

Keep With Operator's Manual

VALVE AND PLUMBING KIT NEW HOLLAND TS100A & TS110A TRACTORS

Valve and plumbing kit can be installed using tools ordinarily available. Valve control handle has been factory pre-assembled for ease of installation. References to left and right used in these instructions refer to position when seated in operating position on tractor. Shut off engine and engage brakes during installation.



WARNING: Escaping hydraulic fluid under pressure can penetrate skin, causing serious injury.

- *DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.*
- *Stop engine and relieve pressure before connecting or disconnecting lines.*
- *Tighten all connections before starting engine or pressurizing lines.*

If any fluid is injected into skin, obtain medical treatment immediately or gangrene may result.

Handle Lock Operation

Single lever joystick in this kit has a handle locking feature.

- To lock handle, rotate locking lever on base of joystick assembly approximately 20° to lock position.
- To unlock handle, rotate locking lever to unlock position.

Fastening Cable and Harness Straps to Valve Figure 2

1. Remove and retain cotter pin (22, Figure 2) from clevis pin (23, Figure 2) in harness end of one control cable. Remove clevis (21, Figure 2) from harness end of each control cable (2). Replace clevis (21, Figure 2) with clevis (43) included in kit. Slide clevis (43) over one spool on valve (1) and install clevis pin (44) through clevis and spool. Reinstall cotter pin (22, Figure 2) into clevis pin (44). Repeat procedure to secure remaining cable to other spool in valve (1).

NOTE: Do not remove protective end caps from threaded end of cables (2) until after cables have been routed from valve (1) to control handle (3).

2. Remove two socket head screws that secure dust cap at spool end of valve (1). Place spacer plate (46) on top of dust cap and secure harness straps (20, Figure 2) of cable assemblies (2) to control valve (1) using M5-.8 x 14mm socket head cap screws (45). Mark opposite end of cables to designate which cable will control lift function and which cable will control tilt function on loader. Lift function is controlled by spool with longer bonnet on opposite end of spool.

Assembling Hoses and Fittings onto Control Valve

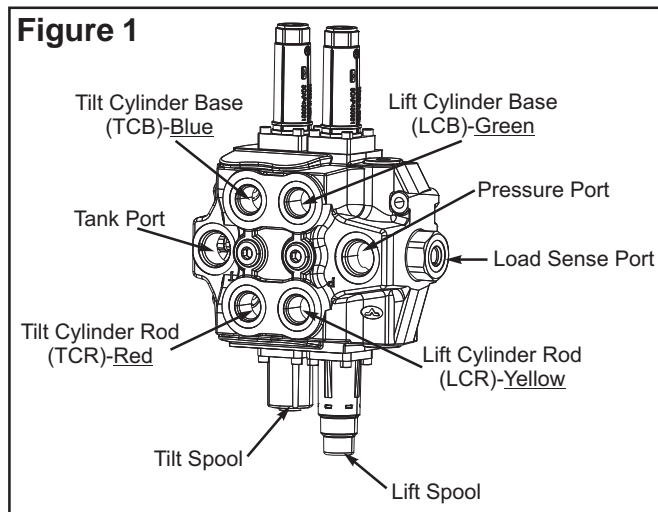
1. Attach 90° adapter fittings (16) to pressure and return ports on valve (1). Attach ½" x 72" hose (34) to pressure port on valve (1). Route hose to rear of the rear remote stack. Attach ½" x 54" hose (33) to tank port on valve (1). Route hose over rear axle to right side of rear remote stack. Attach 90° adapter fitting (17) to load sense port on valve (1). Attach 1/4" x 90" long hose (35) to the load sense port with 90° adapter fitting (17). Orient fittings to face cable end of valve. Route hose over rear axle and behind rear remote stack to the left side of the rear remote stack. (See Figure 3)
2. Attach the two 32" long 3/8" I.D. hoses with 90° adapter fittings (40) to the front most work ports (Lift cylinder rod and bucket cylinder base ports). Attach the two 36" long 3/8" I.D. hoses with 90° adapter fittings (41) to the rear work ports (Lift cylinder base and bucket cylinder rod ports). Route rear hoses around front work ports passing in between the work ports and the pressure or tank port. (See Figure 7)

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Mounting Valve with Assembled Fittings, Figure 4

1. Temporarily remove steps on right side of tractor.
2. Temporarily remove step bracket.
3. Fasten valve with assembled fittings to bottom of valve mounting plate (6) using 5/16" x 2 1/2" cap screws (30) and lock nuts (21).
4. Bolt valve mount plate (6) with valve assembly to tractor as shown in Figure 4 with three 5/16" x 1 1/2" bolts (31) and lock nuts (21).

NOTE: Do not reinstall step bracket and steps until after all plumbing as been finished.



Connecting Valve Cables to Single Handle Joystick

1. Route control cables (2) from valve (1) to area of cab where joystick control will be mounted. Use existing grommets holes through the rear of the cab to route cables through.

Note: When routing cable, make sure cables are not twisted and will not bind or contact any moving parts. Avoid bending cables to a radius of less than 3 inches (8 cm).

2. Assemble cable end clevis adapter (47) onto ends of cables (2).

NOTE: For normal operation, joystick assembly will be positioned with red handle lock lever to right side of joystick.

3. Temporarily lift boot (3, Figure 2) from joystick base to access clevis rod ends (6 & 7, Figure 2).
4. Temporarily remove 6mm x 75mm socket head screw (29, Figure 2) and lock nut (10, Figure 2) from lower side hole in base (11, Figure 2) of joystick assembly (3). Temporarily remove 6mm x 30mm socket head cap screws (13, Figure 2) from bottom of joystick base.
5. Slide cable (2, Figure 5) for control of lift spool and cable adapter (47, Figure 5) through front hole in bottom of joystick assembly base (11, Figure 2). Attach cable adapter (47, Figure 5) to rod end (6, Figure 2) using clevis pin (27) and retaining ring (28).

