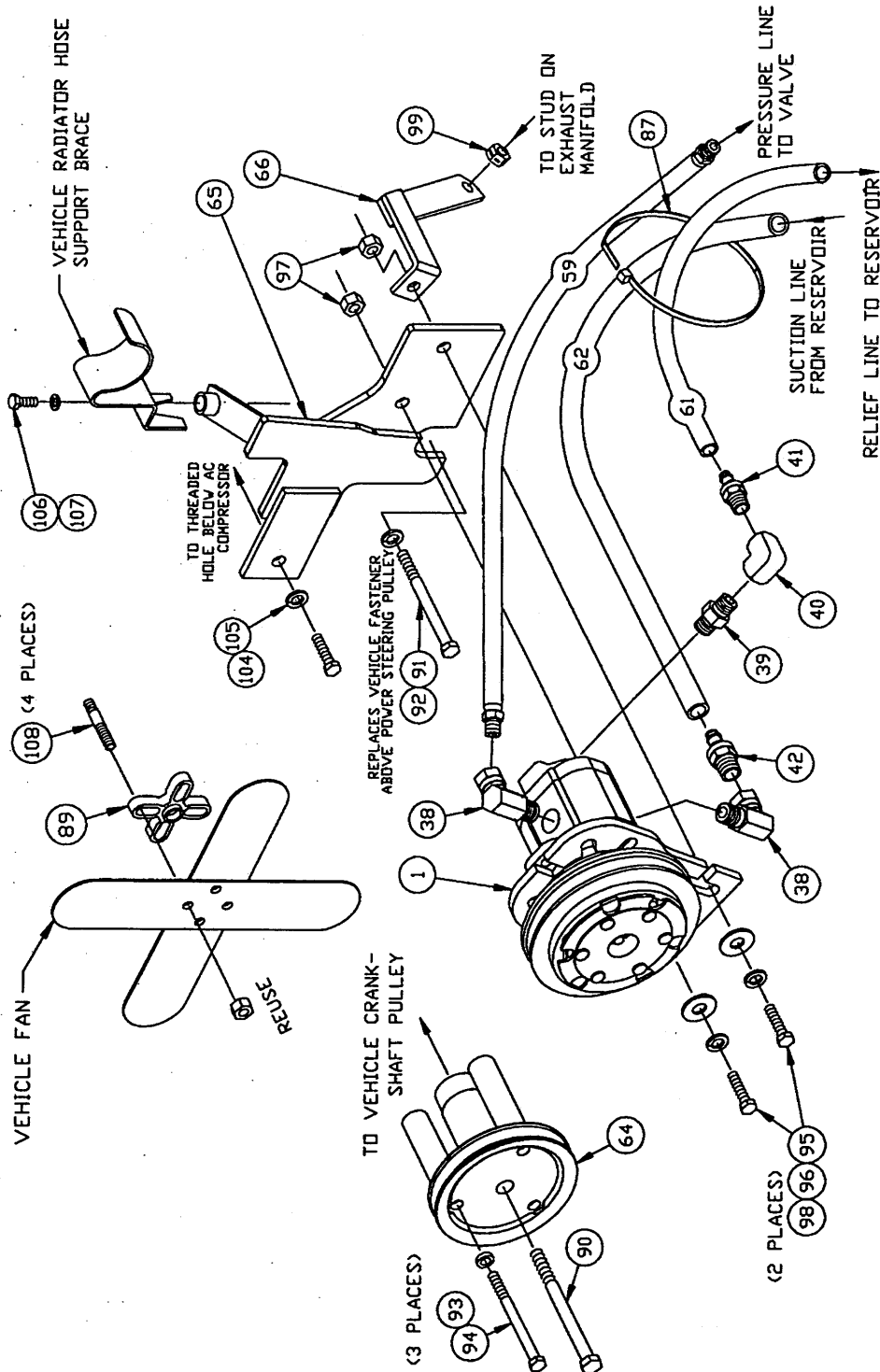
