
Maintenance Instructions



Model 101T Walkie Pallet Truck

Serial No.: 99-07500 and up

PDMM-0072

Issued: 1/4/99

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

Table of Contents

Troubleshooting	5-1
How to Use This Chapter	5-2
Electrical Troubleshooting Guidelines	5-3
Hydraulic Troubleshooting Guidelines	5-6
Definitions	5-7
Electrical Connector Locator Chart	5-12
Fault Codes	5-13
Programmable Maintenance Tool (PMT)	5-15
List of Troubleshooting Charts	5-25
Troubleshooting Flowcharts	5-27
Component Procedures	6-1
List of Component Procedures	6-2
Component Locator Photos	6-5
Tractor Cover	6-7
Battery	6-8
Power Cables	6-16
Wiring Harness	6-17
Diodes	6-19
Fuses	6-20
Circuit Breaker	6-20
Switches (General)	6-21
Control Handle Switches	6-22
Key Switch	6-24
Brake (Deadman) Switch	6-25
Lift Limit Switch	6-27
Hydraulic Solenoids	6-28
Gauges	6-29
Control Handle	6-33
Horn	6-36
Motor Controller	6-37
Contactors	6-41

Battery Safety

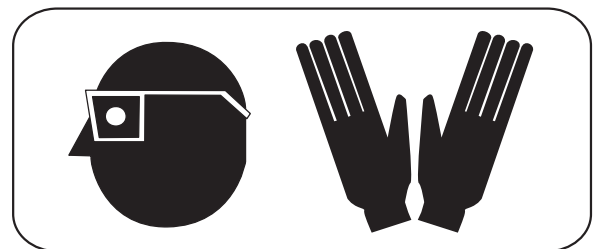
⚠ WARNING

As a battery is being charged, an explosive gas mixture forms within and around each cell. If the area is not properly ventilated, this explosive gas can remain in or around the battery for several hours after charging. Be sure there are no open flames or sparks in the charging area. An open flame or spark can ignite this gas, resulting in serious damage or injury.

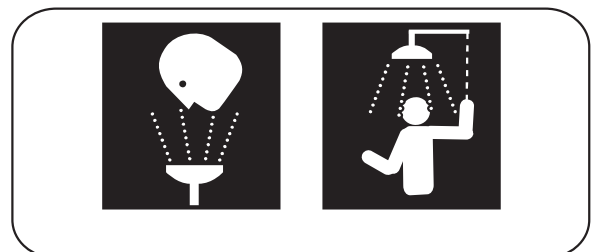
⚠ WARNING

Battery electrolyte is a solution of sulfuric acid and water. Battery acid causes burns. Should any electrolyte come in contact with your clothing or skin, flush the area immediately with cold water. Should the solution get on your face or in your eyes, flush the area with cold water and get medical help immediately.

Wear personal protective equipment to protect eyes, face and skin when checking, handling or filling batteries. This equipment includes goggles or face shield, rubber gloves (with or without arm shields) and a rubber apron.



Make sure a shower and eyewash station are nearby in case there is an accident.



Welding Safety

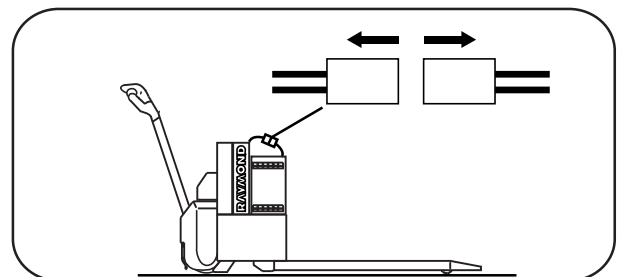
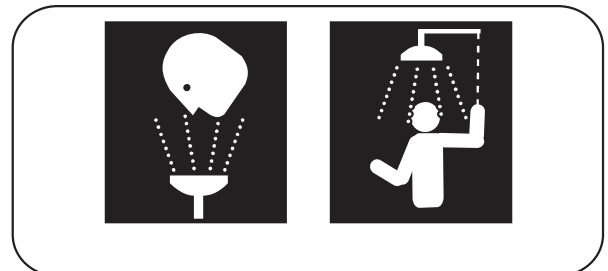
⚠ WARNING

Flame cutting or welding on painted surfaces may produce potentially harmful fumes, smoke and vapors. Prior to performing flame cutting or welding operations, it is recommended that the coating be removed in the vicinity where the operation(s) will be performed.

Coating removal may be by mechanical methods, chemical methods or a combination of methods. Flame cutting and/or welding operations should be carried out only in well ventilated areas using local exhaust if necessary.

Before working on this truck, make sure that:

- Fire protection equipment is nearby.
- You know where the nearest eyewash station is.
- Disconnect the battery before you attempt to inspect, service or repair the lift truck. Discharge residual charge in the motor controller by connecting a load across the controllers B+ and B- (such as a contactor coil or by pressing the horn button).
- Check for shorts to frame as described on [page 5-5](#). If any shorts are detected, remove them before you proceed with the welding operation.
- Clean the area to be welded.
- Protect all truck components from heat, weld spatter and debris.
- Attach the ground cable as close to the weld area as possible.



Scheduled Maintenance

Electrical Troubleshooting Guidelines

Many problems are caused by a faulty or dirty battery. Make sure the battery is clean. Check the electrolyte level and state of charge. See "Battery" on page 6-8. Be sure to block the truck whenever a troubleshooting procedure requires turning the key switch ON. This will avoid accidents caused by unexpected truck travel.

