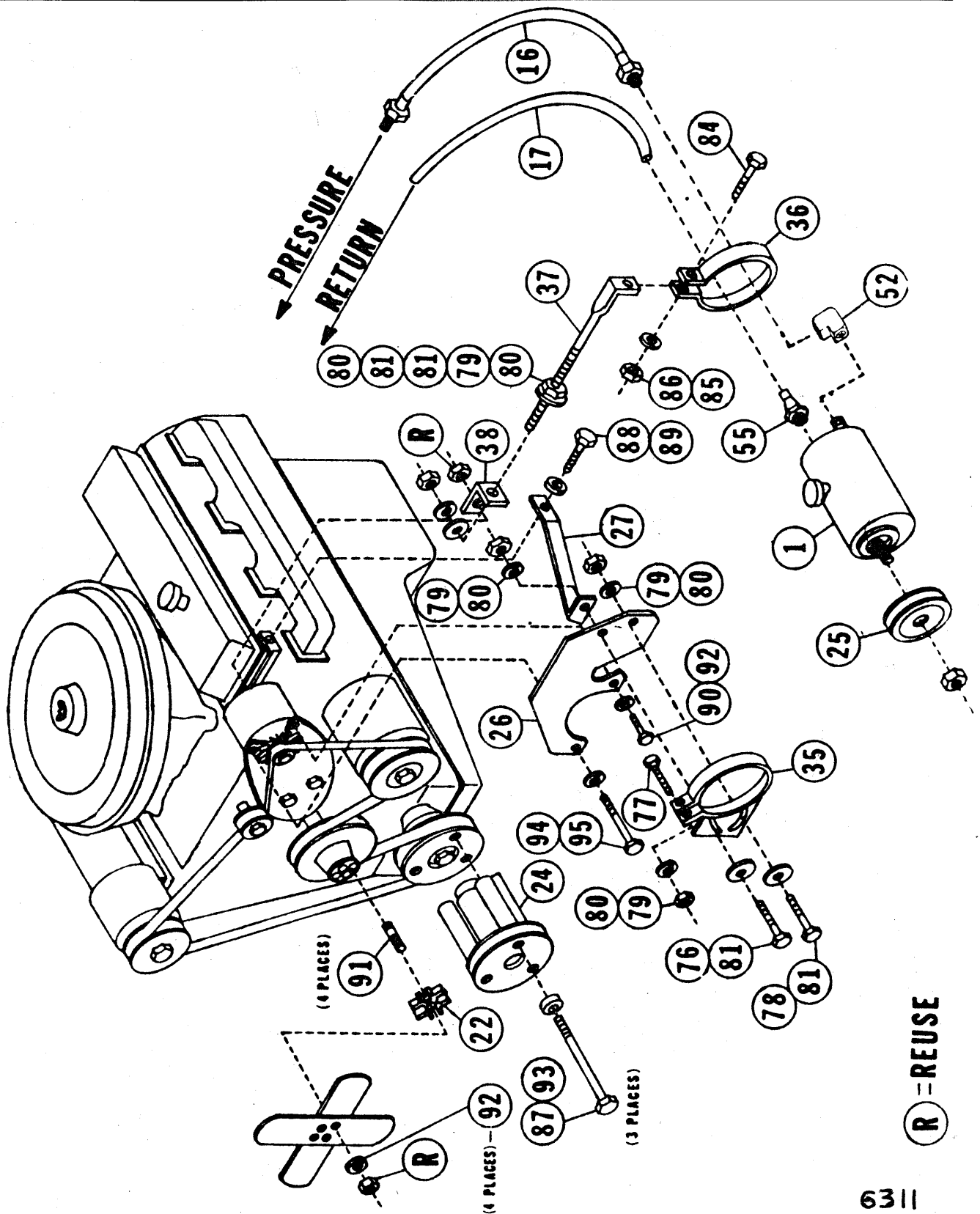


CHEV/GMC V8-454
W-W/O AC; W/SERPENTINE
BELT; W/O DUAL BATTERIES

1988-1993