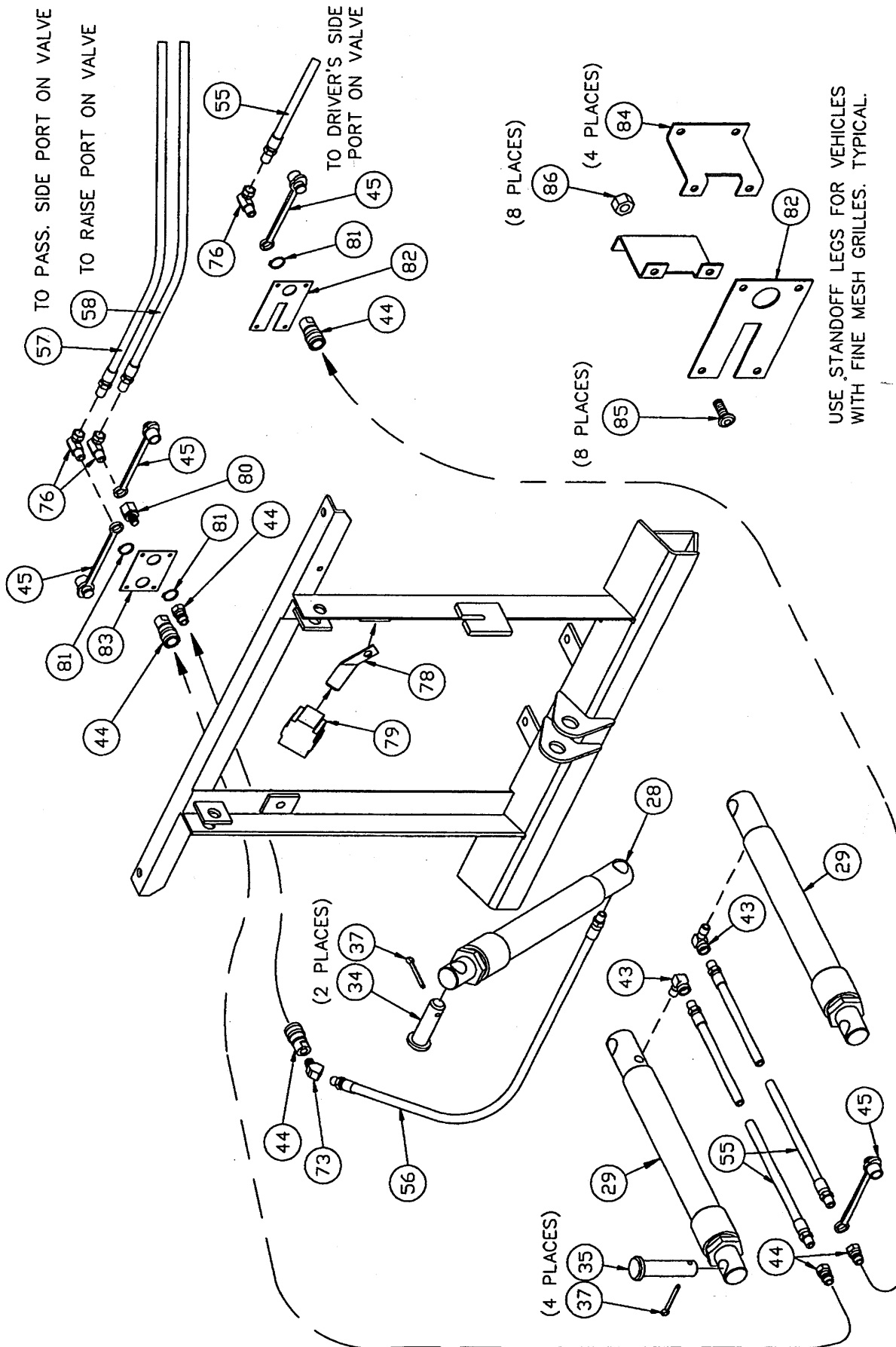
