

# **OPERATOR'S MANUAL**

## **BLUMHARDT SPRAYER BOOMS**

Blumhardt,  
P.O. Box 1030 Wahpeton, ND 58074  
(701) 642-2621

## 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 this 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 judgement 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 manufacturers 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 our judgement 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.

**Personal safety is important!**

**All personnel involved with the assembly and/or operation of this equipment must be informed of proper safety procedures. Operator's and assembly manuals provide the necessary information. If a manual is lost for a particular implement, order a replacement at once. Operator's and assembly manuals are available at no charge upon request.**

**Address inquires to:**

**Wil-Rich**

**P.O. Box 1030**

**Wahpeton, ND 58074**

**PH (701) 642-2621 FAX (701) 642-3372**

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## TO THE OWNER

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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 of the product and to lubricate and maintain the product according to the information outlined in the Operator's Manual.

The user is responsible for inspecting his machine, and for having parts repaired or replaced when continued use of the 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; special information such as specifications, techniques, reference information, safety practices, and other information of supplementary nature.

<b>BLUMHARDT EQUIPMENT</b>	
Model No.	<input type="text"/>
Serial No.	<input type="text"/>
<b>ASHLEY, ND 58413</b>	

48396

When in need of parts, always specify the model and the serial number. Write this number in the space provided. The serial number plate is located on each boom.

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## MODIFICATIONS

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It is the policy of Blumhardt Equipment to improve its product whenever possible and practical to do so. We reserve the right to make changes, improvements, and modifications at any time without incurring the obligation to make such changes, improvements, and modifications on any equipment sold previously.

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## CONTENTS

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Safety . . . . .	1
Preparation . . . . .	2
<b>Boom Installation</b>	
Boom Lift Options . . . . .	3-4
Boom Arms . . . . .	5
Boom Extensions . . . . .	6
Rigging the Booms . . . . .	7-8
<b>Booms</b>	
Folding & Unfolding . . . . .	9-10
Application Rates . . . . .	11
Calibration . . . . .	11-12
Cone Spray Tip Metering Chart . . . . .	13
Flood Tip Calibration Chart . . . . .	14
Flodd Tip Calibration . . . . .	15
<b>Components</b>	
Boom Post Assembly . . . . .	16
10' Boom Assembly . . . . .	17
16' Boom Assembly . . . . .	18
21' Boom Assembly . . . . .	19
33' Boom Assembly . . . . .	20
Boom Hinge . . . . .	21
Boom Lift . . . . .	22
Boom Manifolds . . . . .	23
Metric Conversion . . . . .	24

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## SAFETY

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Safety decals appear at various locations on your machine. These decals are provided for your safety and must be kept clean. Replace any decal that becomes worn, damaged, painted over or otherwise difficult to read. Replacement decals are available through your Blumhardt dealer.

Hydraulic fluid escaping under pressure can have enough force to penetrate the skin. Hydraulic fluid may also infect a minor cut or opening in the skin. If injured by escaping fluid, see a doctor at once. Serious infection or reaction can result if medical treatment is not given immediately. Make sure all connections are tight and that hoses and lines are in good condition before applying pressure to the system. Relieve pressure before disconnecting the lines or performing other work on the hydraulic system. To find a leak under pressure use a small piece of cardboard or wood. *Never use your hands.*

### BEFORE OPERATING

Use extreme care when making adjustments.

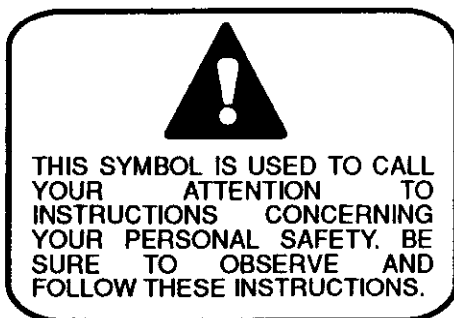
When hitching the sprayer to the tractor, do not allow anyone to get between the tractor and the sprayer.

When hitching or unhitching, come from behind the sprayer to get to the hitch pins.

When lubricating or working on the sprayer, make sure it is resting on the ground. If it is in a raised position, the sprayer should have proper supports under the tool bar to prevent the machine from falling.

After servicing, make sure all tools, parts, and servicing equipment has been removed from the sprayer.

Make sure that there is no one near the machine just before operating and during operation.



### DURING OPERATION

Reduce speed when cornering on field ends and when operating on or across dead furrows.

Do not attempt to remove any obstruction while the sprayer is in motion.

Use extreme care when operating close to ditches, fences, or on hillsides.

When using with a 3PT sprayer no one other than the operator should ride on the tractor.

Before and during operation be sure no one is on or around the implement. Serious injury can result from improper use.

When using with a 3PT sprayer always set the parking stand(s) on a firm surface before unhitching the implement from the tractor.

Use safe operating practices at all times.

### ON-HIGHWAY OPERATION

Be sure that all safety lights and/or reflectors are wiped clean before transporting.

The implement must always be placed in the transport position and the booms locked when traveling on public roads.

**NOTE:** Use extreme caution when working around overhead power transmission lines.

Always place the machine in the transport position.

Comply with your state and local laws governing highway safety when moving machinery on a highway.

Reduce road speed on corners.

Drive at a reasonable speed to maintain complete control of the machine at all times.

A S.M.V. emblem should be used at all times while traveling on public roads.

## PREPARATION

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.

Tighten all loose nuts and bolts and replace any bent or broken parts.

When tightening bolts, they must be torqued to the proper number of foot-pounds as indicated in the table unless otherwise 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.



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
UNC GRADE	2	18	45	89	160	252
	5	30	68	140	240	360
	8	40	100	196	340	528
UNF GRADE	2	21	51	102	178	272
	5	32	70	168	264	392
	8	48	112	216	368	792

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When replacing a bolt use only a bolt of the same grade or higher.

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.

## LUBRICATION

Gease booms daily or every 10 hours.

# BOOM INSTALLATION

## BOOM LIFT OPTIONS

Insert stub into 4" center frame until it stops at the tab of the stub and lock in place.

Reference dimensions are shown for the different lift bracket and boom support arm tube combinations. An angle finder template is supplied to find an exact boom post setting. (See figure 2.) (Always set with the cylinder or actuator fully extended.)

The lift bracket should be positioned so the boom support arm is angled slightly inward. An angle finder template (provided) is used as a guide between the center tube and the boom support arm. The boom support arm should then be tilted inward until it matches the angle finder template. (see figure 2.)

When the correct angle is found, tighten the u-bolt on the lift bracket.

The following dimensions are for reference only and are only used to get all components in the general area before final measurements.

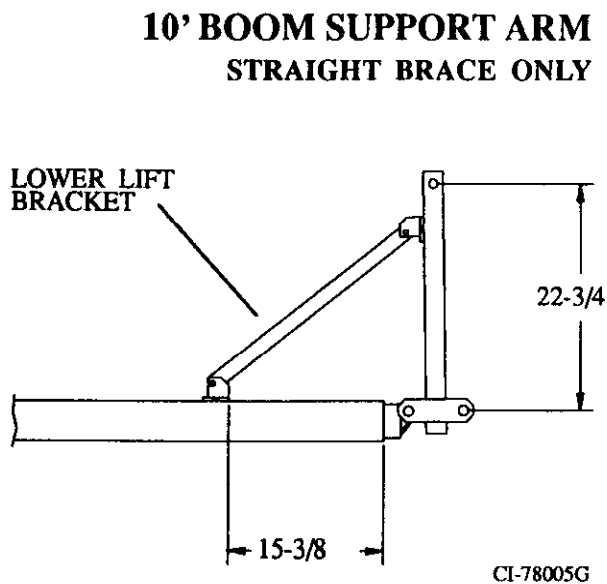


Figure 1

## 16' BOOM SUPPORT ARM STRAIGHT BRACE

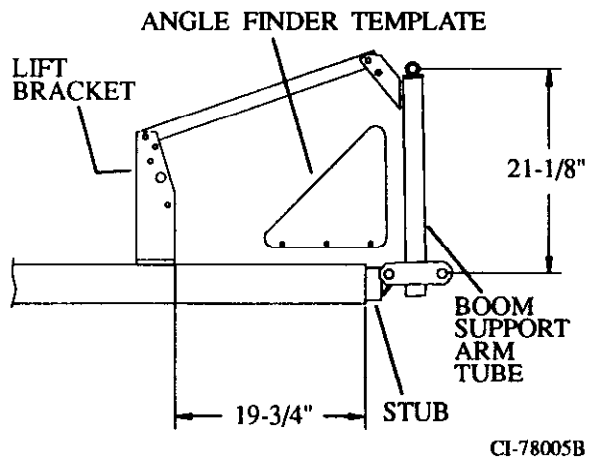


Figure 2

## 16' BOOM SUPPORT ARM HYDRAULIC

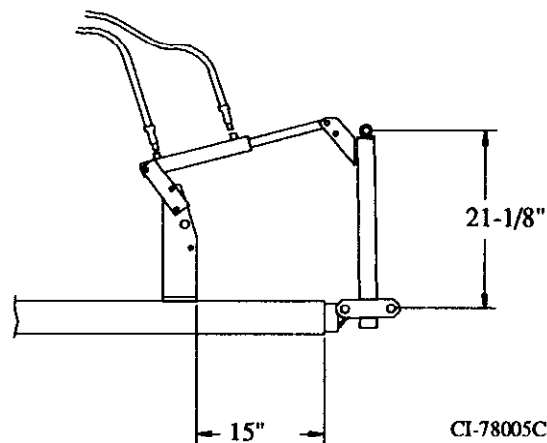


Figure 3

**21' BOOM SUPPORT ARM  
ELECTRIC ACTUATOR**

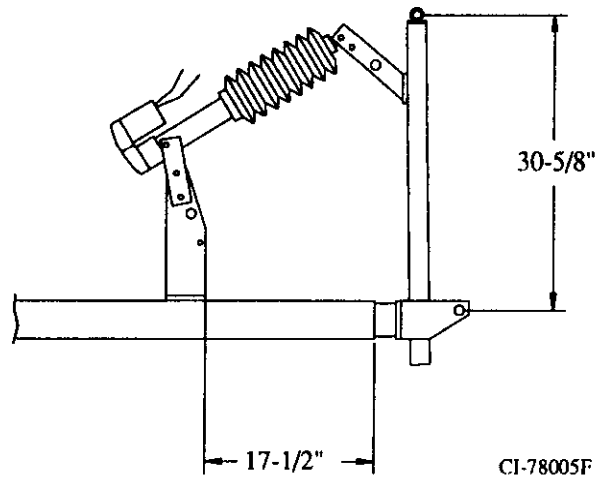


Figure 4

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**21' BOOM SUPPORT ARM  
HYDRAULIC**

