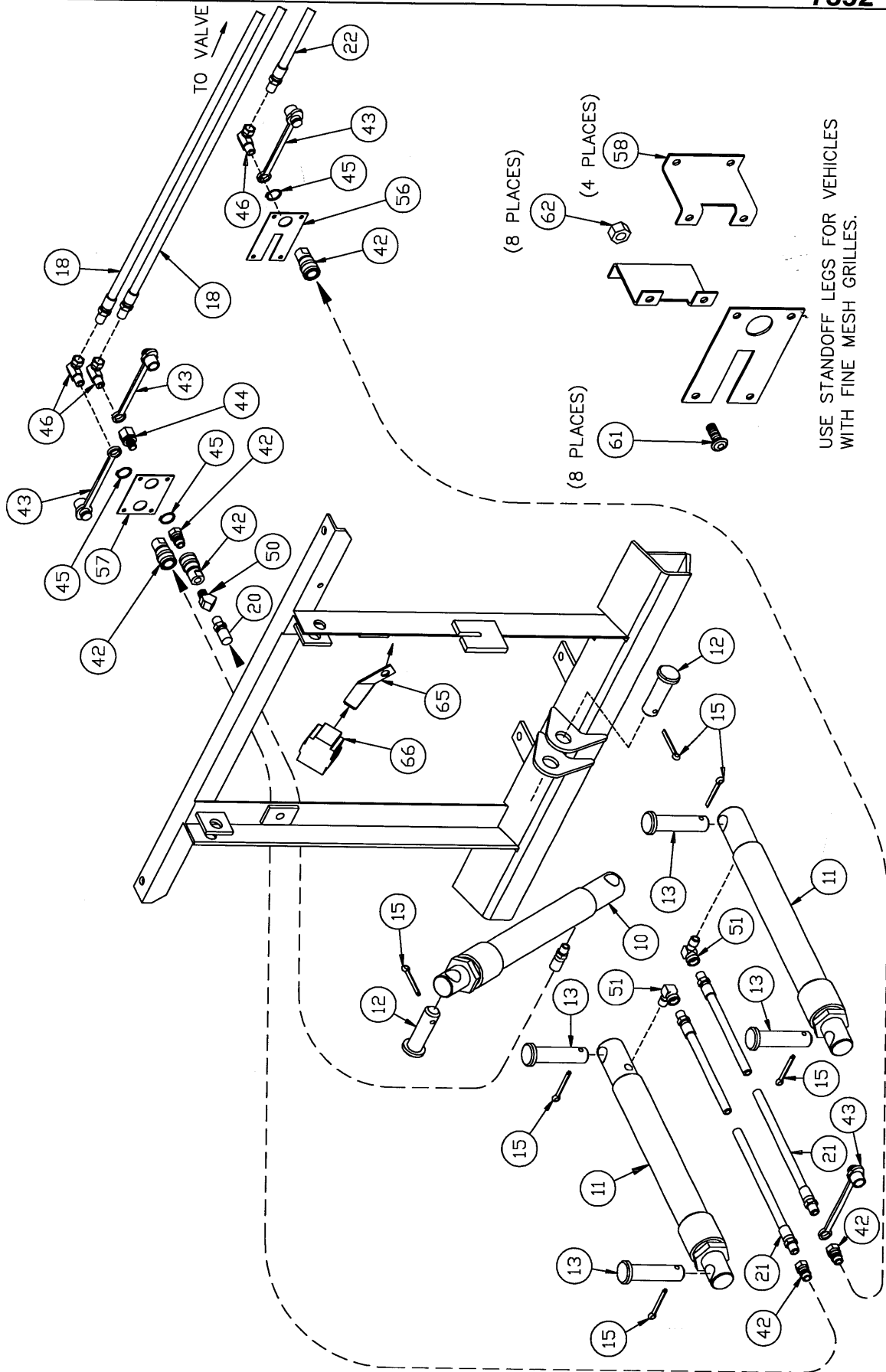
