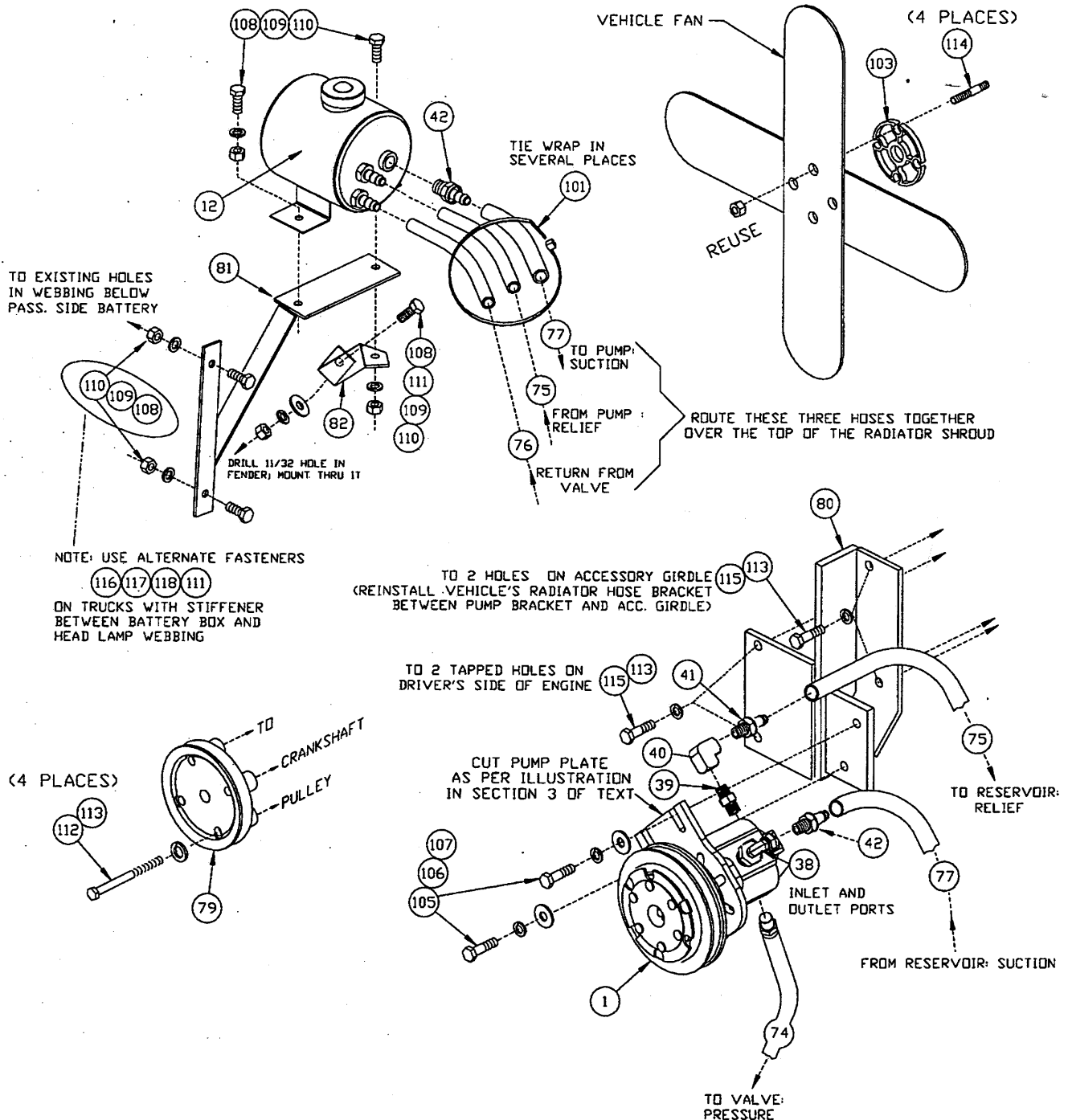
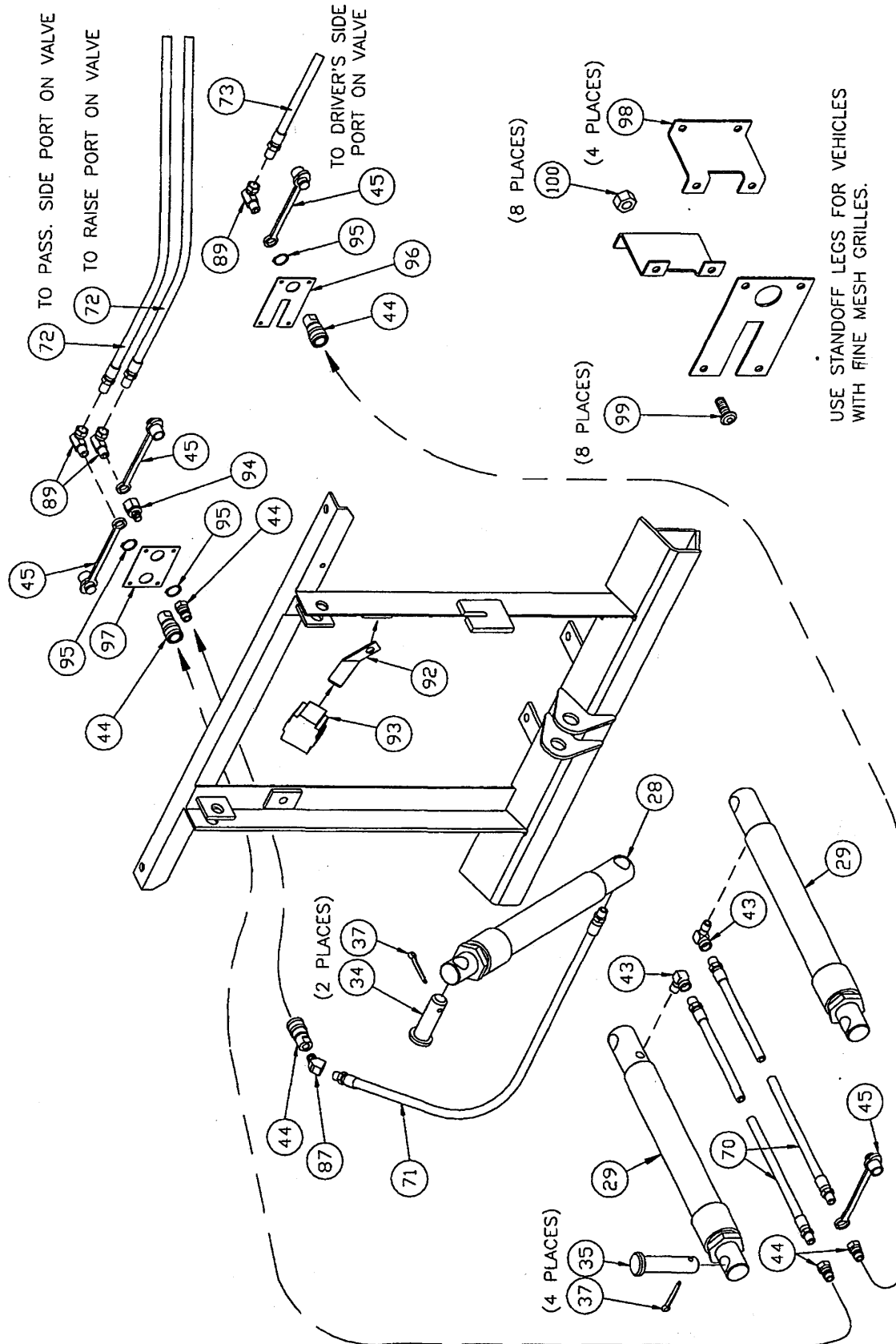
