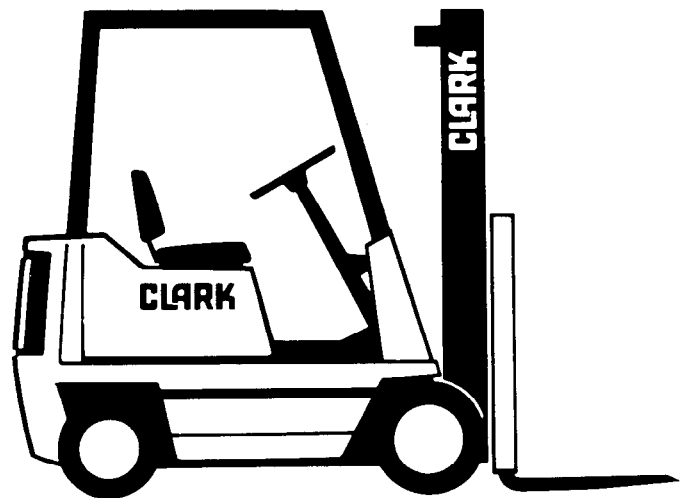


Planned Maintenance & Adjustment Procedures



PMA 273 10th Rev.
C500 355

OWNER SAFE MAINTENANCE PRACTICES

Powered industrial trucks may become hazardous if adequate maintenance is not done. Therefore, maintenance facilities, personnel and procedures must be provided.

Maintenance and inspection of all powered industrial trucks should be done in agreement with the recommendation in this manual and the following practices.


1. A scheduled preventive maintenance, lubrication, and inspection system must be followed.
 2. Only qualified and authorized personnel should be permitted to maintain, repair, adjust, and inspect industrial trucks.
 3. Before Leaving The Truck:
 - A. Stop Truck.
 - B. Fully lower the load engaging means.
 - C. Put directional controls in neutral.
 - D. Apply the parking brake.
 - E. Stop the engine or turn off power.
 - F. Lock the control or ignition circuit.
 - G. Put blocks at the wheels if truck is on a ramp, or being worked on.
 4. Before Working On Truck:
 - A. Raise wheels free of floor or disconnect power source.
 - B. Use blocks or other positive truck positioning devices.
 - C. Put blocks under the load engaging means, innermast(s), or chassis before working under them.
- Before working on engine fuel system of gasoline powered trucks with gravity feed fuel systems, make sure fuel shutoff valve is closed.
- Before working on engine fuel system of LP gas powered trucks, close LP gas cylinder valve and run engine until there is no more fuel in the system and engine stops running.
- Operation to check performance of the truck or attachments must be done in a clear, authorized, safe area.
5. Before Starting To Operate The Truck:
 - A. Be in operating position.
 - B. Push clutch (or brake pedal on automatic transmission and electric trucks).
 - C. Put the directional controls in neutral.
 - D. Start engine or turn on power.
 - E. Before operating truck, check functioning of lift and tilt systems, directional and speed controls, steering, warning devices, brakes, and any attachment. (If used)
 - F. Release parking brake.

OWNER SAFE MAINTENANCE PRACTICES (CONT.)


6. Avoid fire hazards and have fire protection equipment available. Do not use an open flame to check level, or for leakage, of fuel, electrolyte or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.
7. Provide ventilation to the work area, vent exhaust fumes, and keep shop clean and floor dry.
8. Handle LP gas cylinders with care. Do not drop, dent, or damage in any way.
9. Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, lift overload devices, guards and safety devices must be inspected regularly and maintained in a safe operating condition.
10. All parts of lift and tilt mechanisms and frame members must be carefully and regularly inspected and maintained in a safe operating condition.
11. Special trucks or devices designed and approved for hazardous area operation must receive special attention to make sure that maintenance keeps the original, approved safe operating features.
12. Fuel systems must be checked for leaks and condition of parts. Extra special consideration must be given in the case of a leak in the fuel system. Action must be taken to prevent the use of the truck until the leak has been corrected.
13. All hydraulic systems must be regularly inspected and maintained in conformance with good practice. Tilt cylinders, valves, and other like parts must be checked to make sure that "drift" has not developed to the extent that it would create a hazard.
14. Capacity, operation and maintenance instructions plates, tags, or decals must be maintained in legible condition.
15. Batteries, motors, controllers, limit switches, protective devices, electrical conductors and connections must be inspected and maintained in conformance with good practice. Special attention must be paid to the condition of electrical insulation.
16. Industrial trucks must be kept in a clean condition to minimize fire hazards and help in the detection of loose or defective parts.
17. Modifications and additions which affect capacity and safe truck operation must not be done by the customer or user without manufacturers prior written approval. Capacity, operation and maintenance instruction plates, tags or decals must be changed accordingly.
18. Care must be taken to make sure that all replacement parts are interchangeable with the original parts and of a quality equal to that provided in the original equipment.


SAFETY MESSAGES

PLEASE READ AND UNDERSTAND THE SAFETY MESSAGES
SHOWN BELOW BEFORE YOU DO ANY WORK ON A LIFT TRUCK

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

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

 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.

 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.

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


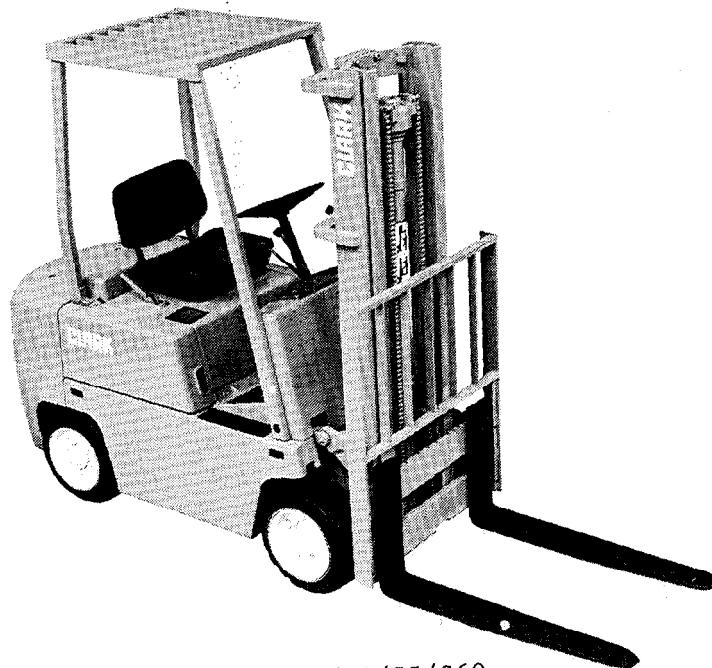
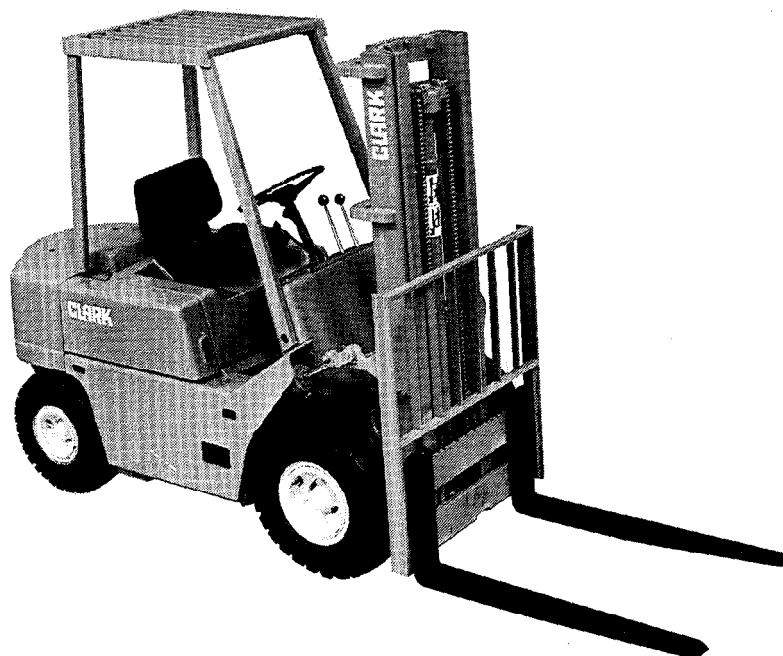
 WARNING
HYDRAULIC FLUID PRESSURE
DO NOT USE YOUR HANDS TO CHECK FOR HYDRAULIC LEAKAGE. FLUID UNDER PRESSURE CAN PENETRATE YOUR SKIN AND CAUSE SERIOUS INJURY.