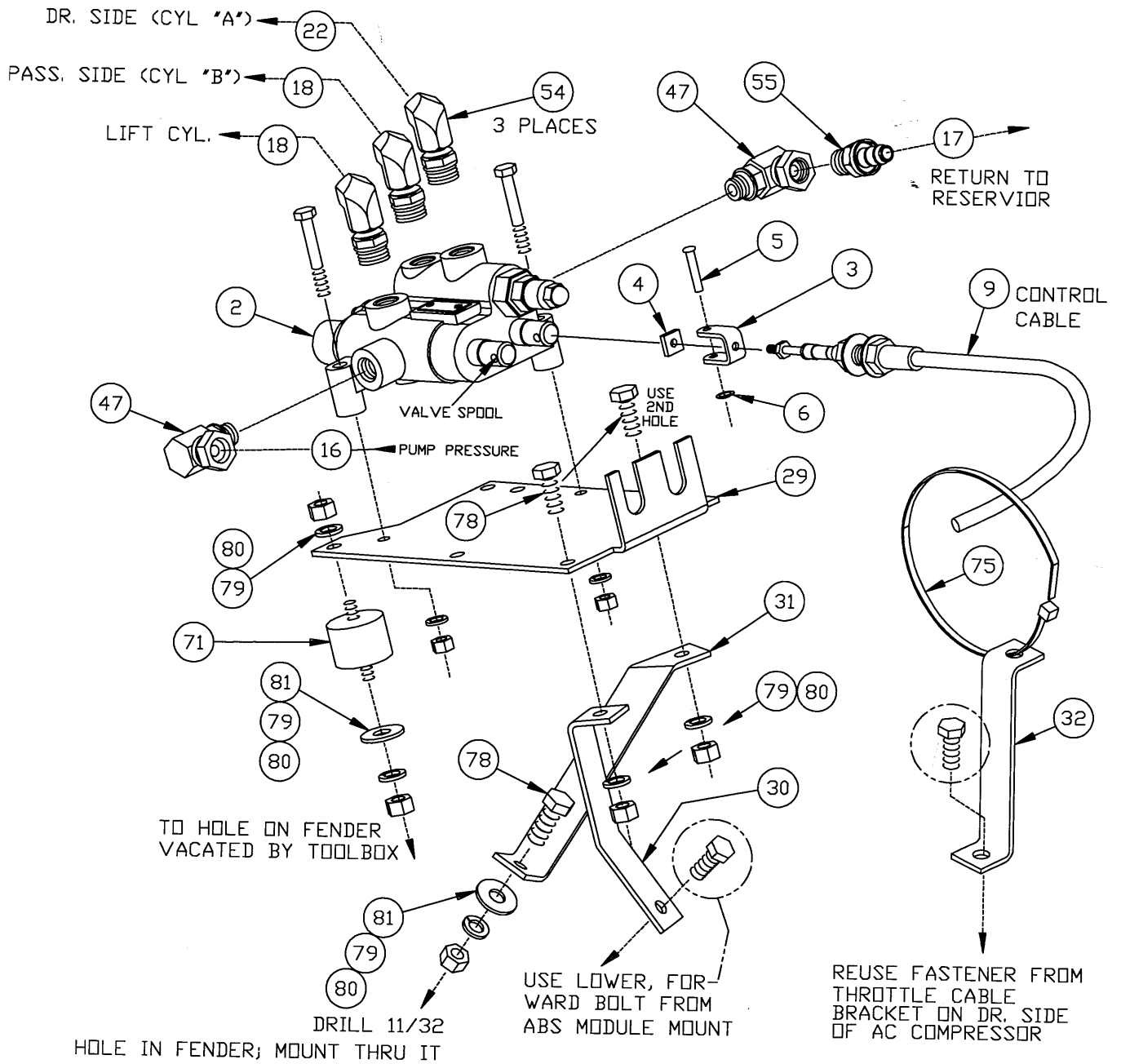


