

# **OPERATOR'S MANUAL**

## **BLUMHARDT MIDMOUNT PICKUP SPRAYER**

Printed in USA (74194)JM-200 7/95

**WIL-RICH**  
**PO Box 1030**  
**Wahpeton, ND 58074**  
**PH (701) 642-2621**  
**Fax (701) 642-3372**

# WARRANTY

The only warranty Wil-Rich gives and the only warranty the dealer is authorized to give is as follows:

We warrant products sold by us to be in accordance with our published specifications or those specifications agreed to by us in writing at time of sale. Our obligation and liability under this warranty is expressly limited to repairing, or replacing, at our option, within 12 months after date of retail delivery, any product not meeting the specifications. *We make no other warranty, express or implied and make no warranty of merchantability or of fitness for any particular purpose.* Our obligation under the warranty shall not include any transportation charges or costs or installation or any liability for direct, indirect or consequential damage or delay. If requested by us, products or parts for which a warranty claim is made are to be returned transportation prepaid to our factory. Any improper use, operation beyond rated capacity, substitution of parts not approved by us, or any alteration or repair by others in such manner as in our judgment affects the product materially and adversely shall void this warranty. *No employee or representative is authorized to change this warranty in any way or grant any other warranty.*

Wil-Rich reserves the right to make improvement changes on any of our products without notice.

*When warranty limited or not applicable:* Warranty on hoses, cylinders, hubs, spindles, engines, valves, pumps or other trade accessories are limited to the warranties made by the respective manufactures of these components. Rubber tires and tubes are warranted directly by the respective tire manufacturer only, and not by Wil-Rich.

Warranty does not apply to any machine or part which has been repaired or altered in any way so as in the our judgment to affect its reliability, or which has been subject to misuse, negligence or accident.

*A Warranty Validation and Delivery Report Form must be filled out and received by Wil-Rich to initiate the warranty coverage.*

## WARRANTY CLAIMS PROCEDURE

1. The warranty form must be returned to Wil-Rich within fifteen (15) working days from the repair date.
2. Parts returned to Wil-Rich without authorization will be refused. The parts must be retained at the dealership for ninety (90) days after the claim has been filed. If the Service Department would like to inspect the parts, a packing slip will be mailed to the dealer. The packing slip must be returned with the parts. The parts must be returned prepaid within thirty (30) days of receiving authorization. After the parts are inspected and warranty is verified, credit for the return freight will be issued to the dealer.
3. Parts that will be scrapped at the dealership will be inspected by a Wil-Rich Sales Representative, District Sales Manager or Service Representative within the ninety (90) day retaining period.

# **CONTENTS**

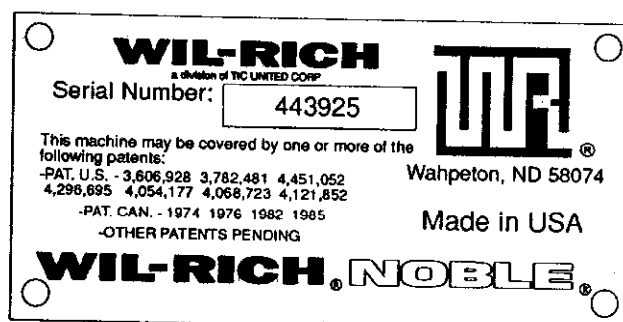
TO THE OWNER .....	4	WIRING .....	32-35
MIDMOUNT SPECIFICATIONS .....	5	Honda Ignition .....	32
SPRAYER LOADING .....	6	Target Master .....	33
SPRAYER UNLOADING .....	7	RC-1B .....	34
BOOM OPERATION .....	8-9	Raven .....	35
Unfolding .....	8	BOOM TILT .....	36
Folding .....	9	FOAMER WIRING .....	37
BOOM SET UP .....	10-18	MAINTENANCE .....	38
Boom Arms .....	10	Cleaning and Nightly Storage .....	38
Rear Frame Assembly .....	11	Lubrication .....	38
Boom Height Adjustment .....	12	Seasonal Storage .....	38
Boom Tilt .....	13	TROUBLESHOOTING .....	39-40
21' Boom Post Assembly .....	13	FRAME ASSEMBLY .....	42
21' Boom Post Assembly .....	13	CLEAN WATER & FOAMER ASSEMBLY .....	43
Rigging the Booms .....	14-15	CHEMICAL WAND ASSEMBLY .....	44
Boom Latch Adjustment .....	16	PLUMBING .....	45-47
Control Panel Folding .....	17	Target Master .....	45
Boom Extension .....	18	Raven .....	46
FEEDLINE HOOK UP .....	19	RC-1B .....	47
2 Solenoid Setup .....	19	NOZZLE PLACEMENT .....	48-49
3 Solenoid Setup .....	19	METRIC CONVERSION .....	50
ENGINE INSTALLATION .....	20		
CALIBRATION .....	21-25		
OPERATION .....	26-31		

# TO THE OWNER

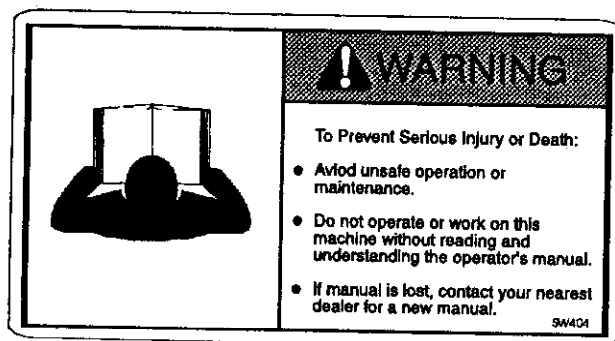
It is the responsibility of the user to read the Operator's Manual and comply with the safe and correct operating procedures as pertains to the operation, lubrication and maintenance of the product according to the information outlined in the Operator's Manual.

If this machine is used by an employee or is loaned or rented, make certain that the operator(s), prior to operating, is instructed in safe and proper use and reviews and understands the Operator's Manual.

The user is responsible for inspecting his/her machine and for having parts repaired or replaced when continued use of this product would cause damage or excessive wear to the other parts. The word NOTE is used to convey information that is out of context with the manual text; special information such as specifications, techniques, reference information of supplementary nature.



When in need of parts, always specify the serial number. Write this number in the space provided. The serial number plate is located on the engine mount frame.






Before using the Blumhardt sprayer, a careful inspection must become routine. A check must be made to insure that all hardware is securely tightened and moving parts are properly lubricated.

Wherever the terms "left" and "right" are used, it must be understood to mean from a position behind and facing the machine.

Lubricate all bearings and moving parts as you proceed and make sure they work freely.

When tightening bolts, they must be torqued to the proper number of foot-pounds as indicated in the table unless specified. It is important that all bolts be kept tight.

On new machines, all nuts and bolts must be rechecked after a few hours of operation.

GRADE 2	GRADE 5		GRADE 8			
						
TORQUE IN FOOT POUNDS						
BOLT DIA	3/8	1/2	5/8	3/4	7/8	1
HEX HEAD	9/16	3/4	15/16	1-1/8	1-5/16	1-1/2
UNCGR2	18	45	89	160	282	320
UNCGR5	30	68	140	240	360	544
UNCGR8	40	100	196	340	528	792
UNFGR2	21	51	102	178	272	368
UNFGR5	32	70	168	264	392	572
UNFGR8	48	112	216	368	792	840

TORQUE.EPS

## MIDMOUNT ASSEMBLY

**When replacing a bolt, use only a bolt of the same grade or higher. Except in shear bolt applications, where you must use the same grade bolt.**

**Bolts with no markings are grade 2**

Grade 5 bolts furnished with the machine are identified by three radial lines on the head.

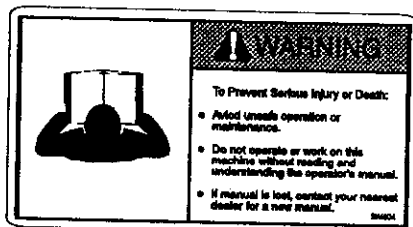
Grade 8 bolts furnished with the machine are identified by six radial lines on the head.

All U-bolts are grade 5.

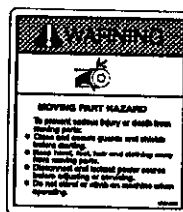
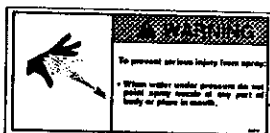


**THIS SYMBOL USED TO CALL YOUR ATTENTION TO INSTRUCTIONS CONCERNING YOUR PERSONAL SAFETY. BE SURE TO OBSERVE AND FOLLOW THESE INSTRUCTIONS**

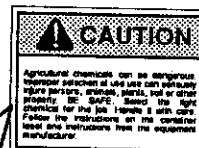
49165.EPS



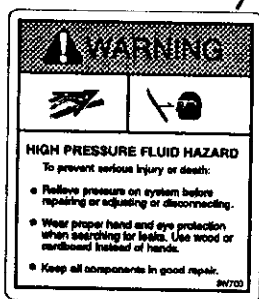
60712 READ  
WARNING  
DECAL

61405 MOVING  
PART DECAL

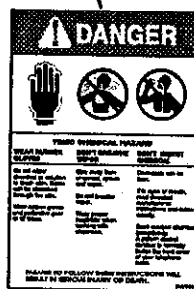
61404  
PRESSURE  
DECAL



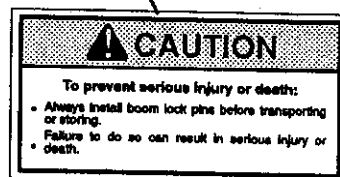
58005  
CAUTION  
DECAL



60711 OIL WARNING  
DECAL



61403 TOXIC  
CHEMICAL DECAL



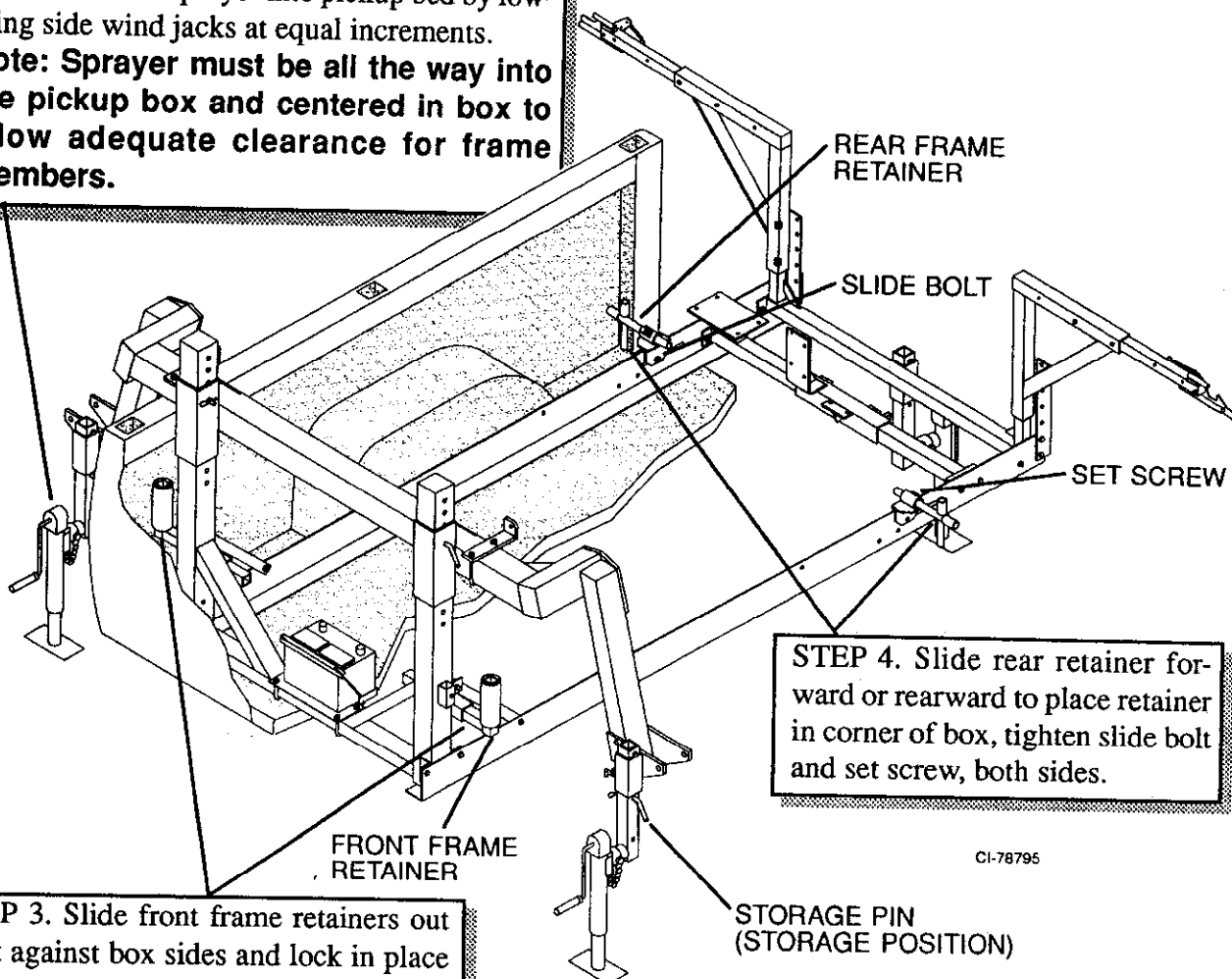
61402 BOOM  
LOCK DECAL

# LOADING

**STEP 1.** Make sure sprayer is high enough to fit into pickup box

**STEP 2.** Lower sprayer into pickup bed by lowering side wind jacks at equal increments.

**Note:** Sprayer must be all the way into the pickup box and centered in box to allow adequate clearance for frame members.



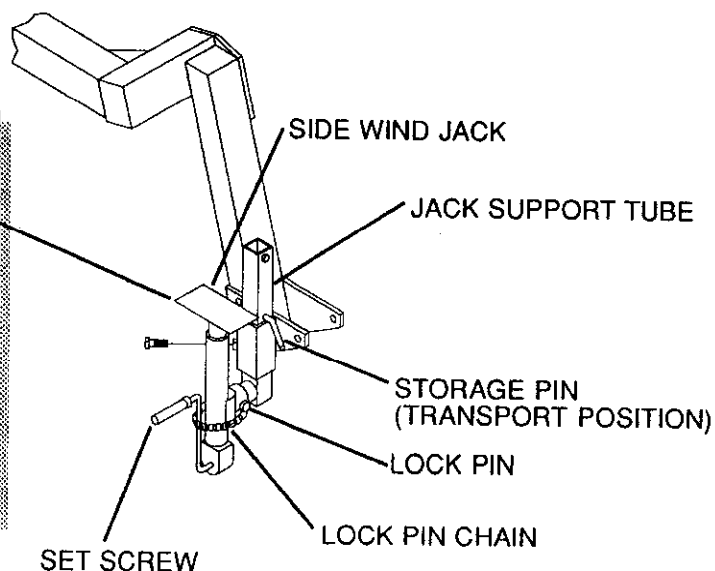
CI-78795

**STEP 3.** Slide front frame retainers out tight against box sides and lock in place with set screws. Retainers should be extended the same amount when sprayer is centered in pickup box.

**STEP 5.** Crank side wind jack up to its shortest height.

**STEP 6.** Remove storage pin and lift jack support tube up to its highest position and reinstall storage pin and tighten set screw.

**STEP 7.** Remove jack lock pin and rotate jack 180 degrees. Reinsert lock pin and wrap lock pin chain around handle and lock in place.



CI-78788A

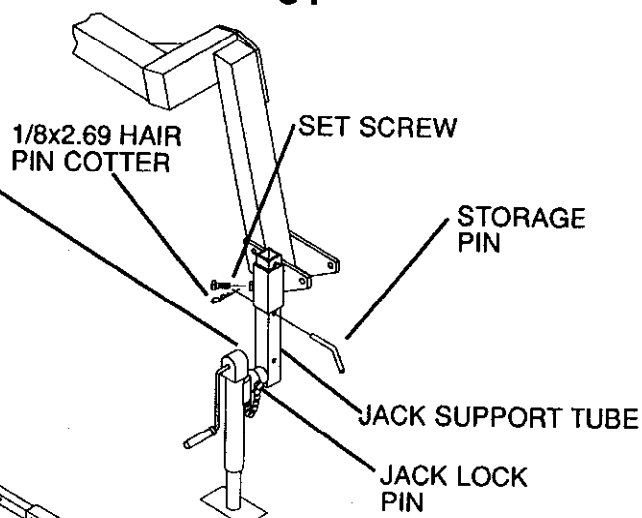
# UNLOADING

**STEP 3.** Remove jack lock pin and rotate jack to working position and lock in place.

**STEP 4.** Loosen set screw and lower jack support tube to the lowest position, reinstall storage pin and tighten set screw.

**Note:** Follow steps 3 & 4 for all three jacks.

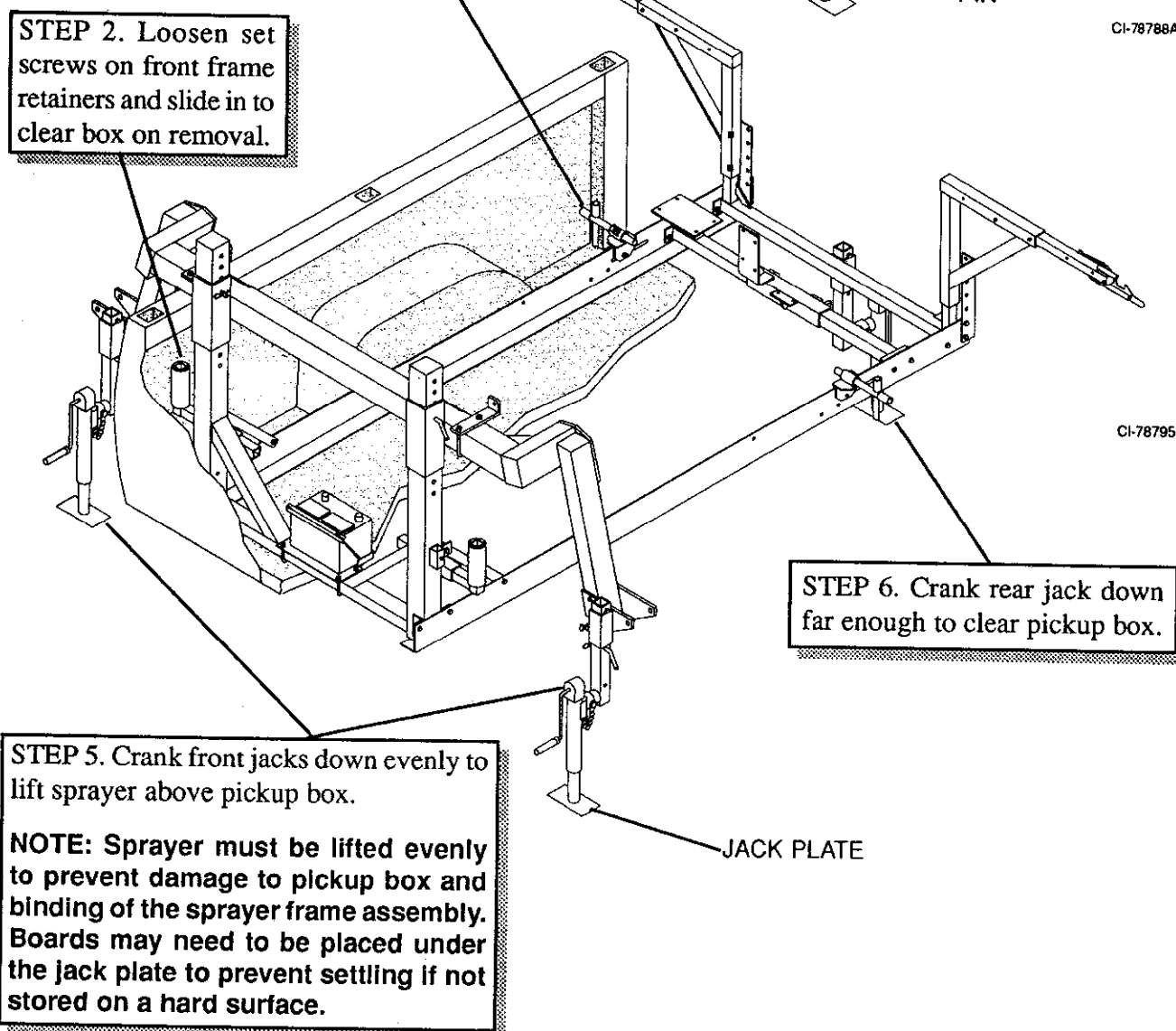
**Jack in working position**



CI-78788A

**STEP 1.** Loosen set screws on rear retainers and slide in to clear box on removal.

**STEP 2.** Loosen set screws on front frame retainers and slide in to clear box on removal.



CI-78795

**STEP 5.** Crank front jacks down evenly to lift sprayer above pickup box.

**NOTE:** Sprayer must be lifted evenly to prevent damage to pickup box and binding of the sprayer frame assembly. Boards may need to be placed under the jack plate to prevent settling if not stored on a hard surface.

# BOOMS

## Unfolding

STEP 1. Move anti-swing clutch handle to the unlock position.

STEP 2. Remove boom lock pin & release transport lock latch and lift the boom from the transport lock.

BOOM LOCK PIN

TUBE PROTECTOR

LATCH HANDLE

1/8x2.69  
HAIRPIN  
COTTER

HOSE CLAMP

TRANSPORT  
LOCK

MAIN BOOM

STEP 3. Walk the main boom back to where the boom is perpendicular to the pickup.

TARP STRAP

STEP 5. Rotate the pivot arm down to the working position

STEP 4. Lift the outrigger away from the main boom and walk the outrigger around until it locks in place.

STEP 6. Lock the anti-swing clutch handle.