▲ CAUTION

Unless otherwise directed, disconnect the battery connector when you check electrical circuits or components with an ohmmeter. Electrical current can damage the ohmmeter.

Save time and trouble by looking for simple causes first.

Visually inspect all wiring and electrical components for:

- Loose connections or connectors
- Loose or broken terminals
- Damaged terminals, blocks, or strips.
- Broken wiring and shorted conditions (especially those that are close to metal edges or surfaces)

Use an ohmmeter to check for wiring continuity.

For information on pin, connector, and harness connections, see "Wiring Harness" on page 6-17 and see "Electrical Connector Locator Chart" on page 5-12.

Fault Codes

An internal microcontroller automatically checks the function of the motor controller. When this microcontroller detects a fault, it signals the appropriate fault code through the LED on the bottom of the motor controller.

Under normal operation, the LED flashes a single flash at approximately one flash every five seconds. A two-digit flash code signals a fault has been detected by the microcontroller.

Correct faults by following the Troubleshooting Charts beginning on page 5-21.

Fault Code		Explanation / Possible Cause
LED off	■	No power or defective controller
Solid on	□	Defective motor controller
Single flash	□	Controller operational, normal operation, no faults
1, 1	□ □	Current sensor error: Motor controller defective
1, 2	□ □□	Hardware fail-safe error: defective motor controller
1, 3	□ □□□	Internal M- short to B-: Motor controller defective
1, 4	□ □□□□	Static return to off (SRO) fault: Improper sequence of key switch, interlock, or direction inputs. Wrong SRO type selected. Interlock or direction switch circuit open. Sequence delay too short.
2, 1	□□ □	Pot wiper circuit fault: Pot wiper wire open. Pot wiper wire shorted to B- or B+. Throttle pot defective.
2, 2	□□ □□	Emergency reverse wiring fault: Belly button wire open. Belly button check wire open.
2, 3	□□ □□□	High-pedal-disable (HPD) fault: Improper sequencing of key switch, brake switch and throttle inputs. Wrong HPD type selected, Misadjusted throttle pot. Sequencing delay too short.
2, 4	□□ □□□□	Pot low fault: Pot wiper wire open. Pot wire shorted to B- or B+.
3, 1	□□□ □	Contactor driver output overcurrent or field winding shorted: Main contactor coil shorted. Field winding shorted.
3, 2	□□□ □□	Main contactor welded: Main contactor stuck closed. Main contactor driver shorted.
3, 3	□□□ □□□	Motor field winding open: Field winding open. Field connection open.
3, 4	□□□ □□□□	Missing contactor: Main contactor coil open. Wire to main contactor coil open or shorted to B-.

Cloning

With the Programmable Maintenance Tool (PMT) (P/N 950-180), you are able to copy or “clone” the parameters and options from one motor controller to another. Cloning only works between controllers with the same model number and software version.

Copy Parameters

1. Turn the key switch OFF. Remove tractor cover.
2. Turn the key switch ON.
3. Connect the PMT to the motor controller you want to clone. See Figure 5-6.
4. Press and hold the More Info key, then press the Program key. Release both keys after you enter Special Program mode.
5. Scroll through the modes using the Scroll Display keys until “CONT SETTINGS-PROG” is the top line in the display.
6. Press the More Info key again. The PMT will prompt you to acknowledge (save controller settings in PMT) or cancel.