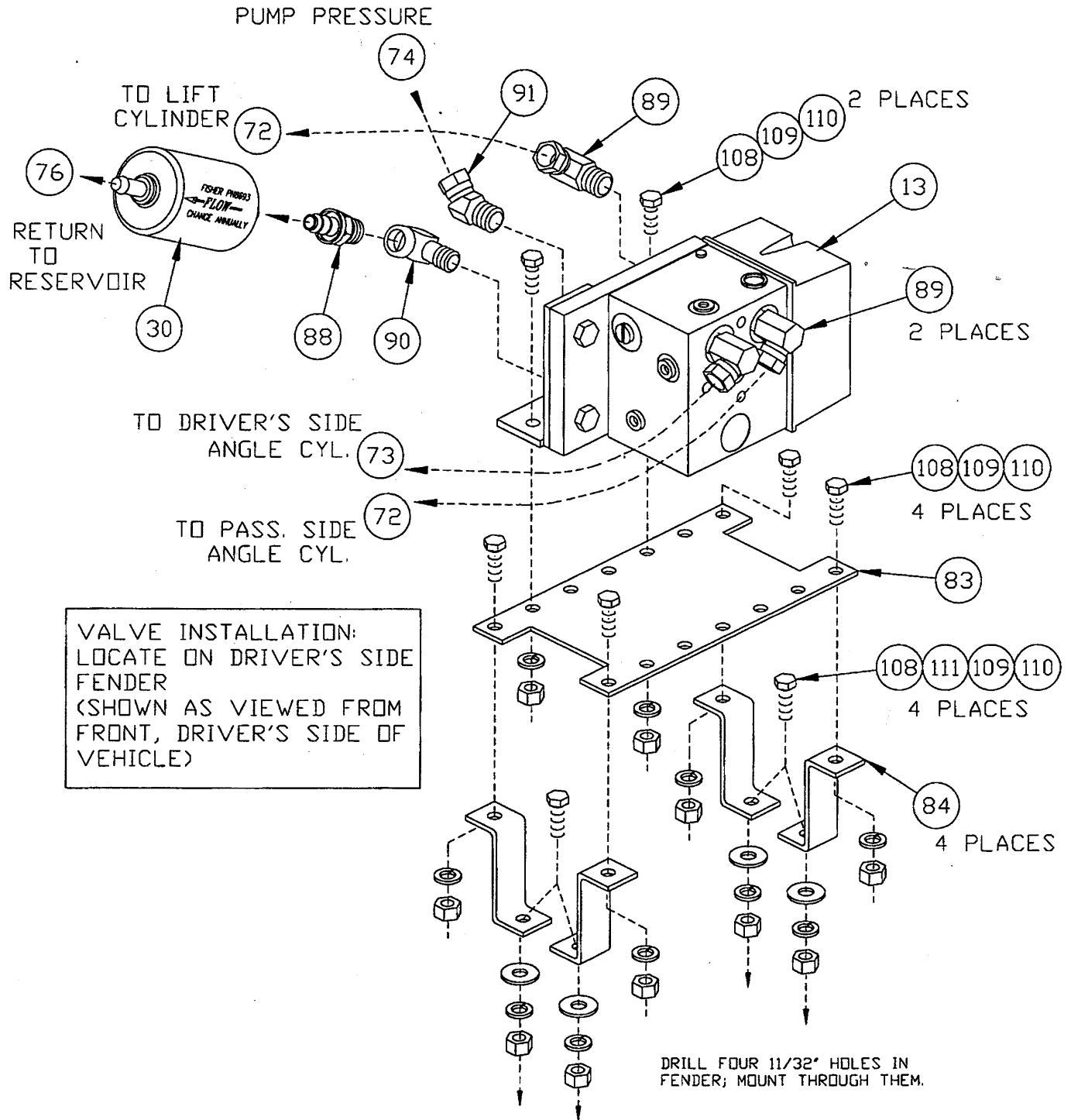


