

## Hydraulics Parts List

Ref #	Qty	In Kit	Part #	Description	Ref #	Qty	In Kit	Part #	Description
* Part of 8390 Bolt Bag					* Part of 8390 Bolt Bag				
1	1		8356	Pump assembly	51	2		2780	1/4 Npt x 90 Deg Street Elbow Frgd
2	1		A4466-40	Control Valve Assembly	52	4		* 2318	1/4 Npt x 90 Deg Union Elbow
3	2		4483	Clevis - VM	53	1		*3979	3/8 Npt x 90 Deg Street Elbow
4	2		4494	10-32 Square Nut - VM	54	3		*3058	9/16-18 O-Ring to 1/4 Npt Adpt
5	2		4491	1" Clevis Pin	55	2		1658	Quill - 3/8 Nptm to 3/8 ID Hose
6	2		4493	3/16" Push Nut Zp	56	2		*8391	Quill - 3/8 Nptm to 1/2 ID Hose
7	1		8389	Oil Reservoir	57				
8		1	4419	SLC Head - Belt Drive	58	1		*DC5297	1/2 x 2 Steel Pipe Nipple
9		2	A4490	90" SLC Cable	59				
10	1		A318	1-1/2" x 10" Cylinder Assembly	60				
11	2		A3660	1-1/2" x 12" Cylinder Assembly	61				
12	2		6814	Clevis Pin - 1 x 3-5/16	62				
13	4		6816	Anchor Pin - 1 x 4	63				
14	1		8764	Filter Kit	64				
15	6		90601	1/4" x 1-1/2" Cotter Pin	65				
16	1		2707	Hose - 26" Hp 1/4P - 3/8P	66				
17	1		5192	Hose - 60" Hp 1/4P - 1/4P	67				
18	1		6066	Hose - 66" Hp 1/4P - 1/4P	68				
19	2		376	Hose - 32" Hp 1/4P - 1/4P	69				
20	1		4424	Hose - 36" Hp 1/4P - 1/4P	70				
21	1		8393	1/2" Hose 19" Lp	71				
22	2		8451	3/8" Hose 16" Lp	72	1		5704	Caution Label - Cab
23	1		8394	45" V-Belt (3-V Series) (not shown)	73	2		3042	Grommet - Rubber, Split
24	1		8371	Drive Sheave	74	1		4477	Grommet - Split Hose
25	1		3696	Pump Sheave	75	3	8	*3666	Hose Tie, nylon 3/16 x 8
26	1		8381	Pump Bracket	76	2		*90048	5/16 x 1-1/4 (NC) Gr. 5 Cap screw
27	1		8380	Pump Plate	77	1		90054	5/16 x 1-1/2 (NC) Gr. 5 Cap screw
28					78	4	4	*90042	5/16 x 1 (NC) Gr. 5 Cap screw
29	1		5329	Valve Plate	79	6	2	* 90360	5/16 Sp Lk Washer
30	2		* 8454	4" Hose Protector	80	7	3	*90332	5/16 (NC) Nut
31	1		* 8453	Flex Guard Conduit - 10"	81	4	1	*90313	5/16 Plain Washer
32					82	5		*4433	1/2 Special Washer
33					83				
34		3	7966	Brace	84	1		90614	1/4 x 1-1/4 (NC) Gr. 5 Cap screw
35					85	1		90359	1/4 Sp Lk Washer
36					86	1		90330	1/4 (NC) Nut
37					87				
38					88				
39		1	4467	Disconnect Mounting Plate	89				
40					90				
41					91				
42	2		A1587	Hose Disconnect Assembly	92	9		*90361	3/8 Sp Lk Washer
43	2		1588	Dust Plug - Closure/Male	93	4		*90106	3/8 x 1-1/4 (NC) Gr. 5 Cap Screw
44		1	* 4486	Adaptor - Bulkhead 1/4" Npt	94	4		*90680	3/8 x 2-3/4 (NC) Gr. 8 Cap Screw
45		2	* 4485	Snap Ring - 7/8" External Bowed	95	4		*90638	3/8 x 5/8 (NC) NY Gr. 5 Cap Screw
46	1		319	1/4 Npt x 90 deg Swivel adt Union	96	1		* 90170	3/8 x 6 (NC) Gr. 5 Cap Screw
47	2		2315	9/16-18 w/O-Ring x 3/8 F Pi Swivel	97	6		*90315	3/8 Plain Washer
48					98				
49					99				
50		1	* 765	1/4 Npt x 90 Deg Street Elbow	100				

FASTENER TORQUE (FT-LB)			
DIAMETER- THREADS	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
9/16 - 12	150	250	370
7/8 - 9	150	378	591
1 - 8	220	583	893

**1. Cylinder & 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 ear gears. Attach cylinder to ears using clevis pins (12) and cotter pins (15).
- B. Using bench vise to hold 32" Hp hose (19), install female half of hose disconnect assembly (42) directly to hose. Then, holding 36" Hp hose (20), 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" Hp hose with female disconnect half to driver side angle cylinder street ell. Install other Hp hose with male disconnect half to passenger side angle cylinder street ell. 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 and ram end. Secure anchor pins with cotter pins (15).