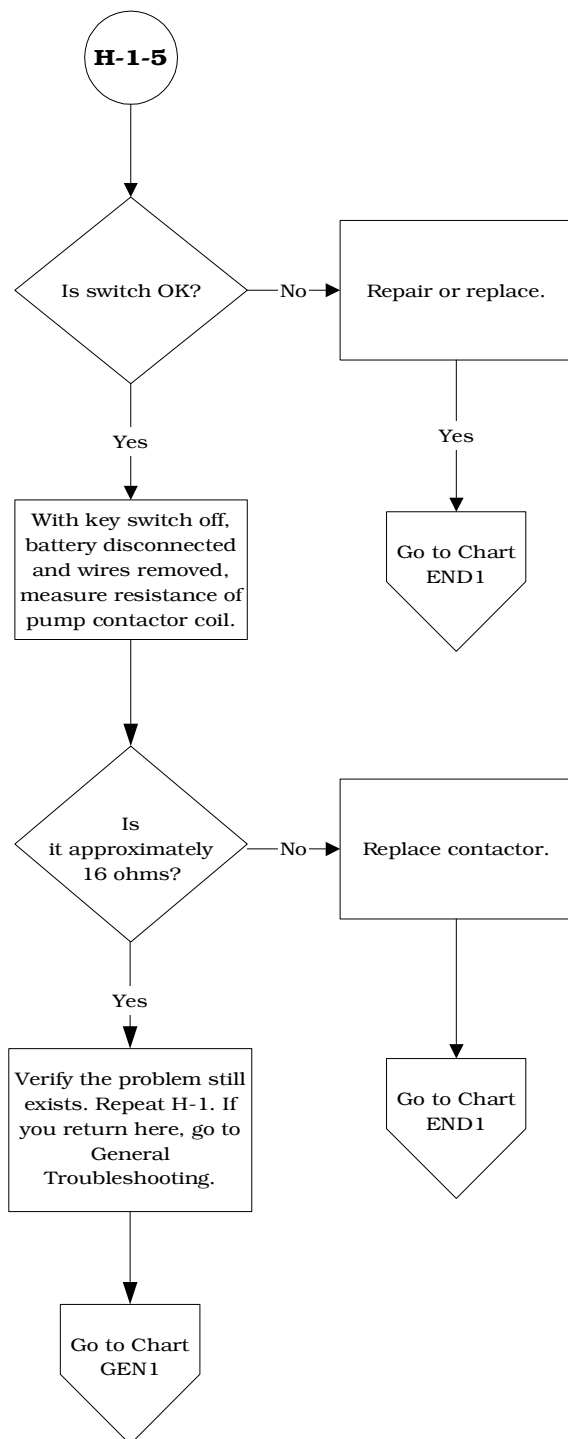


Figure 5-6: Connecting the PMT to the Motor Controller

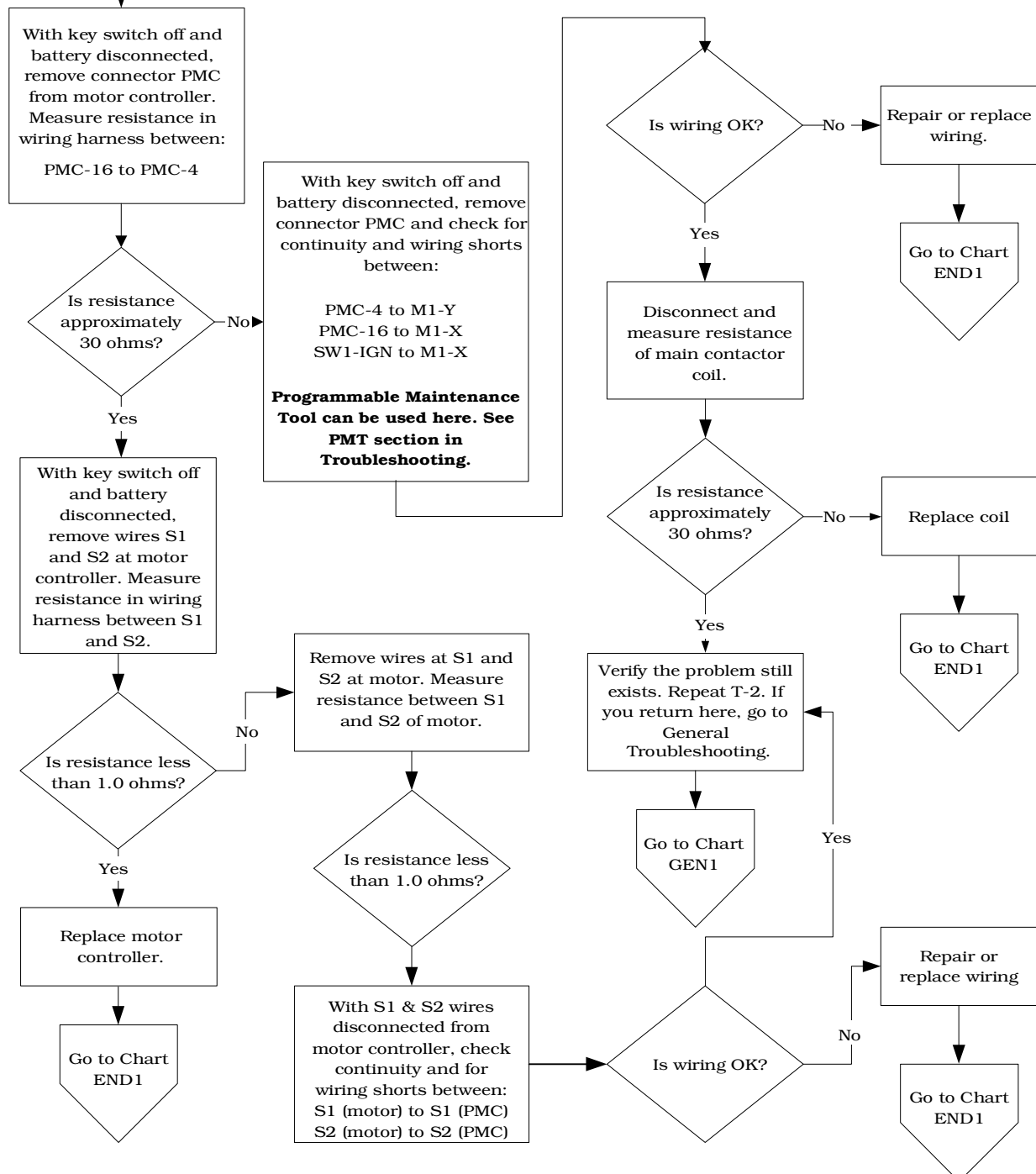
Enter Parameters

1. Disconnect the PMT from the motor controller that you used to “clone” parameters.
2. Turn the key switch OFF. Remove the tractor cover.
3. Turn the key switch ON.
4. Reconnect the PMT to the motor controller you want to program.
5. Press and hold the More Info key, and press the Program key. Release both keys after you enter Special Program mode.
6. Scroll through the modes using the Scroll Display keys until “PROG SETTINGS-CONT” is the top line in the display.
7. Press the More Info key again. The PMT will prompt you to acknowledge (load programming settings in controller) or cancel.