TARP STRAP

OUTRIGGER

ANTI-SWING  
CLUTCH  
HANDLE IN  
UNLOCK  
POSITION

UNFOLDED  
POSITION

ANTI-SWING CLUTCH  
HANDLE IN LOCK POSITION

MAIN BOOM

CI-78796A

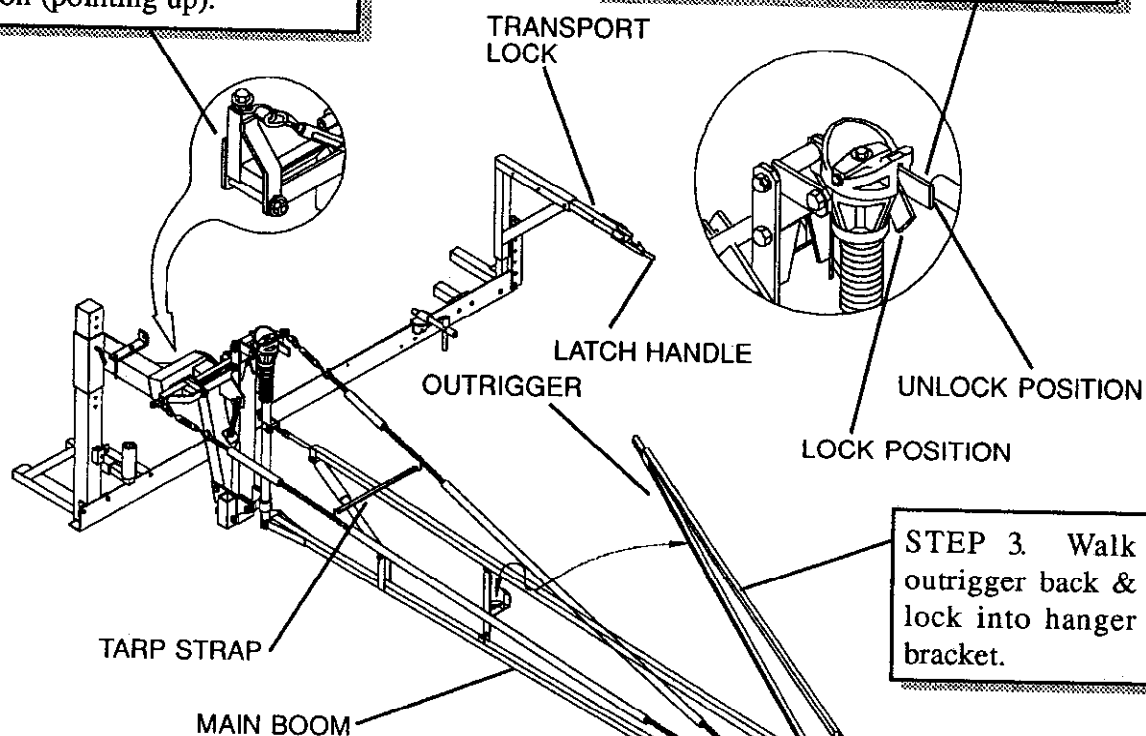


# BOOMS

## Folding

**STEP 2.** Rotate pivot arm to the transport position (pointing up).

**STEP 1.** Unlock the anti-swing clutch handle.



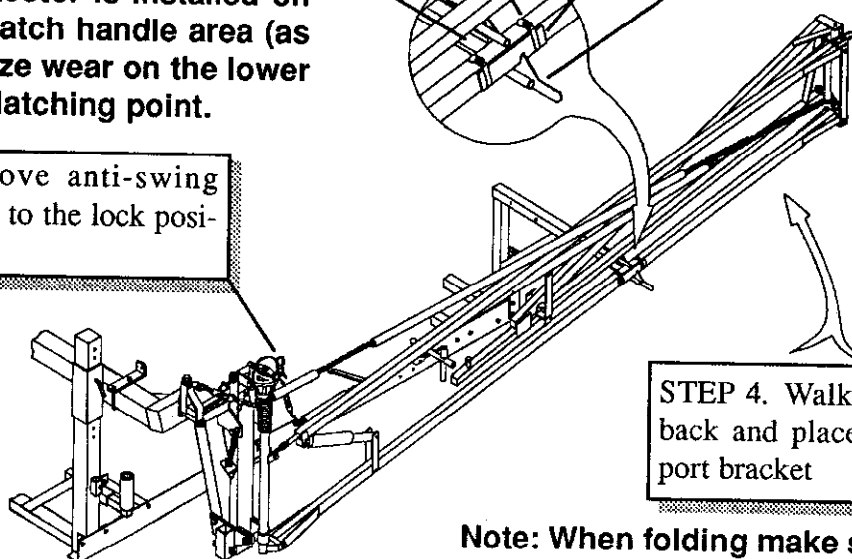
**STEP 3.** Walk outrigger back & lock into hanger bracket.

**STEP 5.** Install transport lock pin and lock in place with cotter pin.

**Note:** A tube protector is installed on the boom in the latch handle area (as shown) to minimize wear on the lower boom arm at the latching point.

HOSE CLAMP  
TUBE PROTECTOR  
LATCH HANDLE

**STEP 6.** Move anti-swing clutch handle to the lock position (down).



**STEP 4.** Walk boom assy back and place into transport bracket

**Note:** When folding make sure feed lines do not kink and sprayer nozzles don't hit the boom or other nozzles being folded into them.

CI-78796

# BOOM INSTALLATION

## Boom Arms

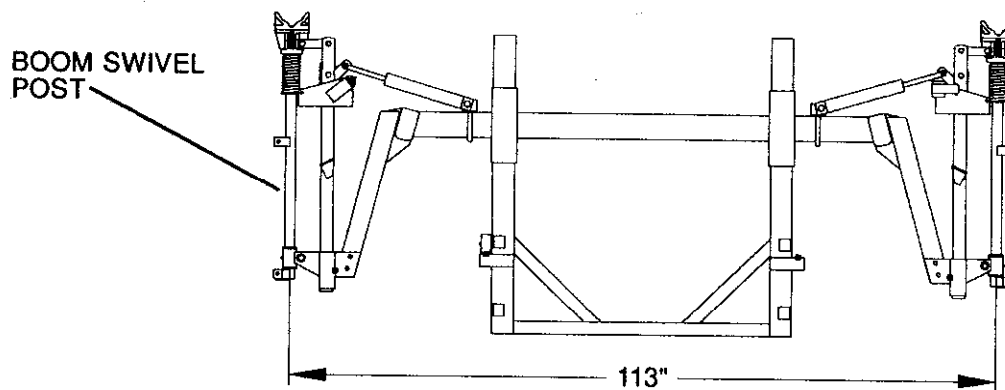
The Blumhardt Midmount sprayer is available with a 21' parallel flotation boom. The widths/lengths stated are for the main boom and outrigger assembled and do not include the boom extension.

The center section is measured from the center of the left boom swivel post to the center of the right boom swivel post.

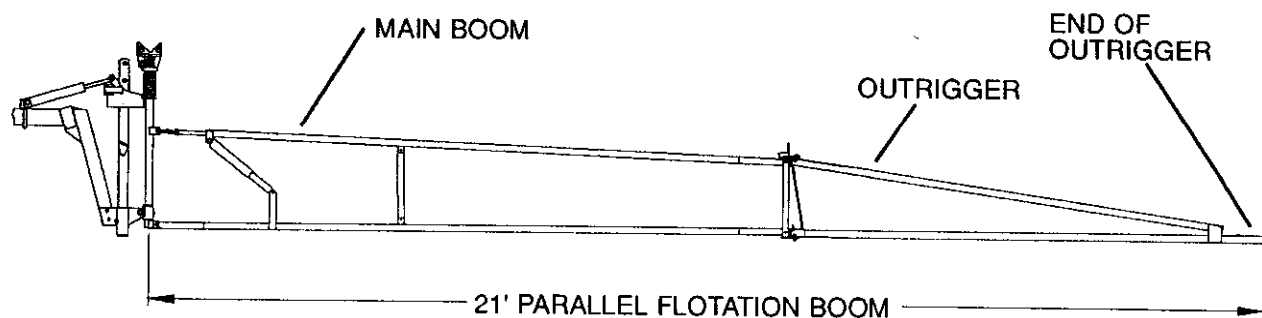
The booms are measured from the center of the boom swivel post to the end of the outrigger.

**Note:** All boom lengths are given in approximate lengths.

**Note:** Midmount pickup sprayer standard center section is 113". No other sizes are available for pickup sprayers.



CI-78798



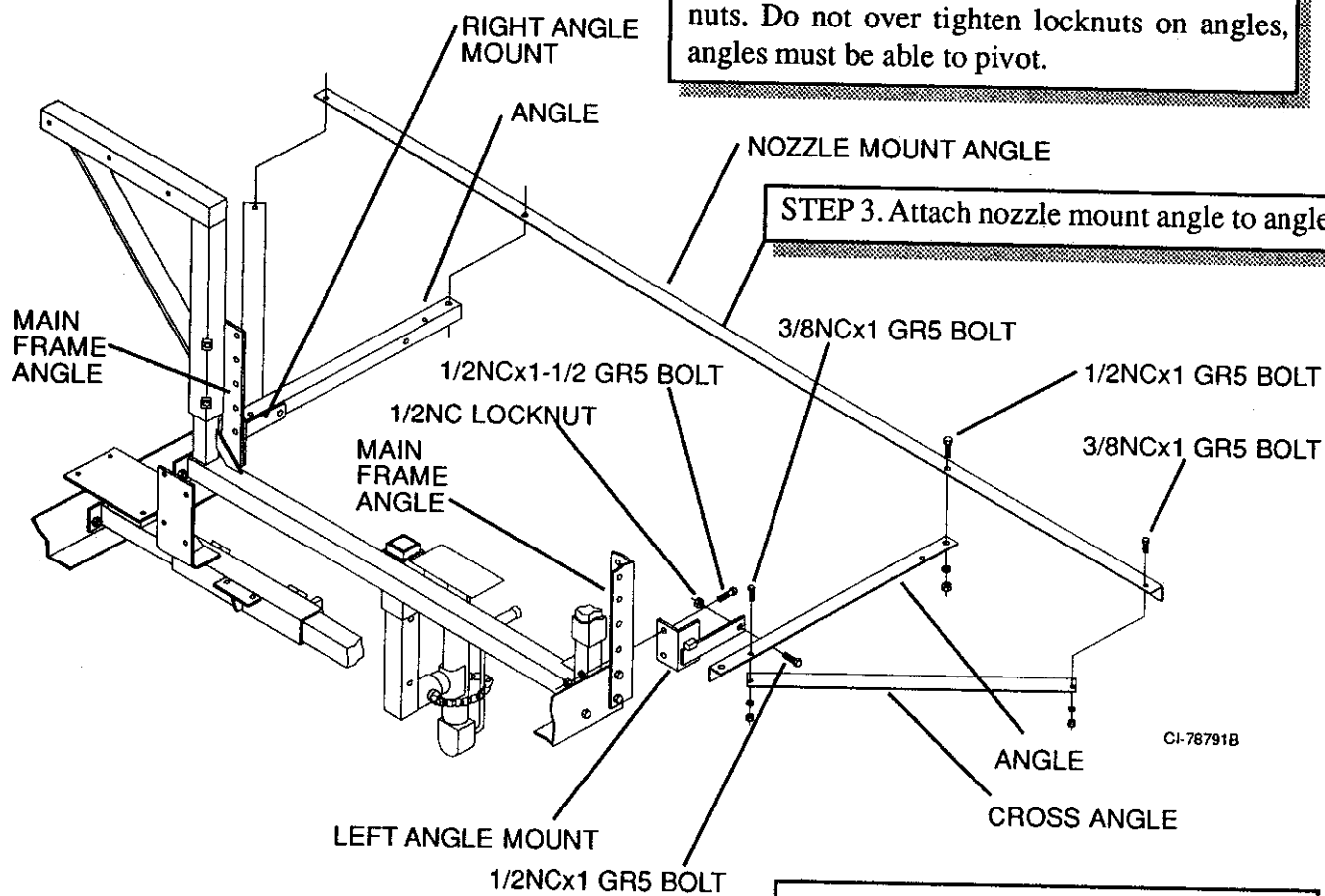
CI-78798A

## REAR FRAME ASSEMBLY

**Note:** Do not tighten hardware until all components are assembled.

**STEP 1.** Install left and right angle mounts to main frame angles.

**STEP 2.** Attach angles to left and right angle mounts with the 1/2NCx1 GR5 bolts and locknuts. Do not over tighten locknuts on angles, angles must be able to pivot.



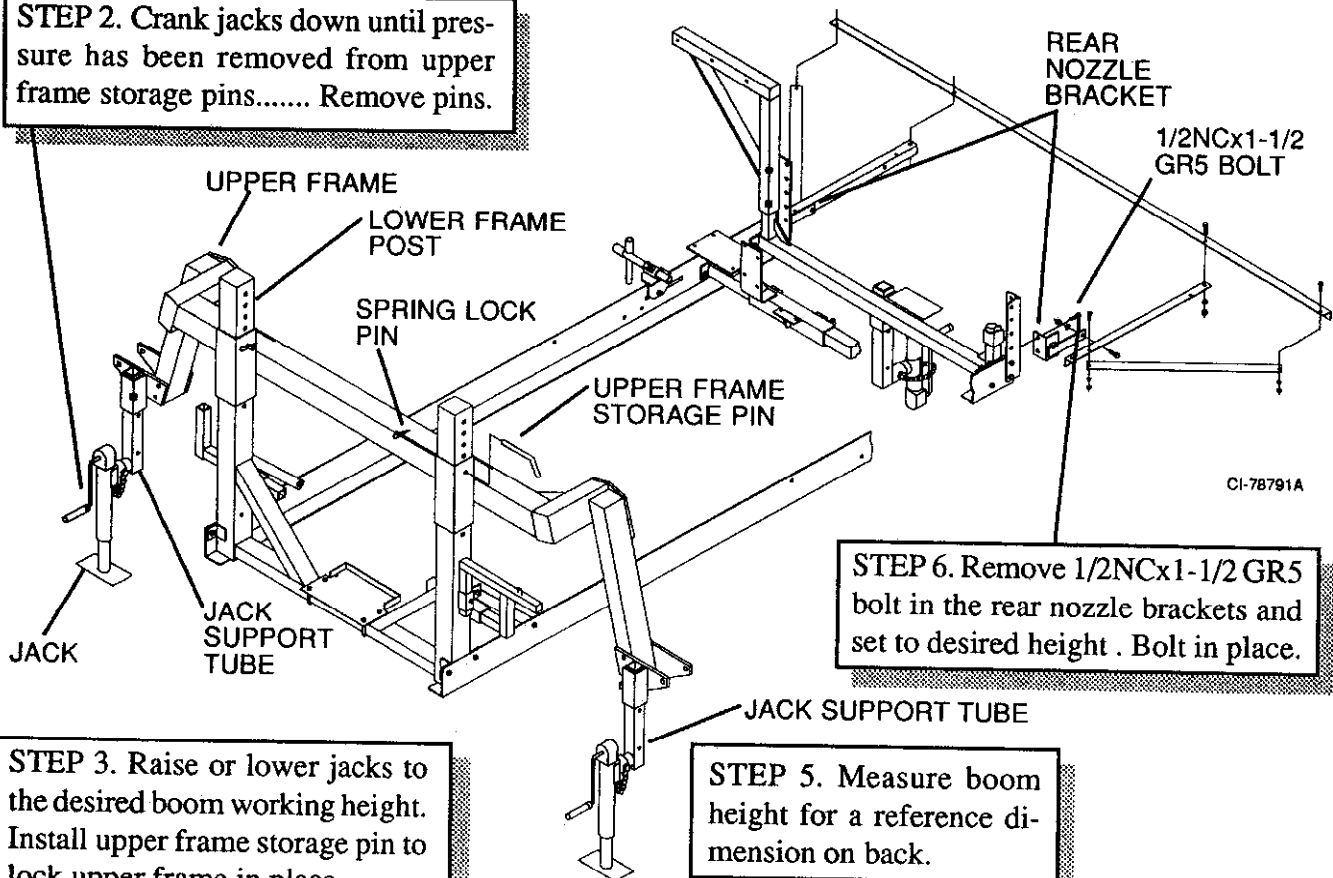
# BOOM HEIGHT ADJUSTMENT

**Note:** The main boom height is adjusted by sliding the upper frame on the lower frame posts. (Steps 1-4)

**STEP 1.** Rotate jacks to working position, lock in place. Lower jack support tube until jack reaches surface, install storage pin and tighten set screw (front jacks only).

**Note:** The rear nozzles are adjusted by moving the rear nozzle bracket. (Step 5 & 6) The rear jack is not used in the leveling procedure.

**STEP 2.** Crank jacks down until pressure has been removed from upper frame storage pins..... Remove pins.



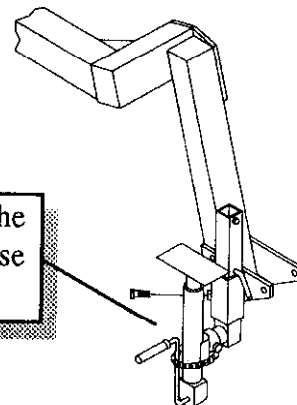
**STEP 6.** Remove 1/2NCx1-1/2 GR5 bolt in the rear nozzle brackets and set to desired height . Bolt in place.

**STEP 3.** Raise or lower jacks to the desired boom working height. Install upper frame storage pin to lock upper frame in place.

**Note:** Adjust evenly to prevent binding.

**STEP 5.** Measure boom height for a reference dimension on back.

**STEP 4.** Return jacks to the storage position. Reverse STEP 1.

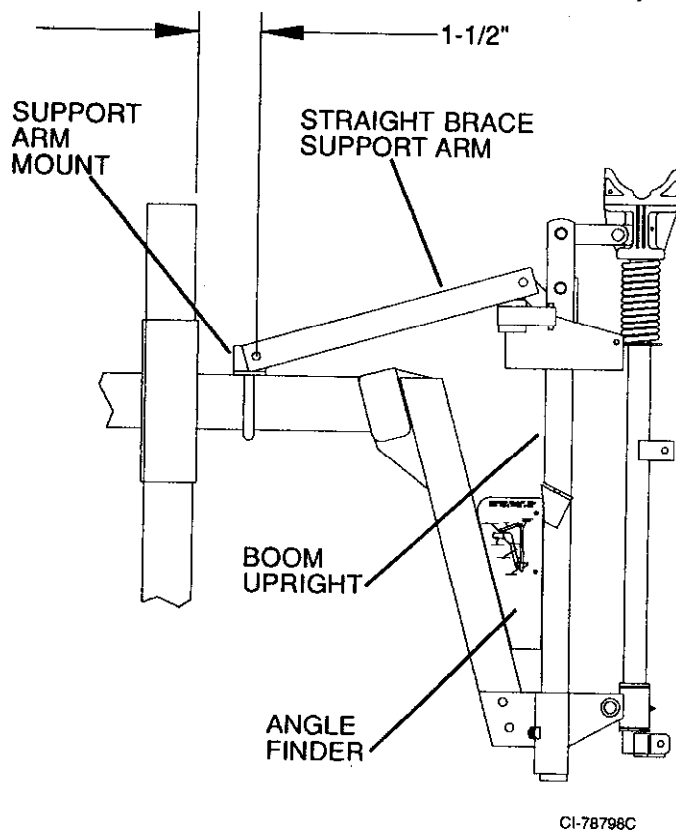


# BOOM TILT

With the straight brace support arm, the support arm mount must be positioned so the boom upright is angled slightly inward at the top. An angle finder template (provided) is used as a guide between the upper frame and the boom upright. The boom upright should then be tilted inward until it matches the angle finder template.

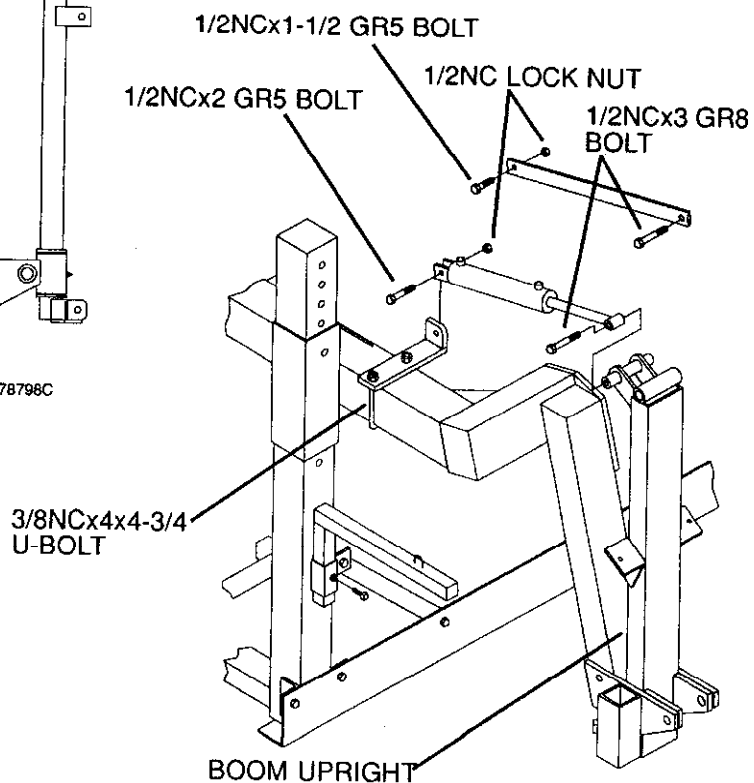
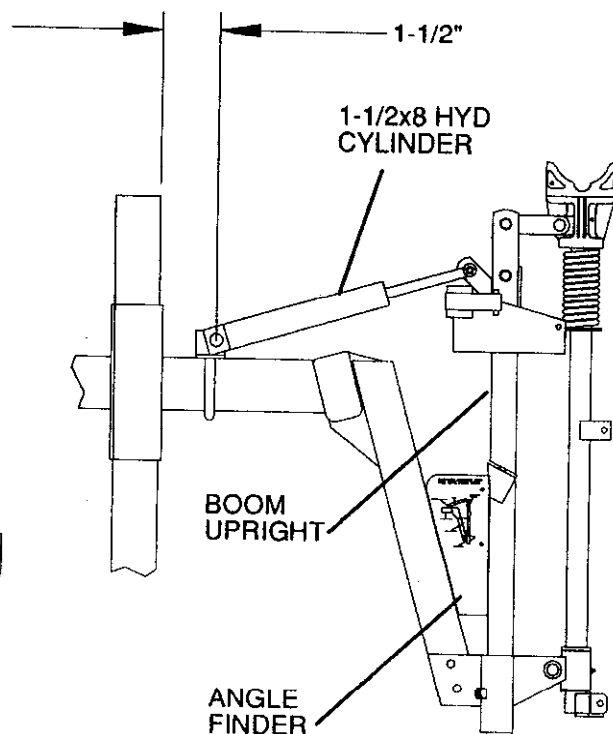
When the correct angle is found, tighten the support arm mount.

## 21' BOOM POST ASSEMBLY STRAIGHT BRACE SUPPORT ARM (STANDARD)



## 21' BOOM POST ASSEMBLY

### HYDRAULIC CYLINDER (OPTIONAL)



# RIGGING THE BOOMS

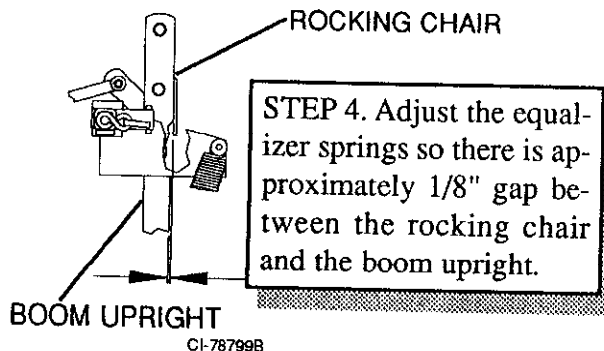
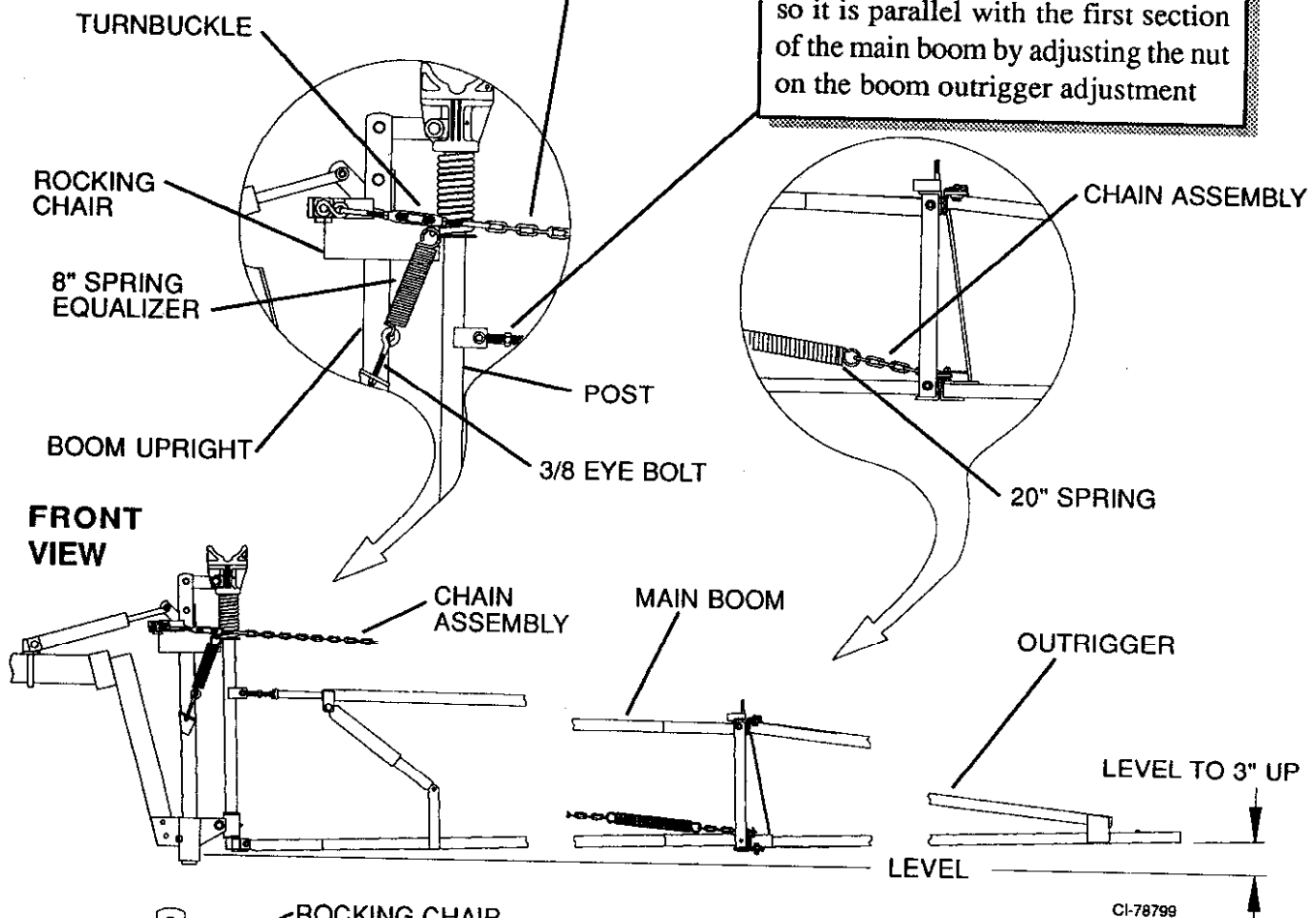
**Note:** Before starting adjustments, boom must be completely assembled, all joints well lubricated and moving freely, boom post set and the sprayer must be setting on level ground.