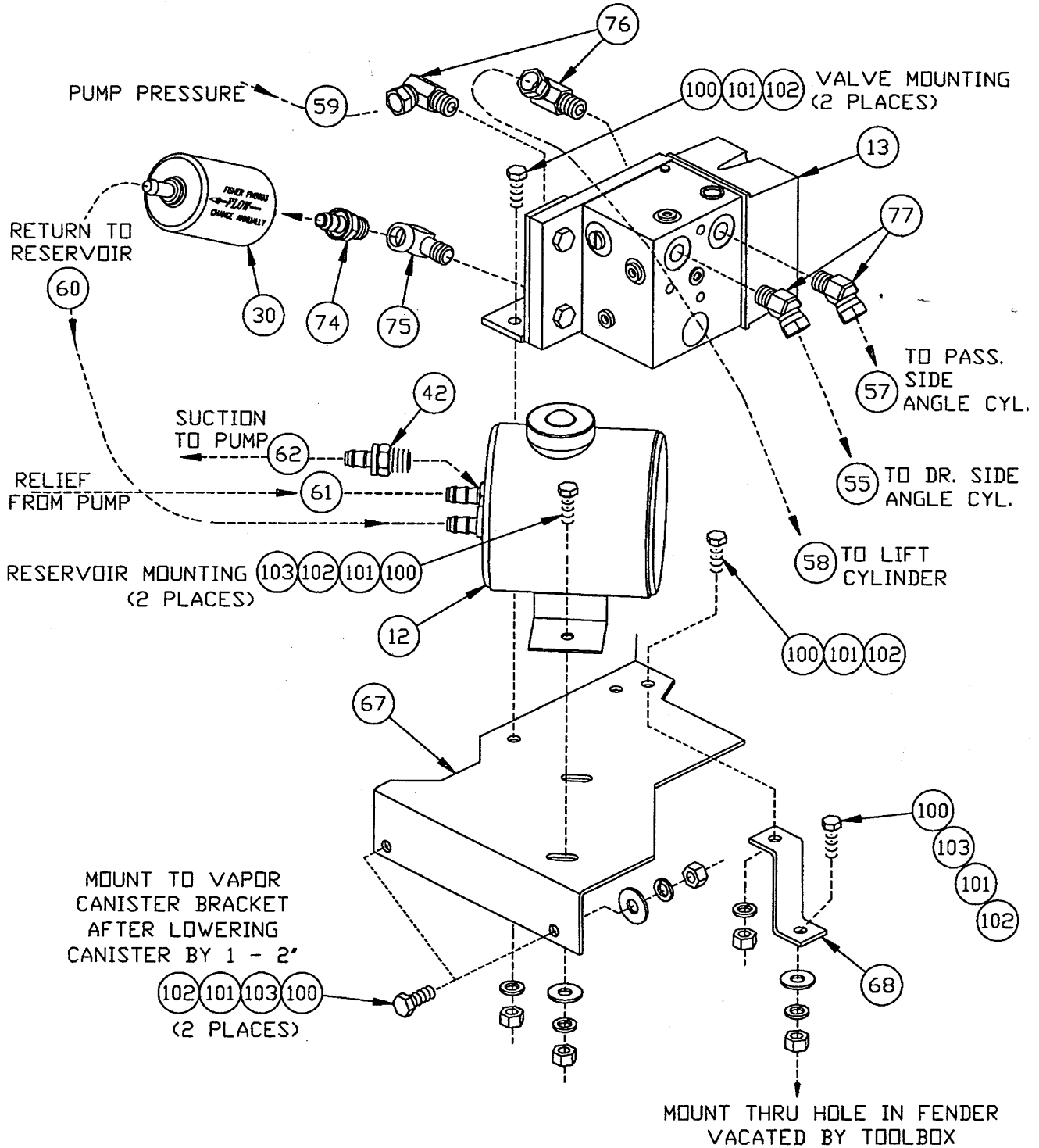