6. Slide cable (2, Figure 5) for control of tilt spool and cable adapter (47, Figure 5) through front hole in bottom of joystick assembly base (11, Figure 2). Attach cable adapter (47, Figure 5) to rod end (7, Figure 2) using clevis pin (44) and retaining ring (28).

7. Lock lift and tilt cables (2, Figure 5) into place by reinstalling 6mm x 30mm socket head cap screws (13, Figure 2) and flat washers (12, Figure 2) into bottom of joystick base (11, Figure 2) and 6mm x 75mm socket head cap screw (29, Figure 2) and lock nut (10, Figure 2) through side hole in joystick base (11, Figure 2).

8. Slide boot (3, Figure 5) over joystick base (11, Figure 5), and secure boot to joystick base using plastic tie strap (14, Figure 5) provided with joystick assembly.

Installing Joystick, Figure 5

1. Install joystick mount bracket (22) on right side of seat using two 8mm x 16 mm cap screws (36) and two 3/8" flat washers (32).
2. Loosely bolt adjustment bar (23) to joystick mount bracket (22) using 5/16" x 1" cap screws (29) and six 5/16" flat washers (20). Place two washers (20) between adjustment bar (23) and joystick mount bracket (22) and one between the adjustment bracket and the bolt head.

Installing Joystick (Continued)

NOTE: Plate for attaching joystick control (3) has a slotted hole to allow adjustment of angle at which joystick is mounted for ease of operation.

3. Bolt joystick (3) to adjustment bar with two 5/16"-18 x 3-1/2 cap screws (19), four 5/16" flat washers (20), and two 5/16"-18 lock nuts (21).
4. Position assembled joystick where joystick control will be most convenient for the operator without interfering with any tractor control levers.
5. Tighten bolts (29) holding adjustment bar onto mount bracket (22).

Plumbing Control Valve to Tractor Hydraulics

1. Attach 3/8" to 9/16" adapter (25) into load sensing port on the rear remote stack. (See Figure 6). Attach 9/16" 90° adapter (26). Slide 1" x 90" nylon sleeve over load sensing hose (39) and attach hose.

NOTE: Remove shuttle valve before installing load sensing line if tractor is so equipped.

2. Attach M22 to 7/8" adapter (18) to pressure port on bottom of the rear remote stack (See Figure 6). Attach 7/8" 90° adapter (27). Slide 1.25" x 72" nylon sleeve (37) to pressure hose (34) and attach hose to pressure port.
3. Attach M22 to 7/8" adapter (18) to tank port on right side in front of the rear remote stack (See Figure 6). Attach 45° adapter (28). Slide 1.25" x 54" nylon sleeve (38) over tank hose (33) and attach tank hose to tank port.
4. Secure hoses away from rear tire using 1/2" x 20" tie straps (51) along hose routings.

Plumbing Loader Boom Oil Lines to Loader Control Valve (Figure 1A)

1. Install mid mount coupling bracket (48) onto right mid mount with four 5/16" x 3/4" cap screws (53) and lock nuts (21). Install snap rings (49) in first groove on hose side of female couplings (5). Insert couplings (5) into mid mount coupling bracket (48) from the bottom side of bracket and attach using snap rings (49). Couplings should occupy first four holes in bracket (48) moving from left to right when facing bracket.

2. Slip yellow plug (10) over lift cylinder rod control hose (See Figure 7) and attach to coupler in position 1 (See Figure 7), then tighten.
3. Slip green plug (15) over lift cylinder base control hose and attach to coupler in position 2, then tighten.
4. Slip blue plug (9) over bucket cylinder base control hose and attach to coupler in position 3, then tighten.
5. Slip red plug (8) over bucket cylinder rod control hose and attach to coupler in position 4, then tighten.
6. Attach hoses (7) to oil lines beginning with bottom oil line and tighten. Mark opposite end of each hose (7) to identify color. Slide two hoses through nylon sleeve (42). Slide remaining two hoses through second nylon sleeve (42). Loosely attach color coded dust caps (12, 13, 14, and 15) and male couplers (4) as illustrated in Figure 7.
7. Insert male couplers (4) into female couplers (5) making sure that colors correspond.

NOTE: It is important to make sure color coding corresponds between duct caps and plugs on each hose.

8. Tighten male coupler to hoses (7). Using adjustable plastic straps (50), secure nylon sleeve (42) to hoses (7) by running adjustable straps (50) around sleeve to avoid slippage and interference with moving parts.
9. Attach hoses (7) and nylon sleeves (42) to tractor with tie strap (52).
10. After all plumbing has been completed, supply hydraulic power to loader control valve. Slowly cycle lift and bucket cylinders several times to purge air from hydraulic system. Retract cylinders and shut off tractor engine. Replenish tractor hydraulic system, if necessary.

NOTE: When cycling loader using joystick control, operate loader as you normally would. If direction is wrong or loader will not lower, recheck connections.



WARNING: Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious personal injury. If injured by escaping hydraulic fluid, obtain medical treatment immediately.

