







### Hydraulics Parts List

Ref #	Qty	In Kit	Part #	Description	Ref #	Qty	In Kit	Part #	Description
* Part of 9098 Bolt Bag					* Part of 9098 Bolt Bag				
1	1		A2311	Pump assembly	54	3		*20316	9/16" O-Ring to 1/4 Npt 90° Elbow
2	1		A4466	Control Valve Assembly	55	2		1658	Quill - 3/8 Nptm to 3/8 ID Hose
3	2		4483	Clevis - VM	56	1		*8599	QD/Electric Grille Plt (Long)
4	2		4494	10-32 Square Nut - VM	57	1		*8600	2 QD Grille Plt (Long)
5	2		4491	Clevis Pin - 3/16" x 1"	58	2		*6595	3/4" Split Hose Grommet
6	2		4493	3/16" Push Nut Zp	59	8		*8324	Cable tie, Nylon - 3/16" x 14"
7	1		8764	Filter Kit	60	1		*8127	1/4" x 45° Street Swivel
8		1	4419	Single Lever Control	65	1		*8741	Bracket - cable boot
9		2	A4490	90" Control Cable, SLC	66	1		*8284	Cable Boot
10	1		20116	1-1/2" x 10" Cylinder Assy - XL	71				
11	2		20117	1-1/2" x 12" Cylinder Assy - XL	72	1		5704	Caution Label - Cab
12	2		6814	Clevis Pin - 1" x 3-5/16"	73	2		3042	Grommet - Rubber, Split
13	4		6816	Anchor Pin - 1" x 4"	74	1	3	*4477	Grommet - Split Hose
14					75	3	8	*3666	Hose Tie, Nylon 3/16" x 8"
15	6		90601	1/4" x 1-1/2" Cotter Pin	76	5		*90048	5/16" x 1-1/4" (NC) Gr 5 Cap Screw
16		1	2707	Hose - 26" Hp 1/4P - 3/8P	77	1		90054	5/16" x 1-1/2" (NC) Gr 5 Cap Screw
17		1	4471	Hose - 26" Lp	78	4	7	*90042	5/16" x 1" (NC) Gr. 5 Cap Screw
18		2	6066	Hose - 66" Hp 1/4P - 1/4P	79	6	15	*90360	5/16" Sp Lock Washer
19		2	375	Hose - 42" Hp 1/4P - 1/4P	80	7	15	*90332	5/16" (NC) Nut
20		1	3074	Hose - 22" Hp 1/4P - 1/4P	81	4	4	*90313	5/16" Flat Washer
21		2	4424	Hose - 36" Hp 1/4P - 1/4P	82	4		*5743	5/16" Stud
22		1	*8457	Fan Spacer - 3/16"	83	4		*90461	1/4" x 3/4" (NC) Gr 5 Cap Screw
23		1	1723	Fan Belt, 41" (not shown)	84	1		90614	1/4" x 1-1/4" (NC) Gr 5 Cap Screw
24		1	8458	Drive Sheave	85	1	4	*90359	1/4" Sp Lock Washer
25		1	7909	Pump Sheave	86	1	4	*90330	1/4" (NC) Nut
26		1	6525	Pump Bracket	87	3		*4433	1/2" Flat Washer
27		1	6526	Pump Bracket Brace	88	1		*90612	1/4" x 1" (NC) Gr. 5 Cap Screw
28					89	1		*90106	3/8" x 1-1/4" (NC) Gr. 5 Cap Screw
29		1	5329	Valve Plate	90	1		*90619	3/8" x 2-1/2" (NC) Gr. 5 Cap Screw
30					91	2		*90361	3/8" Lock Washer
31					92	1		*90334	3/8" (NC) Nut
32		2	7965	Brace	93	1		*90315	3/8" Flat Washer
33		1	*6018	Bolting Bar	94	1		*90319	1/2" Special Flat Washer
34		2	7966	Brace	95				
35		1	4921	Saddle Bracket	96				
36		1	2036	Rear Tank Strap	97				
37		1	2116	Universal Brace Rod	98				
38		1	*2115	Universal Brace Tab	99				
42	3		21096	Hose Disconnect Assembly					
43	2	2	*1588	Dust Plug - Closure/Male					
44		1	*4486	Adaptor - Bulkhead 1/4" Npt					
45		2	*4485	Snap Ring - 7/8" External					
46	1		319	1/4" x 90° Swivel Adapter					
47	2		2315	9/16 w/O-Ring x 3/8 F Pi Swivel					
48									
49									
50									
51	2		2780	1/4 Npt x 90° Street Elbow Frgd					
52		1	*2318	1/4 NPT x 90° Union Elbow					
53									

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
9/16 - 12	150	250	370
7/8 - 9	150	378	591
1 - 8	220	583	893

