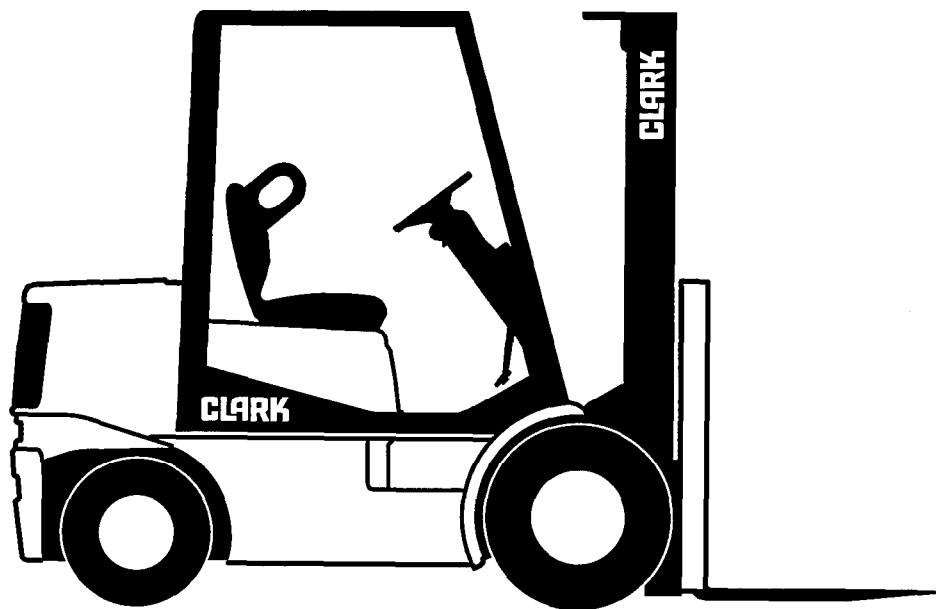


SM-568

PWD/HWD 25/30/36



CLARK

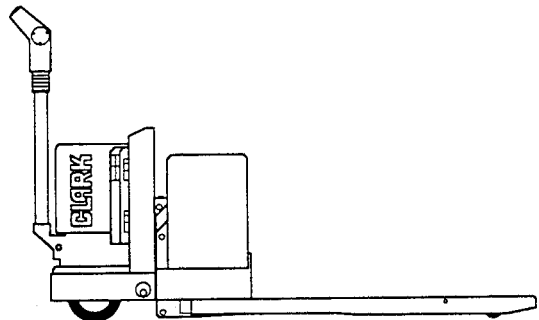
Technical
Publications
Lexington, KY
40508

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Service Manual



		P-30
	P-25	HWP-30
SM 568	HWP-25	PWD-30
	PWD-25	HWD-30
	HWD-25	HWD-36
		PWD-36

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Technical
Publications
Lexington, KY
40507-1640

This service publication provides information covering normal service, maintenance and repair of the Clark industrial trucks noted on the cover. It has been specifically prepared to help owners and service personnel maintain these trucks in efficient and safe operating condition.

Regular, correct maintenance and care of industrial trucks is not only important for long and efficient truck life; it is essential for safe operation. The importance of proper maintenance through planned service, inspection and qualified repairs cannot be emphasized too strongly.

To assist in keeping industrial trucks in good operating condition, this manual includes preventive maintenance procedures to be performed at regular intervals. These are essential to the service life and safe operation of all industrial trucks. Instructions for safety inspections, operational checks, cleaning, and lubrication are provided for reference in setting-up and conducting a recommended periodic Planned Maintenance (PM) program.

Refer to the *Operator's Manual*, located on the truck, for additional information on the operation, care and maintenance of your truck.

Genuine Clark replacement parts should be used for all service and repair requirements. Substitute parts from other sources may be different than original parts and may not meet OSHA or other safety requirements.

Any reference to brand names other than Clark in this manual is made simply as an example of the type of tools and materials recommended for use and, as such, should not be considered as an endorsement. Equivalents, if available, may be used.

For more information on maintenance and repair of these trucks, contact your authorized Clark dealer.

NOTICE

The descriptions and specifications included in this manual were in effect at the time of printing. Clark Equipment Company reserves the right to discontinue models at any time, or make improvements and changes in specifications or design without notice and without incurring obligation. Specifications, torques, pressures, measurements, adjustments, illustrations and other items may change at any time. Contact your authorized CLARK dealer for information on possible updates or revisions.

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About This Manual

This manual is intended for use by persons who are trained and authorized to do lift truck maintenance. It is designed to provide essential information about the correct and safe service maintenance and repair of the truck by *trained mechanics or service technicians*.

The information is organized by use of the Basic Group Numbering System used in the Master Parts Book and the Customer Parts manuals. The manual includes:

- | | |
|----------------|--|
| P.M. | Planned Maintenance Procedures including precautions and safe maintenance practices. |
| 01 ~ 40 | Service specifications, adjustments, maintenance and overhaul procedures including lubrication charts and recommended lubricants, etc. |

General and detailed service and repair procedures are outlined (as required) for each component or subsystem. Some procedures include explanations that are common to several components or subsystems.

In general, each **Section** is written to show and describe the general arrangement, adjustment, removal, disassembly, inspection, repair, and assembly steps that are normally required to service the component. Component specifications (as applicable), information notes and safety messages are included within those procedures. In most cases, specifications are also listed in GROUP 40, Truck Specifications, for convenience of reference.

The Pictorial Index lists components or systems by Basic Group Number of Major Parts. Additional content listings are placed at the beginning of each Section in the manual,

This manual has been made easier to use by providing only specific steps when necessary and general instructions required to explain the activity, component, assembly, or process being worked on. The technician is expected to include obvious additional steps of standard procedure for removal, disassembly, cleaning, inspection, reassembly, installation, etc., as needed.

To be better prepared to do the necessary service work, take time to completely read the entire *procedure, including any special instructions, before doing any work.*

The technician is cautioned and expected to always work in a safe manner by using the correct procedure. *Do not take chances which may result in injuries.*

IMPORTANT SAFETY NOTICE

Read and understand all safety precautions and warnings before performing repairs on lift trucks.

Appropriate service methods and proper repair procedures are essential to the safe, reliable operation of industrial trucks as well as the personal safety of the individual doing the work. This Service Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure successful repair and reliable truck operation.

There are numerous variations in procedures, techniques, tools, and parts for servicing industrial trucks, as well as in the skill of the individual doing the work. This manual cannot possibly anticipate all such variations and provide advice or precautions as to each. Accordingly, anyone departing from the instructions provided in this manual through procedures used or choice of tools, materials, and parts may jeopardize his or her personal safety and/or the safety of the vehicle user.

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.

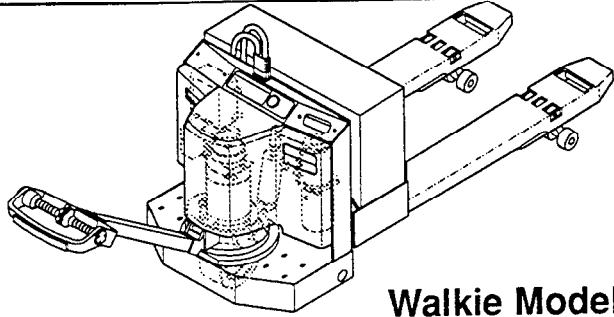
DRIVE AND WORK SAFELY and follow the safety signs and their messages displayed on the truck and in this manual.

