

SERIES
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HYDRAULICS PARTS LIST

HPS4596
A5092

REF#	QTY IN KIT		PART#	DESCRIPTION
	A5092-25	HPS4596		* PART OF 6993 BOLT BAG
1	1		A2311	PUMP TANK ASSEMBLY
2	1		A4466	CONTROL VALVE ASSEMBLY
3	2		4483	CLEVIS
4	2		4494	10-32 SQUARE NUT
5	2		4491	CLEVIS PIN
6	2		4493	PUSH NUT
7				
8		1	4419	SINGLE LEVER CONTROL HEAD
9		2	A5701	36" CONTROL CABLE, SLC
10	1		A5096	6" LIFT CYLINDER ASSEMBLY
11	2		A318	10" ANGLE CYLINDER ASSEMBLY
12	2		6814	CLEVIS PIN
13	4		6816	ANCHOR PIN
14				
15	6		90601	1/4 X 1-1/2 COTTER PIN
16		1	2623	48" H.P. HOSE, 1/4P TO 3/8P
17		1	2549	48" L.P. HOSE
18		1	5215	48" H.P. HOSE, 1/4P TO 1/4P
19		2	375	42" H.P. HOSE, 1/4P TO 1/4P
20		1	3074	22" H.P. HOSE, 1/4P TO 1/4P
21		1	376	32" H.P. HOSE, 1/4P TO 1/4P
22				
23		1	358	FAN BELT, 51"
24		1	6988	DRIVE SHEAVE
25		1	5741	PUMP SHEAVE
26		1	6016	PUMP BRACKET
27		1	6017	PUMP BRACKET BRACE
28				
29		1	5329	VALVE PLATE
30		1	5975	VALVE PLATE BRACE
31				
32		1	6018	BOLTING BAR
33				
34				
35		1	4921	SADDLE BRACKET
36	1		2036	REAR TANK STRAP
37	1		2116	UNIVERSAL BRACE ROD
38		1	* 2115	BRACE TAB
39		1	4467	DISCONNECT MOUNTING PLATE
40				
41				
42	2		A1587	DISCONNECT ASSEMBLY
43	2		1588	DUST PLUG
44		1	* 4486	BULKHEAD ADAPTER
45		2	* 4485	7/8" SNAP RING
46	1		319	1/4" X 90 SWIVEL ADAPTER
47	2		2315	9/16 O.R. TO 3/8P X 90 SWL.ADPT.
48				
49				

REF# QTY IN KIT PART# DESCRIPTION
 A5092-25 HPS4596 * PART OF 6993 BOLT BAG

50		2	*	765	1/4" BRASS BAR STREET ELL
51	2			2780	1/4" BRASS BAR STREET ELL (FORGED)
52		4	*	2318	1/4 BRASS BAR ELL (F/F)
53		1	*	3979	3/8 BRASS BAR STREET ELL (M/F)
54		3	*	3058	ADAPTER (9/16 O-RING TO 1/4P)
55	2			1658	QUILL
56		3	*	5529	RUBBER SHOCK MOUNT
57					
58					
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72		1		5704	SAFETY DECAL
73	2			3042	GROMMET
74	1			4477	SPLIT HOSE GROMMET
75	3	1	*	3666	TIE WRAPS
76		1	*	90048	5/16X1-1/4 (NC) CS GR5
77	1			90054	5/16 X 1-1/2 (NC) GR. 5 CAPSCREW
78	3	1	*	90042	5/16 X 1 (NC) CAPSCREW
79	6	8	*	90360	5/16 LOCKWASHER
80	7	8	*	90332	5/16 (NC) NUT
81	4	3	*	90313	5/16 FLATWASHER
82					
83					
84	1			90614	1/4 X 1-1/4 (NC) CAPSCREW
85	1			90359	1/4 LOCKWASHER
86	1			90330	1/4 (NC) NUT
87		1	*	90632	M10 X 1.5 X 80 CAPSCREW GR. 10.9
88		1	*	90631	M10 X 1.5 X 20 CAPSCREW GR. 10.9
89		2	*	90429	M10 LOCKWASHER
90		1	*	90498	M12 X 1.5 X 100 GR. 10.9 CS

FASTENER TORQUE (FT-LB)			
DIAMETER- THREADS PER INCH	GRADE DESIGNATION		
			
	GRADE 2	GRADE 5	GRADE 8
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 AND CLYINDER HOSE ASSEMBLY

A. USING BENCH VISE TO HOLD LIFT CYLINDER (10), REMOVE CLOSURE FROM PORT. SCREW 90 DEGREE SWIVEL ADAPTER (46) INTO PORT. PLACE LIFT CYLINDER WITH INSTALLED ADAPTER BETWEEN EARS ON UNDERSIDE OF LIFT ARM AND LOWER HEADGEAR EARS. ATTACH CYLINDER TO EARS USING CLEVIS PINS (12) AND COTTER PINS (15).