**PUMP/CLUTCH & RESERVOIR INSTALLATION:
VIEWED FROM FRONT/DR. SIDE OF VEHICLE**

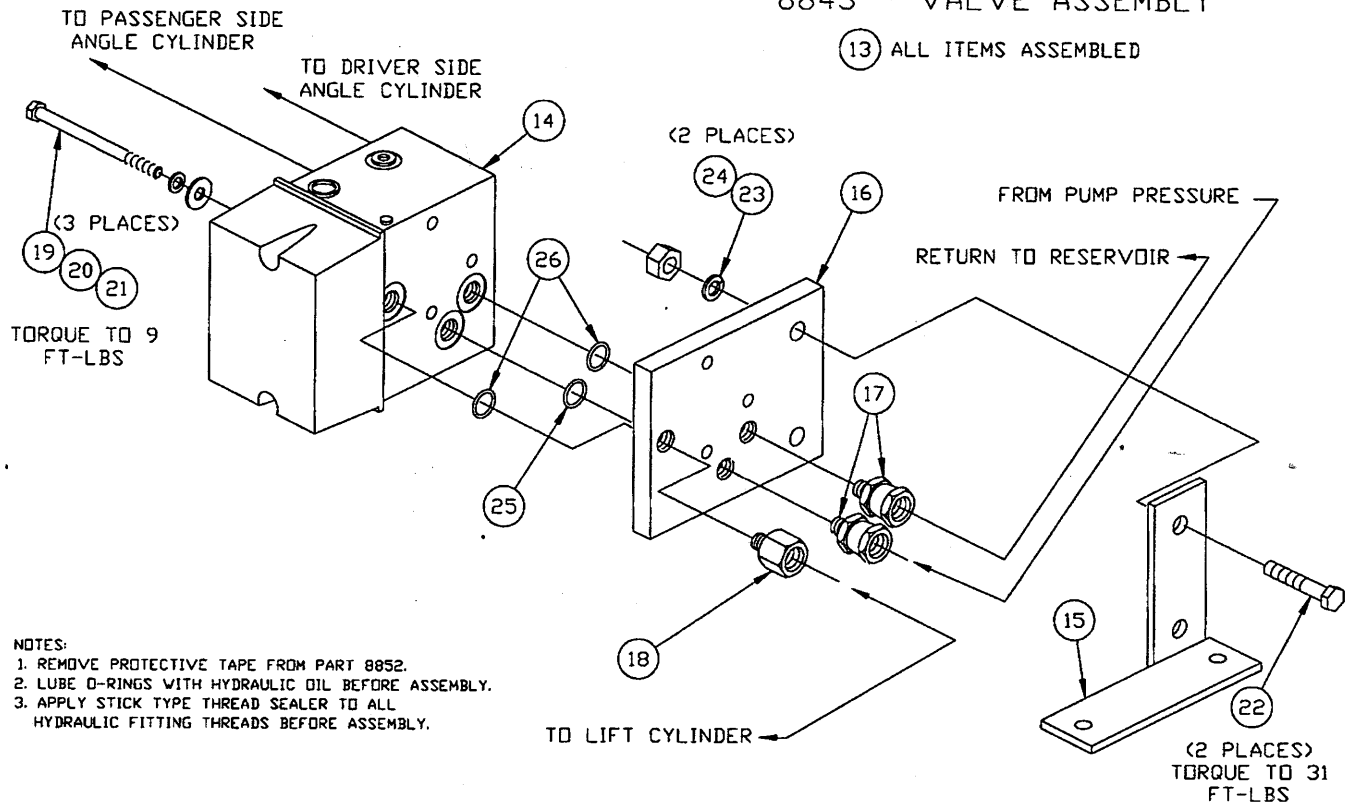






8843 - VALVE ASSEMBLY

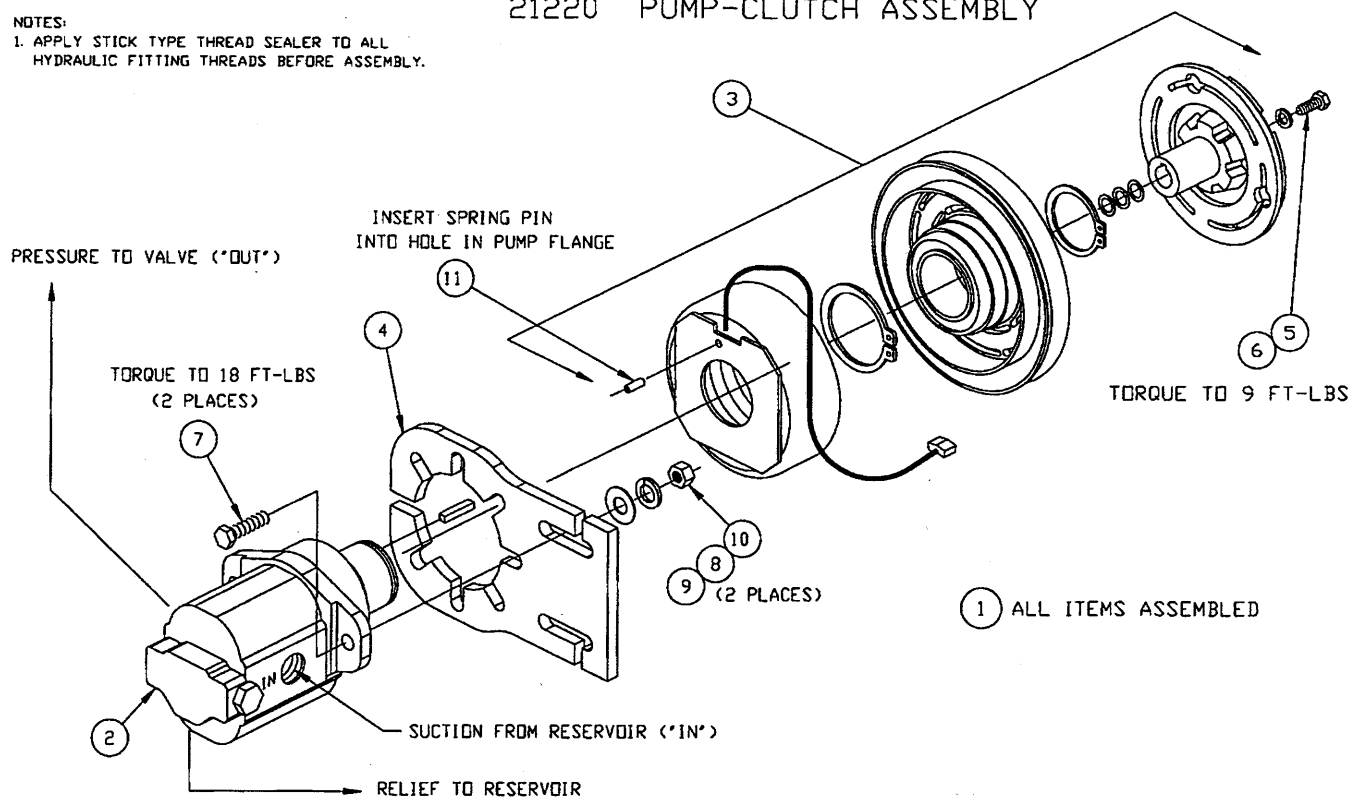
(13) ALL ITEMS ASSEMBLED



21220 PUMP-CLUTCH ASSEMBLY

NOTES:

1. APPLY STICK TYPE THREAD SEALER TO ALL HYDRAULIC FITTING THREADS BEFORE ASSEMBLY.



Parts List
8840-40B Electric Clutch Common Hydraulic Kit

Ref #		Qty	Part #	Description
Assy	Comp			
1		1	21220	Pump-Clutch Assembly
	2	1	21221	Pump Assembly
	3	1	21222	Electric Clutch
	4	1	21219	Pump Plate
	5	1	90461	1/4 x 3/4 (NC) Gr.5 Cap Screw
	6	1	90359	1/4 Lock Washer
	7	2	90048	5/16 x 1-1/4 (NF) Gr.5 Cap Screw
	8	2	90360	5/16 Lock Washer
	9	2	90313	5/16 Plain Washer
	10	2	90332	5/16 Hex Nut
	11	1	90707	5/32 x 1/2 Spring Pin
12		1	8389	Oil Reservoir
13		1	8843	Valve Assembly--Elec Clutch/Sol
	14	1	7921	Valve Manifold Assy Sol - 4000
	15	1	8851	Valve Bracket
	16	1	8852	Mounting Plate - Valve
	17	2	8849	1/8 Nptm to 1/4 NPT Swivel Adapter
	18	1	8848	1/8 Nptm to 1/4 NPT Reducing Adapt
	19	3	90696	1/4 x 3-1/2 (NC) Gr.5 Cap Screw
	20	3	90359	1/4 Lock Washer