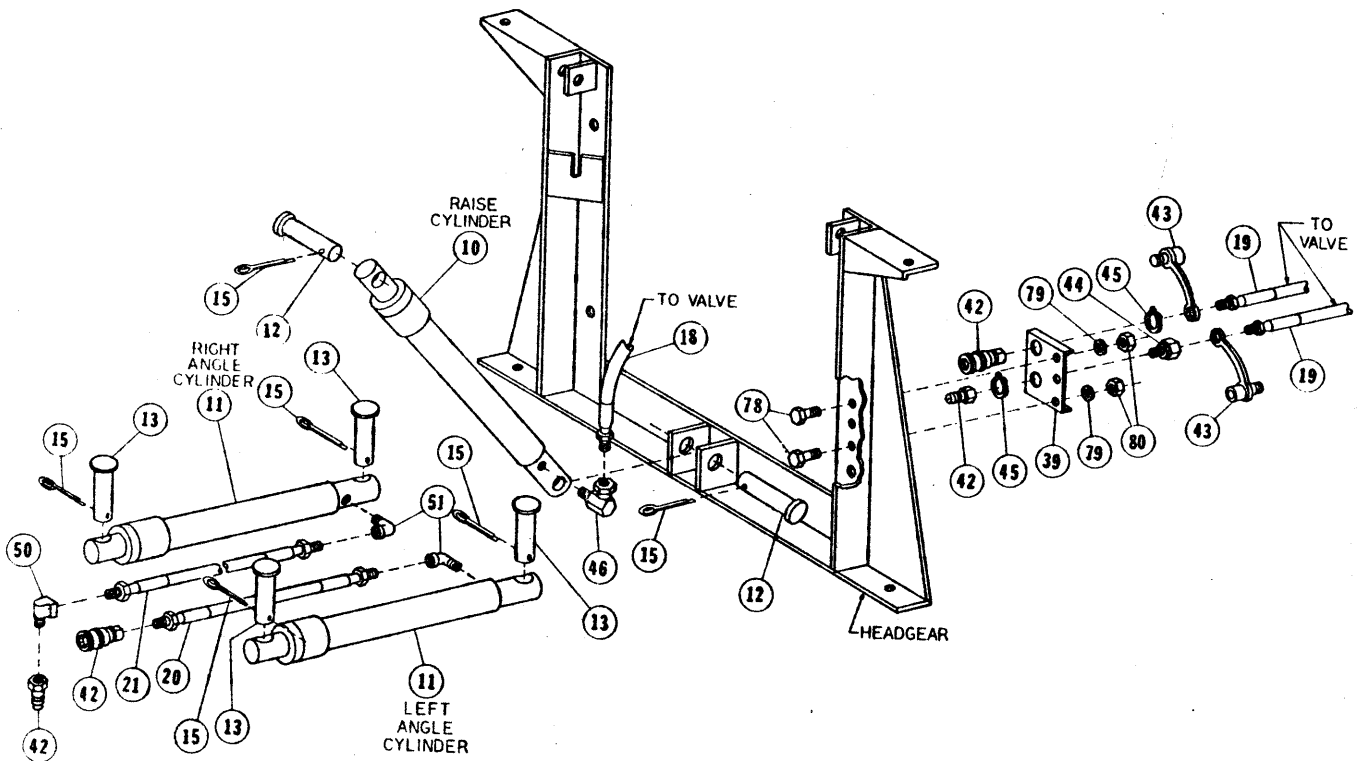
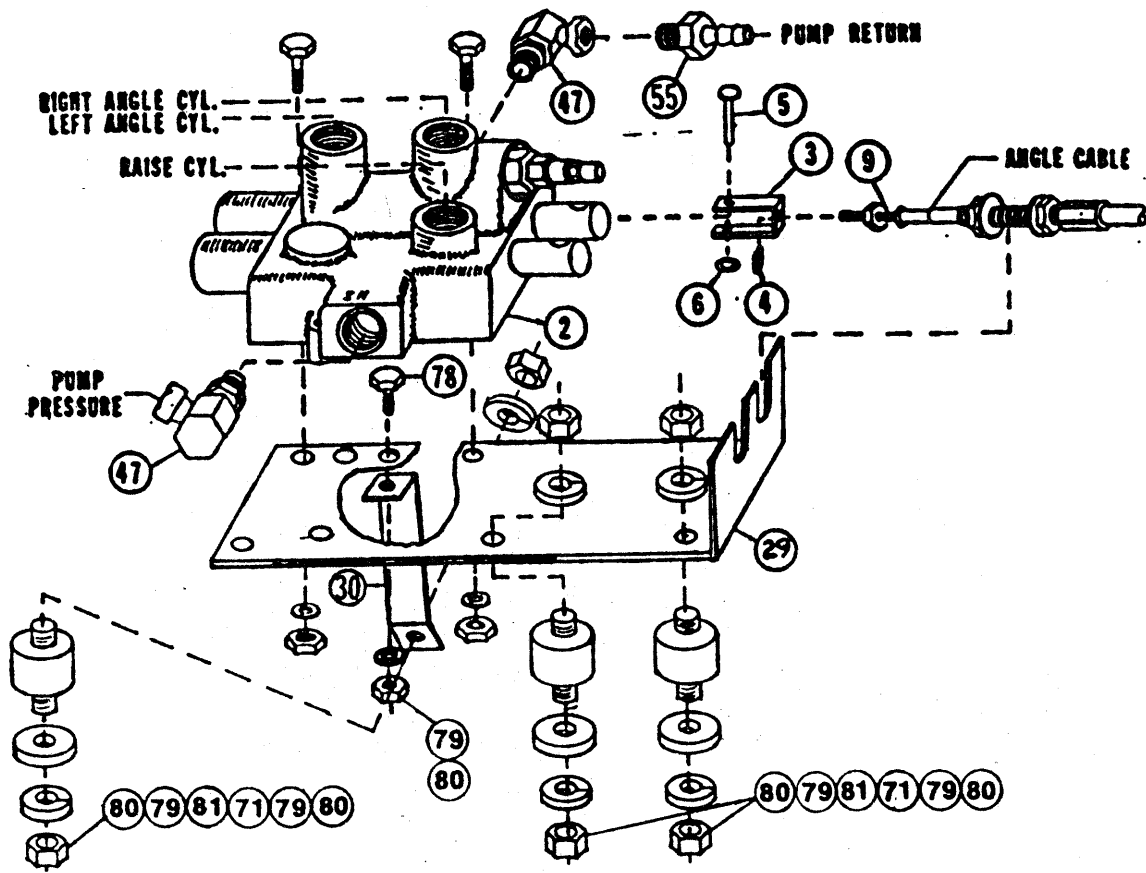
PECULIAR HYDRAULICS
BELT DRIVE, SLC
UNDERHOOD VALVE