A4468-40 uses Bolt Bag 5425

## 1. Cylinder and Cylinder Hose Assembly

- A. Attach the female half of the disconnect (42) and 1/4" x 45 deg. swivel (60) to the 22" Hp hose (20). Using a bench vise to hold the lift cylinder (10), remove the closure from the port and screw the other end of the hose directly into this port. Place the lift cylinder with the hose pointing to the passenger side into the ears on the lift arm and the upper gear. Secure with the clevis pins (12) and cotter pins (15).
- B. Attach the male half of the quick disconnect (42) to one end of a 36" Hp hose (21). On the other 36" Hp hose (21), attach a male disconnect half (42) and a dust plug (43) to one end.
- C. Using a bench vise to hold the angle cylinders (11), remove the closures from the ports and fasten brass forged street ells (51) into the ports. Point them forward toward the live end of the cylinder and slightly upward as they will be installed on the A-frame. The driver's side cylinder uses the 36" Hp hose (21) with the dust plug and male disconnect half. The passenger's side uses the 36" hose (21) with the male disconnect half and **no dust cover**. Install the cylinders to their respective sides so that the elbows are between the cylinders and the A-frame. Secure the cylinders with the anchor pins (13) and cotter pins (15) at both ends.

## 2. Control Head and Control Cables

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

- A. Drill two 5/8" holes in the firewall for the control cables using the 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 the control head of the cables (9) and install them into the slots in the control head (8) (raise the cable centers in the beginning of the lower slot). Snap the cable ends onto the ball studs and tighten the jam nuts to secure the cable to the control head. Remove the nuts and the washers from the valve end of the cables. Route the cables out through the firewall and up to the top of the driver's side fender well. Attach the control head to the dash bracket as per the dash bracket instructions. Install the rubber grommets (73) around the cables where they pass through the fire wall.

## 3. Valve and Valve Plate

- A. Using a bench vise to hold the control valve assembly (2) remove the closures from the valve ports. Screw the 90 degree swivel adaptor unions (47) into the "in" and "out" ports. Screw the Quill (55) into the installed adaptor in the "out" port.
- B. Install three 9/16" O-ring to 1/4" NPT 90° elbows (54) in the lift and angle ports. When tight, the elbows should point at two O'clock, away from the cable end of the valve.
- C. Disconnect the canister above smog vacuum. Disconnect the large vacuum canister from the fender. Place the bottom hole on the bracket to the top screw on the smog vacuum. Lean the canister toward the firewall and tighten both fasteners. Loosen positive battery clamp and rotate it clockwise as far as possible. 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 cap screws from the bottom of the valve plate, with lock washers and nuts on top of the valve. Attach the two long braces (32) to the two holes in the "cable attaching end" of the valve plate. For 1994 - 19\_\_ vehicles use 7966 (34) brace (see illustration) in place of one of the long braces (32). Fasten with two 5/16" x 1" cap screws (78), lock washers (79), and nuts (80). Attach the rear left brace (34) to the hole in the rear of the valve plate on the "out" side with one 5/16" x 1" cap screw (78), lock washer (79), and nut (80). Attach the split hose (74) to the end of the valve plate and the two split hoses (58) to the inside of both the front braces.

- D. Install the control cables to the valve plate by reinstalling the jam nuts and washers on the cables. Place the control cables in respective slots of the valve plate bulkhead with one nut and one washer on each side of the bulkhead. Center the cables in the slots so that they are exactly in line with the valve spool centers.

Attach the cable clevis (3) to the cables using the square nuts (4). Slip the cable clevises over the spools. Install the clevis pin (5) through the clevis and spools and secure with a pushnut (6). Adjust the cables so that the control lever is centered between both the angle and the raise/lower positions. If the cable clevis does not allow enough adjustment, reposition the cable at the valve plate bulkhead. After checking to see that the valve spools are in the centered position, tighten cable clevis nuts.

**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 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. Use three nylon ties to run cables along air intake hoses.**

- E. Place the valve plate and legs over the smog control vacuum on the passenger's side of the vehicle. Position it so the split hoses are keeping the vacuum hoses from chaffing. Drill three 11/32" holes in the fender. Attach with three 5/16" x 1" cap screws (78), 1/2" flat washers (87), 5/16" flat washers (81), lock washers (79), and nuts (80). Drill fender and re-fasten large vacuum canister to the fender to allow room for the valve.

