Service and Maintenance Manual

Model
60HT
60HTH

3120257
August 01, 1989

ANSI

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

e. Lubricant Key.

Table 1-2. Lubrication Specifications.

KEY	SPECIFICATIONS
MPG	Multipurpose Grease having a minimum dripping point of 350 degrees F. Excellent water resistance and adhesive qualities, and being of extreme pressure type (Timken OK 40 pounds minimum).
EPGL	Extreme pressure gear lube (oil) meeting API service classification GL-5 or Mil-Spec MIL-L-2105.
HO	Hydraulic oil. API Service Classification GL-3, SAE 10W-20, Viscosity Index 152, e.g. Kendall Hyken 052.
EO	Engine (crankcase) oil. Mil-Spec MIL-L-2104.

Note

Refer to Lubrication Chart, Figure 1-1 for specific lubrication procedures.

NOTES:

1. **Crankcase oils must meet API Service Classification:**
   a. **Gas - SF, SF-SE, SF-CC, SF-CD, MS, SD**
   b. **Diesel - CD-SE, CD-SF**
2. **Hydraulic oils must have anti-wear qualities at least to API Service Classification GL-3, and sufficient chemical stability for mobile hydraulic system service, (e.g. Kendall Hyken 052).**
3. **Temperatures listed in above hydraulic oil chart are system cold start to maximum operating temperature.**
4. **For machines equipped with a steering wheel, hydraulic oil must be diluted with diesel fuel by 20% when ambient temperature is below 20° F (-7° C.). System capacity is approximately 60 U.S. gallons (227.10 L). Add 12 U.S. gallons (45.42 L) diesel fuel after draining an equivalent amount of hydraulic fluid. Diesel fuel will dissipate gradually over time so that this would need to be done each winter as necessary.**

1-6. PRESSURE SETTINGS.

a. Proportional Valve, Racine w/Gear Pump

(1). Main Relief - 2900 PSI.

(2). Drive - 2900 PSI.

(3). Lift Up - 2900 PSI.
Lift Down - 1100 PSI.

(4). Swing - 1200 PSI.

b. Proportional Valve, HPI w/Piston Pump

(1). Main Relief - 3000 PSI.

(2). Drive - 3000 PSI.

(3). Lift Up - 3000 PSI.
Lift Down - 1100 PSI.

(4). Swing - 1200 PSI.

Note

Allowable variance for above pressures - plus or minus 5%.

Note

The pilot pressure is factory set and normally should not require adjusting. Adjust only if you notice poor or sluggish response to proportional functions or loss of auxiliary power.

c. Proportional Valve, Vickers.

(1). Main Relief - 3400 PSI.

(2). Drive - 3200 PSI.

(3). Lift Up - 2500 PSI (Plus 150 PSI, Minus 0)
Lift Down - 1200 PSI.

(4). Swing - 1100 PSI.

Note

Allowable variance for above Vickers pressures, plus or minus 150 PSI, except lift up.

(5). Sequence Valve - 400 PSI.

(6). Pilot Pressure - 600 PSI.

d. Solenoid Valve

(1). Main Relief - 2500 PSI.

(2). Telescope

(a). In - 2500 PSI.
(b). Out - 1500 PSI.

(3). Cloudy oils indicate a high moisture content which permits organic growth, resulting in oxidation or corrosion. If this condition occurs, the system must be drained, flushed, and refilled with clean oil.

(4). Aside from JLG recommendations, it is not advisable to mix oils of different brands or types, as they may not contain the same required additives or be of comparable viscosities. Good grade mineral oils, with viscosities suited to the ambient temperatures in which the machine is operating, are recommended for use.

Note

Metal particles may appear in the oil or filters of new machines due to the wear-in of meshing components.

b. Hydraulic Oil.

(1). Refer to Table 1-1 for recommendations for viscosity ranges for gear pumps and gerotor motors.

(2). SAE 10W-20 is the best all round recommendation and JLG Industries recommends Kendall Hyken 052 hydraulic oil, which has an SAE viscosity of 10W-20 and a viscosity index of 152.

Note

Start-up of hydraulic system with oil temperatures below -15° F. is not recommended. If it is necessary to start the system in a sub-zero environment, it will be necessary to heat the oil with a low density, 100V ac heater to a minimum temperature of -15° F.

