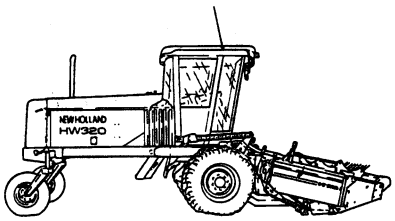
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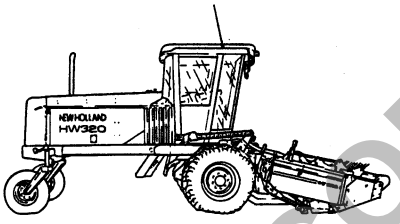


SPEEDROWER® SELF-PROPELLED WINDROWER REPAIR

HW300, HW320, HW340

Vol. 1

86589299



SPEEDROWER® SELF-PROPELLED WINDROWER REPAIR

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HW300, HW320, HW340 REPAIR MANUAL CONTENTS



SECTION 1 - ELECTRICAL SYSTEMS

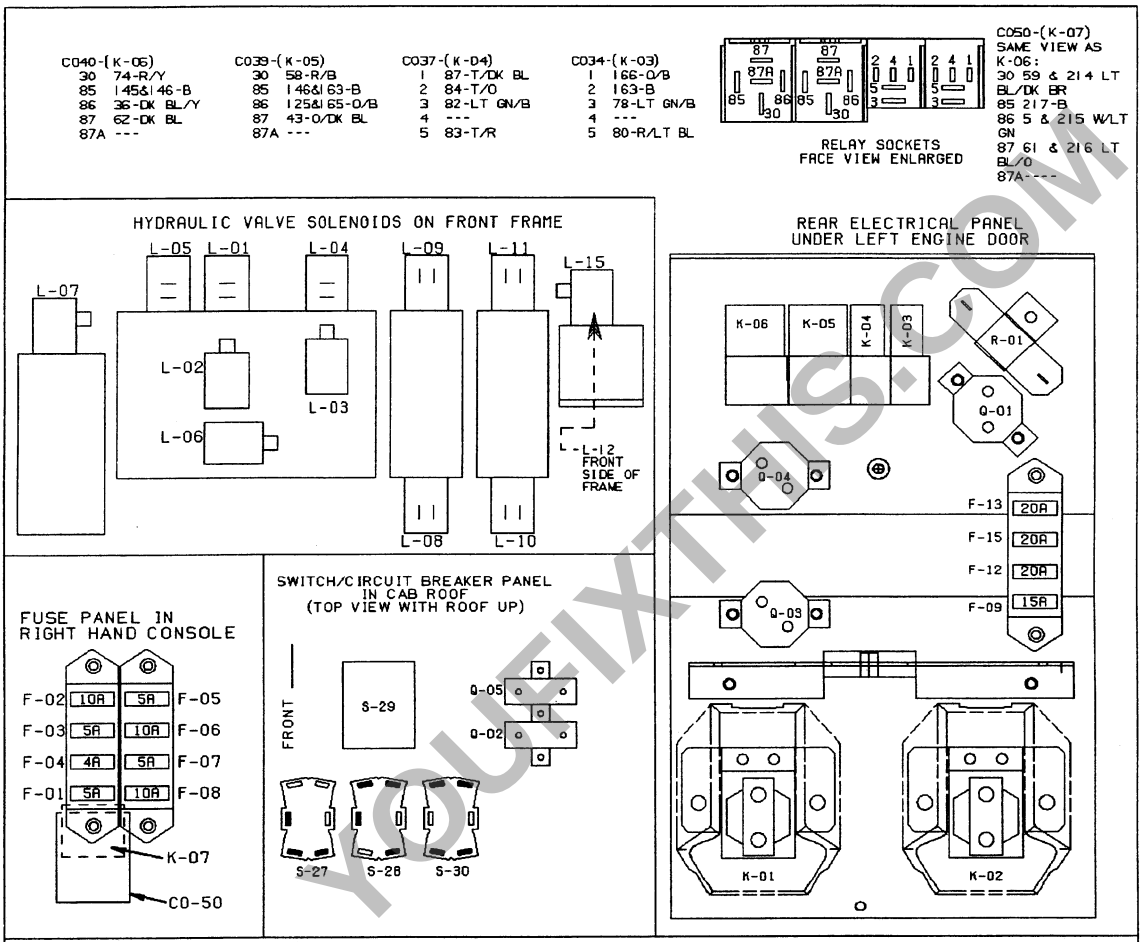
SECTION 2 - HYDRAULIC SYSTEMS
SECTION 3 - HYDROSTATIC SYSTEM
SECTION 4 - FINAL DRIVES
SECTION 5 - BRAKE SYSTEM
SECTION 6 - ENGINE
SECTION 7 - AIR CONDITIONING

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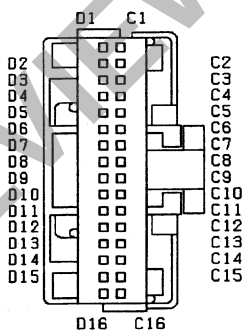
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FRAME A - COMPONENTS AND CONNECTORS - ALL MODELS



ELECTRONIC CONTROLLER
LOCATED INSIDE RIGHT CONSOLE

EIC- C001 P1
& C002 P2



C001 P1

C1	177-R (POWER UP DISPLAY)
C2	79-T (SEAT SWITCH)
C3	52-Y/LT GN (TRANSMISSION NEUTRAL SW.)
C4	55-R/B (DISPLAY TOP ROW SEL SW.)
C5	71-PU/R (HEADER LOWER SWITCH)
C6	8-Y (HEADER LIFT SWITCH)
C7	136-GY/R (HEADER REVERSE SWITCH)
C8	85-T/LT BL (HEADER TILT UP SWITCH)
C9	70-PU/W (FUEL LEVEL SENDER)
C10	69-PU/B (ENGINE OIL PRESSURE)
C11	77-PU/DK GN (ENGINE COOLANT TEMP.)
C12	3-W (HYDRAULIC OIL TEMP. SW.)
C13	-------
C14	53-Y/DK BR (AIR FILTER SWITCH)
C15	68-PU (HYDRALIC CHARGE PRESS. SW.)
C16	199-LT BL (2-SPEED SWITCH)
D1	66-DK BL/W (WORK LIGHT SWITCH)
D2	196-DK GN/Y (HEADER SPEED DECREASE)
D3	133-PU/LT BL (RIGHT TRIM INC (FLOAT ADJ.))
D4	-------
D5	-------
D6	-------
D7	178-LT BL (DISPLAY-CLOCK)
D8	180-DK BL (DATA OUT)
D9	179-GY (DATA IN)
D10	81-T/B (HEADER DRIVE SWITCH)
D11	76-LT GN (LEFT TRIM INC (FLOAT ADJ.))
D12	202-O/LT GN (LEFT TRIM DECREASE SW.)
D13	114-B/PU (FUEL RETURN)
D14	195-DK GN/R (HEADER SPEED INCREASE)
D15	203-PU/PK (RIGHT TRIM DECREASE SW.)
D16	174-Y/PK (OIL LEVEL SWITCH)