General Precautions

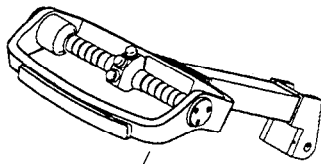
The following list contains general precautions that should be followed when working on a lift truck:

- **Always wear safety glasses** for eye protection.
- **Remove rings, watches, loose jewelry and open clothing** before working on a vehicle, to avoid serious injury.
- **Do not smoke** while working on a vehicle.
- **Put ignition switch in the OFF position**, unless otherwise required by the procedure.
- **Set the parking brake.** Place wheel chocks or wood blocks of 4" x 4" size or larger to the front and rear surfaces of the tires to provide further restraint from inadvertent vehicle movement.
- **Use safety stands or blocks** whenever a procedure requires you to be under the vehicle.
- **Service Electric Truck Batteries in a well-ventilated area** to avoid the danger of igniting explosive gases.
- **Follow the Safety Instructions outlined in GROUP 12 "Handling Storage Batteries"**.
- **Always Discharge the Capacitors prior to working on or around electrical components.** Refer to the instructions outlined in GROUP 19 "Discharging Capacitors:."
- **Avoid contact with Battery Acid.** The battery contains corrosive acid which can cause injury. Following the instructions outlined in GROUP 12 "Handling Storage Batteries".

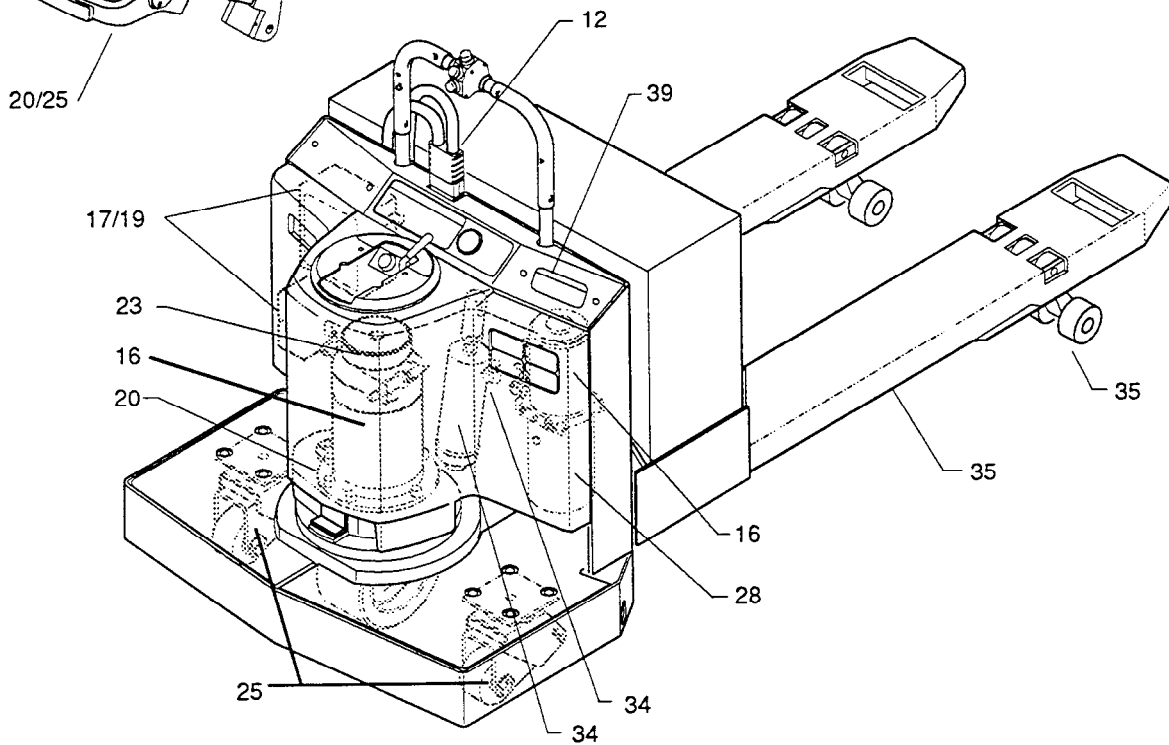
PICTORIAL INDEX



Walkie Models



Rider Models



- 01 Lubrication Charts
- 12 Battery
- 16 Motors
- 17 Contactors
- 19 EV-T5 Control
- 20 Drive Unit
- 23 Brakes
- 25 Caster / Stabilizer
- 28 Hydraulic Unit & Lines
- 34 Lift Cylinder
- 35 Load Wheel / Lift Linkage
- 39 Body Partss
- 40 Specifications

P.M. CHECK SHEET

A special coding system on the P.M. Check Sheet allows truck condition to be reported with a minimum number of words. As the P.M. is performed, a check mark should be made in the appropriate box of the component being checked.

- (✓) indicates the particular truck component or system has been checked and is O.K.
- (x) indicates the component or system is in need of a minor adjustment or service (not part of the normal P.M.) that should be taken care of in the near future.
- (r) indicates there is a potential problem that could result in damage to a component or system and requires attention.
- (s) indicates the need for urgent repair or replacement of a component or system and the truck should be shut down as eminent damage or possible injury may result.

The nature of problems found during a PM should be noted in the "comments" portion of the check sheet. Whenever a system or component is faulty or unsafe, it must be noted on the check sheet, and reported to the designated authority at the conclusion of the P.M.

P.M. Check Sheet Example

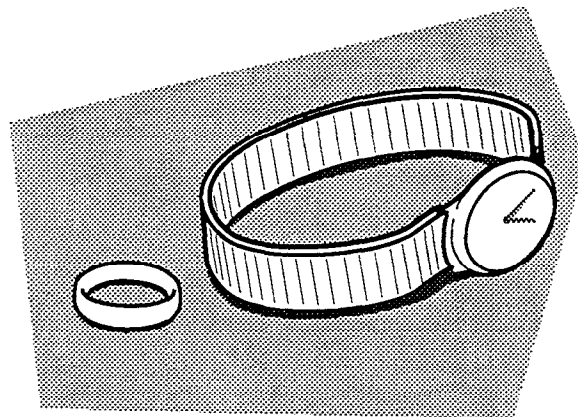
1. Visual Inspection			
A. Oil Leaks	✓		
B. Switches	✓		
C. Drive Tire	✓		
D. Load Wheels	✓		
E. Caster Wheels	✓		
F. Control Linkage	✓		
2. Operational Tests			
A. Brakes			S
B. Brake Switch		r	
C. Horn	✓		
D. Steering	✓		
E. Speed Control	X		
F. Lift & Lower Control	✓		

Code

	✓ = O.K.
O.K.	X = Adjust (Not P.M.)
Potential	r = Repair or Replace
Urgent	S = Requires Shop Repair

⚠ WARNING

Remove all jewelry before examining electrical components.

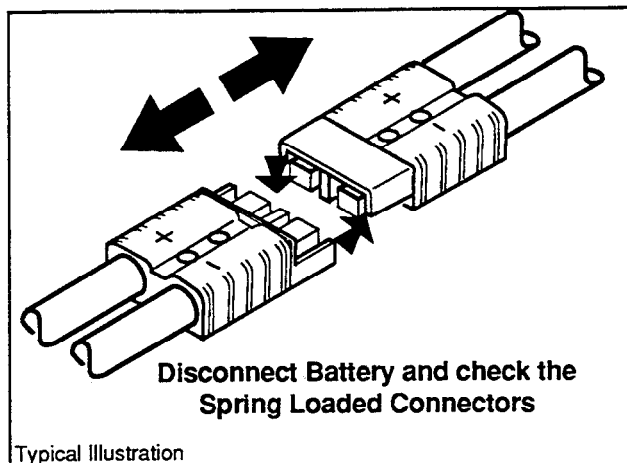


Planned Maintenance Procedures

Visual Inspection

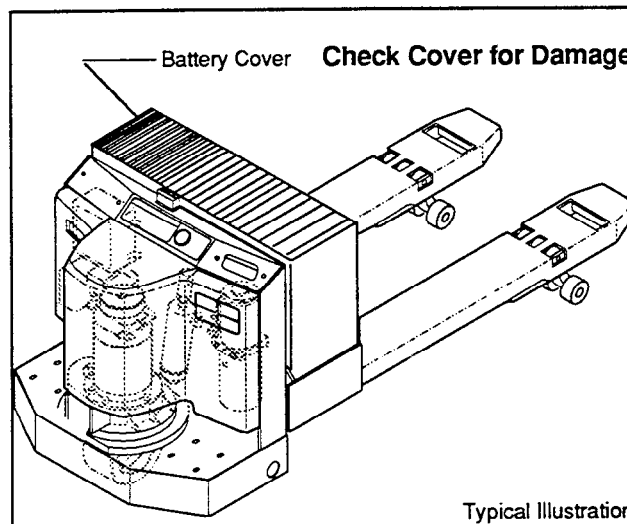
1. Inspect Battery Plug & Truck Receptacle

- Disconnect battery from truck.
- Inspect the spring loaded connectors in the truck battery receptacle and check the battery plug connectors. Severely burned connectors should be noted on the P.M. check sheet.



