

Keep With Operator's Manual

VALVE & PLUMBING KIT INSTRUCTIONS RHINO 3110 LOADER NEW HOLLAND TRACTORS

MODEL	2WD	FWA	ROPS
TT60A	X	X	X
TT75A	X	X	X

TRACTOR AND VALVE KIT GENERAL INFORMATION

Valve and plumbing kit can be installed on tractor using tools ordinarily available. Valve control linkage has been factory preassembled for ease of installation.



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

- DO NOT use your hands to check for leaks. Use a piece of cardboard or paper. Always wear eye protection when searching for leaks.
- Place control lever in float position and stop tractor engine to relieve hydraulic pressure before connecting or disconnecting lines.
- Tighten all connections before starting engine or pressurizing lines.

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

Shut off tractor engine, remove key, engage tractor brakes, and completely lower three-point hitch during installation.

If tractor has no optional auxiliary valve continue with instructions on page 1. If tractor is equipped with one or two optional auxiliary valves continue instructions on page 5.

TRACTOR WITH NO OPTIONAL AUXILIARY VALVE:

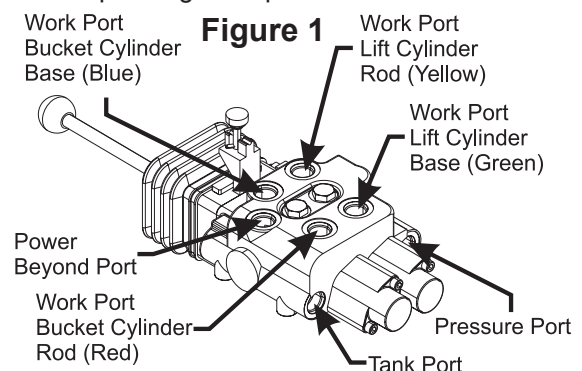
ASSEMBLING VALVE AND HOSES ONTO VALVE MOUNTING TUBE (Figures 1 & 2)

1. Unpack all parts and check to see that nothing is missing.
2. Install 3/8" x 78" hose (2) to tank port of control valve (1). Slide 78" nylon sleeve (11) over 3/8" x 78" hose (2) and secure it to fitting at valve end with plastic tie strap (34).

Install 3/8" x 42" hose (4) to pressure port of control

valve (1). Slide 42" nylon sleeve (16) over 3/8" x 42" hose (4) and secure it to fitting at valve end with plastic tie strap (34). Tighten hoses (2 & 4) to ports in valve.

3. Attach valve mounting tube (10) to right mount bracket using 1/2" x 2-1/2" cap screws (39), 1/2" flat washers (40), and 1/2" lock nuts (41).
4. Fasten valve mounting plate (9) to valve mounting tube (10) using 3/8" x 2-1/4" cap screws (37) and 3/8" lock nuts (38).
5. Fasten valve (1) to valve mounting plate (9) using 5/16-18 x 3/4" cap screws (35), and 5/16" lock washers (36).
6. Install 3/8" x 85" hose (3) to power beyond port on control valve (1). Slide 86" nylon sleeve (12) over 3/8" x 85" hose (3) and secure it to fitting at valve end with plastic tie strap (34). Tighten hose (3) to control valve (1).
7. Install long straight 3/4" O-ring to 9/16" JIC adapters (19), 90° elbows (21), dust plugs (24), and female couplers (22) onto upper work ports (blue and yellow as shown in Figure 1). Install blue and yellow identification bands (29 & 31) on the coupler on the corresponding work port.
8. Install two short straight 3/4" O-ring to 9/16" JIC adapters (20), 90° elbows (21), dust plugs (24), and female couplers (22) onto lower work ports (red and green as shown in Figure 1). Install red and green identification bands (30 & 32) on the coupler on the corresponding work port.



2-7723

PARTS LIST - VALVE & PLUMBING KIT

Item	Part No.	Description	Qty.
1	54881	VALVE, Prince	1
2	44269-11	HOSE 0.375ID X 78" (TANK)	1
3	53631-1	HOSE 0.375ID X 85" (POWER BEYOND)	1
4	50439-6	HOSE 0.375ID X 42" (PRESSURE NON-AUX)	1
5	53630-2	HOSE 0.375ID X 42" (PRESSURE NON-AUX)	1
6	53638-2	HOSE 0.375ID X 76" (PRESSURE AUX)	1
7	38576-23	HOSE #6-6MB-8FJX - 50" (LOADER LINES)	2
8	38576-16	HOSE #6-6MB-8FJX - 53" (LOADER LINES)	2
9	54879	PLATE, Valve Mounting	1
10	54878	TUBE, Valve Mounting	1
11	34853-56	SLEEVE, Hose, Nylon, 1-1/4" ID x 78" Long	1
12	34853-70	SLEEVE, Hose, Nylon, 1-1/4" ID x 86" Long	1
13	34853-43	SLEEVE, Hose, Nylon, 1-1/4" ID x 50" Long	2
14	34853-76	SLEEVE, Hose, Nylon, 1-1/4" ID x 54" Long	2
15	34853-69	SLEEVE, Hose, Nylon, 1-1/4" ID x 76" Long	1
16	34853-84	SLEEVE, Hose, Nylon, 1-1/4" ID x 42" Long	2
17	53628	FLOW BOLT M22-1.5 x 2.56" (NON-AUX)	1
18	44634	FLOW BOLT M22-1.5 x 1.56" (AUX)	1
19	54684-1	ADAPTER, 8MB-6MJ Long	2
20	32844-5	ADAPTER, 9/16 JIC X 3/4 O-ring	2
21	44277-2	FITTING, 9/16 O-RING X 9/16 JIC Swivel 90°	4
22	6147-11	COUPLER, 3/8 FEMALE	4
23	6137-11	COUPLER, 3/8 MALE	4
24	4838-17	DUST PLUG, .38	4
25	4838-18	DUST CAP, .38	4
26	32845-5	90° ELBOW	1
27	36665-3	TEE	1
28	34128-1	90° ELBOW, 7/8 JIC X 7/8 JIC Swivel	1
29	36240-5	BAND, Plastic Identification, Blue, 5/8"	2
30	36240-6	BAND, Plastic Identification, Red, 5/8"	2
31	36240-7	BAND, Plastic Identification, Yellow, 5/8"	2
32	36240-8	BAND, Plastic Identification, Green, 5/8"	2
33	8137-3	STRAP, Adjustable, 1/2 x 20"	2
34	8137-1	STRAP, Plastic Tie, 3/16x11"	12
35	41838-26	SCREW, Cap, 5/16-18 x .75, Grade 5	2
36	41837-2	WASHER, Lock, 5/16	2
37	41838-19	SCREW, Cap, 3/8-16 x 2-1/4, Grade 5	2
38	41840-3	NUT, Lock, 3/8-16, Type N	2
39	41838-25	SCREW, Cap, 1/2-13x2-1/2"	2
40	42502-10	WASHER, Flat, 1/2" SAE	2
41	41840-5	NUT, Lock, 1/2-13, Type-N	2
42	42502-8	WASHER, Flat 3/8	2

NOTE: Items 4, 5, 16, 17, 27, and 28 are not used when tractor is equipped with auxiliary valve(s), but DO NOT DISCARD. These items are required if auxiliary valve(s) are removed in the future.