HPS4593
REV. C



R = REUSE

6311



HYDRAULICS PARTS LIST




HPS4593 REV C
A4468

REF#	QTY IN KIT		PART#	DESCRIPTION
	A4468-40	HPS4593		* PART OF 6944 BOLT BAG
1	1		A2311	PUMP TANK ASSEMBLY
2	1		A4466	CONTROL VALVE ASSEMBLY
3	2		4483	CLEVIS
4	2		4494	10-32 SQUARE NUT
5	2		4491	CLEVIS PIN - 3/16 X 1
6	2		4493	3/16 PUSH NUT
7	1		8764	FILTER KIT
8		1	4419	SINGLE LEVER CONTROL HEAD
9		2	6027	45" CONTROL CABLE, SLC
10	1		A318	10" LIFT CYLINDER ASSEMBLY
11	2		A3660	12" ANGLE CYLINDER ASSEMBLY
12	2		6814	CLEVIS PIN - 1 X 3-5/16
13	4		6816	ANCHOR PIN - 1 X 4
14				
15	6		90601	1/4 X 1-1/2 COTTER PIN
16		1	21214	26" H.P. HOSE, 1/4P TO 3/8P-FLAT CRIMP
17		1	4471	26" L.P. HOSE
18		1	1665	60" H.P. HOSE, 9/16 O-R TO 1/4P
19		2	1664	54" H.P. HOSE, 9/16 O-R TO 1/4P
20		1	376	32" H.P. HOSE, 1/4P TO 1/4P
21		1	4424	36" H.P. HOSE, 1/4P TO 1/4P
22		1	* 3675	FAN SPACER
23		1	707	FAN BELT, 58"
24		1	6559	DRIVE SHEAVE
25		1	3696	PUMP SHEAVE
26		1	6562	PUMP BRACKET
27		1	6561	PUMP BRACKET BRACE
28				
29		1	5329	VALVE PLATE
30		1	5975	VALVE PLATE BRACE
31				
32				
33				
34				
35		1	5467	SADDLE BRACKET
36	1		2036	REAR TANK STRAP
37	1		2116	UNIVERSAL BRACE ROD
38		1	* 2115	UNIVERSAL BRACE TAB
39		1	4467	DISCONNECT MOUNTING PLATE
40				
41				
42	2		A1587	DISCONNECT ASSEMBLY
43	2		1588	DUST PLUG
44		1	* 4486	BULKHEAD ADAPTER
45		2	* 4485	7/8" SNAP RING
46	1		319	1/4" X 90 SWIVEL ADAPTER
47	2		2315	9/16 O.R. TO 3/8P X 90 SWL.ADPT.
48				