ILLUSTRATION OF MACHINE



C500 35/40/45/60/55/S60
C500 H30/H40/H50



C500 Y40/Y45/Y50/Y55/SY60
C500 HY40/HY50



INDUSTRIAL TRUCK DIVISION



CUSTOMER SERVICES ENGINEERING DEPARTMENT, BATTLE CREEK

F O R E W O R D

PLANNED MAINTENANCE SECTION

The Planned Maintenance Procedures located in the front of this book provide a basic step by step guide which should be followed in servicing the vehicle. Adjustment Procedures, specifications and other data including lubrication guides, are found in the rear of this book and are listed under GROUP and Section Numbers. Refer to the Index or the Product Identification Card.

About Planned Maintenance

Planned Maintenance is a program in which inspections, minor adjustments, lubrication, oil changes and replacement of filters are performed on a scheduled and systematic basis. A solid PM program should incorporate a method of record keeping which enables you to better determine PM schedules and enables you to track the maintenance costs per machine.

An effective PM program should incorporate two basic phases:

1. An inspection performed by the driver or maintenance man at the beginning of each shift. This is a quick visual check for obvious damage and leaks ... a check of engine oil and water levels, lights, instruments and warning devices.

2. THE PLANNED MAINTENANCE ROUTINE IS BASED ON 50 TO 250 OPERATING HOURS ... WITH THE INTERVAL BEING DETERMINED BY OPERATING CONDITIONS.

Records will tell you how often PM should be done. If an operation is clean and not punishing, a PM interval can be extended. If an operation is extremely dirty and punishing, the PM interval may have to be reduced. Thus ... the PM interval can be tailored to answer the needs of your operation.

If the PM is religiously followed, needs for repair, major adjustment and component replacement will be discovered automatically and such work will be done only as needed. For

instance, brake checks which are part of the PM will uncover the need for adjustments and/or repairs which may be required periodically. Who can say? The point is that this will be done only when needed and that's true for all systems and components. Thus, in this program we are able to eliminate 500, 1000 and 2000 hour inspections and the things normally covered in these inspections will be done only when the PM uncovers the need for repairs.

The objectives of PM are:

1. To reduce costly unscheduled downtime.
2. Reduce maintenance costs.
3. Increase vehicle productivity.
4. Above all, to increase personal safety of drivers and other personnel.

Inspection Forms

To insure that the daily inspection and PM are properly performed, we recommend the use of the inspection forms in GROUP 40. Such forms not only provide a guide for the inspections and procedures, but serve as a record in tracking maintenance requirements for each vehicle. Moreover, they will assist you in determining when to schedule a vehicle for major repairs which can be done without the disruptive effect of unscheduled downtime.

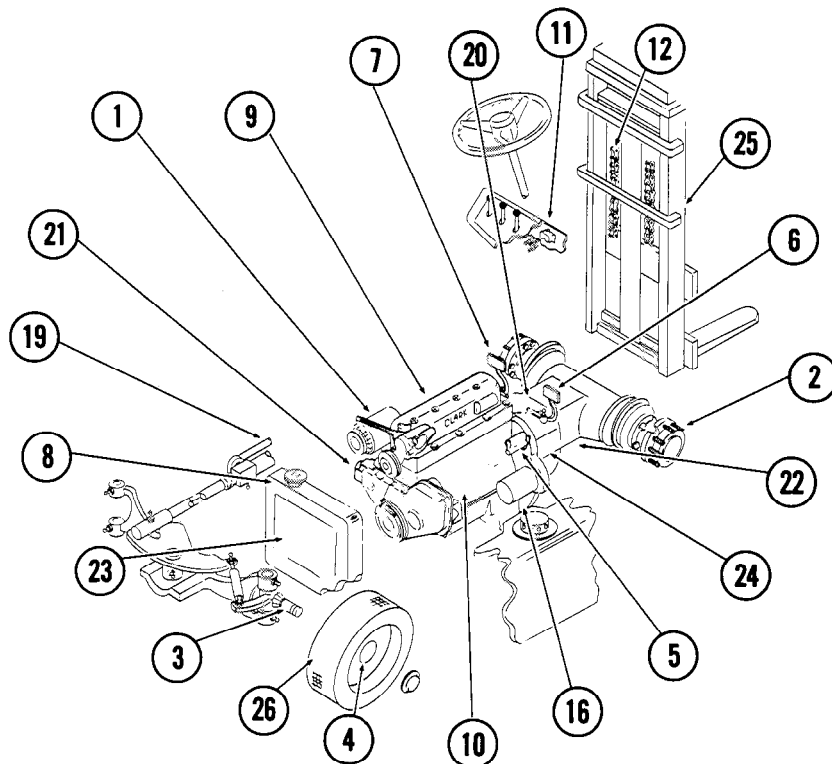
Inspection Forms may be purchased from your local CLARK Dealer.

SPECIAL NOTICE TO ALL USERS OF THIS MANUAL.

IF ... in the process of using this manual for PM procedures, adjustments, references, etc ... you find that this manual can be improved in any way, put your ideas in writing and send them to:

CUSTOMER SERVICES ENGINEERING
CLARK EQUIPMENT COMPANY
BATTLE CREEK, MICHIGAN (49016)

We can't promise that your idea will be used, but it will be seriously considered. If you do submit any such ideas, please understand that Clark Equipment Company can use it without obligation.