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PARTS LIST – CABLE & HARNESS ASSEMBLY AND JOYSTICK CONTROL ASSEMBLY - Figure 2

Item	Part No.	Description	Qty.
1	51814	HANDLE, Joystick Control	1
2	G11506909	SCREW, Set, 6mm-1.00 x 8mm	1
3	51805	BOOT, Handle, Cable Joystick Control	1
4	51816	LEVER, Joystick Control	1
5	6040-19	RETAINING RING, External, 15/16"	3
6	51808	ROD END, Single	1
7	51807	ROD END, Double	1
8	51894	BOLT, Pan Head, Slotted, 6mm-1.00 x 22mm	1
9	51806	CLEVIS, Joystick Lever Base	1
10	48257-2	NUT, Lock, Nylon Insert, 6mm-1.00	1
11		BASE, Joystick, With Lock Mechanism (Not available as separate repair item.)	1
12	41837-1	WASHER, Lock, 1/4"	1
13	51812-1	SCREW, Socket Head, 6mm-1.00 x 30mm	1
14		STRAP, Tie, Plastic, 3/16" (Not available as separate repair item.)	1
15	52242	CLEVIS, Cable End Adapter, To Handle, 6mm-1.00 x 13mm EFF Thread	2
16		CABLE, Push-Pull (Not available as separate repair item.)	2
17	48948-18	NUT, Jam, 3/4-16	2
18	51798-1	WASHER, Lock, Internal Tooth, 3/4"	2
19	51799-1	NUT, Knurled, 3/4-16	2
20	41800	STRAP, Valve, Cable Adapter	2
21	48948-12	NUT, Jam, 5/16-24	2
22	51903-15	PIN, Cotter, 3/32 x 3/4"	2
23	41902-20	PIN, Clevis, 5/16 x 1"	2
24	51804	CLEVIS, Cable End, To Valve Spool	2
25	44743-1	SCREW, Socket Head, 1/4-20 x 3/8"	4
26	51758-3	CABLE ASSEMBLY, 80" (Includes Items 16, 17, 18, 19, 20, 21, 22, 23 & 24)	2
27	51896	PIN, Clevis, 1/4"	2
28	47778-2	RETAINING RING, External, 1/4"	2
29	51812-2	SCREW, Socket Head, 6mm-1.00 x 75mm	1

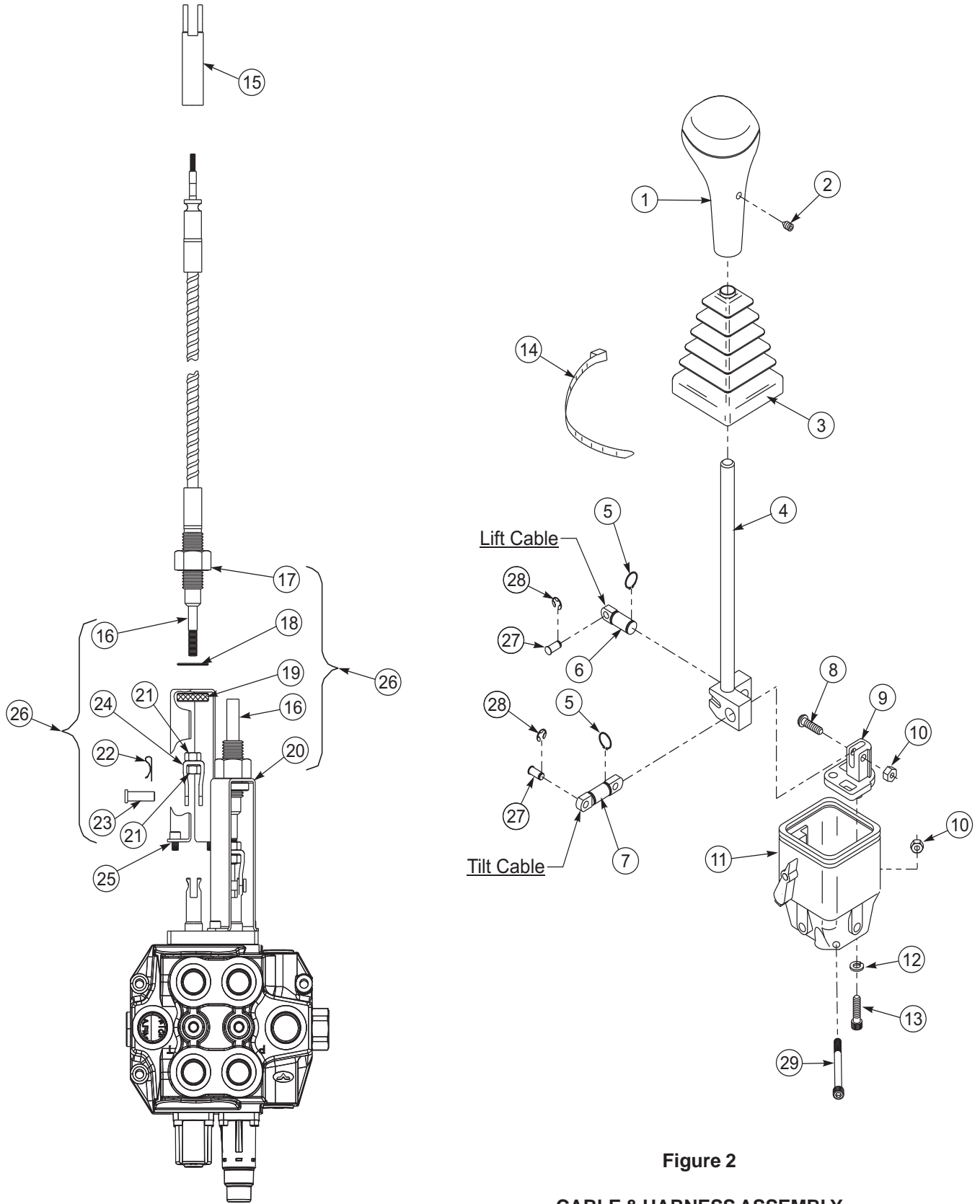
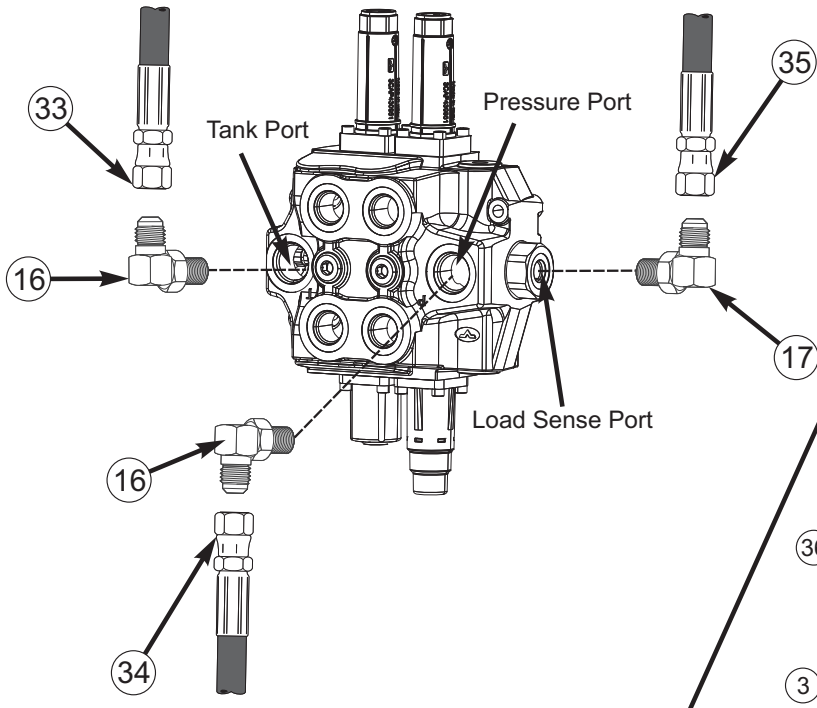