PUMP & RESERVOIR INSTALLATION:
VIEWED FROM FRONT/DR.
SIDE OF VEHICLE



VALVE INSTALLATION: AS VIEWED FROM BEHIND



Parts List

Ref #	Qty	Part #	Description	Ref #	Qty	Part #	Description
	8500				8500		
	-40	7552			-40	7552	
1	1	8356	Pump Assembly	46	1	2	*319 1/4" x 90 Deg Swivel Adapter
2	1	A4466-40	Control Valve Assembly	47	2		2315 9/16"-18 w/O-Ring x 3/8" F Pi Swvl
3	2	4483	Clevis - VM	49	2		*8391 Quill - 3/8" NPTM to 1/2" ID Hose
4	2	4494	10-32 Square Nut - VM	50	2		*8476 1/4" x 45 Deg Street Elbow
5	2	4491	Clevis Pin - 3/16" x 1"	51	2		2780 1/4" Npt x 90 Deg Street Elbow
6	2	4493	3/16" Push Nut Zp	53	1		*3979 3/8" Npt x 90 Deg Street Elbow
7	1	8764	Filter Kit	54	3		*20316 9/16" O-ring to 1/4" NPT 90° Elbow
8	1	4419	SLC Head - Belt Drive	55	2		1658 Quill - 3/8" Npfm to 3/8" ID Hose
9	2	A4926	78" SLC Cable	56	1		*8688 QD/Electric Plate -Short
10	1	20116	1-1/2" x 10" Cylinder Assy- XL	57	1		*8686 2 QD Plate- Short
11	2	20117	1-1/2" x 12" Cylinder Assy- XL	58	4		*8687 Standoff Leg
12	2	6814	Clevis Pin - 1" x 3-5/16"	59	4		*8324 Hose Tie--3/16 x 14
13	4	6816	Anchor Pin - 1" x 4"	61	8		*90687 1/4" x 1/2" (NC) Button Head Socket Swivel
14	1	8389	Oil Reservoir	62	8		*90350 1/4" (NC) Lock nut
15	6	90601	1/4" x 1-1/2" Cotter Pin	64	2		21080 Split Hose Grommet--1/2 x 3
16	1	2518	Hose -66" Hp 1/4P - 3/8P	65	1		*8741 Bracket - Cable Boot
17	1	2549	3/8"x48" LP Hose	66	1		*8284 Cable Boot
18	2	6066	66" Hp Hose,1/4P to 1/4P	67	1		*8992 3" Fitting Protector (not shown)
19	1	8991	1/2"x32" LP Hose -	71	1		*5529 Shock Mount
20	1	3074	Hose - 22" Hp 1/4P - 1/4P	72	1		5704 Caution Label - Cab
21	2	4424	Hose - 36" Hp 1/4P - 1/4P	73	2		3042 Grommet - Rubber, Split
22	1	21061	Hose - 46" Hp 1/4P - 1/4P	74	1		*4477 Grommet - Split Hose
23	1	1687	42" LP Hose - 3/8"	75	3	9	*3666 Tie Wrap, nylon 3/16" x 8"
24	1	21045	Drive Sheave **	76	1		*90048 5/16" x 1-1/4 (NC) Gr. 5 Cap screw
25	1	3696	Pump Sheave	77	1		90054 5/16" x 1-1/2 (NC) Gr. 5 Cap screw
26	1	21040	Pump Bracket	78	4	5	*90042 5/16" x 1 (NC) Gr. 5 Cap Screw
27	1	21039	Pump Bracket Brace	79	6	7	*90360 5/16" Sp Lk Washer
28	1	*20057	Drive Sheave Bushing .750 **	80	7	5	*90332 5/16" (NC) Nut
29	1	5329	Valve Plate	81	4	2	90313 5/16" Flat Washer
30	1	21037	Valve Plate Brace	84	1		90614 1/4" x 1-1/4 (NC) Gr. 5 Cap Screw
31	1	21038	Valve Plate Brace	85	1		90359 1/4" Sp Lk Washer
32	1	21062	Cable Support Brace	86	1		90330 1/4" (NC) Nut
33	1	8380	Pump Plate	87	1		*91165 7/16" x 6 (NF) Gr. 5 Cap Screw
34	1	21034	Stand-Off Brace	88	1		*90317 7/16" Flat Washer
35	1	21074	Pump Bracket Spacer	89	3		*91166 3/8" x 4-1/2" (NF) Gr. 5 Cap Screw
39	1	393	45" V-Belt (not shown)	90	2		*90103 3/8" x 1" (NC) Cap Screw
40	1	21032	Reservoir Bracket	91	4		*90361 3/8" Lock Washer
41	1	21033	Reservoir Brace	92	2		*90334 3/8" (NC) Nut
42	3	21096	Hose Disconnect Assembly	93	3		*4268 5/8" Spacer Washer
43	2	*1588	Dust Plug - Closure/Male	94	1		*91167 3/8" x 2-1/4" (NC) Gr. 5 Cap Screw
44	1	*4486	Adapter - Bulkhead 1/4" Npt	95	2		*90124 3/8" x 2" (NC) Gr. 5 Cap Screw
45	3	*4485	Snap Ring- 7/8" External Bowed	96	6		*90315 3/8" Flat Washer
				97	4		*90638 3/8" x 5/8" (NC) Gr. 5 Nylock Cap Screw
				98	2		90379 M8 x 1.25 x 30 Cap Screw Gr. 8.8
				99	2		90423 M8 x 1.25 nut
				100	2		90428 M8 Lock washer