(3). The only exception to the above is to drain and fill the system with Mobil DTE 11 oil or its equivalent. This will allow start-up at temperatures down to -20° F. However, use of this oil will give poor performance at temperatures above 120° F. Systems using DTE 11 oil should not be operated at temperatures above 200° F. under any condition.

c. Changing Hydraulic Oil.

(1). Use of any of the recommended crankcase or hydraulic oils eliminates the need for changing the oil on a regular basis. However, filter elements must be changed after the first 40 hours of operation and every 250 hours thereafter. If it is necessary to change the oil, use only those oils meeting or exceeding the specifications appearing in this manual. If unable to obtain the same type of oil supplied with the machine, consult local suppliers for assistance in selecting the proper equivalent. Avoid mixing petroleum and synthetic base oils. JLG Industries recommends changing the hydraulic oil annually.

(2). Use every precaution to keep the hydraulic oil clean. If the oil must be poured form the original container into another, be sure to clean all possible contaminants from the service container. Always clean the mesh element of the filter and replace the cartridge any time the system oil is changed.

(3). While the unit is shut down, a good preventive maintenance measure is to make a thorough inspection of all hydraulic components, lines, fitting, etc., as well as a functional check of each system, before placing the machine back in service.

d. Lubrication Specifications.

Specified lubricants, as recommended by the component manufacturers, are always the best choice, however, multi-purpose greases usually have the qualities which meet a variety of single purpose grease requirements. Should any question arise, regarding the use of greases in maintenance stock, consult your local supplier for evaluation. Refer to Table 1-2 for an explanation of the lubricant key designations appearing in the Lubrication Chart.

2-4. CYLINDERS - THEORY OF OPERATION.

a. Cylinders are of the double-acting type. Systems incorporating double-acting cylinders are as follows: Lift, Telescope, Platform Leveling and Steer. A double-acting cylinder is one that requires oil flow to operate the cylinder rod in both directions. Directing oil (by actuating the corresponding control valve to the piston side of the cylinder) forces the piston to travel toward the rod end of the barrel, extending the cylinder rod (piston attached to rod). When the oil flow is stopped, movement of the rod will stop. By directing oil to the rod side of the cylinder, the piston will be forced in the opposite direction and the cylinder rod will retract.

b. Holding valves are used in the Lift, Telescope and Slave Level circuits to prevent retraction of the cylinder rod, should a hydraulic line rupture or a leak develop between the cylinder and its related control valve.