Figure 2
CABLE & HARNESS ASSEMBLY
AND
JOYSTICK CONTROL ASSEMBLY

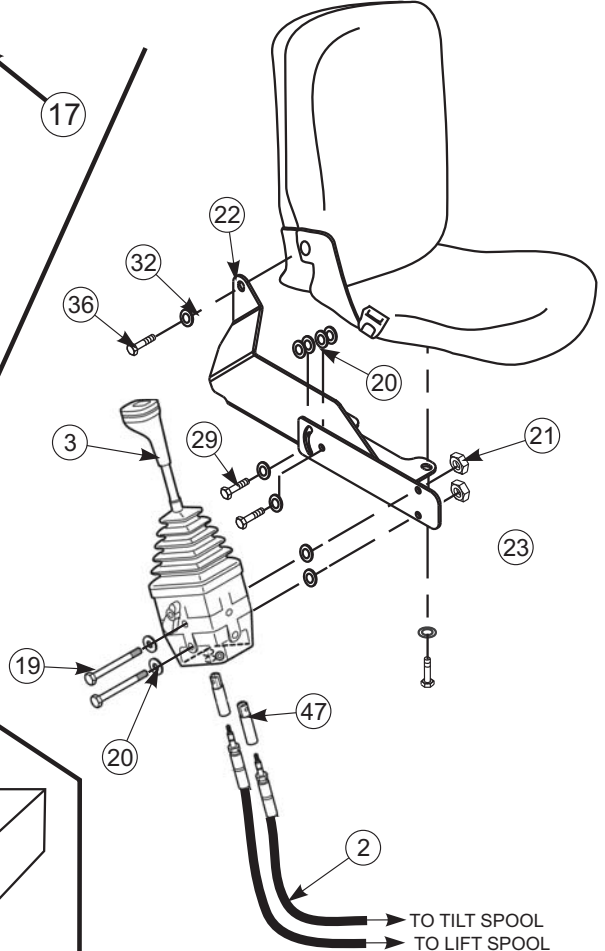
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PARTS LIST - VALVE & PLUMBING KIT - Figures 3, 4, 5, 6, and 7

