# INDEX



# ESC 500/800/1000
# OPERATORS MANUAL

1991 Edition 104252

Dear Owner:

Thank you sincerely for purchasing one of our products and welcome to the ever-increasing family of HARDI sprayer owners.

Our sprayers are rapidly becoming a familiar sight on North American farms. We believe that this results from growers becoming increasingly conscious of chemical input costs and the vital need for cost effective chemical application equipment.

Please take the time to thoroughly read the Operator's Manual before using your sprayer. You will find many helpful hints as well as important safety and calibration information.

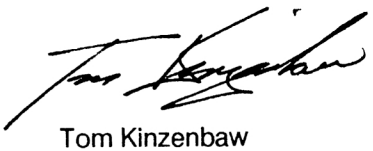
Some of the features on your HARDI sprayer were suggested by growers. There is no substitute for "on-farm" experience and we invite your comments and suggestions.

Please address your correspondence to the Service Manager at one of these branches:

HARDI MIDWEST
1500 West 76th St.
Davenport, Iowa
52806

HARDI GREAT LAKES
290 Sovereign Rd.
London, Ontario
N6M 1B3

Sincerely,



Tom Kinzenbaw
President

# WARNING

**ALWAYS READ OPERATORS MANUAL BEFORE USING EQUIPMENT**

**DO NOT REMOVE ANY SAFETY DEVICES OR SHIELDS. NEVER SERVICE, CLEAN OR REPAIR A MACHINE WHILE IT IS OPERATING.**

**ALWAYS WATCH FOR THIS SYMBOL TO POINT OUT IMPORTANT SAFETY PRECAUTIONS.**

**IT MEANS ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**

HARDI MIDWEST
1500 West 76th St.
Davenport, Iowa 52806

HARDI GREAT LAKES
290 Sovereign Rd.
London, Ontario N6M 1B3

# 1. SAFETY INFORMATION

All agricultural chemicals should be handled with care.

We urge you to wear protective clothing such as rubber gloves, goggles, coveralls, and respirator. All protective clothing should be kept in excellent condition and cleaned regularly or discarded.

Keep a generous sized container of clean water on or near the sprayer for rinsing hands or face and cleaning nozzles.

Always read the label on the chemical container carefully before use.

Extreme care should be taken in measuring chemicals. Powders should be used in suitable sized packages or accurately weighed. Liquids should be poured into a suitable graduated container.

Empty chemical containers should be rinsed thoroughly. The rinse water should be added to the sprayer tank and the empty container disposed of in accordance with local regulations or bylaws.

To clean nozzles, use a soft brush such as a toothbrush. Never attempt to clean by placing nozzle on the lips and blowing.

Know the telephone number of your nearest poison control center. Keep a list of all chemicals in use.

Always keep children away from your spraying.

# 1. SAFETY INFORMATION

## PTO SAFETY

Attach sprayer tongue to tractor drawbar with correct size drawbar pin and install safety pin.

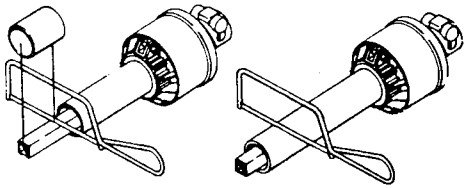
Attach PTO shaft to tractor.

Ensure that all guards and covers are in place.

Attach PTO safety chains to sprayer tongue and tractor drawbars.

CAREFULLY CHECK THAT PTO SHAFT IS OF CORRECT LENGTH AND WILL NOT BOTTOM OUT WHEN TURNING OR GOING THROUGH GULLIES. FAILURE TO DO SO WILL DAMAGE PTO SHAFT AND MAY BREAK PUMP BASE.

If PTO shaft is too long, cut equal amounts off both halves to shorten to correct length.



Ensure that control post is adjusted so that controls are conveniently located but do not strike tractor when turning or driving across low ground.