PUMP/CLUTCH INSTALLATION
(VIEWED FROM FRONT DRIVER SIDE OF VEHICLE)



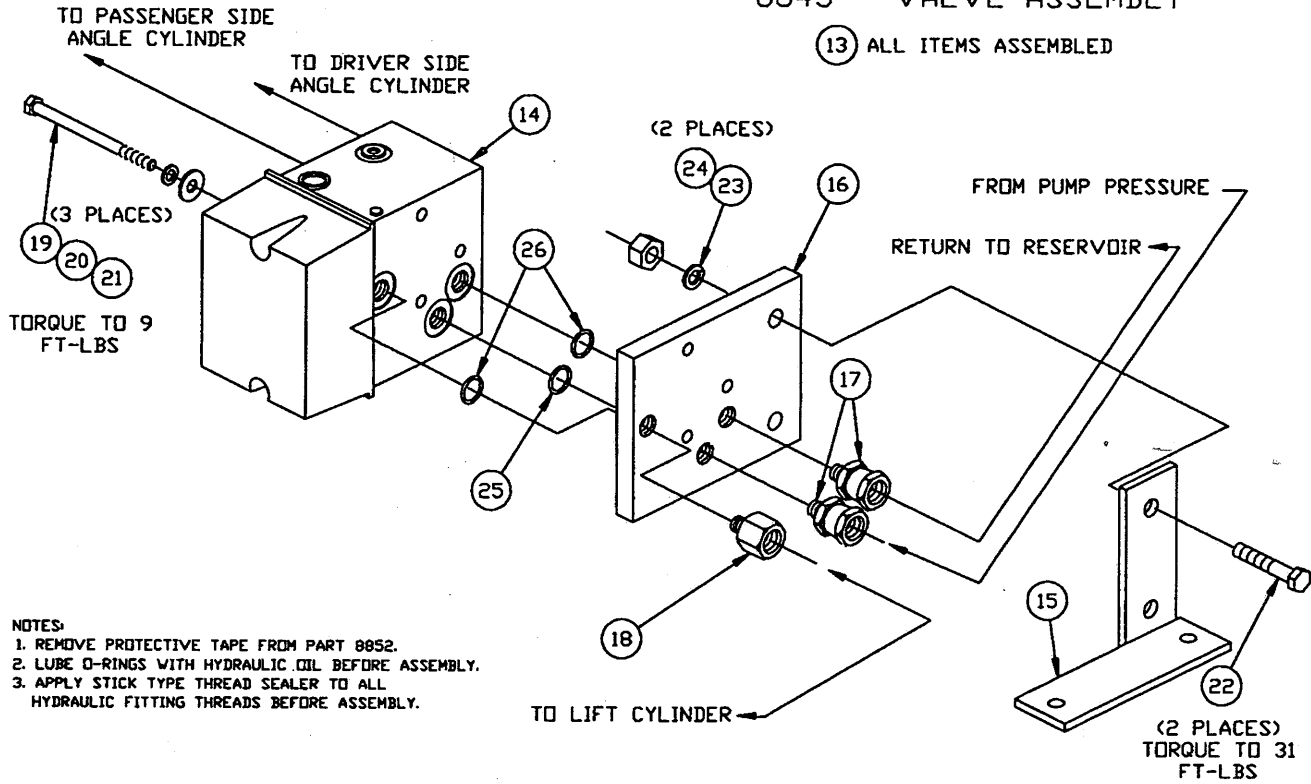


VALVE / RESERVOIR INSTALLATION
 (VIEWED FROM FRONT PASS. SIDE OF VEHICLE)



8843 - VALVE ASSEMBLY

13 ALL ITEMS ASSEMBLED



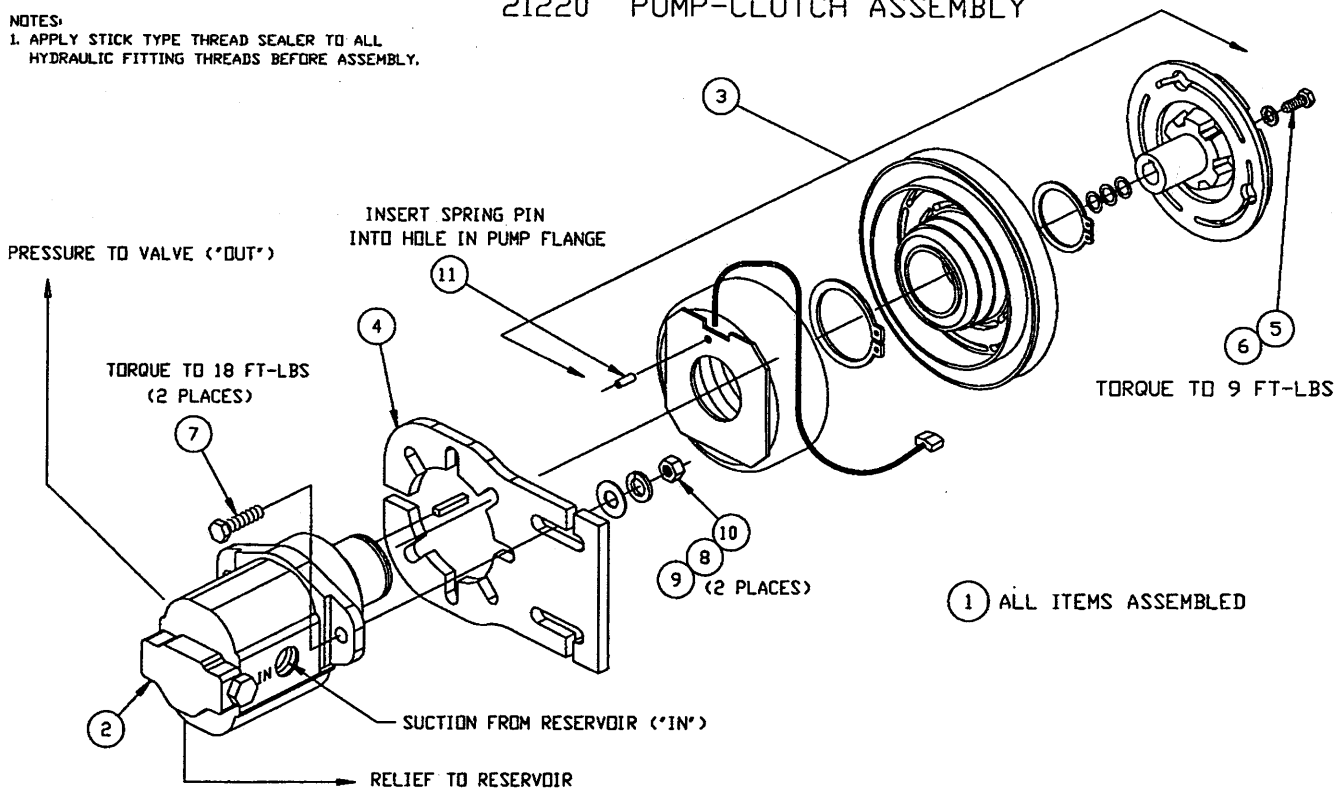
NOTES:

1. REMOVE PROTECTIVE TAPE FROM PART 8852.
2. LUBE O-RINGS WITH HYDRAULIC OIL BEFORE ASSEMBLY.
3. APPLY STICK TYPE THREAD SEALER TO ALL HYDRAULIC FITTING THREADS BEFORE ASSEMBLY.

21220 PUMP-CLUTCH ASSEMBLY

NOTES:

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



1 ALL ITEMS ASSEMBLED

Parts List
8840-40B Electric Clutch Common Hydraulic Kit

Assy	Ref # Comp	Qty	Part #	Description
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 (NC) 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 (NC)
	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 Nptf Swivel Adapter
	18	1	8848	1/8 Nptm to 1/4 Nptf 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 & sol 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 Pipe Nipple
	40	1	2318	1/4 Npt x 90° Union Elbow
	41	1	8850	Quill - 1/4 Nptf to 3/8 ID Hose
	42	2	8391	Quill - 3/8 Nptm to 1/2 ID Hose
	43	2	2780	1/4 Npt x 90 degree Street Elbow
	44	3	A1587	Hose Disconnect Assembly
	45	4	1588	Dust Plug - Closure/Male
	46	1	3042	Grommet - Rubber, Split (not shown)
	47	1	4477	Grommet - Split Hose (not shown)
	48	1	8329K	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
7554 Electric Clutch Peculiar Hydraulic Kit

Ref #		Qty	Part #	Description
Assy	Comp			
55		3	4424	Hose - 36" HP 1/4P to 1/4P
56		1	3074	Hose - 22" HP 1/4P to 1/4P
57		1	5192	Hose - 60" HP 1/4P to 1/4P
58		1	21064	Hose - 72" HP 1/4P to 1/4P
59		1	2707	Hose - 26" HP 1/4P to 3/8P
60		1	5653	3/8" Hose - 28" LP
61		1	21273	3/8" Hose -21" LP
62		1	8393	1/2" Hose - 19" LP
63		1	1118	56" V-Belt (not shown)
64		1	21279	Drive Sheave
65		1	21271	Pump Bracket
66		1	21272	Pump Bracket Brace
67		1	21286	Reservoir/Valve Plate
68		1	20403	Brace - Short
72		1	21274	Bolt Bag for 7554
	73	1	8476	1/4 Npt x 45 Deg Street Elbow
	74	1	8850	Quill - 1/4 Nptf to 3/8 ID Hose
	75	1	2780	1/4 Npt x 90 degree Street Elbow
	76	5	319	1/4 Npt x 90° Swivel Adt. Union
	77	2	8127	1/4 Npt x 45° Swivel Adt. Union
	78	1	8741	Bracket - Cable Boot
	79	1	8284	Cable Boot
	80	1	4486	Bulkhead Adapter
	81	3	4485	7/8" Snap Ring - External Bowed
	82	1	8688	QD/Electric Grille Plate (short)
	83	1	8686	2 QD Grille Plate (short)
	84	4	8687	Stand-Off Leg
	85	8	90687	1/4 x 1/2 (NC) Button Head Cap Screw
	86	8	90350	1/4 (NC) Locknut
	87	4	8324	Tie Wrap - 3/16 x 14
	88	8	3666	Tie Wrap - 3/16 x 8 (not shown)
	89	1	3677	Fan Spacer - 1/2"
	90	1	91195	1/2 x 6 (NF) Hx Cap Screw G8 Plain
	91	1	90199	7/16 x 5 (NC) Hx Cap Screw G5 ZP
	92	1	90362	7/16 Lock Washer
	93	3	4268	5/8" Spacer Washer
	94	3	90643	3/8 x 6 (NF) Hx Cap Screw G8 Plain
	95	2	90111	3/8 x 1-1/2 (NC) Gr. 5 Cap Screw
	96	2	90361	3/8 Lock Washer
	97	2	90334	3/8 (NC) Nut
	98	2	90315	3/8 Plain Washer
	99	1	90352	3/8 (NC) Locknut-Prevailing Torque ZP
	100	8	90042	5/16 x 1 (NC) Gr. 5 Cap Screw