**Note:** If setting chain length is required see steps 1 & 2 . If chain is assembled go to step 3.

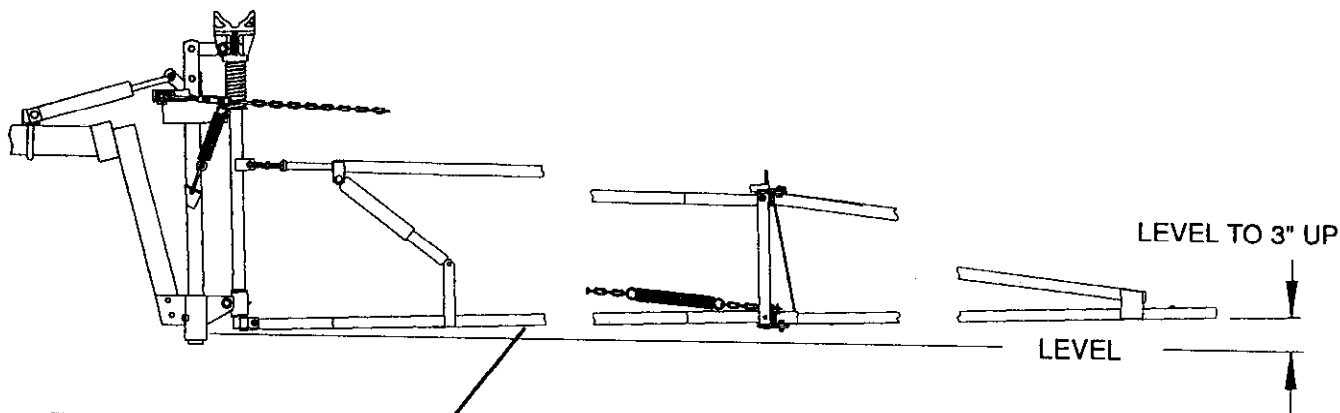
**STEP 2.** Install chain assemblies from the rocking mechanism to the boom outrigger so that it holds the boom in its resting position.

**STEP 1.** Main boom must be resting on a stand, level or slightly down and turnbuckles loose so that no threads are showing in turnbuckle body.

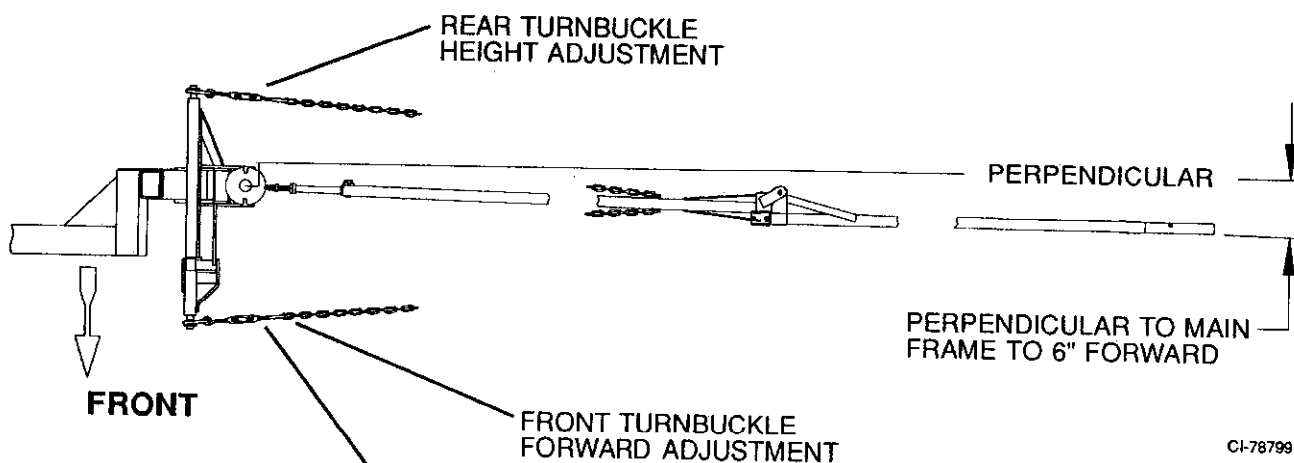
**STEP 3.** Adjust the boom outrigger so it is parallel with the first section of the main boom by adjusting the nut on the boom outrigger adjustment



**Note:** Check the boom flotation by pushing down where the outrigger and main boom arms join. The boom must float back up to the level position. If the boom does not float back up, the 3/8 eye bolts on the rocking chair equalizer springs must be tightened evenly until the boom floats up.



**STEP 6.** Adjust the rear turnbuckle for adjusting levelness. The main boom and outrigger must be level to 3" above level of the main frame.



**STEP 5.** Adjust the front turnbuckle so that the main boom and outrigger are perpendicular to the main frame to 6" forward.

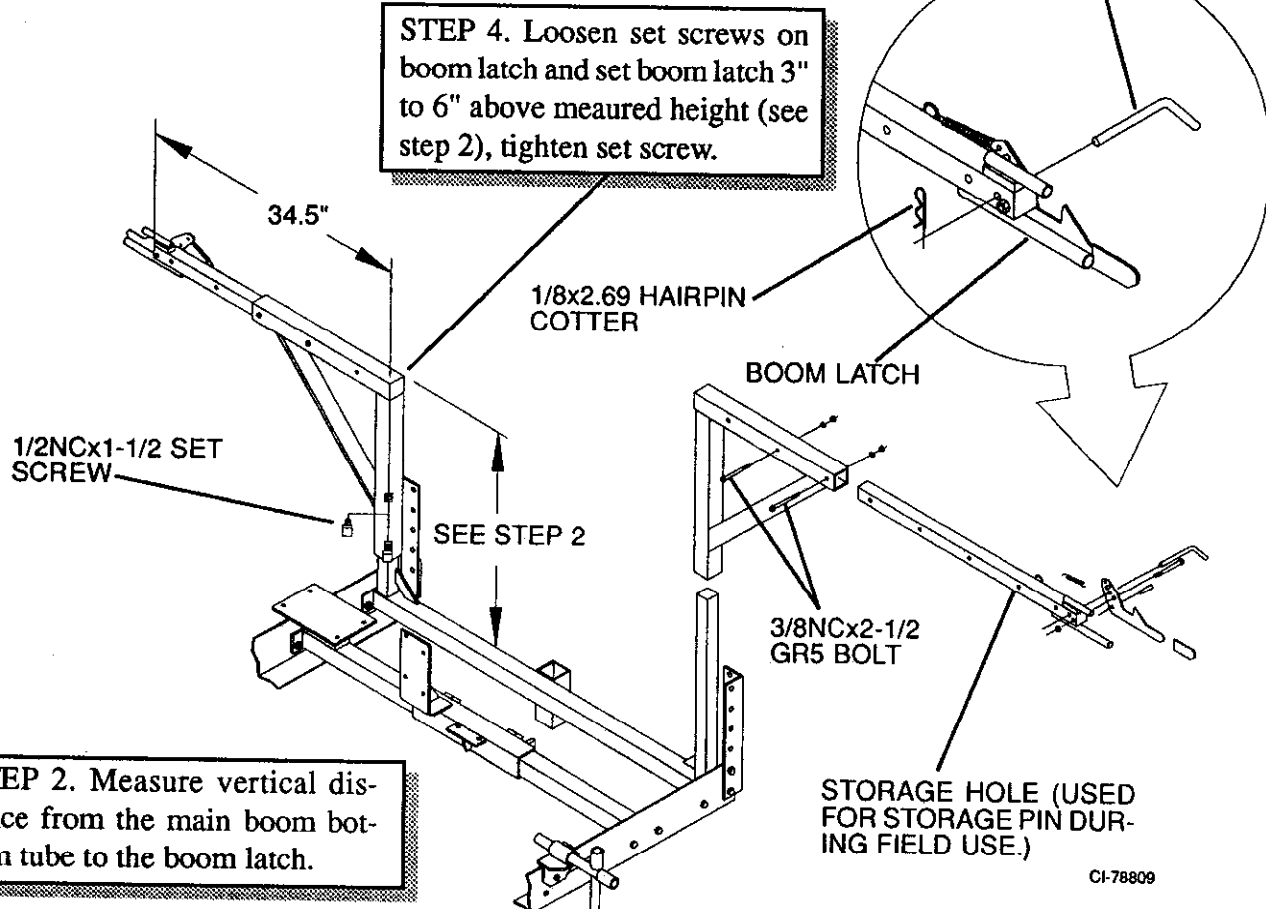


**Note:** To prevent serious injury from pinching: Keep all persons and objects clear while any adjusting is being done on machine.

# BOOM LATCH ADJUSTMENT

**Note:** If the boom working height is changed the boom latch height must be adjusted.

**STEP 1.** Fold boom back to its folded transport position and let it hang unsupported.



CI-78809

**STEP 2.** Measure vertical distance from the main boom bottom tube to the boom latch.

**STEP 3.** Unfold boom

**Note:** Boom must rest on boom latch to prevent damage to the boom.



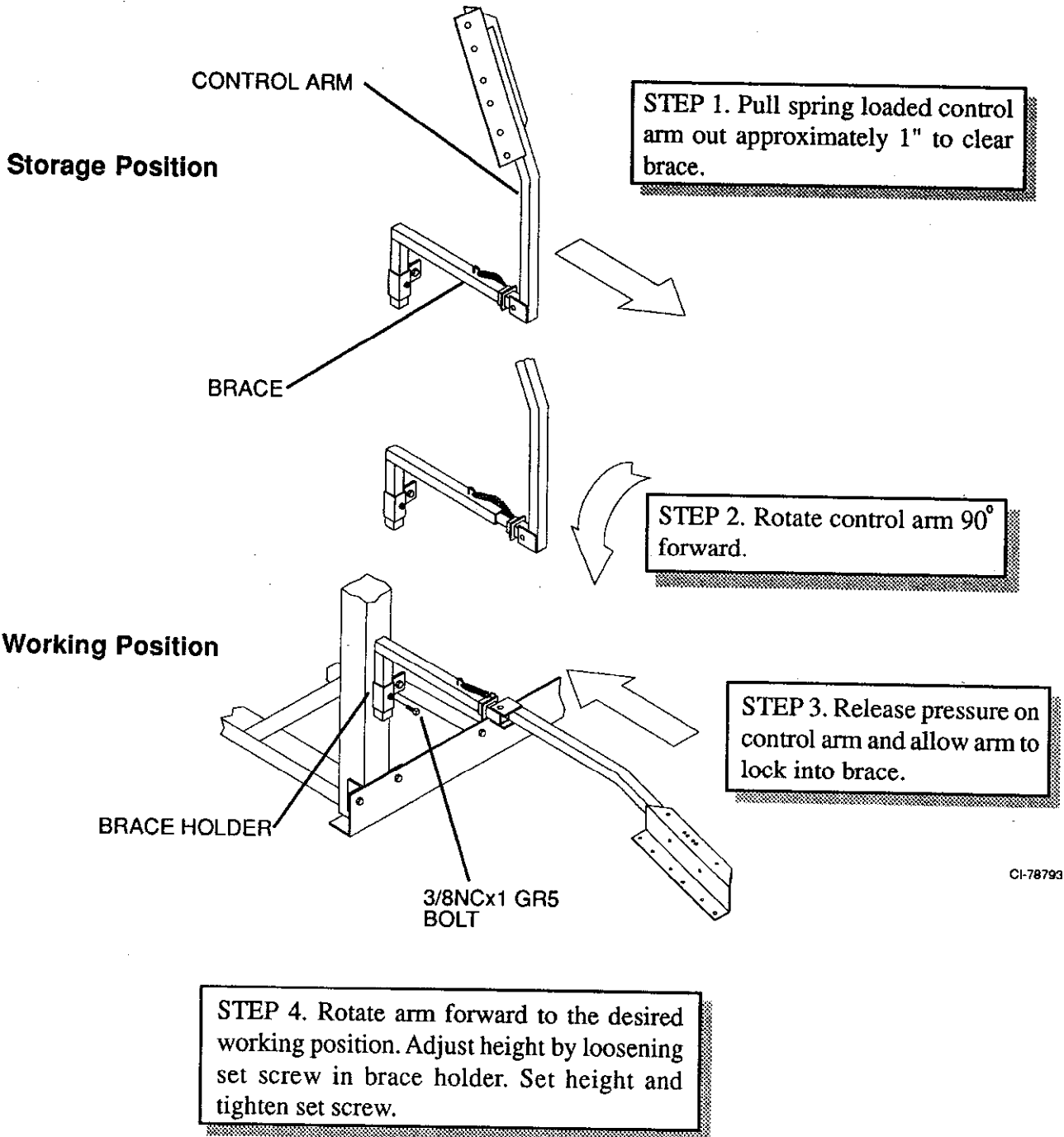
## CAUTION

**To prevent serious injury or death:**

- Always install boom lock pins before transporting or storing.
- Failure to do so can result in serious injury or death.



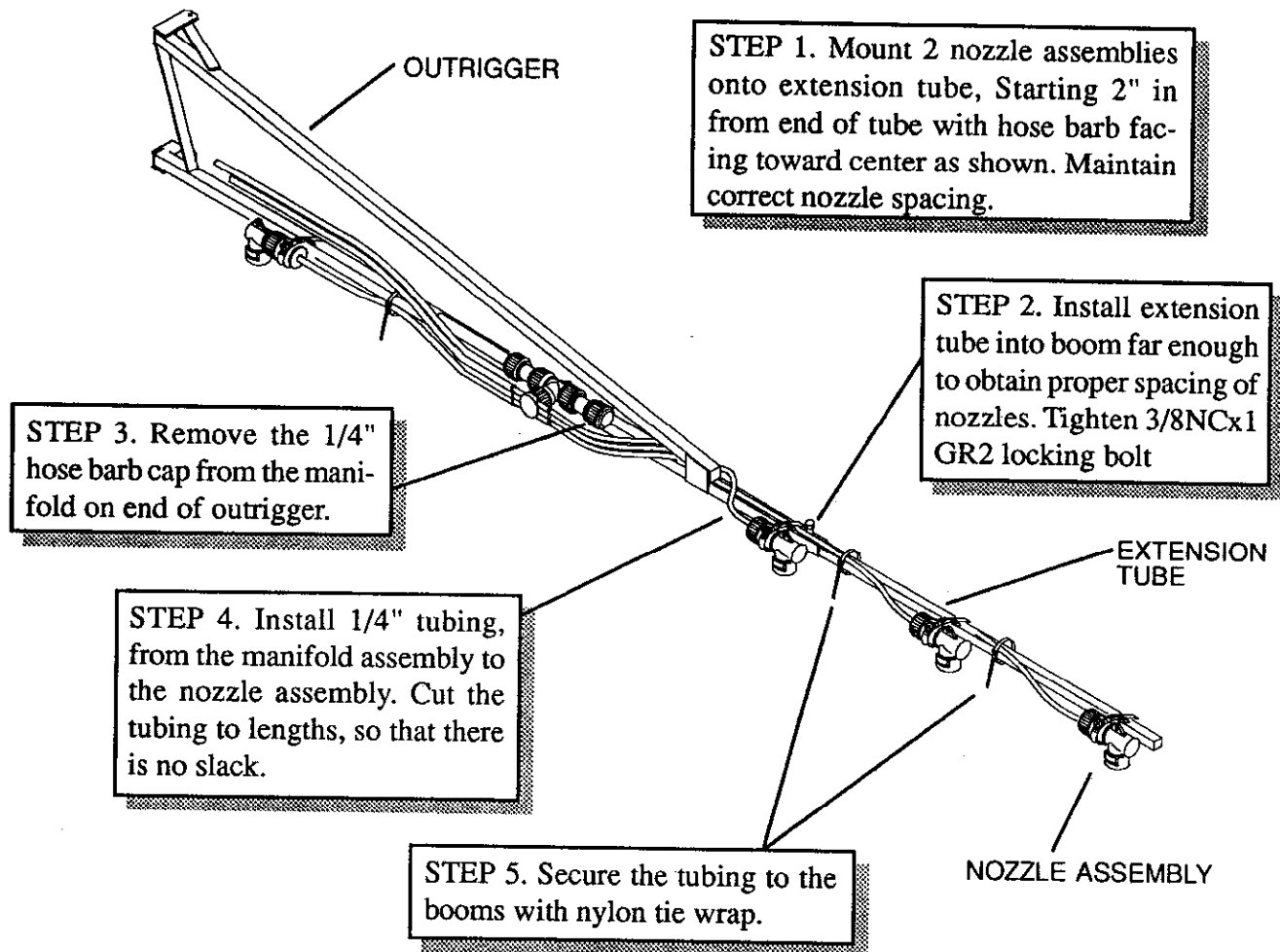
# CONTROL PANEL FOLDING



CI-78793

## BOOM EXTENSION

**Note:** Extension tubes may be added on all booms. This extension tube is adjustable out to 2 nozzle maximum extension beyond the outrigger on the Mid Mount Pick up sprayer.



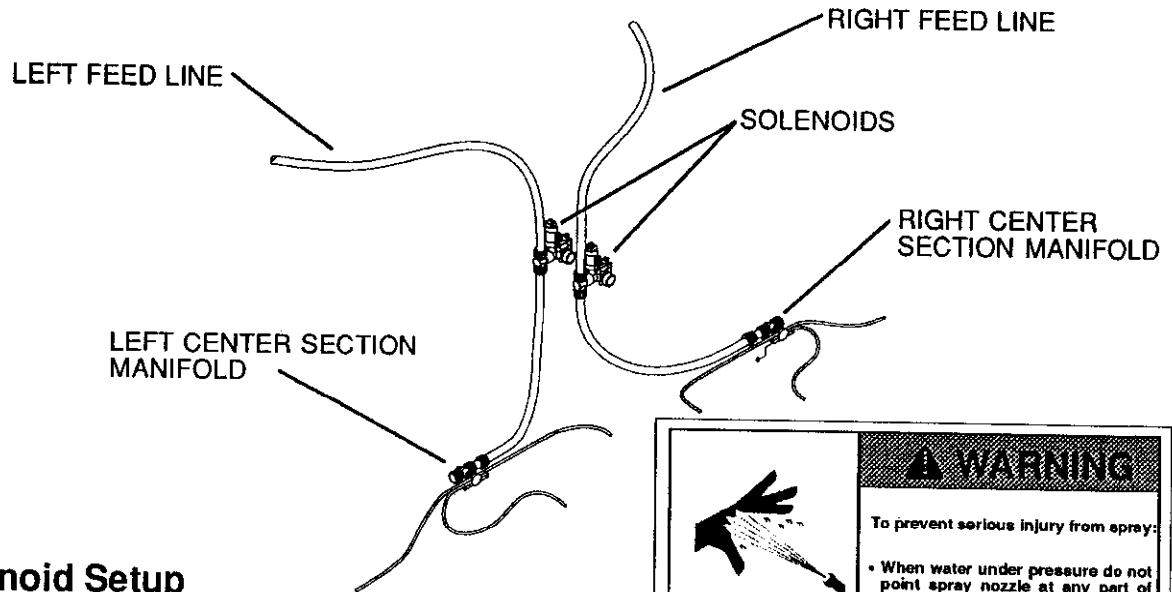
CI-78001

# FEEDLINE HOOK UP

## 2 Solenoid Setup

Each solenoid feeds a boom and splits the center section feed.

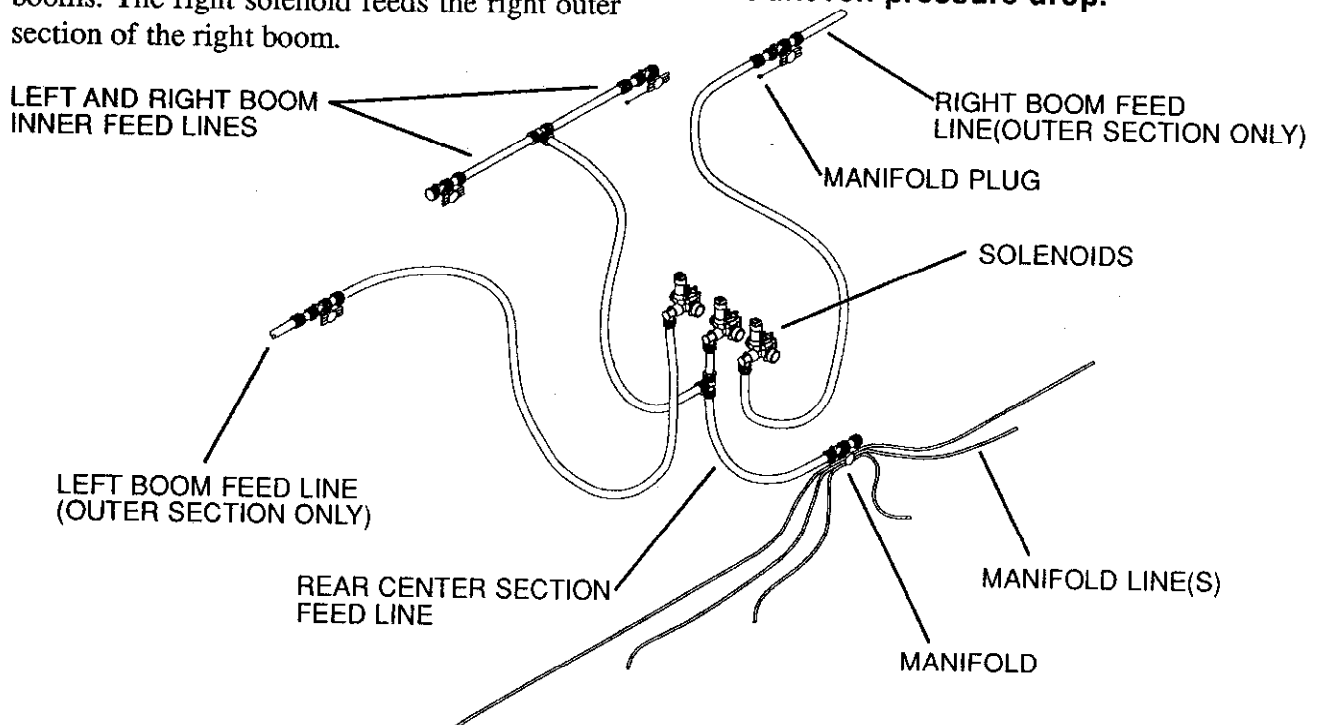
**Note:** The optimum setting would be to have each solenoid feed an equal amount of nozzles.