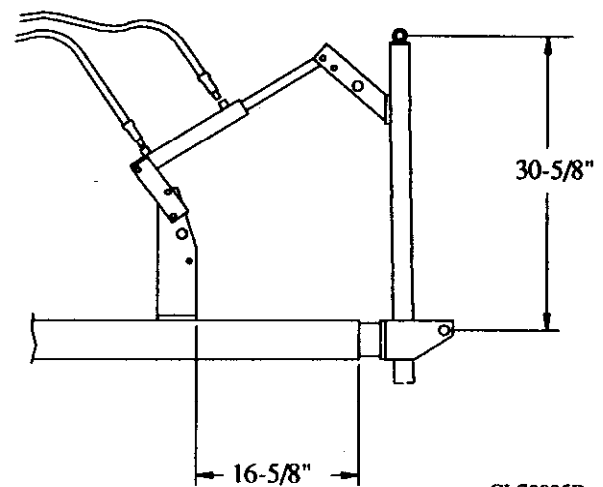


Figure 7

CI-78005D

**16' BOOM SUPPORT ARM  
ELECTRIC ACTUATOR**

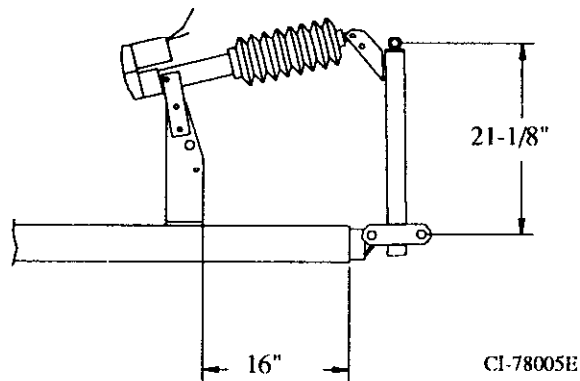


Figure 5

CI-78005E

**21' BOOM SUPPORT ARM  
STRAIGHT BRACE**

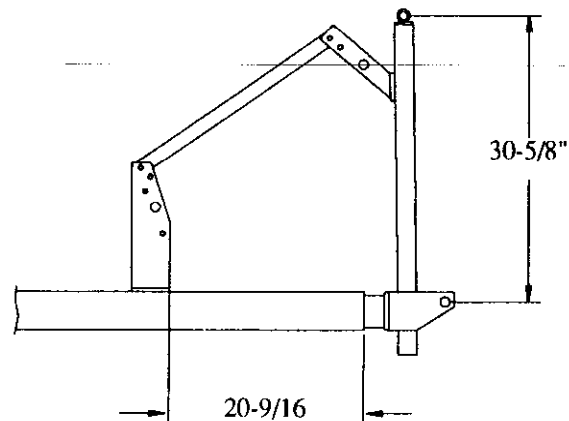


Figure 6

CI-78005

**33' BOOM SUPPORT ARM  
ELECTRIC ACTUATOR**

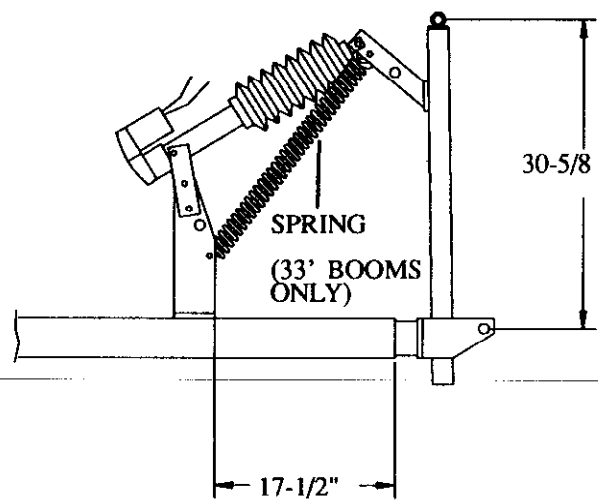


Figure 8

CI-78005H



## BOOM ARMS

Blumhardt has 4 sizes of boom arm available. They are the 10' standard flotation and 16', 21' and 33' parallel flotation booms. The sizes stated are for the main boom/outrigger assembly and do not include the boom extensions.

The center section is measured from the center of the left boom post to the center of the right boom post. (See figure 9.)

The booms are measured from the center of the boom post to the end of the outrigger. (See figure 10.)

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

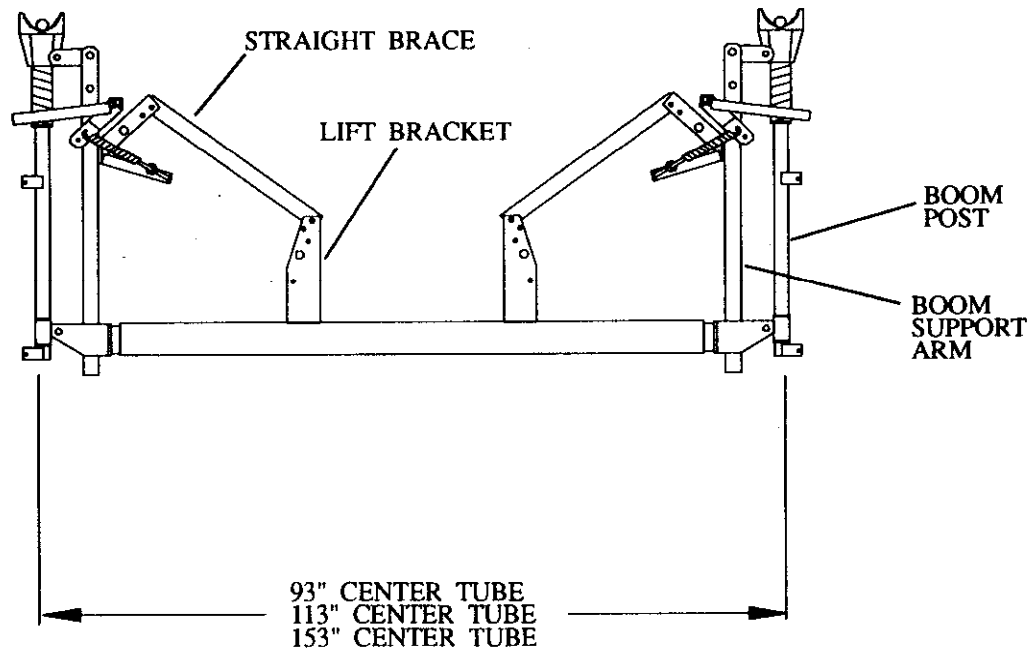


Figure 9

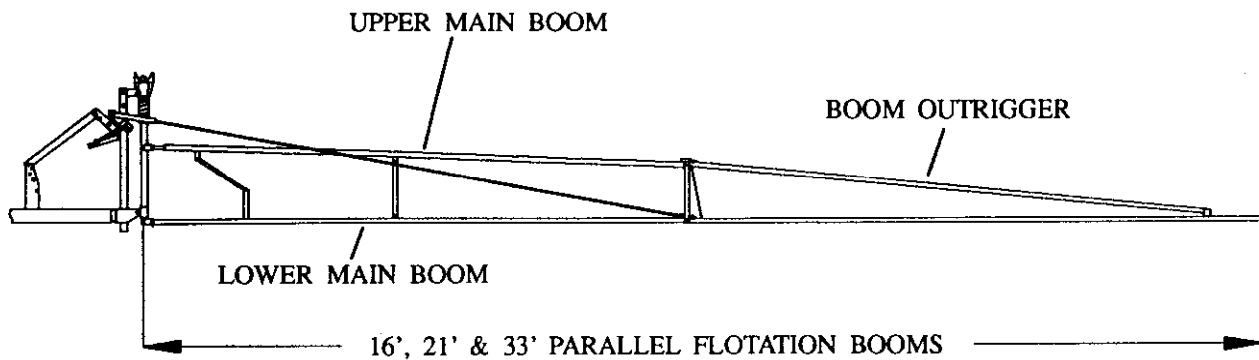


Figure 10

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## BOOM EXTENSION

**NOTE:** Extension tubes may be added on all booms. The extension tube is adjustable out to 5 feet beyond the outrigger.

Mount nozzle assemblies onto the extension tube 2" in from the end of the tube with the hose barb facing toward center as shown.

Install extension tube into the boom far enough to obtain proper spacing of nozzles. Tighten the boom extension locking bolt securely.

**NOTE:** Boom extension tube must be inserted a minimum of 12 inches.

The manifold on the end of the outrigger has unused hose barbs for nozzles on the extension.

Remove 1" FSPT cap from the tee on the manifold assembly and replace with a hose barb adapter.

Install 1/4" tubing from the manifold assembly to the nozzle assembly. Cut the tubing to length, so that there is no slack. Secure the tubing to the booms with 9" nylon ties.