- | | | | |
|---|---------------------|---|------------------------|
| 1. Alternator Maintenance | GROUP 12, Section 1 | 14. Driver Restraint System Checks ... | GROUP 39, Section 1 |
| 2. Axle End Lubrication | GROUP 20, Section 1 | 15. Name Plates & Machine Stampings ... | GROUP 40, Section 1 |
| 3. Bearings (Steer Wheel)..... | GROUP 26, Section 3 | 16. Parking Brake Adjustment | GROUP 23, Section 4 |
| 4. Brake Adjusters (Service) | GROUP 23, Section 3 | 17. PM Inspection & Drivers Daily | Inspection Forms |
| 5. Brake Bleeding | GROUP 23, Section 1 | | GROUP 40, Section 3 |
| 6. Brake Pedal Adjustment | GROUP 23, Section 2 | 18. Specifications | GROUP 40, Section 2 |
| 7. Clutch Adjustment | GROUP 04, Section 1 | 19. Steering Adjustments | GROUP 26, Section 2 |
| 8. Cooling System Maintenance | GROUP 01, Section 2 | 20. Steering Gear Adjustment | GROUP 25, Section 1 |
| 9. Fuel Pump Tests | GROUP 02, Section 2 | 21. Steering Pressure Check | GROUP 26, Section 1 |
| 10. Governor Adjustment | GROUP 02, Section 1 | 22. Transmission Fluid Aeration | GROUP 06, Section 2 |
| 11. Hydraulic System Pressure Check ... | GROUP 30, Section 1 | 23. Transmission Fluid Cooling | GROUP 06, Section 3 |
| 12. Lift Chains | GROUP 34, Section 2 | 24. Transmission Pressure Checks | GROUP 06, Section 1 |
| 13. Lubrication Charts | GROUP 01, Section 1 | 25. Upright Adjustment | GROUP 34, Section 1 |
| 14. Lubrication Key | GROUP 40, Section 4 | 26. Wheels & Tires | GROUP 22, Section 1 |



INDUSTRIAL TRUCK DIVISION



SERVICE ENGINEERING DEPARTMENT, BATTLE CREEK

ABOUT PM

A special coding system on the PM check sheet allows the PM man to efficiently report truck condition, with a minimum number of words. As the PM is performed, a check is made on the check sheet indicating truck condition regarding a potential problem, or needs urgent repair. Whenever a system or component is faulty or unsafe, it must be noted on the PM check sheet, and reported to the designated authority at the conclusion of the PM.

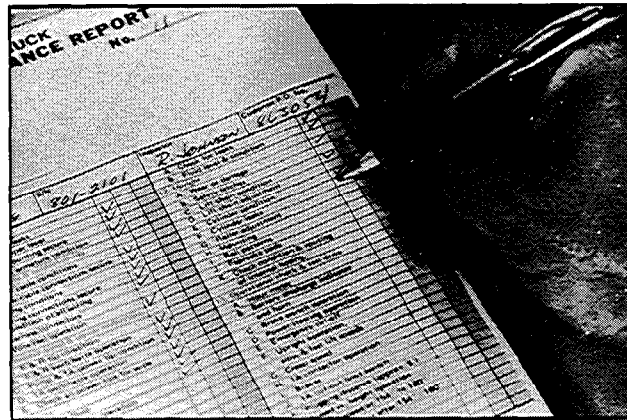


Fig. 12618

What should a PM include? The best answer is to go through a PM based on the knowledge and experience of PM men, service managers, engineers and customer services engineering personnel.

What should a P. M. include ?

P.M. OBJECTIVES? To reduce costly unscheduled downtime, reduce maintenance costs, increase truck productivity, and ... above all ... to increase personal safety of drivers and other personnel. These worthwhile ends can be met only through sensible, consistent measures which include ...

1. Complete inspection to uncover minor or potential trouble before it becomes major.
2. Air cleaning and lubricating the machine to reduce dirt damage and excessive wear.
3. Making adjustments to assure proper and safe functioning of systems and components.

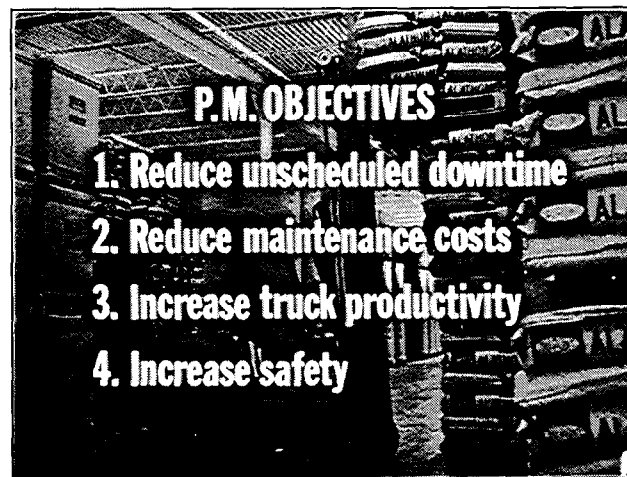


Fig. 10889

Make a quick visual check of the truck. Look for signs of obvious and heavy leaks.

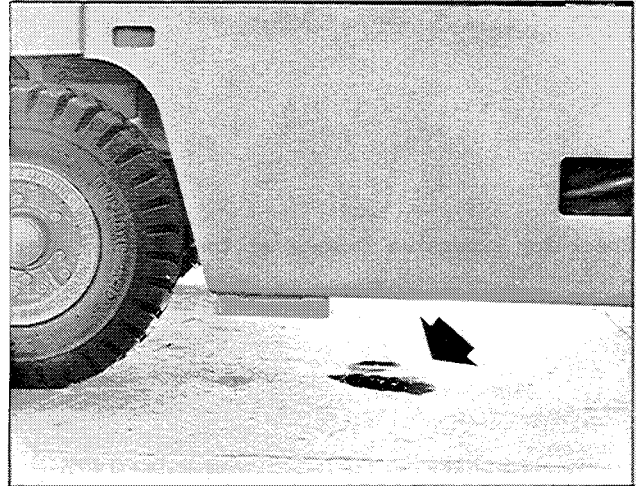


Fig. 12141

Check mounting and condition of the driver's overhead guard.

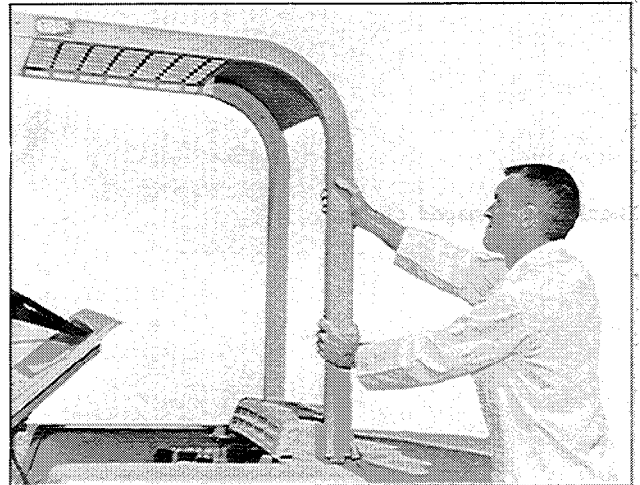


Fig. 12142

Check the condition of the load back rest.