C002 P2

C1	25-R/LT GN (CONTROLLER V-BATT)
C2	26-R/LT GN (CONTROLLER V-BATT)
C3	57-O/LT BL (KEYSWITCH "ON" POSITION)
C4	216-LT BL/O (FUEL SOLENOID DRIVER)
C5	176-T/LT GN (BRAKE LIGHT RIGHT DRIVE)
C6	175-T/Y (BRAKE LIGHT LEFT DRIVE)
C7	30-DK BR/LT GN (RIGHT TURN SIGNAL DRIVE)
C8	7-W/PU (HYDRALIC MASTER DRIVE)
C9	73-PU/Y (HEADER LOWER DRIVER (FLOAT I))
C10	--------
C11	44-DK BR/Y (LEFT TURN SIGNAL DRIVE)
C12	12-W/GY (HEADER LIFT DRIVER)
C13	-------
C14	36-DK BL/Y (WORK LIGHT RELAY DRIVE)
C15	93-GY/Y (HEADER FORWARD DRIVE)
C16	96-B/R (HEADER REVERSE DRIVE)
D1	102-B (CONTROLLER V-BATT RTN)
D2	197-R/LT GN (CONTROLLER V-BATT)
D3	198-R/LT GN (CONTROLLER V-BATT)
D4	182-B/O (DISPLAY MODULE PWR RTN)
D5	181-O (DISPLAY POWER OUT)
D6	51-Y/B (SENSOR +5VOLT OUTPUT)
D7	4-W/LT GN (KEYSWITCH "START" POSITION)
D8	-------
D9	45-PU/O (ENGINE RPM)
D10	42-PK (HEADER RPM)
D11	41-O/Y (GROUND SPEED RIGHT)
D12	-------
D13	-------
D14	-------
D15	-------
D16	-------

FRAME -A

COMPONENTS AND CONNECTORS

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Figure 1-89

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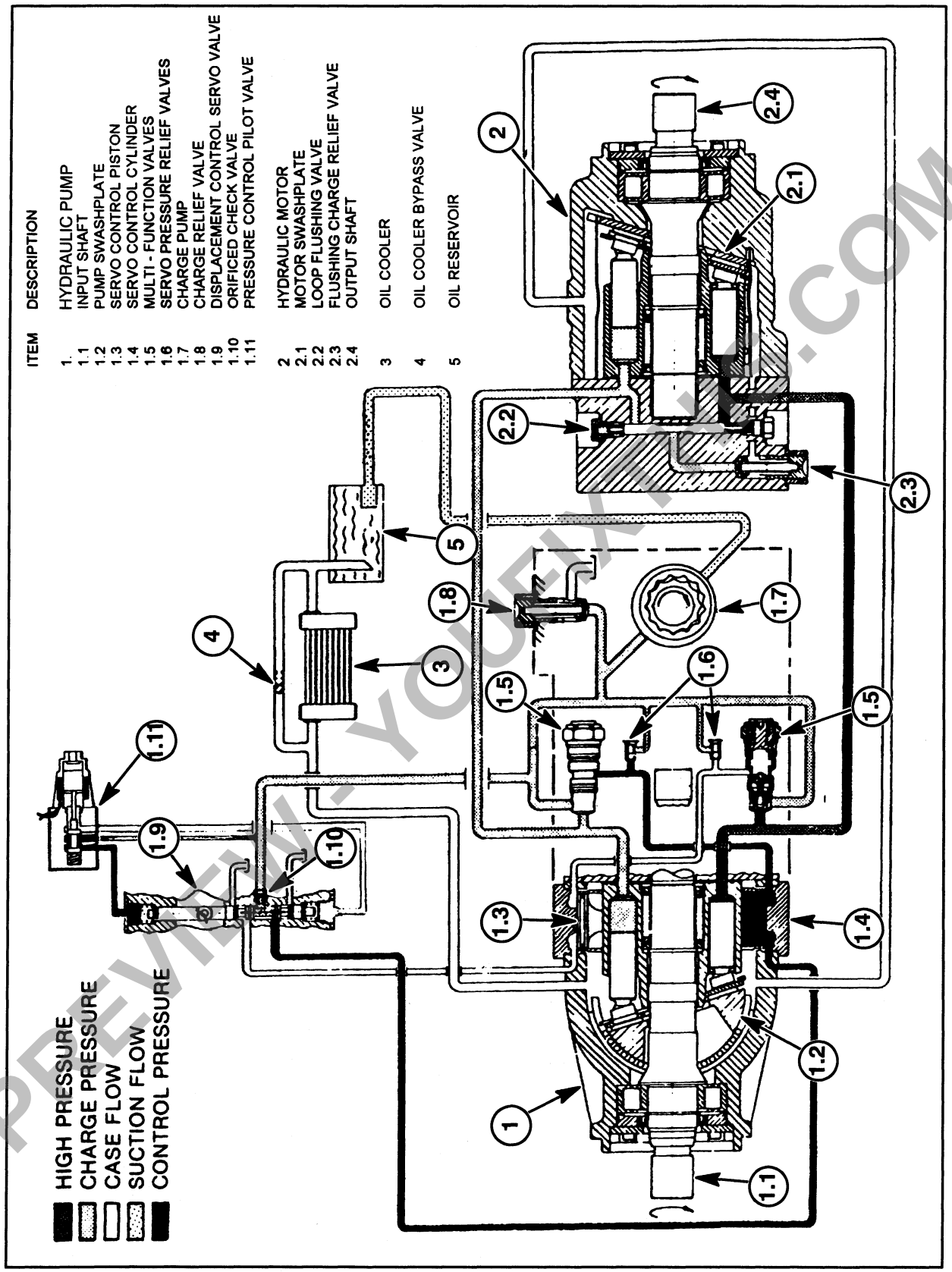