**2. Control Head & Control Cables**

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

- A. Drill three 5/8" holes in the firewall for the control cables and wiring harness using drilling guide as a reference only. **Be sure both sides of the firewall are clear of obstructions before drilling.**
- 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 nuts and washers from the valve end of the cables. Route the cables out through the firewall up to top of the driver's 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. Valve & Valve Plate**

- A. Using a bench vise to hold control valve assembly (2), remove closures from valve ports. Screw the 90 degree swivel adaptor unions (47) into the "in" and "out" ports. Screw quill (55) into installed adapter in the "out" port.

**Note: The valve fittings are installed as described to insure proper operation. First indication of incorrect installation is failure of plow to lift, although the plow will angle.**

Install three 9/16" O-rings to 1/4" pipe adapters (54) in lift and angle ports. Install one 1/4" brass bar ell (52) to each adapter. Tighten so open ends will face towards exposed valve spools. This will allow for adjustment when installing hoses.

- B. Mount valve to valve plate (29) using two 1/4" x 1-1/4" capscrews, lock washers and nuts located in the valve bag. Install capscrews from bottom of valve plate, with lock washer and nut on top of valve. Attach two valve plate braces (34) to the two holes in the cable attaching end of valve plate. Attach with two 5/16" x 1" capscrews Gr. 5 (NC) (78), lock washer (79) and nuts (80). Attach a third valve plate brace (34) to hole in rear of valve plate on "out" port side with one 5/16" x 1" cap screw Gr. 5 (NC) (78), lock washer (79) and nut (80). Position valve plate 2" from battery and 3-1/2" from inner fender wall. Place alternator wiring and heater hose with "T" between two front valve plate braces. Position valve plate to prevent chafing of any vehicle parts. Using holes in valve plate brace as guides, drill three 11/32" holes through inner fender. Attach valve plate bracket to inner fender with three 5/16 x 1 cap screw Gr. 5 (78), large flat washers (82), 5/16 flat washers (81), lock washers (79) and nuts (80) .
- C. Install control cables to valve plate 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 clevis

clevises over spools and attach with two clevis pins (5) and pushnuts (6). Adjust cables so control 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 center position, tighten cable clevis nuts. Use three nylon ties (75) to run cables along air intake hoses.

**CAUTION: The valve spools must be free and self centering when the cables and the control head are attached. Failure to center the spools will restrict the fluid flow through the 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.**

**Note: Apply "LOCTITE" to all pump bracket and drive sheave fasteners prior to installation to prevent loosening.**

## 4. Drive Sheave Installation

- A. Remove serpentine belt from vehicle. Remove four 3/8" cap screws from crankshaft pulley.

**Note: Do not remove spacer washers from front or back of vehicle sheave.**

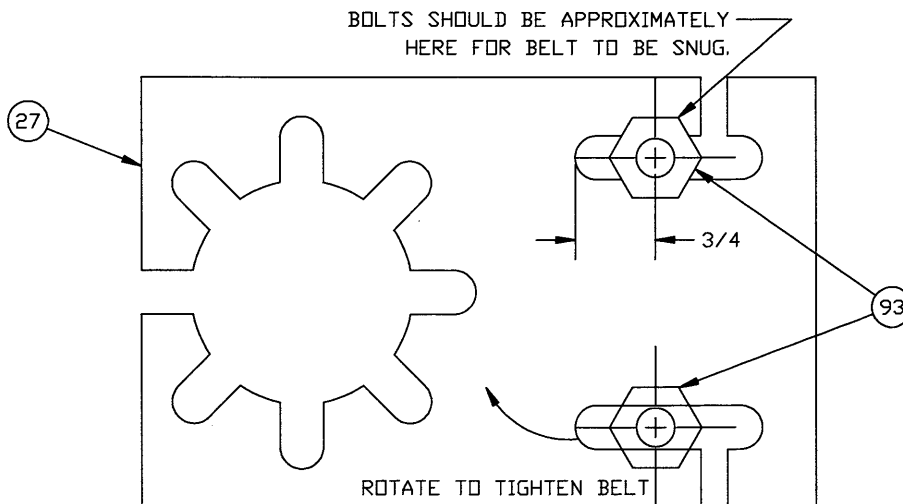
- B. Install drive sheave (24) over vehicle sheave washer and into center of crankshaft pulley. **Make certain that machined pilot of drive sheave seats fully into crankshaft pulley.** Fasten drive sheave to crankshaft with four 3/8 x 2-3/4 NC Gr. 8 cap screws (94) and lock washers (92). Torque these fasteners to 46 ft-lbs.