H-1: No Lift, Lift Motor Does Not Run, Travel is OK



**T-2: No Travel in Either Direction, Lift/Lower OK.
Motor Controller Fault Code 3,1.**



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below

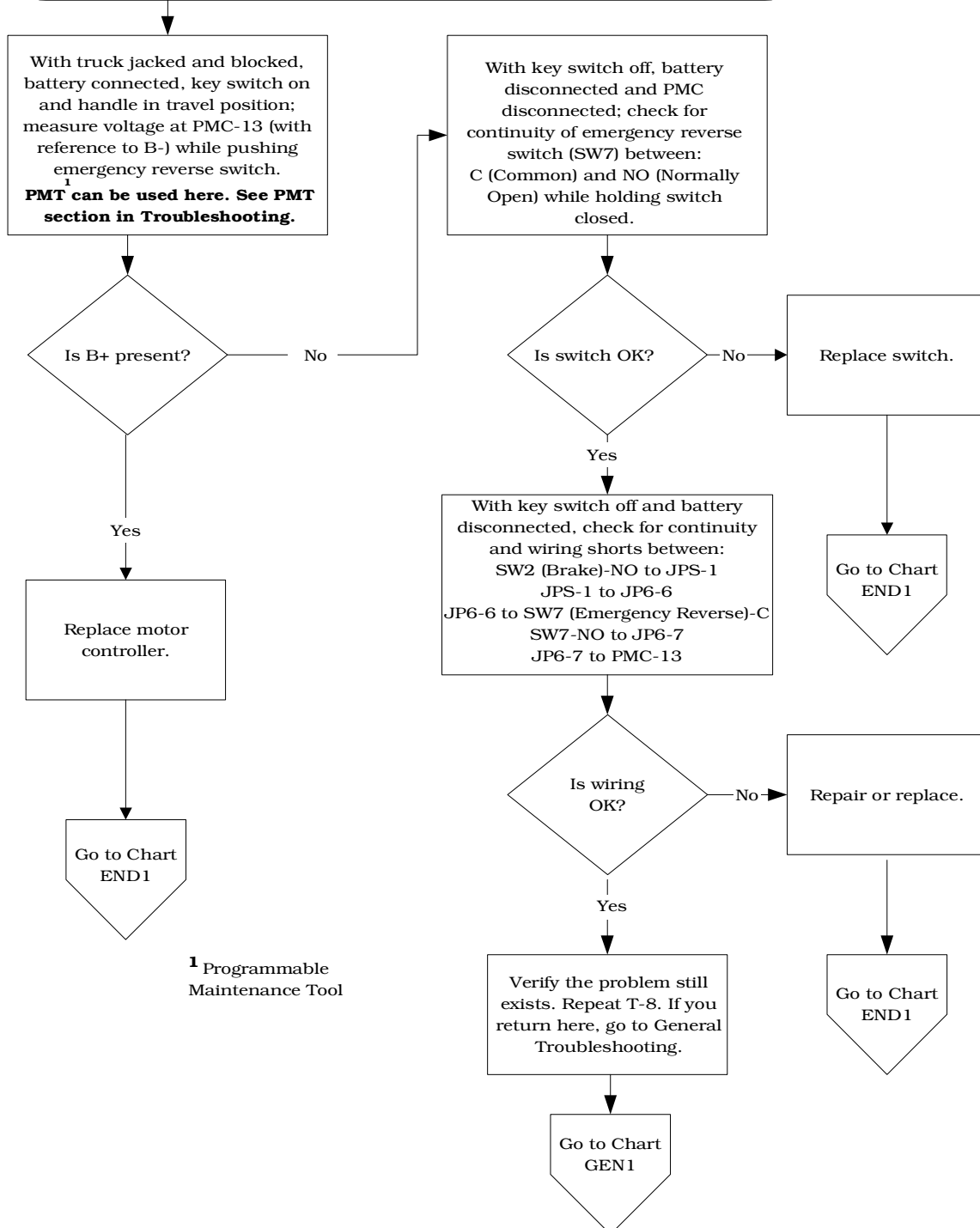


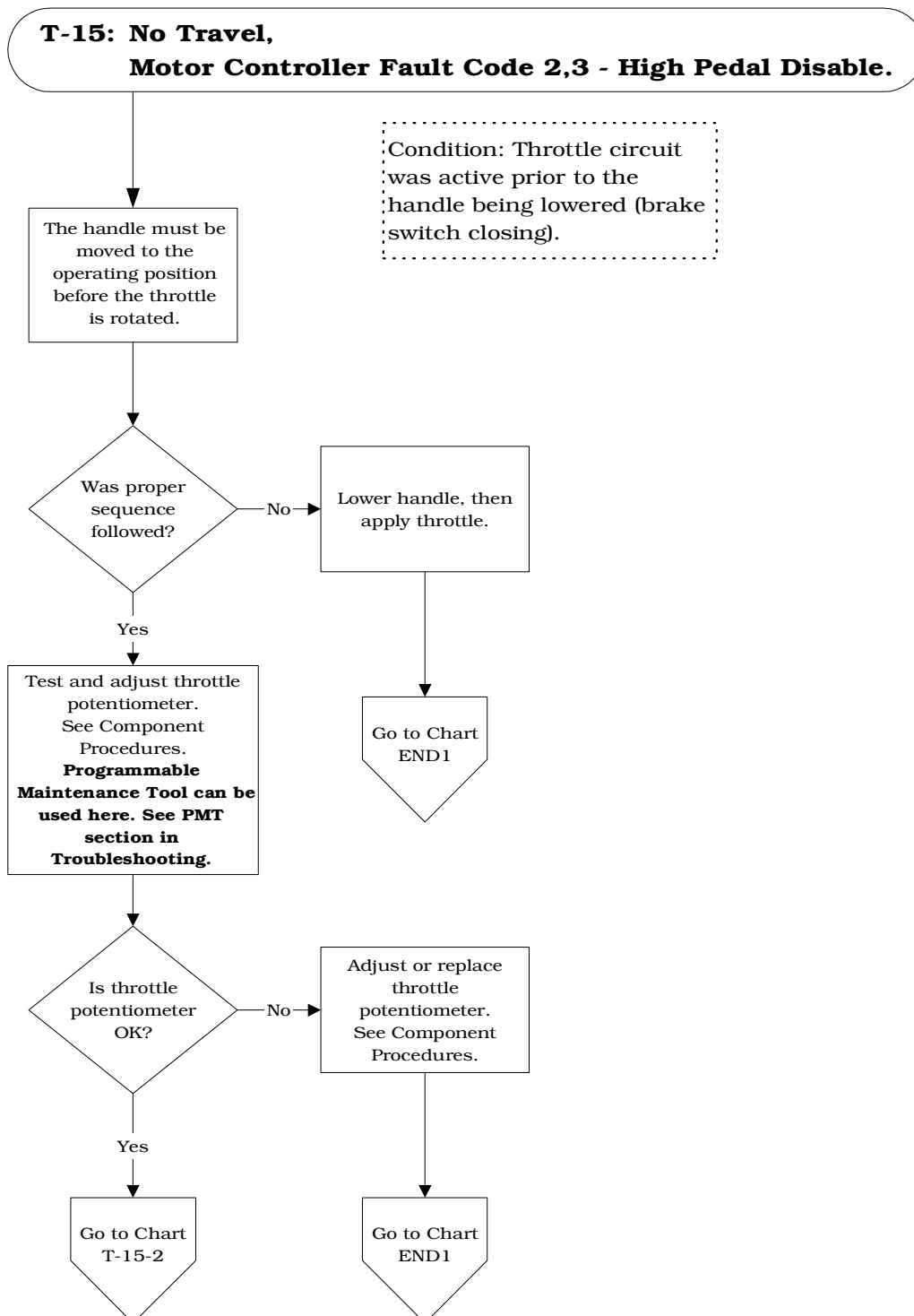
- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

T-8: No Emergency Release, Travel/Lift/Lower OK

**T-8: No Emergency Reverse, Travel/Lift/Lower OK.
No Motor Controller Fault Codes.**