Figure 2-31

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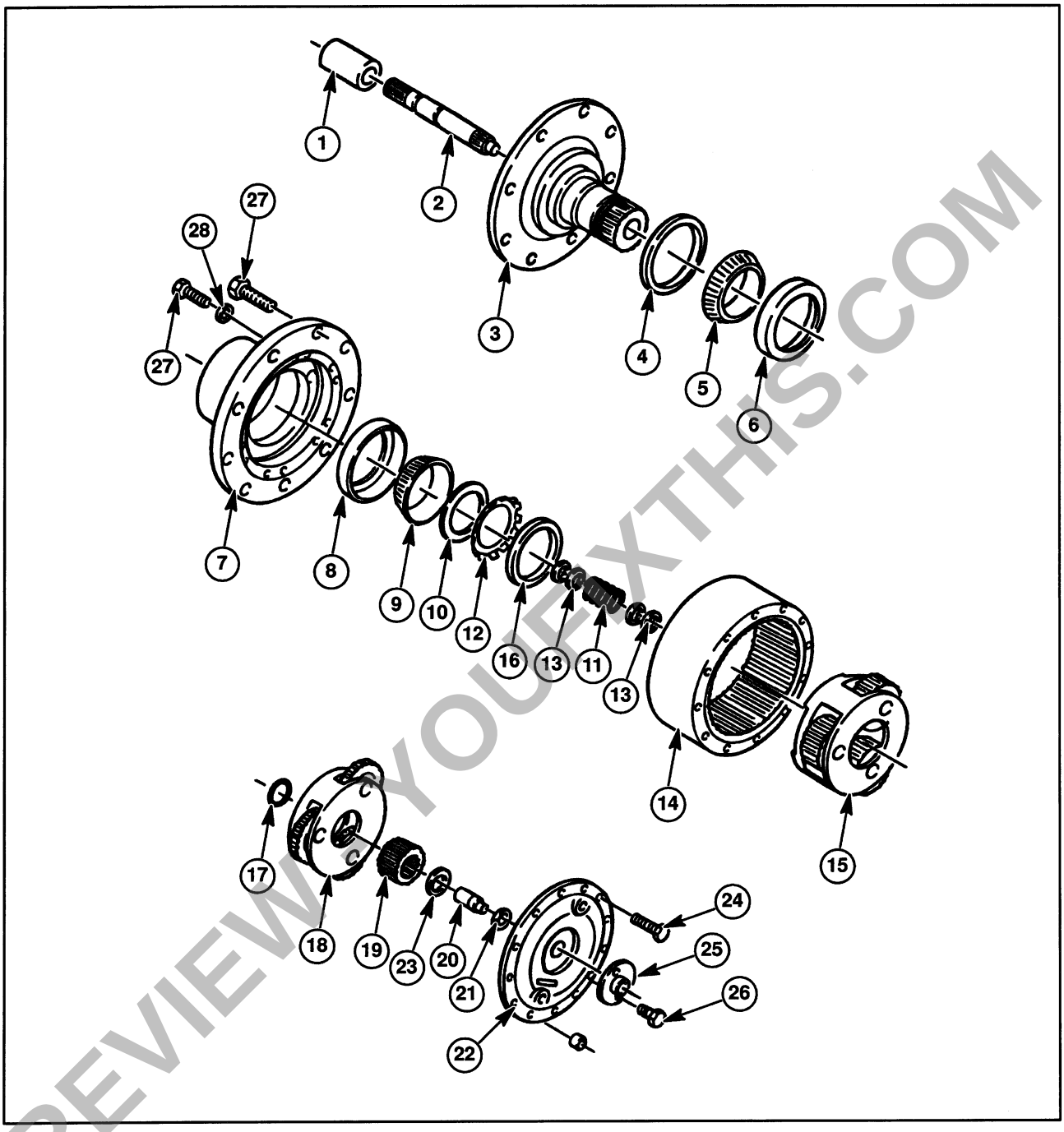


Figure 4-12

Parts Layout

1. Coupler
2. Shaft
3. Spindle
4. Oil Seal
5. Bearing
6. Bearing Cup
7. Hub
8. Bearing Cup
9. Bearing
10. Thrust Washer
11. Spring
12. Lock Washer
13. Thrust Washer
14. Ring Gear
15. Secondary Carrier
16. Bearing Nut
17. Thrust Washer
18. Primary Carrier
19. Sun Gear
20. Plunger
21. Retaining Ring
22. Final Drive Cover
23. Thrust Washer
24. Retaining Bolt
25. Plunger Cover
26. Retaining Screw
27. Ring Gear Retaining Bolt
28. Washer

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TORQUE VALUES - VARIOUS	N·m	ft. lbs.
Balancer Bolts	115	85
Camshaft Gear Bolt	58	43
Camshaft Idler Drive Gear-to-Block	237	175
Camshaft Gear Plate Bolts	38	28
Connecting Rod Bolts	146	108
Connecting Rod Nuts	109	80
Cover Bolts (Blanks Oil Drilling)	31	23
Crankshaft Pulley-to-Crankshaft	224	210
Crankshaft Rear Oil Seal Retainer		
Initial Tightening	11	8
Final Tightening	20	15
Cylinder Head Bolts (with Engine Cold)	217	160
Dynamic Balancer - Cylinder Block	88	65
Exhaust Manifold-to-Cylinder Head	38	28
Exhaust Pipe-to-Flange	31	23
Fan-to-Pulley Bolts	27	21
Flywheel-to-Crankshaft	197	145
Front Adaptor Plate-to-Cylinder Block	19	14
Idler Gear-to-Block	237	175
Injector Attachment Bolts	23	17
Injector Line Nuts	24	18
Injection Pump-to-Front Adaptor Plate	24	18
Injecion Pump-to-Gear Nut	51	38
Intake Manifold-to-Cylinder Head	35	26
Leak-off Tube Banjo Fitting Bolts	11	8
Main Bearing Bolts	197	145
Oil Filter Retaining Bolts	65	48
Oil Filter Mounting Bolt Insert	34	25
Oil Pan Drain Plug	41	30
Oil Pan-to-Cylinder Block	34	25
Oil Pressure Switch Assembly	31	33
Oil Pump-to-Block	49	36
Self-Locking Screw - Valve Rocker Arm	24	18
Single Fan-to-Pulley Nose Thread	27	21
Starter Motor-to-Rear Adapter Plate	31	23
Thermostat Housing Bolts	24	18
Turbocharger-to-Exhaust Manifold Nut	44	33
Valve Rocker Cover Bolts	24	18
Water Pump Cover-to-Pump	27	20
Water Pump-to-Cylinder Block	48	35
Water Pump Bypass Hose Clamps	24	18

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TROUBLESHOOTING

Problem	Possible Causes	Remedy
Engine overheats	Hose connection leaking or collapsed	Tighten hose connection, renew hose if damaged
	Radiator cap defective or not sealing	Renew radiator cap
	Radiator leakage	Repair/renew radiator
	Improper fan belt adjustment	Readjust fan belt
	Radiator fins restricted	Clean with compressed air
	Faulty thermostat	Renew thermostat
	Internal engine leakage	Check for source of leakage, renew gasket or defective parts
	Water pump faulty	Overhaul water pump
	Exhaust gas leakage into cooling system	Renew cylinder head gasket, check head for damage or distortion
	Coolant aeration	Tighten all connections and check coolant level is correct. Ensure cylinder head gasket has not blown
	Cylinder head gasket improperly installed	Renew cylinder head gasket
	Hot spot due to rust and scale or clogged water jackets	Reverse, flush entire cooling system
	Obstruction to radiator air flow	Remove the obstruction
	Extended engine idling	Do not allow engine to idle for long periods
	Oil cooler tube blocked	Clean
	Radiator core tubes blocked	Check free flow
Water temperature gauge fails to reach normal operating temperature	Faulty temperature sender	Renew sender switch
	Incorrect or faulty thermostat	Renew thermostat
	Faulty water temperature gauge	Renew temperature gauge

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START-UP PROCEDURE

Follow this start-up procedure any time you remove the pump or motor from the system, whether for replacement or service.

WARNING: THE FOLLOWING PROCEDURE MAY REQUIRE YOU TO DISABLE THE WINDROWER, RAISING THE WHEELS OFF THE GROUND AND LOCKING OR DISCONNECTING THE HEADER. DISABLE THE MACHINE DURING SERVICE TO PREVENT INJURY.

1. Inspect the pump or motor for shipping damage prior to installing it. All system components (reservoir, hoses, valves, fittings, heat exchanger, etc.) should be clean prior to filling them with fluid.
2. Fill the reservoir with 134D hydraulic fluid passed through a 10-micron (nominal, no bypass) filter. Fill the inlet line leading from the reservoir to the pump prior to start-up. Tighten the fittings properly and keep the inlet line free of restrictions and air leaks.
3. Fill the pump and motor with clean hydraulic fluid prior to start-up. Fill the housing by pouring filtered hydraulic fluid into the upper case drain port.
4. Install a 70 bar (1000 PSI) pressure gauge in the charge pressure port to monitor charge pressure during start-up.
5. Disconnect the electric displacement control (EDC) wire plug, which is at the pressure control pilot valve on the pump.
6. Disconnect the fuel solenoid wire from the injection pump to keep the engine from starting.
7. Crank the engine until charge pressure shows on the gauge. Recheck the oil level in the hydraulic reservoir before starting the engine.

