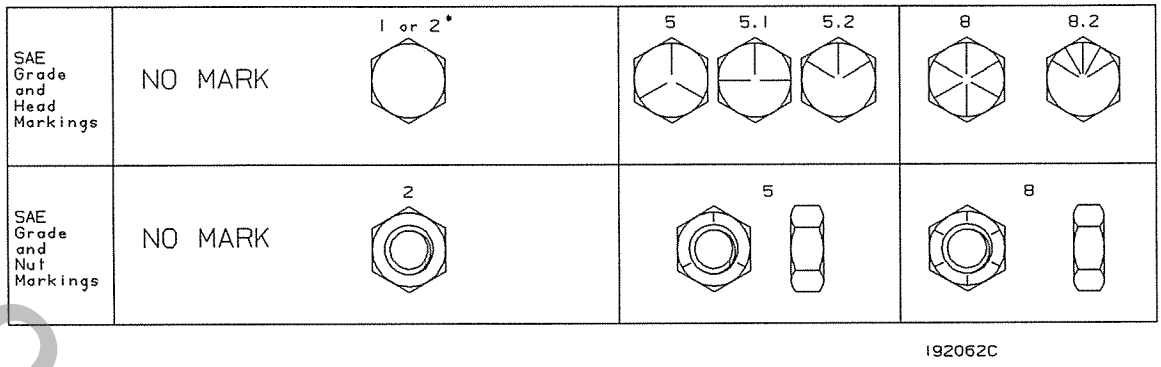
2.1 BOLT TORQUES

UNIFIED INCH BOLT AND CAP SCREW TORQUE VALUES



192062C

Size	Grade 1				Grade 2*				Grade 5, 5.1, or 5.2				Grade 8 or 8.2			
	Lubricated**		Dry**		Lubricated**		Dry**		Lubricated**		Dry**		Lubricated**		Dry**	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
1/4	3.7	2.8	4.7	3.5	6	4.5	7.5	5.5	9.5	7	12	9	13.5	10	17	12.5
5/16	7.7	5.5	10	7	12	9	15	11	20	15	25	18	28	21	35	26
3/8	14	10	17	13	22	16	27	20	35	26	44	33	50	36	63	46
7/16	22	16	28	20	35	26	44	32	55	41	70	52	80	58	100	75
1/2	33	25	42	31	53	39	67	50	85	63	110	80	120	90	150	115
9/16	48	36	60	45	75	56	95	70	125	90	155	115	175	130	225	160
5/8	67	50	85	62	105	78	135	100	170	125	215	160	215	160	300	225
3/4	120	87	150	110	190	140	240	175	300	225	375	280	425	310	550	400
7/8	190	140	240	175	190	140	240	175	490	360	625	450	700	500	875	650
1	290	210	360	270	290	210	360	270	725	540	925	675	1050	750	1300	975
1-1/8	470	300	510	375	470	300	510	375	900	675	1150	850	1450	1075	1850	1350
1-1/4	570	425	725	530	570	425	725	530	1300	950	1650	1200	2050	1500	2600	1950
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2150	1550	2700	2000	3400	2550
1-1/2	1000	725	1250	925	990	725	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

DO NOT use these values if a different torque value or tightening procedure is given for a specific application. Torque values listed are for general use only. Check tightness of fasteners periodically.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade material.

DEFINITIONS

*** "Lubricated" means coated with a lubricant such as engine oil, or fasteners with phosphate and oil coatings. "Dry" means plain or zinc plated without any lubrication.*

** Grade 2 applies for hex caps (not hex bolts) up to 152mm (6-in.) long. Grade 1 applies for hex cap screws over 152mm (6-in.) long, and for all other types of bolts and screws of any length.*

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fasteners threads are clean and that you properly start thread engagement. This will prevent them from failing when tightening.

Tighten plastic insert or crimped steel-type lock nuts to approximately 50 percent of the dry torque shown in the chart, applied to the nut, not to the bolt head. Tighten toothed or serrated-type lock nuts to the full torque value.

NOTE: All U bolts on Flexi-coil Field Sprayers will be tightened to Grade 2 torque specifications shown in the table above.

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3.8a CYLINDER IDENTIFICATION AND LOCATION Continued . . .

