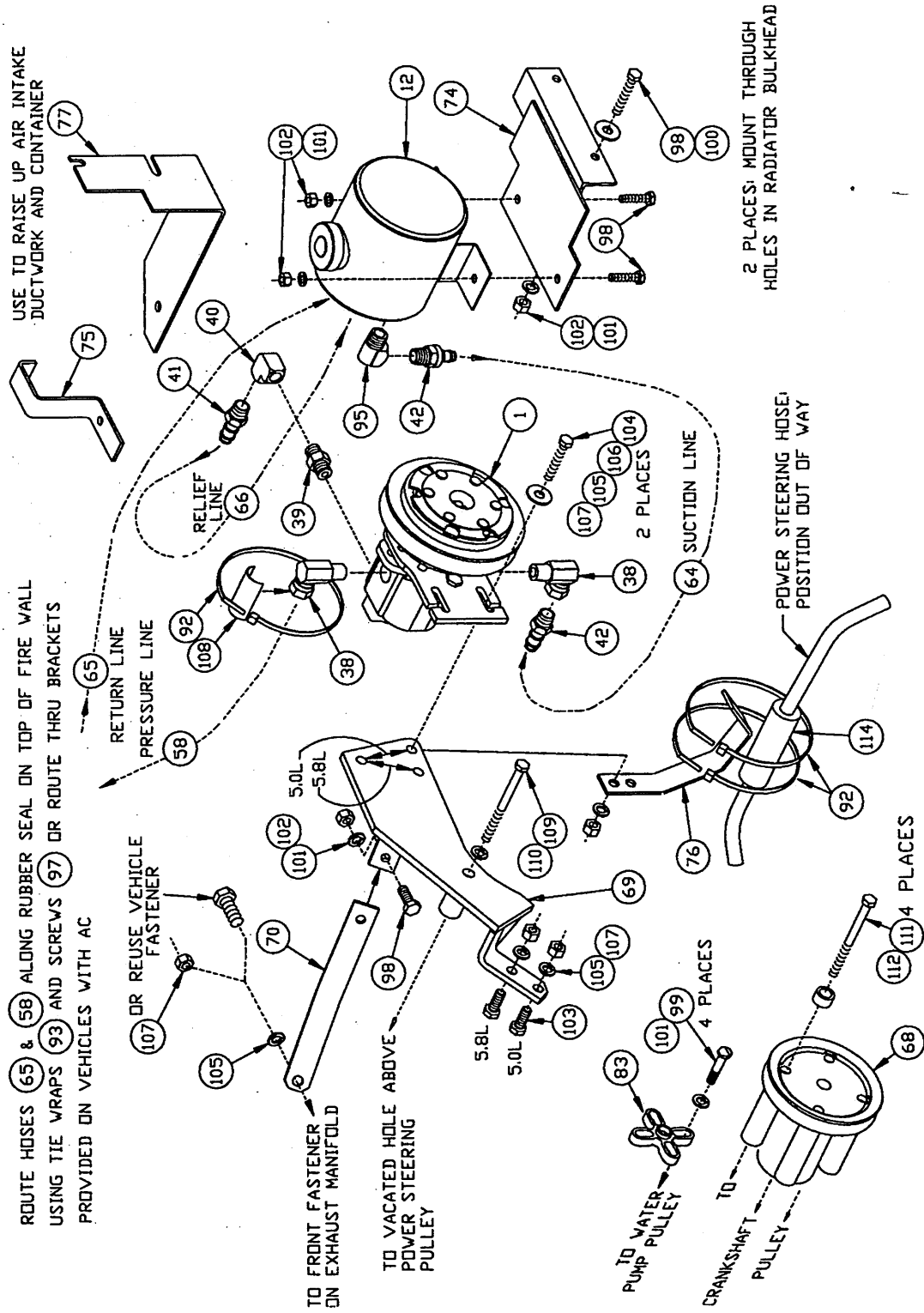


PUMP-CLUTCH AND RESERVOIR INSTALLATION AS VIEWED FROM FRONT PASSENGER SIDE OF VEHICLE



USE TO RAISE UP AIR INTAKE DUCTWORK AND CONTAINER

ROUTE HOSES (65 & 58) ALONG RUBBER SEAL ON TOP OF FIRE WALL USING TIE WRAPS (93) AND SCREWS (97) OR ROUTE THRU BRACKETS PROVIDED ON VEHICLES WITH AC