## 3 Solenoid Setup

Each solenoid feeds a specific area of the boom. The left solenoid feeds the outer section of the left boom. The center solenoid feeds the center section and the inside sections of the left and right booms. The right solenoid feeds the right outer section of the right boom.

**Note:** Try to keep feed lines and nozzle lines symmetrical from side to side to prevent uneven pressure drop.



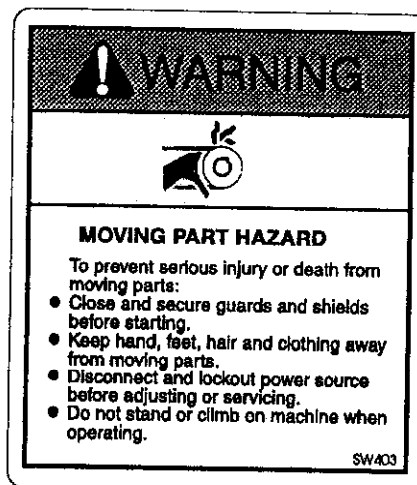
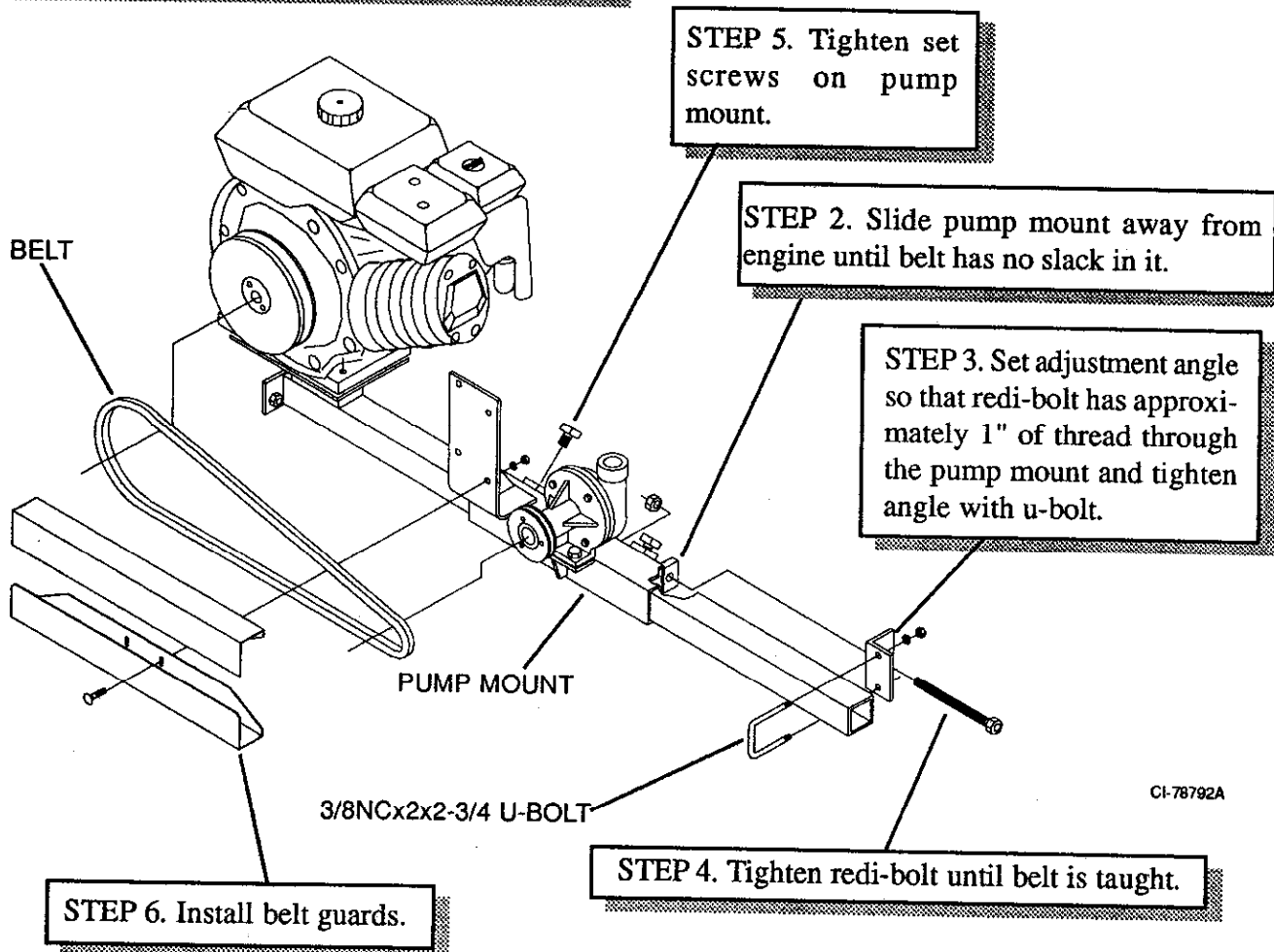
CI-78800

# ENGINE AND BELT INSTALLATION



**Note:** Always keep belt guards in place when working around engines and pumps. Serious bodily injury can result if care is not taken.

**STEP 1.** With pump mount set screws loose, adjustment angle and redi-bolt loose, install belt onto pulleys.



## APPLICATION RATES

The application Rate Chart on pages 24 & 25 are based on water at 8.3 lbs per gallon and 20 and 30 inch nozzle spacings. When spraying solutions that are heavier or lighter than water, multiply the tabulated gallonage figure from the chart by the appropriate factor shown below.

WEIGHT OF SOLUTION	CONVERSION FACTOR
7.0 LBS. PER GALLON	1.09
8.0 LBS. PER GALLON	1.02
8.34 LBS PER GALLON - WATER	1
9.0 LBS PER GALLON	0.96
10.0 LBS PER GALLON	0.91
11.0 LBS PER GALLON	0.87
12.0 LBS PER GALLON	.83

**Note:** This table is based on theoretical solution densities only and may vary in actual practice because of differing solution characteristics.

RECOMMENDED SPRAY HEIGHTS	
20" SPACING	30" SPACING
20" TO 40"	30" TO 40"

## CALIBRATION

**Pre Calibration Check:** Be sure that all sprayer parts are free of foreign material and are functioning properly. Inspect nozzle tips and internal parts for obvious wear, defects, proper size and type. Check the flow rate of each nozzle using water at the planned operating pressure for uniform output, and uniform appearance of spray pattern. Replace any nozzle tips having flow 5% more or less than average of the other nozzles checked and/or having obvious different patterns. Check the flow rate of new nozzles.

This engineering practice provides information on the calibration of boom type field sprayers used for broadcast, band or row applications.

This engineering practice sets forth guidelines for those who prepare field sprayer calibration procedures. The purpose is to encourage practices that will improve uniformity, accuracy and safety of pesticide application with field sprayers.

Never use chemical to calibrate the sprayer. Always use clean water.

Use water alone to calibrate the sprayer unless the flow rate of the actual spray mixture varies more than 5% from the flow rate of water.

Calibration with actual spray mixture. Wear suitable, approved safety equipment and protective clothing. Avoid contact of spray.

Avoid contamination of area. Calibrate only when wind speed is below 5 m.p.h. (8km/h).

General Calibration information. The volume of spray material applied to a given area depends on nozzle flow rate, ground speed of the sprayer and the sprayed width per nozzle. Each variable must be determined when developing a specific calibration procedure.

Nozzle flow rate. Nozzle flow rate varies with nozzle capacity, nature of the fluid and fluid pressure.

Nozzle capacity. Select the nozzle that will best fit the requirements of application volume, pressure and ground speed.

Nature of the fluid. If the spray mixture will be altered considerably by addition of adjuvants, compare the flow rate of the spray mixture to that of water. If the flow rate difference is 5% or more, adjust the actual spray mixture in the calibration.

Fluid pressure. A constant pressure must be maintained to achieve uniform application. Flow rate is generally proportional to the square root of pressure drop across the nozzle.

Ground speed of sprayer. Spray volume has an inverse relationship to ground speed. Ground speed is the easiest factor to change for minor corrections in application rate. Ground speed must be constant for uniform application.

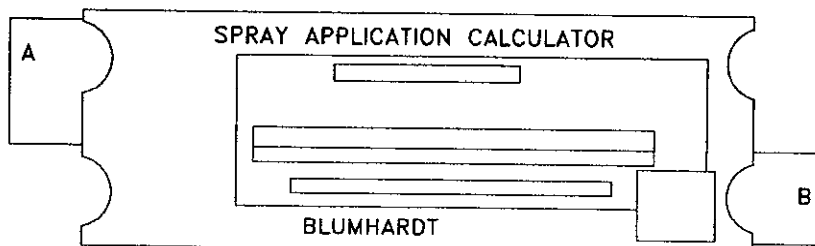
(Reference: ASAE Standards ASAE EP 367.1 Guide for Preparing Field Sprayer Calibration Procedures.)

**Note:** Calibration is not a one time occurrence! Sprayers must be periodically be calibrated during the season, particularly when changing chemicals. You can calibrate during application if field dimensions are accurately known

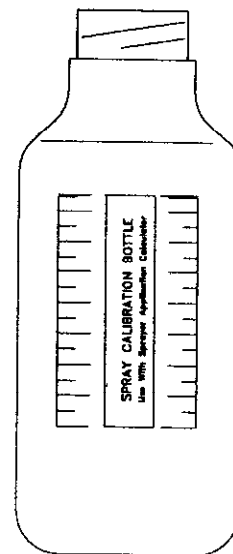
# CONE TIP CALIBRATION

## SPRAYER CALIBRATION

The tip charts must be used to get an approximate application rate for choosing proper tip size. Once you have the desired tip installed in the sprayer, it will be necessary to calibrate the sprayer to get an exact rate. Use the calibration bottle, and spray application calculator, for this purpose. If not available use the method described below.



CI-78013



CI-78013A

### Calibration instructions without Blumhardt bottle and calculator.

**Equipment:** A bottle with 1 ounce graduations on it, a watch with a second hand, pencil and paper calculator.

**Procedure:** Determine desired gallons per acre and speed in miles per hour. Choose a level in graduated bottle, any level can be used however greater accuracy exists by using a higher level. Figure from the equation the amount of seconds it should take to fill the bottle to the desired number of ounces. Adjust the sprayer pressure accordingly to fill the bottle to the desired number of ounces. Adjust the sprayer pressure accordingly to fill the bottle to desired level in the proper amount of time.

Equation:

$$\text{Seconds} = \frac{2589 \times \text{level (liquid ounces)}}{\text{MPH} \times \text{Gallons Per Acre} \times \text{nozzle spacing}}$$

Example: Determine 10 gallons per acre, 5 miles per hour speed of travel, 30 " nozzle spacing and 8 ounces to be collected.

$$\frac{2598 \times 8}{5 \times 10 \times 30} = 13.808 \text{ seconds}$$

It should take 13.8 seconds to fill the bottle to 8 ounces.



## CAUTION

Agricultural chemicals can be dangerous. Improper selection of use use can seriously injure persons, animals, plants, soil or other property. **BE SAFE.** Select the right chemical for the job. Handle it with care. Follow the instructions on the container label and instructions from the equipment manufacturer.

## FLOOD TIP CALIBRATION

### Broadcast Application Rate

Although total sprayer capacity is determined by nozzle flow rate and the number of nozzles, the volume of liquid applied per acre is a function of flow rate, nozzle spacing, and sprayer speed as defined in the following formula:

$$\frac{\text{Gallons per acre (gpa)}}{\text{or}} = \frac{5940 \times \text{gpm per nozzle}}{\text{Nozzle Spacing-inches} \times \text{m.p.h.}}$$

$$\text{GPM} = \frac{\text{GPA} \times \text{M.p.h.}}{5940} \times \text{Nozzle Spacing-Inches}$$

Note: The performance of any agricultural chemical depends upon the proper application of the correct amount... based on chemical manufacture's equipment recommendation. Be sure that your equipment has been properly calibrated before spraying.

This information on Flood Tips is taken from the Delavan Ag Spray Products Catalog #1609P.

### Broadcast Nozzle Spacing Conversion Factors

To calculate GPA capacities for nozzle spacings other than those shown in capacity charts, note on what nozzle spacing the capacity chart is based and use the corresponding conversion table. Multiply capacities from chart by the proper factor indicated.

#### FACTORS FOR 20" SPACING CAPACITIES

NOZZLE SPACING	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"
FACTOR	2	1.67	1.43	1.25	1.11	1	0.91	0.86	0.77	0.71	0.67

#### FACTORS FOR 30" SPACING CAPACITIES

NOZZLE SPACING	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"
FACTOR	1.88	1.67	1.5	1.36	1.25	1.15	1.07	1	0.94	0.88

### Hypro 9203C Pump Performance Tables

SPEED (RPM)	PUMP OPERATING PRESSURE											
	20 PSI		40 PSI		60 PSI		80 PSI		100 PSI		120 PSI	
	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
2400	8.1	1.2										
3600	105	4.2	90	3.9	34	2.4						
4200	22	0.7	115	5.5	38	3.0	16	1.2				
5000			134	10.7	130	10.5	112	10	88	9	41	6.6
5000			36	1.5	134	15.4	101	15.7	125	16	120	16.2

Note: All information is taken from the Hypro Series 9000 centrifugal pumps form 197.

See Hypro series pump manuals for more specific operation, maintenance and performance tables.

# D-TYPE FLOOD TIP CHART: WATER

FLOOD TIP	PSI	GPM	20" SPACING					30" SPACING				
			4 MPH	5 MPH	6 MPH	10 MPH	15 MPH	4 MPH	5 MPH	6 MPH	10 MPH	15 MPH
D 2.5 45767 DARK BLUE	20	0.3										
	30	0.43	32.1	25.7	21.4	12.8	8.6	21.4	17.1	14.3	8.6	5.7
	40	0.5	37.1	29.7	24.8	14.9	9.9	24.8	19.8	16.5	9.9	6.6
D3 45768 DARK GREEN	20	0.3										
	30	0.52	39	31.2	26	15.6	10.4	26	20.8	17.3	10.4	6.9
	40	0.6	45	36	30	18	12	30	24	20	12	8
D5 45769 TAN	20	0.3										
	30	0.87	64.5	51.6	43	25.8	17.2	43	34.4	28.7	17.2	11.5
	40	1	75	60	50	30	20	50	40	33.3	20	13.3
D7 45770 LIGHT BLUE	20	0.3										
	30	1.3	96.2	76.9	64.1	38.5	25.6	64.1	51.3	42.7	25.6	17.7
	40	1.5	111	88.8	74	44.4	29.6	74	59.2	49.3	29.6	19.7
D10 45766 LIGHT GREEN	20	0.3										
	30	1.74	129.3	103.5	86.2	51.7	34.5	86.2	69	5	34.5	23
	40	2	148.5	118.8	99	59.4	39.6	99	79.2	66	39.6	26.4

# D-TYPE FLOOD TIP CHART: FERTILIZER

FLOOD TIP	PSI	GPM	20" SPACING						30" SPACING					
			4 MPH	5 MPH	6 MPH	8 MPH	10 MPH	14 MPH	4 MPH	5 MPH	6 MPH	8 MPH	10 MPH	14 MPH
D 2.5 45767	20	0.3												
	30	0.302	22.4	17.9	15	11.2	9	6.4	15	12	10	7.5	6	4.3
	35	0.344	25.5	20.4	17	12.8	10.2	7.3	17	13.6	11.3	8.5	6.8	4.9
D 3 45768	20	0.3												
	30	0.392	29.2	23.4	19.5	14.6	11.7	8.4	19.05	15.6	13	9.7	7.8	5.6
	35	0.436	32.5	26	21.7	16.3	13	9.3	21.7	17.3	14.5	10.8	8.7	6.2
D 5 45769	20	0.3												
	25	0.591	44.1	35.2	29.1	22	17.6	12.6	29.4	23.5	19.6	14.7		
	30	0.681	50.8	40.7	33.9	25.4	20.3	14.5	33.9	27.1	22.6	16.9	13.6	9.7
	35	0.759	56.7	45.3	37.8	28.3	22.7	16.2	37.8	30.2	25.2	18.9	15.1	10.8
D 7 45770	20	0.683	49.4	39.5	32.9	24.8	19.7	14.1	32.9	26.3	21.9	16.5	13.3	9.4
	25	0.766	56.1	45.0	37.9	28.7	22.7	16.2	37.9	30.4	25.3	19.9	15.8	11.3
	30	0.896	66.5	53.2	44.3	33.2	26.6	19	44.3	35.5	29.6	22.2	17.7	12.7
	35	0.969	71.9	57.6	48	36	28.8	20.6	48	38.4	32	24	19.2	13.7
D 10 45766	20	1.14	84.6	67.7	56.4	42.3	33.9	24	84.6	67.7	56.4	42.3	33.9	24
	30	1.34	99.8	79.8	66.5	49.9	39.9	28.5	66.5	53.2	44.4	33.3	26.6	19
	35	1.47	109.1	87.3	72.8	54.6	43.7	31.2	72.8	58.2	48.5	36.4	29.1	20.8



# CONE SPRAY TIP METERING CHART

(Gallons Per Acre)

CONE TIP	PSI	GPM	20" SPACING						30" SPACING					
			4 MPH	5 MPH	6 MPH	8 MPH	10 MPH	14 MPH	4 MPH	5 MPH	6 MPH	8 MPH	10 MPH	14 MPH
45680 RED														
	80	0.061	4.6	3.7	3	2.3	1.8	1.3	3	2.4	2	1.5	1.2	0.9
	100	0.073	5.4	4.3	3.6	2.7	2.2	1.5	3.6	2.9	2.4	1.8	1.4	1
45681 WHITE														
	80	0.084	6.3	5	4.2	3.1	2.5	1.8	4.2	3.4	2.8	2.1	1.7	1.2
	100	0.098	7.3	5.9	4.9	3.7	2.9	2.1	4.9	3.9	3.3	2.4	2	1.4
45682 BLUE														
	80	0.124	9.2	7.4	6.2	4.6	3.7	2.6	6.2	4.9	4.1	3.1	2.5	1.8
	100	0.14	10.4	8.3	7	5.2	4.2	3	7	5.6	4.6	3.5	2.8	2
45683 GREEN														
	80	0.18	13.5	10.8	9	6.7	5.4	3.8	9	7.2	6	4.5	3.6	2.6
	100	0.203	15.2	12.1	10.1	7.6	6.1	4.3	10.1	8.1	6.7	5.1	4	2.9
45684 YELLOW														
	80	0.217	16.2	12.9	10.8	8.1	6.5	4.6	10.8	8.6	7.2	5.4	4.3	3.1
	100	0.271	20.2	16.2	13.5	10.1	8.1	5.8	13.5	10.8	9	6.7	5.4	3.8
45685 PURPLE														
	80	0.306	22.8	18.3	15.2	11.4	9.1	6.5	15.2	12.2	10.1	7.6	6.1	4.3
	100	0.372	27.7	22.2	18.5	13.9	11.1	7.9	18.5	14.8	12.3	9.2	7.4	5.3
45686 BLACK														
	80	0.443	33	26.4	22	16.5	13.2	9.4	22	17.6	14.7	11	8.8	6.3
	100	0.504	37.6	30.1	25.1	18.8	15	10.7	25.1	20	16.7	12.5	10	7.2
45687 PINK														
	80	0.6	44.8	35.8	29.8	22.4	17.9	12.8	29.8	23.9	19.9	14.9	11.9	8.5
	100	0.706	52.7	42.1	35.1	26.3	21.1	15.1	35.1	28.1	23.4	17.6	14	10
45688 BROWN														
	80	0.763	56.9	45.5	37.9	28.4	22.8	16.3	37.9	30.3	25.3	19	15.2	10.8
	100	0.844	62.9	50.4	42	31.5	25.2	18	42	33.6	28	21	16.8	12
45689 ORANGE														
	80	0.969	72.3	57.8	48.2	36.1	28.9	20.6	48.2	38.5	32.1	24.1	19.3	13.8
	100	1.18	88	70.4	58.7	44	35.2	25.1	58.7	46.9	39.1	29.3	23.5	16.8
45690 OLIVE														
	80	1.21	90.3	72.3	60.2	45.2	36.1	25.8	60.2	48.2	40.1	30.1	24.1	17.2
	100	1.34	100.2	80.2	66.8	50.1	40.1	28.6	66.8	53.5	44.6	33.4	26.7	19.1

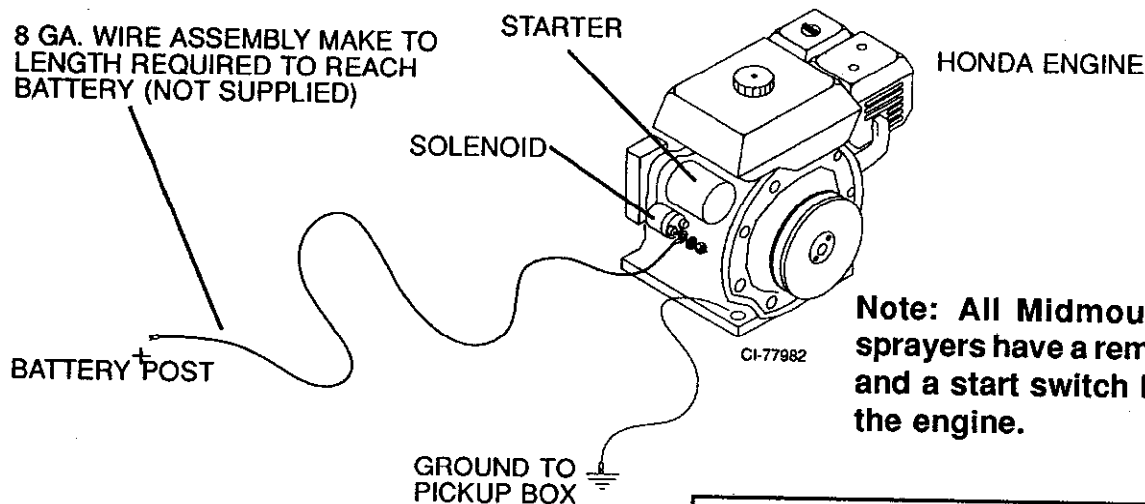
## OPERATION

**Note:** The following setup is referring to the standard RC-1B control panel. Please refer to the controls manufacturer for optional Micro-Trak or Raven control operations.