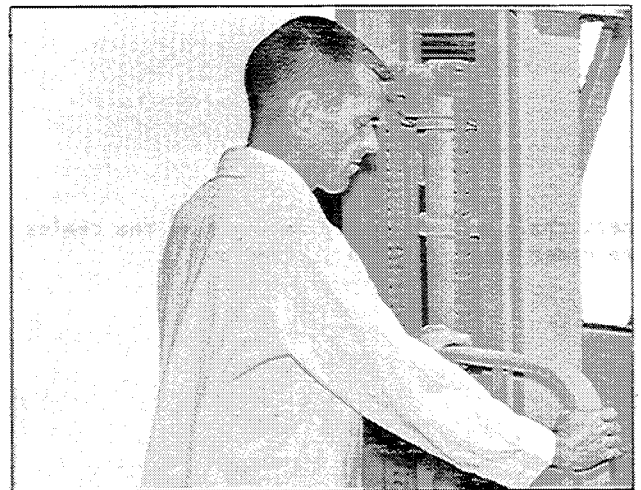


Fig. 12143

Check for excessive leakage at the lift cylinder.

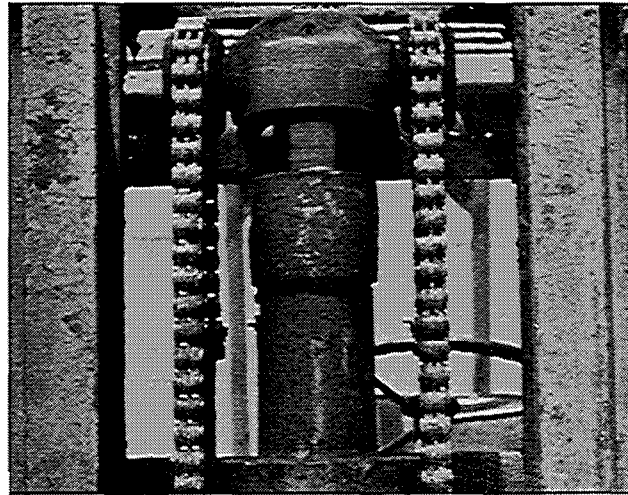


Fig. 12144

Check for damaged chains.

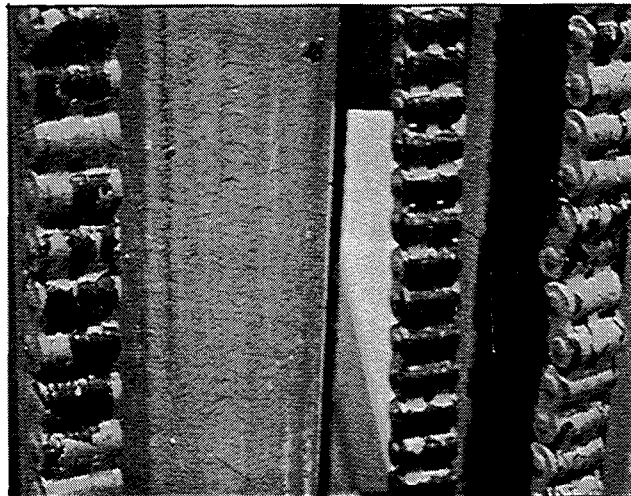


Fig. 12145

Check chain adjustment by making sure the chains are under equal tension ... and by ...

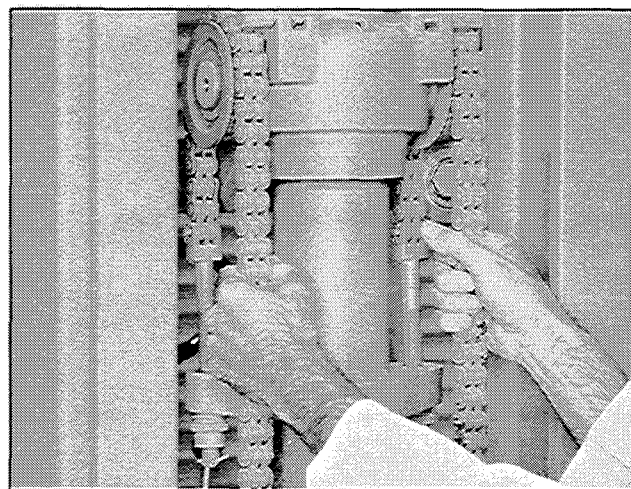


Fig. 12146

... checking wear patterns in the rails. A wear pattern like this indicates that chain adjustment is about right. But ...

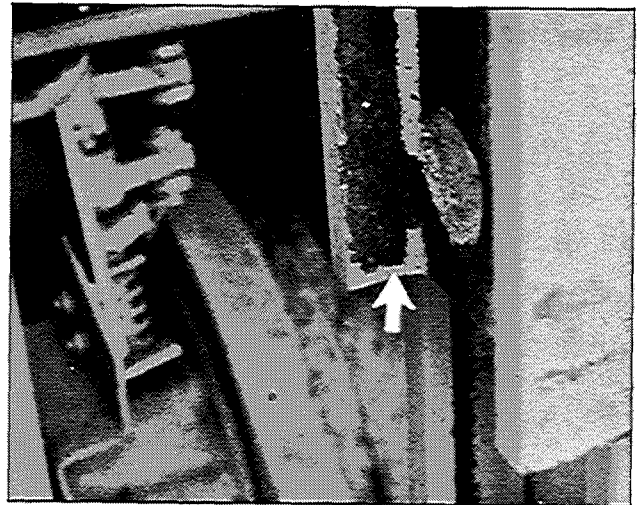


Fig. 12147

... a wear pattern like this means that the chains are too long and must be adjusted to correct length.

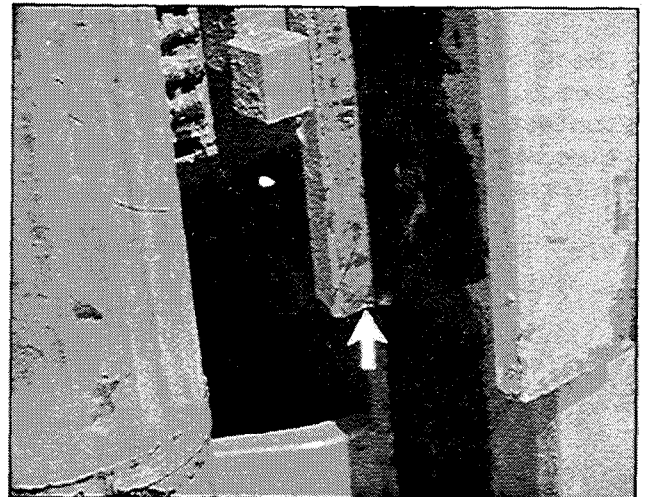


Fig. 12148

Check the forks to make sure they are not bent or broken.