OR REUSE VEHICLE FASTENER

TO FRONT FASTENER ON EXHAUST MANIFOLD

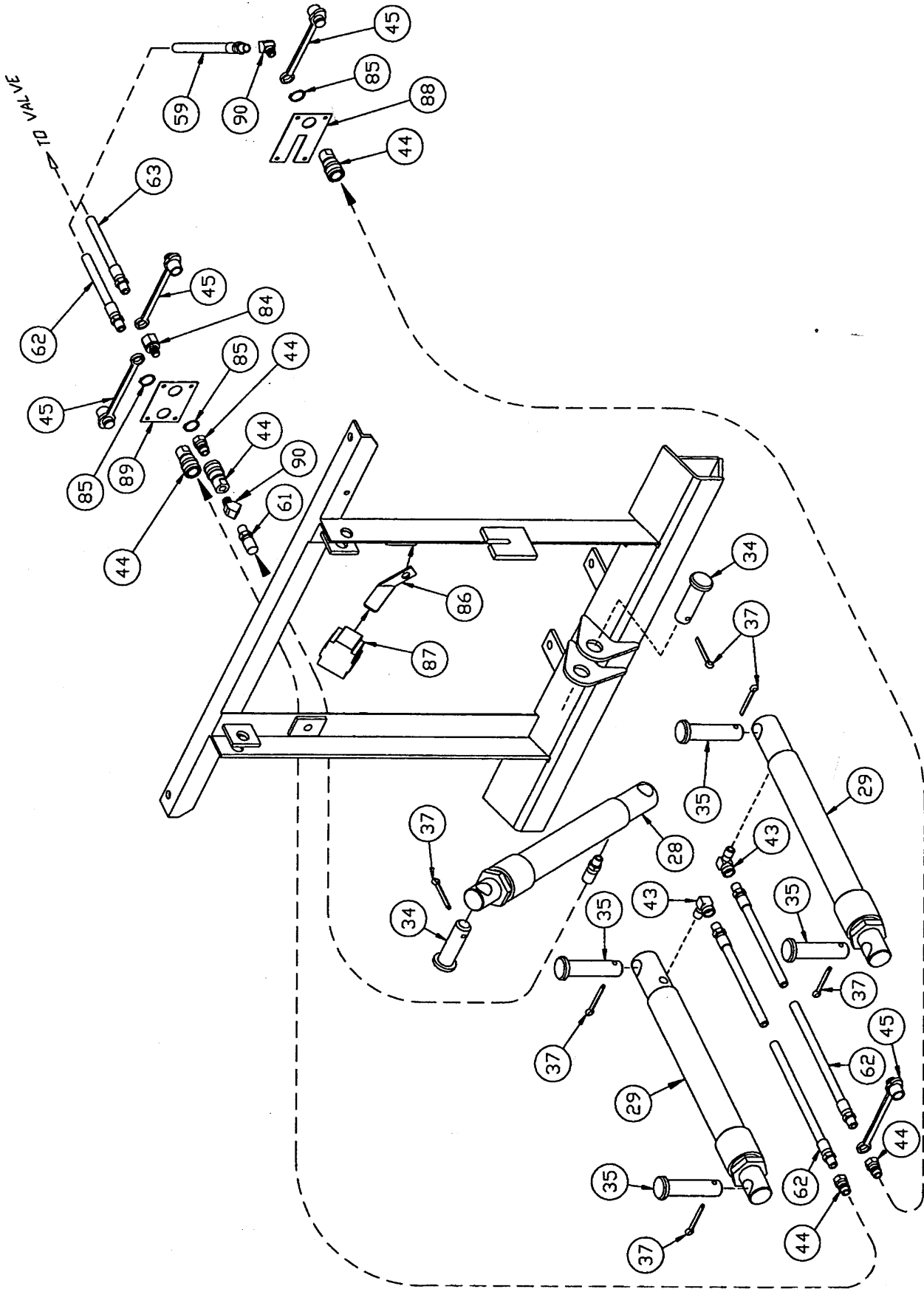
TO VACATED HOLE ABOVE POWER STEERING PULLEY