Figure 2A

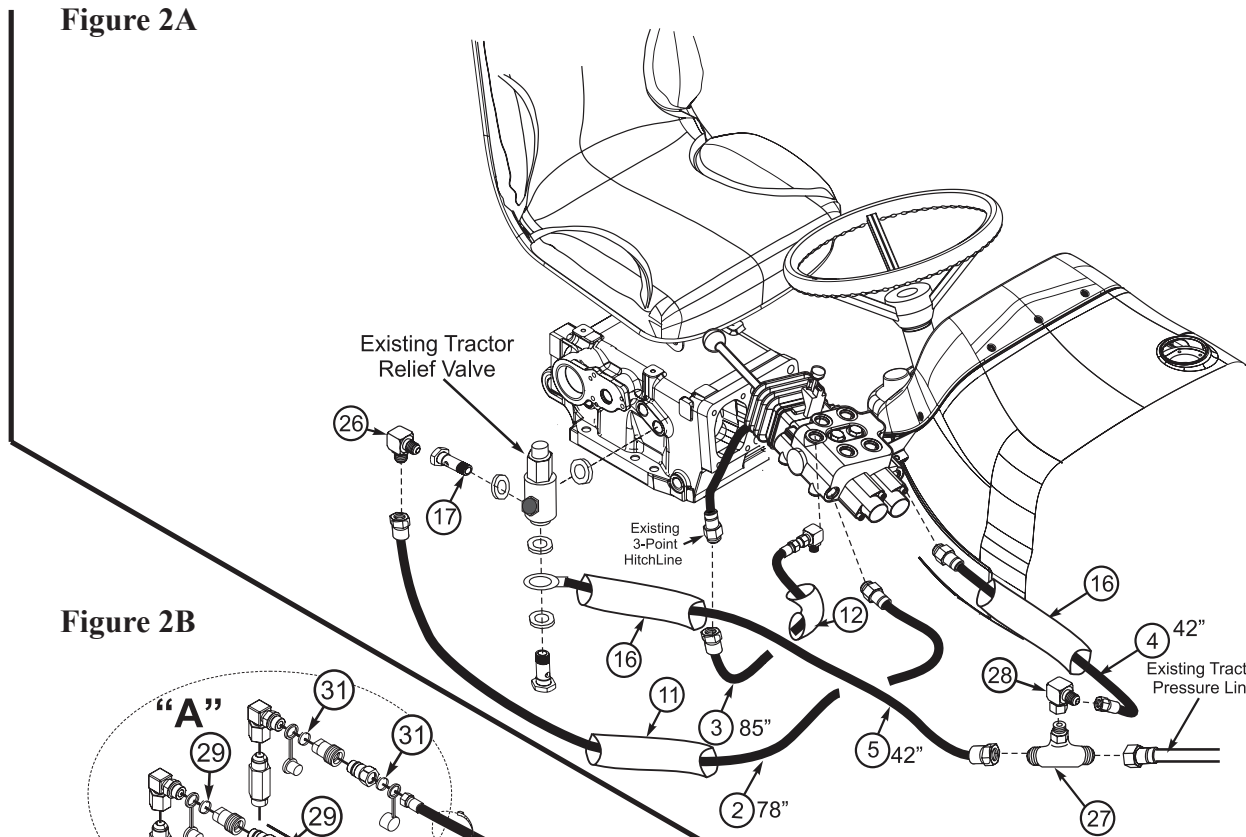
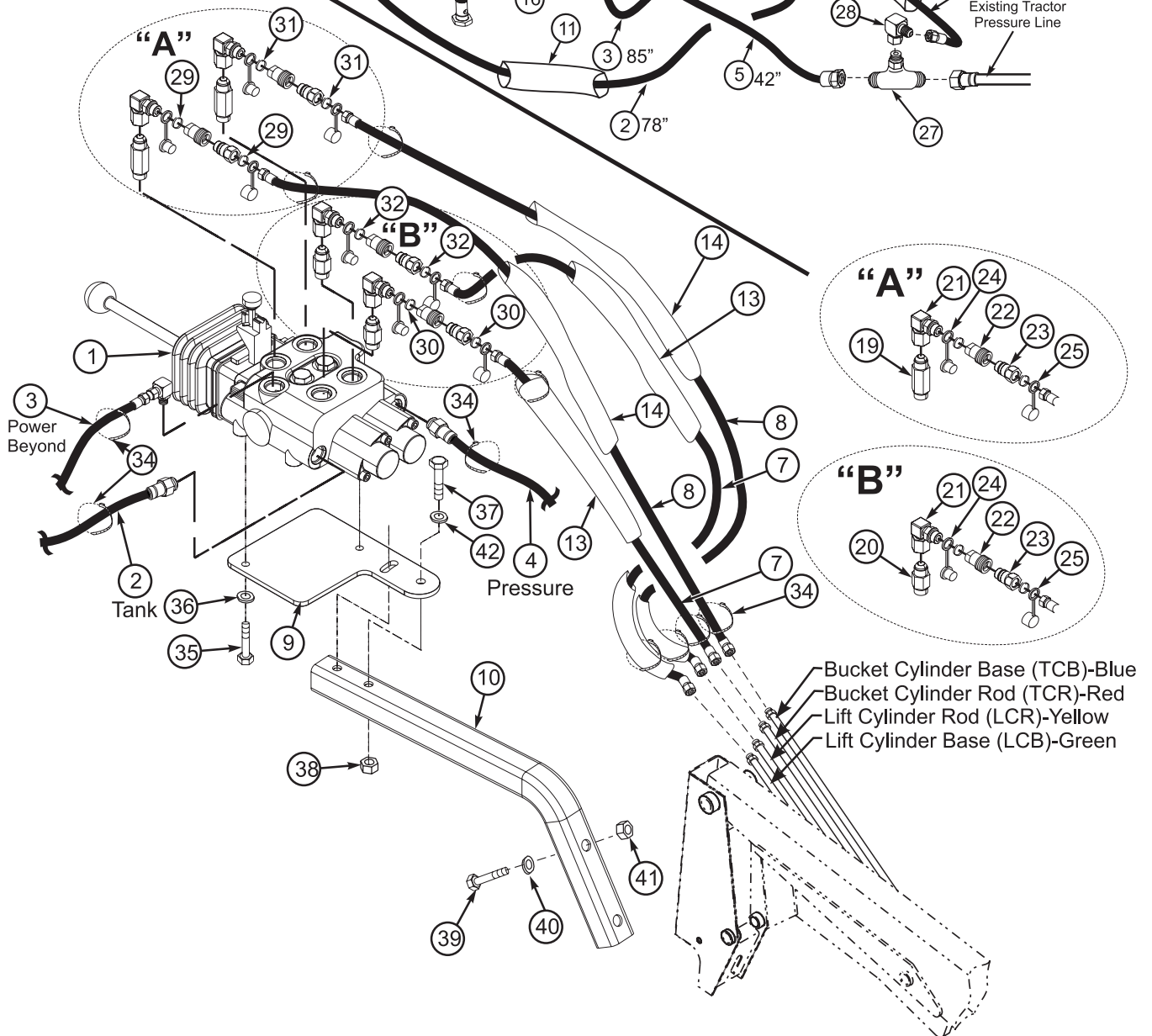