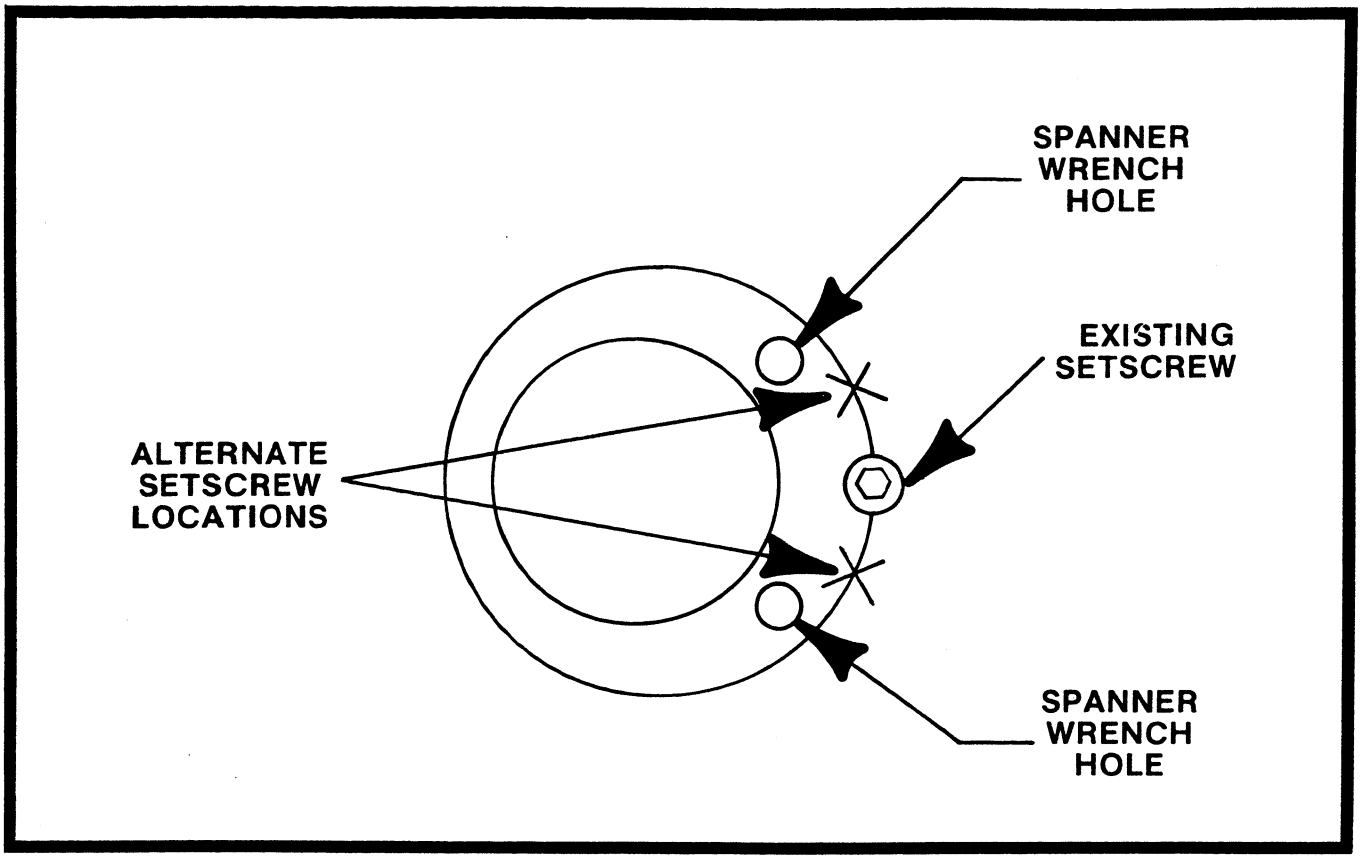


Figure 2-3. Telescope Cylinder Eccentric Bushing.

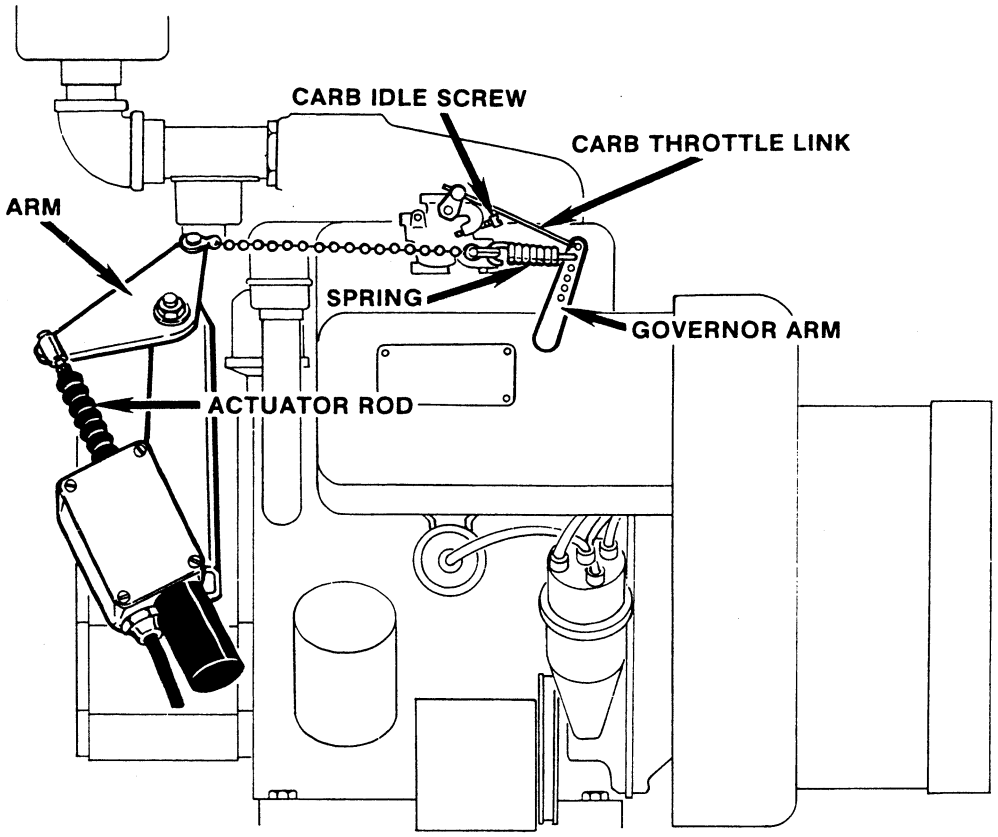


Figure 2-9. Throttle Adjustment, V465D. Typical.