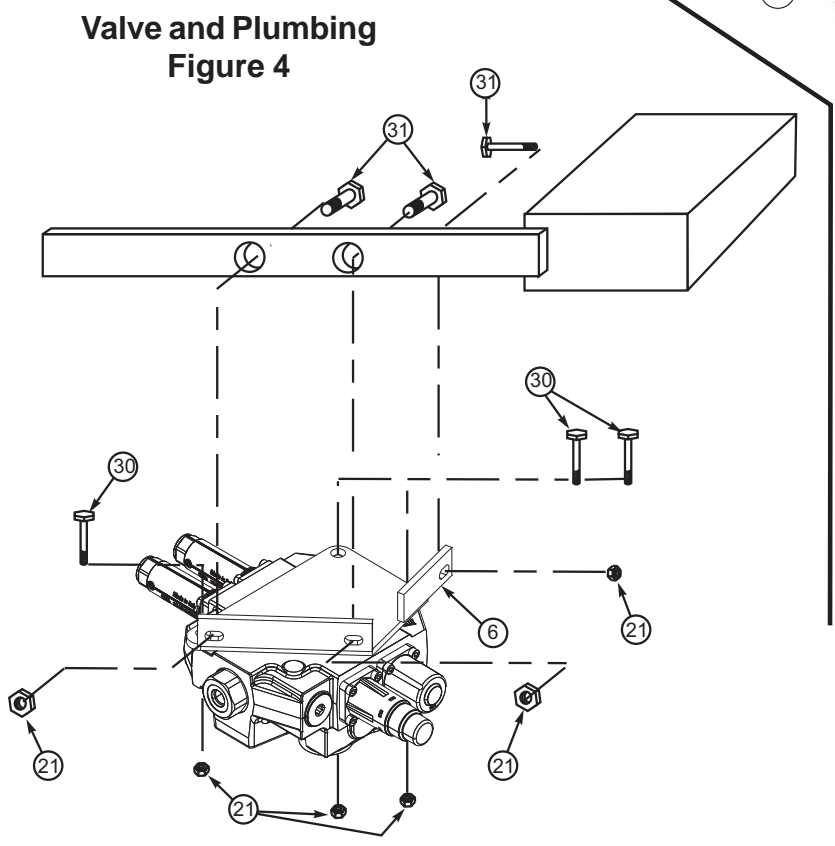
Item	Part No.	Description	Qty.
1	52457	VALVE, Walvoil Pressure Comp. Load Sense	1
2	51758-3	CABLE ASSEMBLY, Push-Pull, 80" Nominal Length	2
3	51757	CONTROL HANDLE ASSEMBLY, Single Joystick , Dual Axis, Cable	1
4	6137-13	COUPLER, Quick, Male, 1/2 " Body-3/4-16 ORB	4
5	47110-1	COUPLER, Quick, Female, 1/2 " Body-3/4-16 ORB	4
6	53553	PLATE, Valve Mount	1
7	44269-10	HOSE, 3/8" x 60"	4
8	4838-4	DUST PLUG, 1/2" Quick Coupler, Red	1
9	4838-12	DUST PLUG, 1/2" Quick Coupler, Blue	1
10	4838-13	DUST PLUG, 1/2" Quick Coupler, Yellow	1
11	4838-14	DUST PLUG, 1/2" Quick Coupler, Green	1
12	4838-3	DUST CAP, Red	1
13	4838-8	DUST CAP, Blue	1
14	4838-9	DUST CAP, Yellow	1
15	4838-10	DUST CAP, Green	1
16	32845-4	FITTING, 90° ,1 1/16" ORB x 7/8"-14 JIC	2
17	32845-1	FITTING, Adapter, 9/16"-18 ORB x 9/16"-18 JIC	1
18	52305-1	ADAPTER, Male JIC x Male Metric O-Ring, 7/8" JIC x M22-1.50	2
19	41838-81	SCREW, Cap, Hex Head, 5/16"-18 x 3-1/2" Grade 5	2
20	42502-7	WASHER, Flat, 5/16"-18, Type N	10
21	41840-2	NUT, Lock, 5/16"-18, Type N	13
22	53557	BRACKET, Mount	1
23	53559	BAR, Adjustment	1
24	38929	DECAL, Single Handle Control	1
25	36249-1	FITTING, Str. Adapter, 3/8" BSPP x 9/16"-18 JIC	1
26	34128-3	FITTING, 90° Adapter, 9/16"-18 x 9/16"-18 JIC	1
27	34128-1	FITTING, 90° Adapter, 7/8"-14 x 7/8"-14 JIC	1
28	38226-6	FITTING, 45° Adapter, 7/8"-14 x 7/8"-14 JIC	1
29	41838-60	SCREW, Cap, Hex Head, 5/16"-18 x 1" Grade 5	2
30	41838-24	SCREW, Cap, Hex Head, 5/16"-18 x 2 1/2" Grade 5	3
31	41838-34	SCREW, Cap, Hex Head, 5/16"-18 x 1 1/2" Grade 5	3
32	42502-8	WASHER, Flat, 3/8"	2
33	36698-8	HOSE, 1/2" x 54"	1
34	36698-16	HOSE, 1/2" x 72"	1
35	32837-19	HOSE, 1/2" x 90"	1
36	42672-96	SCREW, Cap 8mm-1.25 x 16mm, Class 8.8	2
37	34853-74	NYLON SLEEVE, 1.25" I.D. x 72"	1
38	34853-76	NYLON SLEEVE, 1.25" I.D. x 54"	1
39	34853-71	NYLON SLEEVE, 1" I.D. x 90"	1
40	53498-1	HOSE, 3/8" x 32"	2
41	53498-2	HOSE, 3/8" 36"	2
42	34853-11	NYLON SLEEVE, 1.59 I.D. x 66"	2
43	53560	CLEVIS	2
44	41902-28	PIN, Clevis	2
45	53562-1	SCREW, Socket Head Cap, M5-.8x14mm	2
46	53563	PLATE, Spacer	2
47	52242	CABLE ADAPTER	2
48	52311	ANGLE, Bulkhead	1
49	6040-16	RING, 1 1/2" Retainer	8
50	8137-1	STRAP, Plastic Tie, 3/16 x 11"	4
51	8137-3	STRAP, Plastic Tie, 1/2 x 20"	2
52	7438-1	STRAP, Tarp	1
53	41838-26	SCREW, Cap, Hex Head, 5/16"-18 x 3/4" Grade 5	4