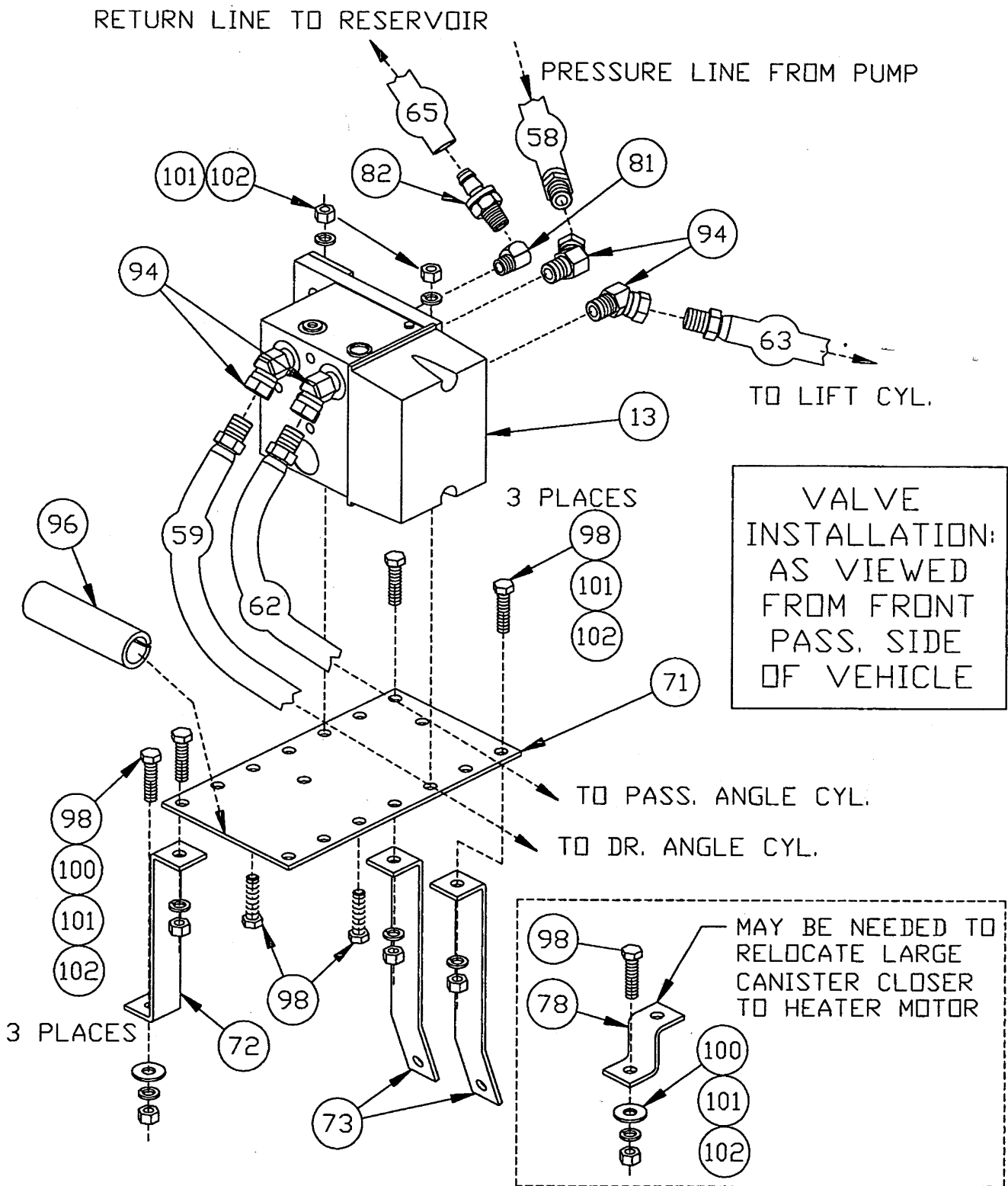
TO WATER PUMP PULLEY

TO CRANKSHAFT PULLEY

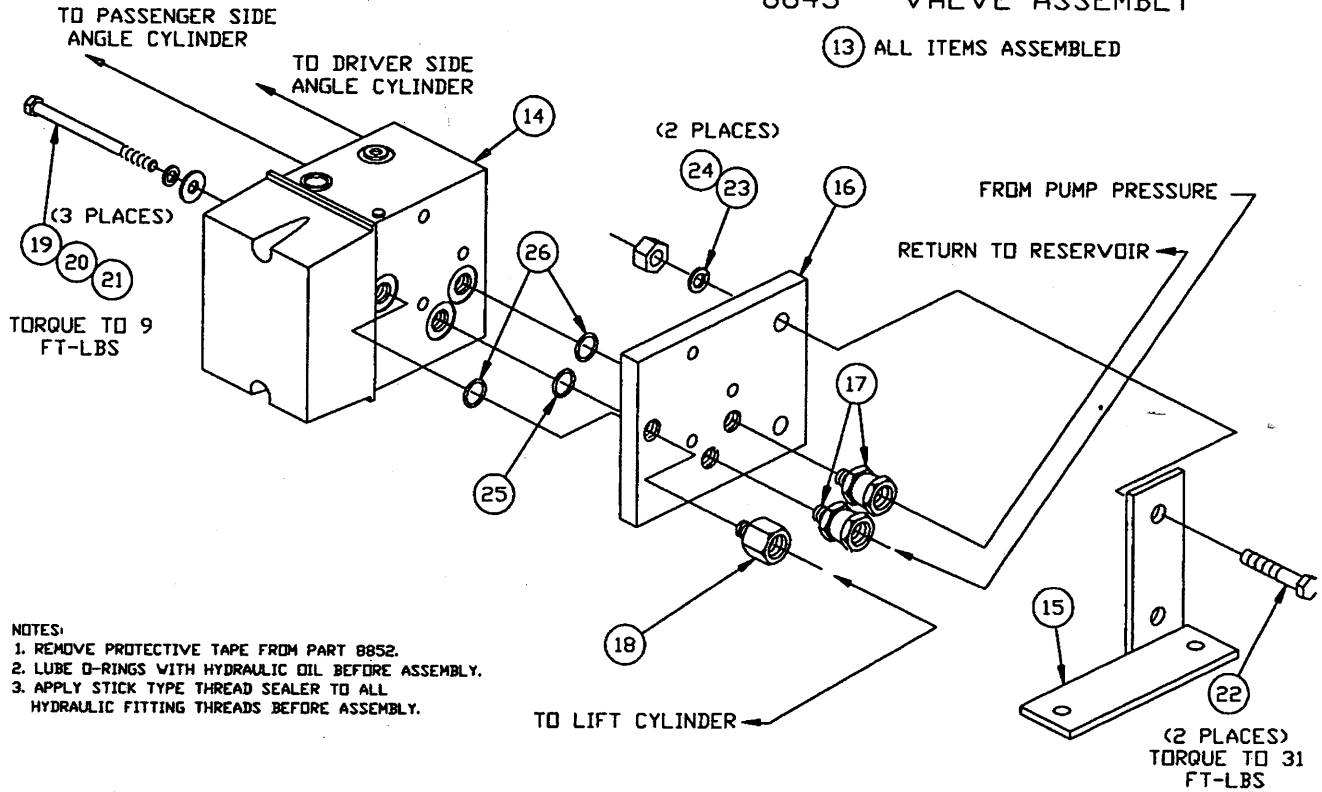
2 PLACES: MOUNT THROUGH HOLES IN RADIATOR BULKHEAD