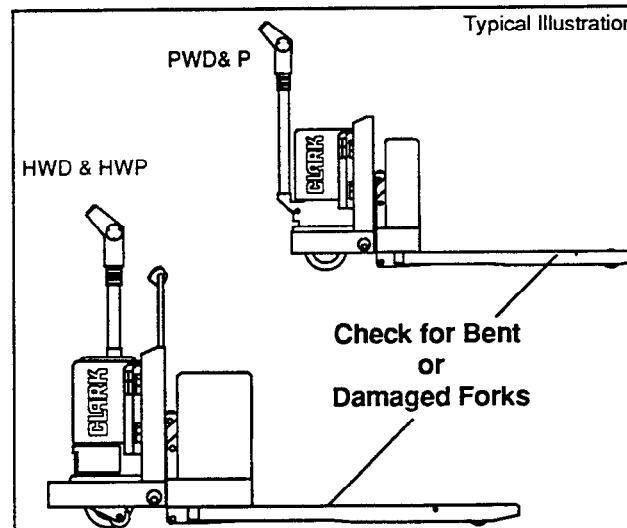
2. Inspect Battery Cover for damage

- The cover should not be dented. A badly dented cover could short out across the battery cell connectors.
- The cover should be free to swing open and closed without binding.



3. Inspect Pallet Forks for obvious damage

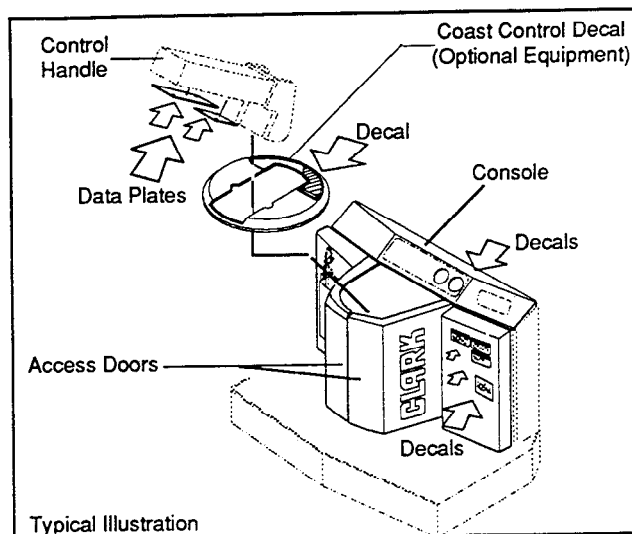
- Forks should not be bent or warped. If the forks are damaged, report condition to the designated authority.



Planned Maintenance Procedures

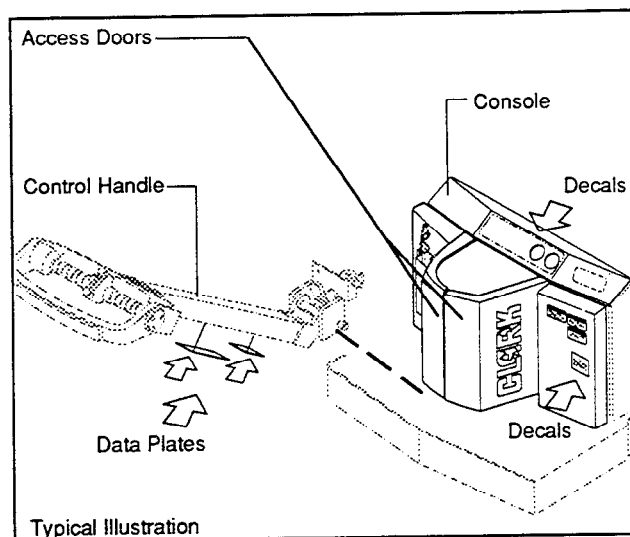
4. Rider Models

- **Inspect Frame Components**
- Check truck console, access cover and doors for damage.
- Inspect name plates and decals for damage and to be sure they are not missing.



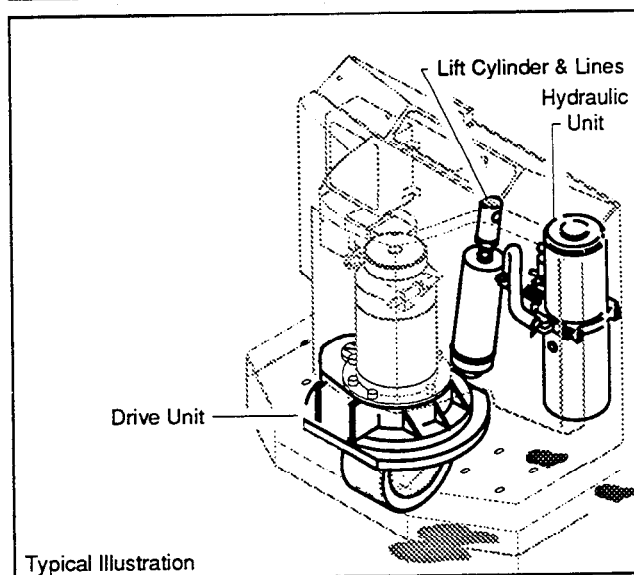
4A. Walkie Models

- **Inspect Frame Components**
- Check truck console, access covers and doors for damage.
- Inspect name plates and decals for damage and to be sure they are not missing.



5. **Check for obvious oil leaks**

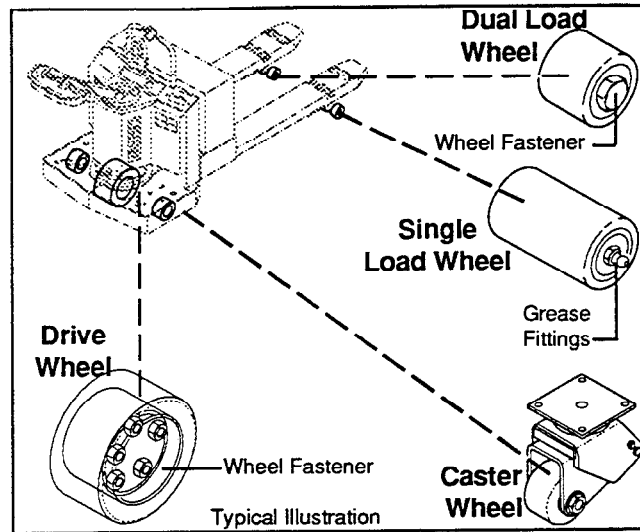
- Make a quick overall inspection for leakage. If an oil leak appears to be major, note condition on the check sheet for immediate attention. Minor leaks should be repaired during the P.M.



Planned Maintenance Procedures

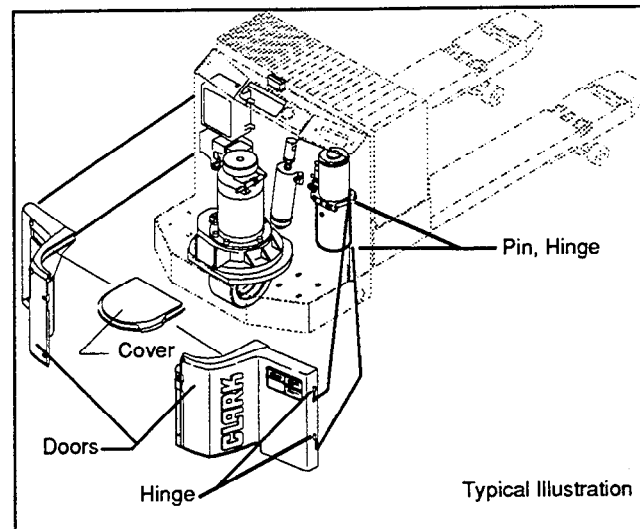
6. Inspect Tires & Wheels

- Check for obvious damage to tires on the load, caster and drive wheels.
- Look for excessive tire wear, cuts, breaks, chunking or bond failure between the tires and wheels. Note condition on the PM check sheet.
- Remove embedded objects from the tires.
- Be sure wheel fasteners are secure and none are missing.
- Make certain grease fittings are not damaged or missing.