Figure 2B



PLUMBING CONTROL VALVE TO TRACTOR HYDRAULICS (Figure 2)

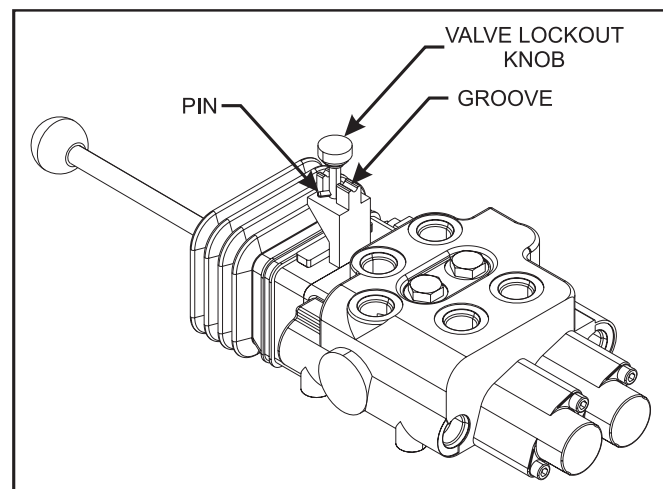
1. Tractor pressure steel oil line is made of two parts connected together with an intermediate pipe underneath and directly in front of the tractor right platform. Disconnect and remove the pressure line running to rear of the tractor from the intermediate pipe (DO NOT disconnect the short intermediate pipe). Remove up to and including the “Y” shaped tube that connects to hitch and tractor relief valve, and discard. Be sure to save copper washers for reuse.
2. Remove bolt from side of tractor relief valve located above tractor rear axle on right side of the tractor. Be sure to save copper washers for reuse. Install M22-1.5 x 2.56” flow bolt (17), with copper washers just removed, and install 90° elbow (26) into end of flow bolt (17). Tighten elbow (26) making sure to position free end down.
3. Install tee fitting (27) to end of remaining tractor pressure line. Install 90° swivel elbow (28) onto top of tee and orient elbow facing the front of the tractor. Install 3/8” x 42” hose (5) onto left side of tee fitting (27). Slide 42” nylon sleeve (16) over 3/8” x 42” hose (5) and secure to fitting at tee end with plastic tie strap (34). Route hose (5) with sleeve from tee fitting under tractor platform and up the back side of platform above rear axle.
4. Install 3/8” x 42” hose with M16 Banjo fitting (5) onto tractor relief valve in place of banjo fitting from “Y” shaped tube removed earlier. This installs on lower end of relief valve and is held in place by flow bolt from tractor. Reuse copper washers saved earlier.
5. Route hose (4) in sleeve from pressure port on valve (1) in front of right loader mount, then back between right loader mount and tractor frame, along inside surface to tee fitting (27), and attach to top port.
6. Route hoses (2 & 3) in sleeves from valve in front of right loader mount, then back between right loader mount and tractor frame, and along inside surface. Route hoses under platform and up the back side of platform above rear axle.
7. Install 3/8” x 78” hose (2) onto 90° elbow fitting (26) on relief valve flow bolt and tighten.
8. Install 3/8” x 85” hose (3) onto tractor 3 pt. hitch line located on right side of tractor directly above back side of platform and tighten.
9. Make sure nylon sleeves (11, 12, & 16) cover entire lengths of hoses, including crimps, secure hoses and sleeves to oil lines under tractor using plastic tie straps (33).

PLUMBING LOADER TO CONTROL VALVE

1. Attach dust caps (25) and male couplers (23) to 53” and 50” hoses (7 & 8). Slide 54” and 50” hose sleeves (14 & 13) on corresponding hoses and secure at each end with a plastic tie strap (34).
2. Attach hoses to loader oil lines as shown in Figure 2B. Starting on the lowest oil line, install 50” hose (7) then install 53” hose (8) on second lowest oil line followed by 50” hose (7) on the second oil line to the top and finally install 53” hose (8) on the top oil line. Place color identification bands on the hoses as shown in Figure 2B to correspond with the correct work ports/ colors placed on the valve shown in Figure 1.
3. Connect hoses (7 & 8) from loader to control valve taking care to match colors on ends of the hoses to the corresponding color on the valve.
4. After all plumbing has been completed, slowly cycle loader 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, as specified in tractor operator’s manual.

NOTE: When cycling loader, operate loader according to operation decal. If direction of control lever is wrong, or loader will not lower recheck connections shown.

NOTE: The valve lock mechanically locks the spools in the neutral position. To disengage lock, lift knob then rotate and place pin in groove. To engage lock, lift and turn knob then lower until lock is engaged. The lock mechanism is spring loaded to the engaged position.



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.

**TRACTOR WITH ONE OR TWO OPTIONAL
AUXILIARY VALVES:**

**ASSEMBLING VALVE AND HOSES ONTO VALVE
MOUNTING TUBE (Figures 1 & 5)**

1. Unpack all parts and check to see that nothing is missing.
2. Install 3/8" x 78" hose (2) to tank port of control valve (1). Slide 78" nylon sleeve (11) over 3/8" x 78" hose (2) and secure it to fitting at valve end with plastic tie strap (34).

Install 3/8" x 76" hose (6) to pressure port of control valve (1). Slide 76" nylon sleeve (15) over 3/8" x 76" hose (6) and secure it to fitting at valve end with plastic tie strap (34). Tighten hoses (2 & 6) to ports in valve.