Parts List
7554 Electric Clutch Peculiar Hydraulic Kit

Ref #	Assy	Comp	Qty	Part #	Description
		101	8	90360	5/16 Lock Washer
		102	8	90332	5/16 (NC) Nut
		103	5	90313	5/16 Plain Washer
		104	1	90391	M10 x 1.50 x 30 Hx Cap Screw G8.8 ZP
		105	1	90429	M10 Lock Washer
		106	1	90605	M8 x 1.25 x 35 Hx Cap Screw G8.8 ZP
		107	1	90428	M8 Lock Washer
		108	4	5939	M8 x 1.25 x 50 Dble End Stud G10.9 ZP

Installation Instructions

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 the female half of the quick disconnect (44) and a 1/4" Npt 45° street elbow (73) to 22" HP hose (56). Using a bench vise to hold the lift cylinder (28), remove the closure from the port and screw the other end of the hose directly into the ears on lift arm and upper gear. Secure with clevis pins (34) and cotter pins (37).
- B. Attach the male half of the quick disconnect (44) to one end of a 36" HP hose (55). Place a dust cover (45) on the end of the other 36" HP hose (55). Put another male half of a quick disconnect (44) on this hose.
- C. Using a bench vise to hold angle cylinders (29), remove closures from ports. Screw the brass forged street ells (43) into the ports. Ells should point forward toward the live end of the cylinder and slightly upward. 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 cylinder uses the 36" HP hose with the male disconnect half and no dust cover. This male half will be plugged into the raise cylinder female half for storage. Install the cylinders in their respective sides so that the ells are between the cylinders and the A-frame. Secure the cylinders with anchor pins (35) and cotter pins (37) at both ends.




2. Drive Sheave Installation

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

- A. Remove the top half of the fan shroud and loosen the serpentine belt. Remove and discard the four bolts and washers holding crank pulley onto crankshaft.

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




- B. Position the drive sheave (64) in crank pulley. Fasten to the crankshaft with three 3/8 x 6 (NF) Gr. 8 cap screws (94) and three spacer washers (93). Install a 1/2 x 6 (NF) Gr. 8 cap screw (90) into the center of the drive sheave. Alternately tighten the three 3/8" cap screws to assure proper installation. Torque these fasteners to 75 ft-lbs. Torque the center fastener to 115 ft-lbs.

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

- C. Remove and discard the four studs from the flange on the water pump shaft. Install the four longer M8 studs (108) 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 and add the fan spacer (89). Reinstall the fan with the original nuts torqued to 18 ft-lbs.

3. Pump - Clutch Assembly and Pump Bracket

- A. The pump-clutch assembly (1) should be rotated in the pump plate (4) so the suction 'in' port is pointing toward the mounting slots in the pump plate (4). Looking down on the pump-clutch assembly (1) with the 'out' pressure port up, (using the pump shaft as a 12:00 reference) position the pressure port and the suction port 90° swivel fittings (38) pointing down. Lock the fittings in their proper orientation with the jam nuts. Attach a 1/2" quill (42) into the suction fitting. Install the 19" long 1/2" LP hose (62) onto the quill. Install the 1/4" pipe nipple (39) into the relief port on the end plate of the pump. Screw the 1/4" brass elbow (40) onto the nipple and aim it away from the back of the pump. Install 1/4"-3/8 ID hose quill (41) into the elbow. Install the 21" x 3/8" LP hose (61) onto the relief quill. Screw the 3/8" end of the 26" x 1/4" to 3/8" HP hose (59) into the pressure fitting. Make sure all fittings are tight.
- B. Remove and discard the toolbox.
- C. Remove the vapor recovery canister and canister bracket. Alter the canister bracket by bending the bottom tabs down. Reinstall canister. The canister should sit approximately 1-2" lower, and will provide clearance for the pump and the hose routings.
- D. Loosen the radiator hose clamp where the hose connects to the radiator. Rotate radiator hose counter-clockwise, (looking from the back) to increase clearance for the clutch sheave. Reinstall the hose clamp.
- E. Remove and discard the long 7/16 fastener that mounts the power steering bracket to the engine block. Remove and discard the M8 fastener holding the radiator hose bracket.
- F. Align the pump bracket (65) over the two holes just vacated, as well as the unused tapped hole to the left. Attach the pump bracket by using an M10 x 1.5 x 30 cap screw (104) and M10 lock washer (105) in the left hole. Use a 7/16 x 5 (NC) cap screw (91) and 7/16 lock washer (92) in the lower hole. For the top hole, locate the radiator hose bracket over the tube spacer on the pump bracket. Attach the pump bracket using an M8 x 1.25 x 35 cap screw (106) and M8 lock washer (107). Tighten all fasteners.
- G. Attach the pump bracket brace (66) to the stud on the exhaust manifold using 3/8 (NC) locknut (99). Do not tighten at this time. The bent end of the pump bracket brace should mate flush to pump bracket.
- H. Mount the pump-clutch assembly to the pump bracket using only the left 3/8 x 1-1/2" (NC) cap screw (95), 3/8 flat washer (98), 3/8 lock washer (96) and 3/8 nut (97). Place the 56" V-belt (63) over the drive sheave. Rotate the pump assembly down and place the belt over the clutch sheave. Rotate the pump back up so that it is aligned with the right-side pump bracket hole and pump bracket brace. Install the right 3/8 x 1-1/2 (NC) cap screw (95), 3/8 flat washer (98), 3/8 lock washer (96) and 3/8 nut (97). Tighten the V-belt. Carefully position the pump leaving adequate space between the V-belt and other engine components; particularly the center hub of the power steering sheave. Tighten all fasteners.