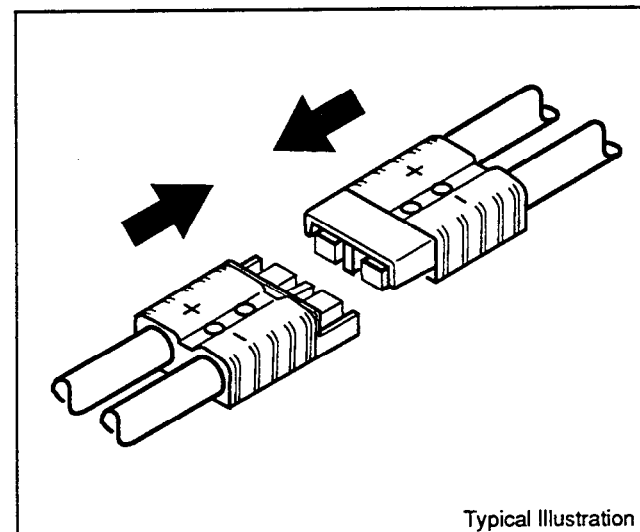
7. Expose Internal Components

- Open the access doors exposing the drive unit, brake, lift cylinder, hydraulic unit, and SCR control. Each door hangs on a hinge pin. Lift the doors from their pins and set them to one side.



8. Connect Truck Battery

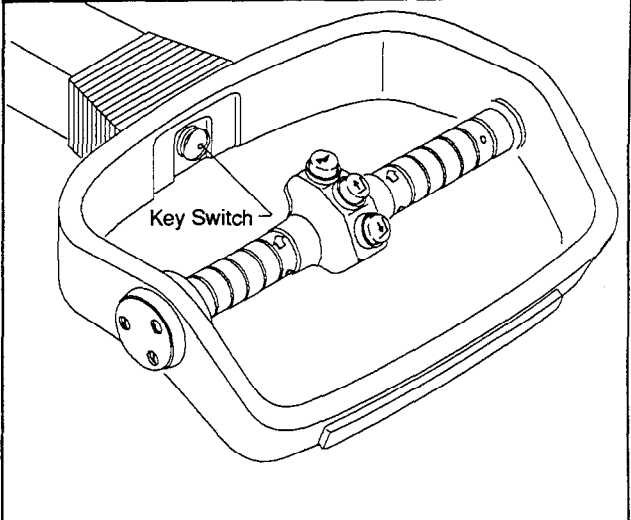
- Connect truck battery and check truck operation.



Planned Maintenance Procedures

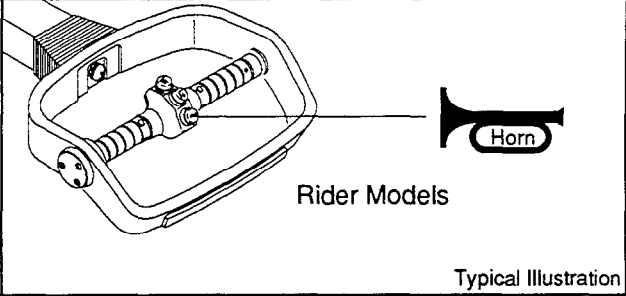
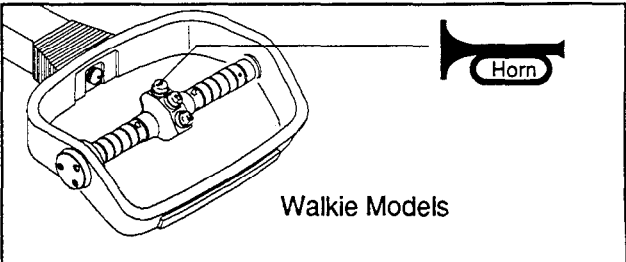
Operational Tests

9. Turn the key switch on.



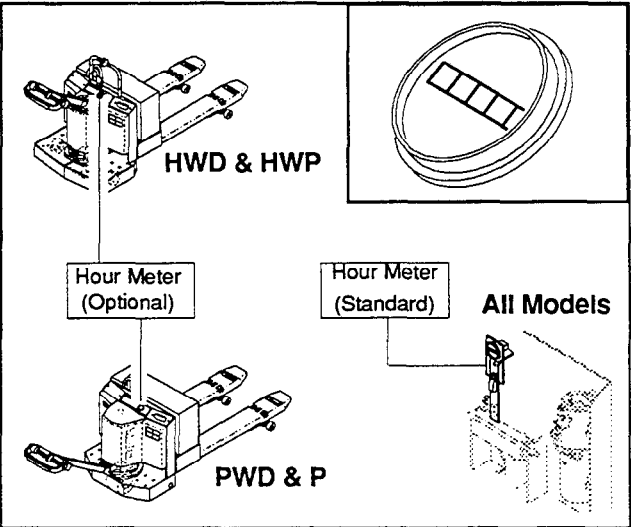
10. All Models

- Check the horn to be sure it operates.



11. All Models

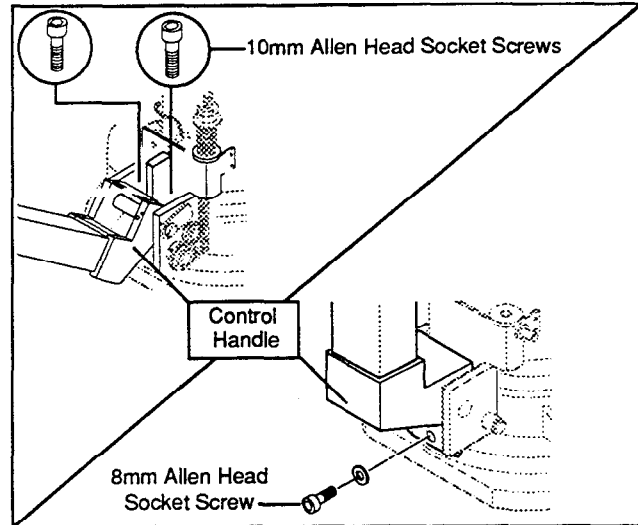
- Check the hour meter to be sure it operates.



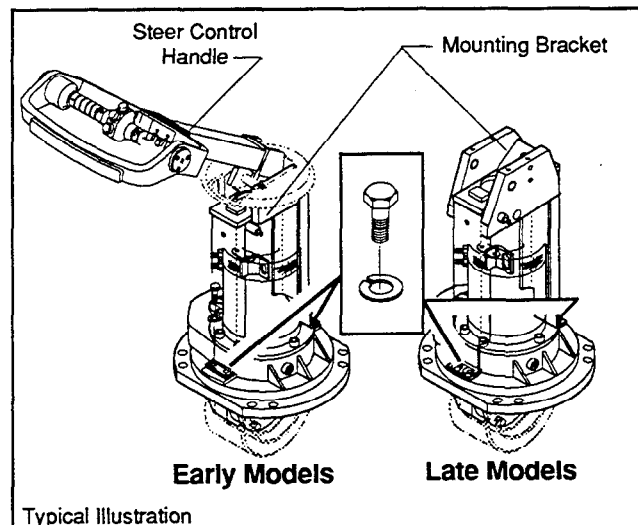
Planned Maintenance Procedures

12. Check Steer Control Handle

- **Walkie Models**
- Be certain the control handle is mounted securely at the base of the drive unit.
- Make sure fasteners are tight and none are none missing.