HYDRAULICS PARTS LIST

HPS4593 REV C

REF#	QTY IN KIT		PART#	DESCRIPTION
	A4468	HPS4593		
49				
50		1	* 765	1/4" BRASS BAR STREET ELL
51	2		2780	1/4" BRASS BAR STREET ELL (FORGED)
52		1	* 2318	1/4" BRASS BAR ELBOW
53				
54				
55	2		1658	QUILL
56				
57				
58				
59				
60				
61				
62				
63				
64				
65				
66				
67				
68				
69				
70				
71		3	* 5529	SHOCK MOUNT
72		1	5704	SAFETY DECAL
73	2		3042	GROMMET
74	1		4477	SPLIT HOSE GROMMET
75	3	2	* 3666	TIE WRAPS 3/16 X 8
76		1	* 90048	5/16 X 1-1/4 (NC) GR.5 CAPSCREW
77	1		90054	5/16 X 1-1/2 (NC) GR. 5 CAPSCREW
78	4		90042	5/16 X 1 (NC) GR.5 CAPSCREW
79	6	5	* 90360	5/16 LOCKWASHER
80	7	5	* 90332	5/16 (NC) NUT
81	4	3	* 90313	5/16 FLATWASHER
84	1		90614	1/4 X 1-1/4 (NC) GR.5 CAPSCREW
85	1		90359	1/4 LOCKWASHER
86	1		90330	1/4 (NC) NUT
87		3	* 90621	3/8 X 6 (NC) GR.8 CAPSCREW
		3	* 90643	3/8 X 6 (NF) GR.8 CAPSCREW
88		1	* 90103	3/8 X 1 (NC) GR.5 CAPSCREW
89		1	* 90361	3/8 LOCKWASHER
90		1	* 90379	M8 X 1.25 X 30 GR.8.8 CAPSCREW
91		4	* 5939	M8 X 1.25 X 50 STUD GR.10.9
92		5	* 90428	M8 LOCKWASHER
93		3	* 4268	SPACER WASHER
94		1	* 90397	M10 X 1.5 X 90 GR.8.8 CAPSCREW
95		1	* 90429	M10 LOCKWASHER

FASTENER TORQUE (FT-LB)			
DIAMETER- THREADS PER INCH	GRADE DESIGNATION		
	 GRADE 2	 GRADE 5	 GRADE 8
1/4 - 20	6	9	13
5/16 - 18	11	18	28
3/8 - 16	19	31	46
7/16 - 14	30	50	75
1/2 - 13	45	75	115
9/16 - 12	66	110	165
5/8 - 11	93	150	225
3/4 - 10	150	250	370
7/8 - 9	150	378	591
1 - 8	220	583	893

1. CYLINDER AND CYLINDER HOSE ASSEMBLY

A. USING BENCH VISE TO HOLD LIFT CYLINDER (10), REMOVE CLOSURE FROM PORT. SCREW 90 DEGREE SWIVEL ADAPTOR (46) INTO PORT. PLACE LIFT CYLINDER WITH INSTALLED ADAPTOR BETWEEN EARS ON UNDERSIDE OF LIFT ARM AND LOWER HEADGEAR EARS. ATTACH CYLINDER TO EARS USING CLEVIS PINS (12) AND COTTER PINS (15).

B. USING BENCH VISE TO HOLD 32" H.P. HOSE (20), INSTALL FEMALE HALF OF HOSE DISCONNECT ASSEMBLY (42) DIRECTLY TO HOSE. THEN, HOLDING 36" H.P. HOSE (21), INSTALL BRASS BAR STREET ELL (50) AND MALE HALF OF HOSE DISCONNECT ASSEMBLY (42) ON THE SAME HOSE END.