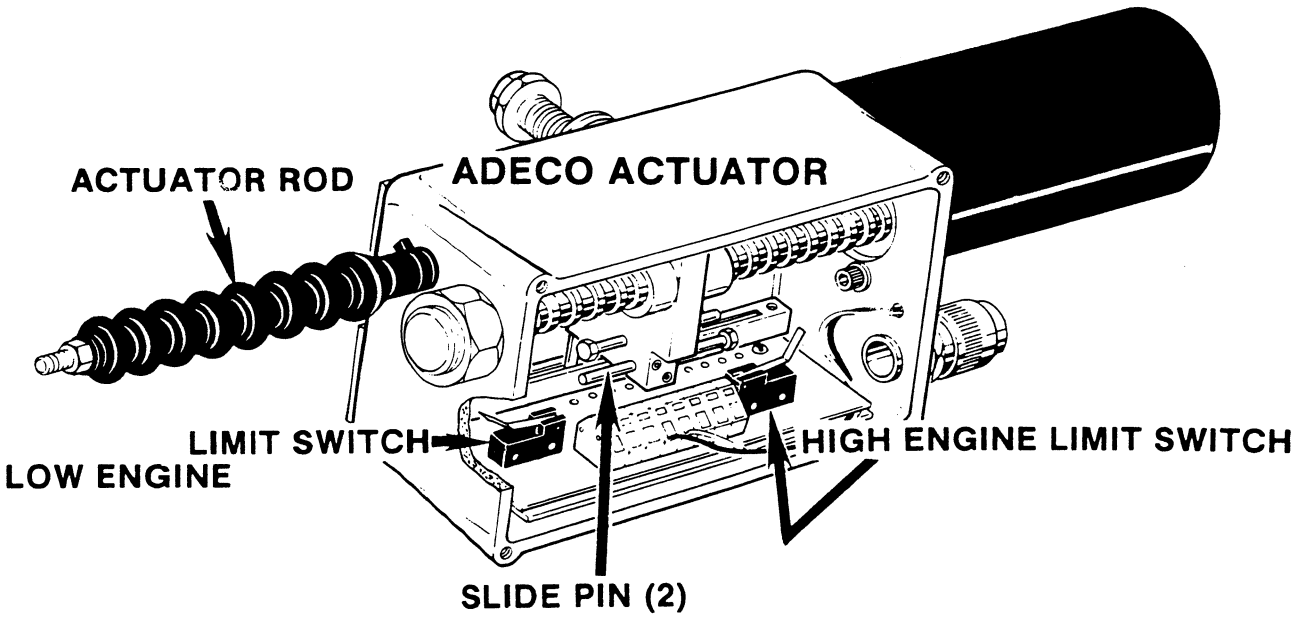


Figure 2-10. Adeco Actuator Adjustment, V465D.

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

2-21. SWING BEARING.

a. Wear Tolerance.

(1). From the underside of the machine, at rear center, with the boom fully elevated and fully retracted (See Figure 2-16a), using a magnetic base dial indicator, measure and record the distance between the swing bearing and frame. (See Figure 2-17.)

(2). At the same point, with the boom at horizontal and fully extended (See Figure 2-16 b) using a magnetic base dial indicator, measure and record the distance between the swing bearing and frame. (See Figure 2-17.)

(3). If you determine a difference greater than .057" (1.45 mm) the swing bearing needs replacing.

b. Replacement and Devcon Application Procedures.

(1). **Removal.**

(a). From the ground control station, operate the boom lift control and raise the boom adequately to provide access to the rotary coupling.

WARNING

NEVER WORK BENEATH THE BOOM WITHOUT FIRST PROVIDING ADEQUATE OVERHEAD SLING SUPPORT AND/OR BLOCKING.

(b). Attach an adequate support sling to the boom and draw all slack from the sling. Block the boom if feasible.