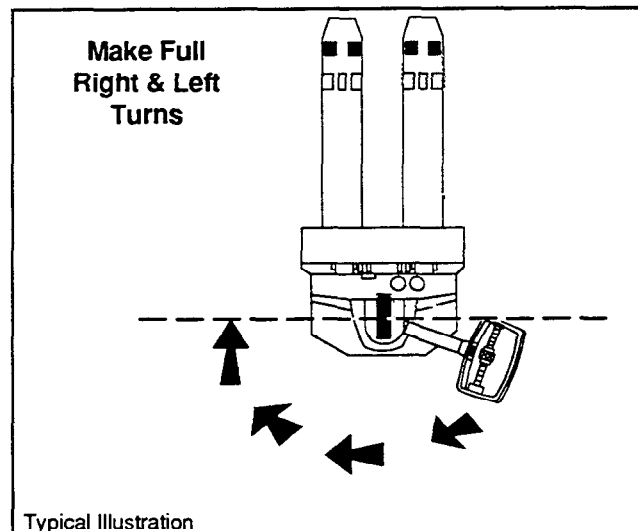


- **Rider Models**
- Check the mounting bracket to be sure it is securely mounted to the base of the drive unit.
- Make sure fasteners are tight and none are missing.



13. Check Steering

- Operate truck in reverse at a *slow rate of speed*. Move control handle through a full right and full left turn. Steering should be smooth without binding or hisitation.
- If there is binding, hard spots or movement appears to be stiff this indicates either lack of lubrication, misadjusted or damaged steering ring.
- Report condition on the P.M. check sheet.



Planned Maintenance Procedures

14. Check Brake Operation

- Move the steer control handle downward 10 degrees from vertical (brake on) position.
- Operate truck in reverse *at a slow rate of speed*.
- Slowly move control handle upward from the 10° travel (brake off) position..

As Control Handle approaches "Brake On" position:

(1st)

the brake switch should operate shutting off the drive motor.

(2nd)

the brake should operate bringing the truck to a stop.

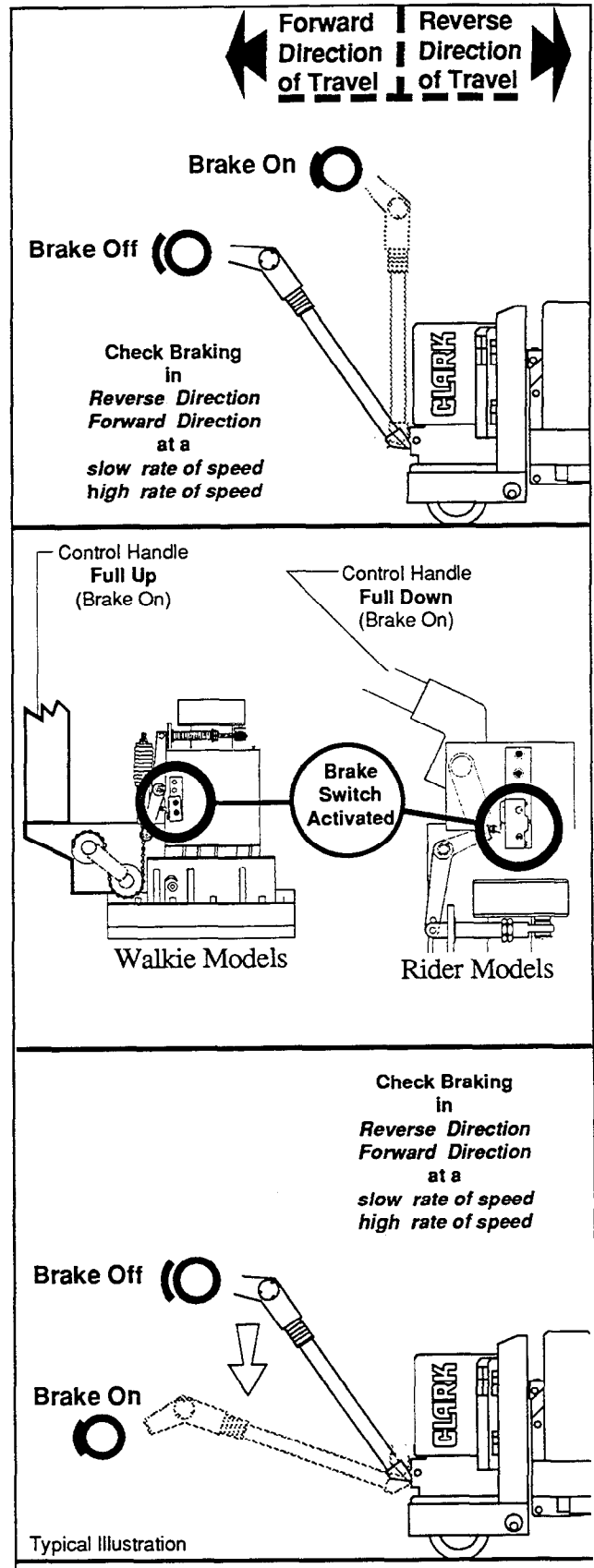
- Operate the truck in **forward** *at a slow rate of speed*.
- Slowly move control handle **upward** from the 10° (brake off) position. The brake should apply when handle reaches the full up (brake on) position.
- Now, check the brake at a high rate of speed in both forward and reverse directions.

14A. Next, check for proper brake operation by moving the handle **downward** from the 10° (brake off) position. The brake check should be done at Low and High Speeds, and in Forward & Reverse directions.

- If operation is not satisfactory, note condition on the P.M. check sheet. Report condition to designated authority for immediate attention.

NOTE

Plugging Control is normally used for gradual brake applications. Braking with the *steer control handle* is normally used in emergency situations and parking the truck.



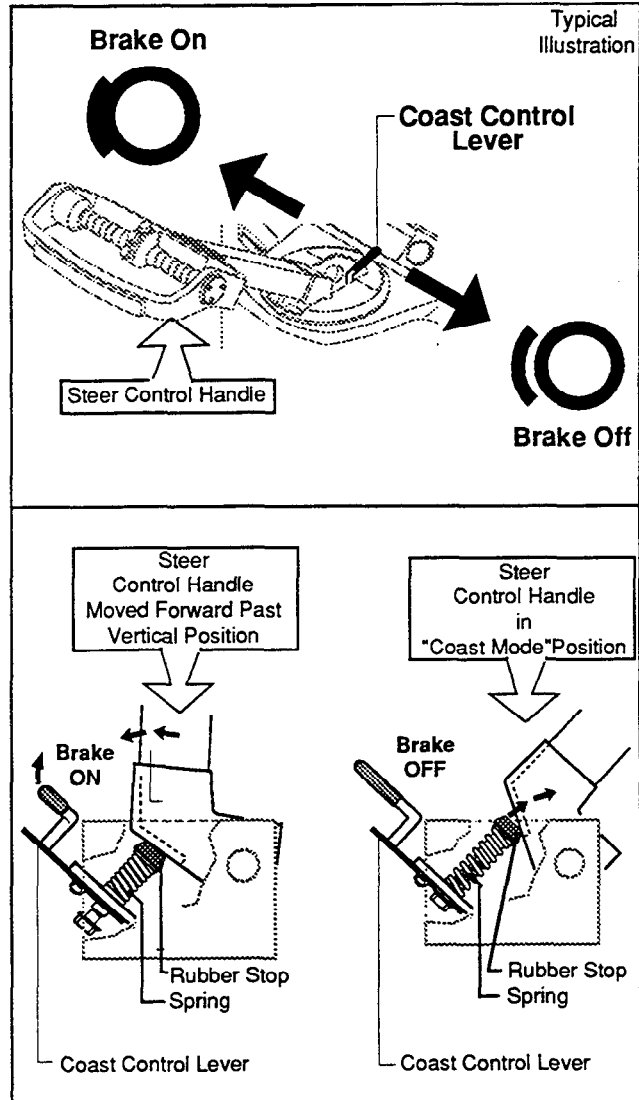
Planned Maintenance Procedures

⚠️ WARNING

After checking the coast control, be certain to return the coast control lever to the (brake on) position before resuming normal truck travel.