# 1. SAFETY INFORMATION

## ADDING CHEMICAL TO THE TANK

1. Fill the tank approximately 2/3 full of water.
2. Start tractor, engage pump and activate agitation.
3. Add the correct measure of chemical.
4. Top off tank with water while still continuing agitation.
5. If two or more chemicals are to be mixed in the sprayer tank, consult with your chemical supplier to ensure that chemicals are compatible and in what order they should be added to the sprayer tank.

Powders should be pre-mixed with water before adding to the sprayer tank.

**WEAR PROTECTIVE CLOTHING WHEN HANDLING AGRICULTURAL CHEMICALS.**

# 2. CALIBRATION

### WHY MUST WE CALIBRATE A SPRAYER?

A nozzle selection chart will tell us approximately what application rate we should expect, but variations due to nozzle wear, errors in pressure adjustment and tractor speedometer can result in a large error in application rate.

### HOW DO WE CALIBRATE A SPRAYER?

Special calibration bottles are available. They generally recommend that the operator drive at his spraying speed and note the length of time required to travel a specific distance. The operator then catches the liquid from one nozzle at spraying pressure for the length of time noted. The bottle will give a direct reading of application rate. Slight adjustments can then be made by varying pressure.

Following are some tips to remember when using the calibration bottle method:

# 2. CALIBRATION (contd.)

1. Follow the instructions on the calibration bottle carefully.
2. Check the output of each nozzle by running the sprayer at spraying pressure and collecting the liquid from each nozzle for the same length of time. Nozzle output should not vary more than +/- 5%.
3. When determining the length of time required to drive the recommended distance, drive in actual field conditions with a half-full tank, repeat the test several times, each time avoiding the tracks from the previous test. Take the average of the times recorded.

**If calibration bottles are not available, there is a second, very simple method: -**

1. Fill the sprayer tank approximately half-full of water.
2. Set up two stakes, 204 feet apart in actual field conditions.
3. Driving at spraying speed, note the length of time required to drive 204 feet. Repeat several times, each time avoiding the tracks from the previous trip. Take the average of the times recorded.
4. Collect liquid from a nozzle for the length of time determined in step 3. The number of US fluid ounces will exactly indicate your application rate.

   e.g. 20 fluid ounces = 20 US gallons per acre

   The above method is based on water with nozzles set at 20". If your nozzle spacing is other than 20", use this easy formula:

$$\frac{\text{GPA (as measured in step 4)}}{\text{Nozzle spacing (on your boom)}} \times 20$$

Example: $\frac{\text{Measured GPA (30)}}{\text{Nozzle spacing (40")}} \times 20 = 15 \text{ GPA}$

Calibration of the sprayer should be completed at the beginning of the season and repeated after every 2 to 3 full days of spraying; and every time you change volume rate or use new nozzles.

For conversion to Imperial gallons per acre, multiply US GPA x .833
For conversion to litres per hectare, multiply US GPA x .934
For conversion to litres per acre, multiply US GPA x 3.87
Formula for tractor speed $\frac{\text{Distance}}{\text{Time}} \times 0.682 = \text{MPH}$

# 3. NOZZLE SELECTION

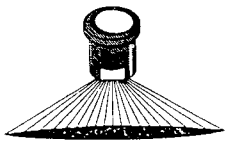
Correct selection of nozzle and calibration of the sprayer are critically important in achieving maximum accuracy and cost effective use of farm chemicals.

Your HARDI sprayer has been supplied with 110° flat spray nozzles that will apply approximately 20 US GPA at 30 PSI and 5 MPH The 110° flat spray nozzle was chosen rather than the 80° nozzle for two reasons. It may be used at a lower minimum height, reducing the risk of wind drift and its greater overlap permits better uniformity of spray distribution, particularly if boom height varies on rough ground. Normal boom height setting with 110° nozzles is 20" above the crops or weeds, whichever is taller.

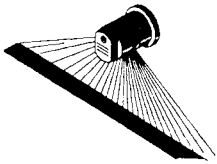
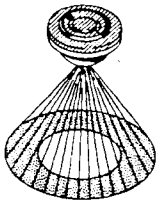
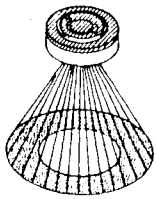
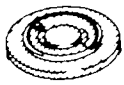
Should you wish a different application rate or different type of nozzle, HARDI manufactures a nozzle for virtually every need.