B. USING BENCH VISE TO HOLD 22" H.P. HOSE (20), INSTALL BRASS BAR STREET ELL (50) AND FEMALE HALF OF HOSE DISCONNECT ASSEMBLY (42) ON SAME HOSE END. THEN, HOLDING 32" H.P. HOSE (21), 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 22" H.P. HOSE WITH FEMALE DISCONNECT HALF TO DRIVER'S SIDE ANGLE CYLINDER STREET ELL. INSTALL OTHER H.P. HOSE WITH MALE DISCONNECT HALF TO PASSENGER SIDE ANGLE CYLINDER STREET ELLS. 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 END AND RAM END. SECURE ANCHOR PINS WITH COTTER PINS (15).

2. CONTROL HEAD AND CONTROL CABLES.

NOTE: DASH BRACKET, HARDWARE, DRILLING GUIDE AND MOUNTING INSTRUCTIONS WILL BE FOUND IN PECULIAR ATTACHING BOX.

A. DRILL THREE 5/8" HOLES IN FIREWALL FOR CONTROL CABLES AND WIRING HARNESS USING DRILLING GUIDE AS A REFERENCE ONLY. THERE ISN'T MUCH ROOM TO DRILL ON THIS VEHICLE SO BE SURE THAT BOTH SIDES OF FIREWALL ARE CLEAR OF OBSTRUCTIONS, WIRES, ETC.

B. INSTALL DASH BRACKET AS PER DASH BRACKET INSTRUCTIONS.

C. LOOSEN 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 THE NUTS AND WASHERS FROM THE VALVE END OF THE CABLES. ROUTE THE CABLES OUT THROUGH THE DRILLED HOLES IN THE FIREWALL AND UP TO THE AREA BETWEEN THE BRAKE LINES AND WINDSHIELD WASHER BOTTLE. ATTACH CONTROL HEAD TO DASH BRACKET AS PER DASH BRACKET INSTRUCTIONS. INSTALL RUBBER GROMMETS (73) AROUND CABLES WHERE THEY PASS THROUGH FIREWALL.

3. VALVE AND VALVE PLATE

A. USING BENCH VISE TO HOLD CONTROL VALVE ASSEMBLY (2) REMOVE CLOSURES FROM VALVE PORTS. SCREW 90 DEGREE SWIVEL ADAPTER UNIONS (47) INTO "IN" AND "OUT" PORTS BEING SURE THEY ARE FACING AWAY FROM SPOOL END AT APPROX. 45 DEGREES UP. SCREW QUILL (55) INTO INSTALLED ADAPTER IN "OUT" PORT.

NOTE: VALVE FITTINGS ARE INSTALLED AS DESCRIBED TO INSURE PROPER INSTALLATION. FIRST INDICATION OF INCORRECT INSTALLATION IS FAILURE OF PLOW TO LIFT ALTHOUGH PLOW WILL ANGLE.

B. INSTALL THREE 9/16 O-RINGS TO 1/4 P. ADAPTERS (54) IN THE LIFT AND ANGLE PORTS OF VALVE. INSTALL ONE 1/4" ELL (52) TO EACH OF THESE THREE ADAPTERS. THE 1/4" ELLS SHOULD POINT AWAY FROM THE CABLE END OF VALVE.

C. CONNECT CONTROL CABLES TO VALVE PLATE (29) BEFORE FASTENING VALVE PLATE TO VEHICLE. BEGIN 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 ON BULKHEAD FOR MAXIMUM ADJUSTMENT IN BOTH DIRECTIONS.

D. ATTACH THE VALVE PLATE BRACE (30) TO FRONT CORNER OF PASS. SIDE OF THE VALVE PLATE WITH ONE 5/16 X 1 CAPSCREW (78), LOCKWASHER (79) AND NUT (80). FASTEN A RUBBER SHOCK MOUNT (56) TO BOTH REAR CORNERS OF THE VALVE PLATE AND TO THE END OF THE VALVE PLATE BRACE USING ONE 5/16 LOCKWASHER (79) AND NUT (80) ON EACH SHOCK MOUNT. POSITION THE VALVE PLATE SO THAT THE PLATE AND VALVE (WHEN INSTALLED) WILL CLEAR ANY OBSTRUCTIONS. THEN, USING THE SHOCK MOUNTS AS GUIDES, MARK AND DRILL THREE 11/32" HOLES IN FENDER WELL. SECURE SHOCK MOUNTS TO FENDERWELL WITH THREE 5/16 FLATWASHERS (81), LOCKWASHERS (79) AND NUTS (80).