NC FASTENER TORQUE (FT-LB)			
DIAMETER - THREADS PER INCH	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

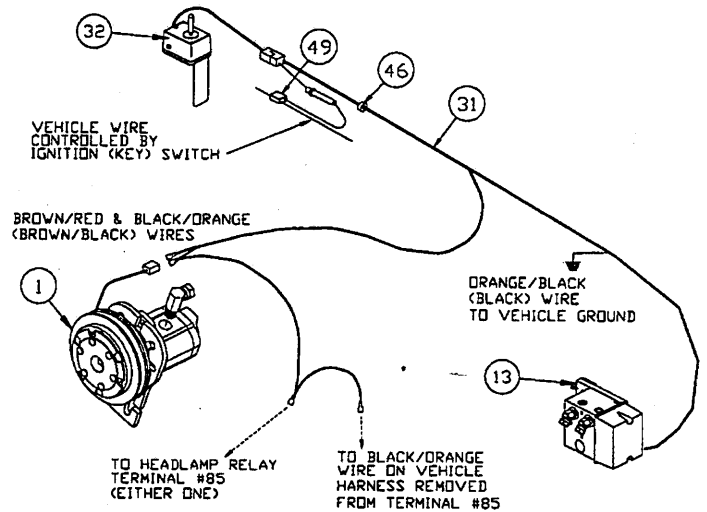
4. Solenoid Control and Harness Installation

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 the fire wall for wires and hot or moving engine parts. Drill a 5/8" hole in the driver-side of the fire wall for the control harness (31).

- B. Install the solenoid control (32) and dash bracket according to 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 control harness (31) through hole drilled in fire wall. Attach the connector to plug on solenoid control. Connect the red wire from the fuse holder to a circuit which is on only when the ignition key is on. Use the in-line connector (49). Route the main portion of harness (white, green, blue and black wires) to the valve. Place a grommet (46) around the control harness where it passes through fire wall. Remove the plastic cover from valve and install solenoid wires according to instructions inside cover. Install the cover with the harness strain relief in place inside the cover. Attach orange/black (black) wire with ring terminal, exiting loom near the 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 the 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.

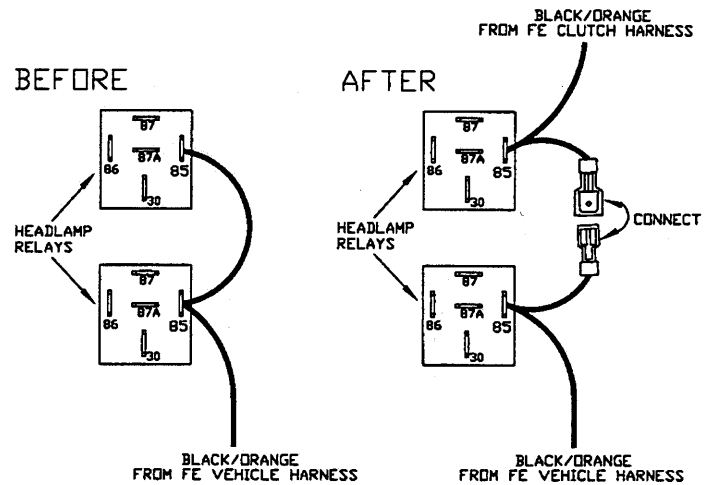


Diagram 1

5. Valve and Oil Reservoir

Caution: Reservoir tank fill must be vertical to engine.