   IMPORTANT: Do not continuously operate the starter motor for more than 30 seconds at a time. Let the starter motor cool for at least two minutes after operating for 30 seconds.

WARNING: DO NOT START THE ENGINE UNLESS THE PUMP IS IN NEUTRAL (0° SWASH PLATE ANGLE). KEEP THE HANDBRAKE ON, THE WINDROWER BLOCKED UP, AND/OR THE HEADER LOCKED OR DISCONNECTED. ACCIDENTAL MOVEMENT OF THE WINDROWER OR HEADER DURING START-UP CAN CAUSE INJURY.

8. Once the pressure gauge indicates charge pressure, reconnect the fuel solenoid wire and start the engine. With the engine running, minimum charge pressure should be 22.8 bar (330 PSI). If the charge pressure is too low, shut off the engine and determine the cause of the problem.
9. If necessary, bleed excess air from the high-pressure lines through the high-pressure gauge ports.
10. With the engine shut off, reconnect the electric displacement control (EDC) wiring connector at the pressure control pilot valve on the header drive pump.
11. Recheck the oil level in the hydraulic oil reservoir before operating the hydraulic system.
12. Start the engine but do not allow the header drive to rotate.
13. With the engine running at 2100 RPM, run the header forward and reverse. The header should stop when the header drive pump is in neutral (0° swash plate angle).

    If you are pressure-testing without the header, the pressure should increase at only one high-pressure port on the pump when it engages in forward. The pressure should increase in the other port when the header drive engages in reverse.

    Charge pressure at the pump should remain at 22.8 bar (330 PSI) with the header drive in both forward and reverse.

    The high-pressure ports on the pump should be at equal pressure with the header drive in neutral.

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Header Drive - Header Not Running

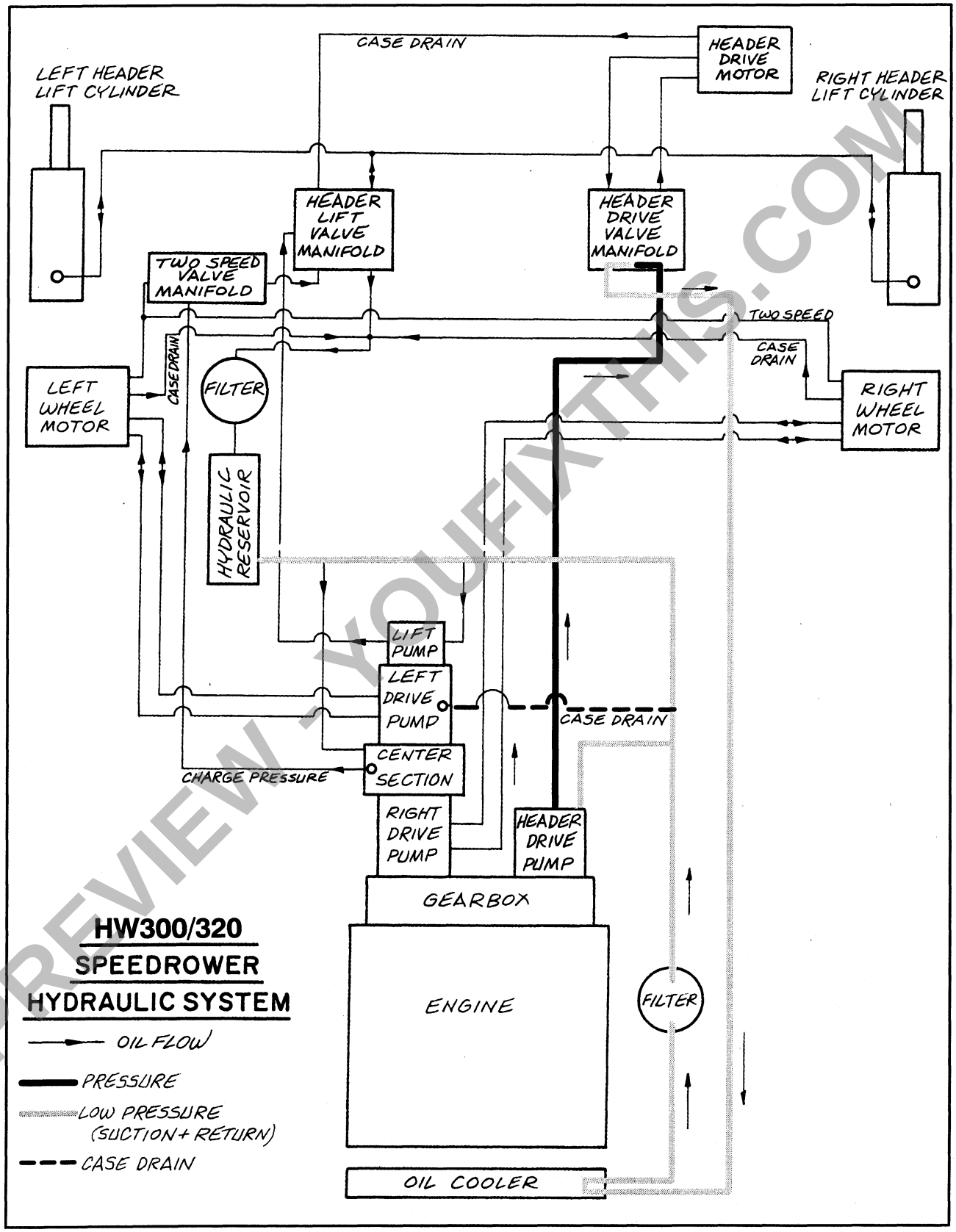


Figure 2-7

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SPECIFICATIONS

	HW300	HW320	HW340
Cylinders	4	4	6
Bore	111.8mm (4.4″)	111.8mm (4.4″)	111.8mm (4.4″)
Stroke	127.0mm (5.0″)	127.0mm (5.0″)	127.0mm (5.0″)
Displacement	5.0L (304 cu. in.)	5.0L (304 cu. in.)	7.5L (456 cu. in.)
Aspiration	Natural	Turbocharged	Turbocharged
Compression Ratio	17.5:1	17.5:1	17.5:1
Cylinder Bore Compression @ 200 RPM	25.5 bar (370 PSI)	25.5 bar (370 PSI)	25.5 bar (370 PSI)
Firing Order	1342	1342	153624
Idle Speed (RPM)	1000	1000	800
Maximum Speed (RPM)	2200	2170	2300
Rated Speed (RPM)	2100	2100	2100
Rated Horsepower	87	108	166