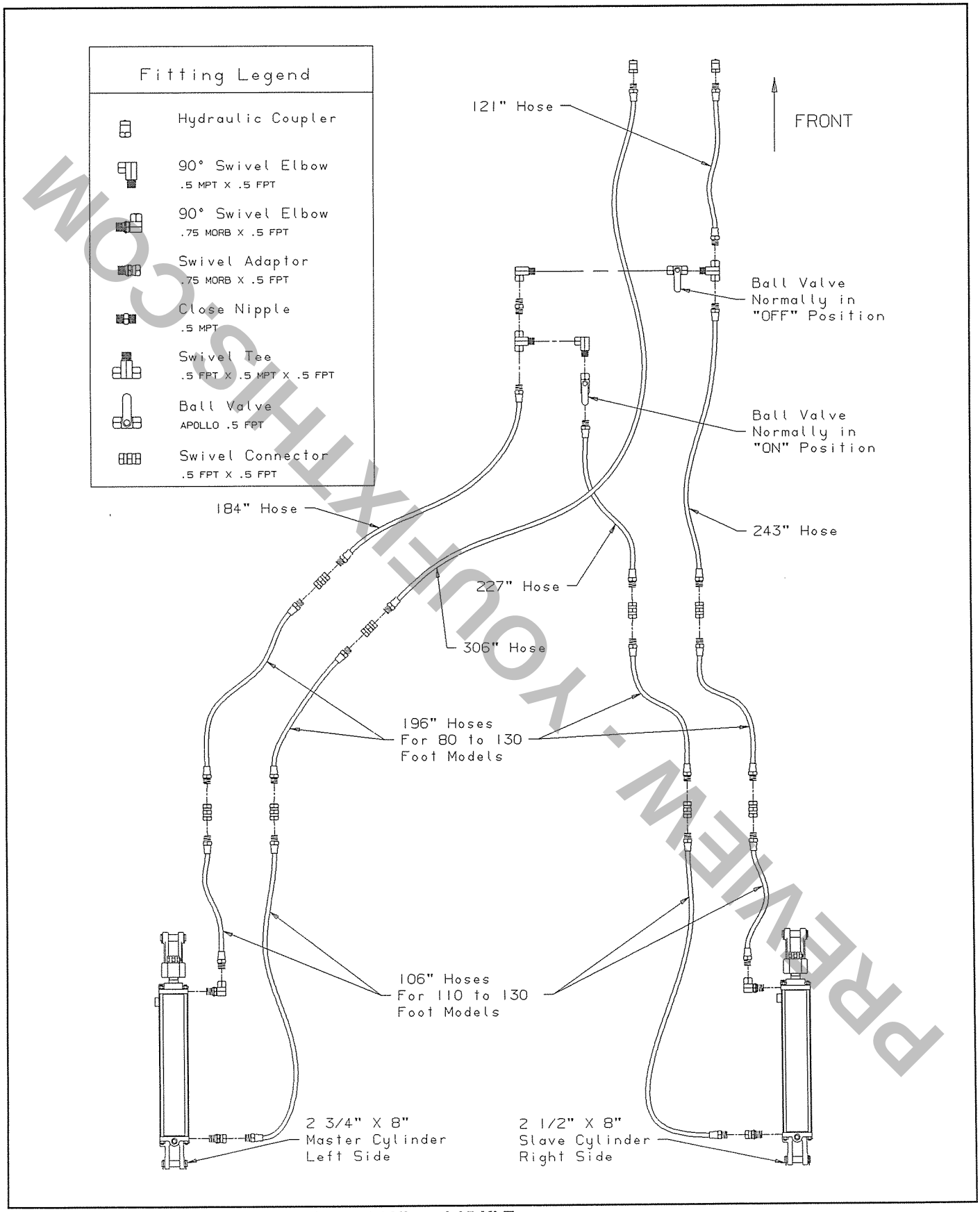


Figure 3.8d: Hydraulic Layout: Models 65, 65 XL and 65 XLT

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4.10 SPRAYER 744A CONTROL SYSTEM

A. Discussion

The purpose of the control box is to enable the operator to make changes in pressure, to shutoff and turn on booms without stopping the unit. This gives the operator the option of spraying only one boom section to complete a field or to shutoff sprayer to return to the headland to refill, etc..

The sprayer control box comes with wiring and switches for three solenoids. The standard sprayer is sent with two solenoids, one for each wing boom. The third solenoid may be wired to your preference, refer to Figure 10.3a to decide which switch corresponds to which wire in the wiring harness.