Component Locator Photos

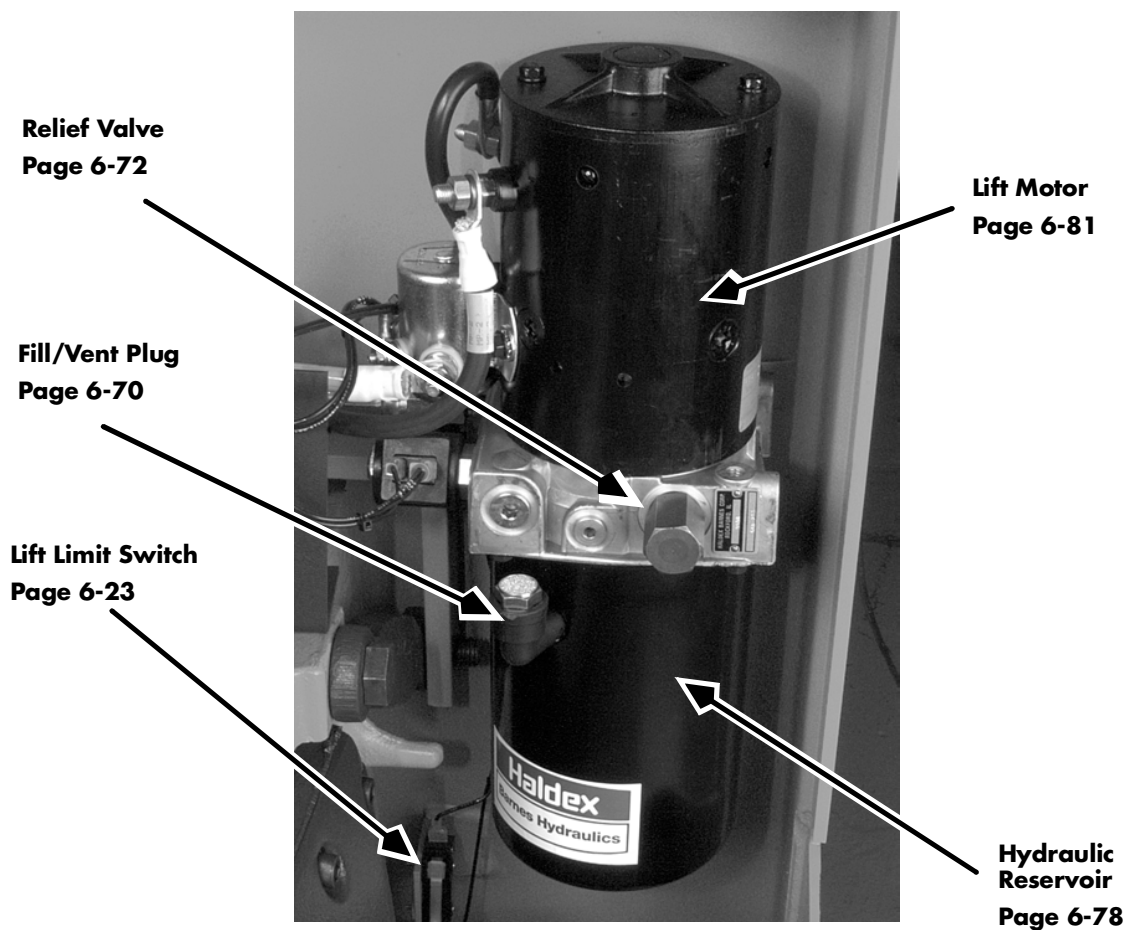


Figure 6-2: Hydraulic Components

Power Cables

Power Cables

Power cables should be checked for damage, including:

- Evidence of overheating
- Burned spots in the cable
- Nicks in the insulation
- Damaged or overheated terminal lugs
- Damaged mounting hardware or brackets

Repair or replace damaged cables or mounting hardware as necessary.