	21	3	90311	1/4 Plain Washer
	22	2	90111	3/8 x 1-1/2 (NC) Gr.5 Cap Screw
	23	2	90361	3/8 Lock Washer
	24	2	90334	3/8 (NC) Nut
	25	1	3719	O-Ring - 013
	26	2	5827	O-Ring - 012
27		1	7714	Dash Bracket Bag (not shown)
28		1	20116	10" Lift Cylinder Assy - XL
29		2	20117	12" Angle Cylinder Assy - XL
30		1	8764	Filter Kit
31		1	20040	Control Harness--Clutch & Solenoid Valve
32		1	8292	Solenoid Control
33		1	21295	Bolt Bag for 8840-40B
	34	2	6814	Clevis Pin - 1 OD x 3-5/16
	35	4	6816	Anchor Pin - 1 OD x 4
	36	1	21296	Bolt Bag - Part of 21295
	37	6	90601	1/4 x 1-1/2 Cotter Pin
	38	2	21270	3/4-16 O-Ring to 3/8 NPT Swivel Elbow
	39	1	5804	1/4" Hex Male Nipple
	40	1	2318	1/4 NPT x 90° Union Elbow
	41	1	8850	Quill - 1/4 NPT to 3/8 ID Hose
	42	2	8391	Quill - 3/8 NPT to 1/2 ID Hose
	43	2	2780	1/4 Npt x 90° Street Elbow
	44	3	21096	Hose Disconnect Assembly
	45	4	1588	Dust Plug - Closure/Male
	46	1	3042	Grommet - Rubber, Split
	47	1	4477	Grommet - Split Hose (not shown)
	48	1	8329	Dielectric Grease Tube (not shown)
	49	1	4302	3M 560 in-line Connector
	50	1	4303	Female Connector (not shown)
	51	1	5048	Male Connector (not shown)