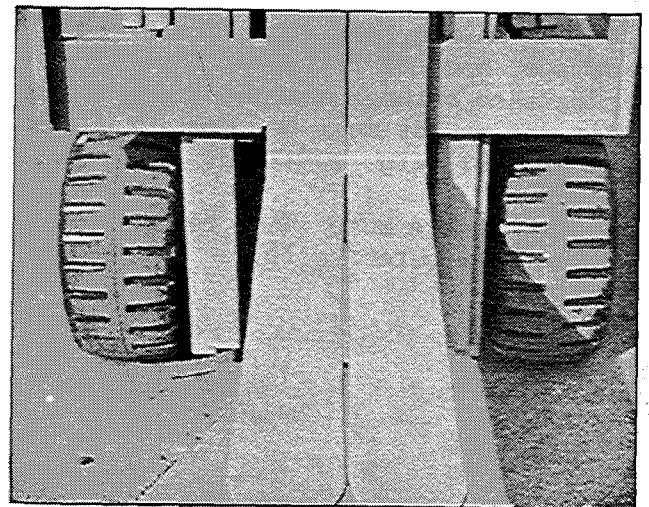


Fig. 12149

Check the fork latches to make sure they work properly.

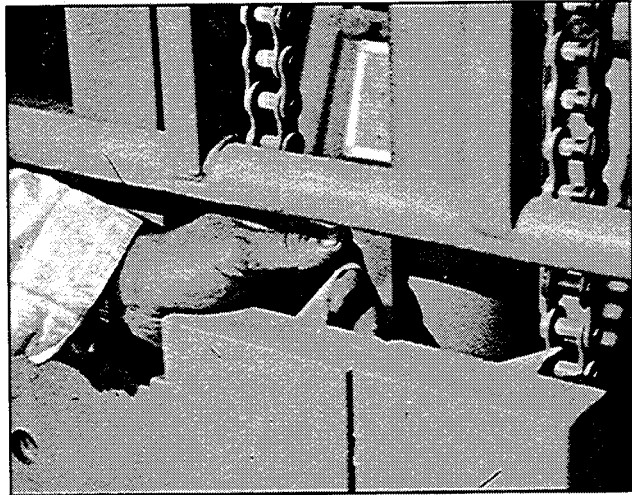


Fig. 12150

Standard Uprights: Deck Numbers beginning with an 'F'.

Check the Fabreeka (Stop) Pads for damage, and check to make sure the pads contact the rail tie bar at the same time when lowering inner slide.
Reference: Fig. 10910.

With innerslide fully lowered, both stop blocks must contact rail tie bar.

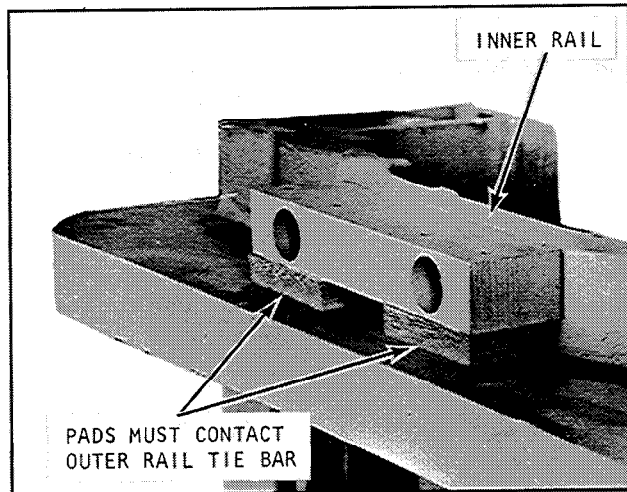


Fig. 10910

Full Free Lift Uprights: Deck Numbers beginning with an 'M'.

Check the Fabreeka (Stop) Pads for damage, and see if there is some clearance between bottom of pad/s and tie bar. Pads must not contact tie bar.
Reference: Fig. 10911.

Check to make sure inner rails are not lower than outer rails.

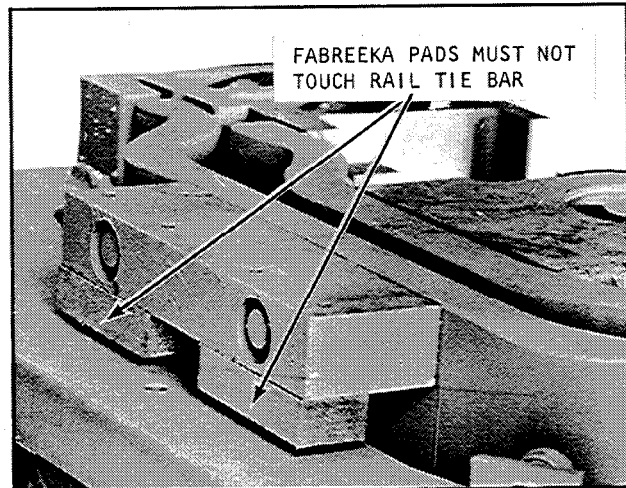


Fig. 10911

Check tires for excessive wear and cuts and pry out of tire treads any objects which could damage the tires. Also check wheel lug nuts for tightness and make sure none are missing.

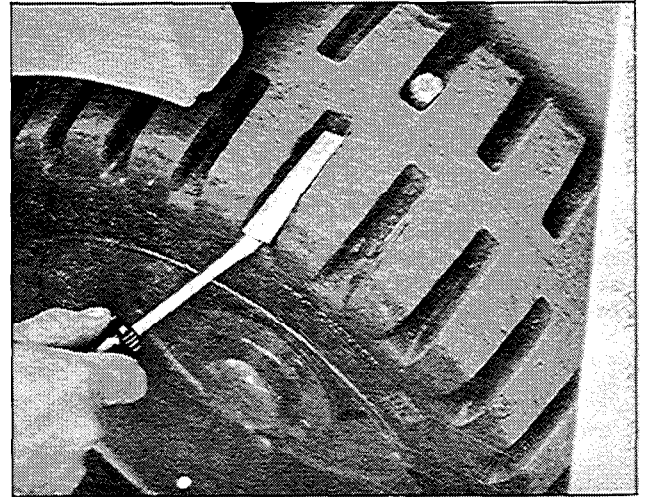


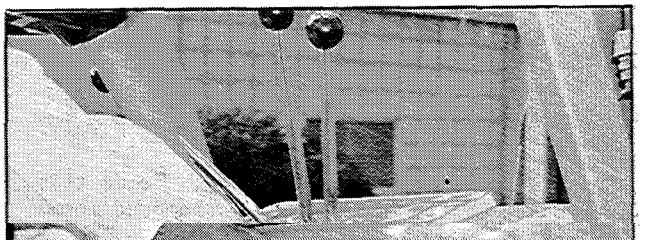
Fig. 12151

Now ... check the brake pedal for free play and the brake pedal pad for excessive wear.



Fig. 12152

Reverse. The engine should not start with the



... check the neutral starting switch after the floorboard is removed. At that time, make sure the wires are spread as shown. If the engine still starts in gear, the switch must be adjusted or replaced.