* Part of 21072 Bolt Bag

** Order PN 21081 for Drive Sheave w/Bushing for service

1. Cylinder and Cylinder Hose Assembly

- A. Attach female half of disconnect (42) and a 1/4" Npt 45 degree street ell (50) to 22" Hp Hose (20). Using bench vise to hold lift cylinder (10), remove closure from port and screw the other end of the hose directly into this port. Place lift cylinder with hose pointing to passenger side into ears on lift arm and upper gear. Secure with clevis pins (12) and cotter pins (15).
- B. Attach male half of quick disconnect (42) to one end of a 36" Hp hose (21). Place a dust cover (43) on the end of the other 36" Hp Hose (21) and put another male half of a disconnect (42) on this hose.
- C. Using a bench vise to hold angle cylinders (11), remove closures from ports and screw brass forged street ells (51) into ports. Point forward toward live end of cylinder and slightly upward as they will be installed on the A-Frame. The driver side cylinder uses the 36" Hp hose with the dust cover and male disconnect half. The passenger side uses the 36" Hp hose with the male disconnect half and **no dust cover**. Install cylinders to their respective sides so that ells are between the cylinders and the A-frame. Secure cylinders with anchor pins (13) at both ends, with cotter pins (15) in each anchor.

2. Control Head and Control Cables

Note: Dash bracket, hardware, drilling guide and mounting instructions will be found in peculiar attachments box.




- A. Drill two 5/8" holes in the firewall for the control cables using drilling guide as a reference only. **Be sure both sides of the firewall are clear of obstructions before drilling.** Drill 1/2" hole in underside of dash as shown in dash illustration.
- B. Install the dash bracket as per dash bracket instructions.
- C. Loosen the "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 top of the driver side fender well. Attach control head to dash bracket as per dash bracket instructions. Install rubber grommets (73) around cables where they pass through the fire wall.

3. Drive Sheave Installation

Note: Apply a removable loosening prevention compound (such as "Lock-tite") to all drive sheave fasteners prior to installation.

- A. Remove the top half of the fan shroud, fan and clutch from water pump shaft (right hand thread), and loosen the serpentine belt. Remove and discard the three cap screws holding the vehicle crank pulley to the harmonic balancer. If the vehicle is equipped with a fourth cap screw in the center of the vehicle pulley remove and discard it also. Check the vehicle crank pulley and remove any burrs around the mounting holes.

Caution: Before inserting bushing, check center of crankshaft for rust or foreign material and remove.

NF FASTENER TORQUE (FT-LB)			
DIAMETER- THREADS PER INCH	GRADE		
	 G2	 G5	 G8
1/4 - 28	6	10	14
5/16 - 24	12	19	27
3/8 - 24	23	35	50
7/16 - 20	38	55	80
1/2 - 20	55	85	120
9/16 - 18	80	120	170
5/8 - 18	110	170	240
3/4 - 16	200	300	420
7/8 - 14	180	470	670
1 - 12	270	700	980

- B. Install drive sheave bushing (28) into center of crank shaft, reinstall vehicle sheave. Place the drive sheave (24) center hub through the vehicle sheave and bushing. Place a 7/16 x 6 (NF) Gr. 5 cap screw (87) and flat washer (88) in center of sheave, plus three 3/8 x 4-1/2 (NF) Gr. 5 cap screws (89) with spacer washers (93) through sheave spacers. **Tighten 7/16 x 6 cap screw (torque to 50 ft-lbs) before tightening the three 3/8 x 4-1/2 cap screws (torque to 31 ft-lbs).**