Parts List
7553B Electric Clutch Peculiar Hydraulic Kit

Ref #		Qty	Part #	Description
Assy	Comp			
70		2	4424	Hose - 36" HP, 1/4P to 1/4P
71		1	3074	Hose - 22" HP, 1/4P to 1/4P
72		2	8632	Hose - 78" HP 1/4P to 1/4P
73		1	6066	Hose - 66" HP 1/4P to 1/4P
74		1	4935	Hose - 30" HP 1/4P to 3/8P
75		1	2519	3/8" Hose - 66" LP
76		1	1663	3/8" Hose - 54" LP
77		1	21107	1/2" Hose - 58" LP
78		1	1674	54" V-Belt (not shown)
79		1	6589	Drive Sheave
80		1	21106	Pump Bracket
81		1	21032	Reservoir Bracket
82		1	21033	Reservoir Brace
83		1	21168	Valve Plate - Sol valve
84		4	20403	Brace - Short
85		1	5704	Caution Label
86		1	21108	Bolt Bag for 7553B
	87	1	8476	1/4 x 45 Deg Street Elbow
	88	1	8850	Quill - 1/4 Nptf to 3/8 ID Hose
	89	6	319	1/4 NPT x 90 Deg SWV ADT Union
	90	1	2780	1/4 NPT x 90 Deg Street Elbow
	91	1	8127	1/4 x 45 Deg Street Swivel
	92	1	8741	Bracket - Cable Boot
	93	1	8284	Cable Boot
	94	1	4486	Bulkhead Adapter
	95	3	4485	7/8" Snap Ring - External Bowed
	96	1	8688	QD/Electric Grille Plate (short)
	97	1	8686	2 QD Grille Plate (short)
	98	4	8687	Stand off Leg
	99	8	90687	1/4 x 1/2 (NC) Button Head Cap Screw
	100	8	90350	1/4 (NC) Locknut
	101	8	8324	Tie Wrap - 3/16 x 14
	102	8	3666	Tie Wrap - 3/16 x 8 (not shown)
	103	1	8244	Fan Spacer - .25
	104	1	4477	Split Hose Grommet (3/8 x 6)
	105	2	90106	3/8 x 1-1/4 (NC) Gr.5 Cap Screw ZP
	106	2	90361	3/8 Lock Washer
	107	2	90315	3/8 Plain Washer
	108	15	90042	5/16 x 1 (NC) Gr.5 Cap Screw
	109	15	90360	5/16 Lock Washer
	110	15	90332	5/16 (NC) Nut
	111	7	90313	5/16 Plain Washer
	112	4	90579	M10 x 1.5 x 90 Hx CS Gr. 10.9 Ny PI
	113	8	90429	M10 SP Lock Washer ZP
	114	4	5939	M8 x 1.25 x 50 Dbl End Stud G10.9
	115	4	90391	M10 x 1.5 x 30 HX CS G8.8 ZP/PL
	116	2	90379	M8 x 1.25 x 30 HX CS G8.8 ZP/PL
	117	2	90423	M8 x 1.25 Hx Nut G8.8 ZP/PL
	118	2	90428	M8 SP LK Washer ZP/PL

Note: The 20850 Fish-Stik™/Clutch Relay Kit is required for installations that will use the 9400 Fish-Stik Push Button Hand-Held Control.

1. Cylinder and Cylinder Hose Assembly

- A. Attach female half of disconnect (44) and a 1/4" Npt 45° street elbow (87) to 22" Hp Hose (71). Using bench vise to hold lift cylinder (28), 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 (34) and cotter pins (37).
- B. Attach male half of quick disconnect (44) to one end of a 36" Hp hose (70). Place a dust cover (45) on the end of the other 36" Hp Hose (70) and put another male half of a disconnect (44) on this hose.
- C. Using a bench vise to hold angle cylinders (29), remove closures from ports. Screw brass forged street ells (43) into ports. Ells should 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. This male half will be plugged into the female half on the lift cylinder for storage. Install cylinders to their respective sides so that ells are between the cylinders and the A-frame. Secure cylinders with anchor pins (35) at both ends, with cotter pins (37) in each anchor.