C. USING BENCH VISE TO HOLD ANGLE CYLINDERS (11), REMOVE CLOSURES FROM PORTS AND SCREW BRASS FORGED STREET ELLS (51) INTO PORTS SO THAT ELLS ARE PARALLEL WITH CYLINDER AND POINT TOWARD LIVE END. INSTALL 32" H.P. HOSE WITH FEMALE DISCONNECT HALF TO DRIVER'S SIDE ANGLE CYLINDER STREET ELL. INSTALL OTHER H.P. HOSE WITH MALE DISCONNECT HALF TO PASSENGER SIDE ANGLE CYLINDER STREET ELLS. INSTALL ANGLE CYLINDERS TO "A" FRAME ON THEIR RESPECTIVE SIDES SO THAT ELLS ARE BETWEEN CYLINDERS AND "A" FRAME. SECURE CYLINDERS WITH ANCHOR PINS (13) AT PORT END AND RAM END. SECURE ANCHOR PINS WITH COTTER PINS (15).

2. CONTROL HEAD AND CONTROL CABLES

NOTE: DASH BRACKET, HARDWARE, DRILLING GUIDE & MOUNTING INSTRUCTIONS WILL BE FOUND IN PECULIAR ATTACHING BOX.

A. DRILL THREE 5/8" HOLES IN FIREWALL FOR CONTROL CABLES AND WIRING HARNESS USING DRILLING GUIDE AS A REFERENCE ONLY. BE SURE BOTH SIDES OF FIREWALL ARE CLEAR OF OBSTRUCTIONS BEFORE DRILLING. DRILL 1/2" HOLE IN UNDERSIDE OF DASH AS SHOWN IN DASH ILLUSTRATION.

B. INSTALL DASH BRACKET AS PER DASH BRACKET INSTRUCTIONS.

C. LOOSEN JAM NUTS ON CONTROL HEAD END OF CABLES (9) AND INSTALL INTO SLOTS IN CONTROL HEAD (8). RAISE CABLE CENTERS IN BEGINNING OF LOWER SLOT. SNAP CABLE ENDS ONTO BALL STUDS AND TIGHTEN JAM NUTS TO SECURE CABLES TO CONTROL HEAD. REMOVE THE NUTS AND WASHERS FROM THE VALVE END OF THE CABLES. ROUTE THE CABLES OUT THROUGH THE FIREWALL UP TO THE TOP OF THE DRIVER SIDE FENDERWELL. ATTACH CONTROL HEAD TO DASH BRACKET AS PER DASH BRACKET INSTRUCTIONS. INSTALL RUBBER GROMMETS (73) AROUND CABLES WHERE THEY PASS THROUGH FIREWALL.

3. VALVE AND VALVE PLATE

A. USING BENCH VISE TO HOLD CONTROL VALVE ASSEMBLY (2) REMOVE CLOSURES FROM VALVE PORTS. SCREW 90 DEGREE SWIVEL ADAPTOR UNIONS (47) INTO "IN" AND "OUT" PORTS. SCREW QUILL (55) INTO INSTALLED ADAPTOR IN "OUT PORT.

NOTE: VALVE FITTINGS ARE INSTALLED AS DESCRIBED TO INSURE PROPER INSTALLATION. FIRST INDICATION OF INCORRECT INSTALLATION IS FAILURE OF PLOW TO LIFT ALTHOUGH PLOW WILL ANGLE.

B. MOUNT VALVE TO VALVE PLATE (29) USING TWO 1/4 X 1-3/4 CAPSCREWS, LOCKWASHERS AND NUTS FROM VALVE BAG. INSTALL A RUBBER SHOCK MOUNT (71) INTO THE CENTER AND REAR MOST HOLES ON THE DRIVER'S SIDE OF THE VALVE PLATE. FASTEN EACH WITH ONE 5/16 LOCKWASHER (79) AND NUT (80). CONNECT CONTROL CABLES TO VALVE PLATE BEFORE FASTENING VALVE PLATE TO VEHICLE. BEGIN BY REINSTALLING JAM NUTS AND WASHERS ON CABLES. PLACE CONTROL CABLES IN RESPECTIVE SLOTS OF VALVE PLATE BULKHEAD WITH ONE NUT AND ONE WASHER ON EACH SIDE OF BULKHEAD. CENTER CABLES IN SLOTS SO THAT THEY ARE EXACTLY IN LINE WITH VALVE SPOOL CENTERS. ATTACH CABLE CLEVIS (3) TO CABLES USING SQUARE NUTS (4). SLIP CABLE CLEVISES OVER SPOOLS. INSTALL CLEVIS PIN (5) THROUGH CLEVIS AND SPOOL AND SECURE WITH PUSHNUT (6) ON CLEVIS PIN. TEMPORARILY ADJUST CABLES SO THAT CONTROL LEVER IS SOMEWHERE NEAR CENTERED IN CONTROL HEAD.