Power cables are marked on the terminal lug with the location where they belong. If the marking is missing or is not readable, remark the cable with the correct information.

The terminal lugs should be crimped tightly and securely on the wire. Replace the lug if overheating is evident and repair or replace faulty connectors as necessary.

Brake (Deadman) Switch

Removal

1. Lower the forks completely.
2. Turn the key switch OFF and disconnect the battery connector.
3. Remove the drive unit cover.
4. Disconnect the wires on the brake (deadman) switch.
5. Remove the screws holding the brake (deadman) switch on the mounting bracket. See Figure 6-13.
6. Remove the brake (deadman) switch.

Installation

1. Mount the brake (deadman) switch to the mounting bracket.
2. Connect the wires to the brake (deadman) switch.
3. Reconnect the battery connector and turn the key switch ON.
4. Test drive the truck.
5. Adjust the switch if necessary. See "Brake (Deadman) Switch" on page 6-21.
6. Turn the key switch OFF and disconnect the battery connector.
7. Install the drive unit cover.
8. Reconnect the battery connector.

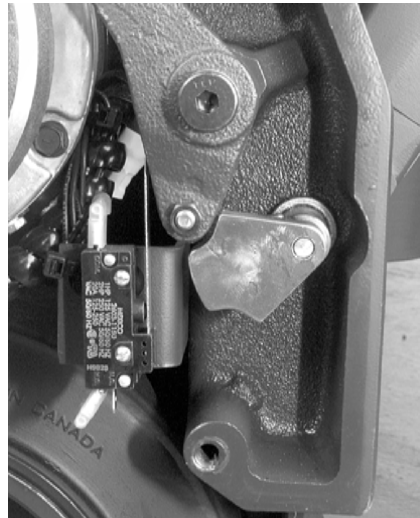


Figure 6-14: Brake (Deadman) Switch Active

Horn

Horn

NOTE: The horn can be sounded with the key switch in the OFF position.

Removal

1. Turn the key switch OFF and disconnect the battery connector.
2. Remove the tractor cover.
3. Disconnect the two wires from the horn.
4. Remove the horn mounting bolt. See Figure 6-21.

Installation

1. Attach the horn to the tractor frame and tighten the mounting bolt. See Figure 6-21.
2. Attach the two wires.
3. Reconnect the battery connector and test operation.
4. Turn the key switch OFF and disconnect the battery connector.
5. Install the tractor cover.
6. Reconnect the battery connector.

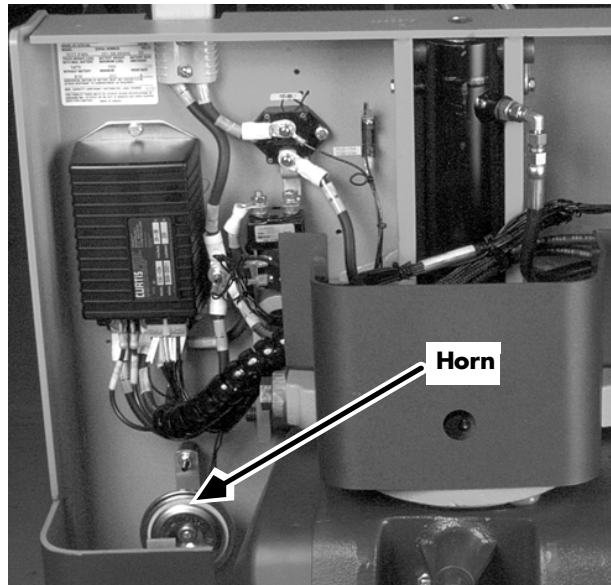


Figure 6-20: Horn Location

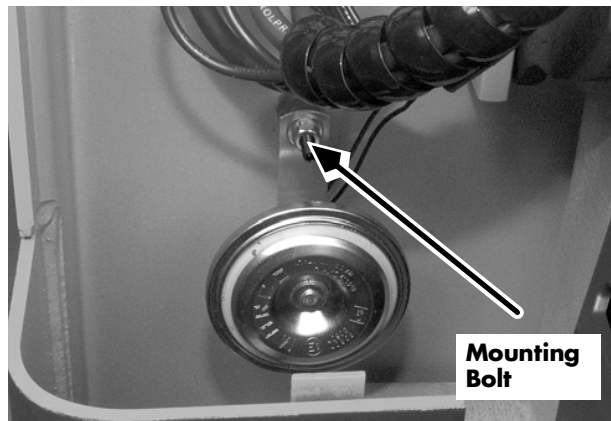


Figure 6-21: Removing Horn

Motors, General

Drive Motor Brushes

Inspection

Conduct a partial inspection of the drive motor after every 1,000 hours of truck operation. If you work in an abnormally severe or caustic environment or if you have a rigorous duty cycle, inspect the motor more frequently.