**IMPORTANT!** Engine is shipped without oil.

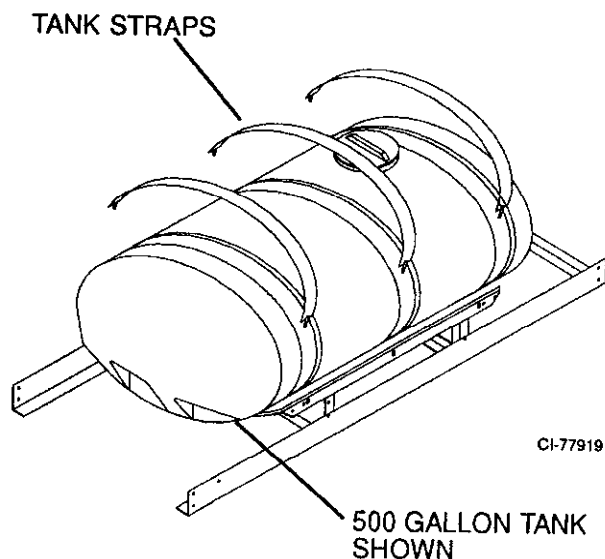
**STEP 1. Initial engine startup.** Engine must be serviced before starting. Refer to the manufacturer's operating and maintenance manual for proper procedures.

**Note:** The engine is shipped without a positive wire (8GA. minimum) assembly to the battery. This is to be supplied by the customer. A ground wire assembly is included and it must be connected to a solid ground in the pickup box (not the sprayer frame).



**Note:** All Midmount pickup sprayers have a remote starter and a start switch located on the engine.

**STEP 3. Before filling the chemical tank, check to be sure the tank straps and/or mounting hardware is secure to the tank frame. This should be done again after the first day of field use and weekly after that.**

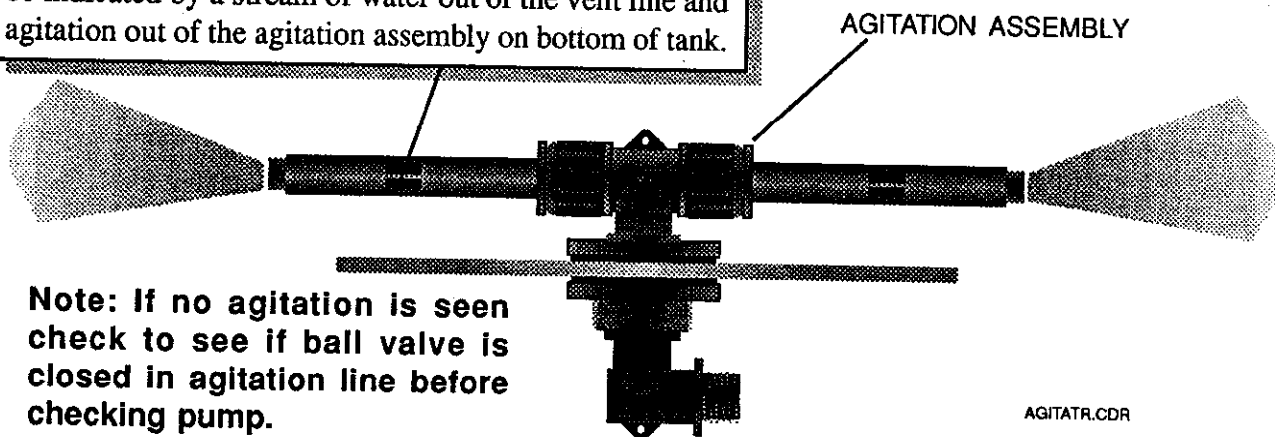


**STEP 2. Check your sprayer equipment to be sure that all components are clean and in good condition. Even if the sprayer is new or used and has been properly stored, it must be checked and tested.**

We suggest before any use new or used to wash the tank to remove dust or oil. For the initial use of the sprayer, use water only, to check hoses for holes, weathering and places that are worn. Check the pump to be certain that it turns freely. Check strainer screens. Clean and replace or repair any defective parts. Doing all of these steps with water will prevent loss of chemical and enable you to test the mechanical functions of the sprayer in a safe manner.

Centrifugal pumps need the liquid level to be above the top of the pump to create a prime. The amount to create a prime will vary with each tank size.

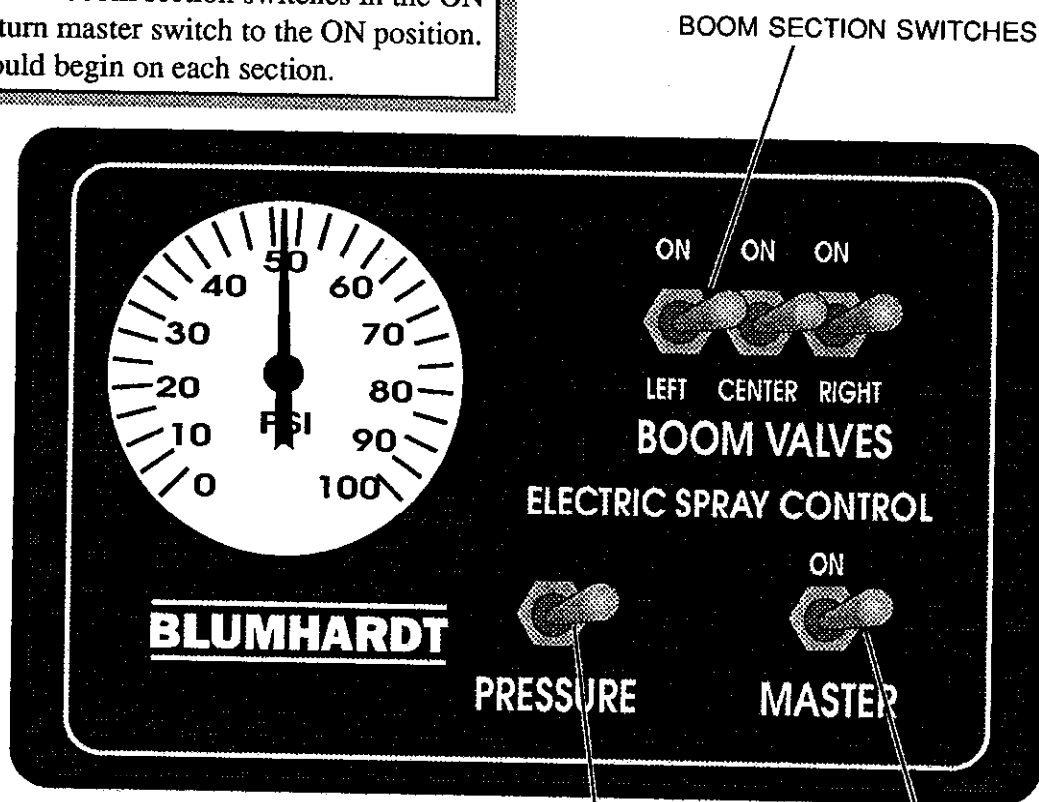
**STEP 4.** Engine running at 1/2 throttle. Refer to "Setting Engine Speed" for adjustment. Check for prime, this will be indicated by a stream of water out of the vent line and agitation out of the agitation assembly on bottom of tank.



**Note:** If no agitation is seen check to see if ball valve is closed in agitation line before checking pump.

AGITATR.CDR

**STEP 5.** With boom section switches in the ON position, turn master switch to the ON position. Spray should begin on each section.



RC-1B.CDR

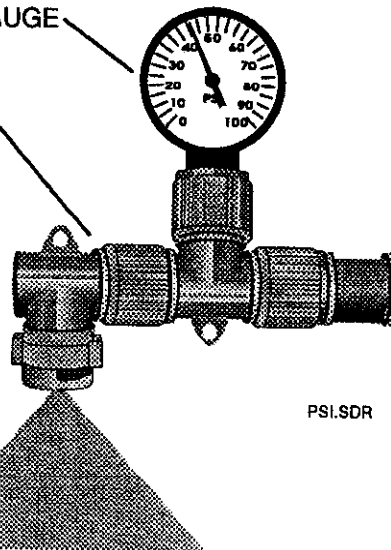
**STEP 6.** Adjust pressure using the spring loaded pressure adjustment switch. The servo valve used for bypassing liquid in the RC-1B has a full circulating butterfly valve. Once the valve goes passed full bypass it will continue around and begin acting as a throttle valve.

**STEP 7.** Set pressure at 50 PSI at RC-1B console....The reading on the console is measured at the solenoids. For an accurate pressure reading at the nozzles a remote gauge may be mounted on the nozzle(s) as shown.

**Note:** A pressure drop of 5-15 PSI is common from solenoids to nozzles. The PSI drop is caused by solenoids, line loss, fittings and nozzles. The greater the total volume the greater the PSI difference. The pressure loss is directly proportional to volume.

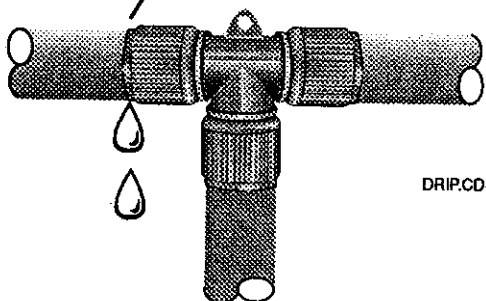
REMOTE PSI GAUGE

NOZZLE BODY



PSI.SDR

**STEP 7.** Check all connections on the boom, pump and solenoids for leaks.



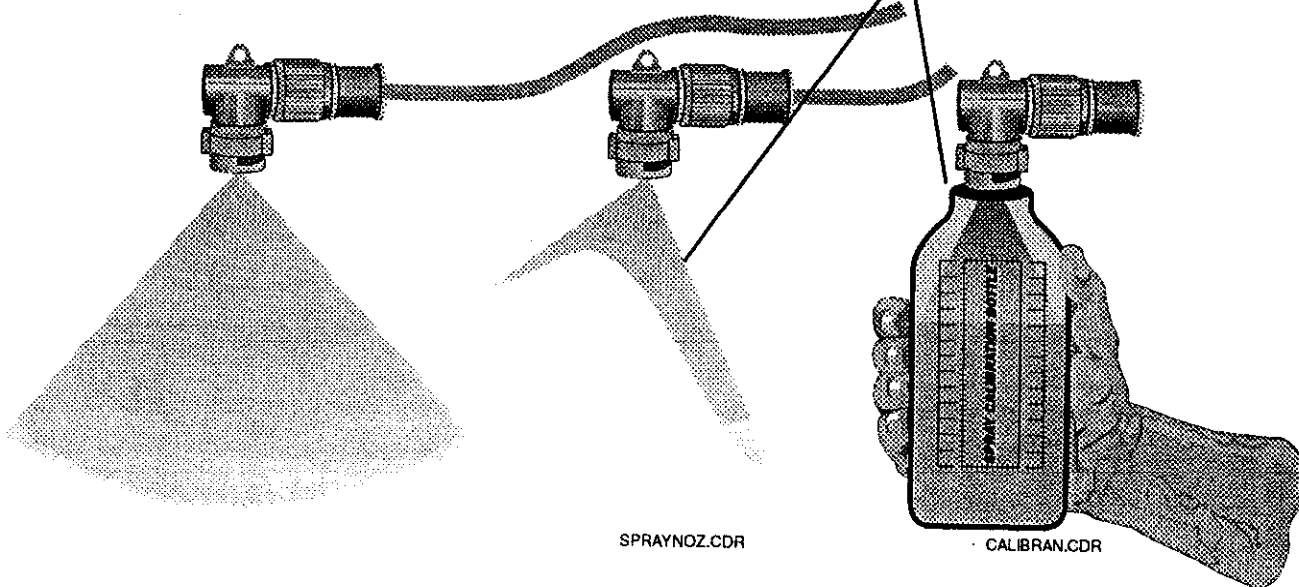
DRIP.CDR



**CAUTION**

Agricultural chemicals can be dangerous. Improper selection of use can seriously injure persons, animals, plants, soil or other property. BE SAFE. Select the right chemical for the job. Handle it with care. Follow the instructions on the container label and instructions from the equipment manufacturer.

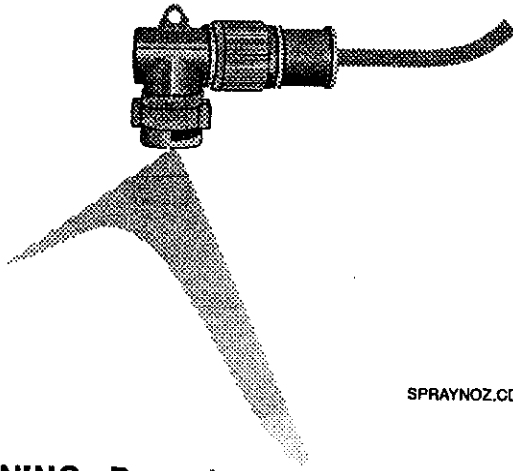
**STEP 8.** Check spray pattern and volume output of each nozzle assembly. Use the calibration bottle for volume output check. See page 22.



SPRAYNOZ.CDR

CALIBRAN.CDR

**STEP 9.** If nozzle has an irregular spray pattern. Clean screens in nozzle assemblies and clean or replace all worn tips.



SPRAYNOZ.CDR

**WARNING:** Do not use a metal probe when cleaning a nozzle orifice. Wash the tips thoroughly with water or a cleaning solution. If the orifice remains clogged or plugged, clean it with a fine bristle brush or toothpick, being careful not to damage the orifice. Rinse with water and dry. Do not attempt to clean tips by blowing through them.

**STEP 10.** Turn each boom OFF and ON to check proper function of each of the solenoid valves (spray at nozzles should shut off and on).

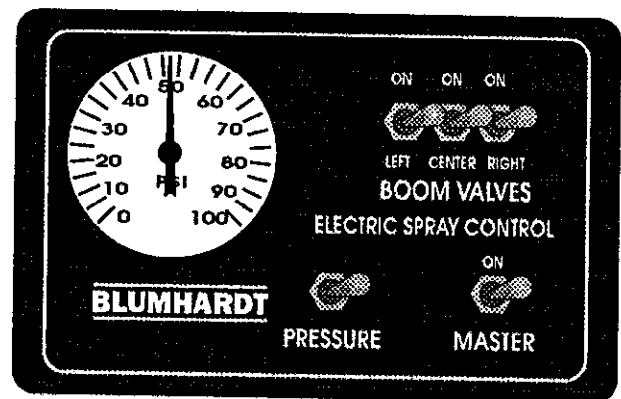
**STEP 11.** Select applicable tip and application rate for the chemical you chose. (Refer to the rate charts on page 24 & 25).

## SETTING ENGINE SPEED

**Note:** The speed of the engine needs to be set so that the required pressure can be obtained at the tips and adequate agitation occurs.

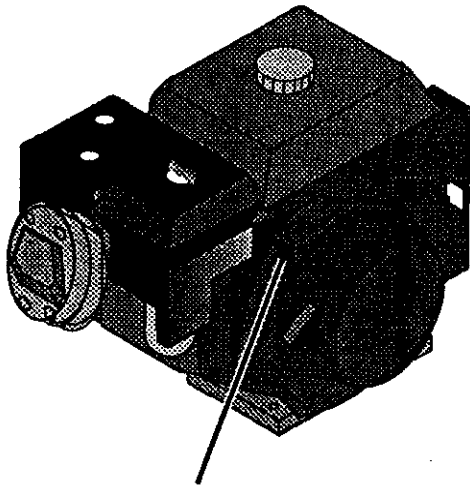
**Step 12.** Set agitation to full open.

**STEP 13.** Adjust servo valve to maximum pressure.



RC-1B.CDR

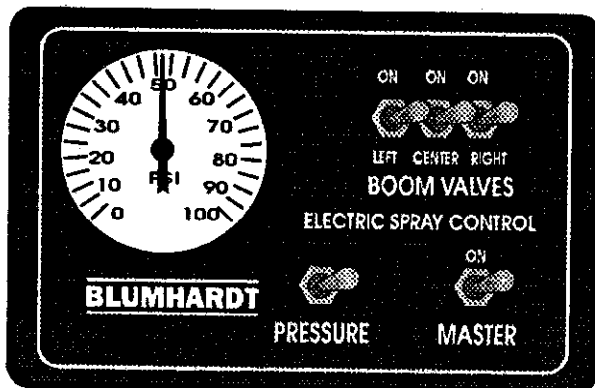
**STEP 14.** Set engine speed using throttle adjustment to the desired volume output, verify output at tips. Note the pressure reading on the console.



HONDA.CDR

THROTTLE

**STEP 15.** Increase engine speed approximately 10 PSI above pressure reading for the desired volume output.



RC-1B.CDR

**STEP 16.** Decrease pressure using the pressure adjustment switch to desired volume output, verify output at the tips. Note pressure reading on console for a reference point.

**Note:** Running the engine at a faster rate than required will result in increased agitation and decreased fuel economy.

**Note:** A pressure drop of 5-15 PSI is common from solenoids to nozzles. The PSI drop is caused by solenoids, line loss, fittings and nozzles. The greater the total volume the greater the PSI difference. The pressure loss is directly proportional to volume.

## Tank Cleaning

Tanks must be kept clean.

Materials will need to be removed before storage or mixing additional materials using incompatible formulas. Extra precaution is needed when spraying crops of different species which require different crop protection materials.

**STEP 17.** Each nozzles must now be checked for proper application rate.

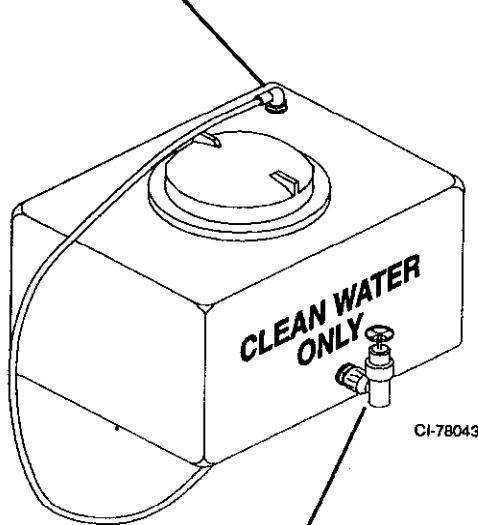
If nozzle flow rate (gpm) is higher than specified. Replace the tip.

Repeat this test for *each* nozzle.

## Clean Water Tank

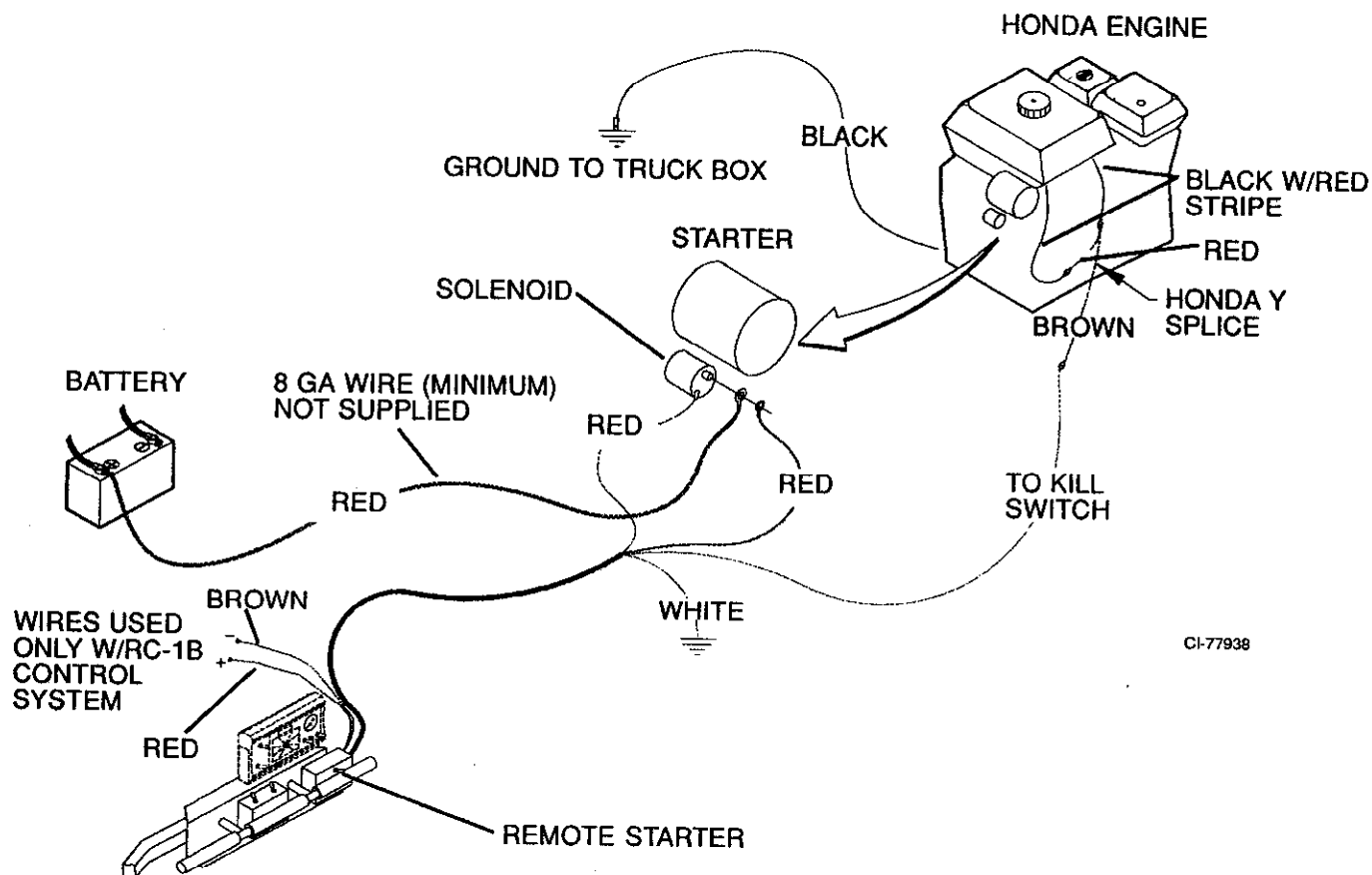
All pickup sprayers are supplied with an 8 gallon clean water tank that is mounted onto the transport lock. This tank is to be used for rinsing your hands and face in the event of contact with chemical. Do not use as drinking water.