ALWAYS CONSULT YOUR CHEMICAL SUPPLIER FOR RECOMMENDED CHEMICAL RATE AND WATER APPLICATION RATE.

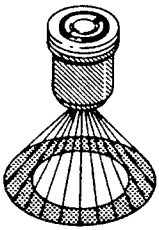
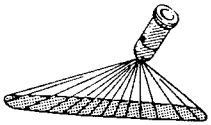
The following chart shows what types of spray nozzles are suit-able for different applications. It is important to use the correct nozzle.

| | | |
|---|---|---|
|  | COLOR TIPS 110° flat fan, one piece cap and nozzle; color coded for flow rate selection. | S4110 |
|  | FLAT SPRAY NOZZLES in 65°, 80° and 110° spray angles. For herbicides, insecticides and fertilizer applications. For pressures of 15-150 psi and volume of .08 to 2.15 GPM. O-Ring 330013 should also be used with pressures in excess of 100 psi. 50, 80 and 100 mesh screens are normally used. | 4665-65°<br>2080-80°<br>4110-110°<br><br>330013 - O-ring |

# 3. NOZZLE SELECTION (contd.)

| | | |
|---|---|---|
|  | FLOOD NOZZLES set at 40" spacing. Designed for high volume application. Volume of .16 to 14.0 GPM. See boom manual for 45° and 90° elbows to provide alternate flood nozzle positioning. | 4598 |
|  | HOLLOW CONE NOZZLES for high pressure and high volume insecticide application in row crops. For pressures 40 to 350 psi and volume of .03 to 2.87 GPM. 1553 nozzles are ALWAYS used with swirl plates shown below EXCEPT when used as solid stream nozzles. O-Ring 330013 should always be used with pressures over 100 psi. Actual swirl plate selection will affect droplet size which in turn affects application rate. 50, 80 or 100 mesh screens are normally used with these nozzles. | 1553<br><br>Must add swirl to produce hollow cone pattern |
|  | HOLLOW CONE CERAMIC NOZZLES for high pressure and high volume fungicide & insecticide application. Pressures of 15 to 350 psi and volume of .06 to 2.50 GPM. 1999 nozzles are always used with grey, black or blue swirl plates and O-Ring 330013. | 1999 |
|  | SWIRL PLATE used in conjunction with cone nozzle to create desired spray pattern. These swirls work in either 1553 or 1999 series cone nozzles. Grey, blue or black swirls are used to create hollow cone effect. White and red swirls are used to create full cone effect. | Grey<br>Blue<br>Black<br>White<br>Red |

# 3. NOZZLE SELECTION (contd.)

| | | |
|---|---|---|
|  | LARGE DROPLET HOLLOW CONE NOZZLE for use where drifting must be kept to a minimum for volume of .11 to 2.20 GPM. These nozzles must always be fitted with 1553 nozzles and grey swirl plates. 50, 80 or 100 mesh screens are normally used with these nozzles. | 371077 |
|  | LARGE DROPLET FLAT SPRAY TIP in 150° spray angle. Always used in conjunction with 1553 cone nozzle where drifting must be kept to a minimum for volume of .8 GPM. 50, 80 or 100 mesh screens are normally used with these nozzles. | 710102 |
|  | SOLID STREAM NOZZLE for high volume liquid fertilizer application. For volume of .08 to 8.11 GPM. In this application, the 1553 nozzle is always used with 330013 O-Ring and either 50, 80 or 100 mesh screens. | 1553 Less Swirl |

## NOZZLE CHARTS

### TO USE THE FOLLOWING COLOR TIPS CHART:

1. You must know your desired speed (ex. 5 MPH)
2. You must know your application rate (ex. 20 GPA)
3. Locate correct rate row (ex 20 GPA)
4. Run your finger across the 20 GPA row until you meet the 5 MPH column - read the correct pressure.
5. Note Color Tip color.