Set up and rigidly adhere to a strict inspection schedule to obtain the maximum efficiency from the electrical equipment.

Each partial inspection of the motor should include the following:

1. Inspect the brushes for wear and for proper contact with the commutator. Record the level of wear on the brushes. This history will give you an indication of whether a brush should be changed or if it can wait until the next inspection. Refer to page 6-49 for acceptable brush length and general motor information.

NOTE: Overloading a unit is ultimately reflected in the motor and brush wear; therefore, you must take this into account when considering brush replacement.

2. Check brush spring tension. See "Drive Motor Brush Spring Tension" on page 6-49.
3. Clean brushes and holders. Wipe the commutator with a dry, lint-free cloth. **DO NOT USE** lubricants of any kind on or around the commutator.
4. Check brush holders for solid connection to the mounting support. Tighten the mounting screws as necessary.
5. Check the cap screws holding the brush cross connectors to the brush holder body.
6. Make sure the motor terminals are secured tightly to the motor frame. Be careful not to strip the threads or crush the insulating parts.

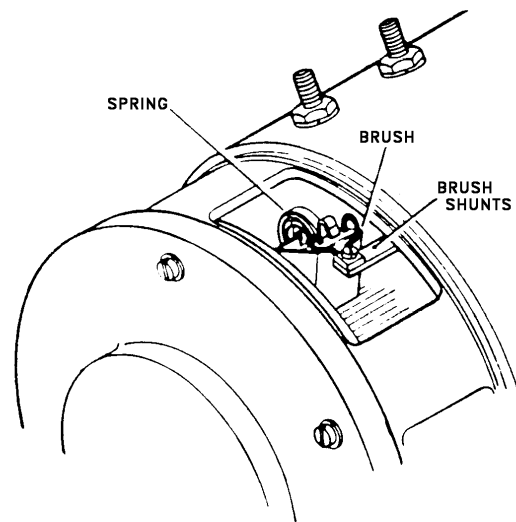


Figure 6-37: Drive Motor Brush, Typical Location

Drive Unit

Removal

1. Lower the forks. Turn the key switch OFF. Disconnect the battery connector.

▲WARNING

Use extreme care whenever the truck is jacked up. Keep hands and feet clear from vehicle while jacking the truck. After the truck is jacked, place solid blocks beneath it to support it. DO NOT rely on the jack alone to support the truck.

For details, see “Jacking Safety” on page 2-13.

2. Jack the truck and block the frame.
3. Remove the drive unit fill plug and drain screw (lower cover screw). See Figure 6-42. Allow the gear oil to drain.
4. Remove the tractor cover.
5. Disconnect the control wiring harness and power cables from the electrical panel. Use two wrenches to avoid twisting the motor stud.
6. Remove the control handle. See “Control Handle” on page 6-29.
7. Remove the pivot bearing retaining nut. See Figure 6-43.

▲WARNING

Transmission assembly may fall free from mounting after nut is removed.

8. Remove the transmission assembly by lowering through the mounting bracket.
9. Remove the control wiring harness and power cable through the transmission pivot mount.

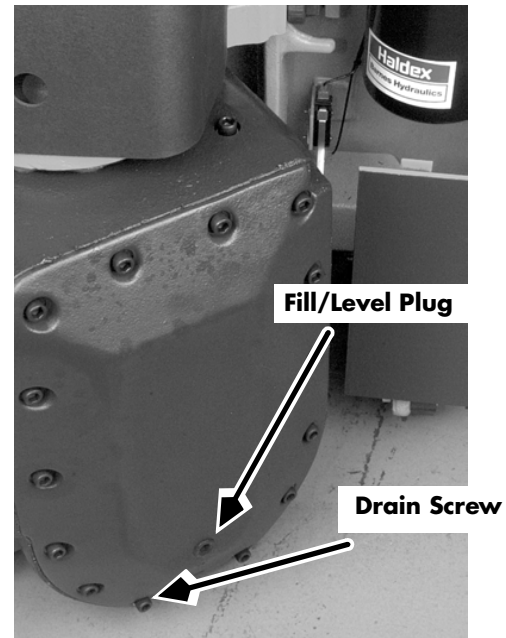


Figure 6-42: Drive Unit Fill Plug

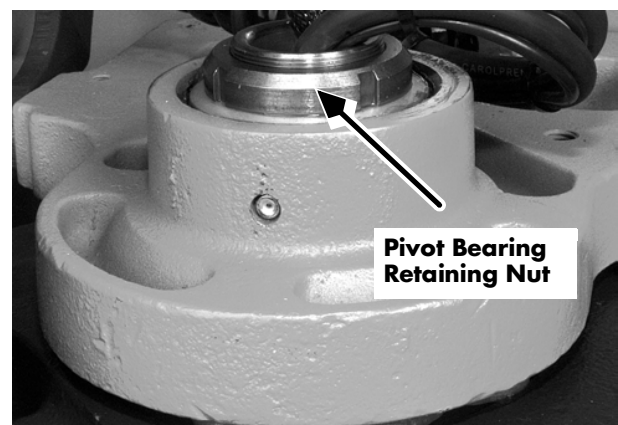


Figure 6-43: Pivot Bearing Retaining Nut

Load Wheels

Replacement

1. Lift the forks to maximum height and block them. See “Jacking Safety” on page 2-13.
2. With a hammer and pin punch, drive out the tension pin. See Figure 6-48.
3. Drive the axle out of the load arm casting with a hammer and brass drift pin. See Figure 6-49.
4. Push the tire out. Note the location of the washers and pin. See Figure 6-50.
5. If the bearings are to be reused, insert a brass drift pin into each end of the load wheel and knock the bearings out.
6. Install the bearings in the load wheel with the shields facing out.
7. Place the new load wheel upright on a flat surface. Position the bearing over the load wheel. Place a flat metal plate over the bearing, and hammer the bearing in place with a plastic mallet. Make sure the bearing is fully seated in the load wheel.
8. Align the tire and washers with the holes in the load arm casting.
9. Drive the axle through the load arm casting, tire and washers. Make sure the pin hole in the axle aligns with the housing.
10. Install the tension pin.
11. Lubricate the grease fittings.