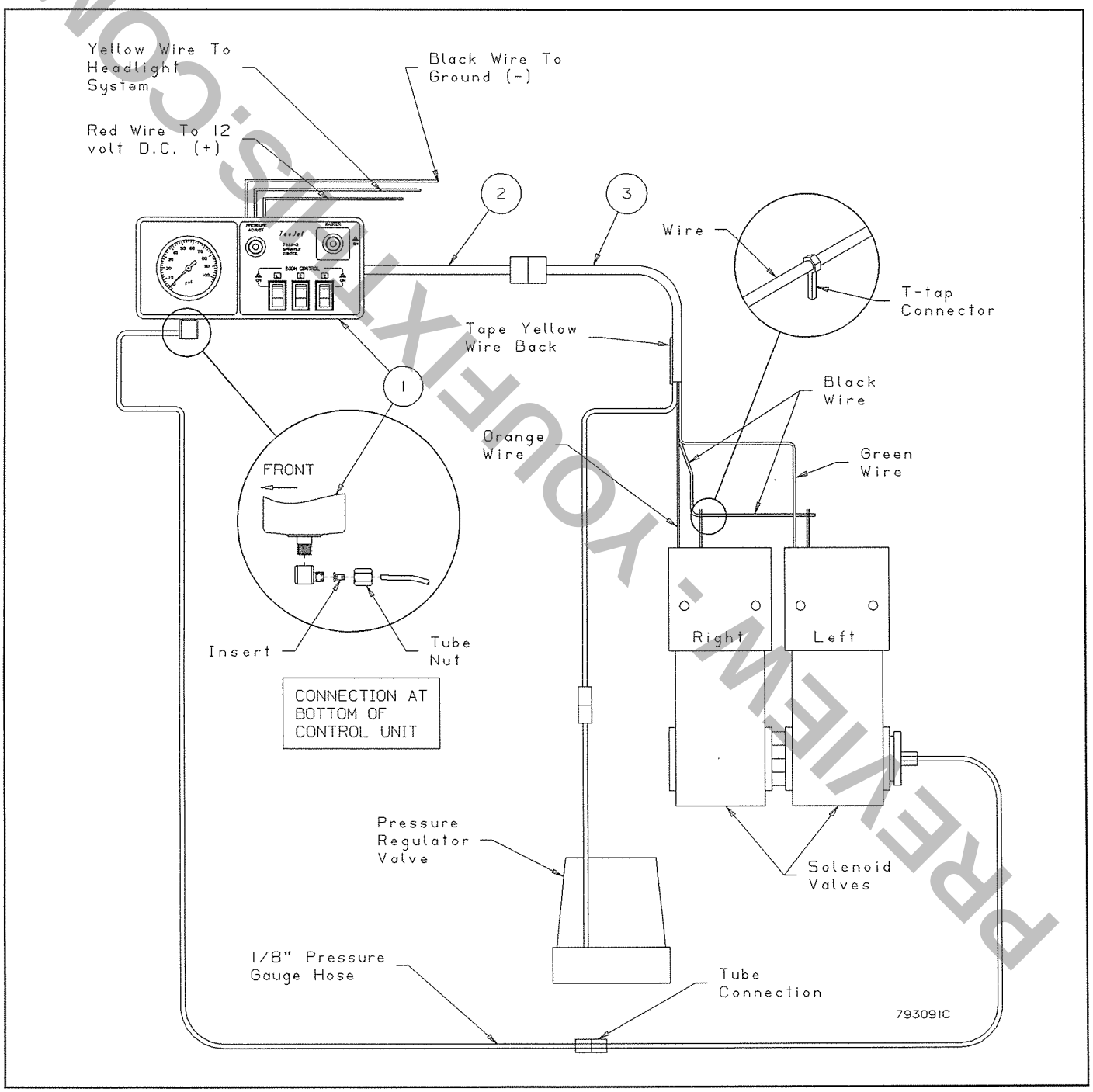


Figure 10.3a: Sprayer Control Box Wiring

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3.8b HYDRAULIC CYLINDER REPAIR Continued . . .

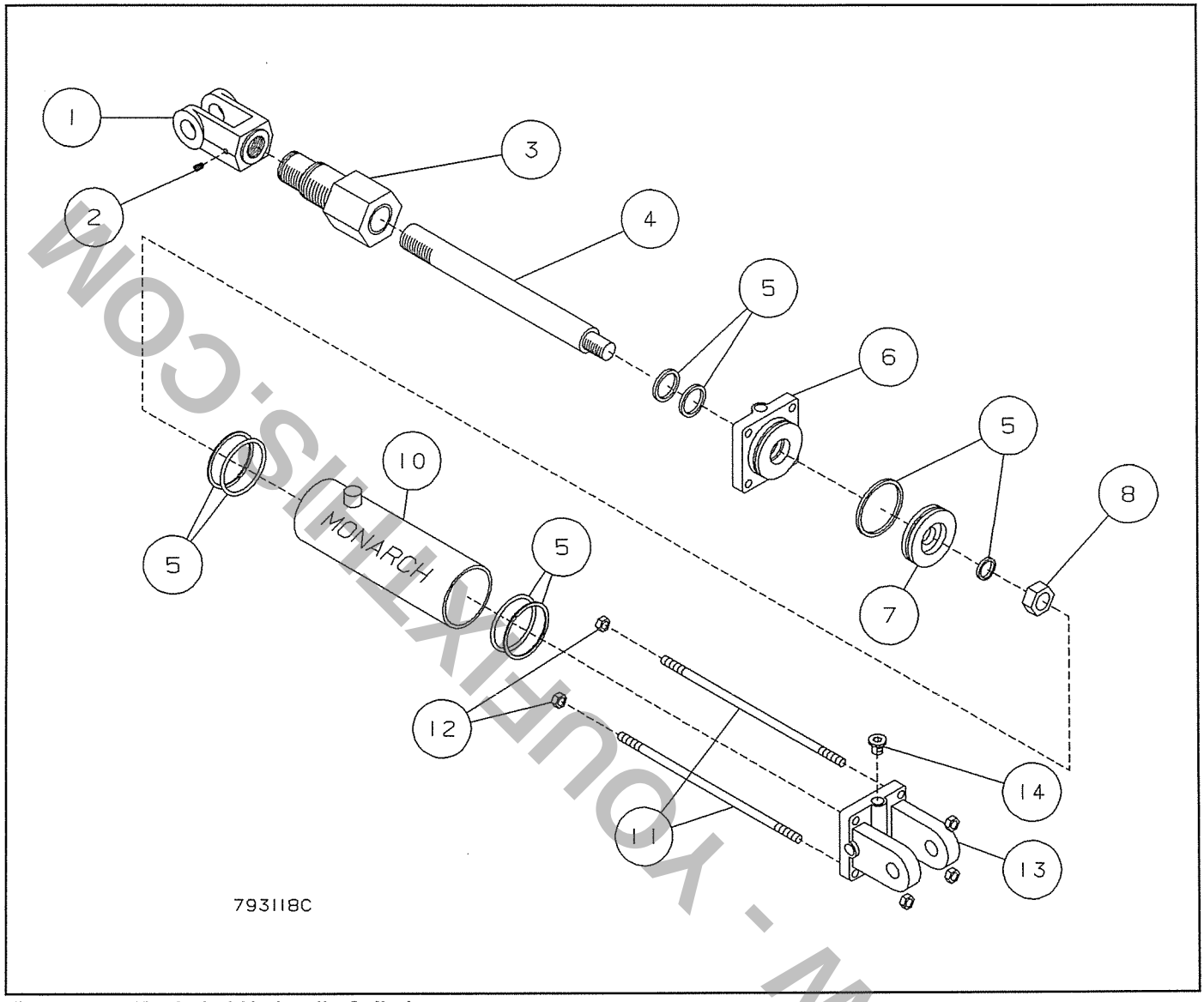


Figure 3.8g: Exploded Hydraulic Cylinder

1. - Clevis
2. - Clevis set screw
3. - Stroke control unit
4. - Cylinder shaft
5. - Seals and o-rings *
6. - Cylinder shaft end-cap
7. - Cylinder piston
8. - Cylinder piston nut
9. -
10.- Cylinder tube
11.- Cylinder tie rod
12.- Cylinder tie rod nut
13.- Cylinder clevis cap
14.- Cylinder fitting plug

* Indicates the pieces of a cylinder seal and o-ring repair kit.