CYLINDER BLOCK

Taper of Cylinder Bore	0.025 mm (0.001″) Repair Limit 0.127 mm (0.005″) Wear Limit
Cylinder Bore out of Round	0.03 mm (0.0015″) Repair Limit 0.127 mm (0.005″) Wear Limit
Cylinder Bore Diameters	111.778 - 111.841 mm (4.4007 - 4.4032″)
Rear Oil Seal Bore Diameter	140.77 - 140.8 7 mm (5.542 - 5.546″)
Block to Head Surface Flatness	0.08 mm (0.003″) in any 152 mm (6″) 0.03 mm (0.001″) in any 25.40 mm (1″)

CYLINDER HEAD

Valve Guide Bore Diameter	9.469 - 9.495 mm (0.3728 - 0.3738″)
Head to Block Surface Flatness	0.03 mm (0.001″) in any 25.4 mm (1″), or 0.127 mm (0.005″) overall limit

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MAINTENANCE

The following regular maintenance steps will help ensure long life for the header drive system:

- Check the hydraulic fluid level in the reservoir daily.
- Inspect the fluid for the presence of water (indicated by a cloudy or milky appearance, or by standing water in the bottom of the reservoir). A rancid fluid odor indicates the fluid overheated.
- Change the fluid and filter after the first 50 hours when new and every 500 hours thereafter.
- If the fluid overheats or accumulates dirt, water or other contaminants, make more frequent changes.
- Never reuse hydraulic fluid.
- Change the filter each time you change the fluid, or whenever the filter indicator shows that it needs a change.

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INTRODUCTION

This section covers the electrical systems of the HW300, HW320 and the HW340 windrowers. The section is divided into parts along with a table of contents and an index. The parts are organized as follows:

- Introduction
- General Electrical
- Electrical System Components
- Wiring Harnesses and Connectors
- Windrower Electronic System
- Air-conditioning Electrical System
- Lighting Electrical Systems
- Engine Electrical Systems
- Charging Electrical System
- Electrohydraulic Electrical Systems
- Miscellaneous Circuits
- Wiring Diagrams
- Electrical System Labor Guide

NOTE: When reference is made to "right" or "left" in this section, it means right or left as viewed by the operator sitting in the cab, facing away from the engine.

GENERAL TROUBLESHOOTING

Review the "General Electrical" portion of this section, which explains the operation of the electrical components found in many circuits. A test procedure is provided for the components.

Before attempting to troubleshoot a circuit, become familiar with the electrical schematics, current flow, and the operation of the electrical components in the circuit.

Operate the windrower and observe the symptom(s) of the problem. Match the symptom(s) observed to the main headings listed in the troubleshooting charts.

Find the heading that describes the symptom(s) observed then follow the step-by-step instructions until the problem is corrected.

This section has a description of each electrical circuit, a schematic of the circuit, and diagnostic test procedures based on the symptom(s) demonstrated by the fault.

All test procedures are based on the assumption that all mechanical items such as filters, oil pressures, etc., have been checked and verified and that the problem is electrical not mechanical.

Prepare the machine for the test by following the pretest instructions. Perform the test and observe the results. Perform the indicated corrective action. Continue through the test procedure until the problem is corrected, then return the system to an operational condition (replace shields, etc.).

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ENGINE ELECTRICAL SYSTEMS

INTRODUCTION

This section covers the electrical portion of the engine. This section includes:

Engine Functions for the WES

- Air Filter Switch
- Fuel Level Gauge
- Coolant Temperature
- Engine Fuel Solenoid
- Engine Oil Pressure Sender
- Hydraulic Oil Temperature Sender
- Hydraulic Charge Pressure Sender

Starting Circuits

- Not in Neutral
- Engine Start
- Engine Fuel Electric Circuit

Engine Functions for the WES

Power for the engine functions is supplied from the WES. The WES must be powered up in order for these functions to work. When this is the case, various voltages, controlled by the WES, are applied to the engine function senders. Depending on the circuitry, current flows back to the WES or to ground through the sender. Follow the diagnostic procedures when checking out the circuits.

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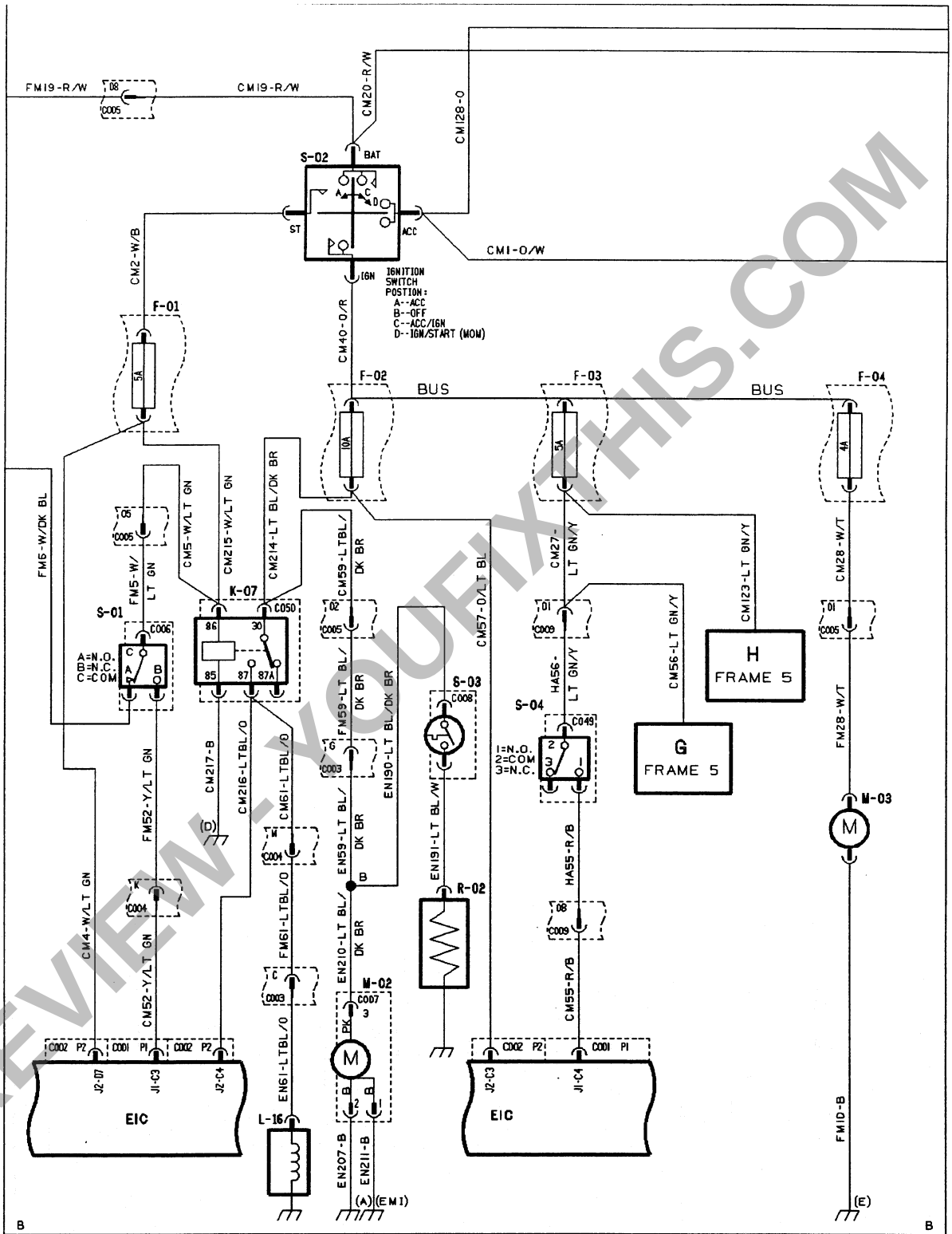
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STEP	PRETEST INSTRUCTIONS	TEST	RESULT	PROBABLE CAUSE AND CORRECTION
8.	Press and hold the "open book" and "hand" buttons on the warning module while turning the key on. Press the "open book" button until menu item 7-DIAG: OUTPUT is displayed. Press the "hand" button until 9-HDR DR FWD is displayed. Press right turn signal to display 1.	Disconnect the connector at the header drive pump. Check voltage of FM94-GY/Y at the connector.	6 to 8 voltage reading. Low or no voltage.	Defective pump controller. Have pump serviced by a certified Sauer Sundstrand service center. Go to next step.
9.	Key off. Disconnect front connector, C012, under the floor of the right console.	Check continuity of the GY/Y wire between header drive pump and C012 at pin L.	No continuity. Continuity.	Open circuit in FM93-GY/Y or FM94-GY/Y between pump and C012. Check splice at loose wiring under cab behind header top link. Repair. Go to next step.
10.	Key off. Disconnect bottom connector, C002, from the console module.	Check continuity of CM93-GY/Y between C012 at pin L and C002 at pin C15.	No continuity. Continuity.	Open circuit between C012 and C002. Repair. Defective console module. Replace.