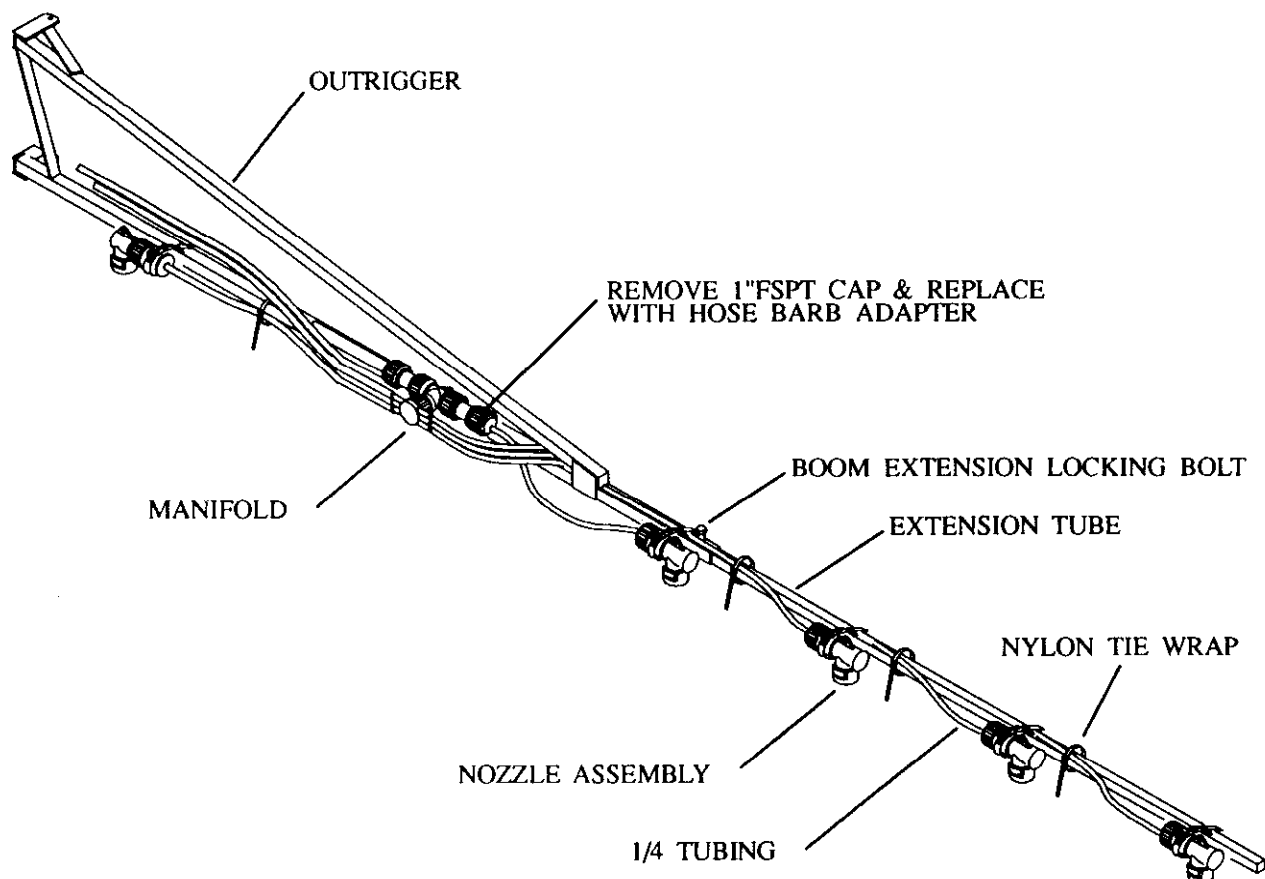


Figure 11

CI-78001

**NOTE:** When using extensions, care must be taken when booms are in a folded position. The extension will stick out behind the sprayer, which can be dangerous when backing up.

# RIGGING THE BOOMS

Before starting adjustments, be sure all joints are well lubricated and are moving freely.

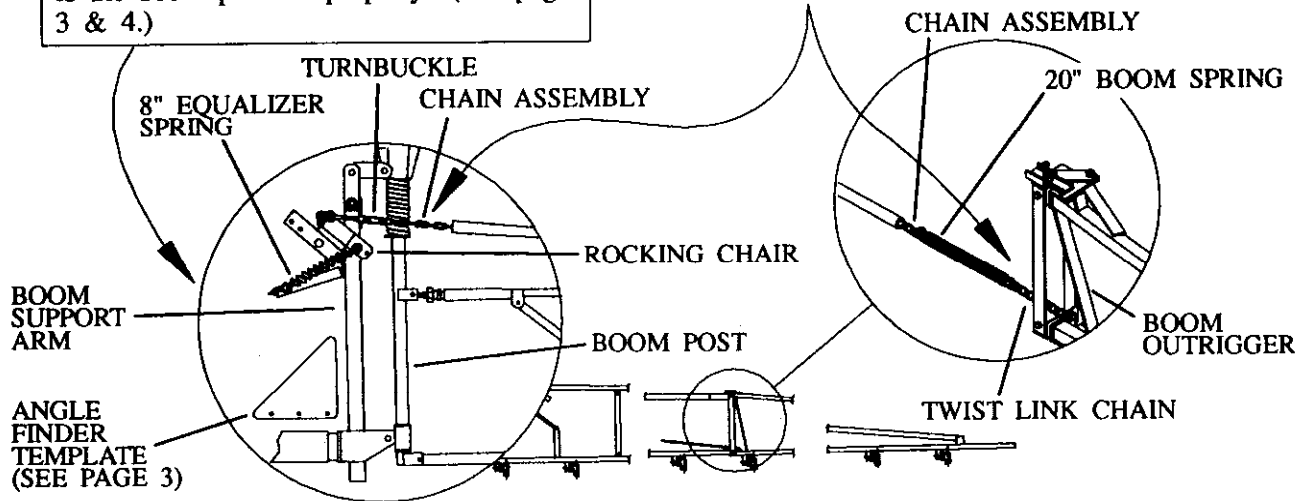
Follow numerical steps below and on the next page to rig the booms.

1. The sprayer is setting on level ground.  
Is the boom post set properly? (See pages 3 & 4.)

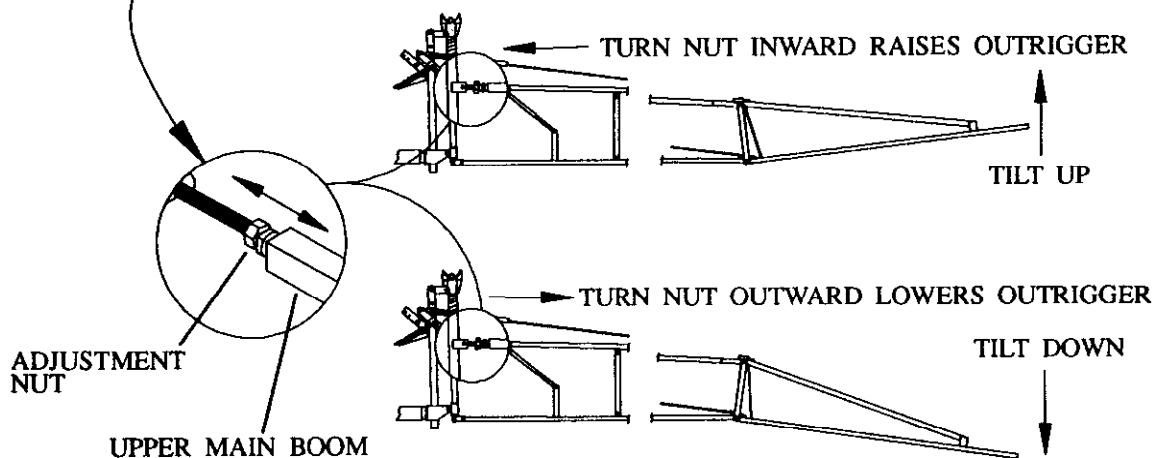
2. Install chain assemblies from the rocking chair mechanism to the 20" boom spring.

Loosen chain turnbuckles so that no threads are showing in the turnbuckle body.

Mount the chain so it holds the boom level or slightly downward.

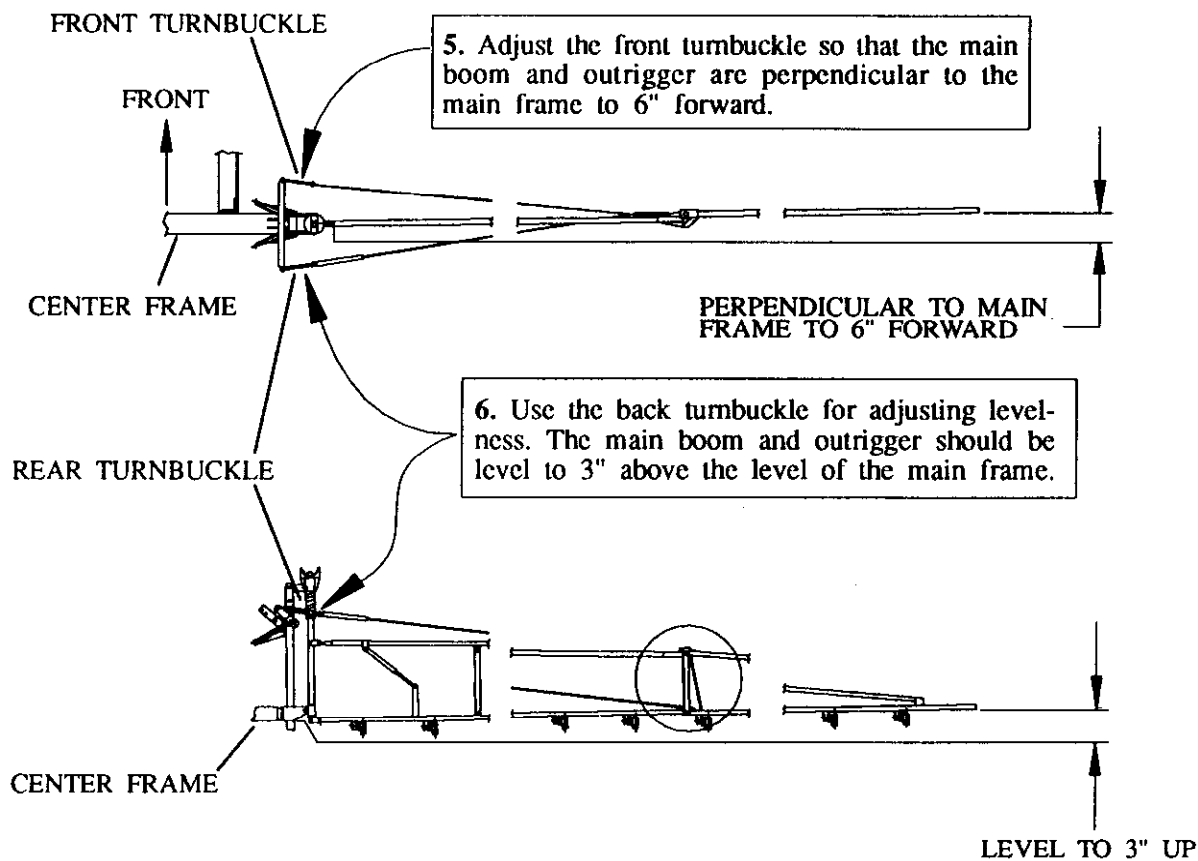
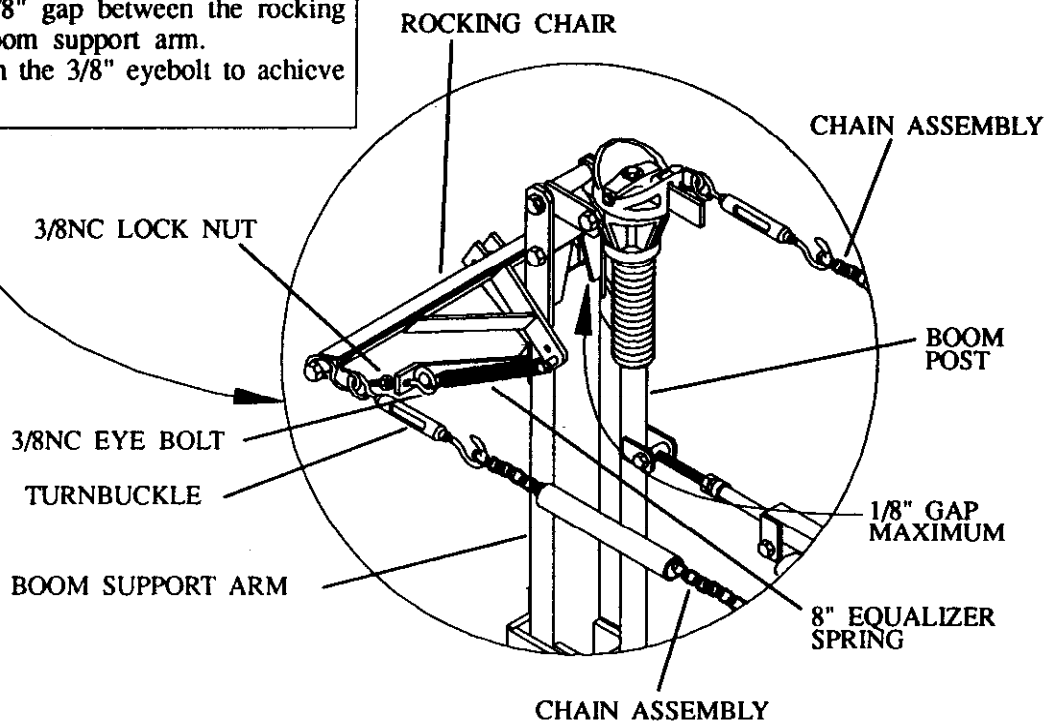