**DO NOT COMPLETE INSTALLATION OF THIS KIT UNLESS THERE IS AT LEAST 3/16 INCH CLEARANCE OF DRIVE SHEAVE TO EACH BLADE FAN.**

## 5. Pump Tank and Pump Bracket

- A. Remove first cap screw under alternator pulley. Position pump bracket (26) behind reinstalled serpentine belt. Attach pump bracket to engine using a 3/8 x 6 NC Gr. 5 cap screw (96) and 3/8 lock washer (92) in place of previously removed fastener and two 3/8 x 1-1/4 NC Gr. 5 cap screws (93) with lock washers (92) into two threaded holes on front of water pump.

- B. Place pump (1) in vise with relief quill up. Install a 3/8" x 16" low pressure hose (22) onto quill. Install a 3/8 Npt x 90 degree street elbow (53) to rear of pump. Align open end of elbow with relief quill. Install a 1/2" quill (56) into elbow and attach 1/2" x 19" low pressure hose (21) to quill. Install 1/4" x 2" threaded nipple (58) and 1/4 Npt x 90 degree union elbow (52) into remaining port on back of pump. Tighten fitting to align with relief quill. Install a 26" Hp hose (16) into elbow. Attach pump plate (27) to pump so that plate is 90 degrees from hoses and that hoses will point up when attached to pump bracket (see illustration). Use four 3/8" x 5/8" (NC) Gr. 5 nylon patched cap screws (95) with flat washers (97) to attach pump to plate. Install pump sheave (25) onto pump shaft using locknut and key supplied with pump.



- C. Attach pump plate to previously installed pump bracket with two 3/8" x 1-1/4 NC Gr. 5 capscrews (93), lock washers (92) and flat washers (97). Do not fully tighten at this time. Install a 45" V-belt (23) over drive and pump sheaves. Pull pump plate back until belt is tight. The upper bolt should be as shown below. "Snug up" upper bolt and rotate using lower bolt slot to tighten belt, as shown in illustration on page 5. Tighten both bolts.

## 6. Oil Reservoir and Hydraulic Hose Installation

**Caution: Reservoir fill cap must be vertical to engine.**

- A. Install 1/2" quill (56) into oil reservoir (7). Position oil reservoir to avoid chafing next to valve plate with quills towards engine. Using holes in reservoir as guides, drill two 11/32" holes through fender. Attach reservoir to fender with two 5/16" x 1-1/4" NC Gr. 5 cap screws (76), 1/2" special washers (82), 5/16" flat washers (81) and nuts (80).
- B. Place lower hoses from pump behind alternator wiring. Attach 3/8" Lp hose to lower quill on oil reservoir and 1/2" Lp hose to 1/2" quill. Place 3/8" Hp hose up between control cables and attach to "in" port of valve. Wrap Hp hose where it passes by control cables with 4" hose protector (30) secured with two tie wraps (75). Place a second hose protector (30) around heater hose as it passes by valve plate secured with two tie wraps (75). Place 10" piece of flex guard conduit (31) on red battery wire running under valve plate.
- C. Install 3/8" x 16" Lp hose (22) to remaining quill on oil reservoir and to "out" quill on valve. **Do not shorten this hose.** Bends in all hoses must have sufficient radius to prevent crimping.

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

- D. Install 60" Hp hose (17) to brass ell in lift cylinder port of valve (Spool #1). Install two 66" hoses (18) to brass ells in angle ports of valve (Spool #2). Route hoses under 3/8" Hp hose. Tie wrap (75) all hoses together at this point. Continue to route hoses out through hole in radiator web, (place split hose grommet (74) on top of radiator web hole to protect hoses) and then through the grill near center of vehicle. Attach 60" Hp hose to previously installed 90 degree swivel adaptor on lift cylinder.
- E. Install in-line oil filter as per filter kit (14) instructions located in the common hydraulic kit.

## 7. Disconnect Assembly

- A. Holding disconnect mounting plate (39) 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 driver's side headgear post with two 5/16" x 1" capscrews (78), lock washers (79) and nuts (80). Install dust plugs (43) over ends of hoses routed to front of vehicle in the previous step. Connect 66" right angle hose (spool #2, cyl. B) to back of female disconnect installed in top of disconnect bracket. Connect 66" left angle hose (spool #2, cyl. A) to bottom (male) disconnect. Tighten by holding hoses and rotating disconnect halves in bracket.

## 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 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 the back of the disconnect bracket.** Raise the front end of the vehicle until the plow is clear of 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 hose 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.