Valve and Plumbing
Figure 3

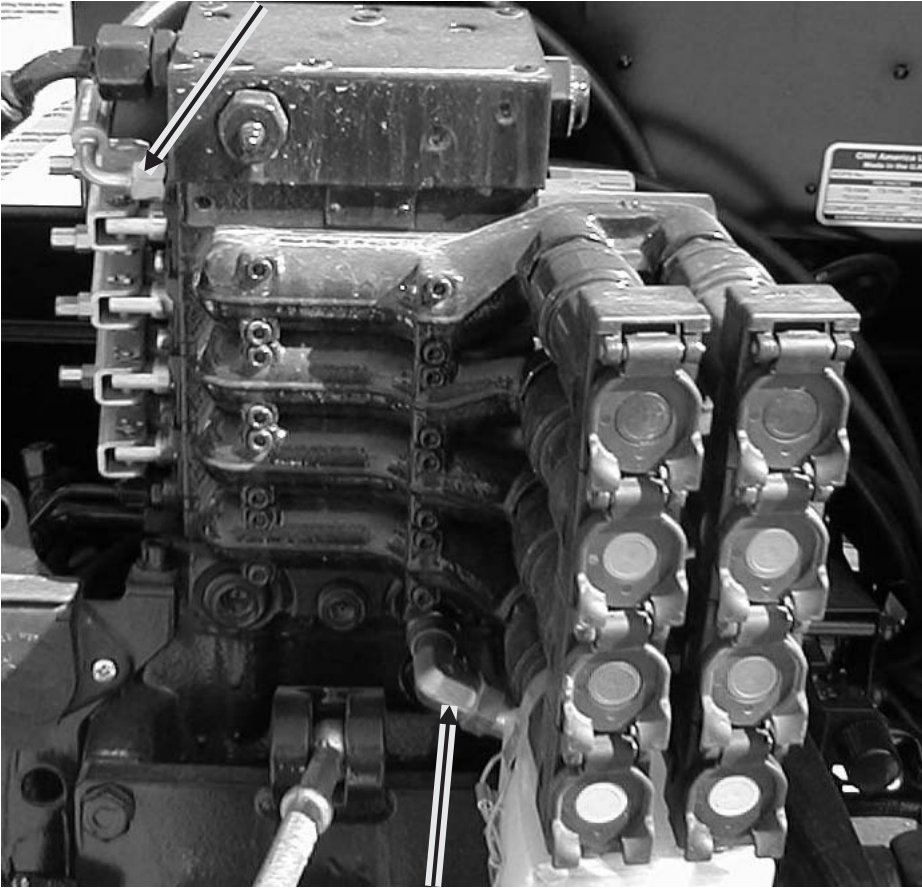


Valve and Plumbing
Figure 5



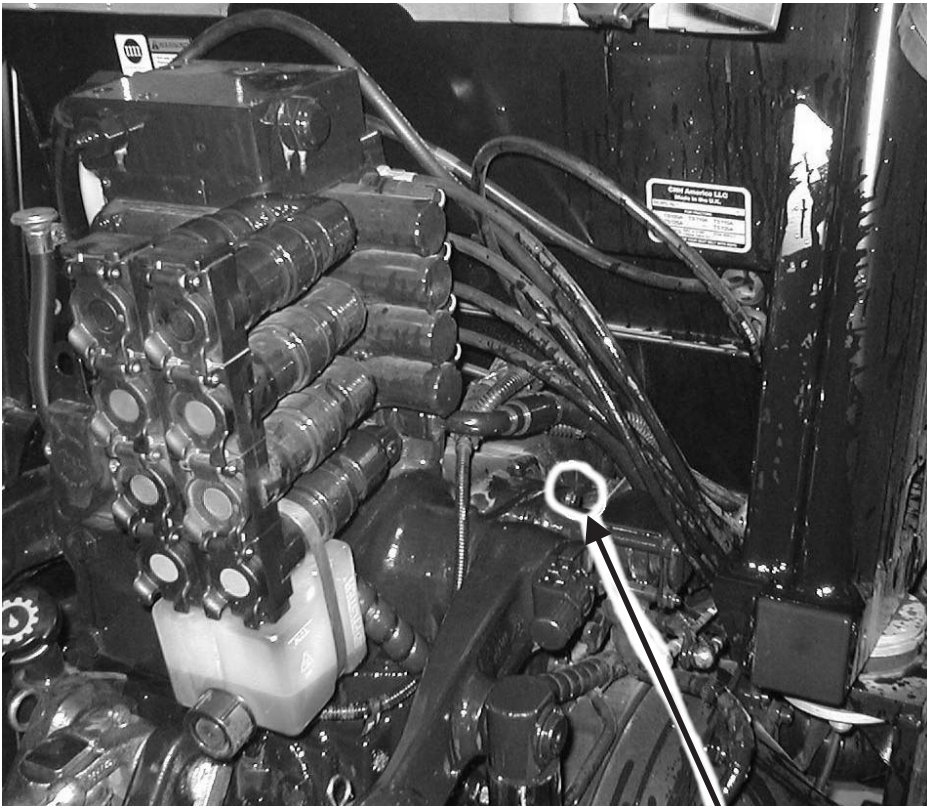
Valve and Plumbing
Figure 4

Load Sense Port



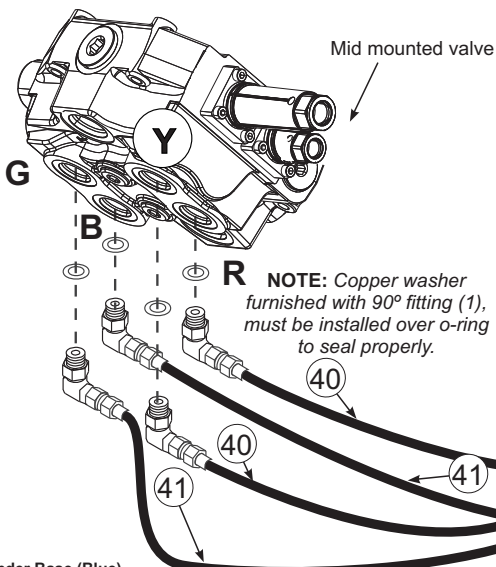
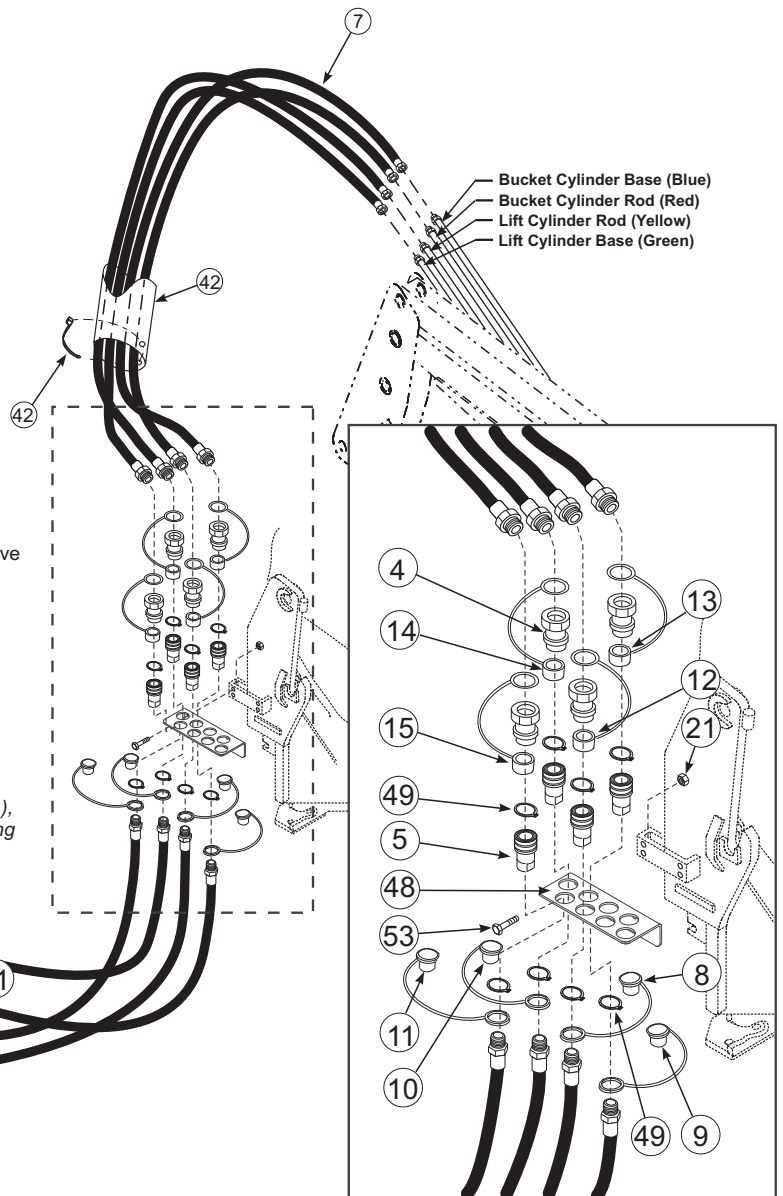