3. Adjust the boom outrigger so it is parallel with the first section of the main boom by adjusting the nut on the upper main boom. Turning the nut towards the boom post will raise the outrigger tip. Turning the nut away from the boom post will lower the outrigger tip.



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4. Adjust the 8" equalizer spring so there is approximately 1/8" gap between the rocking chair and the boom support arm. Tighten or loosen the 3/8" eyebolt to achieve the 1/8" gap.

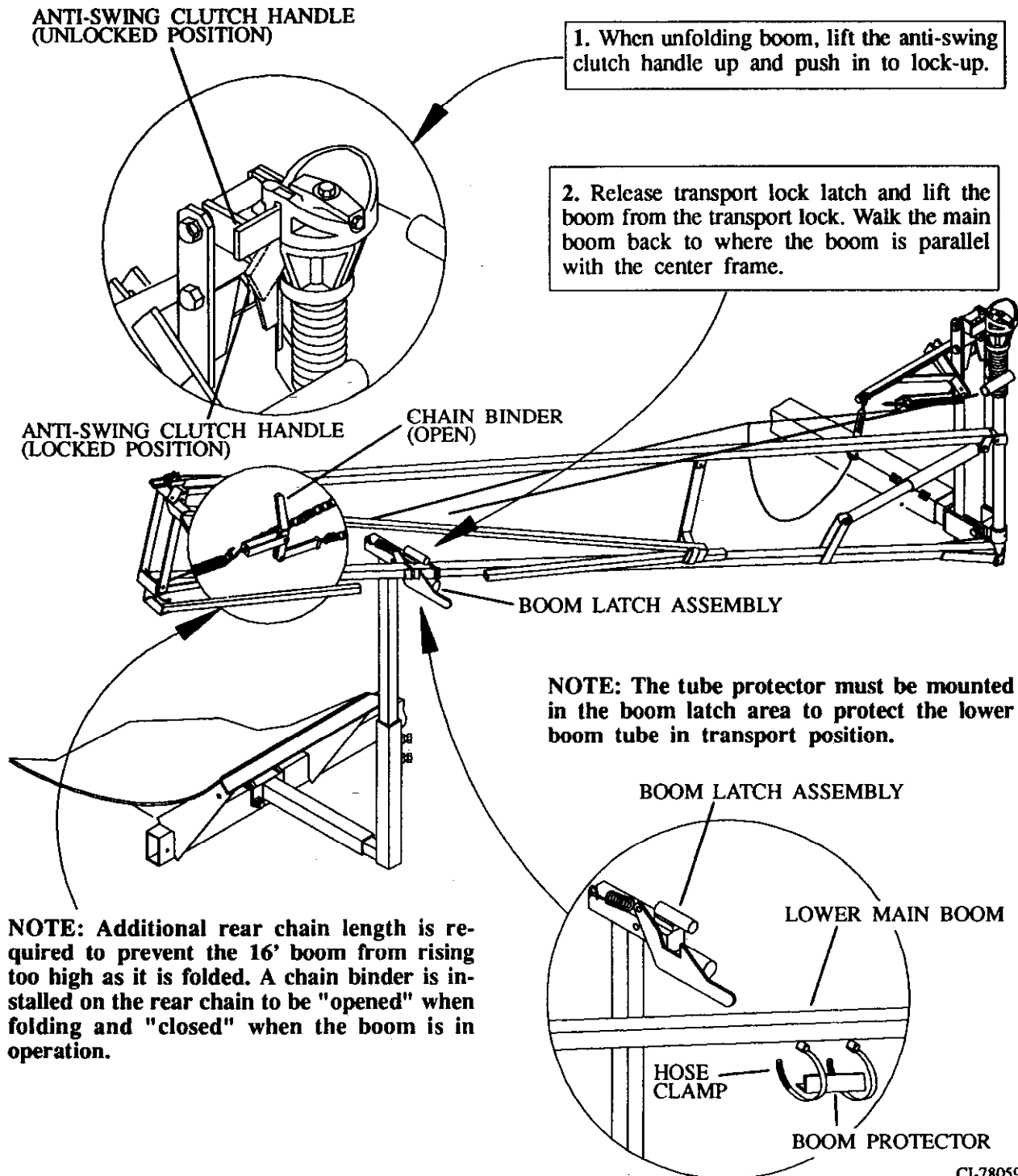


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## FOLDING & UNFOLDING

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

**NOTE:** During transport, the boom must be locked into the boom latch assembly and be parallel to the frame with the anti-swing clutch handle in the locked position.



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3. When boom is parallel to the center frame, pull out anti-swing clutch handle and swing down into the lock position.

4. With main boom locked in place, lift the outrigger away from the main boom and walk the outrigger around until the outrigger locks in place.

ANTI-SWING  
CLUTCH HANDLE  
(UNLOCK POSITION)

ANTI-SWING  
CLUTCH HANDLE  
(LOCKED POSITION)

NOTE: The chain binder must be closed when the boom is in the working position.

CHAIN BINDER  
(CLOSED)

3/16x3-1/4 SPRING LOCK PIN

UPPER MAIN BOOM

The 16' boom must have a 3/16"x3-1/4" spring lock pin installed in the hole indicated to prevent it from floating too high when operating. This boom is too light to permit extreme flotation. Pin must be removed and stored before folding and transporting.

NOTE: For folding reverse the previous steps.

## APPLICATION RATES

The Application Rate Charts on pages 13 and 14 are based on water at 8.3lbs per gallon and 20 and 30 inch nozzle spacings. When spraying solutions that are heavier or lighter than water, multiply the tabulated gallon figure from the chart by the appropriate factor shown below.

Weight of Solution	Conversion Factors
7.0 lbs. per gallon	1.09
8.0 lbs. per gallon	1.02
8.34 lbs. per gallon - water	1.00
9.0 lbs. per gallon	.96
10.0 lbs. per gallon	.91
11.0 lbs. per gallon	.87

**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 percent more or less than the average of the other nozzles checked and/or having obviously 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 procedure. 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 percent from the flow rate of water.

### Calibration with actual spray mixture.

Wear suitable, approved safety equipment and protective clothing. Avoid contact with the spray.

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

### 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 the addition of adjuvants, compare the flow rate of the spray mixture to that of water. If the rate difference is 5 percent 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 the pressure drop across the nozzle.

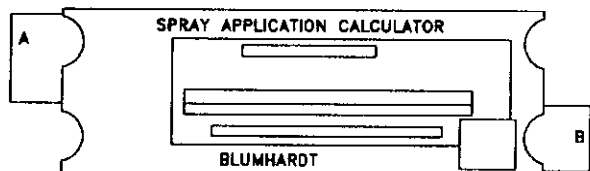
**Ground speed of sprayer.** Spray volume has an inverse relationship to the ground speed. Ground speed is the easiest factor to change for minor corrections in application rate. Ground speed must be constant for uniform application.

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

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

## SPRAYER CALIBRATION

The tip charts should 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, (figure 12), if not available use the method described below.