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3.1 TROUBLE SHOOTING MECHANICAL PROBLEMS

PROBLEM:	POSSIBLE CAUSE	REMEDIES
1. Boom draws not releasing smoothly when going into transport position.	- Latch out of adjustment.	- Adjust latch clearance, Service Section 3.9.
2. Fold arms do not slide into latch guide smoothly.	- Fold arm angle out of adjustment.	- Adjust fold arm angle Service Section 3.9.
3. Spray boom height not uniform along machine.	- Secondary boom adjustment tubes not adjusted properly. - Secondary boom linkage not adjusted properly.	- Adjust secondary booms, Service Section 3.11. - Adjust linkage, Service Section 3.11.
4. Secondary boom bounce or sag in field position.	- Not sufficient clamping action on nylon bushings.	- Secondary booms should rotate easily but not allow spray boom to bounce in the field. Adjust bushing u-bolt tension as required, Service Section 3.11.
	- Air in hydraulic cylinders or lines. - Improperly located hydraulic cylinder linkage.	- Bleed hydraulic system, refer to Service Section 3.8. - Refer to Service Section 3.8 for proper cylinder location.
5. Nozzle angle not uniform between boom sections when viewed from end of machine.	- Tie rods not set properly.	- Loosen tie rod clamp on spray boom and rotate boom to set angle then tighten clamp. Service Section 3.12.
6. Boom draws unlatching in field position.	- Latch out of adjustment. - Fold arm clevis to wide for draw tube yoke. - Insufficient latch angle.	- Adjust latch clearance, Service Section 3.9. - Check fold arm clevis dimension, Service Section 3.9. - Check latch cable adjustment, Service Section 3.9
7. Tank movement.	- Hold down straps loose. - Tank adjustment plate requires adjustment.	- Tighten hold down strap j-bolts. - Adjust tank end adjustment plates.
8. Bending draw tubes.	- This is possible on larger 6 section sprayers used with large 4 wheel drive tractors. The tractors positive turning combined with higher ground speeds may bend draw tubes when making quick corners.	- Use smaller front wheel assisted tractor and slower ground speeds. - Replace draw tube with heavier SQ-439 draw tube which can handle greater loads.

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Model 55 Sprayer

MACHINE WEIGHTS *

		AVAILABLE SIZES: 50′	54′	60′	70′
(a)	- with 2 wheel cart - lbs.	3148	3218	3306	3462
	(kg)	1428	1460	1499	1570
(b)	- as above with windscreen	3438	3560	3750	3949
	(kg)	1559	1615	1701	1791
(c)	- with 4 wheel cart - lbs.	3434	3504	3592	3748
	(kg)	1558	1589	1629	1700
(d)	- as above with windscreen	3724	3846	4036	4235
	(kg)	1689	1745	1830	1921

MACHINE DIMENSIONS

(a) in transport					
-	length - feet	39′ 0"	40′ 8"	44′ 0"	49′ 0"
	(meters)	11.89m	12.40	13.41m	14.94m
-	boom width (see cart width)	10′ 0"	10′ 0"	10′ 0"	10′ 0"
	(Booms at 72" centers)	3.05m	3.05m	3.05m	3.05m
-	fold arm width	13′ 0"	13′ 0"	13′ 0"	13′ 0"
	(in wide position)	3.96m	3.96m	3.96m	3.96m
-	ground clearance				
	- under hitch tongue	14" (0.36m) - model 55			
	- under axle	22" (0.56m) - model 55			
	- under wing booms	32" (0.81m) - model 55			
(b) in field position					
-	length	19′ 1" (5.82m) - model 55			

(c) tracking width settings (center to center of tires)						
-	2 wheel carts	60"	66"	72"	78"	
	(meters)	1.52m	1.68m	1.83m	1.98m	
-	4 wheel carts	60"	72"	78"	84"	88"
	(meters)	1.52m	1.83m	1.98m	2.13m	2.24m
(d) cart width (outside to outside of tires)						
-	2 wheel carts	72"	78"	84"	90"	
	(meters)	1.83m	1.98m	2.13m	2.29m	
-	4 wheel carts	72"	84"	90"	96"	100"
	(meters)	1.83m	2.13m	2.29m	2.44m	2.54m

TIRES

	SIZE	PRESSURE
2 wheel carts	12.5L x 15" 6 Ply	28 psi (193 kpa) spraying water. 36 psi (248 kPa) spraying liquid fertilizer.
4 wheel carts	11L x 15" 8 Ply	24 psi (165 kpa) spraying water. 32 psi (220 kPa) spraying liquid fertilizer.
Wing Booms	6.70 x 15" 4 Ply	10 psi (69 kPa) field position & up to 20 mph 20 psi (138 kpa) high speed road travel.

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10.8 INITIAL SETUP - CALIBRATING THE FLOW SENSOR

A. Discussion:

Calibration of the flow sensor on the sprayer is required to match the flow sensor to the specific installation.

A calibration should be performed when the monitor is first installed and at least once per season. Two different methods may be used. Refer to the next sections.

10.8a. Method #1 - Nozzle Method (Best Method)

B. Procedure:

1. Water should be used for this calibration method. This will give an approximate calibration for most tank mixes. Different solutions, such as liquid fertilizer, have different flow characteristics.

2. Place the monitor into MANUAL mode. The light inside the AUTO/MAN key should be off. If it is on, press the AUTO/MAN key once. The word MAN should be lit up near the bottom left of the display.