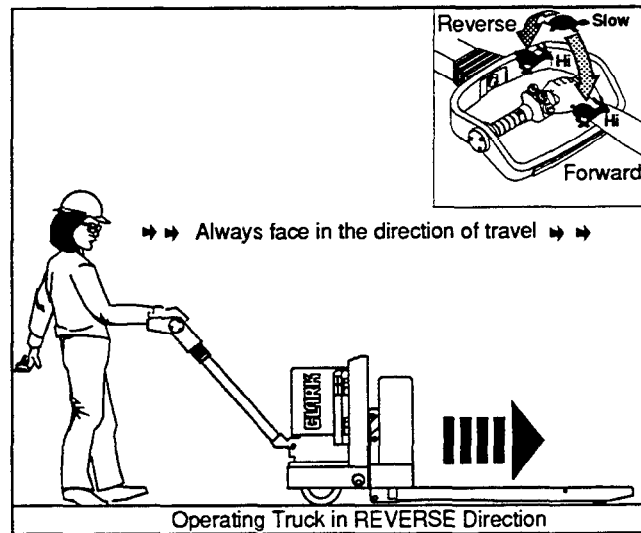
15. Check Coast Control Brake Operation

- Move steer control handle past the full vertical position to partially compress a spring loaded rubber stop, see illustration.
- Now move the coast control lever out of the "brake on" position and into the "brake off" position.
- Release the steer control handle. The truck is now set up for a "coast mode" of operation allowing the operator to "jog" the truck with the F & R speed control.
- Slowly operate truck in a reverse direction of travel.
- Move steer control handle into vertical (brake on) position stopping truck.
- If brake operation is not satisfactory, note condition on P.M. check sheet. Report condition to designated authority for immediate attention.
- Return the coast control lever to the (brake on) position.



16. Check Travel Speeds Check Acceleration Check High Speed

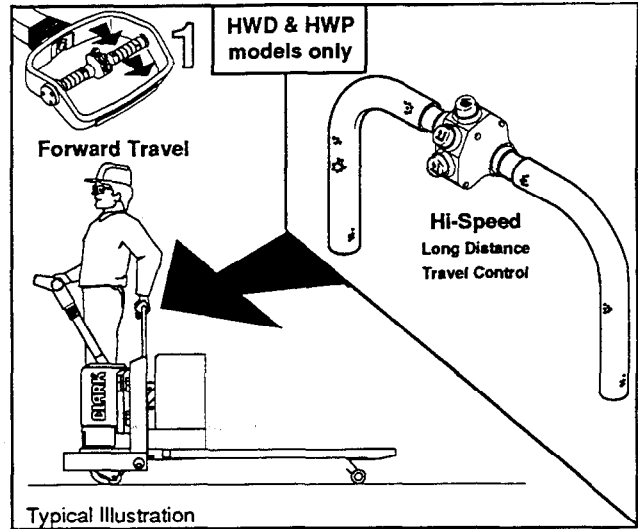
- Drive truck in a straight line, looking in the direction of travel.
- Listen for any unusual drive train noise.
- Accelerate from low to high speed. Acceleration should be a smooth transition from creep through top speed to 1A (battery volts). If transition is erratic, the *accelerator potentiometer circuit* should be checked (Group 19). Note condition on the P.M. check sheet. ~continued next page~



Planned Maintenance Procedures

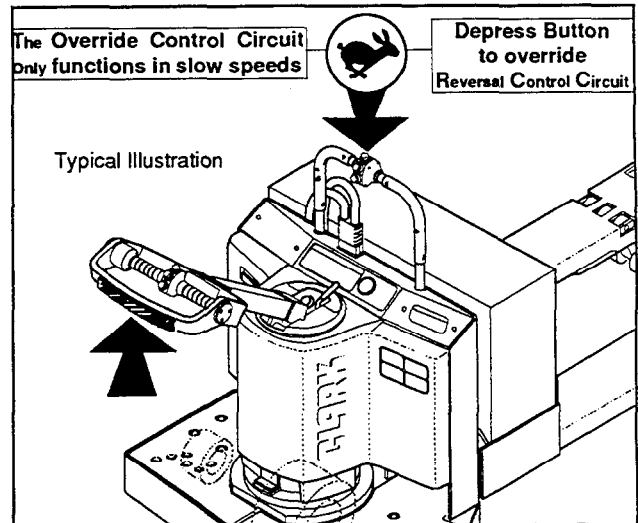
17. Check Hi-Speed Control

- Drive truck forward, in a straight line of travel.
- Fully rotate Directional Speed Control (1) until maximum (solid state control) speed is obtained.
- Depress Hi-Speed Button (2) for approximately *two seconds*. The 1A contactor should close providing direct battery volts across the drive motor for maximum travel speed. This transition should be smooth. If it is not, if it is erratic, jerky etc., the *accelerator potentiometer circuit* should be checked (Group 19). Note condition on the P.M. check sheet.



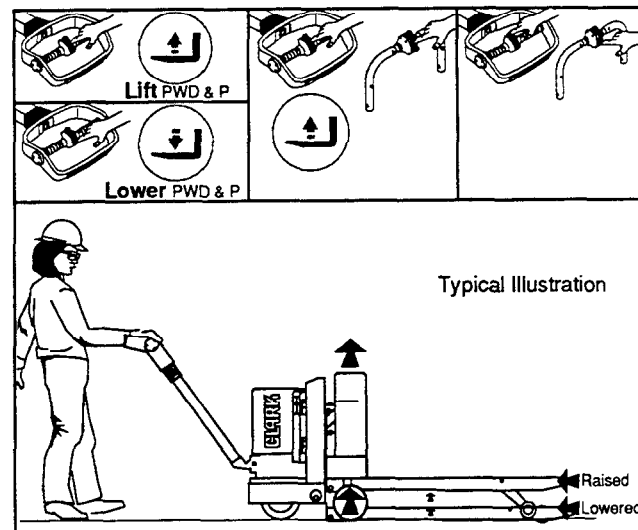
18. Override Control

- The override control is used to by-pass the emergency reversal (belly) switch circuit. This is desirable when the truck is operating in areas where *plastic strip curtain doors* (etc) are used. Example: When moving a truck through this type door, pressure from the door strips can cause the emergency reversal (belly) switch to operate changing the direction of truck travel. By overriding the reversal switch, the truck can pass through the curtain door without miss hap.
- To simulate the above, operate truck in slow speed reverse. "Depress button to override" and then depress the reversal (belly) switch. Truck travel should remain in slow speed reverse. Note condition on the P.M. check sheet.



19. Elevate and Lower Pallet Forks

- Elevate pallet forks to maximum lift. As the forks elevate, check to be sure they elevate smoothly and evenly without binding.
- Lower forks. Look for erratic motion as they lower. They should lower smoothly without hesitation.
- If there is erratic, jerking motion or binding of linkage as the forks elevate or lower, the lift linkage should be checked and adjusted (Group 35). Note condition on the P.M. check sheet.