3. Attach valve mounting tube (10) to right mount bracket using 1/2" x 2-1/2" cap screws (39), 1/2" flat washers (40), and 1/2" lock nuts (41).
4. Fasten valve mounting plate (9) to valve mounting tube (10) using 3/8" x 2-1/4" cap screws (37) and 3/8" lock nuts (38).
5. Fasten valve (1) to valve mounting plate (2) using 5/16-18 x 3/4" cap screws (35), and 5/16" lock washers (36).
6. Install 3/8" x 85" hose (3) to power beyond port on control valve (1). Slide 86" nylon sleeve (12) over 3/8" x 85" hose (3) and secure it to fitting at valve end with plastic tie strap (34). Tighten hose (3) to control valve (1).
7. Install long straight 3/4" O-ring to 9/16" JIC adapters (19), 90° elbows (21), dust plugs (24), and female couplers (22) onto upper work ports (blue and yellow as shown in Figure 1). Install blue and yellow identification bands (29 & 31) on the coupler on the corresponding work port.
8. Install two short straight 3/4" O-ring to 9/16" JIC adapters (20), 90° elbows (21), dust plugs (24), and female couplers (22) onto lower work ports (red and green as shown in Figure 1). Install red and green identification bands (30 & 32) on the coupler on the corresponding work port.

**PLUMBING CONTROL VALVE TO
TRACTOR HYDRAULICS (Figure 2)**

1. Disconnect steel line running between Auxiliary valve or valves and 3-point hitch line located above back side of right platform. Reconnect banjo fitting end of line making sure other end is turned 180 degrees from previous position.
2. Route hoses (2, 3, & 6) in sleeves from valve (1) in front of right loader mount, then back between right loader mount and tractor frame, and along inside surface. Route hoses under platform and up back side of platform above rear axle.
3. Install 3/8 x 76" hose (6) to steel line from tractor Auxiliary valve that was previously turned 180° Slide 76" nylon sleeve (15) over 3/8" x 76" hose (6) and secure to fitting using plastic tie strap (34).
4. Remove flow bolt from side of tractor tank port located above rear axle and below seat on right side of the tractor. Save copper washers for reuse. Install M22-1.5 x 1.56" flow bolt (18) with copper Washers just removed.
5. Install 90° elbow (26) into end of flow bolt (18). Tighten elbow (26) making sure to position free end facing forward.
6. Install 3/8" x 78" hose (2) onto 90° elbow fitting (26) and tighten.
7. Install 3/8" x 85" hose (3) onto tractor hitch line located on right side of tractor directly above platform and tighten.
8. Make sure nylon sleeves (11, 12, & 15) cover entire lengths of hoses, including crimps, secure hoses and sleeves to oil lines under tractor using plastic tie straps (33).

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PARTS LIST - VALVE & PLUMBING KIT

Item	Part No.	Description	Qty.
1	54881	VALVE, Prince	1
2	44269-11	HOSE 0.375ID X 78" (TANK)	1
3	53631-1	HOSE 0.375ID X 85" (POWER BEYOND)	1
4	50439-6	HOSE 0.375ID X 42" (PRESSURE NON-AUX)	1
5	53630-2	HOSE 0.375ID X 42" (PRESSURE NON-AUX)	1
6	53638-2	HOSE 0.375ID X 76" (PRESSURE AUX)	1
7	38576-23	HOSE #6-6MB-8FJX - 50" (LOADER LINES)	2
8	38576-16	HOSE #6-6MB-8FJX - 53" (LOADER LINES)	2
9	54879	PLATE, Valve Mounting	1
10	54878	TUBE, Valve Mounting	1
11	34853-56	SLEEVE, Hose, Nylon, 1-1/4"ID x 78" Long	1
12	34853-70	SLEEVE, Hose, Nylon, 1-1/4"ID x 86" Long	1
13	34853-43	SLEEVE, Hose, Nylon, 1-1/4"ID x 50" Long	2
14	34853-76	SLEEVE, Hose, Nylon, 1-1/4"ID x 54" Long	2
15	34853-69	SLEEVE, Hose, Nylon, 1-1/4"ID x 76" Long	1
16	34853-84	SLEEVE, Hose, Nylon, 1-1/4"ID x 42" Long	2
17	53628	FLOW BOLT M22-1.5 x 2.56" (NON-AUX)	1
18	44634	FLOW BOLT M22-1.5 x 1.56" (AUX)	1
19	54684-1	ADAPTER, 8MB-6MJ Long	2
20	32844-5	ADAPTER, 9/16 JIC X 3/4 O-ring	2
21	44277-2	FITTING, 9/16 O-RING X 9/16 JIC Swivel 90°	4
22	6147-11	COUPLER, 3/8 FEMALE	4
23	6137-11	COUPLER, 3/8 MALE	4
24	4838-17	DUST PLUG, .38	4
25	4838-18	DUST CAP, .38	4
26	32845-5	90° ELBOW	1
27	36665-3	TEE	1
28	34128-1	90° ELBOW, 7/8 JIC X 7/8 JIC Swivel	1
29	36240-5	BAND, Plastic Identification, Blue, 5/8"	2
30	36240-6	BAND, Plastic Identification, Red, 5/8"	2
31	36240-7	BAND, Plastic Identification, Yellow, 5/8"	2
32	36240-8	BAND, Plastic Identification, Green, 5/8"	2
33	8137-3	STRAP, Adjustable, 1/2 x 20"	2
34	8137-1	STRAP, Plastic Tie, 3/16x11"	12
35	41838-26	SCREW, Cap, 5/16-18 x .75, Grade 5	2
36	41837-2	WASHER, Lock, 5/16	2
37	41838-19	SCREW, Cap, 3/8-16 x 2-1/4, Grade 5	2
38	41840-3	NUT, Lock, 3/8-16, Type N	2
39	41838-25	SCREW, Cap, 1/2-13x2-1/2"	2
40	42502-10	WASHER, Flat, 1/2" SAE	2
41	41840-5	NUT, Lock, 1/2-13, Type-N	2
42	420502-8	WASHER, Flat 3/8"	2

NOTE: Items 4, 5, 16, 17, 27, and 28 are not used when tractor is equipped with auxiliary valve(s), but DO NOT DISCARD. These items are required if auxiliary valve(s) are removed in the future.