3. Set tractor engine RPM to RPM to be used at spraying speed and start the pump.

4. Activate all booms and turn on the MASTER switch.

5. Press the PROGRAM and VOLUME keys at the same time to place the monitor into flow calibration mode. The monitor will display CAL for a few seconds and then will display the current pressure and the average flow rate (average flow rate starts at 0.0).

6. The monitor automatically controls the pressure while in flow calibration mode. The pressure setpoint is factory set to 40 psi but can be changed. If desired use the INCREASE or DECREASE keys to select a new pressure setpoint for the automatic controller (Note that the maximum measurable pressure is 76 psi or 524 kPa). When the pressure is automatically stabilized at the setpoint, the flow rate will begin averaging and will be displayed at the left of the display.

NOTE: The automatic pressure controller is a slow controller - it may take several seconds to set the pressure.

7. Place the supplied calibration jug under 1 spray nozzle and collect flow for exactly 1 minute and record the measured volume.

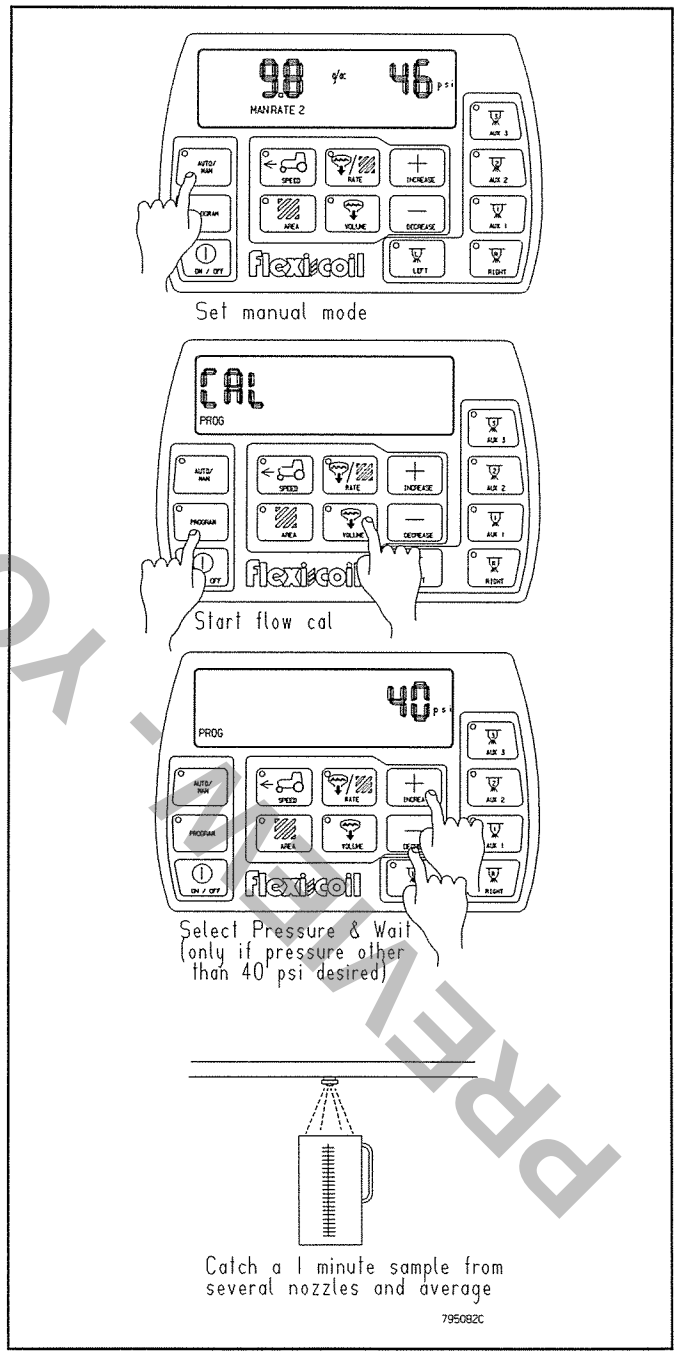


Figure 10.8a: Flow Calibration

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3.8b HYDRAULIC CYLINDER REPAIR

A. Discussion

Hydraulic cylinders generally operate trouble free, but on occasion one needs repairs. The most important thing to remember when dealing with hydraulics is the pressure under which they operate. Under these pressures a thin stream of oil can penetrate the skin and cause injury.

CAUTION! ALWAYS MAKE SURE THAT PRESSURE IS RELIEVED FROM HYDRAULIC CIRCUITS BEFORE SERVICING OR DISCONNECTING FROM COUPLERS. FAILURE TO DO SO MAY RESULT IN HYDRAULIC FLUID BEING INJECTED IN TO THE SKIN, WHICH MAY RESULT IN GANGRENE.