Planned Maintenance Procedures

20. Discharge the Capacitors

- Be sure the battery is unplugged.
- Discharge capacitors using a 100 ohm, 2 watt resistor connected between the **Positive** and **Negative** power terminals on the SCR Control. *Hold the resistor in place for 2 seconds before removing.*

! CAUTION

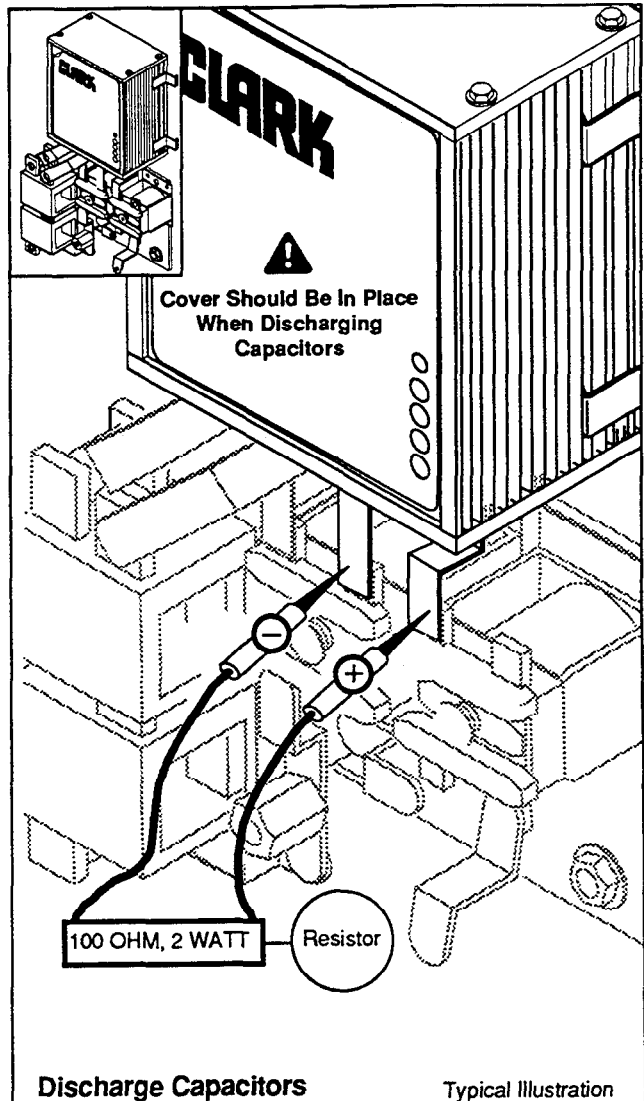
Using a shorting device without a "resistor load" could cause damage to the control.

! WARNING

Discharging the capacitors without using specified resistor could cause serious injury to yourself and bystanders.

! WARNING

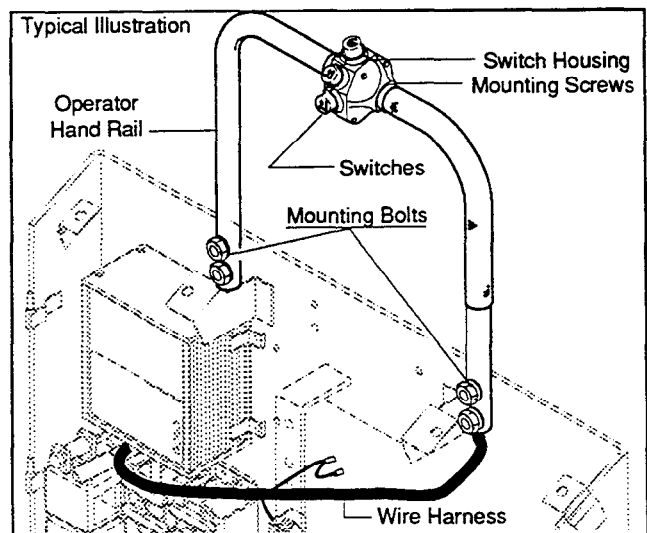
Prior to discharging the capacitors, make certain the Cover is installed on the Control Panel Power Base.



21. Rider Models

Inspect Operator Hand Rail

- Check hand rail for security of mounting. Try moving hand rail fore & aft checking for loose connections and damage. The mounting bolts should be torqued to 177-221 lb.in (20-25 N•m).
- Make certain the switch housing is mounted securely and the switches are not damaged.
- Check wire harness condition. Check for loose connections and harness damage. Report condition on P.M. check sheet.



GROUP 01 LUBRICATION & Planned Maintenance

Contents

Grease Chart & Specifications (Rider Trucks)	01-1-4
Grease Chart & Specifications (Walkie Trucks)	01-1-5
Fluids ~Illustrated Instructions & Specifications	01-1-3
Optional Equipment Lubrication Illustrations & Specifications	01-1-6
Miscellaneous Linkage Illustrations & Specifications	01-1-7

A	=	08	-	010	hours or daily
B	=	50	-	250	hours or every month
C	=	450	-	500	hours or every 3 months
D	=	900	-	1000	hours or every 6 months
E	=		-	2000	hours or every year
Time Intervals					
	A	B	C	D	E
Check truck visually and inspect components		●			
Test drive truck - Check functional performance		●			
Air clean truck		●			
Check torque on critical fasteners		●			
Lubricate truck		●			
Clean / check battery terminals, electrolyte level		●			
Check battery cables & truck receptacle		●			
Perform battery load test		●			
Check drive motor brushes		●			
Check lift pump motor brushes		●			
Test truck ground		●			
Clean drive motor air vents		●			
Check drive unit fluid level		●			
Drain and replace drive unit fluid					●
Check hydraulic unit fluid level		●			
Drain and replace hydraulic unit fluid					●
Check brake shoe linings		●			

LUBRICATION SPECIFICATIONS

The listing of lubrication specifications compiled in this manual is for the reference of Clark Engineering and Service personnel, Dealers and Customers. The list of products is intended as a guide in the selection of a lubricant to meet the requirements of Clark Industrial Truck Operation.

CLARK makes no representation as to the relative merits of any commercial oil product. With the exception of MS-68 Hydraulic Fluid, CLARK has no formal system for approving oil products, but has published herein general specifications which it believes will provide adequate or superior component lubrication of life.

It is the PREROGATIVE of each user to choose suppliers and products as they feel necessary for proper operation of the equipment under the conditions of the individual application. RESPONSIBILITY for the quality of the product and its performance in service must remain with the oil supplier, in agreement with the user.

Hydraulic Fluids and Engine Oils

CLARK does not follow a formal test and approval procedure for specific branded products. Rather it is CLARK policy to establish basic specifications for oils (and fluids) which demonstrated suitable performance for the application. In general these specifications follow the recommendations of the major component manufacturer, such as engines and hydraulic pumps. Any oil or fluid which meets the respective specification is considered acceptable for use in CLARK products. Component operation should not be affected as long as the oil or fluid meets the stated specification and the recommended oil and filter change intervals are followed.

For **Extended Oil or Fluid Drain Intervals**, periodic analysis by a reputable testing laboratory should be made. *It is the responsibility of the manufacturer or supplier of the oil or fluids to insure that this product meets the specifications and gives the expected performance.*

Technical Societies referenced on these pages

AGMA	~~	American Gear Manufacturers Association
API	~~	American Petroleum Institute
ASTM	~~	American Society for Testing Materials
EMA	~~	Engine Manufacturers Association
MIL	~~	Military Specification
MGPA	~~	Natural Gas Processors Association
NLGI	~~	National Lubricating Grease Institute
SAE	~~	Society of Automotive Engineers



HYDRAULIC SYSTEM

- Wipe outside of reservoir clean before removing the fill/level plug. Fluid level should be to the plug opening. Add fluid as required. *Check fluid level with the forks fully lowered and truck on a level surface.*

MS 68 Recommendation *Normal operation* use Hydraulic Fluid per Clark Specification MS68.

Specification Hydraulic Fluid must be high quality with Zinc or equivalent Anti-Wear additive which meets the requirements of ASTM D-2882 pump wear test with 50 mg total weight loss maximum per Clark Specifications MS-68.

Hydraulic System Fluid available under Clark Part Numbers:

-  885385 One (1) Quart Can (MS-68).
-  885382 One (1) Case of Six (6) one gallon cans (MS-68).

Recommendation *Cold Storage Operation* Use Hydraulic Fluid which meets MIL-H-5606A per Clark Specification MS-226.

Specification A petroleum base hydraulic fluid with additives to improve viscosity index, oxidation resistance and anti-wear characteristics blended to form a stable product under storage and operational conditions between -65 and +160° F., meeting MIL-H-5606A* per Clark Specifications MS-226.



(*)The restrictive cleanliness specifications of later revisions is not required.