4. Pump, Pump Bracket, and Vehicle Hose Standoff Brace

- A. Remove the battery ground and the vehicle harness ground from the ground stud at the base of the engine, beside the mechanical fuel pump port. Discard the ground stud. Remove the front passenger side exhaust manifold bolt and discard it. Position the pump bracket (26) against the block where the grounding stud was removed. Attach the pump bracket (26) to the block using the threaded hole vacated by the grounding stud and the threaded hole directly above it with two 3/8 x 1 (NC) cap screws (90), and 3/8 lock washers (91). Reinstall the battery ground and the vehicle harness ground to the bottom bolt. Do not tighten at this time.

Attach the rounded end of the pump bracket brace (27) to the exhaust manifold replacing the previously removed bolt with a 3/8 x 2 1/4 (NC) cap screw (94). Attach the bent end of the pump bracket brace (27) to the pump bracket (26) with a 5/16 x 1- 1/4 cap screw (76), lock washer (79), and nut (80). Tighten all fasteners. Cut a length of 1/2" split hose grommet (64) and slip it over the angled part of the pump bracket (26). Cut another piece and slip it over the pump bracket brace (27).

- B. Remove and save the bolt holding the vehicle hose bracket below the alternator. Attach the hose standoff brace (34) to the alternator bracket reusing the bolt previously removed. The bracket will point up and slightly forward. Attach the vehicle hose bracket, previously removed, to the hose standoff bracket (34) by inserting a 5/16 x 1 cap screw (78) through the hole in the center of the vehicle hose bracket and through the outer hole in the standoff bracket. Fasten with a 5/16 lock washer (79) and nut (80). The vehicle hose bracket will run parallel with the standoff bracket.
- C. Rotate the pump (1) in the pump plate (33) so that the relief quill is pointing toward mounting slots in the pump plate. Fasten the pump to the pump plate using four 3/8 x 5/8 nylock cap screws and flat washers (96). Looking at the back of the pump--the non-shaft end--screw a 1/4" x 45 degree street elbow (50) into the pressure port with the fitting pointing up; opposite the relief quill. Tighten the 1/4" end of the 66" HP hose (16) into the 45 degree fitting just installed. Screw a 3/8 x 1/2 quill (49) into the 3/8" suction port of the pump (1) and install the 32" length of 1/2" LP hose (19) onto the quill. Also install the 42" length of 3/8" LP hose (23) onto the relief quill. Make sure all fittings are tight. Install the pump sheave (25) onto the pump shaft using the lock nut and key supplied with the pump.
- D. Route the loose ends of the pump hoses between the vehicle A/C and heater hoses and the pump bracket (26). Loop the loose ends of the hoses back toward the front of the vehicle over the A/C and heater hoses. Mount the pump, with the pump bracket spacer (35) between the pump plate and the pump bracket, to the front of the pump bracket with two 3/8 x 2 (NC) cap screws (95), flat washers (96), lock washers (91), and nuts (92). Install the 45" V-belt (39) over the drive sheave and pump sheave. Tighten the belt and the pump mounting bolts, allowing for maximum clearance around the pump assembly and belt.

5. Valve Assembly and Valve Plate

- A. Remove the plastic tool box on the driver side fender
- B. Using a bench vise to hold the control valve assembly (2), screw the 90 degree swivel adapter unions (47) into the "in" and "out" ports. Point these fittings toward the spools and slightly up. Screw 3/8 x 3/8 quill (55) into the installed adapter in the "out" port. Install three 9/16 O-ring x 1/4" NPT 90 degree elbows (54) into the lift and the angle ports. The elbows will point at approximately 7 o'clock with the spools at 12 o'clock.