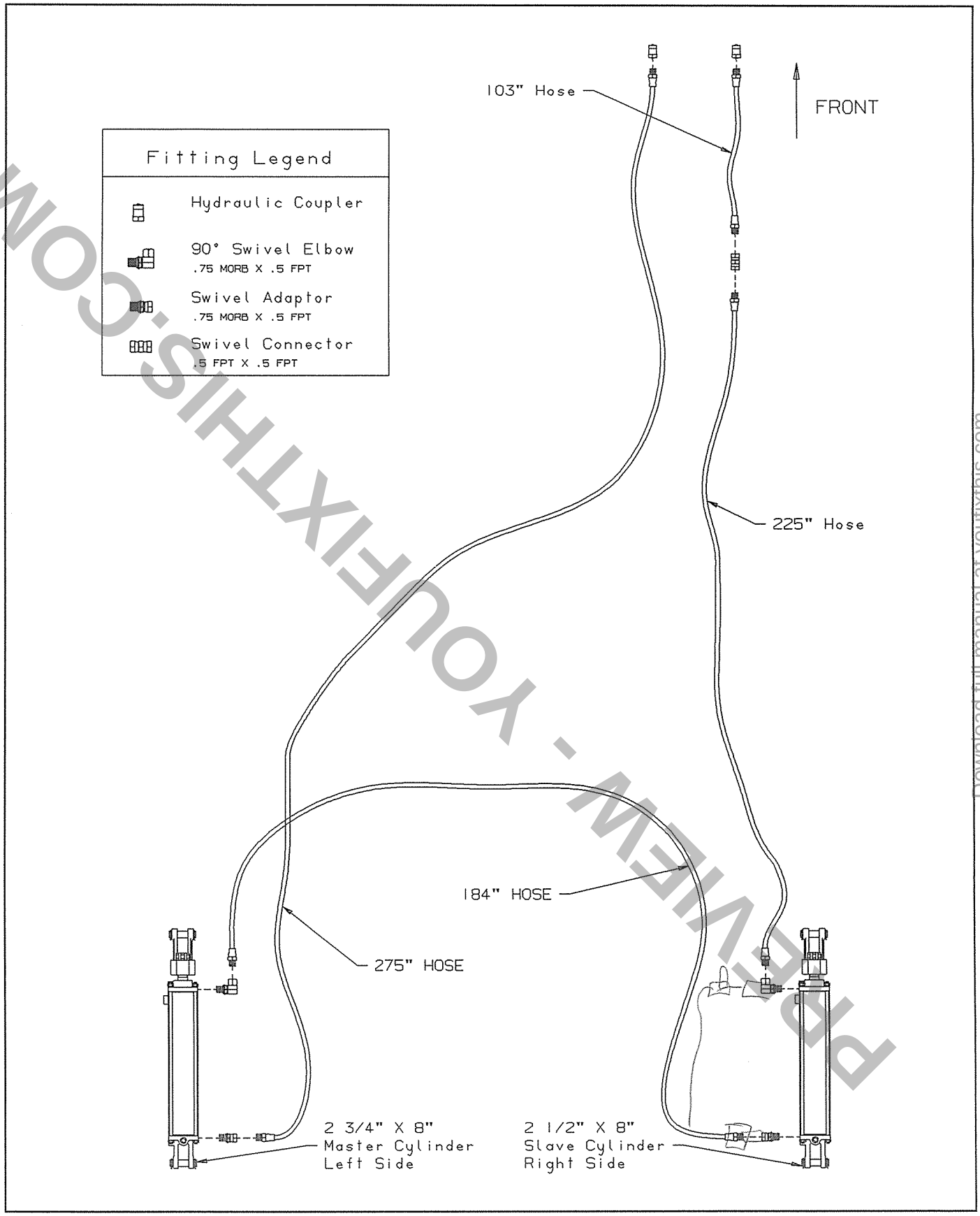
B. Procedure

Before starting this disassembly procedure, be sure to have a clean table or surface to place all components. The numbers referred to in this procedure will be found in Figure 3.8g.

1. First remove cylinder from sprayer.
2. Before placing cylinder on work surface drain as much oil as possible from the cylinder.
3. There is either a set screw or a bolt holding the clevis in place, remove set screw or bolt (2).
4. The clevis and stroke control unit screw on and off in the same fashion as a regular nut, remove clevis (1) and stroke control unit (3).
5. The tie rods hold the end-caps to the cylinder tube, remove tie rods (11) from cylinder.
6. At his point the shaft end-cap (6), shaft (4) and piston (7) can be dismantled from the cylinder tube, along with all attached nuts and seals etc. When the shaft end-cap is removed from the cylinder tube any oil remaining in the cylinder will spill out.
7. Now the shaft nut (8) can be unscrewed and piston (7) removed from the end of the shaft.
8. While the shaft end-cap can be slide over the thread end of the cylinder shaft (4), it is recommended that it be installed from the piston (7) end of the shaft (4) so as to avoid damaging the newly installed seals (5) in the shaft end-cap (6).
9. The clevis end-cap can now be separated from the cylinder tube. It will pull off the end of the tube.
10. Once the cylinder is stripped down to this stage, any repairs can be made. A seal repair kit is available and will contain 5 wipers, 5 O-rings and one seal, not all of these will be used on each cylinder, the kit package will contain the information as to which items will be used on your particular of cylinder.
11. To reassemble reverse items 1 to 9.
12. When reassembling the cylinder coating rubber surfaces with a thin layer of oil will simplify procedure.

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3.8a CYLINDER IDENTIFICATION AND LOCATION Continued . . .



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Figure 3.8e: Hydraulic Layout: Model 55