FOR QUICK ACCESS, PULL TUBE OUT OF FITTING AND HOLD BELOW WATER LEVEL



FOR LARGER QUANTITY OF WATER, USE SPIGOT

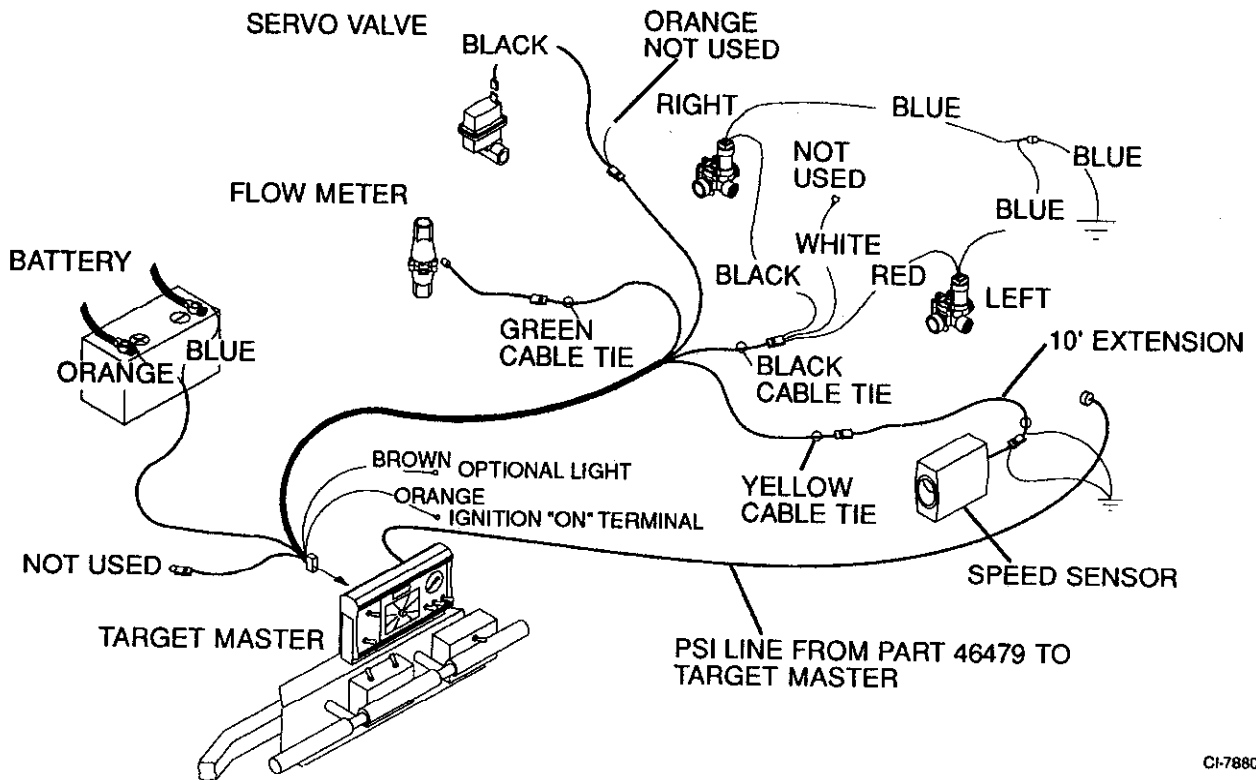
# HONDA IGNITION WIRING





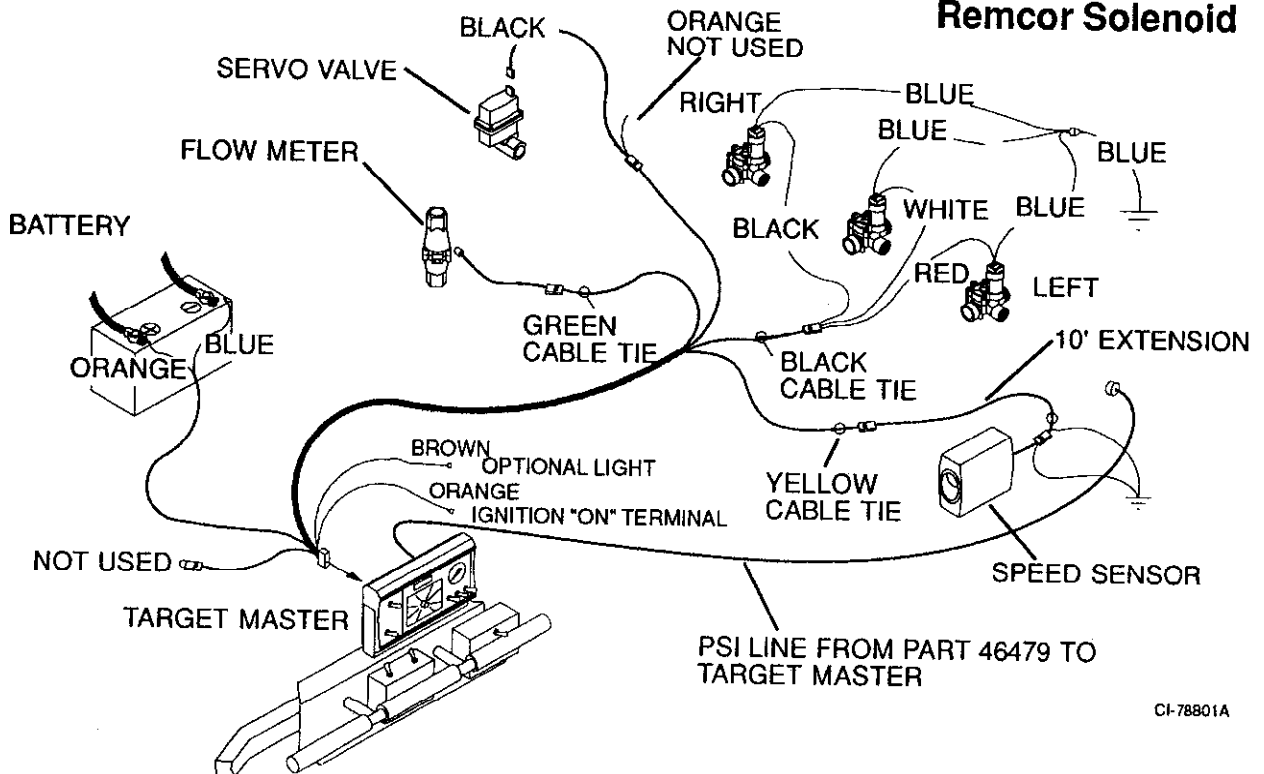
# TARGET MASTER 2 SOLENOID WIRING

Remcor Solenoid



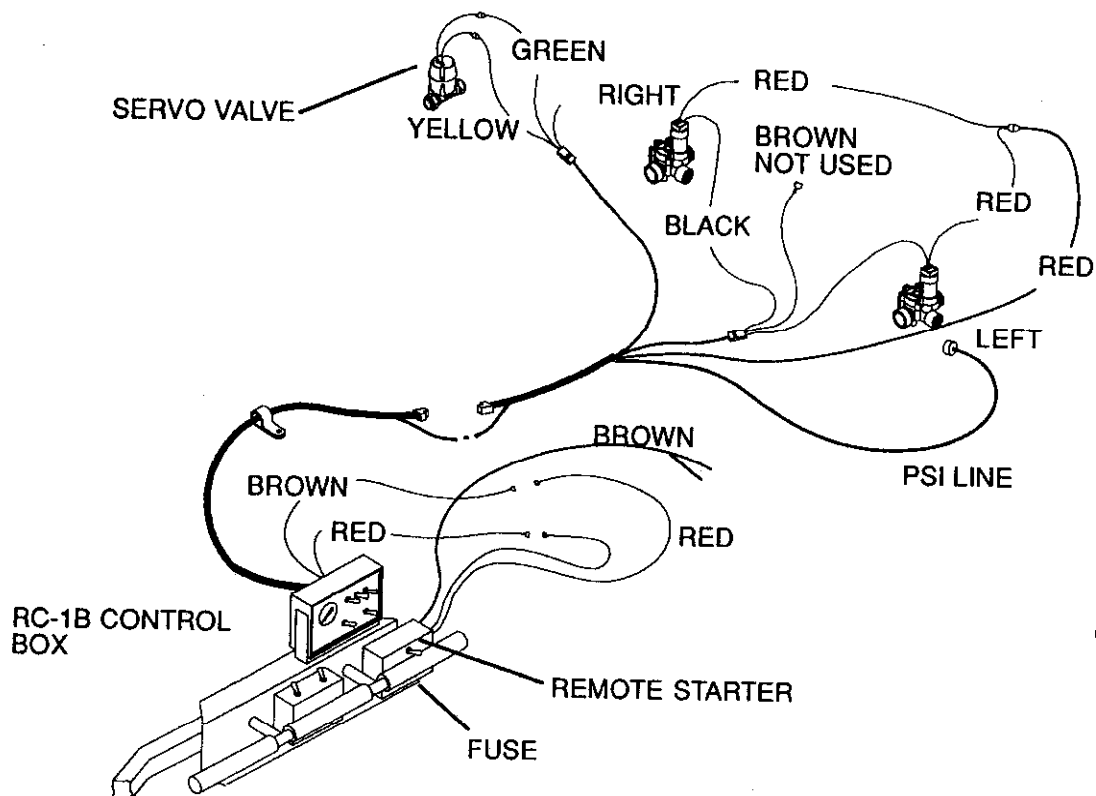
# TARGET MASTER 3 SOLENOID WIRING

Remcor Solenoid



## RC-1B 2 SOLENOID WIRING

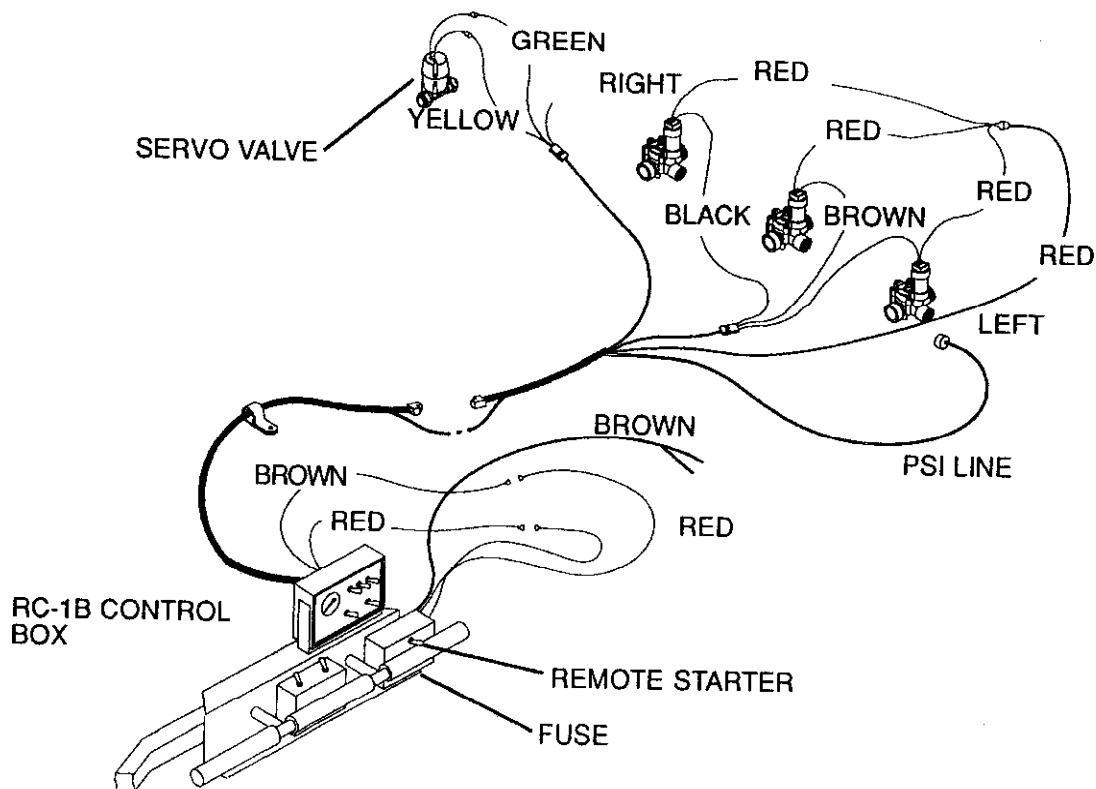
### Remcor Solenoid



CI-78801B

## RC-1B 3 SOLENOID WIRING

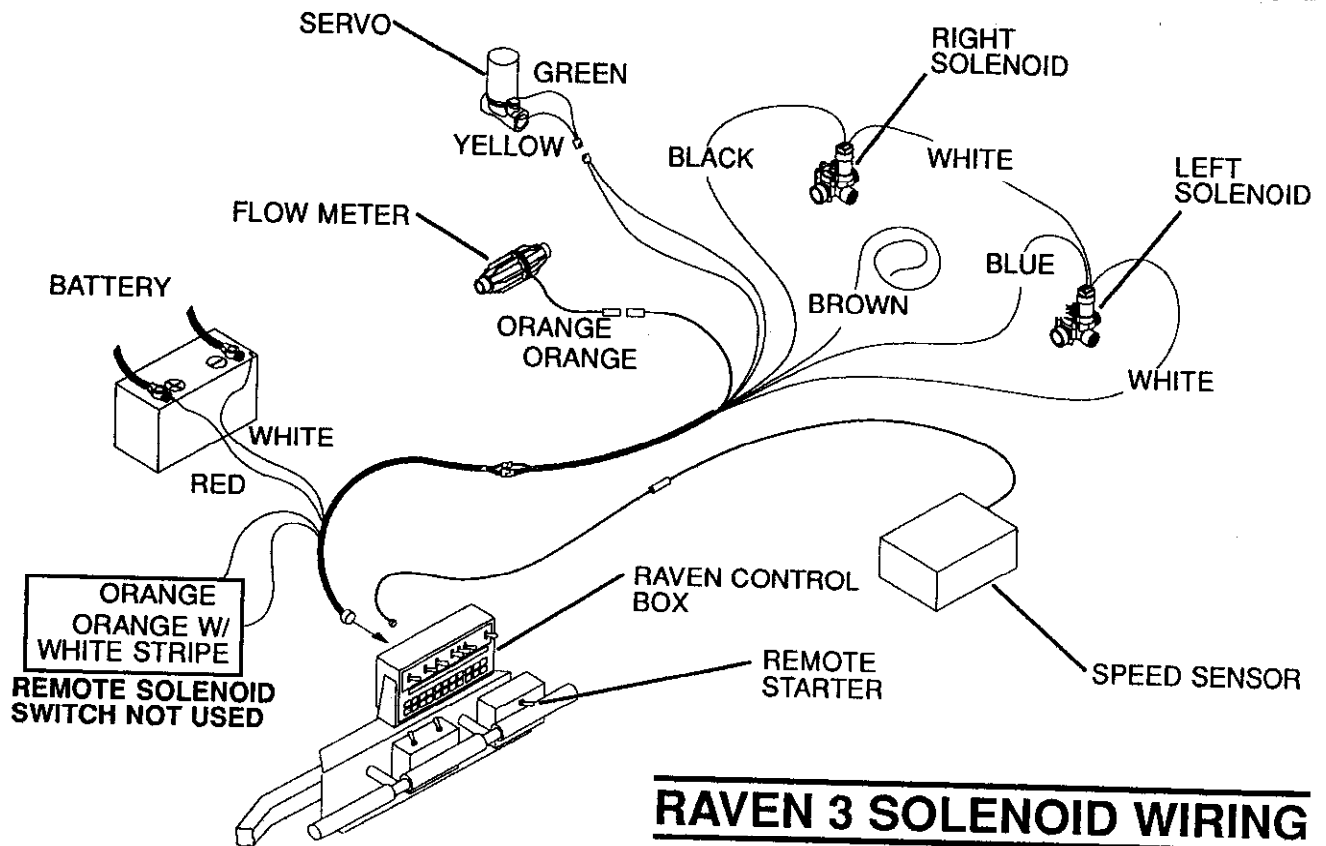
### Remcor Solenoid



CI-78801C

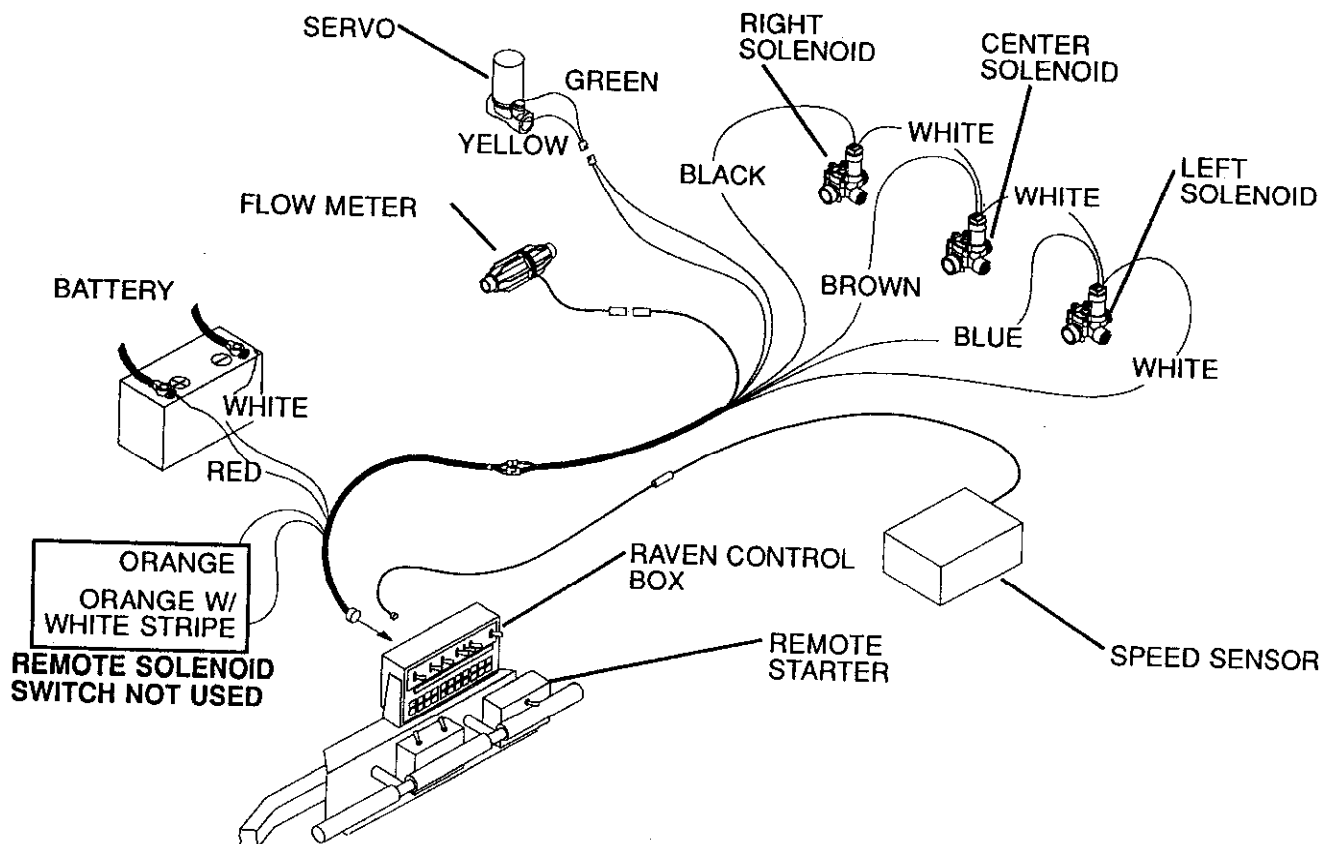
## RAVEN 2 SOLENOID WIRING

### REMCOR SOLENOID

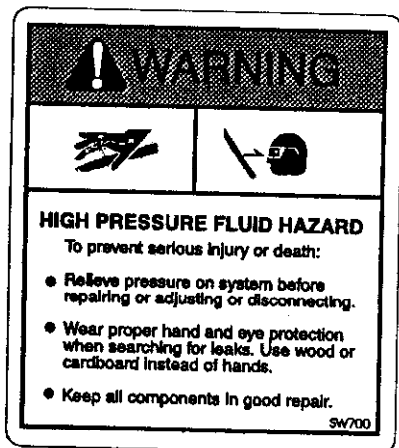
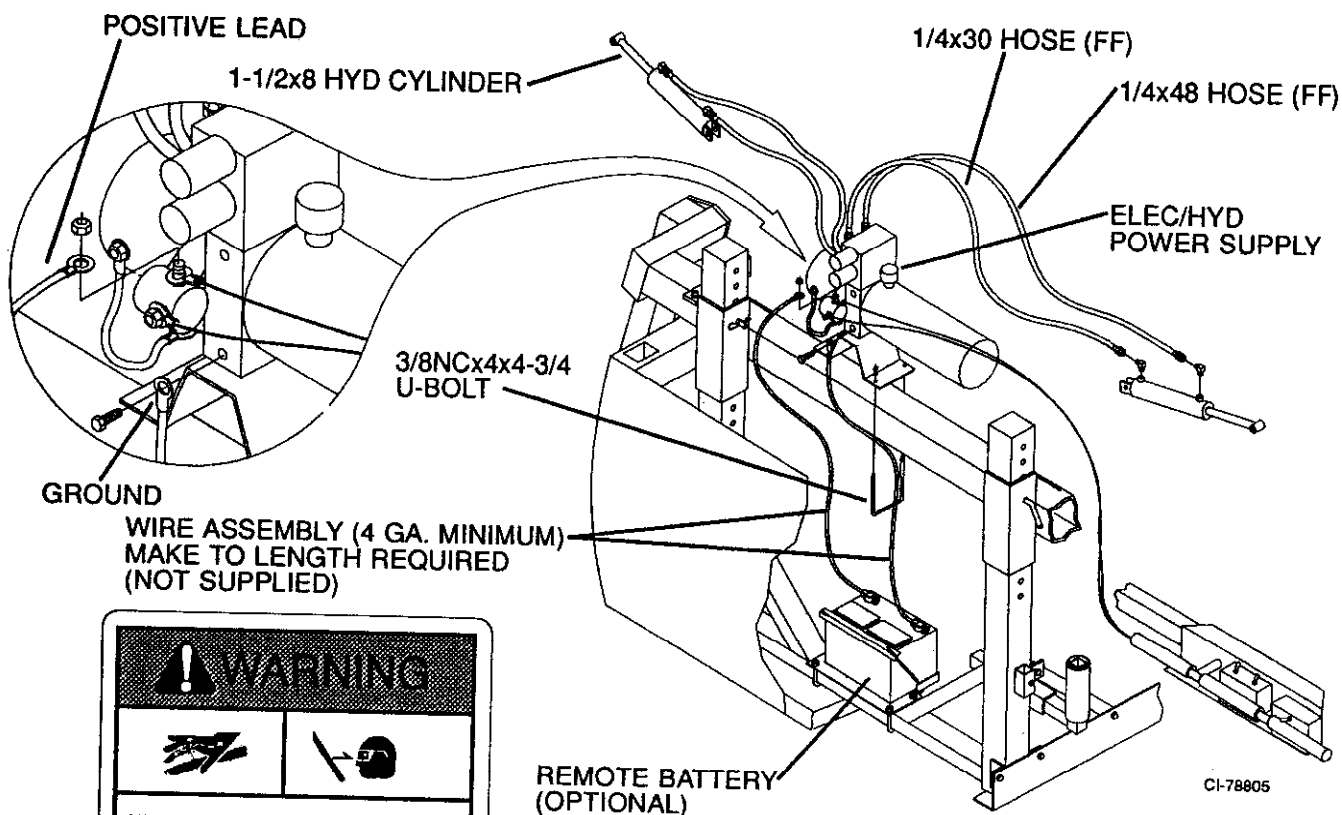


## RAVEN 3 SOLENOID WIRING

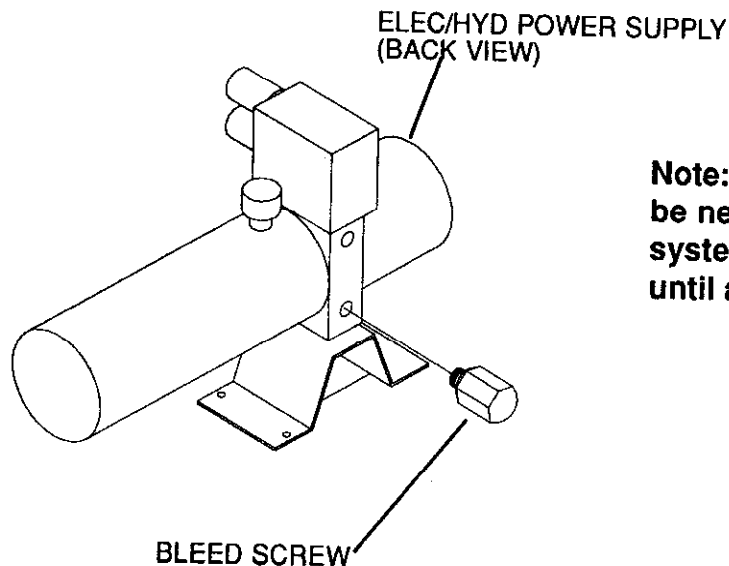
### REMCOR SOLENOID



# BOOM TILT



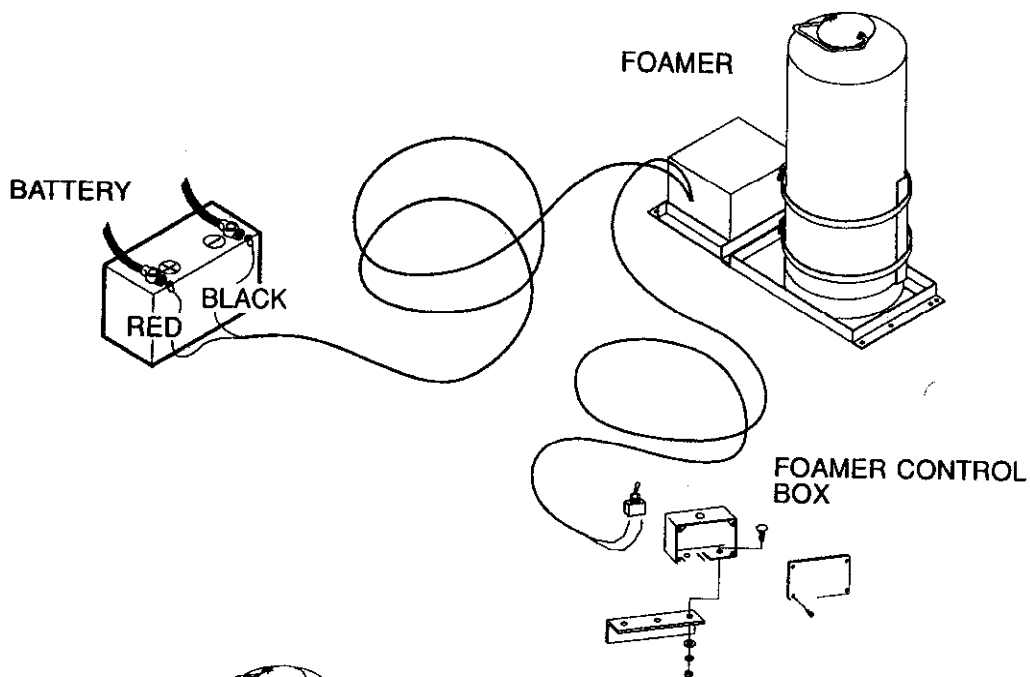
**Note:** Boom tilt pump power supply must be hooked to the pickup electrical system or use the remote battery. If the remote battery is used a wire must be run from the charging system of the pickup to keep it charged.