E. MOUNT VALVE TO VALVE PLATE USING TWO 1/4 X 1-1/4 CAPSCREWS, LOCKWASHERS AND NUTS FROM VALVE BAG. 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 CLEVISES OVER SPOOLS. INSTALL CLEVIS PIN (5) THROUGH CLEVIS AND SPOOL AND SECURE WITH PUSHNUT (6) ON CLEVIS PIN. ADJUST CABLES SO THAT 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 CENTERED POSITION, TIGHTEN CABLE CLEVIS NUTS.

CAUTION: VALVE SPOOLS MUST BE FREE AND SELF CENTERING WHEN CABLES AND CONTROL HEAD ARE ATTACHED. FAILURE TO CENTER SPOOLS WILL RESTRICT FLUID FLOW THROUGH 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 UPPER HALF OF FAN SHROUD. REMOVE AND DISCARD CRANK-SHAFT CENTER BOLT.

B. INSTALL DRIVE SHEAVE (24) INTO CENTER OF CRANKSHAFT. CHECK TO BE SURE DRIVE SHEAVE HAS FULLY SEATED IN CRANKSHAFT AND THAT DRIVE TAB CONTACTS SIDE OF BOLT HEAD IN DIRECTION OF ROTATION. SECURE DRIVE SHEAVE WITH AN M12 X 1.5 X 100 GR. 10.9 CAPSCREW (90) TORQUED TO 62 FT. LBS. REINSTALL UPPER HALF OF FAN SHROUD.

5. PUMP TANK AND PUMP BRACKET

- A.** ALIGN PIPE SPACER ON PUMP BRACKET (26) WITH VACANT TAPPED HOLE IN POWER STEERING BRACKET. FASTEN WITH AN M10 X 1.5 X 80 GR.10.9 CAPSCREW (87) AND LOCKWASHER (89). ALIGN LOWER PUMP BRACKET HOLE WITH TAPPED HOLE IN WATER PUMP AND FASTEN WITH AN M10 X 1.5 X 20 GR 10.9 CAPSCREW (88) AND LOCKWASHER (89).
- B.** PLACE THE MORE SHARPLY BENT END OF THE PUMP BRACKET BRACE (27) ON THE BACK SIDE OF THE PUMP BRACKET AND ALIGN IT WITH THE REMAINING VACANT HOLE IN THE MAIN PART OF THE BRACKET. INSERT A 5/16 X 1-1/4 (NC) CAPSCREW (76) THROUGH THE PUMP BRACKET AND BRACE. PLACE THE SHORT LEG OF THE BRACE TAB (38) OVER THE SAME 5/16" CAPSCREW AND FASTEN THE TAB AND BRACE WITH A 5/16 LOCKWASHER (79) AND NUT (80). INSERT THE 5/16 CAPSCREW WELDED TO THE BOLTING BAR (32) UP THROUGH THE TOP HOLE OF THE ENGINE LIFTING BRACKET. PLACE THE OTHER END OF THE PUMP BRACKET BRACE OVER THE BOLTING BAR CAPSCREW AND FASTEN WITH A 5/16 LOCKWASHER (79) AND NUT (80). DO NOT TIGHTEN.
- C.** HOLDING PUMP TANK (1) IN BENCH VISE, SCREW 1/4" BRASS BAR ELL (52) ONTO PRESSURE PORT AND SCREW 3/8" BRASS BAR STREET ELL (53) INTO RETURN PORT. SCREW QUILL (55) INTO ELL JUST INSTALLED IN RETURN PORT. WHEN LOOKING AT THESE FITTINGS ON THE BACK OF THE PUMP THEY SHOULD POINT TO THE 1 O'CLOCK POSITION. INSTALL PUMP SHEAVE (25) ONTO PUMP SHAFT USING LOCKNUT AND KEY SUPPLIED WITH PUMP. REMOVE PUMP FROM VISE AND INSTALL SADDLE BRACKET (35) ON OVER FRONT OF PUMP. SECURE WITH A 5/16 X 1-1/2 GR. 5 CAPSCREW (77), LOCKWASHER (79) AND NUT (80). ATTACH SADDLE BRACKET AND PUMP TO PUMP BRACKET USING TWO 5/16 X 1 CAPSCREWS (78), FLATWASHERS (81), LOCKWASHERS (79) AND NUTS (80).
- D.** SLIP THE 51" V-BELT (23) ON OVER INSTALLED DRIVE AND PUMP SHEAVES. ALIGN SHEAVES AND TIGHTEN THE 1-1/2" SADDLE BRACKET FASTENER. ADJUST BELT FOR PROPER TENSION BY PIVOTING SADDLE BRACKET ON TOP BOLT. INSTALL REAR TANK STRAP (36) ON OVER REAR OF PUMP AND ALIGN WITH BRACE TAB. MEASURE NEEDED LENGTH OF UNIVERSAL BRACE ROD (37) AND CUT BRACE ROD TO CORRECT LENGTH. INSTALL ONE 5/16 NUT (80) AND FLATWASHER (81) ONTO BRACE ROD. INSTALL BENT END OF BRACE ROD BETWEEN EARS ON TANK STRAP WHILE INSERTING STRAIGHT END OF BRACE ROD INTO BRACE TAB. FASTEN UNIVERSAL BRACE ROD TO TANK STRAP EARS WITH ONE 1/4 X 1-1/4 CAPSCREW (84) LOCKWASHER (85) AND NUT (86). FASTEN THE OTHER END OF THE BRACE ROD TO THE BRACE TAB WITH ONE 5/16 FLATWASHER (81) LOCKWASHER (79) AND NUT (80). TIGHTEN THE 5/16 X 1-1/4 CAPSCREW HOLDING THE PUMP BRACKET BRACE AND BRACE TAB. USE THE BRACE ROD TO ADJUST ALIGNMENT OF DRIVE AND PUMP SHEAVES. CHECK BELT FOR PROPER TENSION.