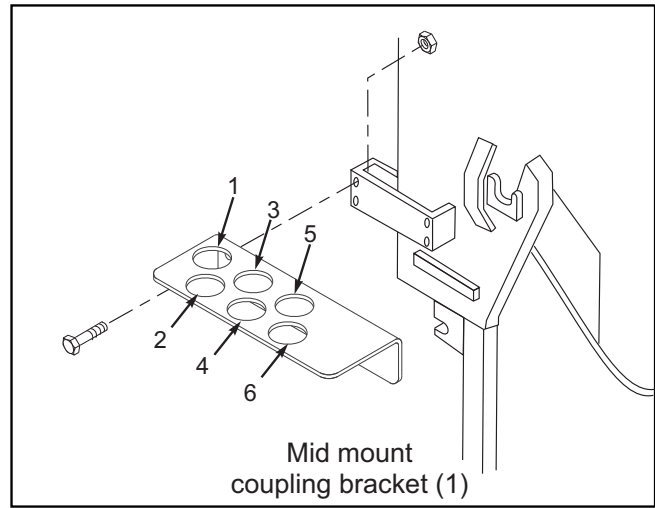
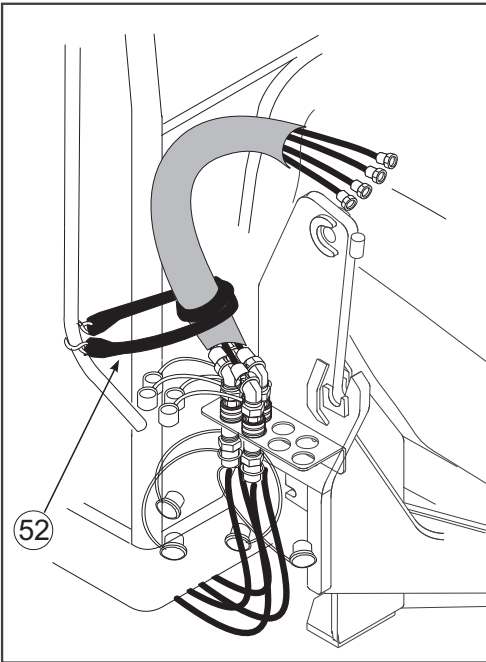
Pressure Port

Valve and Plumbing
Figure 6



Tank Port

Valve and Plumbing
Figure 7



R NOTE: Copper washer furnished with 90° fitting (1), must be installed over o-ring to seal properly.