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FRAME 2 - HW300 AND HW320



FRAME -2			
	F-01 START FUSE	L-16 ENGINE FUEL SOLENOID	S-02 IGNITION SWITCH
	F-02 EIC FUSE	M-02 FUEL PUMP	S-03 COLD ADVANCE SWITCH
	F-03 PTO FUSE	M-03 ROTARY SCREEN MOTOR	S-04 DISPLAY SELECT SWITCH
	F-04 ROTARY SCREEN FUSE	R-02 COLD ADVANCE UNIT	
	K-07 FUEL SOLENOID RELAY	S-01 NEUTRAL SWITCH	

Figure 1-97

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14. Continue to cycle the header drive between forward and reverse for at least five (5) minutes.
15. Shut off the system, remove the gauges and plug the pressure gauge ports.
16. Check the hydraulic fluid level in the reservoir and add fluid as needed.

The header drive system now is ready for use.

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VALVE OPERATION

NEUTRAL POSITION

In the neutral position, no power is supplied to any of the solenoid valves. Oil coming from the pump flows through the master solenoid valve, through internal porting to the return line, and to the reservoir through a 10-micron filter. Oil is blocked in the cylinder lines by the check valve in the lower solenoid valve.

RAISE POSITION

When the raise switch is activated, power is supplied to the master solenoid valve, which closes and blocks off flow to the reservoir. Power is also supplied to the raise solenoid valve. The port closer to the coil is now open and directs oil through its stem, out the end, and toward the end of the check valve in the lower solenoid valve. Pressure builds, opens the check valve and oil flows to the cylinders raising the header. When the switch is released, the system returns to the neutral position previously described.

LOWER POSITION

When the lower switch is activated, power is supplied to the lower solenoid valve which opens the check valve. Oil can now flow in from the lift cylinders through the check valve into the end of the raise solenoid valve. The raise solenoid valve is not energized, so oil flows up the stem and out through the port away from the coil which is normally open. Oil then flows through an internal passageway over to the return line. At the same time, oil coming from the pump flows through the master solenoid valve, which is not energized, through internal porting to the return line.

FLOAT POSITION

Whenever the lower switch is released, the EIC retains power to the lower solenoid valve. When the header reaches the ground, oil can flow in either direction in the cylinders because the check valve is held open. The system is removed from float by activating the raise switch once or by turning the engine off. To reactivate, just press and release the lower switch with the engine running.

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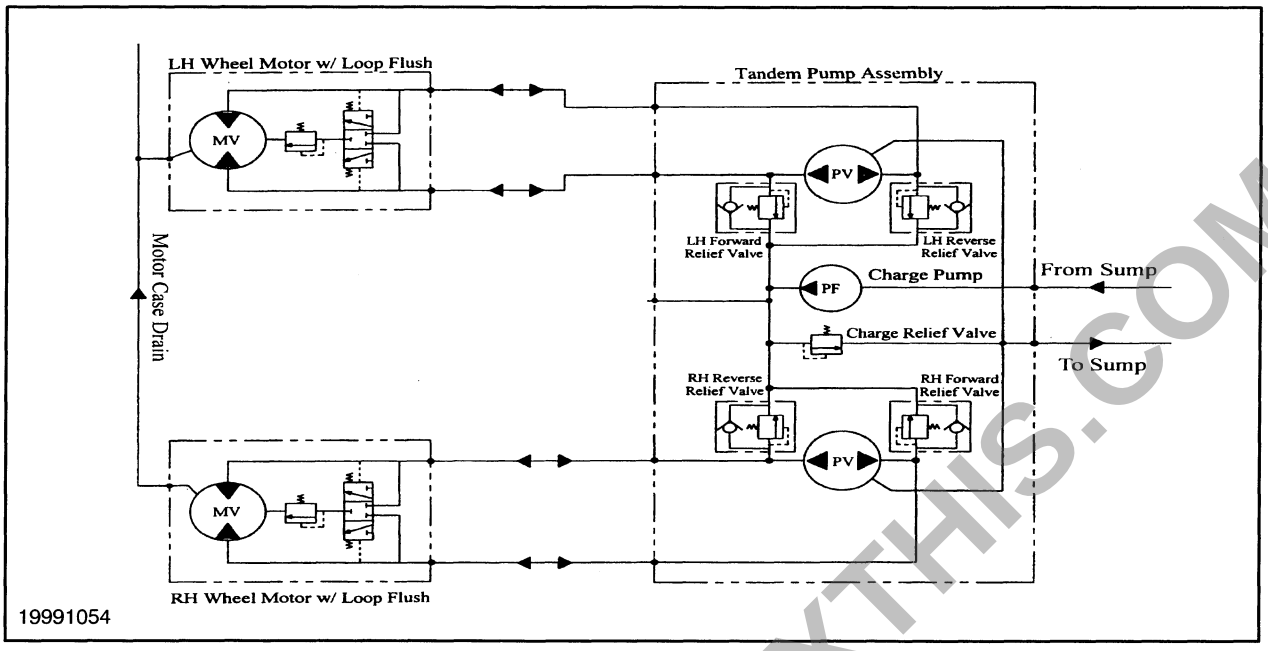


Figure 3-7

OIL FLOW

Neutral

When the hydrostatic system is in neutral, there is no flow from the pumps to the motors. Charge pump flow is minimal to the closed loop circuit and is forced over the charge relief valve to the pump case. Pump case drainage flows back to sump.

Forward/Reverse

When the operator moves the control lever from neutral to forward, the pump pushes oil through the motors. Immediately, one side of the closed loop becomes the high-pressure side supplying oil to the drive motor, while the opposite side becomes the return side, sending oil from the motor back to the pump.

The pressure on the high side of the closed loop is dependent on the load and resistance on the machine. High-pressure relief valves in the center section of the tandem pump limit the maximum pressure. When the relief valve opens, oil flows into the charge pressure side of the low loop and then into the pump inlet.