10.2 SP655 GENERAL INFORMATION Continued. . .

10.2a MONITOR SYSTEM WIRING DIAGRAM

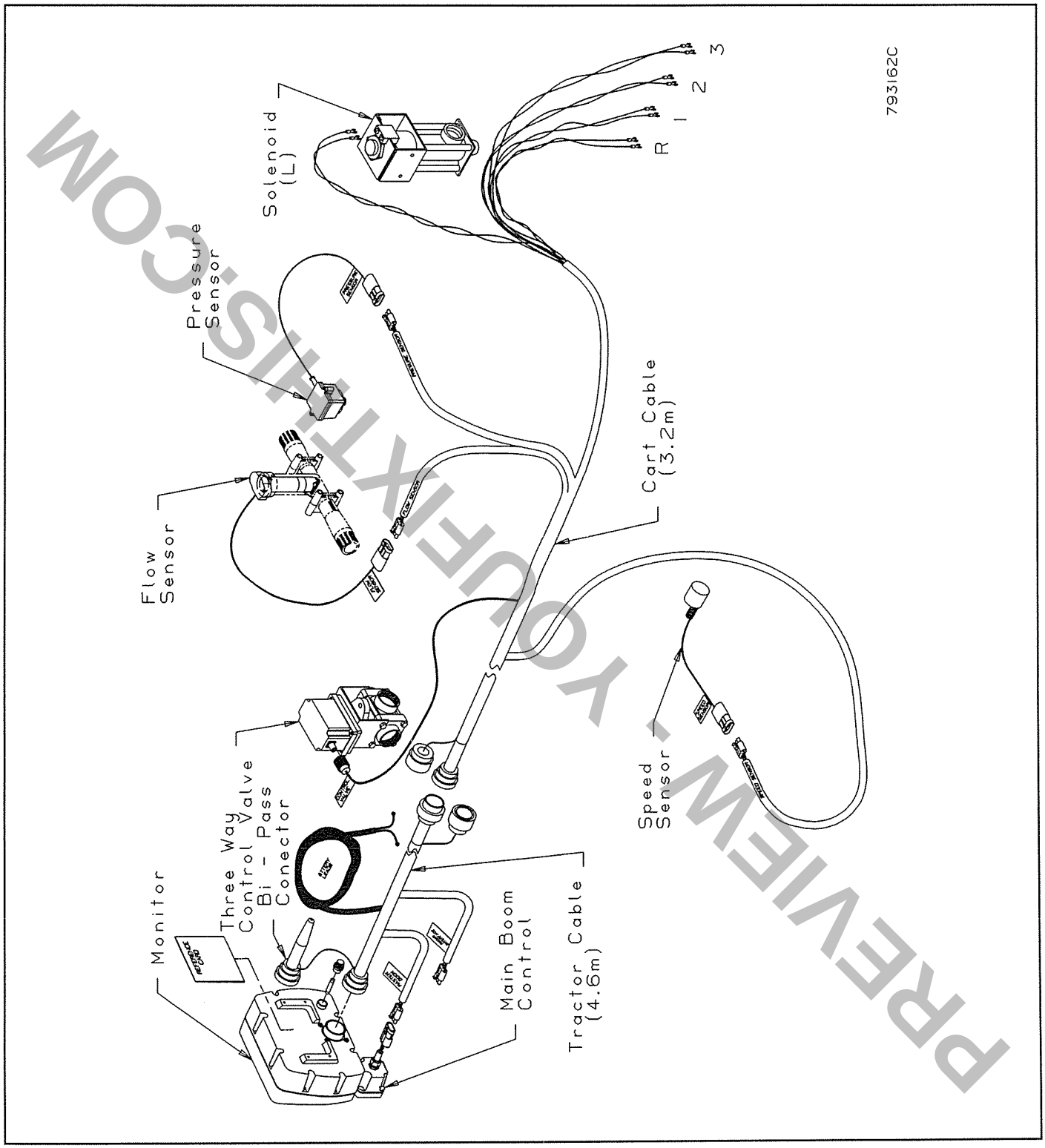


Figure 10.2a: Sprayer Monitor System Wiring

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4.11 SOLENOID MAINTENANCE & REPAIR (145H used on Models 65, 65XL, 65XLT)

4.11a DISASSEMBLY OF SOLENOID (Figure 4.11a)

1. Remove jam nut (2), four screws (1), coil cover (3) and coil assembly (6).

2. Unscrew armature stop (4) from coil cover (3).

3. Remove boot (21), four screws (22), bottom plate (18) and strap subassembly (7).

4. While holding armature (5) push spring retainer (20) toward armature (5) and rotate spring retainer (20) 1/4 turn to allow spring retainer to disengage from lower diaphragm piston (17).

5. Remove spring retainer (20) and spring (19).

6. Using a wrench on flats of armature (5) and another wrench on flats of lower diaphragm piston (27) unscrew armature/stem/lower diaphragm piston assembly. If armature (5) unscrews from stem (13) follow step 7. If lower diaphragm piston (27) unscrewed from stem (13) follow step 8.

7. Remove upper diaphragm housing (8) and remove upper diaphragm (9). Remove lower diaphragm housing (16). Withdraw lower diaphragm (9) and stem (13) as an assembly. Remove seat washer retainer (10), seat washer (11) and spacer (12) remaining in body (14). Using a wrench on flats of stem (13) and another wrench on flats of lower diaphragm piston (17) unscrew assembly and remove washer (15) and diaphragm (9). (Proceed to step 9).

8. Withdraw armature (5) items 8 to 13 as an assembly from body (14). Using a wrench on flats of armature (5) and another wrench on flats of stem (13), unscrew armature (5) from stem (13). Slide seat washer retainer (10), seat washer (11) and spacer (12) off of stem (5). Remove stem (17), lower diaphragm housing (16) and diaphragm (9) from body (14).