C. LOCATE VALVE PLATE, WITH VALVE AND CABLES ATTACHED, ON TOP OF DRIVER'S SIDE INNER FENDERWELL SO THAT VALVE IS NEAR LEVEL AND CABLES RUN IN AS SMOOTH A PATH AS POSSIBLE WHILE STILL CLEARING BRAKE CONTROL BOX. BE SURE SWIVEL ADAPTOR DOES NOT RUB AGAINST WINDSHIELD WATER BOTTLE. USING THE TWO PREVIOUSLY INSTALLED SHOCK MOUNTS AS GUIDES, MARK AND DRILL TWO 11/32" HOLES THROUGH THE FENDERWELL. FASTEN EACH SHOCK MOUNT TO THE FENDERWELL WITH ONE 5/16 FLATWASHER (81), LOCKWASHER (79) AND NUT (80). ATTACH 90 DEGREE BENT END OF VALVE PLATE BRACE (30) TO VALVE PLATE AS SHOWN IN ILLUSTRATION WITH A 5/16 X 1 CAPSCREW (78), LOCKWASHER (79) AND NUT (80). ATTACH A RUBBER SHOCK MOUNT (71) TO HOLE IN OTHER END OF BRACE WITH A 5/16 LOCKWASHER (79) AND NUT (80). USING THE SHOCK MOUNT AS A GUIDE, MARK AND DRILL ANOTHER 11/32" HOLE THROUGH THE FENDERWELL. FASTEN THE SHOCK MOUNT TO THE FENDERWELL WITH A 5/16 FLATWASHER (81), LOCKWASHER (79), AND NUT (80).

D. WITH VALVE PLATE FASTENED TO INNER FENDER, READJUST CONTROL CABLES SO THAT CONTROL HEAD LEVER IS CENTERED BETWEEN BOTH ANGLE AND RAISE/LOWER POSITIONS. IF CABLE CLEVIS DOES NOT ALLOW ENOUGH ADJUSTMENT, REPOSITION CABLE AT VALVE PLATE BULKHEAD. AFTER CHECKING TO SEE THAT THE VALVE SPOOLS ARE IN THE CENTERED POSITION, TIGHTEN CABLE CLEVIS NUTS.

CAUTION: VALVE SPOOLS MUST BE FREE AND SELF CENTERING WHEN CABLES AND CONTROL HEAD ARE ATTACHED. FAILURE TO CENTER SPOOLS WILL RESTRICT FLUID FLOW THROUGH VALVE. THIS MAY CAUSE HYDRAULIC FLUID TO OVERHEAT RESULTING IN PUMP DAMAGE AND OR HYDRAULIC HOSE FAILURE. HOSE FAILURES CAN CAUSE ENGINE FIRES.

WHEN ADJUSTED, THE CONTROL LEVER MUST BE IN THE NEUTRAL POSITION TO ALLOW ENOUGH SPOOL TRAVEL EACH WAY FOR PROPER VALVE ACTUATION.

4. DRIVE SHEAVE INSTALLATION

A. REMOVE FAN SHROUD AND LOOSEN SERPENTINE BELT. REMOVE FAN, WATER PUMP PULLEY AND STUDS FROM WATER PUMP SHAFT FLANGE. (SAVE NUTS, DISCARD STUDS). REMOVE AND DISCARD THE THREE BOLTS HOLDING CRANK PULLEY ONTO CRANKSHAFT.

B. POSITION DRIVE SHEAVE (24) OVER CRANK PULLEY AND FASTEN TO CRANKSHAFT WITH THREE 3/8 X 6 (NC) GR.8 CAPSCREWS (87) AND THREE SPACER WASHERS (93). ALTERNATELY TIGHTEN THESE THREE CAPSCREWS TO ASSURE PROPER INSTALLATION AND TORQUE FASTENERS TO 46 FOOT POUNDS.

NOTE: ON 1990-__ VEHICLES USE 3/8 X 6 (NF) GR.8 CAPSCREWS.