Figure 3A

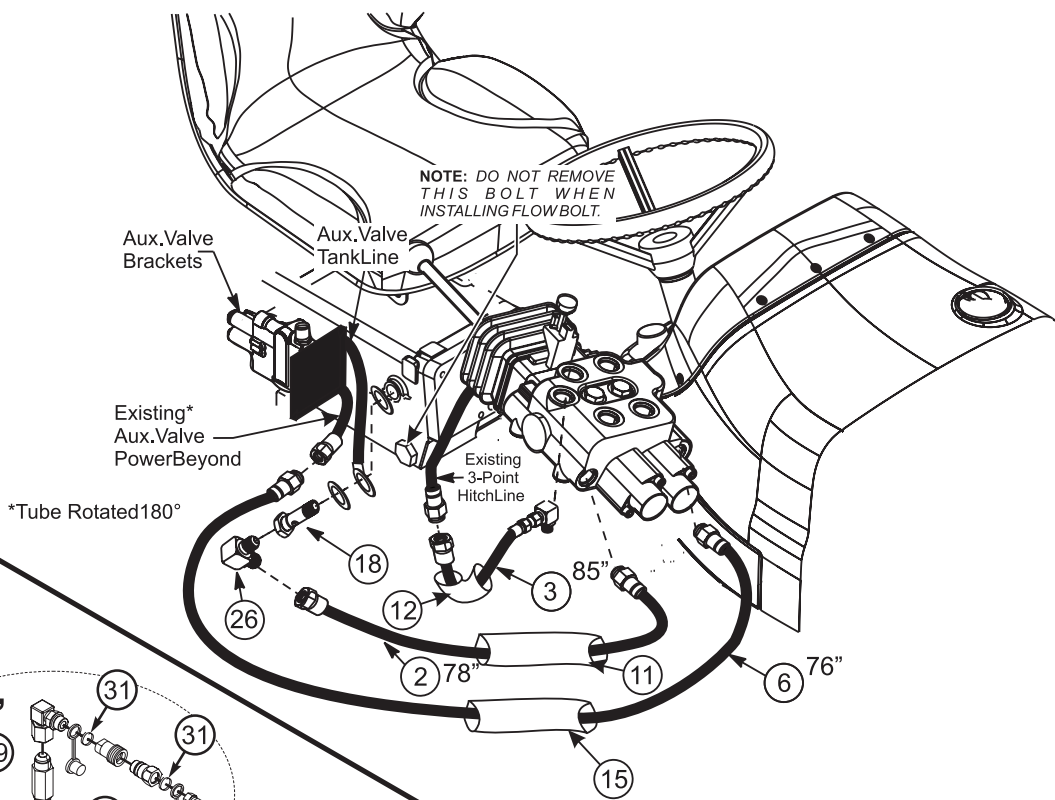
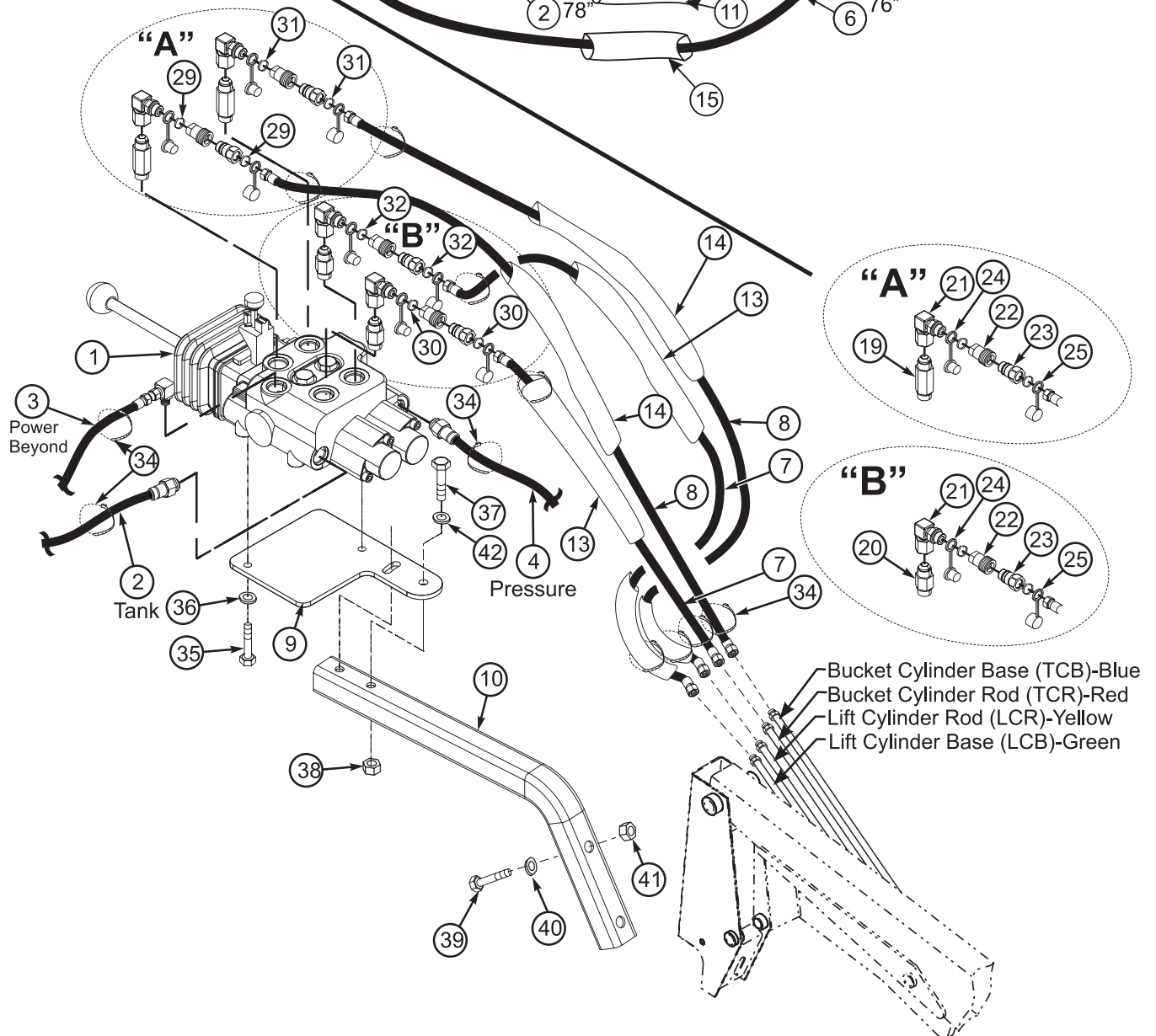