- A. Fasten the solenoid valve assembly (13) to the reservoir/valve plate (67) with two 5/16 x 1 (NC) Gr. 5 cap screws (100), lock washers (101), and nuts (102), according to the illustration on page 3. Tighten fasteners.
- B. Fasten the oil reservoir (12) to the reservoir/valve plate (67) with two 5/16 x 1 (NC) Gr. 5 cap screws (100), lock washers (101), plain washers (103), and nuts (102), according to the illustration on page 3. Do not tighten fasteners at this time.
- C. Fasten the short 'Z' brace (68) to the valve plate with 5/16 x 1 (NC) Gr. 5 cap screw (100), 5/16 lock washer (101), and 5/16 nut (102), according to the illustration on page 3. Do not tighten fasteners at this time.

- D. The valve/reservoir assembly will be mounted on the driver side in the space vacated by the toolbox. Place the assembly so the short 'Z' brace aligns with the hole in the fender vacated by the toolbox fastener. Fasten with 5/16 x 1 (NC) Gr. 5 cap screw (100), lock washer (101), plain washer (103), and nut (102). Fasten bent leg of the valve/reservoir plate to the vapor recovery canister bracket with two 5/16 x 1 (NC) Gr. 5 cap screws (100), lock washers (101), plain washers (103), and nuts (102). Tighten the three mounting fasteners.
- E. Screw two 45° swivel fittings (77) into the two angle cylinder ports on the valve. Screw the 90° swivel fittings (76) into both the pressure port and the lift port on the valve according to the illustration. Screw a 3/8" quill (74) into a 90° street elbow (75) and screw the street elbow into the return port. Position these fittings according to the illustration on page 3. Screw a 1/2" quill (42) into the threaded port on the reservoir.

6. Hydraulic Hose Installation

Caution: Keep hoses away from hot or moving engine components. Failure to do so may cause hoses 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 (59) to the 90° swivel fitting in the pressure port on the valve. Tighten the fitting. Route the loose end of the pump relief hose (61) to the top 3/8" quill on the reservoir. Route the pump suction hose (62) to the reservoir and install it onto the 1/2" quill. Install one end of the 28" long 3/8" LP hose (60) onto the bottom 3/8" quill on the reservoir. Route the loose end of the hose around and install it onto the quill in the valve return port.
- B. Install the in-line return filter according to the instructions located in the filter kit (30). Locate the filter so that it will not chafe against the reservoir. Use the plastic ties (87) to bundle and/or isolate any hoses from moving parts or the engine.
- C. Remove the grille. Route the three cylinder hoses (55,57,58) through the gap between the headlamp webbing and the driver-side fender. The 36" hose (55) goes to the driver-side angle cylinder port. The 60" hose (57) goes to the passenger-side angle port. The 72" hose (58) goes to the lift cylinder port. When the hoses are tightened into their appropriate valve ports, place a length of the split radiator hose (47) between the cylinder hoses and the head lamp webbing. **This is very important due to the sharp edge of the headlamp webbing.**

Note: Some GMC models with fine mesh grille may have to use stand off legs (84) fastened with four 1/4 x 1/2 socket head cap screws (85) and lock nuts (86) on each grille plate.

- D. Attach the female half of a quick disconnect (QD) (44) to one hole in the two QD grille plate (83) with a snap ring (81). Attach the bulk head adapter (80) to the other hole in this grille plate with another snap ring (81). If the vehicle does not need the stand off legs on the grille plates, install a 1/4 x 90 degree swivel fitting (76), with dust plug (45), into the female QD. Install a 1/4 x 90 degree swivel fitting (76), with dust plug (45), into the bulk head adapter. Install a male QD half (44) to the bulk head adapter (80). 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 (88). The female QD should be placed toward the outside of the vehicle.
- E. Attach a female QD half (44) to the QD/Electric grille plate (82) with a snap ring (81). 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 (76) and screw it into the female QD. Screw the driver-side angle cylinder hose (55) 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. The QD should be placed to the outside of the vehicle. Reinstall the grille.

- F. Install cable boot bracket (78) on driver-side headgear brace, between brace and fasteners. Insert cable boot (79) on over bracket.
- G. Align all the fittings on the valve and make sure they are tight.
- H. Tighten serpentine belt and reinstall top half of radiator/fan shroud.

7. Operations

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (87).
- B. Attach the hose disconnects. Push the 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 the engine. Lift and angle blade several times. If blade angles opposite from control lever position, reverse the two angle hoses at the valve. Raise the 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.

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.