The charge pressure relief valve keeps the return side of the closed loop at charge pressure. The high-pressure relief valve on the low loop side acts as a check valve, allowing charge pressure to enter the low side. The charge flow replenishes the oil lost by the pump, motor, and shuttle valve with cool oil.

The high pressure at the motor forces the shuttle valve closed on the high loop side and open on the low loop side. Oil from the low loop side flows through the shuttle valve and the motor charge relief valve and into the motor case. The motor relief valve pressure is slightly lower than that of the charge pressure relief valve in the pump. This maintains a positive charge in the low loop. Oil from the motor case drain is filtered before returning to sump.

When the operator moves the control lever from neutral to reverse, the pump reverses the direction in which it pushes oil through the motors. The shuttle valve on the motor shifts to block oil on the high-pressure side and allow oil from the low-pressure side to flow through the motor relief valve.

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AUTHORIZED SERVICE CENTERS - NORTH AMERICA

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ALASKA

ALASKA HYDRAULICS INC.
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Anchorage, AK 99518
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Whittier, CA 90601
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BERENDSEN FLUID POWER INC.
950 Doolittle Dr.
San Leandro, CA 94577
(510) 635-0500

BERENDSEN FLUID POWER INC.
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Bakersfield, CA 93308
(805) 393-1191

ZEMARC CORP.
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Los Angeles, CA 90040
(310) 692-6912

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Denver, CO 80239
(310) 692-6912

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ACTION HYDRAULICS INC.
7257 Westport Place BLDG
West Palm Beach, FL
33413
(407) 640-6066

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Lawrenceville, GA 30245
(770) 963-6164

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Sauer-Sundstrand SERVICE
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Engine Lubrication System (With Turbocharger)

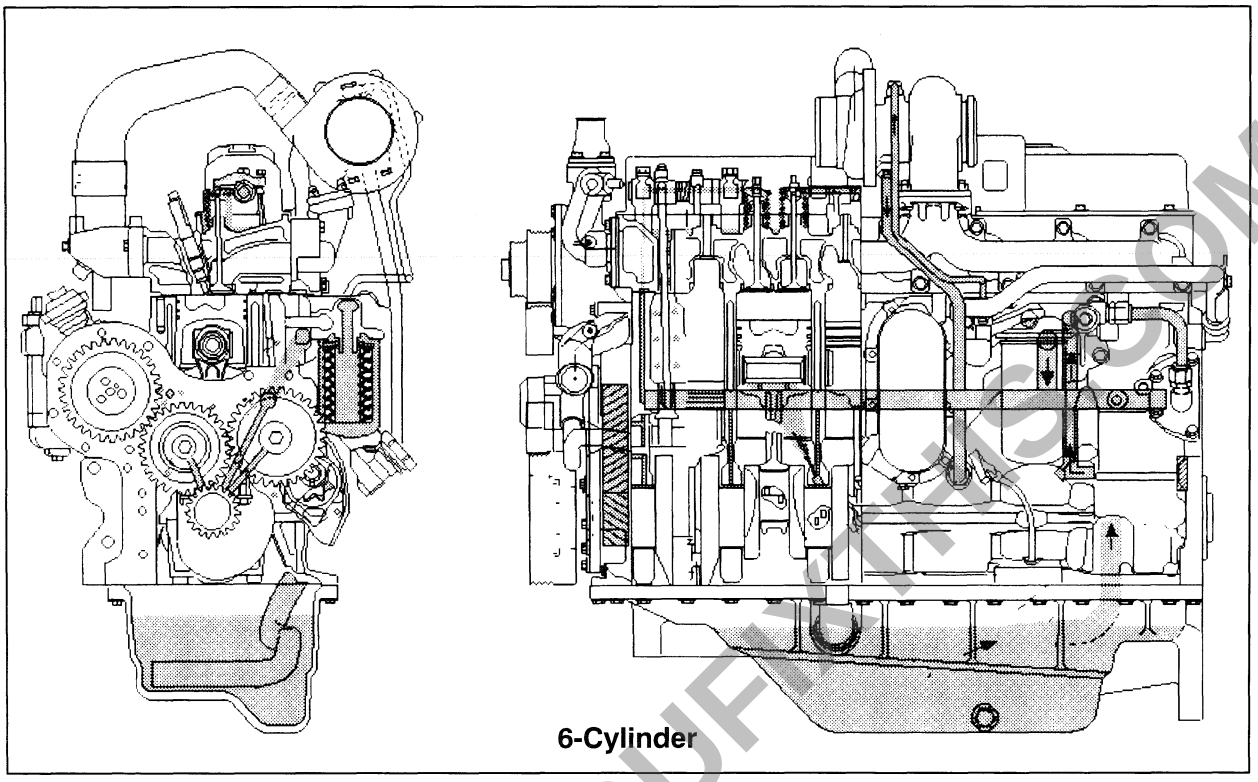


Figure 6-1

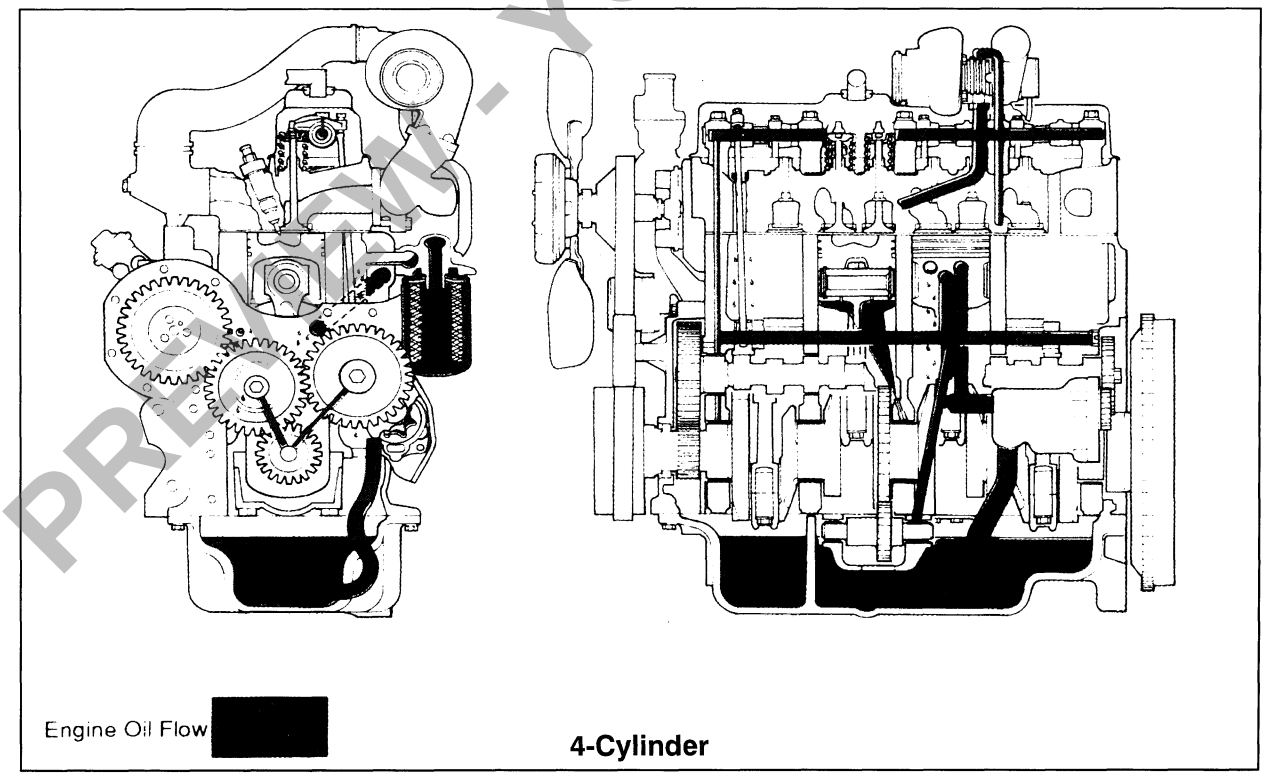


Figure 6-2

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Where special tooling is not available for the removal or installation of the connecting rod bushing, a standard bushing can be installed in the following manner:

a. Place the connecting rod securely in a bench press.