# COLOR TIPS SYNTAL 110° FLAT FAN NOZZLES

Nozzle Choice - US/GPA - Pressure (psi) - Nozzle Spacing 20"
Recommended pressure range - 15 to 150 PSI
Recommended boom height 18" - 20"

| | | MPH | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | GPA | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 8.0 | 10.0 |
| S4110-08 LILAC | 5 | 29 | 37 | 46 | 55 | 66 | 77 | 89 | 117 | |
| 0.07 GPM @ 30 PSI | 10 | 117 | 148 | | | | | | | |
| 755431 | | | | | | | | | | |
| S4110-10 BROWN | 5 | | 16 | 20 | 24 | 28 | 33 | 39 | 51 | 79 |
| 0.10 GPM @ 30 PSI | 10 | 51 | 64 | 79 | 96 | 114 | 134 | 155 | | |
| 755435 | 15 | 114 | 144 | | | | | | | |
| S4110-12 YELLOW | 5 | | | | | | | 16 | 20 | 32 |
| 0.16 GPM @ 30 PSI | 10 | 20 | 26 | 32 | 38 | 46 | 54 | 62 | 81 | 127 |
| 755439 | 15 | 46 | 58 | 71 | 86 | 103 | 121 | 140 | | |
| | 20 | 81 | 103 | 127 | 153 | | | | | |
| | 25 | 127 | 160 | | | | | | | |
| S4110-14 ORANGE | 5 | | | | | | | | | 21 |
| 0.20 GPM @ 30 PSI | 10 | | 17 | 21 | 25 | 30 | 35 | 41 | 53 | 83 |
| 755443 | 15 | 30 | 38 | 47 | 57 | 68 | 79 | 92 | 120 | |
| | 20 | 53 | 68 | 83 | 101 | 120 | 141 | 163 | | |
| | 25 | 83 | 106 | 130 | 158 | | | | | |
| | 30 | 120 | 152 | | | | | | | |
| S4110-16 RED | 5 | | | | | | | | | 14 |
| 0.24 GPM @ 30 PSI | 10 | | | 14 | 17 | 20 | 23 | 27 | 35 | 55 |
| 755447 | 15 | 20 | 25 | 31 | 38 | 45 | 52 | 61 | 79 | 124 |
| | 20 | 35 | 45 | 55 | 67 | 79 | 93 | 108 | 141 | |
| | 25 | 55 | 70 | 86 | 104 | 124 | 146 | | | |
| | 30 | 79 | 100 | 124 | 150 | | | | | |
| | 40 | 141 | | | | | | | | |
| S4110-18 WHITE | 10 | | | | | 14 | 17 | 19 | 25 | 39 |
| 0.29 GPM @ 30 PSI | 15 | 14 | 18 | 22 | 27 | 32 | 37 | 43 | 56 | 88 |
| 755451 | 20 | 25 | 32 | 39 | 47 | 56 | 66 | 77 | 100 | 156 |
| | 25 | 39 | 50 | 61 | 74 | 88 | 103 | 120 | 156 | |
| | 30 | 56 | 71 | 88 | 107 | 127 | 149 | | | |
| | 40 | 100 | 127 | 156 | | | | | | |
| S4110-20 GREEN | 10 | | | | | | | | 17 | 27 |
| 0.35 GPM @ 30 PSI | 15 | | | 15 | 18 | 22 | 26 | 30 | 39 | 61 |
| 755455 | 20 | 17 | 22 | 27 | 33 | 39 | 46 | 53 | 69 | 108 |
| | 25 | 27 | 34 | 42 | 51 | 61 | 71 | 83 | 108 | 169 |
| | 30 | 39 | 49 | 61 | 74 | 87 | 103 | 119 | 156 | |
| | 40 | 69 | 87 | 108 | 131 | 156 | | | | |