(c). From the under side of the machine frame, remove the bolts and lockwashers which attach the retaining yoke of the rotary coupling to the coupling housing.

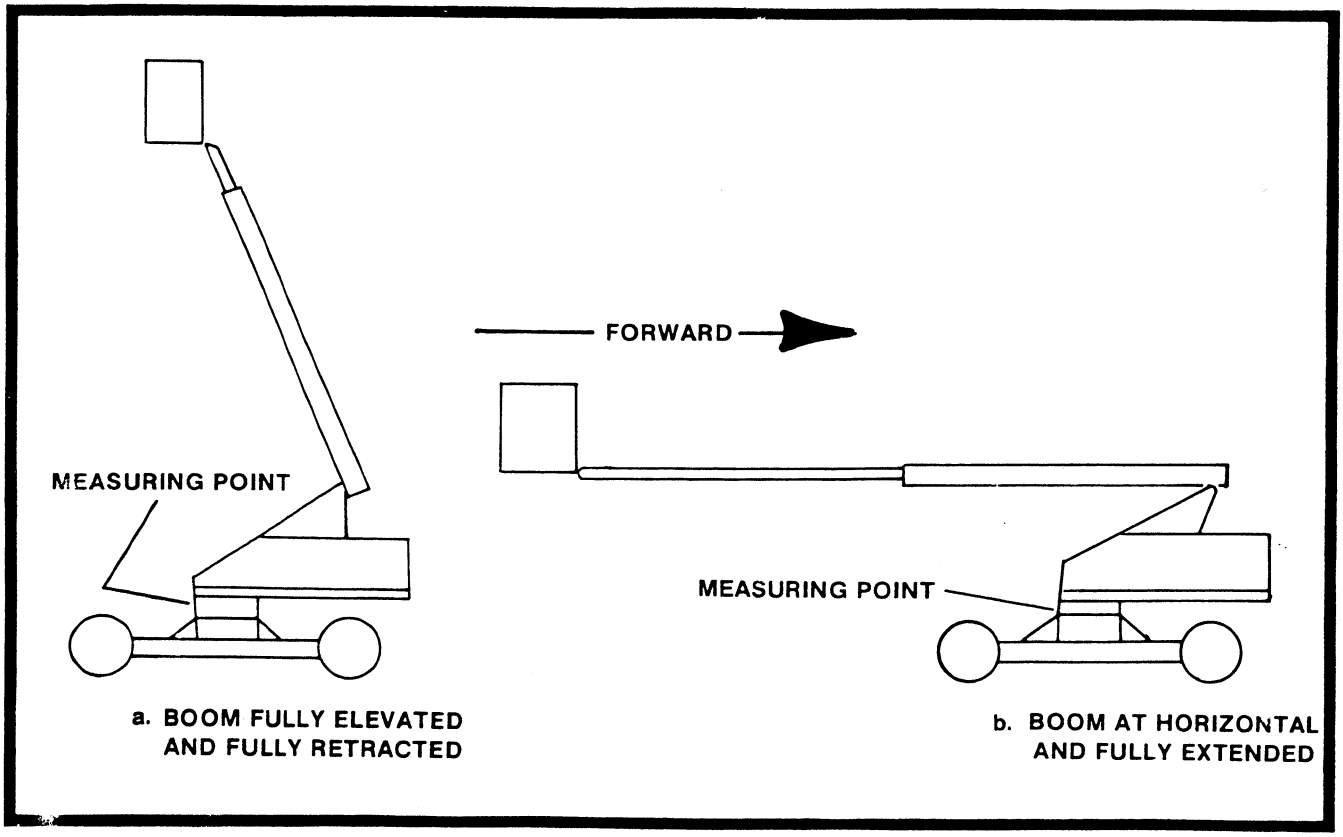


Figure 2-16. Swing Bearing Tolerance Boom Placement.

(7). Insert separators (19) over spiral pins in housing (26). Separators will contact top of bottom disc (20) when properly installed.

(8). Install new o-ring (8), new backup ring (9), new o-ring (11), and new backup ring (12) on piston (10). Insert piston (10) into end cover (4) being careful not to shear o-rings or backup rings. Inserting 1/4-20UNC bolts in piston may simplify installation.

(9). Install new o-ring (6), new bearing (7), new square ring, pipe plug (3), and bleeder screw (13) in end cover.