- C. Mount the valve to the valve plate (29) using two 1/4 x 1-3/4 cap screws, lock washers and nuts from the valve bag. Install the valve plate braces (30 and 31) loosely to the valve plate, as per the illustration, using 5/16 x 1 cap screws (78), lock washers (79) and nuts (80). Attach a rubber shock mount (71) to the valve plate, as per the illustration, using a 5/16 lock washer (79) and nut (80). Remove and save the forward, bottom bolt from the anti-lock brake module. Place the valve plate assembly in the space vacated by the tool box with the control cable bulkheads pointed toward the engine. Route the control cables under the brake master cylinder, over the engine and connect them to the valve plate with the cables in their respective slots so they are in line with the valve spools. Attach the cable clevis (3) to the cables using square nuts (4). Slip the cable clevis over the spools and install the clevis pins (5) through the clevis and spool and secure them with push nuts (6). Temporarily adjust cables so control lever is near centered in the control head. Remove and save the fastener holding the throttle cable bracket on the driver side of the A/C compressor. Using the previously removed fastener, mount the cable support brace (32), with the throttle cable bracket back on to the engine. This will be used to support the control cables to ensure proper routing.
- D. With the cable bulkhead of the valve pointing toward the engine, loosely attach the valve brace (30) to the ABS bracket using the previously removed bolt. Place the other end of the rubber shock mount (71) into the hole in the fender vacated by the tool box fastener. Mark and drill an 11/32" hole in the fender for the valve brace (31). Fasten the valve brace (31) to the fender with a 5/16 x 1 cap screw (78), flat washer (81), lock washer (79), and nut (80). Fasten the rubber shock mount (71) with a flat washer (81), lock washer (79) and nut (80). Tighten all fasteners.

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.

- E. With the valve plate (29) fastened to the fender, readjust the control cables (9) so the control head lever is centered and the valve spools are in the neutral position. If the cable clevis does not allow enough adjustment, reposition the cable at the bulk head. After making sure the valve spools are centered, tighten the cable fasteners. Fasten the cables to the cable support brace (32) using a tie wrap (75).

6. Remote Reservoir Installation

Caution: Reservoir fill cap must be vertical to engine.

- A. Attach the remote reservoir bracket (40) to the battery box using the two existing holes in the webbing below the battery. The bracket will need to be placed behind the transmission oil cooler line. Attach the bracket with two 5/16 x 1 cap screws (78), lock washers (79), and nuts (80).

On some vehicles the holes under the battery, which are used to mount the remote reservoir, are already being utilized to hold a stiffener between the battery box and the head lamp webbing. In this case remove the battery and battery box with the stiffener attached. Replace the two fasteners holding the stiffener to the battery box with two M8 X 1.25 X 30 cap screws (98) and a 5/16" flat washer (81) under the head of the fastener. These fasteners will be used as the mounting "studs" for the reservoir mounting bracket. Reinstall the battery box and battery. Install the remote reservoir bracket (40) to the two "studs" with M8 nuts (99) and M8 lock washers (100). **Note: Be sure to isolate and secure the transmission oil lines from the reservoir bracket to eliminate rubbing.**

Attach the remote reservoir (14) and remote reservoir brace (41) to the remote reservoir bracket (40) temporarily with two 5/16 x 1 cap screws (78), lock washers (79), and nuts (80). Position the reservoir so there is no contact with any vehicle equipment, the positive battery connections may need to be repositioned to eliminate any rubbing on the reservoir, and mark the fender to locate a fastening point for the reservoir brace (41). Drill a 11/32" hole as marked and fasten the brace to the fender with a 5/16 x 1 cap screw (78), flat washer (81), lock washer (79), and nut (80). Tighten all fasteners. Screw a 3/8" street elbow (53) into the threaded port of the reservoir and screw a 3/8" x 1/2" quill (49) into the elbow; point the elbow and quill back toward the fire wall.

- B. Tighten the serpentine belt. Replace the fan/clutch assembly and the top half of the radiator shroud at this time.

7. Hydraulic Hose Installation




Caution: Keep hoses away from hot or moving engine components. Failure to do so may cause hose to burst resulting in a possible fire.

- A. Route the loose end of the pump's high pressure hose (16) over the top of the radiator shroud and screw it into the "in" port fitting on the valve. Install one end of the 48" low pressure hose (17) on to the return quill on the reservoir, run it along with the high pressure hose on top of the radiator shroud and attach the other end to the quill in the "out" port on the valve. Route the loose end of the 1/2" suction hose over the vehicle's AC lines and heater hoses and install it on to the 1/2" quill (49) already screwed into the reservoir. Run the relief hose along with the suction hose and install it into the relief quill on the reservoir. At this time secure the hoses around the pump and reservoir with plastic ties (59) the ensure no contact with any moving engine parts. **Be sure to fasten the suction and relief hoses away from the exhaust manifold and any other hot components. To ensure safe clearance form the exhaust manifold, it may be necessary to cut the LP hose to a slightly shorter length.**
- B. Remove the vehicle's grille. Route the three working cylinder hoses, angle right, angle left, and lift, through the gap between the headlight webbing and the driver side fender. Screw one of the 66" Hp hoses (18) into the "Cyl B" port in the valve (the passenger side angle hose). Screw the other 66" Hp hose (18) into the lift port on the valve. Route these hoses to the passenger side of the vehicle and out through the grille, low and about 14" from the center. Route the 46" driver's side angle hose (22) from the driver's side angle port on the valve and out through the grille low and about 14" to the driver's side of center. Run the head lamp connector (with dust cover) along with this angle cylinder hose.

Note: Some GMC models with fine mesh grills may have to use stand off legs (58) fastened with four 1/4 x 1/2 socket head cap screws (61) and lock nuts (62) on each grille plate (56 and 57).

Vehicles with heavy duty cooling and air conditioning may need the 3" fitting protector (67) on hoses rubbing the edge of the coil between the radiator and the grille. Place the fitting protector around all three hoses and secure with tie wraps (75).

- C. Attach the female half of a quick disconnect (QD) (42) to one hole in the two QD grille plate (57) with a snap ring (45). Attach the bulk head adapter (44) to the other hole in this grille plate with another snap ring (45). If the vehicle does not need the previously mentioned stand off legs on the grille plates, install a 1/4 x 90 degree swivel fitting (46), with dust plug (43), into the female QD. Install a 1/4 x 90 degree swivel fitting (46) with dust plug (43) into the bulk head adapter. Install a male QD half (42) onto the bulk head adapter. The 90 degree swivel fittings will not be used if the stand off legs are used. Attach the passenger side angle cylinder hose to the female QD and the lift cylinder hose to the bulk head adapter. Attach the grille plate assembly to the grille with plastic ties (75). The female QD should be placed toward the outside of the vehicle.
- D. Attach a female QD half (42) to the QD/Electric grille plate (56) with a snap ring (45). If the vehicle does not need the stand off legs on the grille plates put a dust plug (43) on the end of a 90 degree swivel fitting (46) and screw it into the female QD. Screw the driver's side angle cylinder hose into the 90 degree fitting. Slide the head lamp connector into the slot on this grille plate. Attach the grille plate assembly to the grille with plastic ties (75). The QD should be placed to the outside of the vehicle. Reinstall the grille.

DIAMETER- THREADS PER INCH	NC FASTENER TORQUE (FT-LB)		
	GRADE		
			
	G2	G5	G8
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

- E. Install cable boot bracket (65) on driver's side headgear brace, between the brace and fasteners. Insert cable boot (66) on over bracket.
- F. Align all the fittings on the valve and make sure they are tight.
- G. Install the in-line oil filter (7) as per instructions located in the common hydraulics kit.

8. Operations

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (75). Place caution label (72) on the dash beside the control head.
- B. Fill reservoir with FISHER® High Performance Hydraulic Fluid (recommended for superior cold-weather performance) or type "A" automatic transmission fluid. Start the engine, lift and angle the blade. **If the blade angles opposite from the control lever position, reverse the two Hp hose connections on valve.** Raise the front end of the vehicle until the plow is off the ground with the lift cylinder fully retracted. Check the reservoir oil level. Angle the blade (with the lift cylinder retracted) to remove air from the system. Recheck the reservoir oil level.

Note: The installer must inform the end user of the proper procedure for removing any residual hydraulic pressure that may be trapped in the raise or angle hoses. The plow will be much easier to install or remove if the proper procedures are followed.

Before coupling or uncoupling the hydraulic disconnects you must first turn off the ignition. Move the control to all four plowing positions and return the control to lower. You may then remove or install the plow.