POWER STEERING HOSE: POSITION OUT OF WAY



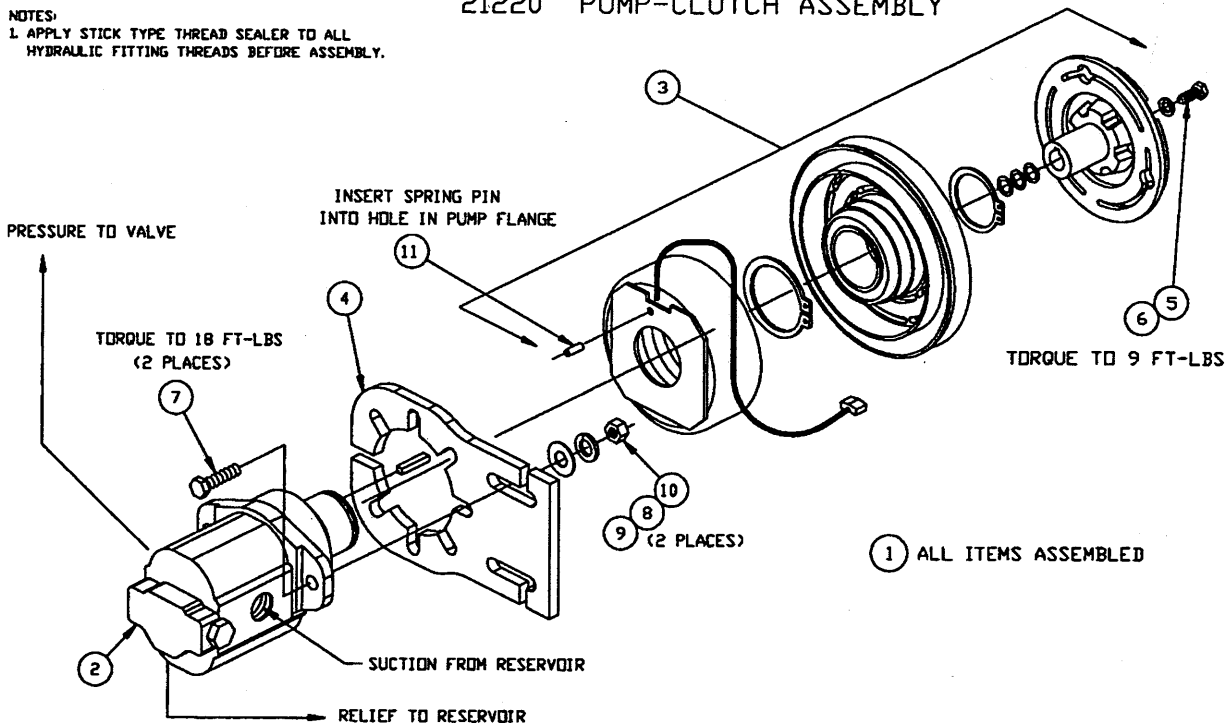


8843 - VALVE ASSEMBLY



- 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.

