







# Hydraulics Parts List

Ref #	Qty In Kit	Part #	Description	Ref #	Qty In Kit	Part #	Description
* part of 8977 Bolt Bag				* part of 8977 Bolt Bag			
1	1	A2311	Pump assembly	56	1	*8688	QD/Electric Grille Plate (Short)
2	1	A4466-40	Control Valve Assembly	57	1	*8686	2 QD Grille Plate (short)
3	2	4483	Clevis	58	4	*8687	Standoff Leg
4	2	4494	10-32 Square Nut	59	4	*8324	Hose Tie - 3/16" x 14"
5	2	4491	Clevis Pin 3/16 x 1"	60	2	*8127	1/4" x 45 degree Swivel
6	2	4493	3/16" Push Nut Zp	61	8	*90687	1/4" x 1/2" Button Head Screw
7	1	8764	Filter Kit	62	8	*90350	1/4" Lock Nut
8	1	4419	Single lever control	63			
9	2	6027	45" Control Cable, SLC	64			
10	1	A318	1-1/2" x 10" Cylinder Assembly	65	1	*8741	Bracket - Cable Boot
11	2	A3660	1-1/2" x 12" Cylinder Assembly	66	1	*8284	Cable Boot
12	2	6814	Clevis Pin - 1 x 3-5/16	67			
13	4	6816	Anchor Pin - 1 x 4	68			
14				71	3	*5529	Shock Mount
15	6	90601	1/4" x 1-1/2" Cotter Pin	72	1	5704	Caution Label
16	1	21214	26" HP Hose--3/8P-1/4P Flat Crimp	73	2	3042	Grommet - Rubber, Split
17	1	4471	26" LP Hose	74	1	4477	Grommet - Split Hose
18	2	8632	78" HP Hose, 1/4P to 1/4P	75	3	*3666	Hose Tie, Nylon - 3/16" x 8"
19	1	375	42" HP Hose, 1/4P to 1/4P	76	1	*90048	5/16" x 1-1/4" (NC) Gr. 5 Cap Screw
20	1	3074	22" HP Hose, 1/4P to 1/4P	77	1	90054	5/16" x 1-1/2" (NC) Gr. 5 Cap Screw
21	2	4424	36" HP Hose, 1/4P to 1/4P	78	4	90042	5/16" x 1" (NC) Gr. 5 Cap Screw
22				79	6	*90360	5/16" Lock Washer
23	1	1022	Fan Belt, 55"	80	7	*90332	5/16" (NC) Nut
24	1	8968	Drive Sheave	81	4	*90313	5/16" Flat Washer
25	1	3696	Pump Sheave	82			
26	1	8972	Pump Bracket	83			
27	1	8971	Pump Bracket Brace	84	1	90614	1/4" x 1 1/4" (NC) Gr. 5 Cap Screw
28				85	1	90359	1/4" Lock Washer
29	1	5329	Valve Plate	86	1	90330	1/4" (NC) Nut
30	1	5975	Valve Plate Brace	87	1	*90705	1/2" x 5-1/2" (NF) Gr. 5 Cap Screw
31				88	2	*90103	3/8" x 1" (NC) Gr. 5 Cap Screw
35	1	5467	Saddle Bracket	89	2	*90361	3/8" Lock Washer
36	1	2036	Rear Tank Strap	90	1	*90334	3/8" (NC) Nut
37	1	2116	Universal Brace Rod	91	1	*90199	7/16 x 5" (NC) Gr. 5 Cap Screw
38	1	*2115	Universal Brace Tab	92	1	*90362	7/16" Lock Washer
42	2	*A1587	Disconnect Assembly	93	3	*4268	Spacer Washer
43	2	*1588	Dust Plug	94	1	*90632	M10 x 1.5 x 80 Gr. 9.8 Cap Screw
44	1	*4486	Adapter - Bulkhead 1/4" NPT	95	1	*90429	M10 Lock Washer
45	3	*4485	7/8" Snap Ring	96	1	*90420	M10 Flat Washer
46	1	319	1/4" x 90 Swivel Adapter	97	3	*90704	3/8" x 5-1/2" (NF) Gr. 8 Cap Screw
47	2	2315	9/16" w/O-Rngx3/8" F PI Swv	98			
48				99			
49				100			
50							
51	2	2780	1/4" NPT x 90 Deg. Elbow FRGD				
52	1	*2318	1/4" Brass Bar Ell. (F/F)				
53							
54	3	*20316	9/16" O-ring to 1/4 NPT 90° Elbow				
55	2	1658	Quill - 3/8" NPTM to 3/8" ID Hose				