b. Manufacture a press tool, 1, from suitable bar stock, grinding the end face at an angle matching the connecting rod bushing side face, 3.

c. Place the tool on the old bushing, 2, and gently drive it out. Make a guide to assist alignment of the bar stock during this operation.

d. Use the same procedure to install a new bushing, using a suitable piece of bar stock with the end face machined flat to suit the standard parallel bushing. Use a guide as described and gently drive in the new bushing. Align the bushing gap as shown, 4.

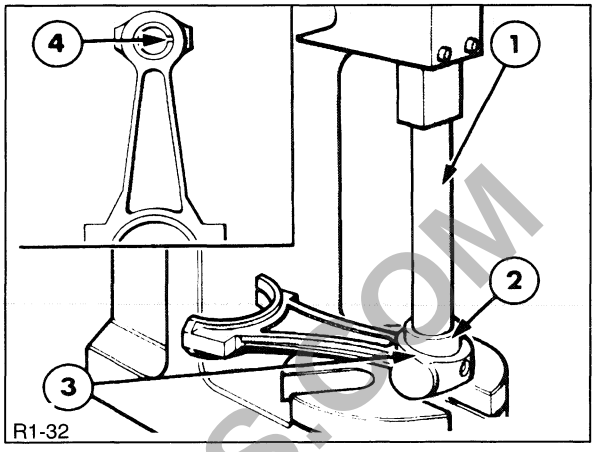


Figure 6-127

3. After installation, grind the side faces of the new bushing to match the side faces of the connecting rod. Remove all sharp edges and clean loose chippings from the connecting rod before reassembly into the engine.

4. With a new bushing installed, drill a hole through the top of the connecting rod using a 4.6 mm (3/16″) bit, and drill through the existing oil hole, 2.

5. Use an expanding reamer to get the correct bushing-to-piston pin clearance of 0.013 mm - 0.025 mm (0.0005″ - 0.0010″). Remove burrs and chippings before reinstalling.

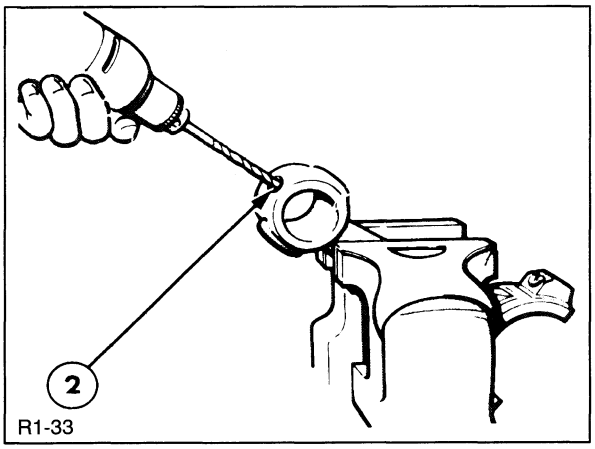


Figure 6-128

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The CA wax motor, 1, attaches to the timing advance mechanism on the bottom of the injection pump. A temperature switch in the thermostat housing controls it. When engine coolant falls below 26.7°C (80°F), the temperature switch cuts off voltage to the wax motor. This puts the injection pump in the cold advance mode and helps avoid white smoke problems associated with cold running.

When engine coolant rises above 26.7°C (80°F), the temperature switch restores electric current to the wax motor, heating the wax and restoring the injection pump to its normal, warm-running mode.

In both pumps a variable-speed mechanical governor controls the metering valve, maintaining a constant engine speed regardless of the load.

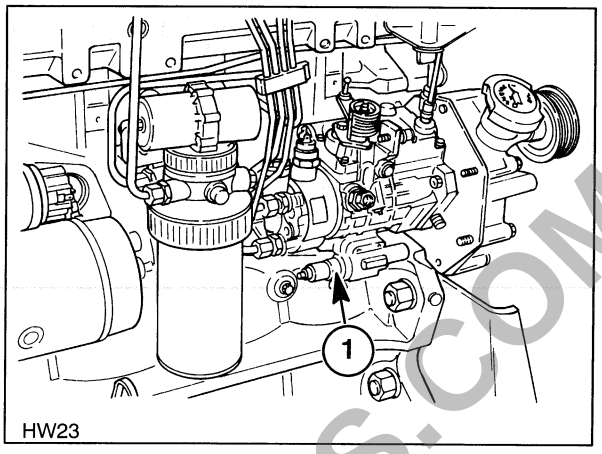


Figure 6-204

SOLENOID SHUTOFF VALVE

An electric fuel shutoff solenoid, which screws into the top of the injection pump's hydraulic head, controls the fuel supply to the input side of the metering valve. This provides the operator with an "ignition key" engine start and stop.

The shutoff solenoid consists of a solenoid assembly, 1, that controls a piston, 3, which is spring loaded, 4. The shutoff solenoid is between the transfer pump outlet and the metering valve, and uses a rubber O ring, 2, to maintain a seal.

During certain operations, such as bleeding the fuel system, you will be instructed to unplug the wire at the shutoff solenoid to prevent the engine from starting during cranking.

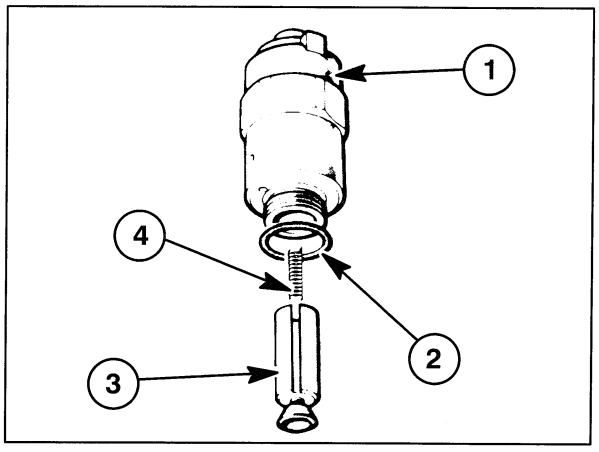


Figure 6-205

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AIR CLEANER

Troubleshooting

Problem:	Possible Cause:	How To Fix It
Engine does not develop full power	Air cleaner clogged	Service air cleaner
Engine uses excessive amounts of fuel	Dirty air cleaner	Service air cleaner

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