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

2. Drive Sheave Installation

- A. Remove top section of fan shroud, loosen serpentine belt from idler pulley and remove fan. Save fasteners. Remove and discard cap screws holding the vehicle crank pulley to the crankshaft. Position drive sheave (79) over holes in crank pulley and fasten drive sheave and crank pulley to crankshaft using four M10 x 1.5 x 90 Gr. 10.9 Nylock cap screws (112) and four M10 lock washers (113). Torque these fasteners to 72 N-m (53 ft-lbs) while making sure lock washers seat properly on the sheave.

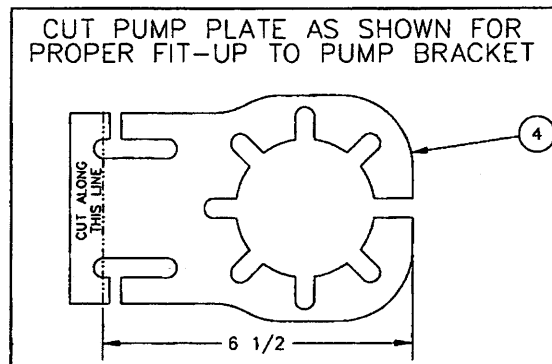
Caution: Before inserting bushing, check center of crankshaft for rust or any foreign material and remove.

METRIC - COARSE FASTENER TORQUE (N-M)			
NOM. SIZE - PITCH	GRADE		
	8.8	10.9	12.9
6 - 1	11	15	18
8 - 1.25	26	36	43
10 - 1.5	51	72	87
12 - 1.75	89	125	150
14 - 2	141	198	240
16 - 2	215	305	365
20 - 2.5	420	590	710
22 - 2.5	570	800	960
24 - 3	725	1020	1220
27 - 3	1070	1510	1810

- B. Remove and discard the four studs from the water pump shaft flange. Install the four longer M8 studs (114) by screwing the end with the short thread into the holes in the water pump shaft flange. Replace the water pump sheave over the studs, add the fan spacer (103) and reinstall the fan with the original nuts torqued to 36 N-m (27 ft-lbs).

3. Pump-Clutch Assembly and Pump Bracket

- A. The pump plate (4) needs to be modified. Cut the end of the pump plate off as shown in the illustration to the right. Remove any slag or burrs left on the plate from the cutting process. Remove and save the two bolts holding the pump to the pump plate. Rotate the pump in the plate as shown in the illustration on page 1. The relief port should point toward the mounting slots. Attach the pump plate to the pump.

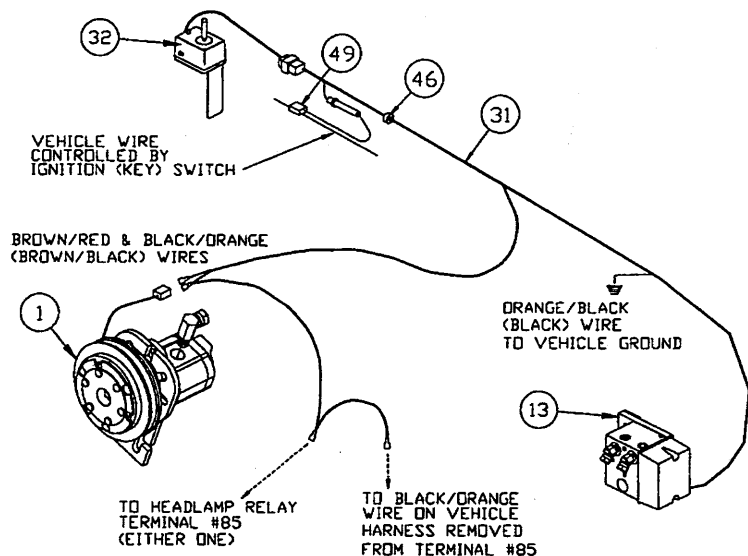


- B. Looking down on the pump-clutch assembly (1) with the 'in' suction port up, install a 3/4 o-ring to 3/8 Npt swivel elbow (38) into the pressure 'out' port. Position the 3/8 Npt swivel elbow (38) to 5:00 with the pump shaft as a 12:00 reference. Install the other 3/4 o-ring to 3/8 Npt swivel elbow (38) into the suction 'in' port. Position it to 10:00. Lock the fittings in their proper orientation with the jam nuts. Attach a 1/2" quill (42), from the common kit, into the suction fitting. Install the 58" long 1/2" LP hose (77) onto the quill. Install the 1/4" hex male pipe nipple (39) into the relief port and attach the 1/4" union elbow (40) so that the elbow outlet points toward the back of the pump. Insert the 3/8 quill (41) into the elbow (40). Attach the 66" long 3/8" LP hose (75) onto the quill. Screw the 3/8" end of the 30" 1/4" to 3/8" HP hose (74) into the pressure fitting. Make sure all fittings are tight.
- C. Remove and discard the two vehicle fasteners on the driver-side of the engine that are holding the top radiator hose bracket. Align the pump bracket (80) over the two unused tapped holes and the two holes just vacated. Position the radiator hose bracket between the pump bracket and the accessory girdle and attach the pump bracket using four M10 x 1.50 x 30 cap screws (115) and M10 lock washers (113). Tighten all fasteners.
- D. Mount the pump-clutch assembly to the pump bracket using the bottom 3/8 x 1-1/4 (NC) Gr. 5 cap screw (105), 3/8 flat washer (107) and 3/8 lock washer (106) only at this time. Place the 54" V-belt (78) over the drive sheave, rotate the pump assembly down and place the belt over the clutch sheave. Rotate the pump assembly back up and install the top 3/8 x 1-1/4 (NC) Gr. 5 cap screw (105), 3/8 flat washer (107) and 3/8 lock washer (106). Tighten the V-belt being careful to position the pump plate so as to leave adequate space between the V-belt and other engine components, particularly the center hub of the power steering sheave. Tighten all fasteners.