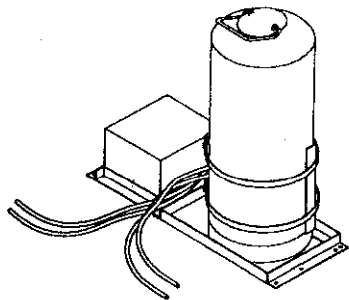
**Note:** After filling system with oil it may be necessary to purge the air out of the system. Loosen bleed screw and run unit until air is out of system.

CI-76805A

# FOAMER WIRING & ASSEMBLY



CI-77945



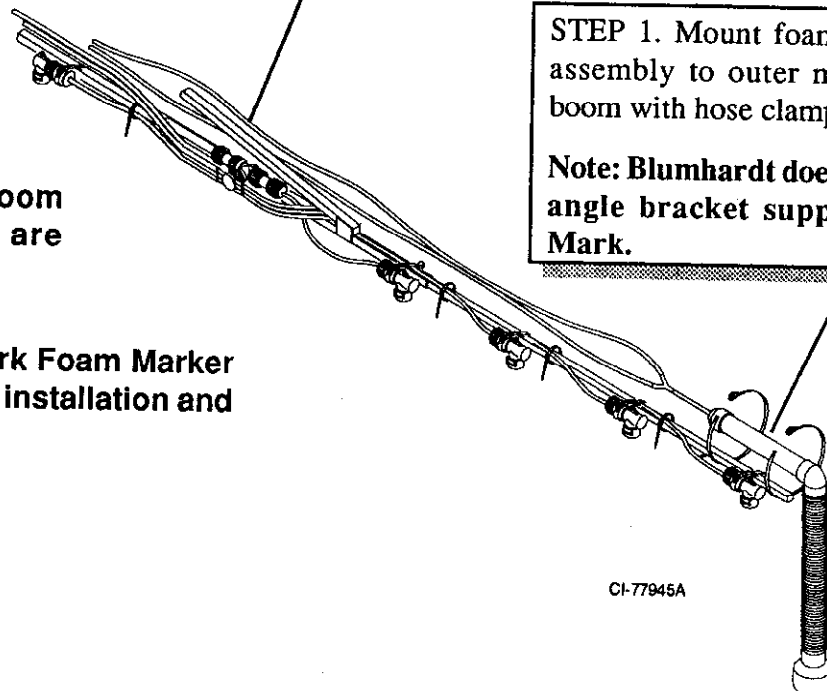
**STEP 2.** Run lines from pump solenoids to foamer assembly, nytie in place.

**STEP 1.** Mount foamer chamber assembly to outer most area of boom with hose clamps.

**Note:** Blumhardt does not use the angle bracket supplied by A-Mark.

**Note:** Only outer boom and extension are shown.

**Note:** See the A-Mark Foam Marker Owner's Manual for installation and operation.



CI-77945A

# MAINTENANCE

## Cleaning and Nightly Storage

Wash the entire sprayer as often as possible to help reduce the chemical build up on the sprayer.

Inspect plumbing daily for cracked or pinched hoses and examine each nozzle assembly for proper working order.

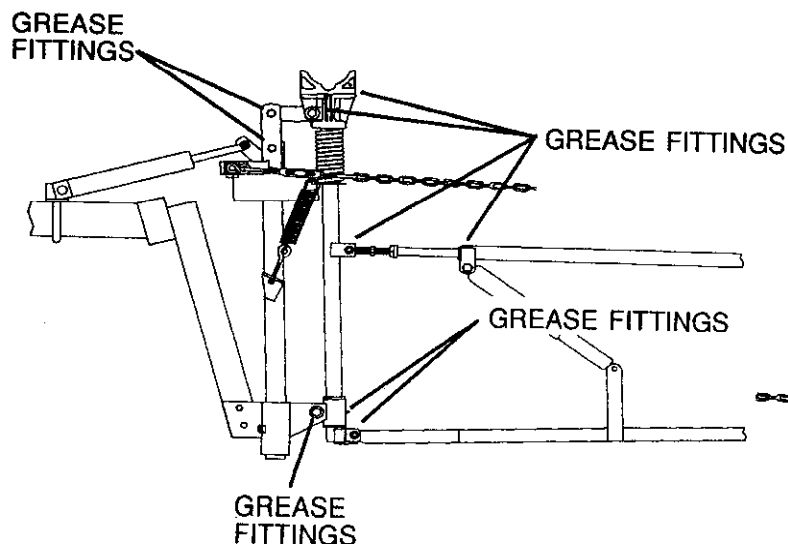
At the end of each days spraying, the entire sprayer system must be flushed with clean water.

As an added precaution when changing chemicals and before storing, the sprayer should be cleaned with household ammonia. This is added to the clean water used for flushing (1 quart per 25 gallons of water) and will neutralize most chemical used in spraying.

If the sprayer system is to be stored overnight during freezing temperatures, the entire system must be thoroughly flushed with permanent type RV antifreeze (using a 50% solution).

During periods of use with freezing temperatures or when the sprayer is to be stored, the swivel nut on all nozzles must be loosened or removed to prevent freezing and damage to the nozzles.

**Note: The above steps must be performed nightly if the sprayer is to be used during periods with freezing temperatures.**



## Lubrication

**Grease booms daily or every 10 hours.**

## Seasonal Storage

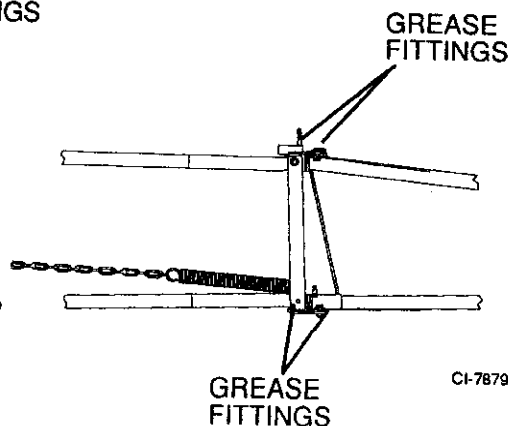
**Note: If possible store your sprayer inside.**

At the end of a season, rinse with ammonia, drain, flush with antifreeze and remove caps and tips. Clean the sprayer thoroughly to remove any trash, soil or dirty grease which could hold moisture and cause premature rusting. Repaint any chipped, bare or rusted areas to prevent any further deterioration. Inspect the machine for any worn or broken parts and adjust or replace as required.

**SEE YOUR BLUMHARDT DEALER FOR ANY PARTS AND/OR SERVICE WHICH MAY BE NEEDED.**

Thoroughly lubricate all grease fittings at the end of the season use and again before the first operation of the next season.

Note: Check with your local or county extension office, state chemical association, or chemical dealer for local laws pertaining to washing and flushing the sprayer. Run off can contaminate ground water supplies.



CI-78799A

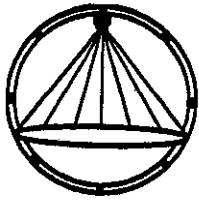
# TROUBLESHOOTING

SYMPTOMS	PROBABLE CAUSE	CORRECTIVE ACTION
No spray pressure	Pump is not primed.	Open ball valve in suction line. Fill tank to level higher than pump.
	Air vent plugged.	Check that restriction orifice at pump vent fitting at top of tank is properly installed.
	Pressure gauge not functioning.	Check connection of 1/8 pressure tube to gauge. Replace if faulty.
Low spraying pressure	Air leak in suction line.	Check for tightness and seal on all fittings in suction line strainer bowl.
	Restriction in suction line.	Check that ball valve is completely open. Clean line strainer screen.
	Pump is not at full RPM.	Tighten drive belt.
	Too much bypass from pump.	Check operation of pressure control valve. Make sure that it is properly controlling bypass. Check that restricting orifice at pump vent fitting on top of the tank is properly installed. Check that agitation orifice is installed.
Spray pressure will not adjust.	Return line is closed.	Open ball valve in return line.
	Pressure control valve is not functioning.	Check electrical connections to vehicle, control panel and valve. Check fuse, master switch and pressure switch on control panel.
One or both booms will not spray.	No pressure from pump.	Follow corrective actions listed above for a sprayer with no pressure.
	No electrical power to solenoids	Check electrical connections to vehicle, control panel and solenoid valves. Check fuse, master switch and boom switches on control panel.
	Coil assembly on solenoid not functioning.	Clean plunger, spring and inside of coil. Replace faulty coil.
	Solenoid valve not functioning.	Disassemble and clean valve and diaphragm. Replace swollen diaphragm or replace complete solenoid valve.

## **TROUBLESHOOTING**

<b>SYMPTOMS</b>	<b>PROBABLE CAUSE</b>	<b>CORRECTIVE ACTION</b>
Elec/Hyd pump does not pump	Poor or loose power connections.	Check connections on pump and battery.
Cylinder goes in or out sporadically	Pump is low on hydraulic fluid.	Fill reservoir with hydraulic fluid.
	Air in cylinder and/or lines.	Bleed air from system by loosening the bleed screw and running pump.

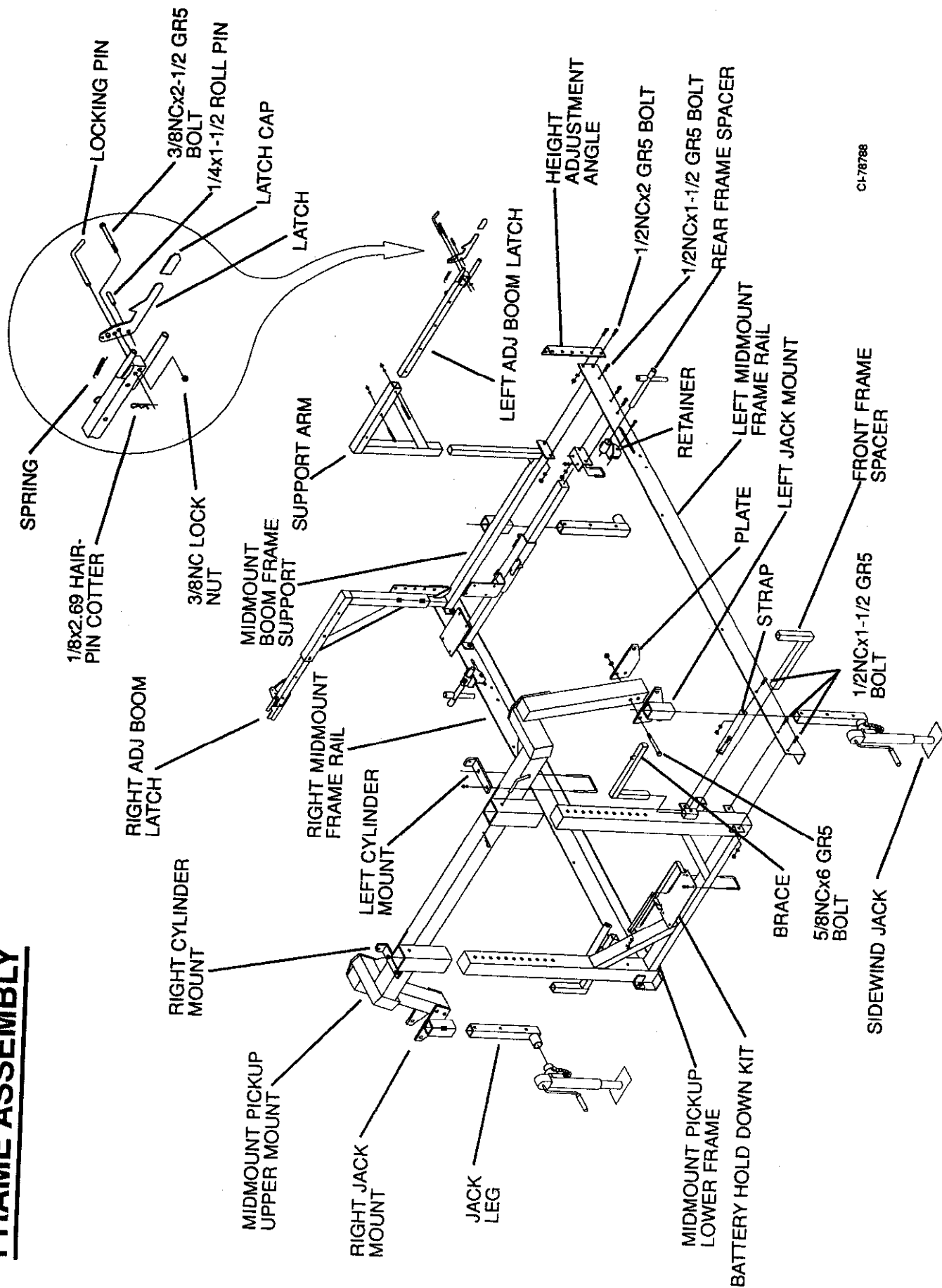




# **BLUMHARDT**

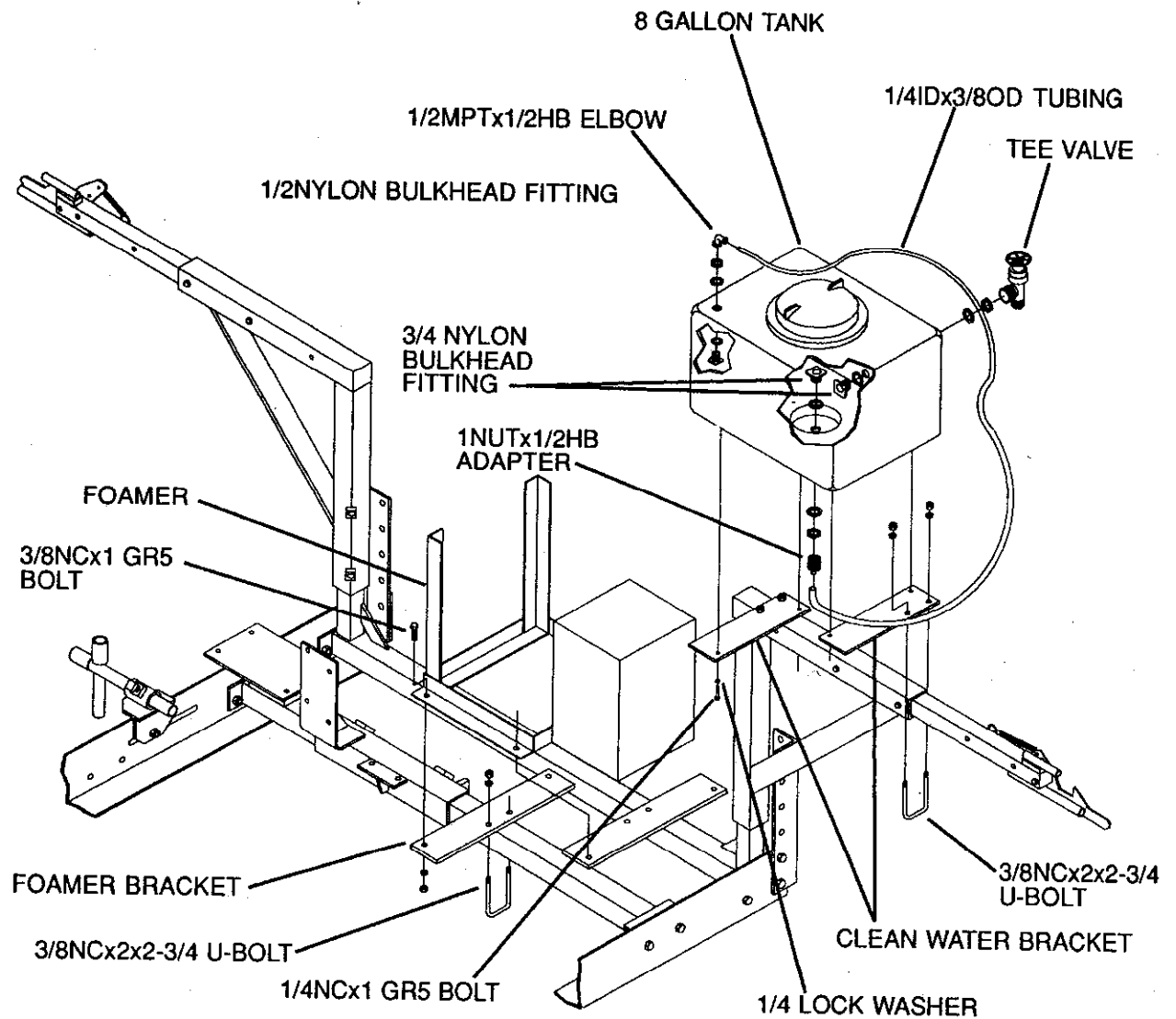
*The right way to spray*

# FRAME ASSEMBLY



CL-78788

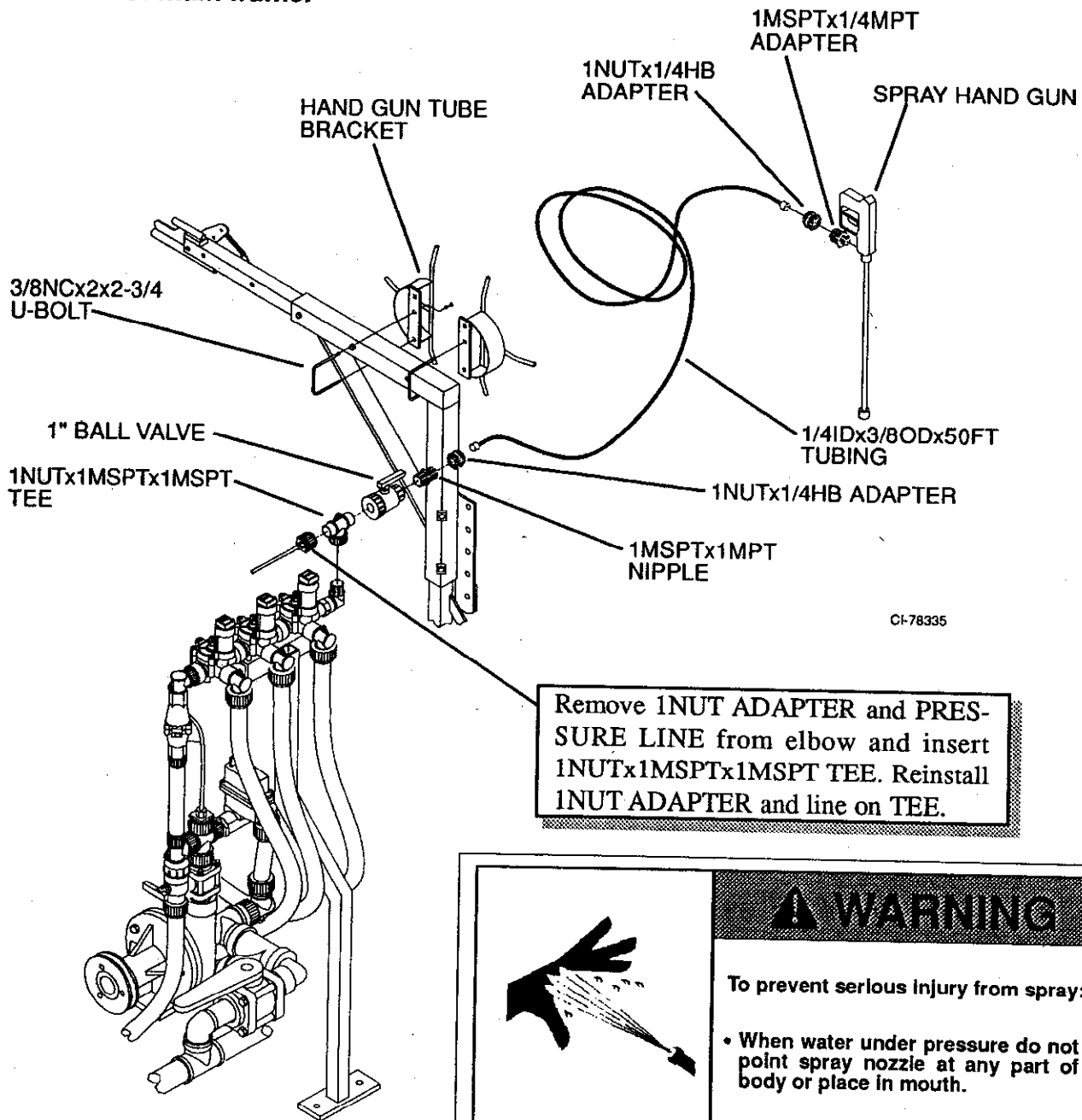
# CLEAN WATER & FOAMER ASSEMBLY



CI-78802

# CHEMICAL WAND ASSEMBLY

Note: Hand gun tube brackets can be mounted in location shown or placed on rear bar of main frame.