CI-78013



CI-78013A

Figure 12

## 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 or 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.

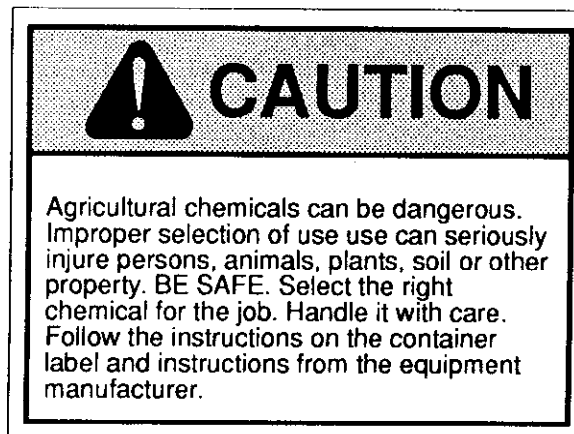
### EQUATION:

$$\text{Seconds} = \frac{2589 \times \text{Level (Liquid ounces)}}{\text{MPH} \times \text{Gallons Per Acre} \times \text{Nozzles Spacing}}$$

**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.





# Cone Spray Tip Metering Chart (GALLONS PER ACRE)

Cone Tip	P S I	G P M	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	40	.044	3.3	2.6	2.2	1.6	1.3	.9	2.2	1.8	1.5	1.1	.9	.6
	60	.052	3.9	3.1	2.6	1.9	1.6	1.1	2.6	2.1	1.7	1.3	1.0	.7
	80	.061	4.6	3.7	3.0	2.3	1.8	1.3	3.0	2.4	2.0	1.5	1.2	.9
	100	.073	5.4	4.3	3.6	2.7	2.2	1.5	3.6	2.9	2.4	1.8	1.4	1.0
45681 White	40	.059	4.4	3.5	2.9	2.2	1.7	1.2	2.9	2.3	1.9	1.5	1.2	.8
	60	.071	5.3	4.2	3.5	2.7	2.1	1.5	3.5	2.8	2.4	1.8	1.4	1.0
	80	.084	6.3	5.0	4.2	3.1	2.5	1.8	4.2	3.4	2.8	2.1	1.7	1.2
	100	.098	7.3	5.9	4.9	3.7	2.9	2.1	4.9	3.9	3.3	2.4	2.0	1.4
45682 Blue	40	.082	6.1	4.9	4.1	3.1	2.5	1.8	4.1	3.3	2.7	2.0	1.6	1.2
	60	.108	8.0	6.4	5.3	4.0	3.2	2.3	5.4	4.3	3.6	2.7	2.1	1.5
	80	.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	.140	10.4	8.3	7.0	5.2	4.2	3.0	7.0	5.6	4.6	3.5	2.8	2.0
45683 Green	40	.120	8.9	7.2	6.0	4.5	3.6	2.6	6.0	4.8	4.0	3.0	2.4	1.7
	60	.154	11.5	9.2	7.7	5.7	4.6	3.3	7.7	6.1	5.1	3.8	3.1	2.2
	80	.180	13.5	10.8	9.0	6.7	5.4	3.8	9.0	7.2	6.0	4.5	3.6	2.6
	100	.203	15.2	12.1	10.1	7.6	6.1	4.3	10.1	8.1	6.7	5.1	4.0	2.9
45684 Yellow	40	.148	11.0	8.8	7.4	5.5	4.4	3.2	7.4	5.9	4.9	3.7	2.9	2.1
	60	.179	13.3	10.7	8.9	6.7	5.3	3.8	8.9	7.1	5.9	4.4	3.6	2.5
	80	.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	.271	20.2	16.2	13.5	10.1	8.1	5.8	13.5	10.8	9.0	6.7	5.4	3.8
45685 Purple	40	.205	15.3	12.2	10.2	7.6	6.1	4.4	10.2	8.2	6.8	5.1	4.1	2.9
	60	.252	18.8	15.0	12.5	9.4	7.5	5.4	12.5	10.0	8.4	6.3	5.0	3.6
	80	.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	.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	40	.286	21.3	17.1	14.2	10.7	8.5	6.1	14.2	11.4	9.5	7.1	5.7	4.1
	60	.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
	80	.443	33.0	26.4	22.0	16.5	13.2	9.4	22.0	17.6	14.7	11.0	8.8	6.3
	100	.504	37.6	30.1	25.1	18.8	15.0	10.7	25.1	20.0	16.7	12.5	10.0	7.2
45687 Pink	40	.396	29.5	23.6	19.7	14.8	11.8	8.4	19.7	15.8	13.1	9.8	7.9	5.6
	60	.497	37.1	29.6	24.7	18.5	14.8	10.6	24.7	19.8	16.5	12.4	9.9	7.1
	80	.600	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	.706	52.7	42.1	35.1	26.3	21.1	15.1	35.1	28.1	23.4	17.6	14.0	10.0
45688 Brown	40	.488	36.4	29.1	24.3	18.2	14.6	10.4	24.3	19.4	16.2	12.1	9.7	6.9
	60	.630	47.0	37.6	31.3	23.5	18.8	13.4	31.3	25.1	20.9	15.7	12.5	9.0
	80	.763	56.9	45.5	37.9	28.4	22.8	16.3	37.9	30.3	25.3	19.0	15.2	10.8
	100	.844	62.9	50.4	42.0	31.5	25.2	18.0	42.0	33.6	28.0	21.0	16.8	12.0
45689 Orange	40	.635	47.4	37.9	31.6	23.7	19.0	13.5	31.6	25.3	21.1	15.8	12.6	9.0
	60	.828	61.8	49.4	41.2	30.9	24.7	17.7	41.2	32.9	27.5	20.6	16.5	11.8
	80	.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	88.0	70.4	58.7	44.0	35.2	25.1	58.7	46.9	39.1	29.3	23.5	16.8
45690 Olive	40	.797	59.4	47.6	39.6	29.7	23.8	17.0	39.6	31.7	26.4	19.8	15.9	11.3
	60	1.02	75.8	60.6	50.5	37.9	30.3	21.6	50.5	40.4	33.7	25.3	20.2	14.4
	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

45716

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

## D-TYPE FLOOD TIP CHART: WATER

Flood Tip	P S I	G P M	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	10	.25	18.6	14.85	12.45	7.5	4.95	12.4	9.9	8.3	5.0	3.3
	20	.35	26.3	21.0	17.5	10.5	7.0	17.5	14.0	11.7	7.0	4.7
	30	.43	32.1	25.7	21.4	12.8	8.6	21.4	17.1	14.3	8.6	5.7
	40	.50	37.1	29.7	24.8	14.9	9.9	24.8	19.8	16.5	9.9	6.6
D 3  45768 DARK GREEN	10	.30	22.35	17.85	14.85	8.85	6.0	14.9	11.9	9.9	5.9	4.0
	20	.42	31.5	25.2	21.0	12.6	8.4	21.0	16.8	14.0	8.4	5.6
	30	.52	39.0	31.2	26.0	15.6	10.4	26.0	20.8	17.3	10.4	6.9
	40	.60	45.0	36.0	30.0	18.0	12.0	30.0	24.0	20.0	12.0	8.0
D 5  45769 TAN	10	.50	37.5	29.7	24.75	14.85	9.9	25.0	19.8	16.5	9.9	6.6
	20	.71	52.5	42.0	35.0	21.0	14.0	35.0	28.0	23.3	14.0	9.3
	30	.87	64.5	51.6	43.0	25.8	17.2	43.0	34.4	28.7	17.2	11.5
	40	1.00	75.0	60.0	50.0	30.0	20.0	50.0	40.0	33.3	20.0	13.3
D 7  45770 LIGHT BLUE	10	.75	55.5	45.0	37.5	22.35	14.85	37.0	30.0	25.0	14.9	9.9
	20	1.10	78.8	63.0	52.5	31.5	21.0	52.5	42.0	35.0	21.0	14.0
	30	1.30	96.2	76.9	64.1	38.5	25.6	64.1	51.3	42.7	25.6	17.7
	40	1.50	111.0	88.8	74.0	44.4	29.6	74.0	59.2	49.3	29.6	19.7
D 10  45766 LIGHT GREEN	10	1.00	75.0	60.0	49.5	29.7	19.8	50.0	40.0	33.0	19.8	13.2
	20	1.40	105.0	84.0	70.0	42.0	28.0	70.0	56.0	46.7	28.0	18.7
	30	1.74	129.3	103.5	86.2	51.7	34.5	86.2	69.0	57.5	34.5	23.0
	40	2.00	148.5	118.8	99.0	59.4	39.6	99.0	79.2	66.0	39.6	26.4

## D-TYPE FLOOD TIP CHART: FERTILIZER

Flood Tip	P S I	G P M	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	.221	16.4	13.1	10.9	8.2	6.6	4.7	10.9	8.8	7.3	5.5	4.4	3.1
	25	.259	19.3	15.4	12.8	9.6	7.7	5.5	12.8	10.3	8.6	6.4	5.1	3.7
	30	.302	22.4	17.9	15.0	11.2	9.0	6.4	15.0	12.0	10.0	7.5	6.0	4.3
	35	.344	25.5	20.4	17.0	12.8	10.2	7.3	17.0	13.6	11.3	8.5	6.8	4.9
D 3  45768	20	.281	21.0	16.8	14.0	10.5	8.4	6.0	14.0	11.2	9.3	7.0	5.6	4.0
	25	.341	25.4	20.3	16.9	12.7	10.2	7.3	16.9	13.6	11.3	8.5	6.8	4.8
	30	.392	29.2	23.4	19.5	14.6	11.7	8.4	19.5	15.6	13.0	9.7	7.8	5.6
	35	.436	32.5	26.0	21.7	16.3	13.0	9.3	21.7	17.3	14.5	10.8	8.7	6.2
D 5  45769	20	.480	35.8	28.7	23.9	17.9	14.3	10.2	23.9	19.1	15.9	11.9	9.6	6.8
	25	.591	44.1	35.2	29.4	22.0	17.6	12.6	29.4	23.5	19.6	14.7	11.7	8.4
	30	.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	.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	.665	49.4	39.5	32.9	24.7	19.7	14.1	32.9	26.3	21.9	16.5	13.2	9.4
	25	.766	56.8	45.5	37.9	28.4	22.7	16.2	37.9	30.3	25.3	18.9	15.2	10.8
	30	.896	66.5	53.2	44.3	33.2	26.6	19.0	44.3	35.5	29.6	22.2	17.7	12.7
	35	.969	71.9	57.6	48.0	36.0	28.8	20.6	48.0	38.4	32.0	24.0	19.2	13.7
D 10  45766	20	1.14	84.6	67.7	56.4	42.3	33.9	24.2	56.4	45.1	37.6	28.2	22.6	16.1
	25	1.24	92.1	73.7	61.4	46.0	36.8	26.3	61.4	49.1	40.9	30.7	24.6	17.5
	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	19.0
	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

# **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:

$$\text{Gallons per acre (GPA)} = \frac{(5940) \times (\text{GPM/nozzle})}{(\text{Nozzle Spacing-inches}) \times (\text{MPH})}$$

OR

$$\text{GPM} = \frac{\text{GPA} \times \text{MPH}}{5940} \times \text{Nozzle Spacing-inches}$$

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

This information on Flood Tip is taken from the Delavan Ag Spray Products 1990 Catalog #1609P.