Figure 3B



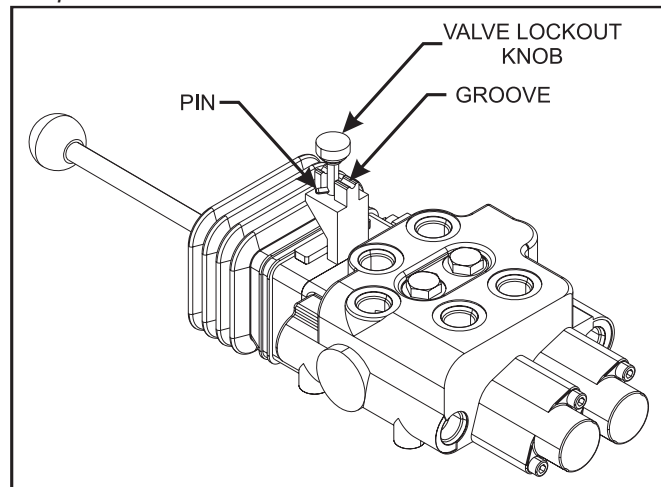
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PLUMBING LOADER TO CONTROL VALVE

1. Attach dust caps (25) and male couplers (23) to 53" and 50" hoses (7 & 8). Slide 54" and 50" hose sleeves (14 & 13) on corresponding hoses and secure at each end with a plastic tie strap (34).
2. Attach hoses to loader oil lines as shown in Figure 2B. Starting on the lowest oil line, install 50" hose (7) then install 53" hose (8) on second lowest oil line followed by 50" hose (7) on the second oil line to the top and finally install 53" hose (8) on the top oil line. Place color identification bands on the hoses as shown in Figure 2B to correspond with the correct work ports/ colors placed on the valve shown in Figure 1.
3. Connect hoses (7 & 8) from loader to control valve taking care to match colors on ends of the hoses to the corresponding color on the valve.
4. After all plumbing has been completed, 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, as specified in tractor operator's manual.

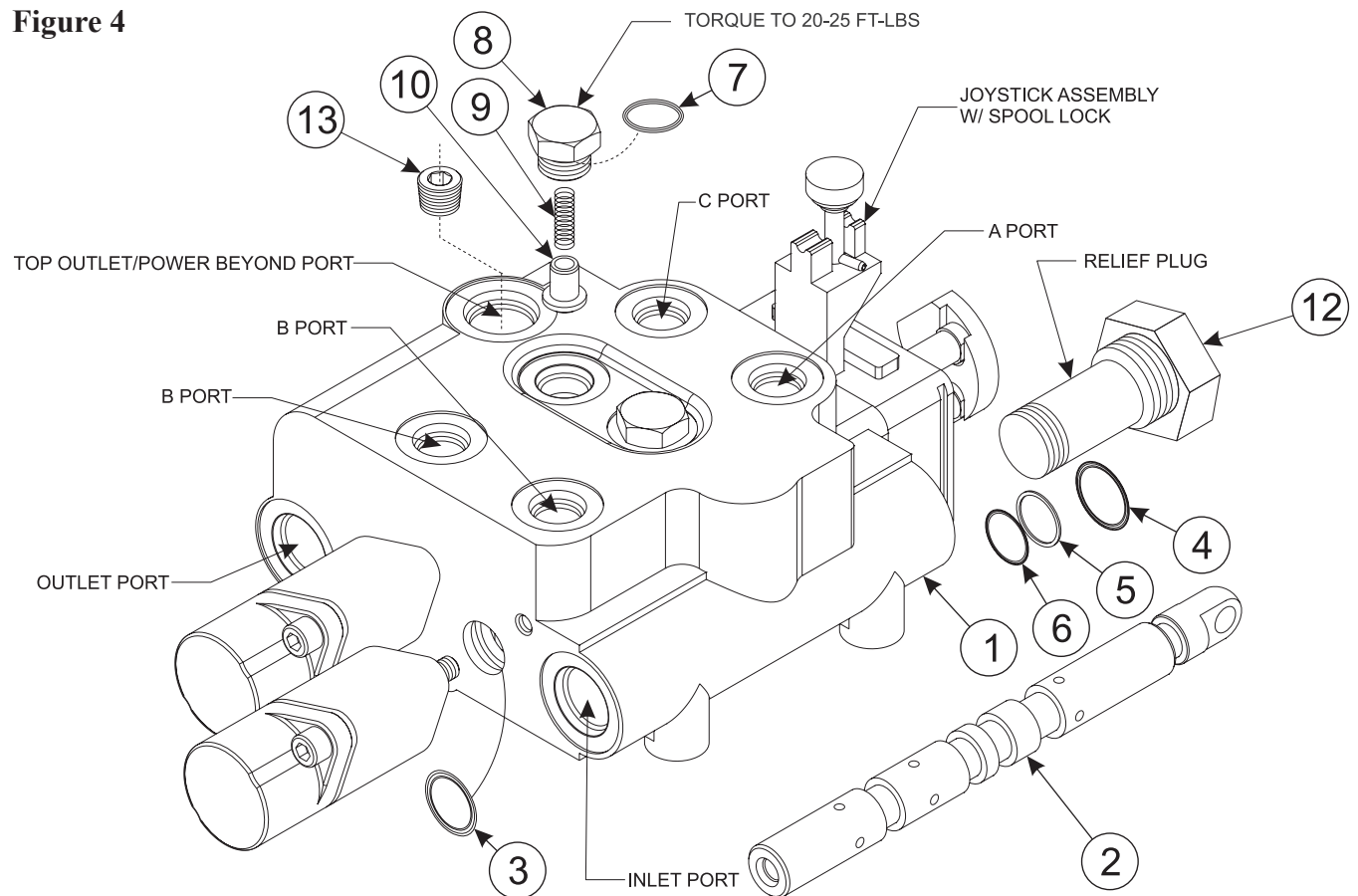
NOTE: When cycling loader, operate loader according to operation decal. If direction of control lever is wrong, or loader will not lower recheck connections shown.

NOTE: The valve lock mechanically locks the spools in the neutral position. To disengage lock, lift knob then rotate and place pin in groove. To engage lock, lift and turn knob then lower until lock is engaged. The lock mechanism is spring loaded to the engaged position.



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.