4. Solenoid Control and Harness Installation

Note: Use dielectric grease (48) to prevent corrosion on all under hood electrical connections. Fill receptacles and lightly coat ring terminals and blades before assembly.

- A. Check both sides of fire wall for wires and hot or moving engine parts. Then, on the driver side, drill a 5/8" hole in the fire wall for the control harness (31).
- B. Install the solenoid control (32) and dash bracket as per the instructions found in the dash bracket bag (27) located in the common hydraulic bolt bag.
- C. Remove negative battery cable from battery. **Warning! Disconnect battery before installing, removing or replacing electrical components.**



- D.** Insert the control harness (31) through the hole drilled in the fire wall. Attach the connector to the plug on the solenoid control. Connect the red wire from the fuse holder to a circuit which is on only when the ignition key is on. Use an in-line connector (49). Route the main portion of harness (white, green, blue and black wires) to the valve. Place a grommet (46) around control harness where it passes through fire wall. Remove the plastic cover from the valve. Install the solenoid wires according to the instructions inside the cover. Install the cover with the harness strain relief in place inside. Attach orange/black (black) wire with ring terminal exiting loom near valve to a good vehicle ground. Route the portion of the harness with the brown/red and black/orange wires with female spade terminals to electric clutch.

Note: Install the 20850 Fish-Stik™/Clutch Relay Kit at this time, if necessary.

Attach female spade terminals to clutch plug (brown/red to black with white stripe and black/orange to black). Fasten other black/orange wire with female spade connector to head lamp relay and male spade connector to black/orange ground wire from vehicle harness. See Diagram 1.

Note: The relay and vehicle harness are found in the peculiar light kit.

- E. Install plow headlamps according to the light kit instructions. Stretch the rectangular opening of the plug cover strap (from light kit) over grille connector ends of the long battery cable (from hydraulics box) and vehicle harness (from light kit). Place the plug cover over the mold on the harness.

- F. Reconnect negative battery cable to battery terminal.

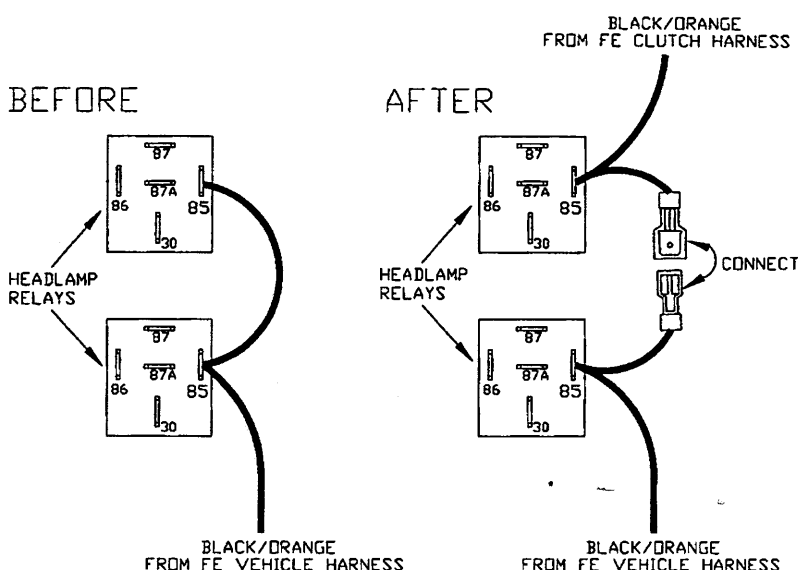


Diagram 1

5. Valve and Valve Plate

- A. Fasten the solenoid valve assembly (13) to the valve plate (83) with two 5/16 x 1 (NC) Gr. 5 cap screws (108), lock washers (109), and nuts (110), as per the illustration. Fasten the four valve plate brackets (84) to the valve plate, as per the illustration, using 5/16 x 1 (NC) Gr. 5 cap screws (108), lock washers (109), and nuts (110). Tighten the fasteners.
- B. The valve plate assembly will be mounted to the driver-side fender in the opening behind the battery. The valve cover will point toward the fire wall. Set the valve assembly in this space and mark the fender for the location of the mounting holes. Drill four 11/32" holes in the fender, as marked, and attach the valve plate assembly to the fender with four 5/16 x 1 (NC) Gr. 5 cap screws (108), flat washers (111), lock washers (109) and nuts (110).
- C. Screw two 90° swivel fittings (89) into the two angle cylinder ports and the lift cylinder port with the fittings pointed as per the illustration. Screw a 45° swivel fitting (91) into the pressure port. Screw a 3/8" quill (88) into a 90° street elbow (90) and screw the street elbow into the return port. Position these fittings according to the illustration.