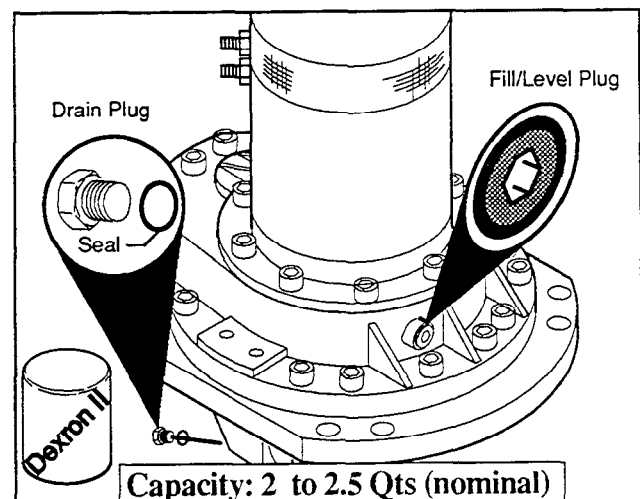
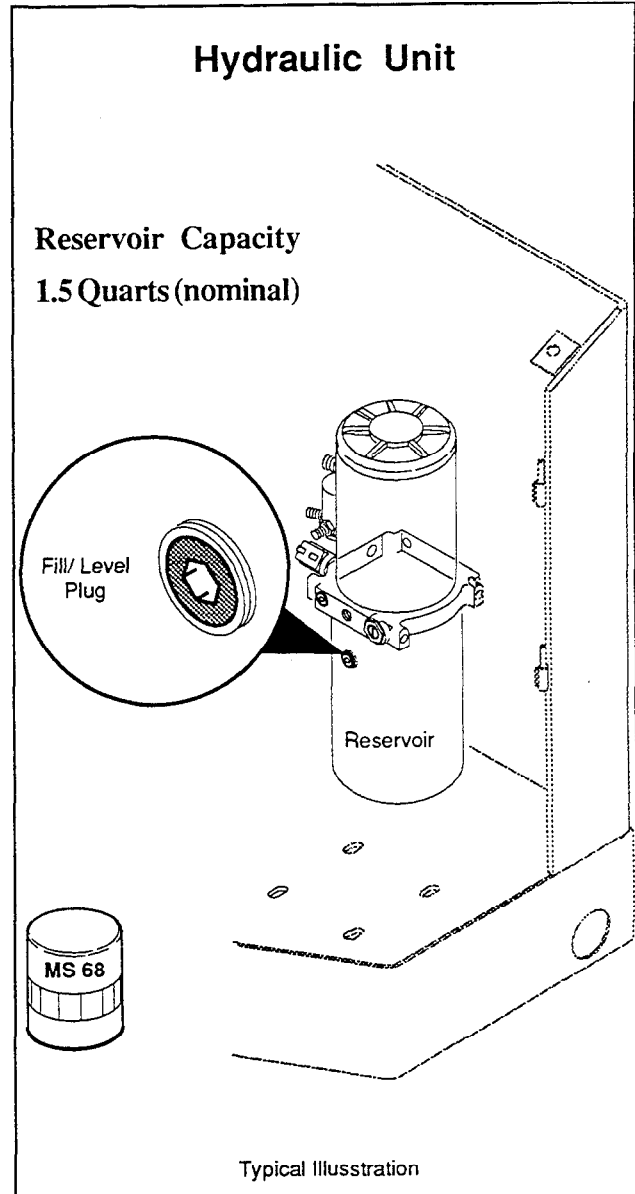
Drive Unit

- Wipe area around fluid level plug before removing plug. Fluid level should be to the plug opening. Add fluid as required.

Recommendation Use Dexron II Automatic Transmission Fluid.

Transmission Fluid available under Clark Part Numbers:

-  897804 One (1) Quart Can.
-  941615 One (1) Case of Six (6) one gallon cans .



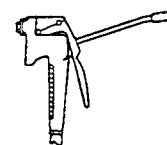
GROUP 01

Lubrication

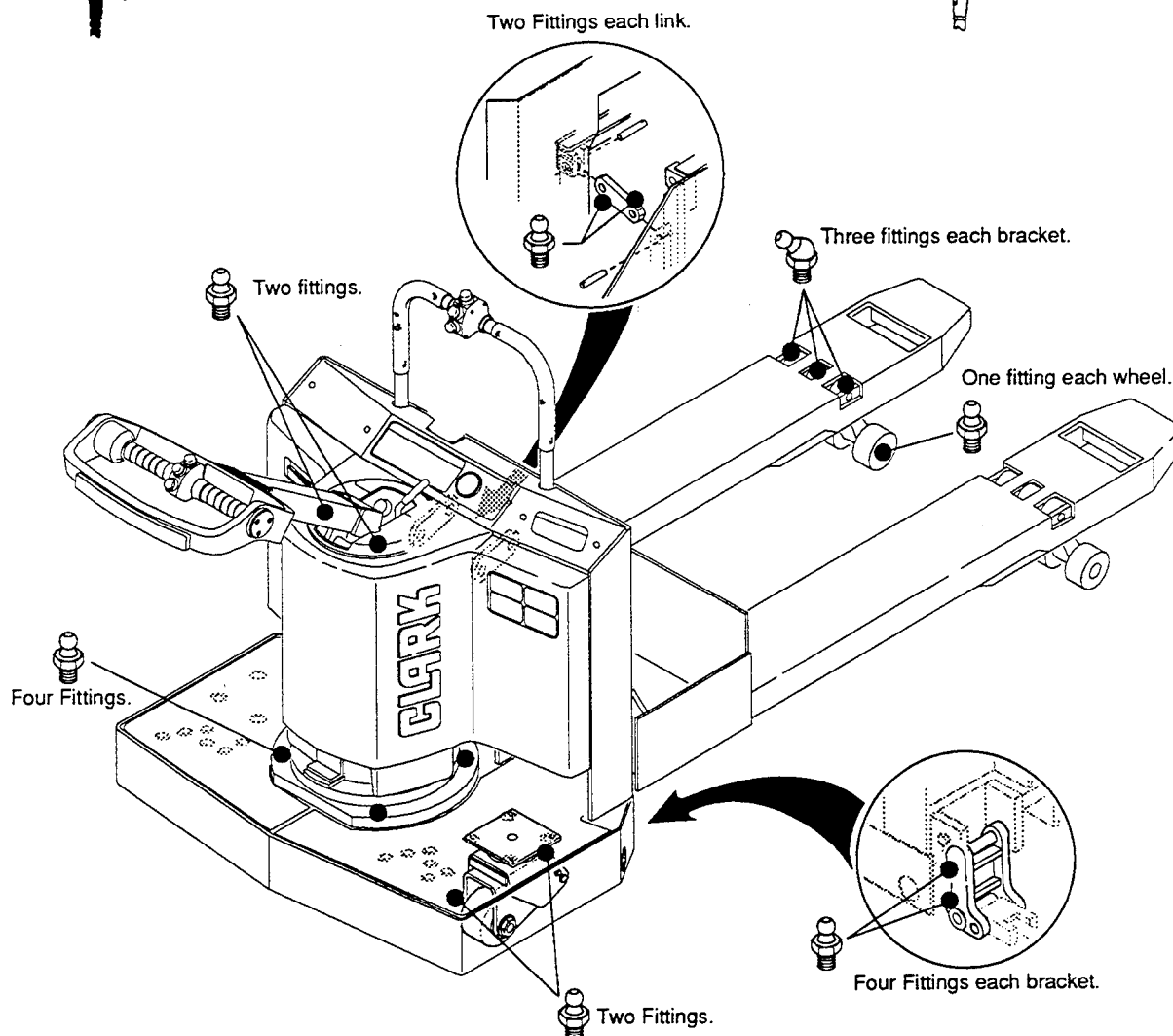
Normal Operation



LUBRICATION CHART RIDER MODELS



Cold Storage



General Purpose Chassis grease

Recommendation Use a Grade NLGI #2 per Clark Specification MS-107C.

Specification MS-107C A multi-purpose grease of refined mineral oil blended with lithium soap thickener or equal containing anti-wear, anti-rust and anti-oxidants with EP additives. Per Clark Specification MS-107C

Cold Storage Operation

Low Temperature Grease An extreme low temperature aircraft quality grease meeting Specification MIL-G-23827A, or equivalent product. Temperature range -100 to +250 F.

Wipe grease fittings clean before applying a grease gun.