Figure 4



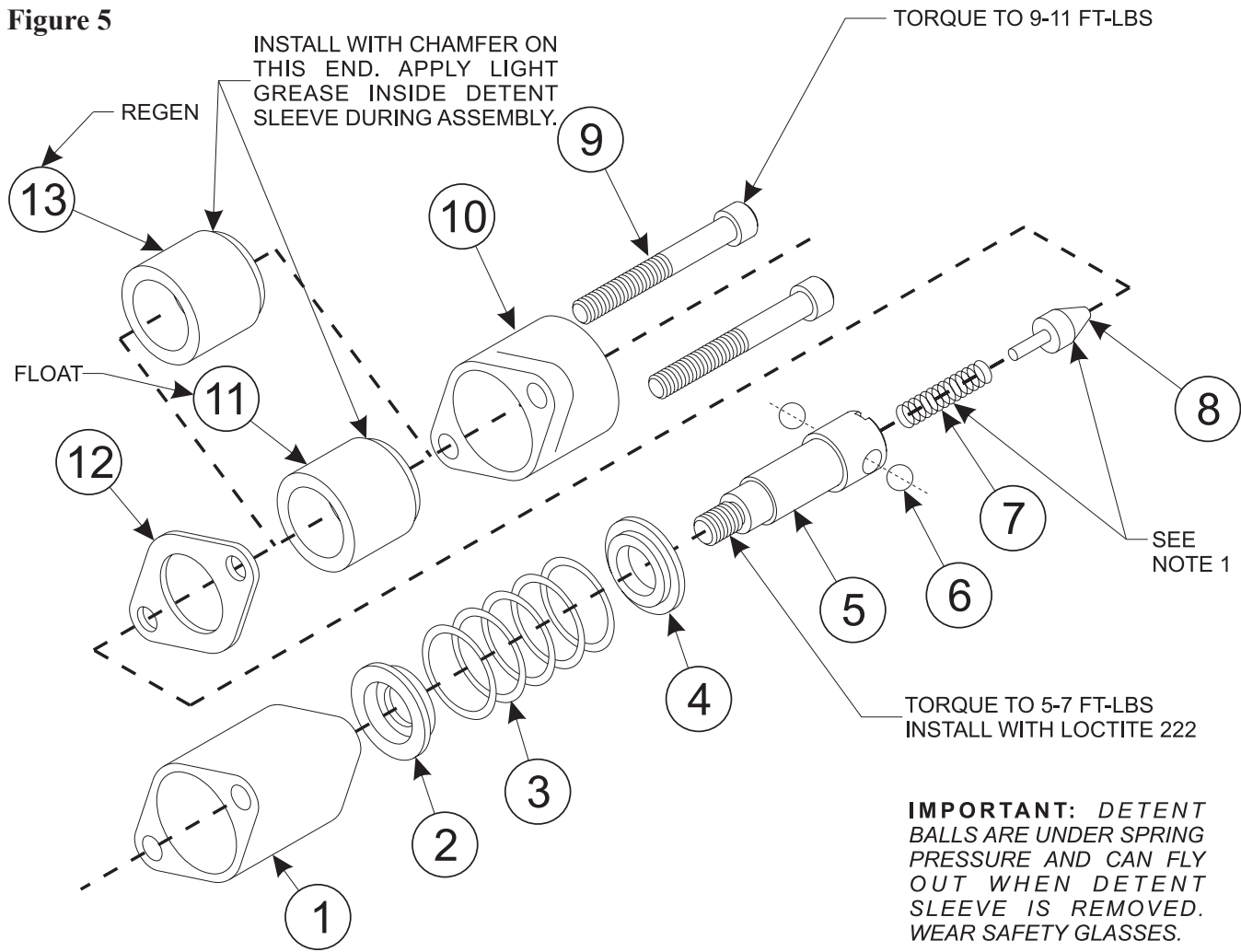
PARTS LIST- SPOOL MONO-BLOCK VALVE

Item	Part No.	Description	Qty.
1	N/A	BODY, 2 Spool Valve (See Note 1 Below)	1
2	N/A	SPOOL (See Note 1 Below)	2
3	*	114 O-RING (See Note 2 Below)	4
4	*	908 O-RING	1
5	*	014 BACK-UP	1
6	*	014 O-RING	1
7	*	906 O-RING	2
8	55764	PLUG, Load Check	2
9	55813	SPRING, Load Check	2
10	55814	POPPET, Load Check	2
11	55815	KIT, Seal, Includes * Items	1
12	55816	PLUG, Relief	1
13	55817	PLUG, 1/4 - NPTF Pipe	1

NOTE: 1. These are matched parts and not sold as service parts.

2. Spool Seal Installation Procedure: Install O-ring in the groove on attachment end of valve. Push spool through from handle end just far enough to expose O-ring groove. Install O-ring and push spool back. Lubricate seals before installation

Figure 5



IMPORTANT: DETENT BALLS ARE UNDER SPRING PRESSURE AND CAN FLY OUT WHEN DETENT SLEEVE IS REMOVED. WEAR SAFETY GLASSES.

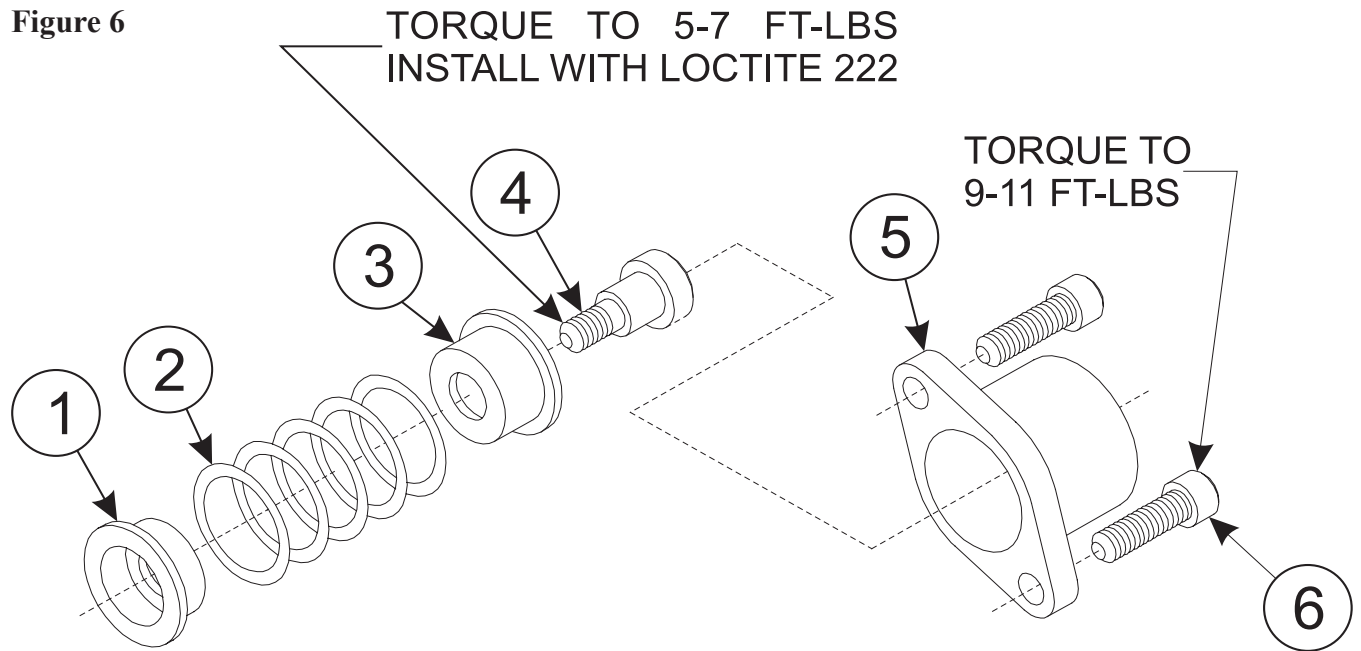
PARTS LIST- SPRING CENTER FLOAT DETENT AND REGEN