## COLOR TIPS SYNTAL 110° FLAT FAN NOZZLES (contd.)

Nozzle Choice - US/GPA - Pressure (psi) - Nozzle Spacing 20"
Recommended pressure range - 15 to 150 PSI
Recommended boom height 18" - 20"

| | | MPH | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | GPA | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 8.0 | 10.0 |
| S4110-24 | 10 | | | | | | | | | 16 |
| TURQUOISE | 15 | | | | | | 15 | 17 | 23 | 36 |
| 0.46 GPM @ 30 PSI | 20 | | | 16 | 19 | 23 | 27 | 31 | 40 | 63 |
| 755459 | 25 | 16 | 20 | 25 | 30 | 36 | 42 | 48 | 63 | 99 |
| | 30 | 23 | 29 | 36 | 43 | 51 | 60 | 70 | 91 | 142 |
| | 40 | 40 | 51 | 63 | 76 | 91 | 107 | 124 | 162 | |
| S4110-30 BLUE | 15 | | | | | | | | | 18 |
| | 20 | | | | | | | 16 | 20 | 32 |
| 0.64 GPM @ 30 PSI | 25 | | | | 15 | 18 | 21 | 24 | 32 | 50 |
| 755463 | 30 | | | 18 | 22 | 26 | 30 | 35 | 46 | 71 |
| | 40 | 20 | 26 | 32 | 38 | 46 | 54 | 62 | 81 | 127 |
| S4110-36 GREY | 20 | | | | | | | | | 17 |
| 0.89 GPM @ 30 PSI | 25 | | | | | | | | 17 | 26 |
| 755467 | 30 | | | | | 14 | 16 | 18 | 24 | 38 |
| | 40 | | 14 | 17 | 20 | 24 | 28 | 33 | 43 | 67 |

## TO USE THE FOLLOWING NOZZLE CHARTS

1. You must know your desired forward speed (example 5 MPH).
2. You must know the pressure you want to use (example 30 PSI).
3. You must know your desired application rate (example 20 gallons per acre.

KNOWING THESE THREE FACTS, PROCEED AS FOLLOWS:

1. Locate correct speed column.

2. Run your finger down the MPH column until you come to a number which is as close as possible to the desired GPA and is also opposite the desired PSI.

3. This exercise will bring you very close to your desired rate.

HOWEVER, FOR FINAL PRESSURE SETTING, YOU MUST CALIBRATE YOUR SPRAYER.

# 4598 FLOOD SPRAY NOZZLE

Nozzle Choice - US/GPA - Nozzle Spacing 40"
Recommended boom height 18" - 20"