Bucket Cylinder Base (Blue)
Bucket Cylinder Rod (Red)
Lift Cylinder Rod (Yellow)
Lift Cylinder Base (Green)

GENERAL TORQUE SPECIFICATIONS

USE THE FOLLOWING TORQUES WHEN SPECIAL TORQUES ARE NOT GIVEN

Standard American and Metric Cap Screws

AMERICAN STANDARD CAP SCREWS									METRIC CAP SCREWS								
SAE Grade	5				8				Metric Class	8.8				10.9			
Typ. Head Markings									Typ. Head Markings								
Cap Screw	TORQUE				TORQUE				Cap Screw	TORQUE				TORQUE			
Size	FT-LBS		N·m		FT-LBS		N·m		Size	FT-LBS		N·m		FT-LBS		N·m	
Inches	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	Millimeters	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
1/4 - 20	6.25	7.25	8.5	10	8.25	9.5	11	13	M6 x 1.00	6	8	8	11	9	11	12	15
1/4 - 28	8	9	11	12	10.5	12	14	16	M8 x 1.25	16	20	21.5	27	23	27	31	36.5
5/16 - 18	14	15	19	20	18.5	20	25	27	M10 x 1.50	29	35	39	47	42	52	57	70
5/16 - 24	17.5	19	23	26	23	25	31	34	M12 x 1.75	52	62	70	84	75	91	102	123
3/8 - 16	26	28	35	38	35	37	47.5	50	M14 x 2.00	85	103	115	139	120	146	163	198
3/8 - 24	31	34	42	46	41	45	55.5	61	M16 x 2.50	130	158	176	214	176	216	238	293
7/16 - 14	41	45	55.5	61	55	60	74.5	81	M18 x 2.50	172	210	233	284	240	294	325	398
7/16 - 20	51	55	69	74.5	68	75	92	102	M20 x 2.50	247	301	335	408	343	426	465	577
1/2 - 13	65	72	88	97.5	86	96	116	130	M22 x 2.50	332	404	450	547	472	576	639	780
1/2 - 20	76	84	103	114	102	112	138	152	M24 x 3.00	423	517	573	700	599	732	812	992
9/16 - 12	95	105	129	142	127	140	172	190	M27 x 3.00	637	779	863	1055	898	1098	1217	1488
9/16 - 18	111	123	150	167	148	164	200	222	M30 x 3.00	872	1066	1181	1444	1224	1496	1658	2027
5/8 - 11	126	139	171	188	168	185	228	251	<p>NOTE: These values apply to fasteners as received from supplier, dry or when lubricated with normal engine oil. They do not apply if special graphite or moly sulphide greases or other extreme lubricants are used.</p>								
5/8 - 18	152	168	206	228	203	224	275	304									
3/4 - 10	238	262	322	355	318	350	431	474									
3/4 - 16	274	305	371	409	365	402	495	544									
7/8 - 9	350	386	474	523	466	515	631	698									
7/8 - 14	407	448	551	607	543	597	736	809									
1 - 8	537	592	728	802	716	790	970	1070									
1 - 14	670	740	908	1003	894	987	1211	1337									

37° JIC Fittings

Size	Thread Size	Assembly Torque		Tube Connection F. F. F. T.	Swivel Nut or Hose Connection F. F. F. T.
		in.-lb.	ft.-lb.		
-4	7/16 - 20	140 ± 10	12 ± 1	2	2
-5	1/2 - 20	180 ± 15	15 ± 1	2	2
-6	9/16 - 18	250 ± 15	21 ± 1	1 1/2	1 1/4
-8	3/4 - 16	550 ± 25	45 ± 5	1 1/2	1
-12	1 1/16 - 12	1000 ± 50	85 ± 5	1 1/4	1
-16	1 5/16 - 12	1450 ± 50	120 ± 5	1	1
-20	1 5/8 - 12	2000 ± 100	170 ± 10	1	1
-24	1 7/8 - 12	2400 ± 150	200 ± 15	1	1
-32	2 1/2 - 12	3200 ± 200	270 ± 20	1	1

O-Ring Face Seal Tube/ Hose Swivel Nut

Metric Tube O.D. (mm)	Dash Size	Thread Size (in.)	Swivel Nut Hex Size (in.)	Swivel Nut Torque	
				N·m	lb _r ·ft
5	-3	--	--	--	--
6	-4	9/16 - 18	11/16	16	12
8	-5	--	--	--	--
10	-6	11/16 - 16	13/16	24	18
12	-8	13/16 - 16	15/16	50	37
16	-10	1 - 14	1-1/8	69	51
20	-12	1-3/16 - 12	1-3/8	102	75
22	-14	1-3/16 - 12	--	102	75
25	-16	1-7/16 - 12	1-5/8	142	105
32	-20	1-11/16 - 12	1-7/8	190	140
38	-24	2 - 12	2-1/4	217	160
50.8	-32	--	--	--	--

SAE O-Ring Fittings

Size	Swivel Nut or Hose	Assembly Torque		F. F. F. T.
		in.-lb.	ft.-lb.	
2	5/16 - 24	90 ± 5	7.5 ± 0.5	1 ± .25
3	3/8 - 24	170 ± 10	14 ± 1	1 ± .25
4	7/16 - 20	220 ± 15	18 ± 1	1 ± .25
5	1/2 - 20	260 ± 15	22 ± 1	1 ± .25
6	9/16 - 18	320 ± 20	27 ± 2	1.5 ± .25
8	3/4 - 16	570 ± 25	48 ± 2	1.5 ± .25
10	7/8 - 14	1060 ± 50	90 ± 5	1.5 ± .25
12	1 1/16 - 12	1300 ± 50	110 ± 5	1.5 ± .25
14	1 3/16 - 12	1750 ± 75	145 ± 6	1.5 ± .25
16	1 5/16 - 12	1920 ± 125	160 ± 6	1.5 ± .25
20	1 5/8 - 12	2700 ± 150	225 ± 12	1.5 ± .25
24	1 7/8 - 12	3000 ± 150	250 ± 12	1.5 ± .25
32	2 1/2 - 12	3900 ± 200	325 ± 15	1.5 ± .25

INSTALLATION INSTRUCTIONS