A4468-40 uses 5425 Bolt Bag

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

## 1. Cylinder & Cylinder Hose Assembly

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

## 2. Control Head & 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 drilling guide as a reference only. **Be sure both sides of the firewall are clear of obstructions before drilling.** Drill 1/2" hole in the underside of the dash as shown in the dash illustration.
- 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 & tighten jam nuts to secure cables to control head. Remove nuts and washers from the valve end of the cables. Route the cables from dash through hole in the firewall to the 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 adapter unions (47) into the "in" and "out" ports. Screw Quill (55) into installed adapter in the "out" port. Install three 9/16" O-ring to 1/4" NPT 90° elbows (54) in lift & angle ports. When tight, elbows should point toward rear of valve at approximately 7 O'clock.
- B. Mount valve to valve plate (29) using two 1/4 x 1-3/4 cap screws, lock washers, & nuts located in the valve bag. Install a rubber shock mount (71) into the center & rearmost holes on the driver's side of the valve plate. Fasten each with one 5/16 lock washer (79) & nut (80). Connect control cables to valve plate before fastening valve plate to vehicle. Begin by reinstalling jam nuts & washers on cables. Place control cables in respective slots of valve plate bulkhead with one nut & washer on each side of bulkhead. Center cables in slots so that they are exactly in line with valve spool centers. Attach cable clevises (3) to cables using square nuts (4). Slip cable clevises over spools. Install clevis pins (5) through clevis & spools & secure with pushnuts (6). Temporarily adjust cables so that control lever is near being centered in the control head.
- C. Locate valve plate with cables attached, on top of driver's side inner fender well so that valve is near level & cables run in as smooth a path as possible while clearing brake control box. Be sure swivel adapter does not rub against windshield water bottle. Using the two previously installed shock mounts as guides, mark & drill two 11/32" holes through the fender well. Fasten each shock mount to the fender well with one 5/16 flat washer (81), lock washer (79), & nut (80). Attach 90 degree bent end of valve plate brace (30) to valve plate as shown in the illustration with a 5/16 x 1 cap screw (78), lock washer (79), & nut (80).

Attach a rubber shock mount (71) to hole in other end of valve plate brace with a 5/16 lock washer (79) & nut (80). Using the shock mount as a guide, mark & drill one 1 1/32" hole through the fender well. Fasten the shock mount to the fender well with a 5/16 flat washer (81), lock washer (79), & nut (80).

- D. With valve plate fastened to inner fender, re-adjust control cables so that control head lever is centered between both angle & 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 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.**

#### **4. Drive Sheave Installation**

- A. Remove fan shroud & loosen serpentine belt. Remove & discard the four bolts 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 drive sheave (24) in crank pulley & fasten to crankshaft with three 3/8 x 5-1/2 (NF) grade 8 cap screws (97) & three spacer washers (93). Install a 1/2 x 5-1/2 (NF) grade 8 cap screw (87) into center of drive sheave. Alternately tighten the three 3/8" cap screws to assure proper installation & torque these fasteners to 75 foot pounds. Torque center fastener to 115 foot pounds. Reinstall serpentine belt & fan shroud.