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

6. Oil Reservoir

Caution: Reservoir tank fill must be vertical to engine.

- A. Attach the remote reservoir bracket (81) to the passenger side battery box using the two existing holes in the webbing below the battery. The bracket will need to be placed behind the air-conditioning "high side" line. Attach the bracket with two 5/16 x 1 cap screws (108), lock washers (109) and nuts (110).

On some vehicles the holes under the battery, which are used to mount the remote reservoir, are already being used 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 (116) and a 5/16" flat washer (111) 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 (81) to the two "studs" with M8 nuts (117) and M8 lock washers (118).

Note: Be sure to isolate and secure the air-conditioning "high side" lines from the reservoir bracket to eliminate rubbing.

Temporarily attach the remote reservoir (12) and remote reservoir brace (82) to the remote reservoir bracket (81) with two 5/16 x 1 cap screws (108), lock washers (109) and nuts (110). 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. Locate a fastening point between the battery and the air filter box for the reservoir brace (82) and mark the fender. Drill a 11/32" hole as marked and fasten the brace to the fender with a 5/16 x 1 cap screw (108), flat washer (111), lock washer (109) and nut (110). Tighten all fasteners. Screw a 1/2" quill (42), from the common kit, into the threaded port of the reservoir.

- B. Tighten the serpentine belt and reinstall the top half of the radiator shroud. The clip holding the negative battery cable, that goes across the top of the shroud, should be fastened with the outer shroud hold down bolt on the driver side in order to keep it away from the hydraulic pump clutch.

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 engine fire.

Note: Do not shorten LP hoses. Bends in all hoses must have sufficient radius to prevent crimping. A crimped hose may cause overheating of the hydraulic system, hose failure, and possible engine fire.

- A. Route the loose end of the pump pressure hose (74) to the 45° swivel fitting in the pressure port on the valve and tighten the fitting. Route the loose end of the pump relief hose over the top of the radiator shroud to the top 3/8" quill on the reservoir. Route the pump suction hose over the top of the radiator shroud and install it onto the 1/2" quill screwed into the reservoir. Install one end of the 54" 3/8" LP hose (76) onto the bottom 3/8" quill of the reservoir. Route the loose end over the top of the shroud and install it onto the quill in the return port on the valve.
- B. Install the in-line return filter according to the instructions located in the filter kit (30). The filter kit is located in the common hydraulic kit. The best location for the filter is on the driver-side of the vehicle between the valve and the top radiator hose. Use the plastic ties (101) to bundle and/or isolate any hoses from moving or hot engine and vehicle parts.
- C. Remove the grille and route the three cylinder hoses (72, 72, 73) through the gap between the headlamp webbing and the driver-side fender. Route the three hoses over the driver-side battery to the valve. The 66" hose (73) goes to the driver-side angle cylinder port. The two 78" hoses (72) go to the passenger-side angle port and the lift cylinder port. When the hoses are tightened into the appropriate valve ports, place a length of the split radiator hose (47), from the common kit, between the cylinder hoses and the head lamp webbing. **This is very important due to the sharp edge of the head lamp webbing.**
- D. Attach the female half of a quick disconnect (QD) (44) to one hole in the two QD grille plate (97) with a snap ring (95). Attach the bulk head adapter (94) to the other hole in this grille plate with another snap ring (95). If the vehicle does not need the stand off legs on the grille plates, install a 1/4 x 90 degree swivel fitting (89), with dust plug (45), into the female QD. Install a 1/4 x 90° swivel fitting (89), with dust plug (45), into the bulk head adapter. Install a male QD half (44) to the bulk head adapter (94). 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 (102). The female QD should be placed toward the outside of the vehicle.

Note: Some GMC models with a fine mesh grille may have to use stand off legs (86) fastened with four 1/4 x 1/2 socket head cap screws (92) and locknuts (93) on each grille plate.

- E. Attach a female QD half (44) to the QD/Electric grille plate (96) with a snap ring (95). If the vehicle does not need the stand off legs on the grille plates, put a dust plug (45) on the end of a 90 degree swivel fitting (89) and screw it into the female QD. Screw the driver-side angle cylinder hose (73) into the 90° fitting. Slide the head lamp connector into the slot on this grille plate. Attach the grille plate assembly to the grille with plastic ties. The QD should be placed to the outside of the vehicle. Reinstall the grille.
- F. Install cable boot bracket (92) on driver-side headgear brace, between brace and fasteners. Insert cable boot (93) on over bracket.
- G. Align all the fittings on the valve and make sure they are tight.

8. OPERATIONS

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (101). Place Caution Label (85) on the dash beside the control.
- B. Attach the hose disconnects, push lift arm all the way down and fill reservoir with FISHER® High Performance Hydraulic Fluid (recommended for superior cold-weather performance) or type "A" automatic transmission fluid. Start engine. Lift and angle blade several times. If blade angles opposite from control lever position, reverse the two angle hoses at the valve. Raise front end of vehicle until plow is clear of ground, with lift cylinder fully retracted. Check reservoir oil level. Angle blade (with lift cylinder retracted) to remove air from system. Recheck 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 turn off the engine and then turn the key to the "on" position (the red LED light will be lit). Move the control to the four plowing positions. Activate lower/float before removing or installing the plow.