## **BROADCAST NOZZLE SPACING CONVERSION FACTORS**

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

### **FACTORS FOR 20" SPACING CAPACITIES**

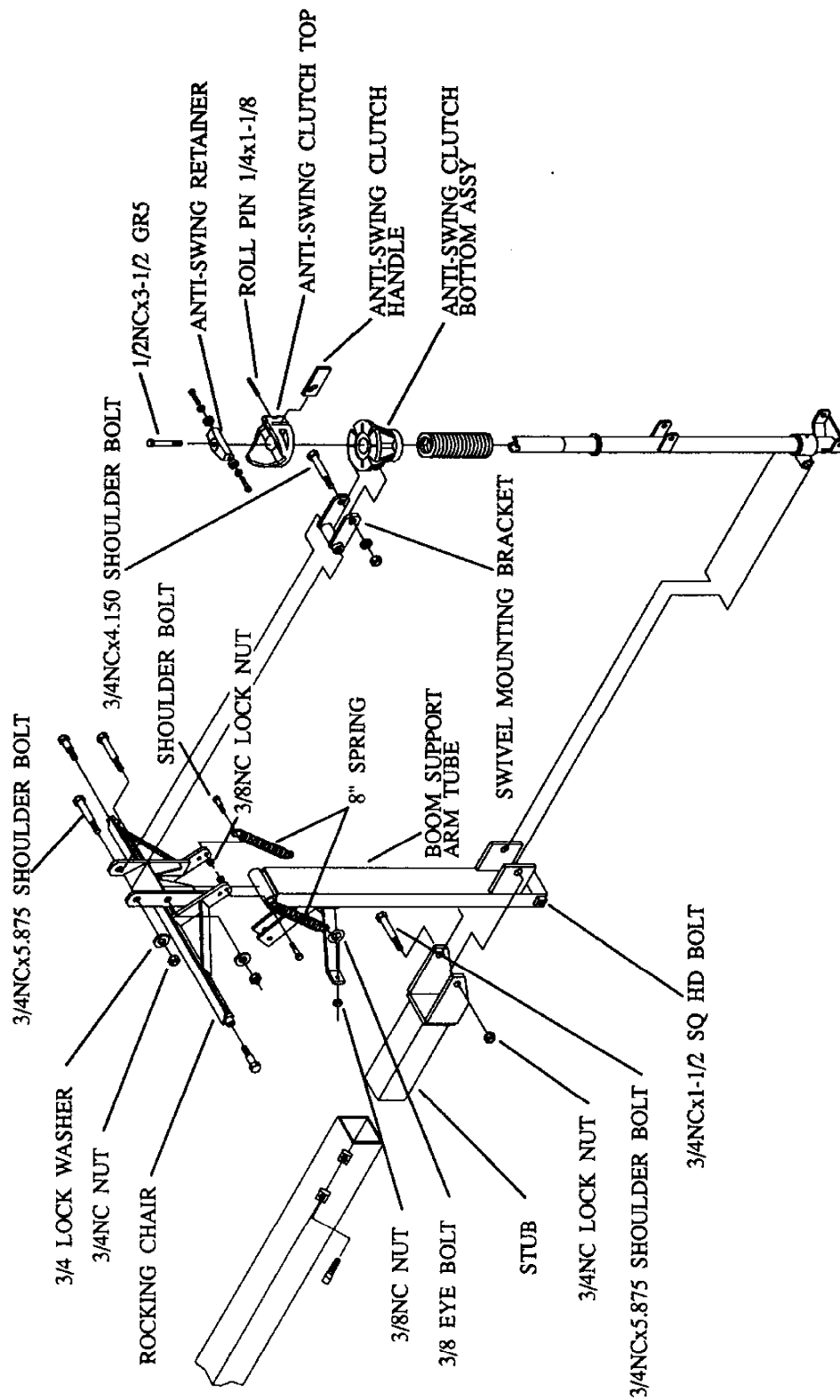
NOZZLE SPACINGS	FACTOR
10"	2.0
12"	1.67
14"	1.43
16"	1.25
18"	1.11
20"	1.00
22"	.91
24"	.86
26"	.77
28"	.71
30"	.67

### **FACTORS FOR 30" SPACING CAPACITIES**

NOZZLE SPACINGS	FACTOR
16"	1.88
18"	1.67
20"	1.50
22"	1.36
24"	1.25
26"	1.15
28"	1.07
30"	1.00
32"	.94
34"	.88

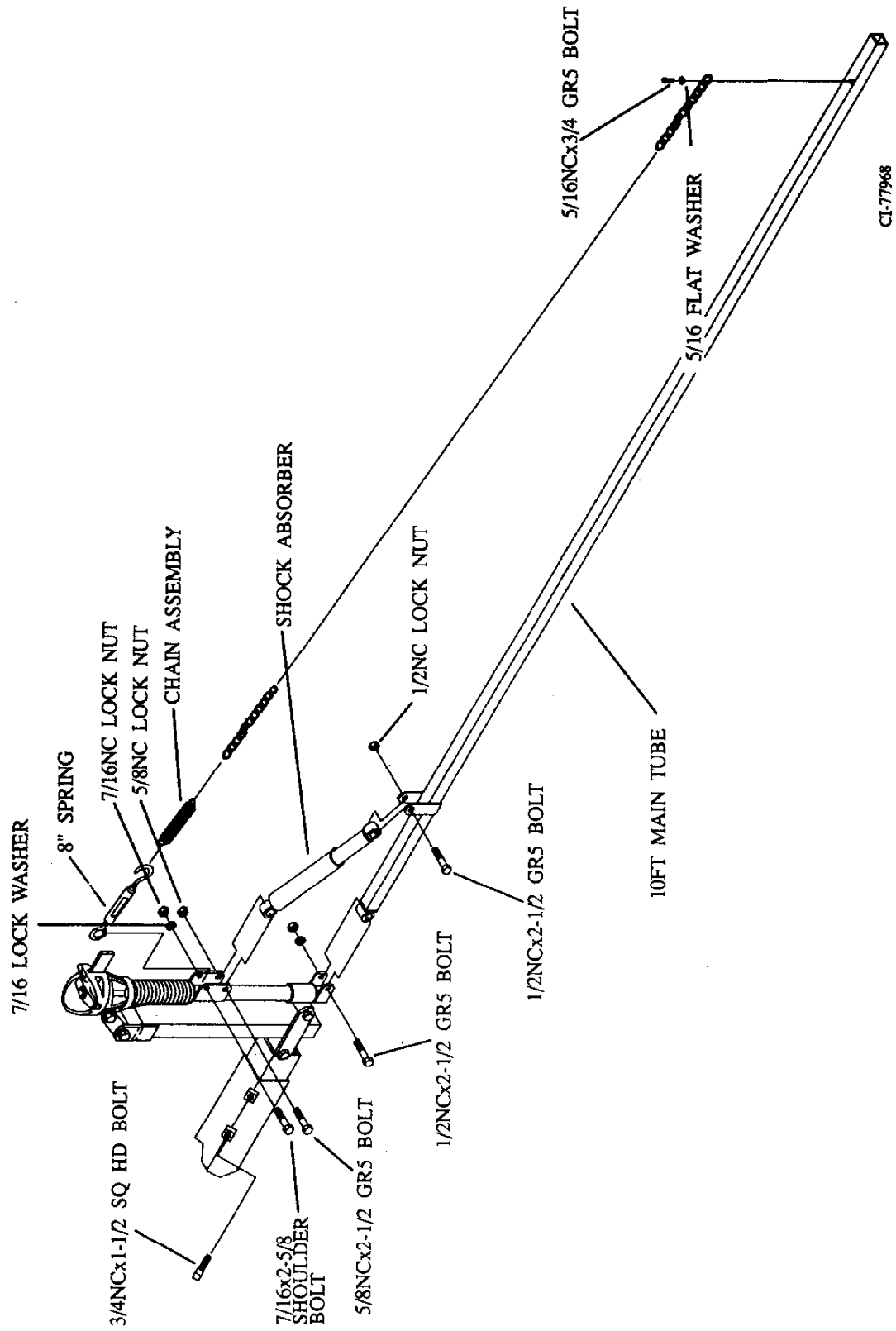
# BOOMPOST ASSEMBLY

(21' BOOM POST SHOWN)