#### **5. Pump Tank & Pump Bracket**

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

- A. Remove & discard alternator bolt above power steering filler cap on driver's side. Remove bolt on engine mount inside of power steering filler cap. Position pump bracket (26) to vacated bolt holes & install a 7/16 x 5 cap screw (91) with lock washer (92) through pump bracket & engine mount and a M10 x 1.5 x 80 cap screw (94), lock washer (95), & flat washer (96) through slotted hole in pump bracket & rear of alternator. Do not fully tighten these fasteners at this time. Place pump bracket brace (27) over hole on engine below valve cover and above exhaust manifold & fasten with a 3/8 x 1 cap screw (88), lock washer (89) into the threaded hole on the engine. Fasten other end of brace to tab on pump bracket with a 3/8 x 1 cap screw (88), lock washer (89), & nut (90). Tighten all fasteners.
- B. Holding pump tank (1) in bench vise, place a 1/4" brass bar ell (52) (pointed slightly inboard) onto the 1/4" pipe nipple of pump tank & a quill (55) in the other threaded hole in pump tank. Install the pump sheave (25) onto the pump shaft using the locknut & key supplied with the pump. Remove pump from vise & install saddle bracket (35) on over front of 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 two 5/16" x 1" cap screws (78), flat washers (81), lock washers (79), & nuts (80).
- C. Install a 55" V-belt (23) on over drive & pump sheaves. Using the top fastener as a pivot, align sheaves & tighten fasteners. Adjust for the proper tension. Remove nut on back of upper alternator bolt. Install universal brace tab (38) & reinstall nut. Install rear tank strap (36) on over rear of pump tank. Align universal brace rod (37) to universal brace tab. Cut shorter if required. Install one 5/16 nut (80) & flat washer (81) onto universal brace rod & insert brace rod through universal brace tab. Connect brace rod to tank strap with one 1/4 x 1-1/4 cap screw (84), lock washer (85), & nut (86). Fasten the other end of brace rod to brace tab with a 5/16" flat washer (81), 5/16" lock washer (79), & nut (80). Use the brace rod to adjust the alignment of the drive & pump sheaves. Check belt for proper tension. Fasten vehicle power steering hose clear of pump belt with tie wraps (75). Tighten serpentine belt.

## 6. Hydraulic Hose Installation

- A. Attach 26" Hp hose (16) to the 1/4" brass bar ell on pump tank & push one end of the 26" LP hose (17) onto quill on pump tank.

**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.**

Fasten HP hose (16) into 90 degree swivel (47) on "in" port side of valve. Turn the swivel so the hose goes just over the top and not hitting the window washer container. Route the LP hose along the HP hose and push onto the quill (55) on the valve. Tie the hoses together. Remove the parking lights and drill a 1-7/8" hole through the web behind the light. Install the 6" split rubber grommet (74) around the drilled hole. Install the end of the 42" angle hose (19) to the elbow on the rear angle port of the valve. Pass it out through the core support and through the grille low and about 14" off the center of the driver's side. Attach a female half of a QD to the QD/Electric Grille plate (56) with a snap ring (45). Put a dust plug (43) on the angle hose and tighten it into the QD. Slide the head light connector (with dust cover) in the slot provided.

**NOTE: Some GMC models with a fine mesh grille may have to use two stand off legs (58) fastened with four 1/4-20 x 1/2" button head socket screws (61) and lock nuts (62) on each grille plate. The grill plate should be oriented with the head light connector to the inside.**

- B. Install the end of the 78" angle hose (18) to the elbow in the front angle port of the valve. Pass it out through the core support and route it out through the grille low and about 14" off center on the passenger side. Attach a female half of a QD to one hole in the 2 QD grill plate (57) with a snap ring (45). Attach a bulkhead adapter (44) with snap ring (45) to the other hole in the plate. Attach a male half of a QD to this adapter.

**NOTE: For GMC's with fine mesh grilles, no further adapters are needed. The hoses may be installed directly to the back of the QD's after sliding dust plugs over the hose fittings. Install the stand off legs after the hoses are tightened.**

On trucks without standoffs, attach a 1/4" NPT 90 degree swivel (46) & dust cover to the female disconnect half which will be the outside fittings when the plate is attached to the grille. Install end of the other 78" hose (18) to the elbow in the raise port of the valve. Pass it out through the grille on the passenger side in the same opening as already installed angle hose. On trucks without grille plate standoffs, attach a 1/4" NPT 45 degree swivel & dust plug to the rear of the male QD half. On grilles with standoff legs, the 45 degree fitting is not necessary. Attach each plate to the grille with two long tie wraps (58).

- C. 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.
- D. 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 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 angle 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 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 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.