C. INSTALL THE SHORT THREADED END OF FOUR M8 X 1.25 X 50 STUDS (91) INTO THE WATER PUMP SHAFT FLANGE. REINSTALL WATER PUMP PULLEY, INSTALL FAN SPACER (22) AND REINSTALL FAN ONTO STUDS. FASTEN WITH PREVIOUSLY REMOVED NUTS AND FOUR M8 LOCKWASHERS (92) PROVIDED IN KIT. TIGHTEN THESE FASTENERS TO 25 FT. LBS.

5. PUMP TANK AND PUMP BRACKET

A. REMOVE AND DISCARD BOTH FRONT BOLTS ON ALTERNATOR. POSITION PUMP BRACKET (26) IN FRONT OF ALTERNATOR AND FASTEN WITH AN M10 X 1.5 X 90 CAPSCREW (94) AND M10 LOCKWASHER (95) IN THE TOP HOLE AND AN M8 X 1.25 X 30 CAPSCREW (90), AND M8 LOCKWASHER (92) IN BOTTOM HOLE. REMOVE TOP AND BOTTOM FASTENERS FROM REAR BRACE ON ALTERNATOR. SAVE THE TOP AND DISCARD THE BOTTOM FASTENER. INSTALL UNIVERSAL BRACE TAB (38) TO TOP OF ALTERNATOR BRACE AND FASTEN WITH THE PREVIOUSLY REMOVED NUT. FASTEN STRAIGHT END OF PUMP BRACKET BRACE (27) ONTO LOWER END OF ALTERNATOR BRACE WITH A 3/8 X 1 (NC) GR.5 CAPSCREW (88) AND 3/8 LOCKWASHER (89).

B. HOLDING PUMP TANK (1) IN BENCH VISE, SCREW 1/4" BRASS BAR ELBOW (52) POINTED SLIGHTLY INBOARD ONTO PRESSURE PORT AND SCREW QUILL (55) INTO RETURN PORT. INSTALL PUMP SHEAVE (25) ONTO PUMP SHAFT USING LOCKNUT AND KEY SUPPLIED WITH PUMP. REMOVE PUMP FROM VISE AND INSTALL SADDLE BRACKET (35) ON OVER FRONT OF PUMP. SECURE WITH A 5/16 X 1-1/2 GR. 5 CAPSCREW (77), LOCKWASHER (79) AND NUT (80). ATTACH SADDLE BRACKET AND 90 DEGREE BENT END OF PUMP BRACKET BRACE (27) TO THE TOP HOLE OF PUMP BRACKET WITH ONE 5/16 X 1-1/4 (NC) CAPSCREW (76), FLATWASHER (81), LOCKWASHER (79), AND NUT (80). FASTEN LOWER END OF SADDLE BRACKET TO PUMP BRACKET WITH ONE 5/16 X 1 (NC) CAPSCREW (78), FLATWASHER (81), LOCKWASHER (79), AND NUT (80).

C. INSTALL 58" V-BELT (23) (NOT SHOWN) ON OVER INSTALLED DRIVE AND PUMP SHEAVES. ALIGN SHEAVES AND TIGHTEN 1-1/2" SADDLE BRACKET FASTENER. ADJUST FOR PROPER TENSION BY PIVOTING SADDLE BRACKET ON TOP BOLT. INSTALL REAR TANK STRAP (36) ON OVER REAR OF PUMP. INSTALL ONE 5/16 NUT (80) AND FLATWASHER (81) ONTO UNIVERSAL BRACE ROD (37). INSTALL BENT END OF BRACE ROD BETWEEN EARS OF TANK STRAP WHILE

INSERTING OTHER END THROUGH UNIVERSAL BRACE TAB. FASTEN BRACE ROD TO EARS OF TANK STRAP WITH A 1/4 X 1-1/4 CAPSCREW (84), LOCKWASHER (85) AND NUT (86). FASTEN OTHER END OF BRACE ROD TO BRACE TAB WITH A 5/16 FLATWASHER (81), LOCKWASHER (79) AND NUT (80). USE BRACE ROD TO ADJUST ALIGNMENT OF DRIVE AND PUMP SHEAVES. CHECK BELT FOR PROPER TENSION. FASTEN VEHICLE POWER STEERING HOSE CLEAR OF PUMP BELT WITH TIE WRAPS (75). TIGHTEN SERPENTINE BELT.

6. HYDRAULIC HOSE INSTALLATION

A. ATTACH 26" H.P. HOSE (16) TO 1/4" SWIVEL ADAPTOR ON PUMP TANK AND PUSH 26" L.P. HOSE (17) ONTO QUILL ON PUMP TANK. ROUTE THESE HOSES TO THE CONTROL VALVE.