9. All parts are now accessible for cleaning and inspection. Replace all worn parts.

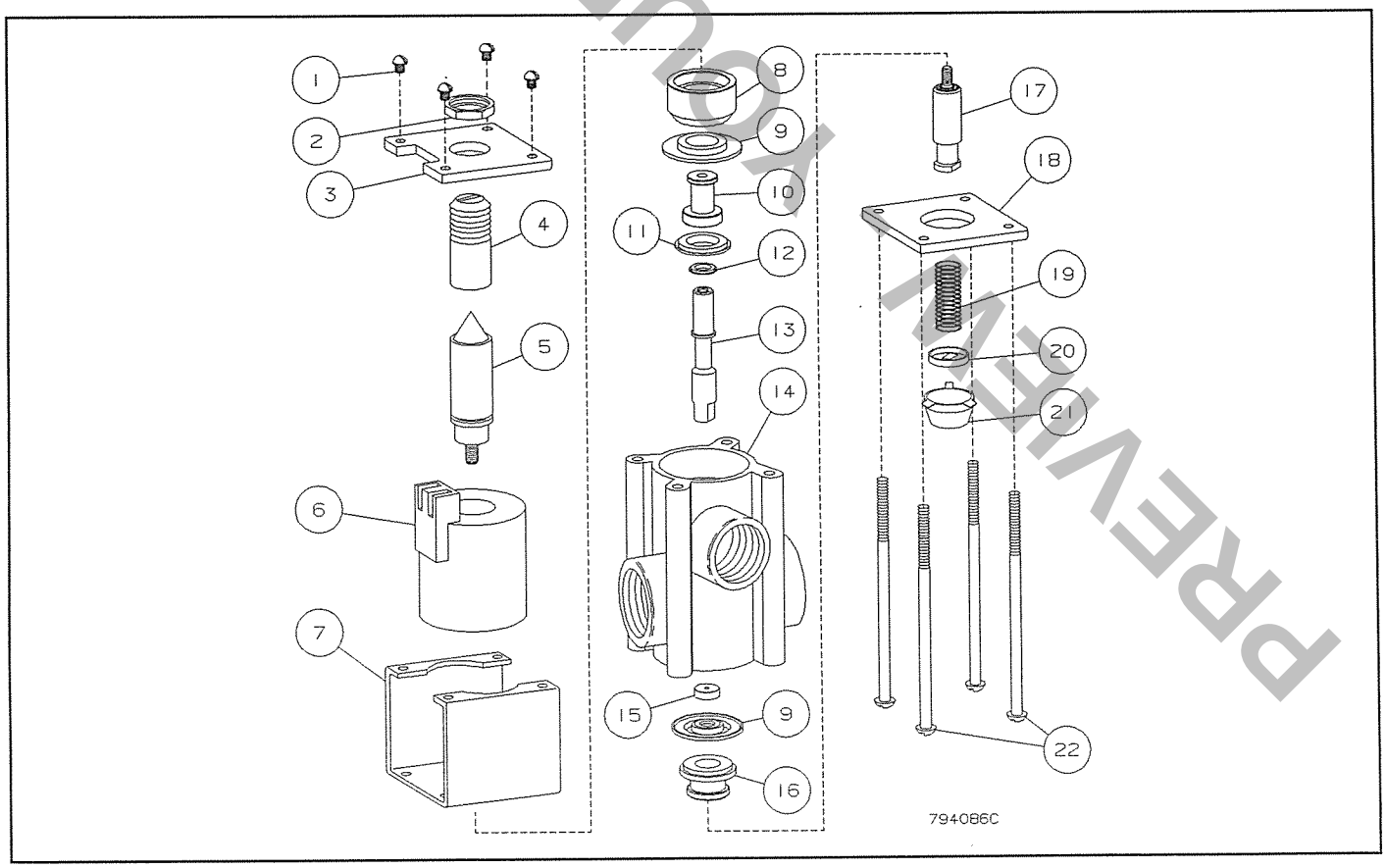


Figure 4.11a: Solenoid Parts Explosion

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3.1 TROUBLE SHOOTING MECHANICAL PROBLEMS Continued . . .

PROBLEM:	POSSIBLE CAUSE	REMEDIES
9. Primary wing booms trail too wide/narrow, off to one side or inconsistently.	- Castor wing boom trailing angle out of adjustment.	- Adjust locking castor trailing boom angle bolts. Service Section 3.6.
	- Universal cross bolts are loose.	- Check and adjust universal cross, Service Section 3.3.
	- Not enough weight on locking castor wheel. Typical on 130' models.	- This will be most noticeable on 130' units. More weight is needed on the locking castor wheel. Move outer castor wheel to the end of the boom and truss the outer boom, Service Section 3.4. - Be sure that the locking castor is in mounted in correct location, Service Section 3.4.
10. Excessive primary wing boom bounce when spraying.	- Excessive castor wheel tire pressure.	- Reduce tire pressure to 10 PSI (69 kPa).
	- Improper shock spring pressure adjustment.	- Check adjustment, Service Section 3.6.
	- Wing boom brace cable not adjusted properly.	- Adjust cable so that wing boom is straight when viewed from front.
	- Insufficient speed.	- Spray between 5 and 10 mph.
11. Castor wheels do not operate smoothly.	- Castor cam and latch pin not adjusted properly.	- Refer to Service Section 3.6.
	- Castor wheel requires lubrication.	- Grease castor wheel pivots.
	- Tension nut not adjusted properly (Friction Castor Wheel).	- Refer to Service Section 3.4.
12. Break-away trip bar not tripping pin.	- Break-away cable not adjusted properly.	- Adjust cable, Service Section 3.7.
	- Trip pin binding.	- Check adjustment, Service Section 3.7.
13. Break away cable assembly has separated from the 3/8" threaded pin	- The travel on the trip bar is too short.	- Readjust trip bar travel as per Service Section 3.7.
	- The assembly is improperly crimped.	- The pin assembly can be replaced with an eye bolt, 3/16" thimble and two 3/16" cable clamps. Be sure to weld the eye on the eye bolt.
14. Model S65 walk-beam spindle bolts come loose	- Insufficient torque on assembly	- Apply loctite to spindle bolt, Service Section 3.2. - Install bolt lock tab, Service Section 3.2.

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