Parts List
8840-40B Electric Clutch Common Hydraulic Kit

Assy	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
7530C Electric Clutch Peculiar Hydraulic Kit

Ref #	Assy	Comp	Qty	Part #	Description
58			1	2518	66" HP Hose, 1/4P To 3/8P
59			1	5192	60" HP Hose, 1/4P to 1/4P
60					
61			1	3074	22" HP Hose, 1/4P to 1/4P
62			3	4424	36" HP Hose, 1/4P to 1/4P
63			1	376	32" HP Hose, 1/4P to 1/4P
64			1	8477	1/2" Hose - 24"
65			1	4439	3/8" LP Hose - 78"
66			1	4438	3/8" LP Hose - 30"
67			1	707	58" V-Belt (not shown)
68			1	5786	Drive Sheave
69			1	8838	Pump Bracket
70			1	6511	Pump Bracket Brace
71			1	8871	Valve Plate
72			1	7966	Valve Plate Brace
73			2	7965	Valve Plate Brace
74			1	8988	Oil Reservoir Bracket
75			1	6514	Fender Bracket
76			1	6507	Hose Support Bracket
77			1	6154	Air Intake Bracket
78			1	7968	Brace (vacuum)
80			1	8834	Bolt Bag for 7530B (not shown)
		81	1	765	1/4 Npt x 90 degree Street Elbow
		82	1	8850	Quill - 1/4 Nptf to 3/8 Hose
		83	1	3677	Fan spacer - 1/2"
		84	1	4486	Bulkhead Adapter
		85	3	4485	7/8" Snap Ring
		86	1	8741	Bracket - Cable Boot
		87	1	8284	Cable Boot
		88	1	8599	QD/Electric Plate (long)
		89	1	8600	2 QD Plate (long)
		90	2	8476	1/4 NPT x 45 degrees Street Elbow
		91	8	8324	Tie Wrap - 3/16 x 14 (not shown)
		92	10	3666	Tie Wrap - 3/16 x 8 (not shown)
		93	2	8011	Nylon Mounting Tie Wraps (W/Hole)
		94	4	8127	1/4 x 45 degree Street Swivel
		95	1	3979	3/8 Brass Street Ell
		96	3	4477	3/8 Split Hose Grommet
		97	2	90659	#12 x 3/4 Panhead Sheet Metal Screw
		98	15	90042	5/16 x 1 (NC) Gr. 5 Cap Screw
		99	4	9015	5/15 x 1-1/2 (NF) Gr. 5 Cap Screw Ground
		100	7	90313	5/16 Flat Washer
		101	19	90360	5/16 Lock Washer
		102	15	90332	5/16 (NC) Nut
		103	1	90103	3/8 x 1 (NC) Gr. 5 Cap Screw
		104	2	90111	3/8 x 1 - 1/2 (NC) Gr. 5 Cap Screw
		105	4	90361	3/8 Lock Washer

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

**Bolt Bag Parts List
7530C Electric Clutch Peculiar Hydraulic Kit**

Assy	Comp	Qty	Part #	Description
	106	2	90315	3/8 Flat Washer
	107	4	90334	3/8 (NC) Nut
	108	1	8992	3" Fitting Protector
	109	1	90706	7/16 x 8 (NC) Gr. 5 Cap Screw
	110	1	90362	7/16 Lock Washer
	111	4	90156	3/8 x 4 -1/4 (NC) Gr. 5 Cap Screw
	112	4	4268	5/8" Spacer Washer
	113	1	4433	1/2" Special Washer
	114	1	6595	3/4" Split Hose Grommet

Installation Instructions

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

1. Cylinder and Cylinder Hose Assembly

- A. Attach female half of disconnect (44) and a 1/4" npt 45 degree elbow (90) to 22" HP hose (61). 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 towards passenger side into ears on lift arm and upper gear. Secure with clevis pins (34) and cotter pins (37).
- B. Attach a male quick disconnect half (44) to one end of a 36" HP hose (62). Place a dust cover (45) and a male quick disconnect half (44) on the end of the other 36" HP hose (62).
- C. Using 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 cylinder 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 A-frame. Secure cylinders with anchor pins (35) and cotter pins (37) at each end.

2. Oil Reservoir Installation

Caution: Reservoir tank fill must be vertical to engine.

- A. Install oil reservoir bracket (74) on radiator bulkhead between radiator and radiator coolant overflow container bracket about 5" up from the bottom of the bulkhead. Place two 5/16 x 1 cap screws (98) with flat washers (100) out through holes in bulkhead and bracket and fasten with two 5/16 lock washers (101) and nuts (102). Attach reservoir (12) to reservoir bracket with two 5/16 x 1 (NC) Gr. 5 cap screws (98), lock washers (101) and nuts (102). Make sure that quills are facing towards cab.

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.

- B. Place a brass street Ell (95) into threaded fitting in reservoir. Tighten Ell to a 6 o'clock position. Install a 1/2" quill (47) to Ell. Remove and save flexible plastic pipe from molded plastic air intake duct.