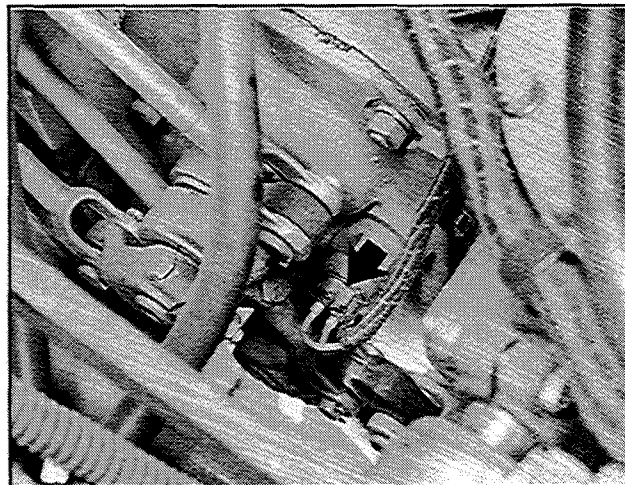


Fig. 12154

Next ... check inching. To do this ... start the engine, engage the transmission, accelerate, and depress the brake pedal until the transmission disengages. While still accelerating, release the pedal slowly. The truck should inch smoothly as the pedal is released. Also check the pedal for sponginess and to make sure it doesn't hit the floorboard.

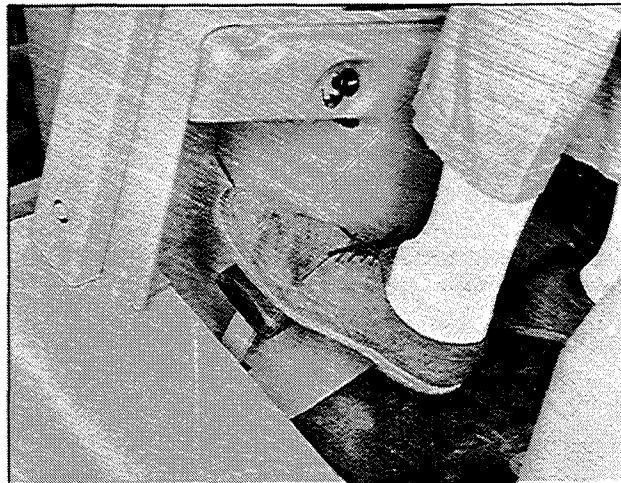


Fig. 12155

Now ... check the power steering. To do this, drive slowly forward and cramp the hand wheel full right and left ... to reduce tire wind-up and to neutralize the power steering booster valve.

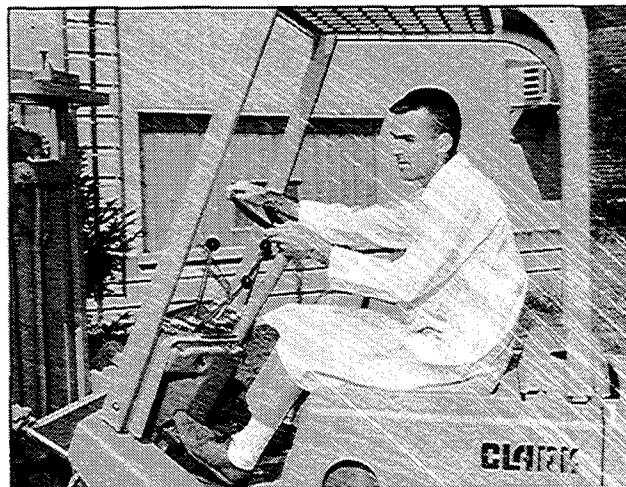


Fig. 12156

Then ... check drive tire inside turning diameters which should be about equal in forward left and right turns. While driving, listen for unusual drive train noise. Next ...

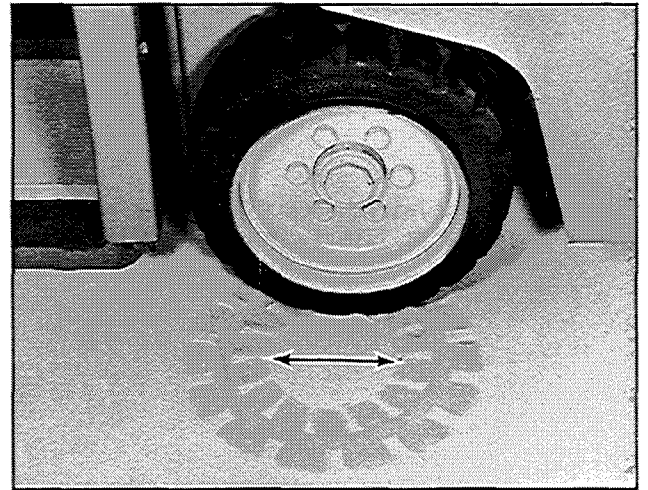


Fig. 11459

... cramp the hand wheel very hard to left and right ... with engine idling and truck not moving. The engine should not lug down. If it does, power steering adjustment is indicated.



Fig. 12158

Now ... check for upright free play and racking by tilting the upright fore and aft with the forks fully raised. If there is excessive free play between rails and channels, upright adjustment is required. If there is racking, adjustment of cylinder rod yokes is required.

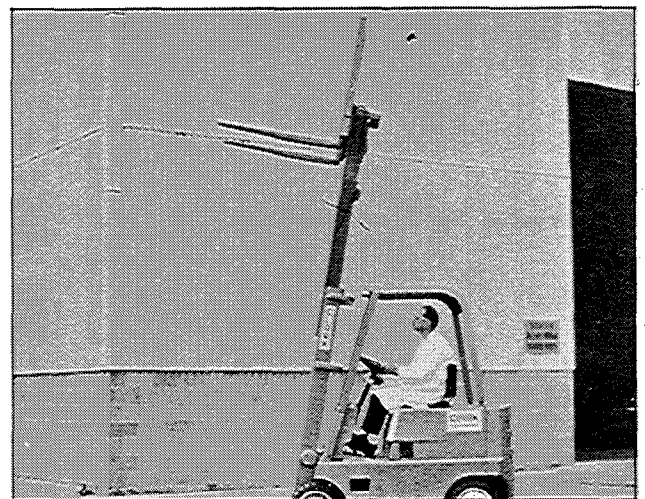


Fig. 12159

Next ... check instruments, horn, head and tail lights, indicator lights, and warning lights.

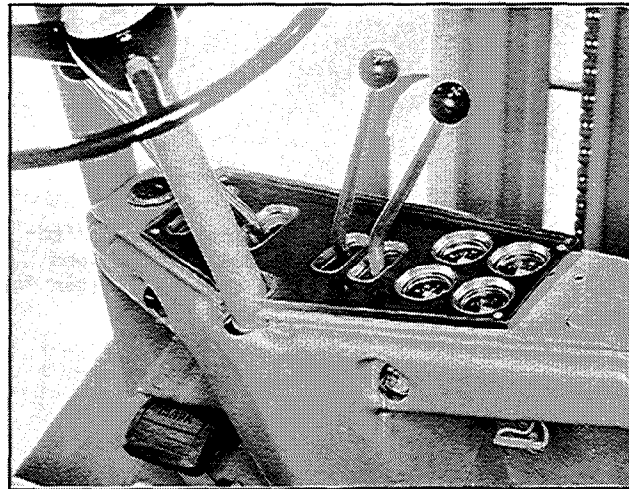


Fig. 12160

Now ... remove the side hoods ...

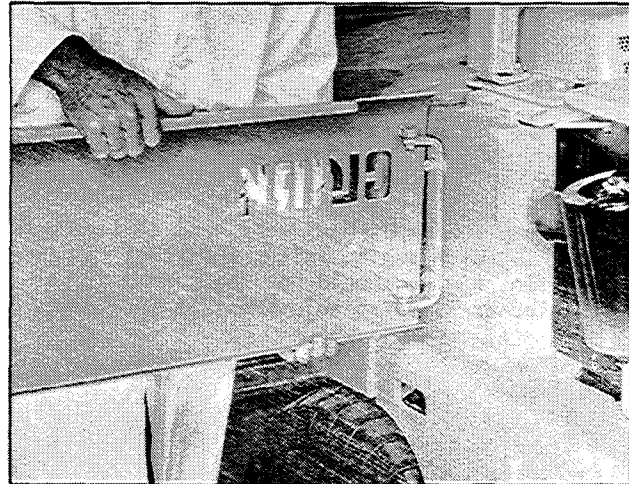


Fig. 12161

... remove the floor board and ...



Expose the engine compartment by lifting the seat and swinging the battery out.

**W A R N I N G**

DO NOT WELD IN THE VICINITY OF THE FUEL TANK TO AVOID AN EXPLOSION AND PERSONAL INJURY.

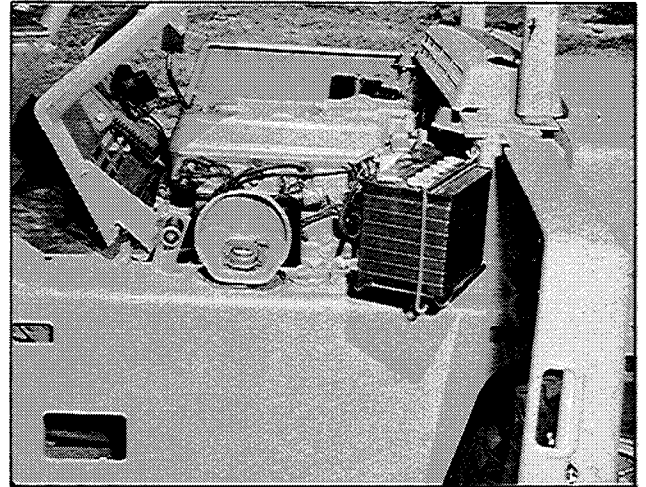


Fig. 12163

Use a two-foot extension on the air hose and clean the radiator from the counterweight side.

**W A R N I N G**

DO NOT USE AIR PRESSURE GREATER THAN 30 PSI. WEAR GOGGLES WHEN CLEANING WITH AIR PRESSURE TO PROTECT YOUR EYES.

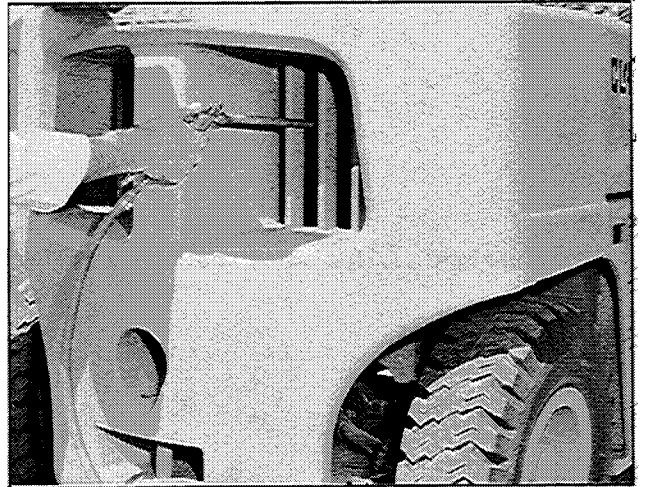


Fig. 12164

Clean the radiator from the engine side.
Clean the engine.

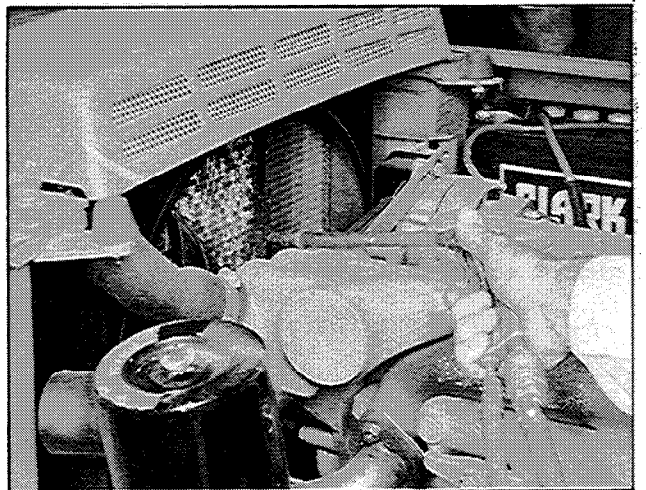


Fig. 12165

... the transmission and drive axle and ...



Fig. 12166

... the upright ... including chains and rollers.

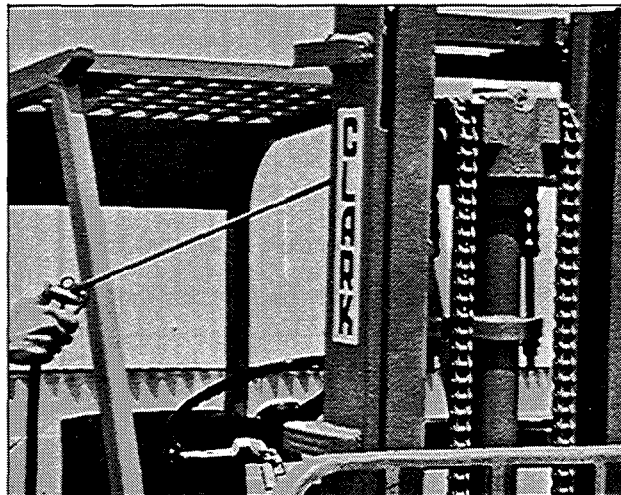


Fig. 12167

If the upright has a compound cylinder, air clean the tops of the outer cylinders.

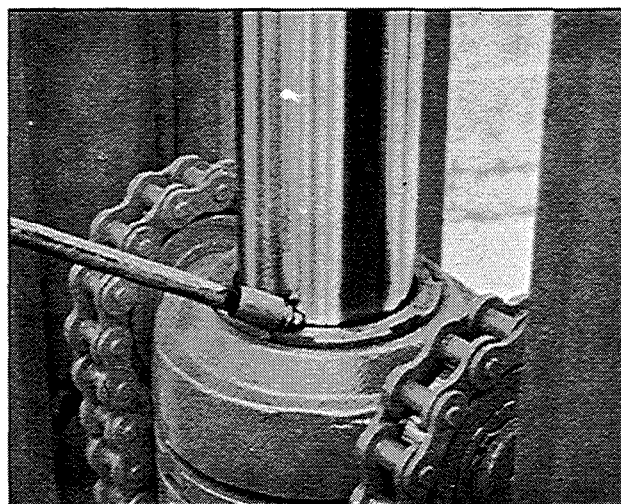


Fig. 12168

Check the oil level to see whether it is too high or too low. Check the condition of the oil to see if it needs to be changed.

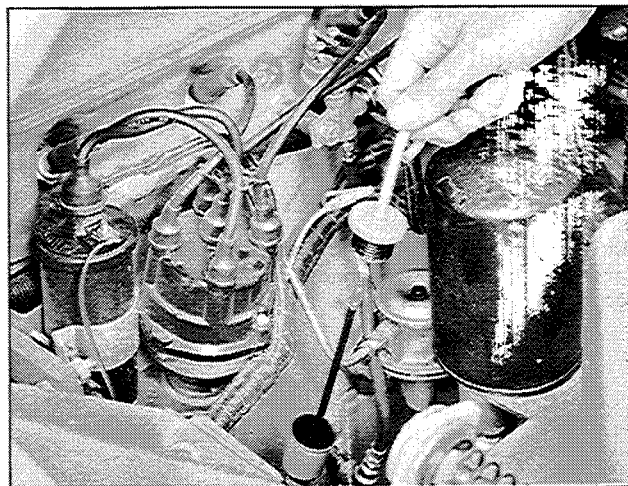


Fig. 12169

If so, jack up the truck and block it under the frame.

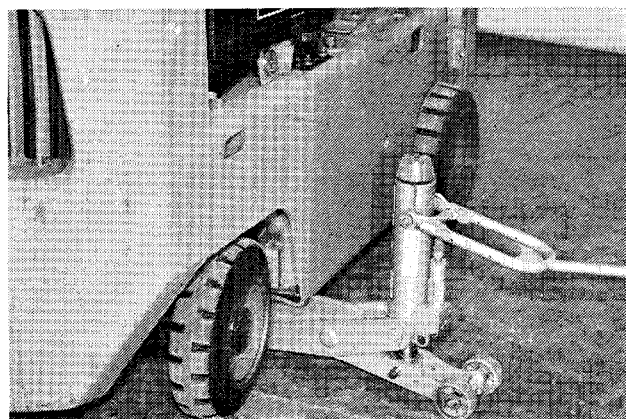


Fig. 21569

Put a shallow pan under the truck. Remove the crankcase drain plug and drain the engine oil.

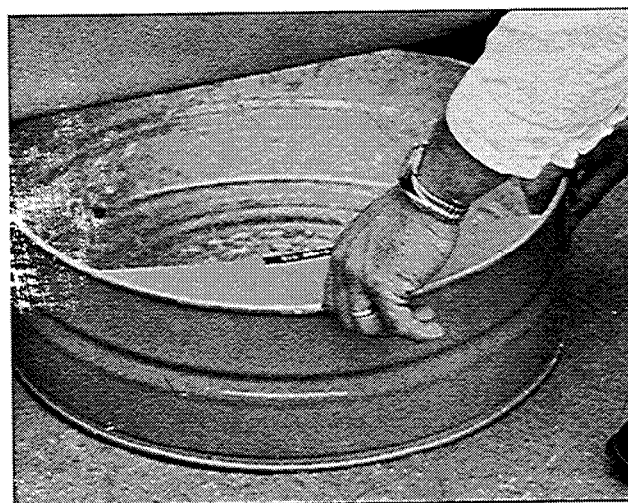


Fig. 12171



INDUSTRIAL TRUCK DIVISION



SERVICE ENGINEERING DEPARTMENT, BATTLE CREEK

While the oil drains, clean and lubricate all grease fittings ... checking for leaks as you go. When you lubricate the steer wheels ...

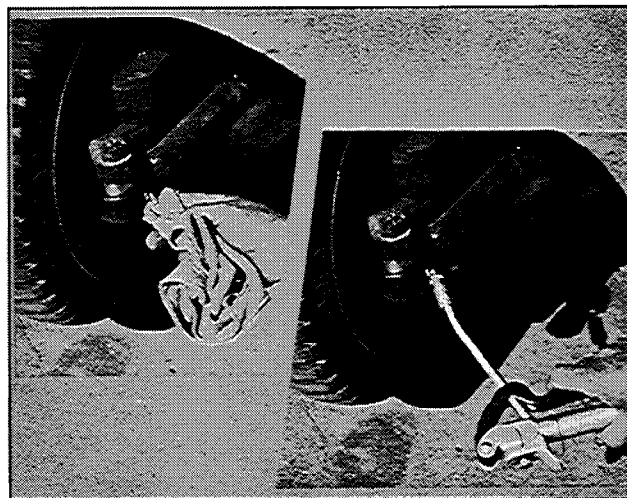


Fig. 12172

... check for loose wheel bearings ... by trying to rock the wheels.

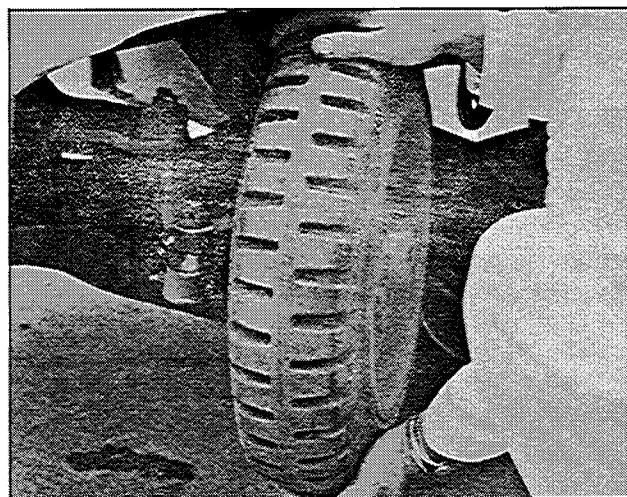


Fig. 12173

Lubricate the free lift guides with chassis lubricant. In dirty and abrasive operations, use a dry type lubricant.

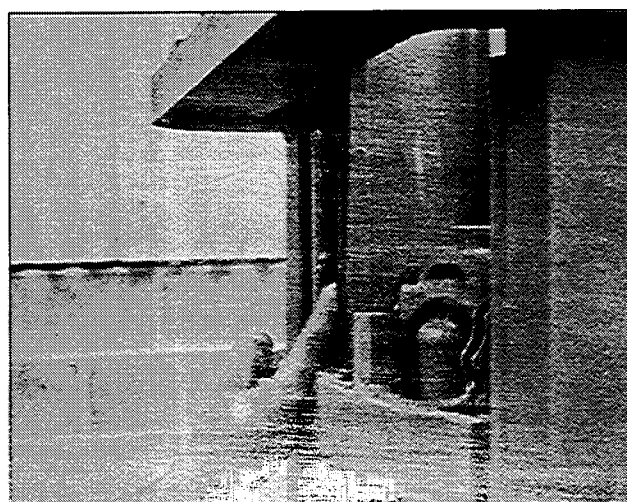


Fig. 12174