(10). Position end cover (4) on housing aligning dowel pin (23) with holes in end cover.

(11). Install capscrews (1) and lockwashers (2). Tighten evenly to draw end cover (4) to housing and bearing (7) onto shaft (15). Torque capscrews to 55 ft. lbs. (7.6 Kgm).

Note

If available, a hydraulic press will simplify installation of end cover on housing. Clamp cover in position while tightening the capscrews.

(12). Press on inner ring of bearing (7) until it shoulders on shaft (15) to eliminate binding on bearings. Be certain to restrain opposite end of shaft to avoid excessive thrust loading on bearing (24).

IMPORTANT

PRESS FORCE SHOULD BE LIMITED TO 2000 LBS (907.2 KG) MAXIMUM TO AVOID POSSIBLE DAMAGE TO SNAP RING (14).

IMPORTANT

IF HYDROSTATIC BENCH TESTING IS PERFORMED ON THE BRAKE ASSEMBLY, RELEASE PRESSURE SHOULD NOT EXCEED 2000 PSI (140.6 KG/CM²) UNLESS TWO ADDITIONAL BOLTS ARE USED FOR SUPPLEMENTAL CLAMPING.

d. Bleeding.

(1). Install brake and connect pressure lines.

(2). Bleed pressure release section of brake by pressurizing side inlet port and allowing air to escape from top port. Pressure should not exceed 100 PSI (7.03 Kg/cm²) during bleeding.

(3). Apply sufficient pressure to release brake and check for proper operation.

2-27. DRIVE BRAKE, MICO.

(See Figure 2-22)

a. Disassembly.

(1). Remove end cover (4) from housing (25) by removing capscrews (1) and lockwashers (2).

WARNING

END COVER IS UNDER SPRING TENSION OF APPROXIMATELY 1500 POUNDS (681 KG). THE FOUR CAPSCREWS SHOULD BE LOOSENED EVENLY TO RELIEVE THIS FORCE. IF A HYDRAULIC PRESS IS AVAILABLE (3000 LBS (1362 KG) MAXIMUM), THE COVER CAN BE HELD IN POSITION WHILE REMOVING THE CAPSCREWS AND LOCKWASHERS.

(2). Tap cover with a soft mallet in order to dislodge bearing (7) from cover.

(3). Remove o-ring (6), square ring (5), pipe plug (3), and bleederscrew (13) from end cover.

(4). Remove piston (10) from end cover by inserting two 1/4-20UNC bolts into threaded holes in piston. By turning and pulling, piston can be removed from bore.

(5). Remove o-ring (8), back-up ring (9), o-ring (11), and back-up ring (12) from piston.

(6). Remove separators (19) from housing (25).

(7). Remove shaft assembly (consisting of shaft (14), discs (15,19) friction discs (17), springs (16), and bearings (7,23) from housinging by pressing or using a soft mallet on male end of shaft.

(8). Remove springs (16) from between tabs of discs (15,19).

(9). Remove bearings (7,23) from shaft using an appropriate bearing puller. The discs and friction discs will then slide off either end of shaft.

(10). Remove dowel pins (22), springs (20,21) and oil seal (24) from housing (25).

b. Inspection.

(1). Clean all parts thoroughly.

SECTION 3 — TROUBLESHOOTING

3-1. GENERAL.

a. This section contains troubleshooting information to be used for locating and correcting most of the operating problems which may develop in the Model 60HT aerial platform. If a problem should develop which is not presented in this section or which is not corrected by listed corrective actions, technically qualified guidance should be obtained before proceeding with any maintenance.

b. Troubleshooting and maintenance information pertaining to the prime mover (engine) that are not contained in this manual are contained in the applicable engine maintenance manual.