6. HYDRAULIC HOSE INSTALLATION

- A.** ATTACH 48" H.P. HOSE (16) TO 1/4" BRASS ELL ON PUMP TANK AND PUSH 48" L.P. HOSE (17) ONTO QUILL ON PUMP TANK. ROUTE THESE HOSES OUT AROUND THE FRONT OF THE PUMP OVER THE TOP OF THE FRESH AIR INTAKE DUCT TO THE VALVE.

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. INSTALL THE 48" H.P. HOSE TO THE SWIVEL ADAPTER ON THE PRESSURE PORT OF THE VALVE. PUSH THE 48" L.P. HOSE ONTO THE QUILL IN THE RETURN PORT OF THE VALVE. SECURE THESE TWO HOSES TO THE UPPER RADIATOR HOSE WITH A HOSE TIE (75) TO PREVENT THEM FROM CONTACTING THE PUMP SHEAVE OR DRIVE BELT. ATTACH THE 48" H.P. HOSE (18) TO THE FITTINGS IN THE LIFT PORT OF THE VALVE. (SPOOL #1). ATTACH THE TWO 42" H.P. HOSES (19) TO THE FITTINGS IN THE ANGLE PORTS OF THE VALVE (SPOOL #2). ROUTE THESE THREE HOSES DOWN UNDER THE CORNER OF THE RADIATOR SHROUD AND UP THROUGH THE GRILL TO THE DISCONNECT BRACKET. CONNECT THE 48" HOSE TO THE SWIVEL ADAPTER IN THE LIFT CYLINDER.

7. DISCONNECT ASSEMBLY

A. WITH DISCONNECT MOUNTING PLATE (39) HELD IN BENCH VISE, INSTALL DISCONNECT HALVES AS SHOWN IN ILLUSTRATION. BULKHEAD ADAPTER (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 DRIVERS SIDE HEADGEAR POST WITH TWO 5/16 X 1 CAPSCREWS (78), LOCKWASHERS (79) AND NUTS (80). INSTALL DUST PLUGS (43) OVER ENDS OF HOSES ROUTED TO FRONT OF VEHICLE IN THE PREVIOUS STEP. CONNECT 42" RIGHT ANGLE HOSE (SPOOL #2, CYL. B) TO BACK OF FEMALE DISCONNECT INSTALLED IN TOP HOLE OF DISCONNECT BRACKET. CONNECT 42" LEFT ANGLE HOSE (SPOOL #2, CYL. A) TO BOTTOM (MALE) DISCONNECT. TIGHTEN BY HOLDING HOSES AND ROTATING THE DISCONNECT HALVES IN THE BRACKET.

8. OPERATIONS

A. CHECK ALL FITTINGS AND FASTENERS FOR TIGHTNESS. SECURE HOSES WITH NYLON TIE WRAPS (75). PLACE SAFETY DECAL (72) ON DASH BESIDE CONTROL HEAD.

B. FILL RESERVOIR WITH TYPE "A" AUTOMATIC TRANSMISSION FLUID. START ENGINE, LIFT AND ANGLE BLADE.

NOTE: IF BLADE ANGLES OPPOSITE FROM CONTROL LEVER POSITION, REVERSE THE TWO H.P. HOSE CONNECTIONS ON THE BACK OF THE DISCONNECT BRACKET.

RAISE 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.