Item	Part No.	Description	Qty.
1	*	SPACER	1
2	*	CUP, Stop	1
3	*	SPRING	1
4	*	WASHER	1
5	*	RETAINER, Detent	1
6	*	BALL, Steel	2
7	*	SPRING	1
8	*	POPPET	1
9	*	SCREW, Cap	2
10	*	CAP, End	1
11	*	SLEEVE, Float Detent (A-B Spool)	1
12	*	RETAINER	1
13	*	SLEEVE, Regen (C-D Spool)	1
14	55818	KIT, Spring Center With Float Detent, Includes All Items Except 13	1
15	55819	KIT, Spring Center With Regen, Includes All Items Except 11	1

NOTE: 1. Install Items 7 & 8 into item 5 and compress spring. Install steel balls, item 6, and slide detent sleeve, item 11 or 13, over retainer, item 5.

2. Float detent sleeve has a detent groove on the inside. The regen sleeve does not.

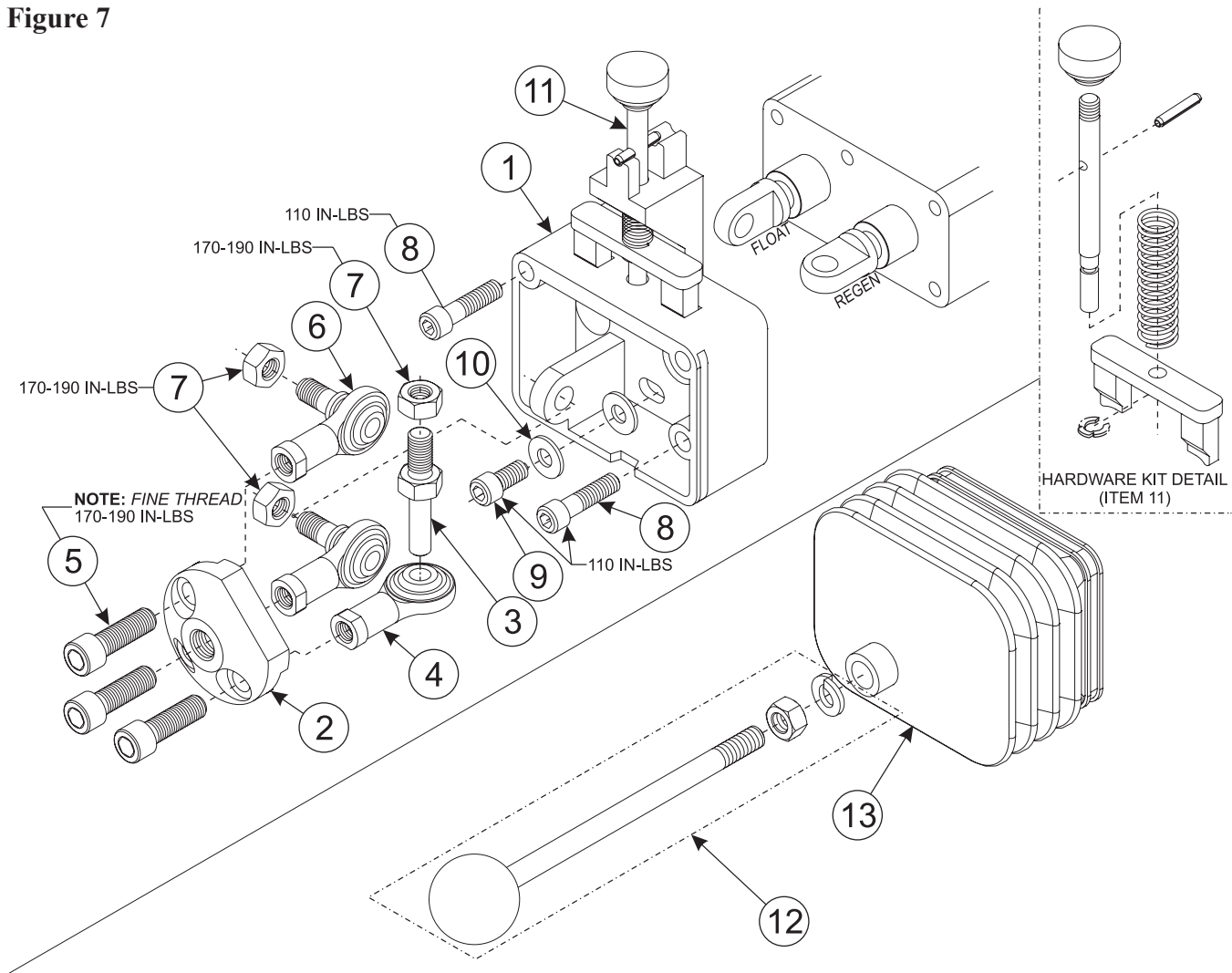
Figure 6



PARTS LIST- SPRING CENTER

Item	Part No.	Description	Qty.
1	*	CUP, Stop	1
2	*	SPRING	1
3	*	CUP, Stop	1
4	*	ADAPTER, Spool	1
5	*	CAP, End	1
6	*	SCREW, Cap	2
7	55820	KIT, Spring Center, Includes * Items	1

Figure 7



PARTS LIST- JOYSTICK SUB-ASSY WITH DUAL SPOOL LOCK

Item	Part No.	Description	Qty.
1	*	CLEVIS, Spool Lock	1
2	*	PLATE, Adapter	1
3	55821	STUD, Spool	1
4	55822	END, Rod	1
5	*	SCREW, Cap	3
6	55823	ASSY, Rod End	2
7	*	NUT, Hex	3
8	*	SCREW, Cap	2
9	*	SCREW, Cap	1
10	*	WASHER, Flat	1
11	55824	KIT, Spool Lock Hardware	1
12	55825	KIT, Handle	1
13	55826	KIT, Boot/Cable Tie	1
14	55827	KIT, Sub-Assy, Includes Items 1-11	1

NOTE: *Installation Procedure: Pre-assemble rod ends. Align spool tangs with bracket tang. Loosely insert rod end studs into tangs. Rotate 2nd spool tang 90° Insert spool stud into rod end and rotate assembly such that the spool stud thread can be inserted into 2nd spool tang. Apply loctite and torque all fasteners as indicated.*

NOTE: *Clean all threaded parts with alcohol, dry and install with loctite 680, 277, or 281.*

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	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.								
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