3-2. TROUBLESHOOTING INFORMATION.

a. The troubleshooting procedures applicable to the Model 60HT aerial platform are listed and defined in Tables 3-1 through 3-6. As an aid to table use, the aerial platform is divided into six major groups, each covered separately within this section. These groups are as follows: platform assembly, boom assembly, turntable assembly, frame assembly, hydraulic system and electrical system.

b. Each malfunction within an individual group or system is followed by a listing of probable causes which will enable determination of the applicable remedial action. The probable causes and the remedial action should, where possible, be checked in order listed in the tables.

c. It should be noted that there is no substitute for a thorough knowledge of the equipment and related systems.

d. It should also be recognized that the majority of the problems arising in the machine will be centered in the hydraulic and electrical systems. For this reason, every effort has been made to ensure that all likely problems in these areas are given the fullest possible treatment. In the remaining machine groups only those problems which are symptomatic of greater problems of which have more than one probable cause and remedy are included. This means that problems for which the probable cause and remedy may be immediately obvious are not listed in this section.

e. The first rule for troubleshooting any circuit that is hydraulically operated and electrically controlled is to determine if the circuit is lacking hydraulic oil or electrical control power. This can be ascertained by overriding the bypass valve (mechanically or electrically) so that oil is available to the function valve, then overriding the function valve mechanically. If the function performs satisfactorily, the problem exists with the control circuit.

3-3. HYDRAULIC CIRCUIT CHECKS.

The first reference for improper function of a hydraulic system, where the cause is not immediately apparent, should be the Troubleshooting Chart. The best place to begin the problem analysis is at the power source (pump). Once it is determined that the pump is serviceable, then a systematic control of the circuit components, beginning with the control would follow. For aid in troubleshooting, refer to the illustrated parts manual for hydraulic diagrams of the various circuits.

Table 3-3. Turntable Assembly Troubleshooting.

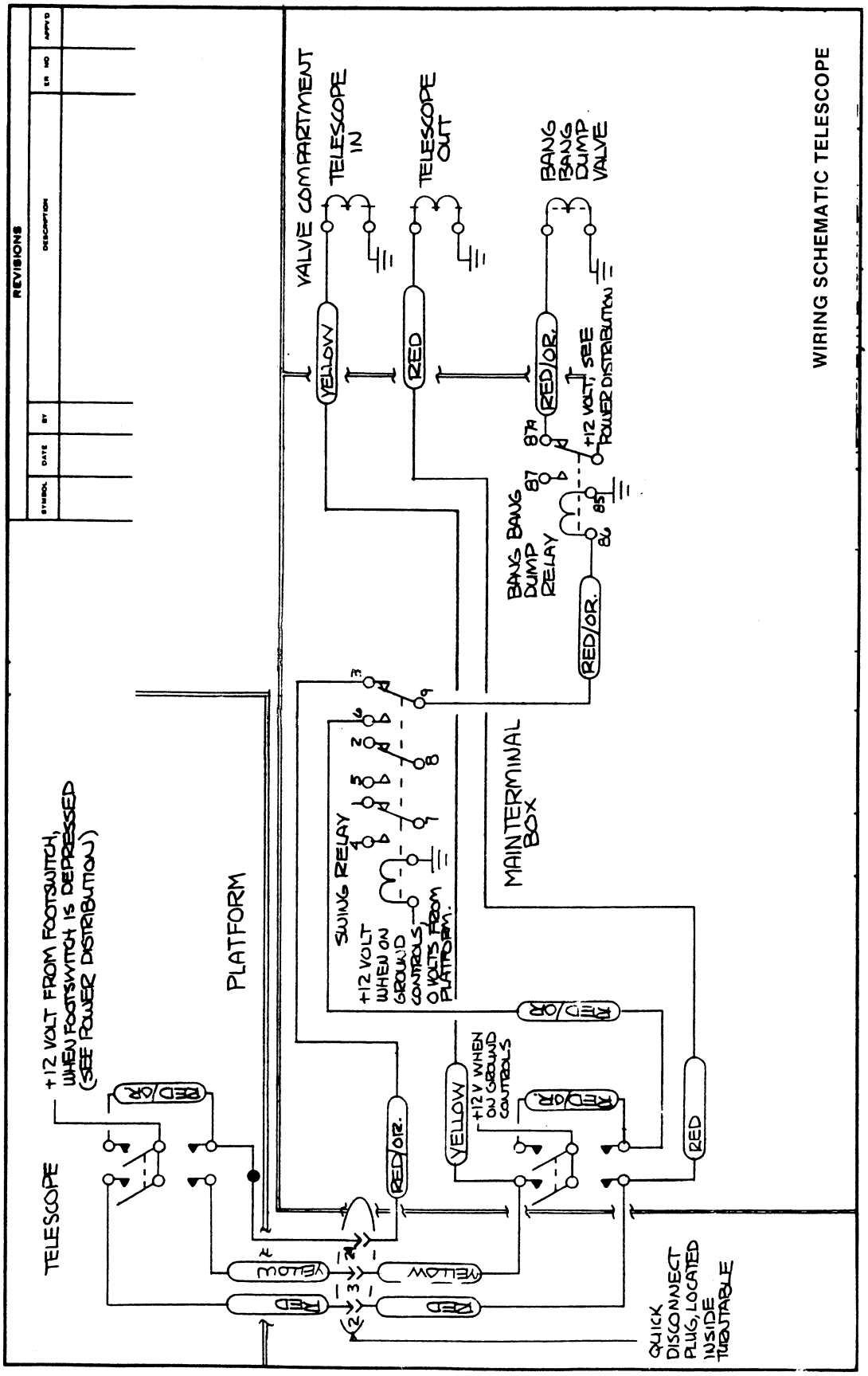
TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
Control Valves.		
Valve spool sticking.	Dirt in oil causing excessive temperature build-up.	Change oil using recommended viscosity and flush system.
	Incorrect valve mounting causing warping of the unit.	Loosen valve and check mounting. Repair as necessary.
	Valve spool scored.	Remove valve and repair or replace as necessary.
	Return spring weak or broken.	Remove valve and repair or replace as necessary.
	Relief valve malfunctioning causing excessive pressure within valve.	Check pressure delivery to and from valve and repair or replace as necessary.
Valve leaking.	Dirt or other foreign material under seal.	Remove and repair valve as necessary.
	Valve spool scored.	Remove valve and repair or replace as necessary.
	Excessive back pressure caused by restricted return line to reservoir.	Remove line and clear obstruction or replace line as necessary.
	Damaged valve seals.	Remove valve and repair or replace as necessary.
Fuel System.		
Strong fuel odor during machine operation.	Fuel tank overfilled.	Check fuel tank and immediately wipe up any spilled fuel.
	Fuel tank damaged.	Drain all fuel from tank and remove tank for replacement or repair.
	Fuel line from tank damaged.	Replace fuel line.
	Adjustments on fuel system not set properly.	Adjust fuel system per manufacturers specifications.