- C. Install low pressure hoses to reservoir at this time. Install the 30" LP Hose (66) to lower 3/8" quill and the 78" LP Hose (65) to the other 3/8" quill. Install the 24" LP Hose (64) on the 1/2" quill. The 78" LP hose will be routed to the valve on the passenger side. **Bends in all hoses must have sufficient radius to prevent crimping. A crimped hose may cause over-heating of the hydraulic system, hose failure, and possible engine fire.**

3. Drive Sheave Installation

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

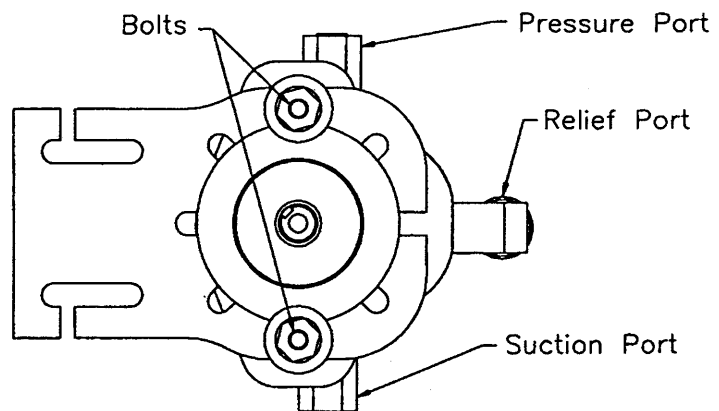
- A. Remove serpentine belt. Remove and discard the four cap screws holding fan to water pump shaft flange. Remove and discard four cap screws from crankshaft pulley. Install drive sheave (68) into center of crankshaft pulley with machined pilot of drive sheave seating fully into crankshaft pulley. Fasten drive sheave with four 3/8 x 4-1/4 cap screws (111) and spacer washers (112). Tighten and torque these fasteners to 18 foot pounds.
- B. Place fan spacer (83) on front of water pump serpentine pulley and reinstall fan. Fasten with four modified 5/16 x 1-1/2 (NF) cap screws (99) and lock washers (101). Tighten and reinstall serpentine belt.

DIAMETER- THREADS PER INCH	NF FASTENER TORQUE (FT-LB)		
	GRADE		
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

4. Pump - Clutch Assembly and Pump Bracket

- A. Remove and discard bolt above power steering pulley. Position pump bracket (69) behind serpentine belt with tab on end of pump bracket over stud in engine block. Note: See illustration on Page 1 to determine which hole to use on 5.0L and 5.8L engines. Install a 3/8 x 1 cap screw (103) through hole and engine mount and fasten with a lock washer (105) and nut (107). Do not tighten fasteners at this time. Install a 7/16 x 8 cap screw (109) with lock washer (110) in hole in pump bracket with pipe spacer. Remove and save front fastener on exhaust manifold (may be a nut on a stud in older vehicles). Place cropped end of pump bracket brace (70) over vacated hole and fasten with vehicle fastener and 3/8 lock washer (105). If nut is present, remove and reuse it to attach brace, otherwise attach brace with a 3/8 lock washer (105) and nut (107). Fasten other end of brace to pump bracket with one 5/16 x 1 cap screw (98), lock washer (101) and nut (102). Tighten all fasteners.
- B. Place fender bracket (75) in the driver side fender well around coil spring bracket (F150 models) or shock mount bracket (F250/F350 models). With inner fender attached to it, position bracket where adequate clearance will result. Using hole in bracket as a guide, drill a 11/32" hole through fender. Install a 5/16 x 1 cap screw (98), flat washer (100), and a 1/2" special washer (113) out through fender and fasten to bracket with a 5/16 lock washer (101) and nut (102). **Note: For vehicles with 5.8L engines, the plastic inner fender well must be pulled outward to provide clearance for hydraulic pump.**

Front View of Pump and Pump Plate without Clutch



- C. Remove plastic air filter intake until pump assembly is installed then reinstall before installing clutch and pump.

Rotate the pump-clutch assembly (1) in the pump plate (4) so the relief port is pointing away from the mounting slots in the pump plate (4) as shown in illustration. Looking down on the pump-clutch assembly (1) with the 'out' pressure port up, (using the pump shaft as a 12:00 reference) position both the pressure port and the suction port 90° swivel fittings (38) pointing down to 6:00.

Remove cap screws holding pump plate to pump, (do not remove electric clutch) and rotate pump.

Lock the fittings in their proper orientation with the jam nuts. Attach a 1/2" quill (42) into the suction fitting. 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 to the rear of the vehicle. Install 1/4"-3/8 ID hose quill (41) into the elbow. Make sure all fittings are tight.