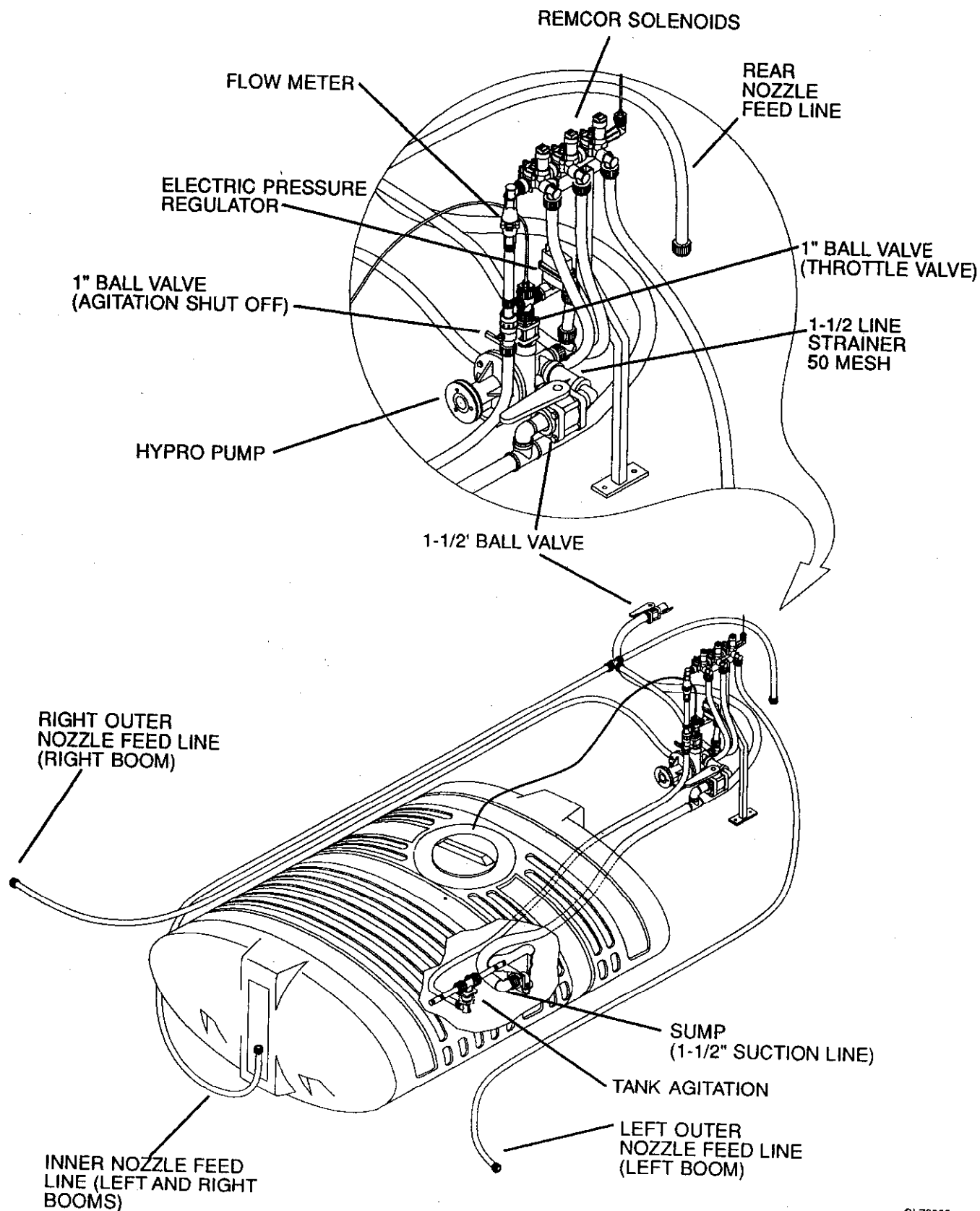


CF-78335

	<p><b>WARNING</b></p> <p>To prevent serious injury from spray:</p> <ul style="list-style-type: none"> <li>• When water under pressure do not point spray nozzle at any part of body or place in mouth.</li> </ul>
--	---

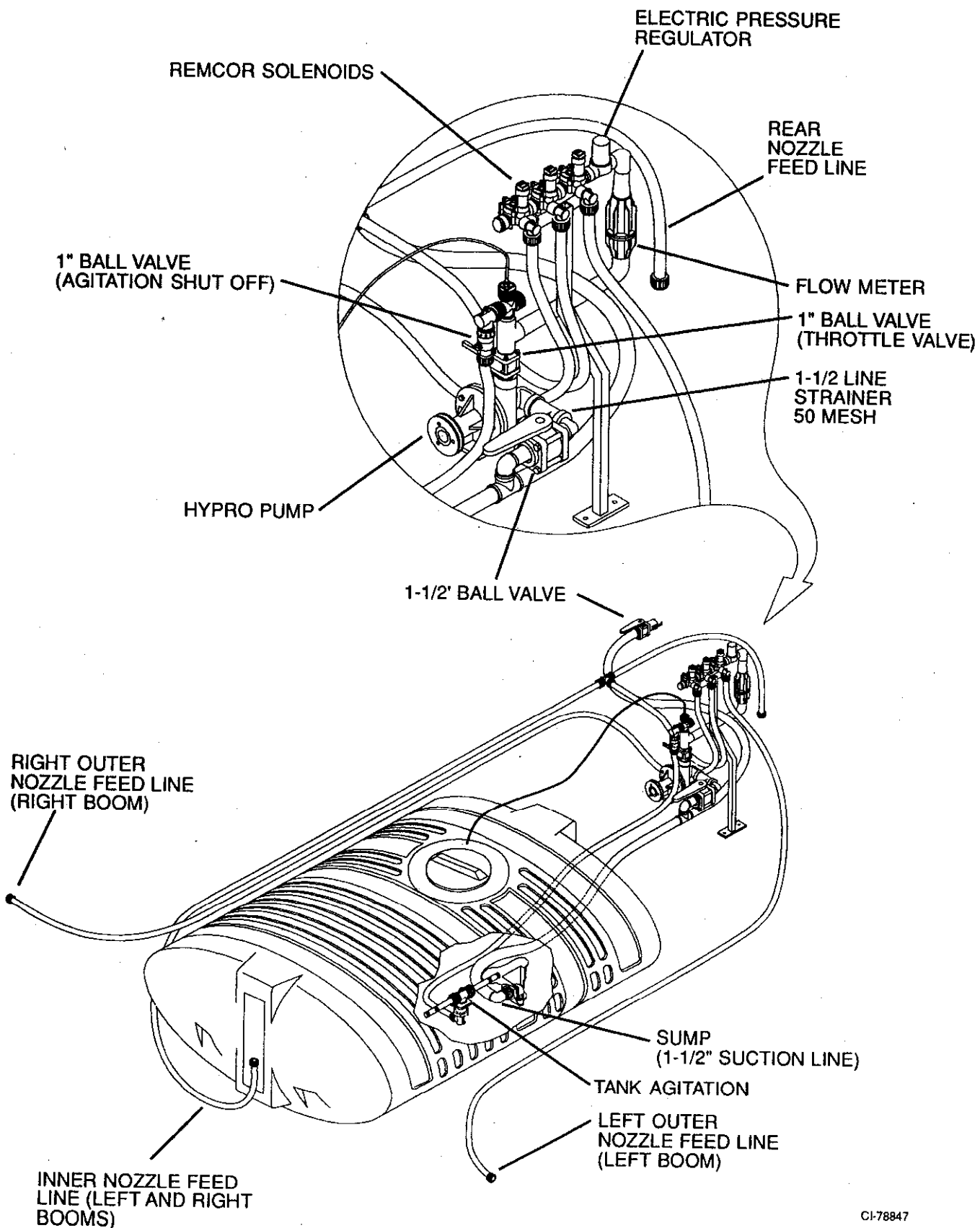
SW761

# 300 & 500 GALLON TARGET MASTER PLUMBING



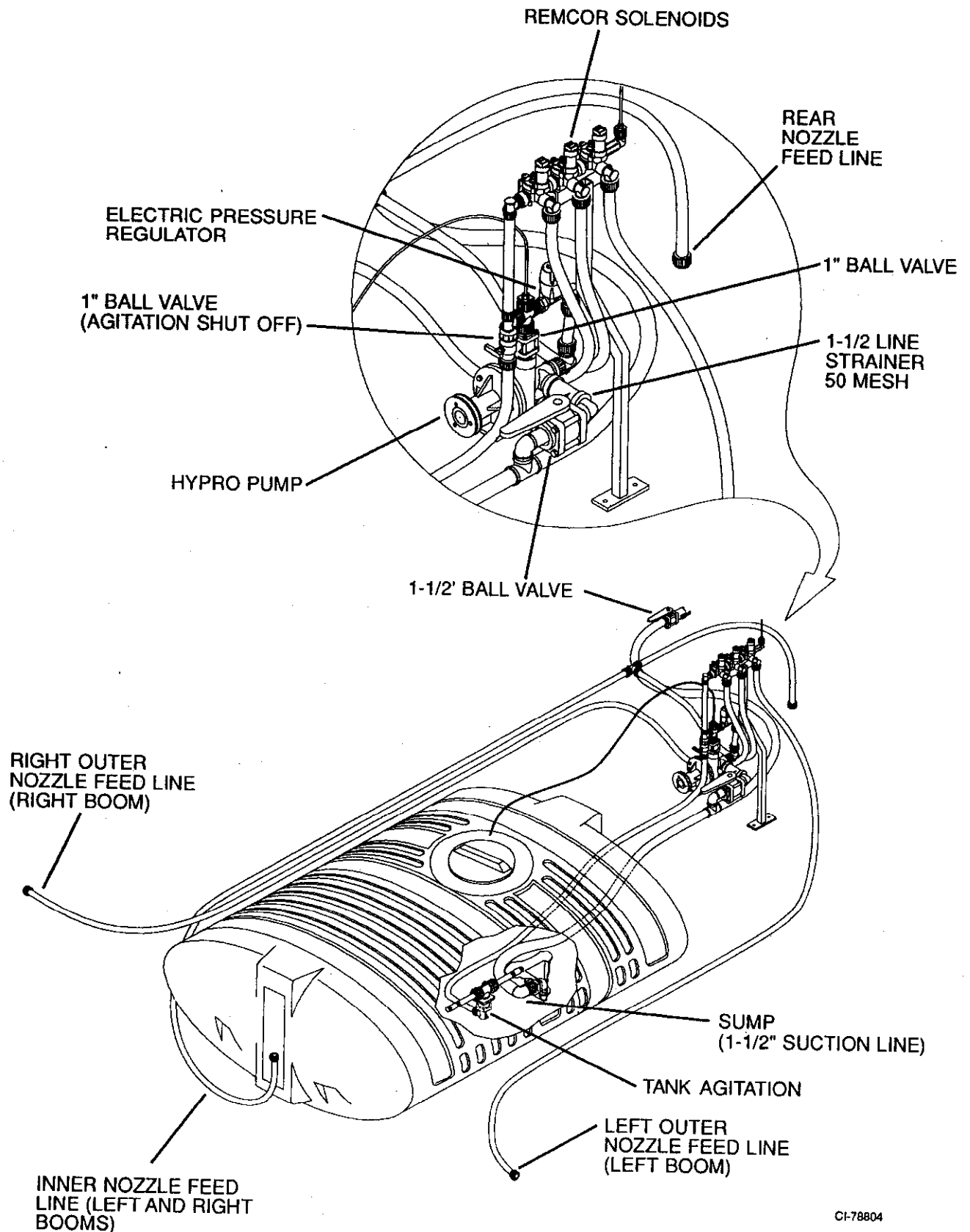
CI-78803

# 300 & 500 GALLON RAVEN PLUMBING



CI-78847

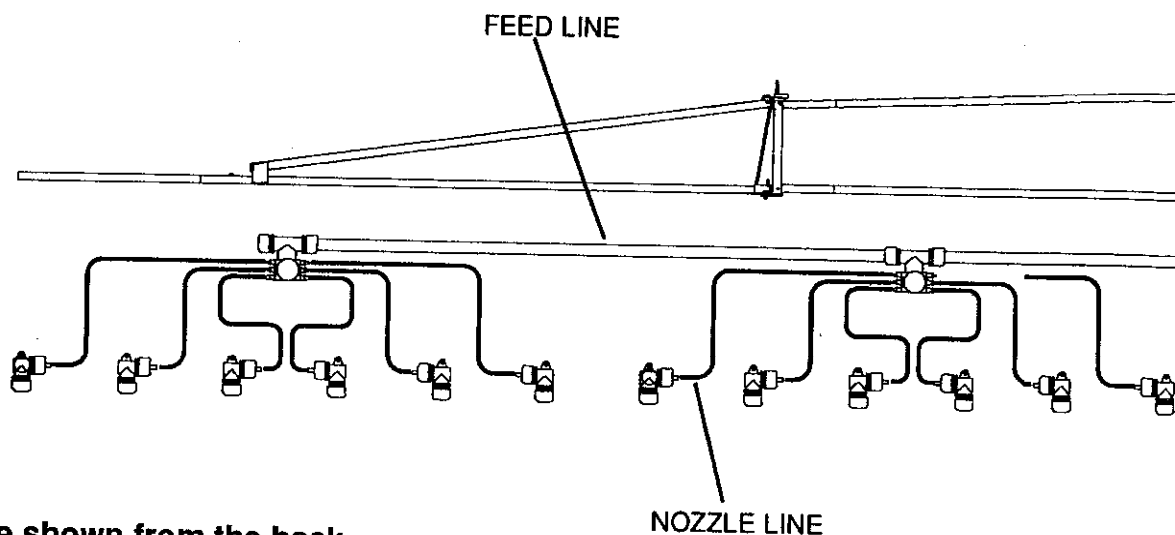
# 300 & 500 GALLON RC-1B PLUMBING



C1-78804

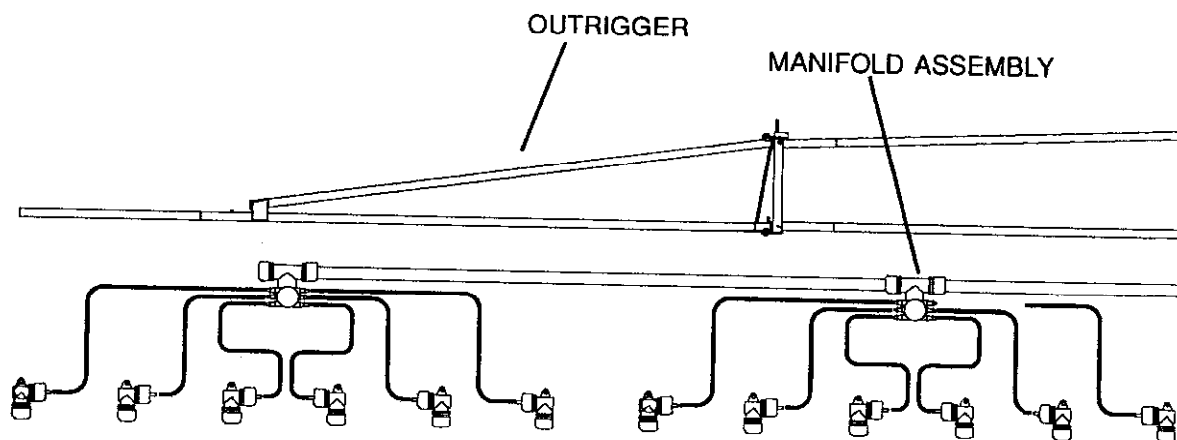
# **NOZZLE AND MANIFOLD PLACEMENT**

## **2 SECTION CONTROL 21' BOOM 20" SPACING**



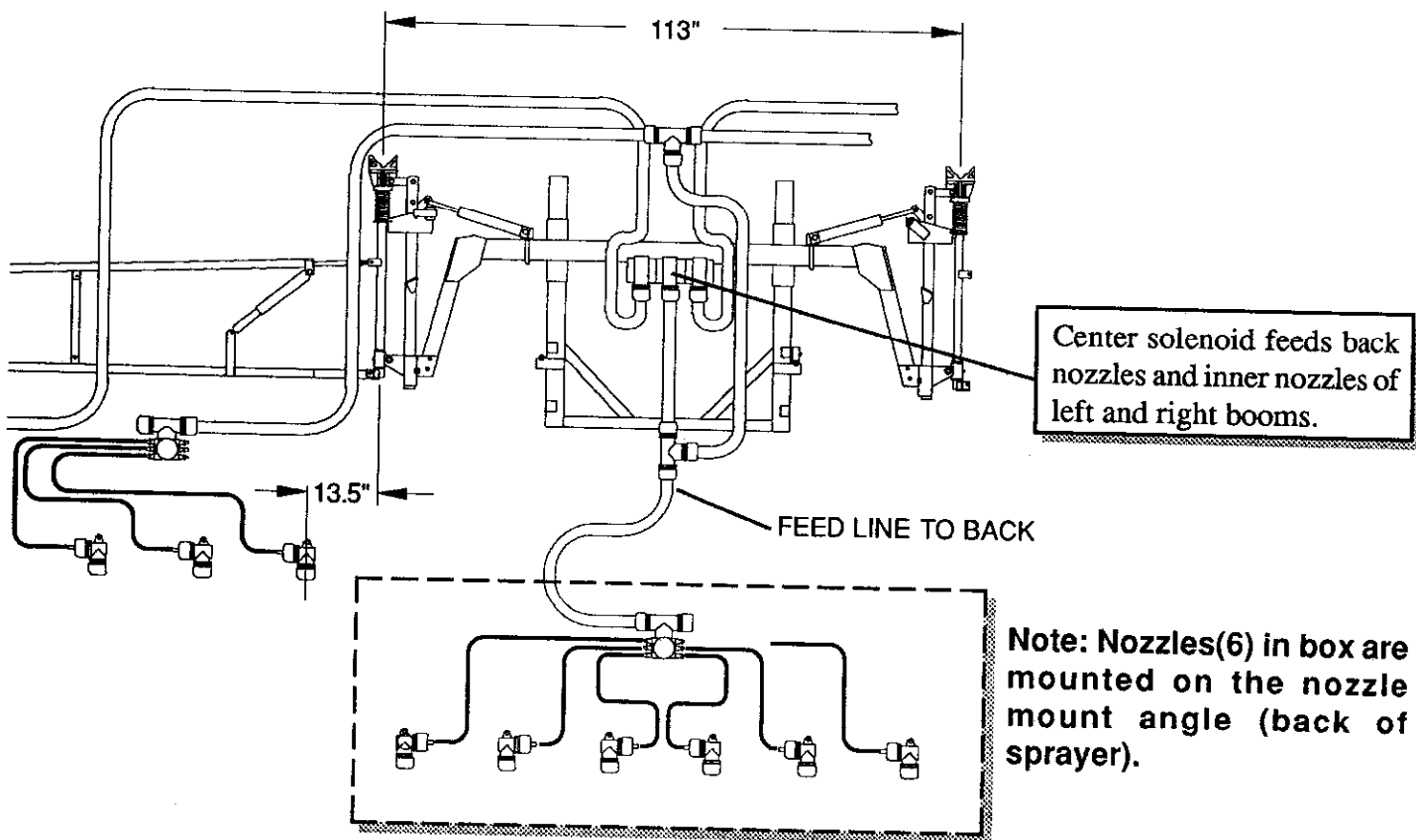
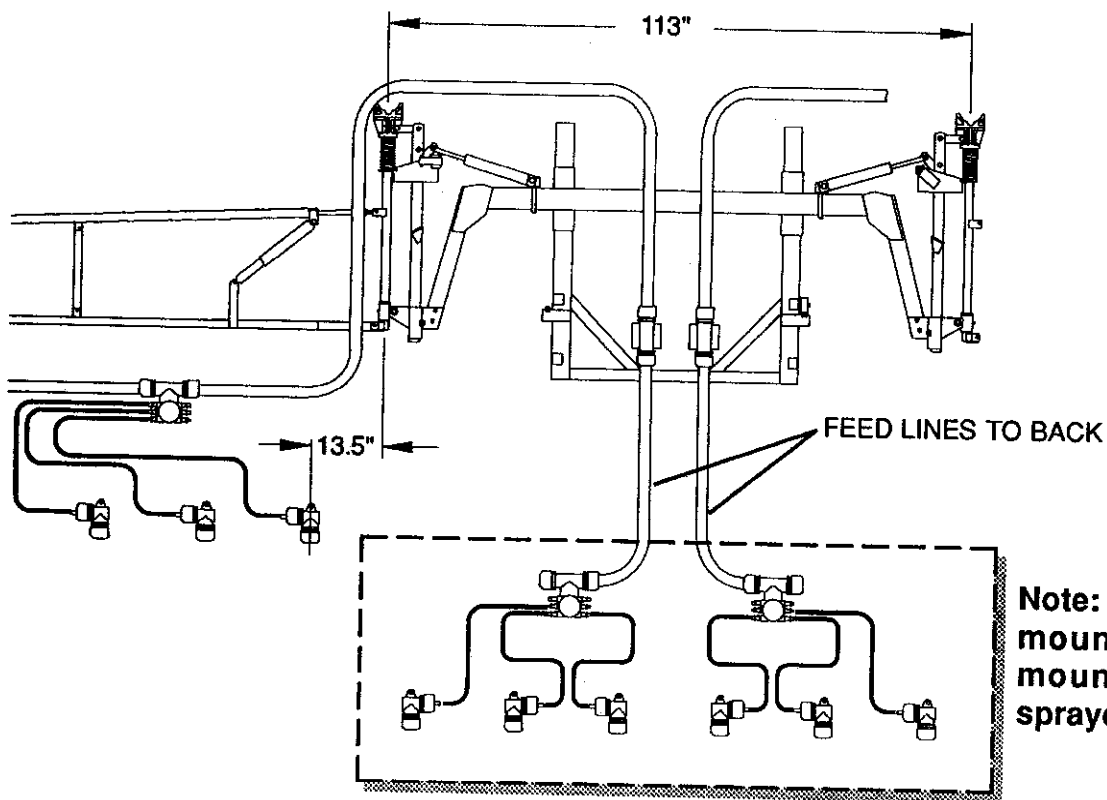
**Note: Booms are shown from the back.**  
The nozzle and manifolds have been **enlarged** for ease of viewing

## **3 SECTION CONTROL 21' BOOM 20" SPACING**



**Note: 20" nozzle spacing on the 21' Mid-mount sprayer starts with the 2 center nozzles being offset 10" off center on the rear angle (back of sprayer).**  
Some nozzles and feed lines may have to be turned around or slightly moved to clear obstructions.





# METRIC CONVERSION FACTORS

	Multiply	By	To Obtain
<b>Length</b>	inches	25.4	millimeters (mm)
	inches	2.54	centimeters (cm)
	feet	0.3048	meters (m)
	miles	1.609	kilometers (km)
<b>Area</b>	acres	4046.7	square meters (m )
	acres	0.4047	hectares (ha)
<b>Volume</b>	gallons	3.785	cubic decimeters (dm )
	gallons	3.785	liters (L)
	Imperial gallons	4.546	liters (L)
<b>Flow Rate</b>	gallons/hour (gph)	3.785	liters/hour (L/h)
	gallons/minute (gpm)	3.785	liters/minute (L/min)
<b>Appl. Rate</b>	gallons/acre (gpa)	9.353	liters/hectare (L/ha)
<b>Pressure</b>	pounds/square inch (psi)	6.895	kilopascals (kPa)
<b>Speed</b>	miles/hour (mph)	1.609	kilometers/hour (km/h)
<b>Imperial Gallon Conversion Factors</b>			
	Multiply	By	To Obtain
<b>Volume</b>	Imperial gallons	1.201	U.S. gallons
	U.S. gallons	0.833	Imperial gallons

43,560 Square Feet= 1 Acre

## Volume and Liquid Measure

8 fluid ounces = 16 tablespoons = 1 cup = 236.6 mL

2 cups = 32 tablespoons = 1 pint = 473.1 mL

2 pints = 64 tablespoons = 1 quart = 964.2 mL

4 quarts = 256 tablespoons = 1 gallon = 3785 mL

128 fluid ounces = 1 gallon = 3785 mL