#### 4. 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 fan from the water pump and discard the capscrews. Install the fine threaded end of four 5/16" x 1 3/4" studs (82) into the water pump flange. The studs should be flush with the back of the flange. Install the drive sheave (24), fan spacer (22), and the fan on over the new studs and fasten with lock washers (79) and nuts (80) torqued to 18ft. lbs. **To prevent potential fan wobble, this bolted joint must be drawn up tight. Rotate the fan to check for wobble during installation. Be sure to torque the fasteners to 18 foot pounds.**

#### 5. Pump Tank and Pump Bracket

**Caution: Pump tank fill must be vertical to engine.**

- A. Remove the front fastener from the thermostat housing. Place the straight end of the pump bracket brace (27) over the hole and reinstall the fastener. Do not tighten any fasteners until the pump bracket is fully installed. Position the lower end of the pump bracket (26) (the end of the bracket without the pipe spacer) behind the lower end of the adjusting slot in the alternator bracket. (Vehicles with small alternator use upper hole on pump bracket to install fastener into slot of alternator bracket.) Insert one 3/8" x 1 1/4" cap screw (89) and flat washer (93) through the alternator bracket and pump bracket. Fasten with a 3/8" lock washer (91) and nut (92). Position the pipe spacer on the opposite end of the pump bracket over the open hole on top of the water pump. Fasten with a 3/8" x 2 1/2" cap screw (90) and lock washer (91). **Tighten all fasteners.**
- B. Holding the pump tank (1) in a bench vise, screw a 1/4" brass bar ell (52) onto the pressure port of the pump and screw the quill (55) into the return port of the pump. Install the pump sheave (25) onto the pump shaft using the lock nut supplied with the pump. When installing the lock nut make sure that the lock nut tightens against the pump sheave, and not against the pump shaft shoulder.
- C. Remove the pump from the vise and install the saddle bracket (35) on over the front of the pump. Secure with a 5/16" x 1 1/2" cap screw (77), lock washer (79), and nut (80). Attach the saddle bracket and pump to the pump bracket using a 5/16" x 1 1/4" cap screw (76) with a flat washer (81) through the passenger's side hole in the saddle bracket and the pump bracket, and also through the pump bracket brace. Fasten with a lock washer (79) and nut (80). Install a 5/16" x 1" cap screw (78) with a flat washer (81) through the other side and fasten with a lock washer (79) and nut (80). Place the bolting bar (33) behind the engine lift bracket with the stud projecting through the hole. Install the universal brace tab (38) on over the stud and fasten with a 5/16" lock washer (79) and nut (80).

- D. Install a 41" V-belt (23) on over the installed drive and pump sheaves. Align the sheaves and tighten the 1 1/2" saddle bracket fastener. Adjust for the proper tension by pivoting the saddle bracket on the top bolt. Install the rear tank strap (36) on over the rear of the pump tank. Install one 5/16" nut (80) and flat washer (81) onto the universal brace rod (37) and insert the brace rod through the previously installed universal brace tab. Install the brace rod to the tank strap with one 1/4" x 1 1/4" cap screw (84), lock washer (85), and nut (86). Fasten the other end of the brace rod to the brace tab with a 5/16" flat washer (81), 5/16" lock washer (79), and nut (80). Use the brace rod to adjust the alignment of the drive and pump sheaves. Check the belt for the proper tension. Tighten the power steering and alternator belts.

## 6. Hydraulic Hose Installation

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

- A. Attach one end of the 26" Hp hose (16) to the 1/4" brass bar ell on the pump tank and push one end of the 26" Lp hose (17) onto the quill on the pump tank. Route these hoses under air intake hoses to the control valve. The Lp hose may be cut off to adjust for travel with the Hp hose. Push the Lp hose onto the Quill and screw the Hp hose into the 90 degree swivel adapter.
- B. Install the 66" Hp hose (18) to the elbow in the angle port closest to the cables on the valve (cyl. A). Pass this hose by the battery and out through the core support near the radiator. Pass the hose out through the grille, low and about 14" off the center toward the driver's side. Attach a female QD half to the long QD/electric grille plate (56) with a snap ring (45). Pass the 66" hose through a rubber dust plug (43) and attach it to the female disconnect half. Put a dust plug on the plug of the vehicle harness and slide it into the slot of the grille plate. Attach the grille plate to the grille with 4 long tie wraps (59).
- C. Attach a 42" Hp hose to the raise port elbow and one 42" Hp hose (19) to the angle port elbow farthest from the cables (Cyl. B). Pass these hoses out through the core support by the radiator, low and about 14" off the center toward the passenger's side of the grille. Attach a bulkhead adaptor (44) to one hole of the long 2 QD grille plate (57) with a snap ring (45). Attach a male half of a QD (42) to this adaptor. Secure a female QD half (42) to the other hole in the grille plate with a snap ring (45). Slide a rubber dust plug over the end of the raise hose and attach this to the male disconnect on the inboard side of the grille plate. Slide a dust plug over the angle hose and attach it to the female QD half on the outboard side of the plate. Slide the plate back to the grille and attach it with 4 long tie wraps (59). Using tie wraps (75), tie the hoses together and keep the hoses away from the battery cables.
- D. Install the cable boot bracket (65) on the driver's side headgear brace, between the brace and fasteners. Insert the cable boot (66) on over the bracket.
- E. Install in line oil filter as per filter kit (7) instructions located in the common hydraulics kit

## 7. Operations

- A. Check all fittings and fasteners for tightness. Secure hoses with nylon tie wraps (75). Place the Caution Label (72) on the dash beside the control head.
- B. Fill the 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 hoses.** 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 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.