Figure 6-48: Removing Tension Pin



Figure 6-49: Removing Axle From Load Arm Casting

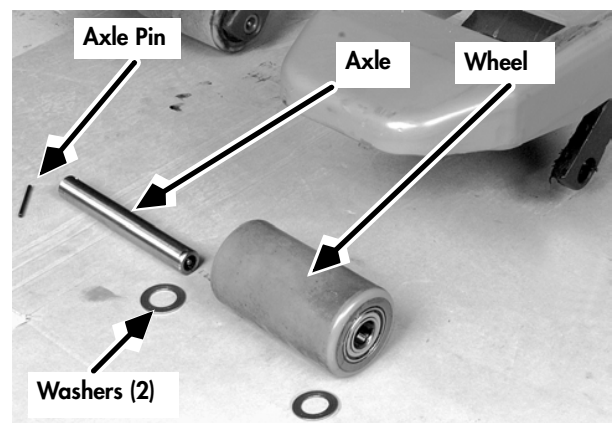


Figure 6-50: Removed Load Wheel and Components

Hydraulic Unit

Draining and cleaning the hydraulic reservoir is important to control the accumulation of condensation and contamination which damage the hydraulic system.

Condensation is caused by the repeated heating and cooling of hydraulic fluid during normal operation. Contaminants include dirt, rust, scaling and products of fluid deterioration.

Removal

The hydraulic pump and motor assembly must be removed from the truck in order to separate the pump from the motor.

1. Lower the forks completely.
2. Disconnect the battery. Remove the access cover and the key switch mounting bracket.
3. Remove and tag all wires and cables connected to the pump motor. See Figure 6-58.
4. Remove and cap the hydraulic line from the hydraulic unit. Disconnect the solenoid control.
5. Remove the bolts that secure the hydraulic unit mounting bracket to the tractor frame.
6. Remove the hydraulic unit from the truck.

Installation

1. Install the hydraulic unit on the tractor frame and secure with the previously removed cap screws.
2. Install the hydraulic line on the hydraulic unit.
3. Fill the reservoir with the specified hydraulic fluid. See "Lubrication Equivalency Chart" on page 7-2. Use a funnel with a flexible neck. Fill the reservoir only until the fluid is visible at the bottom of the vent plug elbow. See Figure 6-58. Use up to 1.5 quarts (1.41 liters).
4. Install the vent plug. See Figure 6-58.
5. Connect all wires and cables to the pump motor. Connect the battery.

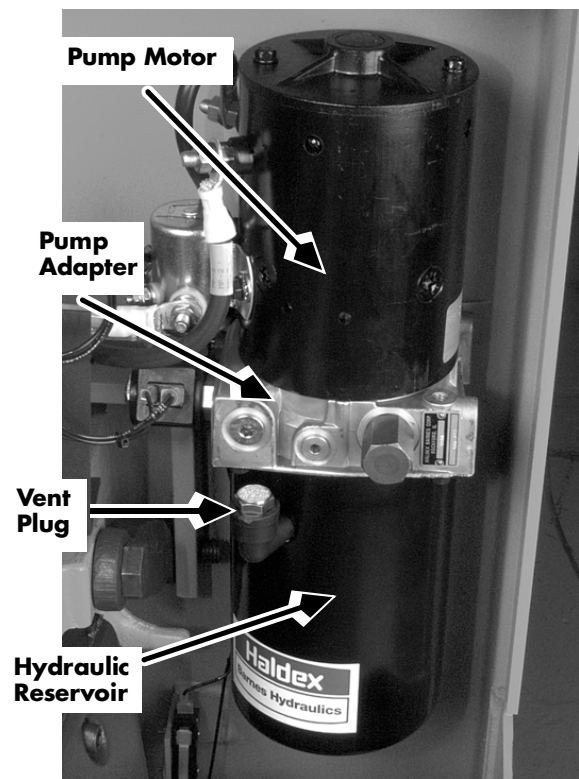


Figure 6-58: Hydraulic Unit

Lubrication Equivalency Chart

Approved Raymond Lubricants			
Where Used	Type	Approved Manufacturer	Raymond Part Number
Bearings, etc.	Grease	Chevron Avi-Motive Grease Citgo HEP2 (above 30° F only) Exxon RONEX MP or UNIREX N2 Gulf Gulfcrown Grease No. 2 Mobil Grease 77 Phillips Philube 1B and RB Grease Shell Alvania Grease EP2 Sohio Bearing Guard "LT" Texaco Regal AFB 2 Grease MIL-G-18709A	990-620/01 (10 cartridges per case) 990-620/02 (5 gal./ 18.9 liters)

Figure 7-1: Lubrication Equivalency Chart

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to **CLICKING** the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL