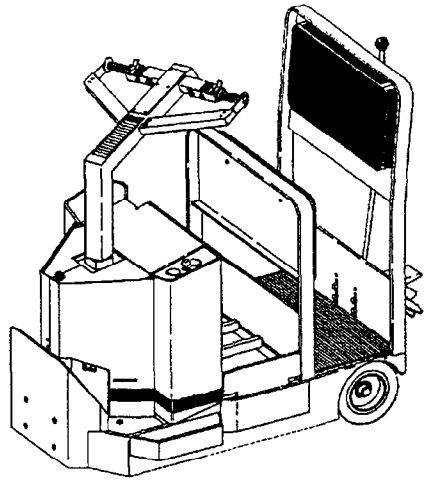
# Service Manual



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**PT5, PT7,**
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# INDEX
## PT-5 & PT-7 and PTT-5 & PTT-7

# FOREWORD

Clark Equipment Company welcomes you to the growing group of professional people who own, operate and maintain Clark lift trucks. This manual will familiarize you with service maintenance and overhaul information about your new truck. It has been especially prepared to help you maintain your Clark lift truck in an efficient and safe operating condition.

Regular, correct maintenance and care of your lift truck is not only important for full and efficient truck life; it is essential for your safety. A faulty lift truck is a potential source of danger to the operator, and to other personnel working near it. The importance of maintaining your lift truck in a safe operating condition by servicing it regularly and, when necessary, repairing it promptly cannot be emphasized too strongly.

To assist you in keeping your lift truck in good operating condition, this manual includes an outline of planned maintenance (PM) procedures that are considered essential to the life and safe performance of your truck. Brief procedures for inspections, operational checks, cleaning, lubrication, and adjustments are included for your reference.

Clark recommends that a planned maintenance and safety inspection program (PM) be performed by a trained and authorized mechanic on a regular basis. The PM program provides the opportunity to make thorough inspections and checks on the safe condition of your truck. Necessary adjustments and repairs can be done during the PM, which will increase the life of components and reduce unscheduled downtime. The need for major adjustments, repairs, or replacements is found and corrections made as required; not after failure has occurred.

# SAFETY SIGNS AND SAFETY MESSAGES

Improper or careless techniques cause accidents. Don't take chances with incorrect or damaged equipment. Read and understand the procedures for safe operation and maintenance outlined in this manual.

STAY ALERT! Follow safety rules, regulations and procedures. Accidents can be avoided by recognizing dangerous procedures or situations before they occur.

DRIVE AND WORK SAFELY and follow the safety signs and their messages displayed on the truck and in this manual.

SAFETY SIGNS and MESSAGES are placed in this manual and also on the lift truck to provide instructions and to identify specific areas where potential hazards exist and special precautions should be taken. Be sure you know and understand the meaning of these instructions, signs and messages. Damage to the truck or death or serious injury to you or other persons may result if these messages are not followed.

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

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

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

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

**DANGER** This message is used when an extreme hazard exists which will result in death or serious injury if proper precautions are not taken.

# USER SAFE MAINTENANCE PRACTICES

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

**1.** Powered industrial trucks can become hazardous if maintenance is neglected. Therefore, suitable maintenance facilities, trained personnel, and procedures must be provided.

**2.** Maintenance and inspection of all powered industrial trucks shall be done in conformance with the manufacturer's recommendations.

**3.** A scheduled planned maintenance, lubrication, and inspection program shall be followed.

**4.** Only trained and authorized personnel shall be permitted to maintain, repair, adjust, and inspect industrial trucks, and in accordance with the manufacturer's specifications.

**5.** Properly ventilate work area, vent exhaust fumes, and keep shop clean and floor dry.

**6.** Avoid fire hazards and have fire protection equipment present in the work area. Do not use an open flame to check for level, or leakage of fuel, electrolyte, or coolant. Do not use open pans of fuel or flammable cleaning fluids for cleaning parts.

**7.** Before Starting Work On Truck:

a) Raise drive wheels off of floor or disconnect power source and use blocks or other positive truck-positioning devices.
b) Put blocks under the load engaging means, innermast(s), or chassis before working on them.
c) Disconnect battery before working on the electrical system.

**8.** Operation of the truck to check performance must be conducted in an authorized, safe, clear area.

**9.** Before Starting To Drive Truck:

a) Be in operating position.
b) Disengage clutch on manual transmissions, or apply brake on trucks with powershift transmission and electric trucks.
c) Put directional control in neutral.
d) Start engine or turn on power.
e) Check functioning of lift and tilt systems, directional and speed controls, steering, brakes, warning devices, and any load handling attachments.

**10.** Before Leaving The Truck:

a) Stop truck.
b) Put directional control in neutral.
c) Apply the parking brake.
d) Stop the engine or turn off power.
e) Turn off the control or ignition circuit.
f) Put blocks at the wheels, if truck is on an incline.

**11.** Brakes, steering mechanisms, control mechanisms, warning devices, lights, guards and safety devices, and frame members must be carefully and regularly inspected and maintained in a safe operating condition.

**12.** Special trucks or devices designed and approved for hazardous area operation must receive special attention to ensure that maintenance preserves the original, approved safe operating features.

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

**14.** 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.

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

# USER SAFE MAINTENANCE PRACTICES

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

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

**19.** When removing tires, follow industry safety practices.

**20.** Use special care when removing heavy components from the truck. Be sure that lifting and handling equipment is of the correct capacity and in good condition.

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

ANSI/ASME B56.1 - 1983: Safety Standard for Low Lift and High Lift Trucks (Safety Code For Powered Industrial Trucks). Published by: Society of Mechanical Engineers, United Engineering Center, 345 E. 47th Street, New York, N.Y. 10017.

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

General Industry Standards, OSHA 2206: OSHA Safety and Health Standards (29 CFR 1910), Subpart N-Materials Handling and Storage, Section 1910.178 Powered Industrial Trucks. For sale by: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C 20402.

# PM - PLANNED MAINTENANCE PROGRAM

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

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

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

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

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

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

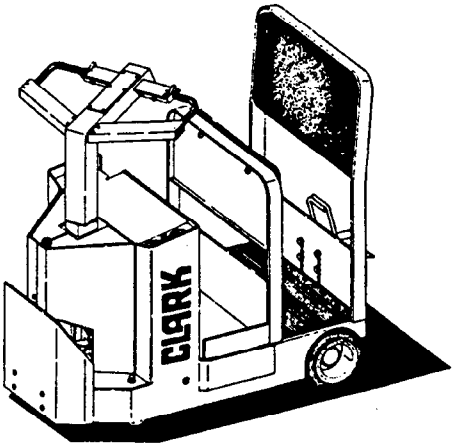
Always wear safety glasses when making repairs.

**Be sure to:**
Make a record of all maintenance and operating problems you find.

Write the hour meter reading on the PM report form.

## HOW TO PERFORM THE PM PERIODIC INSPECTIONS AND MAINTENANCE

### VISUAL INSPECTION
First, perform a visual inspection of the lift truck and its components. Walk around the truck and take note of any obvious damage and maintenance problems. Check for loose fasteners and fittings.




### NAMEPLATES AND DECALS
Check to be sure all capacity, safety, and warning plates or decals are attached and legible.

Do not operate or allow a lift truck with damaged or missing decals and name plates to be operated. They contain important information. Replace them immediately.

Be sure that safety devices are in place, undamaged, and attached securely.

### WHEELS AND TIRES
Check the condition of the drive wheel and rear wheels and tires. Remove objects that are embedded in the tread. Inspect the tires for excessive wear and breaks or "chunking out", and bond failure between the tire and rim.

Check all wheels for proper tightness. Adjust if necessary.

## FUNCTIONAL TESTS
**To be sure that all controls and systems are functioning correctly.**
Test horn and all other safety equipment and accessories. Be sure they are properly mounted and working correctly.

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

Operate service and parking brakes, directional controls, and steering system. Be sure all controls operate freely and return to neutral properly.

# PM - PLANNED MAINTENANCE PROGRAM

**TEST DRIVE THE TRUCK**
Check all around to be sure that your intended path of travel is clear of obstructions and pedestrians.

Test the truck for:
- general correct operation
- drive train function
- steering performance
- brake performance

by driving the truck in both the forward and reverse directions, first in a straight line and then, slowly, through a series of full right and left turns.

Listen for any unusual drivetrain or other running noises, such as wheel bearing noise, vibration, etc. Note any lack of smoothness in steering.

**When you have completed the operational tests, park and leave truck according to standard shutdown procedures.**

**BRAKES**
Check the service / parking brake system. Push the brake pedal all the way down and hold. The brakes should be fully released at this pedal position.

To check parking brake holding capability and adjustment, drive the truck onto a grade and release the pedal. The parking brake should hold the truck on the grade that the truck can climb with a capacity load or a 10 % grade whichever is the lesser.

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

**STEERING SYSTEM**
Check the steering system for abnormal looseness and damage. Check for any changes in steering action. Hard steering or looseness, unusual sounds when turning or maneuvering indicates a need for inspection and servicing.

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

**BATTERY**
Inspect the battery retainment and replace any damaged or missing parts.
Inspect the battery for any damage, cracks, leaking condition. If your battery has removable vent caps, check to be sure the cells are all filled. If possible, refill with distilled water to bottom of vent cap opening.

**MECHANISM**
Finally, inspect all control pedals, levers, and linkages for wear and smoothness of operation.

**AIR CLEANING**
Always maintain a lift truck in a clean condition. Do not allow dirt, dust, lint, or other contaminants to accumulate on the truck. Keep the truck free from leaking oil and grease. Wipe up all oil spills. Keep the controls and floorboards clean, dry, and safe. A clean truck makes it easier to see leakage, loose, missing or damaged parts, and will help prevent fires. A clean truck will run cooler.

The environment in which a lift truck operates will determine how often and to what extent cleaning is necessary. For example, trucks operating in manufacturing plants which have a high level of dirt or lint (e.g., cotton fibers, paper dust, etc.) in the air or on the floor, will require more frequent cleaning.

**Lift trucks should be air cleaned at every PM interval, and otherwise as often as required.**

Air cleaning should be done using an air hose with special adapter or extension having a control valve and nozzle to direct the air properly. Use clean, dry, low-pressure compressed air; restrict air pressure to [207 kPa] 30 psi, maximum.

**CAUTION - Wear suitable eye protection and protective clothing.**

## CRITICAL FASTENER TORQUE CHECKS

Check torque of critical items, including:
- Drive unit mounting
- Drive and rear wheel mounting components.

Replace missing bolts and tightened loose bolts to the correct torque before operating the truck.

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