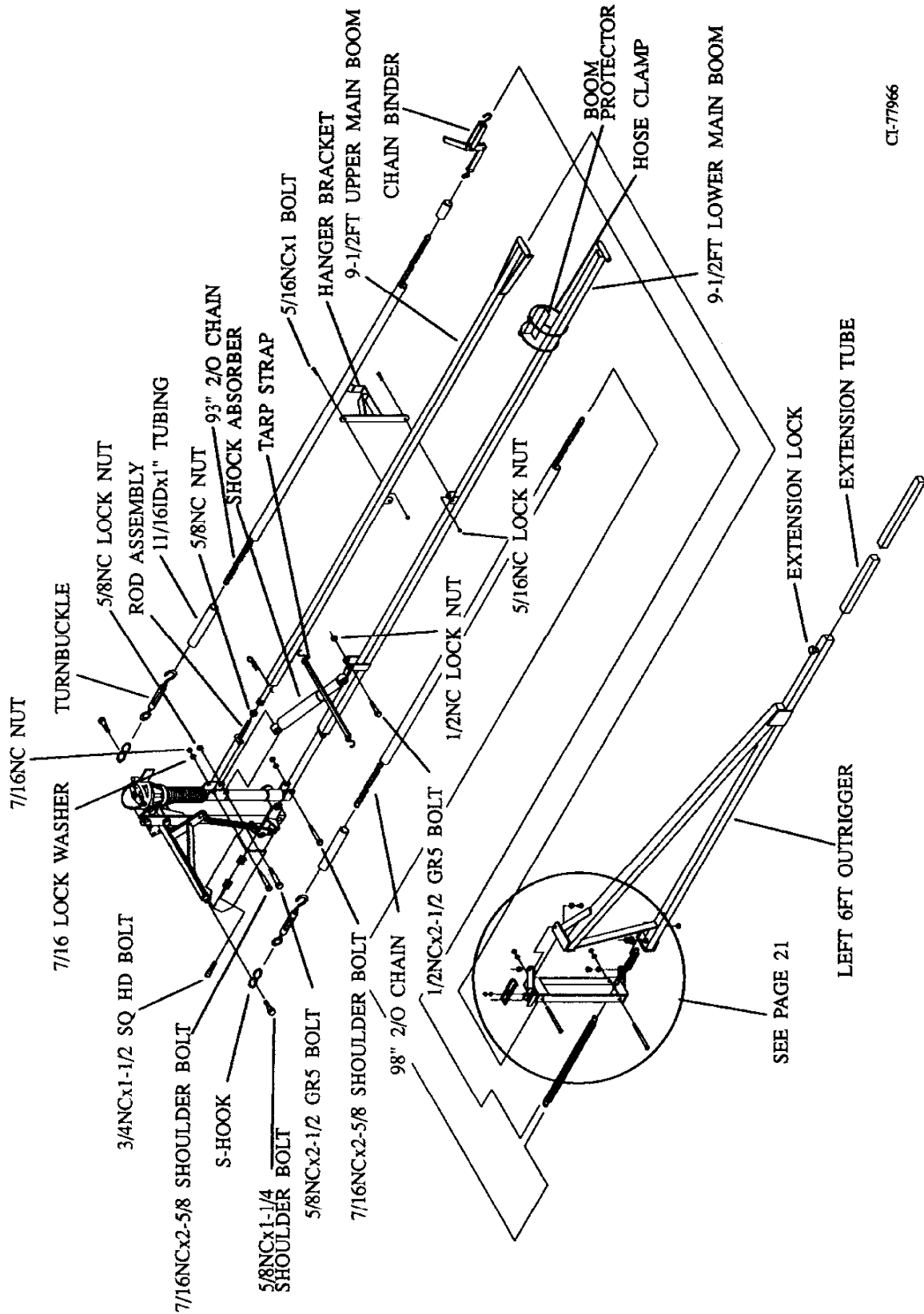


CL-77714

# **10' BOOM ASSEMBLY**

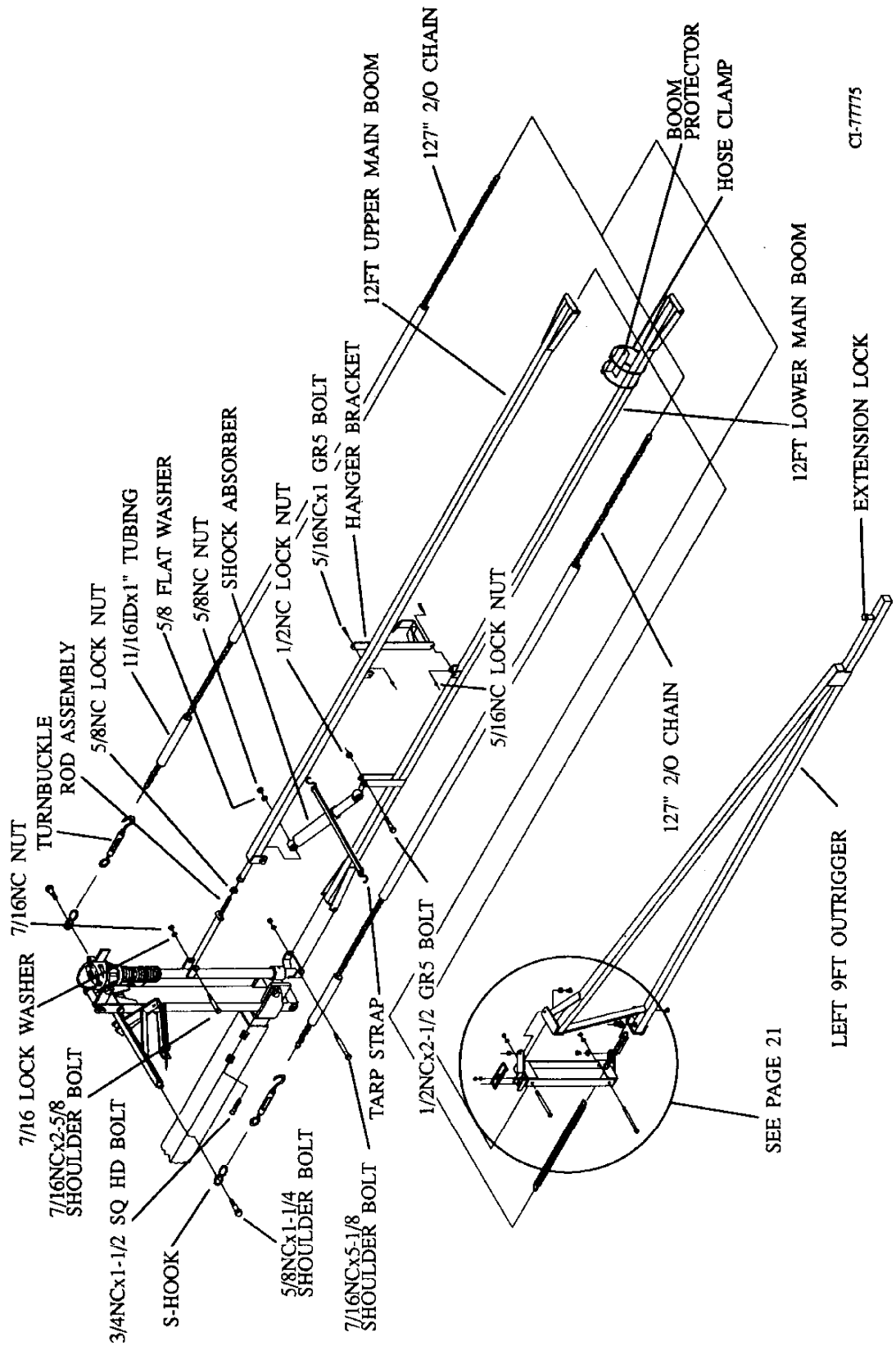


# 16' BOOM ASSEMBLY



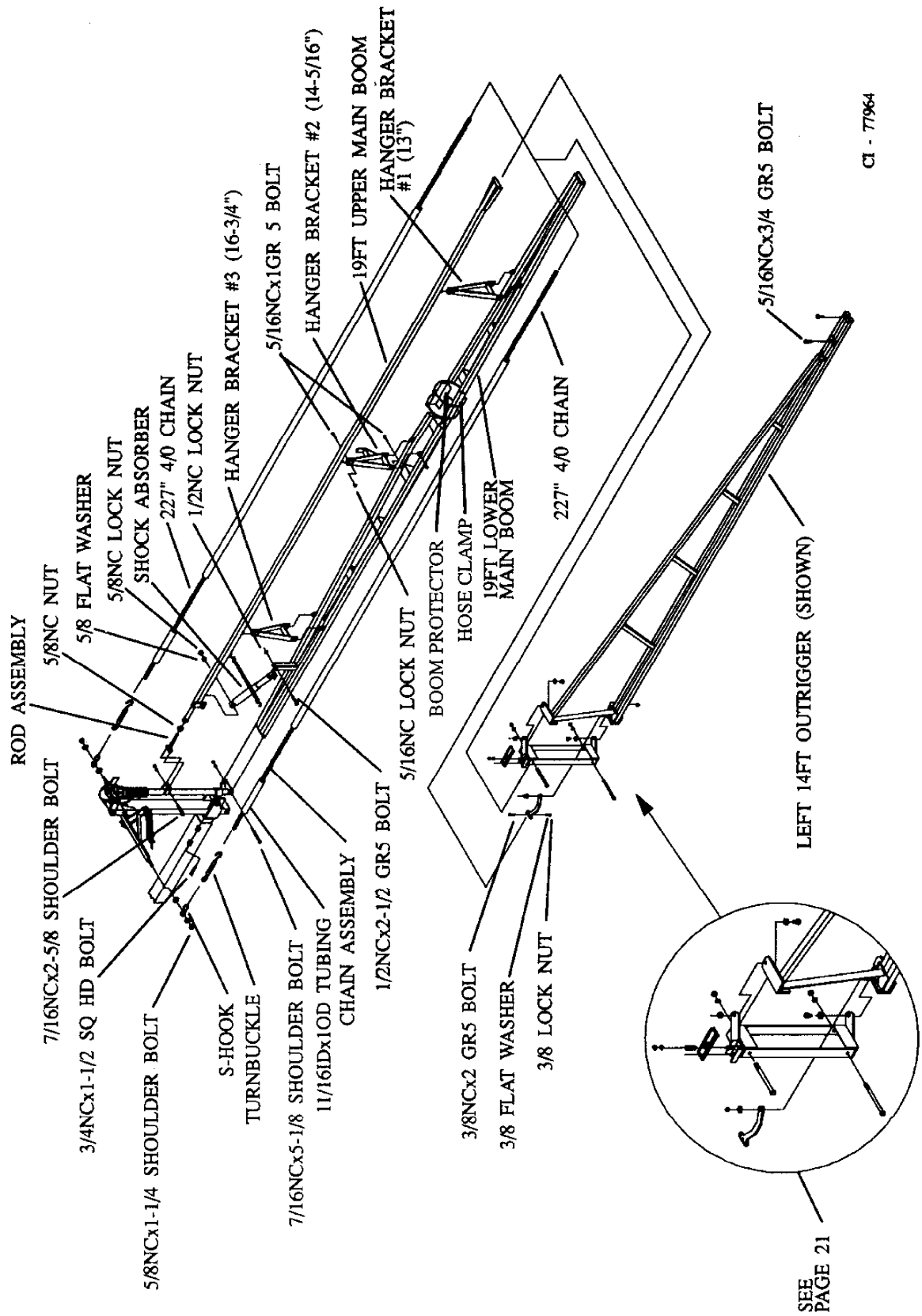
CL-77966

## 21' BOOM ASSEMBLY



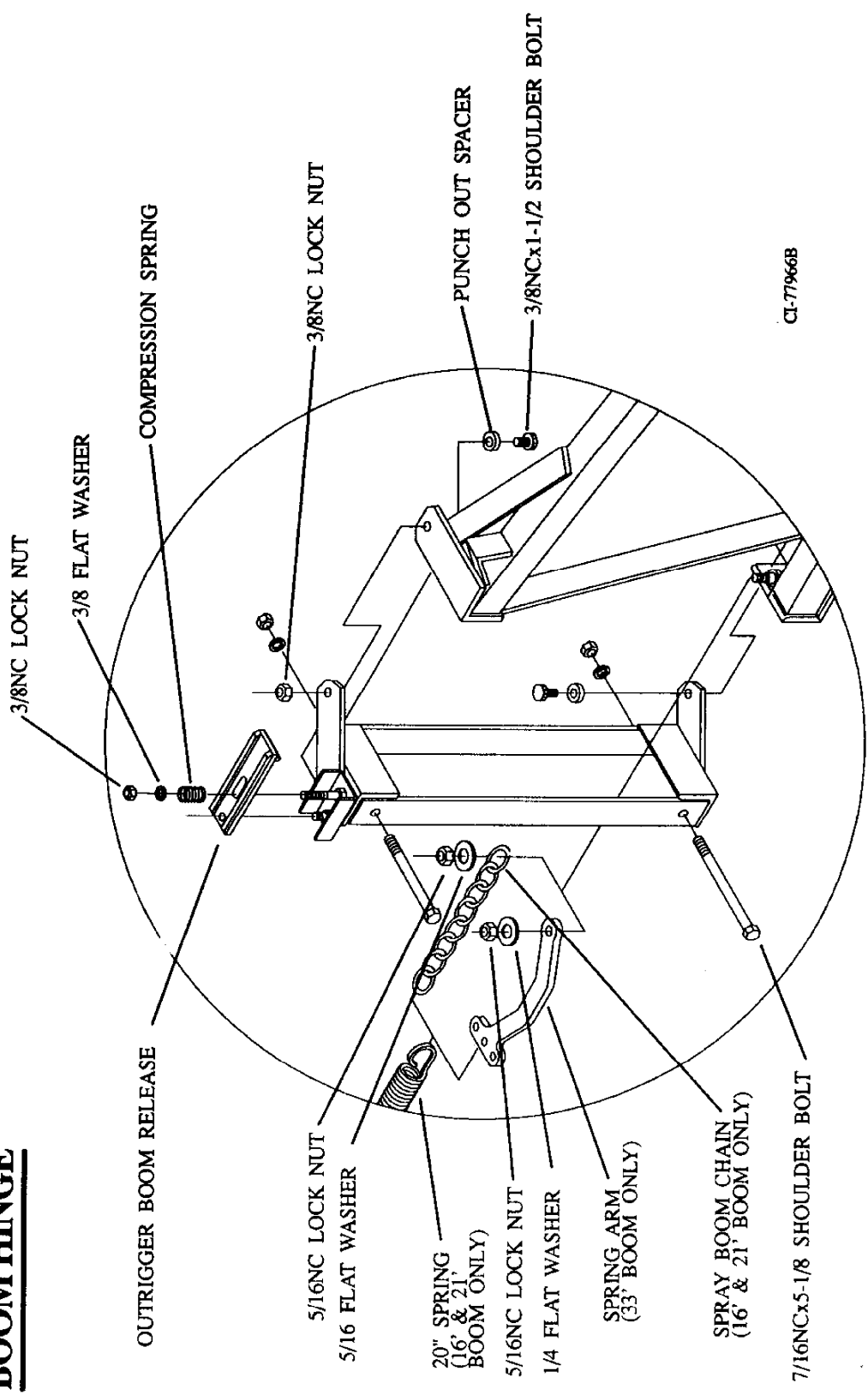
CL-7775

# 33' BOOM ASSEMBLY



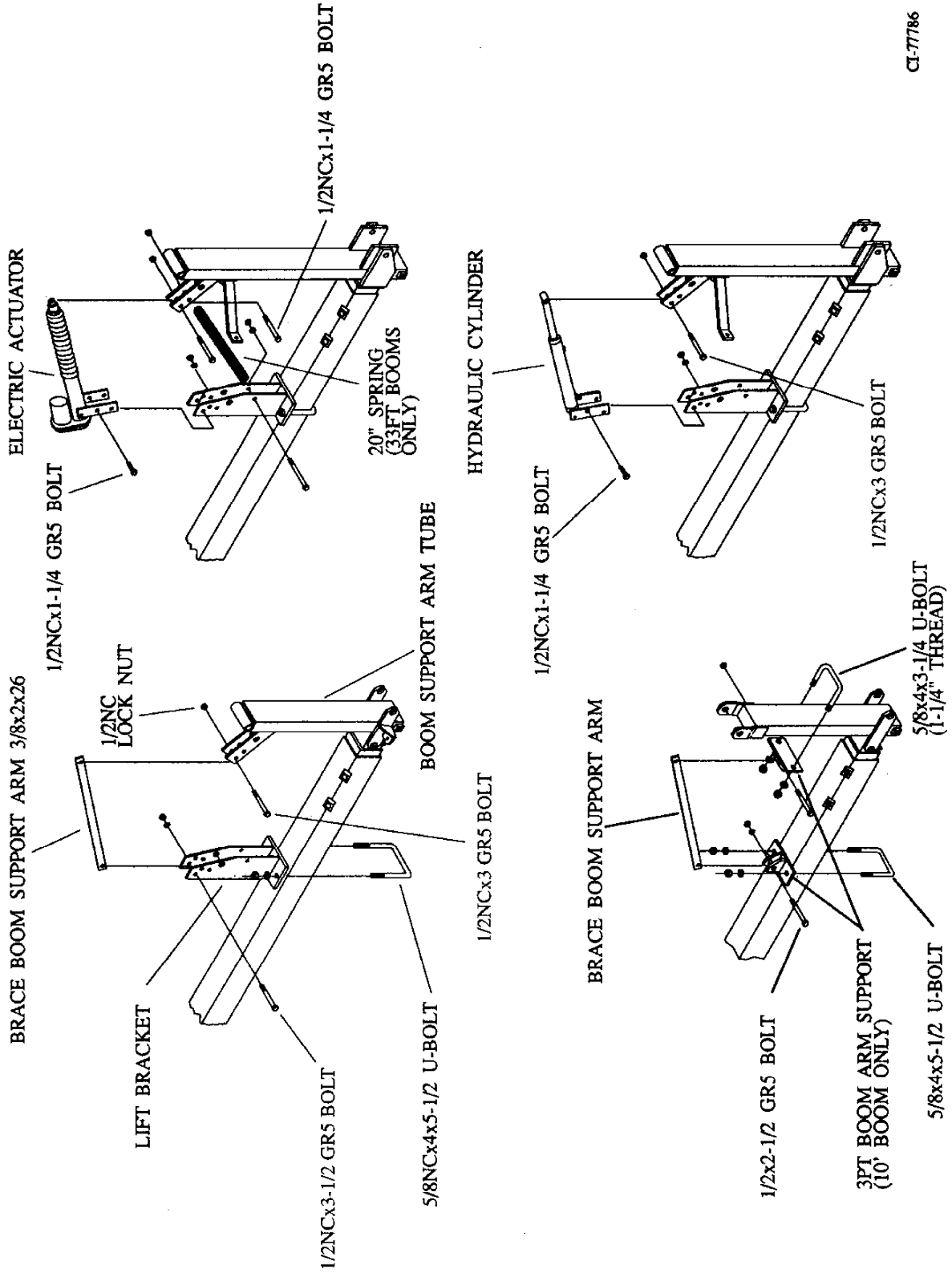


# BOOM HINGE



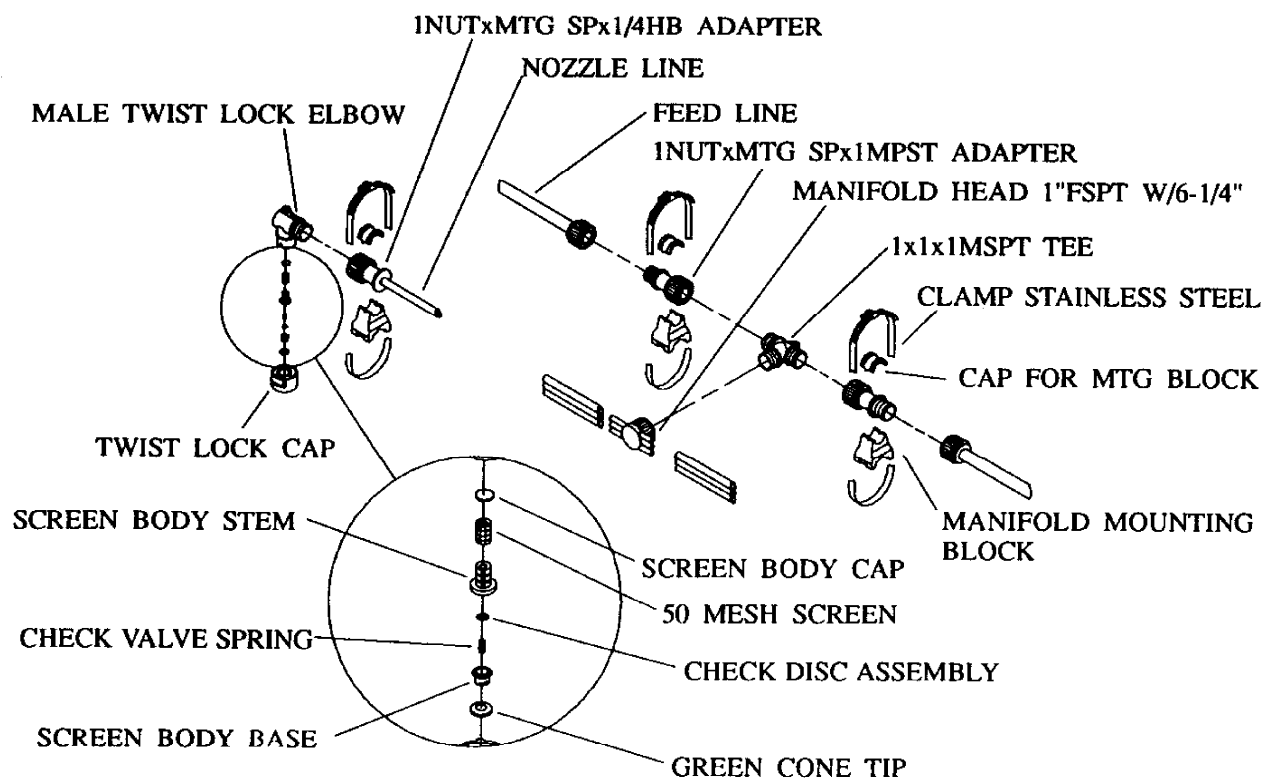
CI-77966B

# BOOM LIFT



CI-77786

# BOOM MANIFOLDS



CI - 77787

# **METRIC CONVERSION FACTORS**

	<b>Multiply</b>	<b>By</b>	<b>To Obtain</b>
<b>LENGTH</b>	inches	25.40	millimeters (mm)
	inches	2.540	centimeters (cm)
	feet	.03048	meters (m)
	miles	1.609	kilometers (km)
<b>AREA</b>	acres	4046.7	square meters (m <sup>2</sup> )
	acres	0.4047	hectares (ha)
<b>VOLUME</b>	gallons	3.785	cubic decimeters (dm <sup>3</sup> )
	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>			
	<b>Multiply</b>	<b>By</b>	<b>To Obtain</b>
Volume	Imperial gallons	1.201	U.S. gallons
	U.S. gallons	.833	Imperial gallons

43,560 Square Feet = 1 Acre

## **VOLUME and LIQUID MEASURES**

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