Table 3-6. Electrical Systems Troubleshooting.

TROUBLESHOOTING CHART

TROUBLE	PROBABLE CAUSE	REMEDY
Valve will not function when handle is moved in either direction.	Blown fuse.	Replace fuse.
	No electrical power to handle.	Check electrical input to handle (12 v).
	No electrical signal to valve.	Check electrical valve output of printed circuit board and electrical signal at the valve.
	Select relay bad.	Replace select relay.
	Failed printed circuit handle.	Replace square wave generator or use a handle assembly that is presently working in the system.
	Broken wires.	See wiring diagram.
	Failed open control handle safety deadman switch.	Check and replace safety deadman switch.
	Improper ground.	Check for proper grounding of handle.
Functions occur in the opposite direction than required in regard to handle movement.	Valve coils are reversed.	Reverse the control valve coils.
Control valve does not respond to command.	Controller does not provide signal (60 ma maximum required).	Replace controller.
	Open wire in control cable.	Replace cable.
	Shorted terminal connector.	Check for terminal and contacting case or poor clamping of wire ends on terminal strip.
Cylinder drifts or drive motor slowly rotates when controller is returned to neutral (high null bias).	Controller failed resulting in a command at neutral position.	Adjust or replace microswitch.


WIRING SCHEMATIC TELESCOPE
REVISIONS
SYMBOL
DATE
BY
DESCRIPTION
ECN NO
APP'D
VALVE COMPARTMENT
TELESCOPE IN
TELESCOPE OUT
BANG BANG DUMP VALVE
YELLOW
RED
RED/OR.
+12 VOLT, SEE POWER DISTRIBUTION
87A
87
85
86
BANG BANG DUMP RELAY
MAIN TERMINAL BOX
SWING RELAY
+12 VOLT WHEN ON GROUND CONTROLS
0 VOLTS FROM PLATFORM.
PLATFORM
+12 VOLT FROM FOOTSWITCH, WHEN FOOTSWITCH IS DEPRESSED (SEE POWER DISTRIBUTION)
TELESCOPE
+12V WHEN ON GROUND CONTROLS
QUICK DISCONNECT PLUG, LOCATED INSIDE TURNTABLE

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