Place pump plate portion of pump-clutch (1) assembly against pump bracket and place the 58" v-belt (67) over both drive and pump sheaves. Install a 3/8 x 1-1/2 cap screw (104) with flat washer (106) through top slot and pump bracket and fasten with a 3/8 lock washer (105) and nut (107). Place a 3/8 x 1-1/2 cap screw (104) with flat washer (106) through bottom slot and pump bracket (5.0L - use outer or fender side lower hole, 5.8L - use inner or engine side lower hole) and through hole in hose support bracket (76). Note: Use the upper hole in the hose support bracket (76) for both 5.0L and 5.8L engines. Attach with a 3/8 lock washer (105) and nut (107). Adjust hose support bracket and place a 3/4" split hose grommet (114) onto power steering hose beneath the hose support bracket and attach hose and grommet to hose support bracket with two tie wraps (92). Position the power steering hose and support bracket to minimize hose twist and bend radius. Adjust for proper v-belt tension by pivoting pump plate on top bolt and tighten pump plate fasteners. **There should be a minimum of 1/2" clearance between hose support bracket and drive sheave v-belt. Bend bracket to increase clearance if necessary.**

- D. Loosen the two brass colored nuts on coolant reservoir and catalyst filter container brace. With long leg of air intake bracket (77) towards fire wall, slide top slot of bracket between catalyst brace and tab on reservoir. Rotate bracket counter clockwise and slide lower slot onto remaining fastener. Tighten fasteners. Reinstall catalyst filter container. The container should rest on top of the air intake bracket.
- E. Install 3/8" x 30" LP hose (66) to quill on pump relief. Install 1/2" x 24" LP hose (64) to 1/2" quill. This hose is long to provide for sufficient bend radius. Install 66" HP hose (58) to swivel adapter on top of pump facing fire wall. Attach fitting protector (108) over top of this fitting with a tie wrap (92). Reinstall previously removed air filter duct. **Check to ensure that all hoses are not crimped and free of all hot or moving engine parts.**

5. Valve Assembly and Valve Plate

- A. Do not attach valve assembly to vehicle until control harness is connected to valve.
- B. Valve will be installed behind battery on passenger side of vehicle. Attach valve plate braces (73) to front of valve plate (71) and valve plate brace (72) to rear and fire wall side of valve plate (see illustration) with three 5/16 x 1 cap screws (98), lock washers (101) and nuts (102). Turn positive battery cables toward engine. Place valve plate with braces over vacuum canister beside battery. Vacuum canister with plastic hose next to battery may have to be moved closer to battery and larger canister will have to be relocated closer to heater motor and parallel with fire wall. This requires a brace (78) for offset on fender, drilling a 11/32" hole, and installing a 5/16 x 1 cap screw (98), flat washer (100), lock washer (101) and nut (102). Locate valve plate with braces attached on top of passenger side inner fender so that valve plate is near level with no contact of vehicle equipment. Using holes in valve plate braces as guides, drill three 11/32" holes through inner fender and attach braces with three 5/16 x 1 cap screws (98), flat washers (100), lock washers (101) and nuts (102). Place a 3/8" split hose grommet (96) over end of valve plate over vacuum.

6. 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.

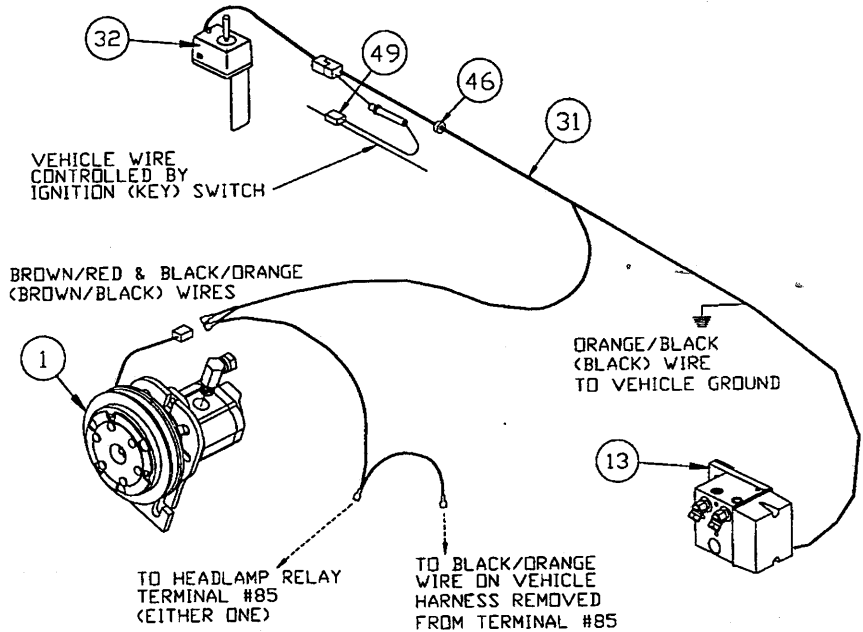
- A. Check both sides of fire wall for wires and hot or moving engine parts. Then, on the driver side, drill a 5/8" hole in the fire wall for the control harness (31).

- 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.

Warning: Disconnect battery before installing, removing or replacing electrical components.