CAUTION: KEEP HOSES AWAY FROM HOT OR MOVING ENGINE COMPONENTS. FAILURE TO DO SO MAY CAUSE HOSE TO BURST RESULTING IN A POSSIBLE ENGINE FIRE.

PUSH L.P. HOSE ONTO QUILL AND SCREW H.P. HOSE INTO 90 DEGREE SWIVEL ADAPTOR. INSTALL 9/16 O-RING END OF 60" H.P. HOSE (18) TO LIFT CYLINDER PORT OF VALVE (SPOOL #1). INSTALL 9/16 O-RING END OF TWO 54" HOSES (19) TO ANGLE PORTS OF VALVE (SPOOL #2). DRILL A 1-7/8" HOLE THROUGH MIDDLE OF RADIATOR WEB ON DRIVERS SIDE, APPROXIMATELY 9-1/2" BELOW TOP OF RADIATOR.

NOTE: VEHICLES WITH HEAVY DUTY RADIATORS, 1-7/8" HOLE WILL HAVE TO BE DRILLED ON DRIVERS SIDE TOP OF RADIATOR SHROUD BETWEEN RADIATOR & GRILL.

CUT A 3" WIDE SECTION OUT OF THE GRILL IN LINE WITH LOCATION WHERE DISCONNECT BRACKET WILL BE LOCATED. INSTALL SPLIT HOSE GROMMET (74) AROUND HOLE. ROUTE 60" AND 54" HOSES OUT THROUGH THIS HOLE AND THROUGH GRILL NEAR CENTER OF VEHICLE. ATTACH 60" HOSE TO PREVIOUSLY INSTALLED 90 DEGREE SWIVEL ADAPTOR ON LIFT CYLINDER.

INSTALL INLINE OIL FILTER AS PER FILTER KIT (7) INSTRUCTIONS AT THE END OF THIS DOCUMENT.

7. DISCONNECT ASSEMBLY

A. WITH DISCONNECT MOUNTING PLATE (39) HELD IN BENCH VISE, INSTALL DISCONNECT HALVES AS SHOWN IN ILLUSTRATION. BULKHEAD ADAPTOR (44) AND MALE DISCONNECT HALF (42) GO IN BOTTOM HOLE. FEMALE DISCONNECT HALF (42) GOES IN TOP HOLE. SECURE BOTH WITH 7/8" SNAP RINGS (45). ATTACH MOUNTING PLATE TO BACK OF DRIVERS SIDE HEADGEAR POST WITH TWO 5/16 X 1 CAPSCREWS (78), LOCKWASHERS (79) AND NUTS (80). INSTALL DUST PLUGS (43) OVER ENDS OF HOSES ROUTED TO FRONT OF VEHICLE IN THE PREVIOUS STEP. CONNECT 54" RIGHT ANGLE HOSE (SPOOL #2, CYL. B) TO BACK OF FEMALE DISCONNECT INSTALLED IN TOP HOLE OF DISCONNECT BRACKET. CONNECT 54" LEFT ANGLE HOSE (SPOOL #2, CYL. A) TO BOTTOM (MALE) DISCONNECT. TIGHTEN BY HOLDING HOSES AND ROTATING THE DISCONNECT HALVES IN THE BRACKET.

8. OPERATIONS

A. CHECK ALL FITTINGS AND FASTENERS FOR TIGHTNESS. SECURE HOSES WITH NYLON TIE WRAPS (75). PLACE SAFETY DECAL (72) ON DASH BESIDE CONTROL HEAD.

B. FILL RESERVOIR WITH TYPE "A" AUTOMATIC TRANSMISSION FLUID. START ENGINE, LIFT AND ANGLE BLADE.

NOTE: IF BLADE ANGLES OPPOSITE FROM CONTROL LEVER POSITION, REVERSE THE TWO H.P. HOSE CONNECTIONS ON THE BACK OF THE DISCONNECT BRACKET.

RAISE FRONT END OF VEHICLE UNTIL PLOW IS CLEAR OF GROUND WITH THE LIFT CYLINDER FULLY RETRACTED. CHECK RESERVOIR OIL LEVEL. ANGLE BLADE (WITH LIFT CYLINDER RETRACTED) TO REMOVE AIR FROM SYSTEM. RECHECK RESERVOIR OIL LEVEL.