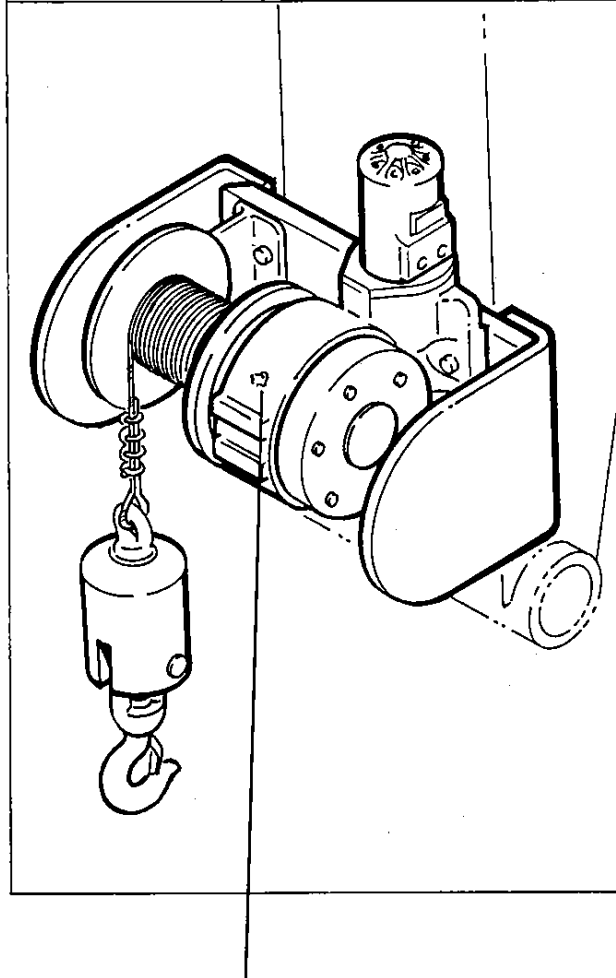
Grease Fittings

Lubricate these Zerk Fittings Daily  
With Multi-Purpose Lithium Grease  
(Under Dusty or Severe Operation -  
Service At Half Intervals)

# OPTIONS

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Winch



## Fluid Fill And Level

Change oil after approx. 50 hours operation and at 1000 hour intervals thereafter.

Maintain level using SAE grade 90 gear oil.

## NOTES

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## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



# TRANSFER OF OWNERSHIP

**To: JLG, Gradall, Lull and Sky Trak product owner:**

If you now own, but ARE NOT the original purchaser of the product covered by this manual, we would like to know who you are. For the purpose of receiving safety-related bulletins, it is very important to keep JLG Industries, Inc. updated with the current ownership of all JLG products. JLG maintains owner information for each JLG product and uses this information in cases where owner notification is necessary.

Please use this form to provide JLG with updated information with regard to the current ownership of JLG Products. Please return completed form to the JLG Product Safety & Reliability Department via facsimile (717) 485-6573 or mail to address as specified on the back of this form.

Thank you,  
Product Safety & Reliability Department  
**JLG Industries, Inc.**  
1 JLG Drive  
McConnellsburg, PA 17233-9533  
Telephone: (717) 485-5161  
Fax: (717) 485-6573

**NOTE:** Leased or rented units should not be included on this form.

Mfg. Model: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Previous Owner: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Zip: \_\_\_\_\_ Telephone: ( \_\_\_\_\_ ) \_\_\_\_\_

Date Of Transfer: \_\_\_\_\_

Current Owner: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Zip: \_\_\_\_\_ Telephone: ( \_\_\_\_\_ ) \_\_\_\_\_

Who in your organization should we notify?

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Please cut on the dotted line and fax to 717-485-6573











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