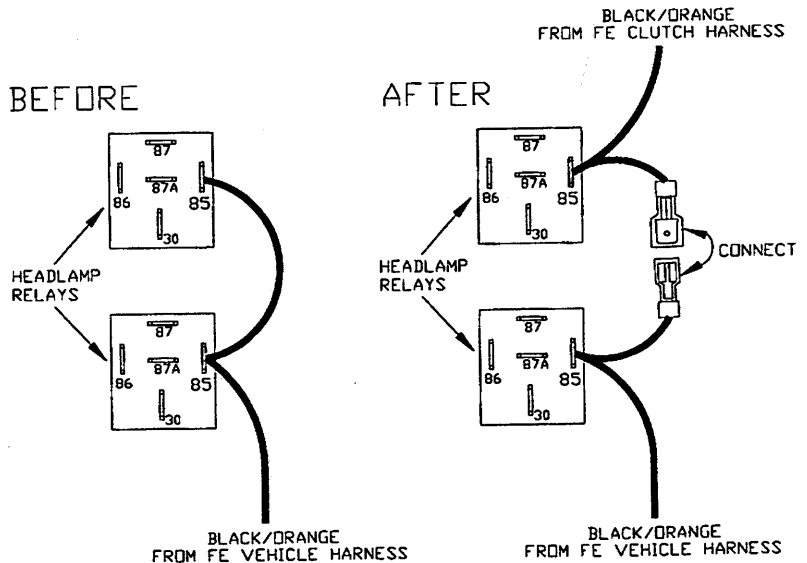
- C. Remove negative battery cable from battery.

- D. Insert control harness (31) through hole drilled in fire wall. Attach 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 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 plastic cover from valve and install solenoid wires according to instructions inside cover. With the harness strain relief in place inside the cover, install the cover. Attach orange/black (black) wire with ring terminal exiting loom near valve to a good vehicle ground. Route portion of harness with 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 illustration above). **Note: The relay & vehicle harness are found in the peculiar light kit.**



- E. Attach valve assembly (13) to fifth set of holes from fender in valve plate with two 5/16 x 1 cap screws (98) up through valve plate and bracket. Solenoid plastic cover will be on the battery side. Fasten with two lock washers (101) and nuts (102).

- F. Install plow headlamps as per 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.

- G. Reconnect negative battery cable to battery terminal.

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 possible engine fire.

- A. Install two 45 degree swivels (94) to the "Lift" and "Pump pressure" ports on valve. These ports are located on the engine side of valve. (See illustration). Tighten the fitting in the "Pump pressure" port to 3 o'clock and the fitting in the "Lift" port to 8 o'clock. Install a 1/4 Npt x 90 degree street elbow (81) and a quill - 1/4 Nptf to 3/8 ID hose (82) to "return" port on valve. Route 66" HP hose (58) and 78" LP hose (65) from pump and reservoir around fire wall to ports on valve. Place both hoses along rubber seal on top of fire wall. Remove two rubber hood screws from seal that are approximately eight inches apart and centered on vehicle. Replace with two nylon mounting tie wraps (93) and #12 sheet metal screws (97). Secure hoses with ties. (Vehicles with air conditioner hoses can be routed through brackets provided.) Install two 45 degree swivels (94) to the "Driver and Passenger side angle cylinder" pressure ports on valve.
- B. Place a 3/8" split hose grommet (53) along hole on passenger side of radiator bulkhead forward of battery. Install 60" HP hose (59) to 45 degree swivel on valve (noted as driver side angle cylinder on valve illustration). Attach 36" HP hose (62) to other 45 degree swivel on valve (noted as passenger side angle cylinder). Attach 32" HP hose (63) to other side of valve (noted as lift cylinder on illustration). Pass hoses out through the core support by the radiator, low and about 14" off center on the driver side (where split grommet was placed). Attach a female quick disconnect half (50) to the long QD/Electric grille plate (88) with a snap ring (85). Attach a 45 degree street ell (90) with dust plug (51) to the female disconnect half. Pass the 60" HP hose behind grille to disconnect and attach it to the 45 degree street ell. Slide plug on vehicle harness into slot in grille plate. Attach the grille plate to the grille with four long tie wraps (91).
- C. Pass the 36" and 32" HP hoses low and about 14" off center of the grille on the passenger side. Attach a bulkhead adapter (84) to one hole of the two QD grille plate (89) with a snap ring (85). Attach a male quick disconnect half (50) to this adapter. Secure a female quick disconnect half (50) to the other hole in the grille plate with a snap ring (85). Slide a rubber dust plug (51) over the end of the 32" raise hose and attach this to the male disconnect half on the inboard side of the grille plate. Slide a dust plug (51) over the 36" angle hose and attach it to the female disconnect half on the outboard side of the plate. Slide the plate back to the grille and attach it with four tie wraps (91). Place a 3/8" split hose grommet (96) over hose on battery and a second split hose grommet (96) on hoses rubbing stiffener edge of radiator bulkhead. Attach with two tie wraps (92).
- D. Install cable boot bracket (86) on driver side headgear brace, between brace and fasteners. Insert cable boot (87) on over bracket.
- E. Install in-line oil filter kit (30) as per instructions in the common hydraulics kit.

8. OPERATIONS

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (92).
- B. Attach 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 off the 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 positions. Activate lower/float before removing or installing the plow.