| | | | MPH | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PSI | GPM | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 4598-10 | 15 | 0.16 | 5.9 | 4.8 | 3.9 | 3.4 | 3.0 | 2.6 | 2.4 |
| 370742 | 20 | 0.18 | 6.7 | 5.3 | 4.5 | 3.8 | 3.3 | 3.0 | 2.7 |
| | 30 | 0.22 | 8.2 | 6.5 | 5.4 | 4.7 | 4.1 | 3.6 | 3.3 |
| | 40 | 0.26 | 9.7 | 7.7 | 6.4 | 5.5 | 4.8 | 4.3 | 3.9 |
| 4598-12 | 15 | 0.23 | 8.5 | 6.8 | 5.7 | 4.9 | 4.3 | 3.8 | 3.4 |
| 370753 | 20 | 0.26 | 9.7 | 7.7 | 6.4 | 5.5 | 4.8 | 4.3 | 3.9 |
| | 30 | 0.32 | 11.9 | 9.5 | 8.0 | 6.8 | 6.0 | 5.3 | 4.8 |
| | 40 | 0.38 | 14.1 | 11.3 | 9.4 | 8.1 | 7.1 | 6.3 | 5.6 |
| 4598-14 | 15 | 0.30 | 11.1 | 8.0 | 7.4 | 6.4 | 5.6 | 5.0 | 4.5 |
| 370764 | 20 | 0.34 | 12.6 | 10.1 | 8.4 | 7.2 | 6.3 | 5.6 | 5.0 |
| | 30 | 0.43 | 16.0 | 12.8 | 10.6 | 9.1 | 8.0 | 7.1 | 6.4 |
| | 40 | 0.48 | 17.8 | 14.3 | 11.9 | 10.2 | 8.9 | 7.9 | 7.1 |
| 4598-16 | 15 | 0.44 | 16.3 | 13.1 | 10.9 | 9.3 | 8.2 | 7.3 | 6.5 |
| 370775 | 20 | 0.50 | 18.6 | 14.9 | 12.4 | 10.7 | 9.3 | 8.3 | 7.4 |
| | 30 | 0.63 | 23.4 | 18.7 | 15.6 | 13.4 | 11.7 | 10.4 | 9.4 |
| | 40 | 0.72 | 27.1 | 21.7 | 18.1 | 15.5 | 13.6 | 12.0 | 10.8 |
| 4598-18 | 15 | 0.54 | 20.0 | 16.0 | 13.4 | 11.5 | 10.0 | 8.9 | 8.0 |
| 370786 | 20 | 0.63 | 23.4 | 18.7 | 15.6 | 13.4 | 11.7 | 10.4 | 9.4 |
| | 30 | 0.77 | 28.6 | 22.9 | 19.1 | 16.3 | 14.3 | 12.7 | 11.4 |
| | 40 | 0.88 | 32.7 | 26.1 | 21.8 | 18.7 | 16.3 | 14.5 | 13.1 |
| 4598-20 | 15 | 0.69 | 25.6 | 20.5 | 17.1 | 14.6 | 12.8 | 11.4 | 10.2 |
| 370797 | 20 | 0.80 | 29.7 | 23.8 | 19.8 | 17.0 | 14.9 | 13.2 | 11.9 |
| | 30 | 1.00 | 37.1 | 29.7 | 24.8 | 21.2 | 18.6 | 16.5 | 14.9 |
| | 40 | 1.15 | 42.7 | 34.2 | 28.5 | 24.4 | 21.3 | 19.0 | 17.1 |
| TK-10 | 15 | 1.20 | 45.0 | 36.0 | 30.0 | 25.0 | 22.0 | 20.0 | 18.0 |
| | 20 | 1.40 | 53.0 | 42.0 | 35.0 | 30.0 | 26.0 | 23.0 | 21.0 |
| | 30 | 1.70 | 64.0 | 51.0 | 43.0 | 36.0 | 32.0 | 28.0 | 26.0 |
| | 40 | 2.00 | 74.0 | 59.0 | 50.0 | 42.0 | 37.0 | 33.0 | 30.0 |
| TK-15 | 15 | 1.80 | 67.0 | 53.0 | 45.0 | 38.0 | 33.0 | 30.0 | 27.0 |
| | 20 | 2.10 | 79.0 | 63.0 | 53.0 | 45.0 | 39.0 | 35.0 | 32.0 |
| | 30 | 2.60 | 96.0 | 77.0 | 64.0 | 55.0 | 48.0 | 43.0 | 39.0 |
| | 40 | 3.00 | 111.0 | 89.0 | 74.0 | 64.0 | 56.0 | 50.0 | 45.0 |

# 1553 CONE NOZZLE with GREY Swirl Plate (370134)

Nozzle Choice - US/GPA - Nozzle Spacing 20"
Recommended boom height 18" - 20"

| | | | MPH | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PSI | GPM | 3 | 5 | 6 | 7 | 8 | 10 |
| 1553-08 | 45 | 0.13 | 12.8 | 7.7 | 6.4 | 5.5 | 4.8 | 3.8 |
| 370016 | 70 | 0.17 | 16.8 | 10.1 | 8.4 | 7.2 | 6.3 | 5.1 |
| | 150 | 0.23 | 22.8 | 13.7 | 11.4 | 9.8 | 8.5 | 6.9 |
| | 220 | 0.29 | 36.6 | 22.0 | 18.3 | 15.7 | 13.7 | 11.0 |
| 1553-10 | 45 | 0.17 | 16.8 | 10.1 | 8.4 | 7.2 | 6.3 | 5.0 |
| 370027 | 70 | 0.22 | 21.8 | 13.1 | 10.9 | 9.3 | 8.2 | 6.6 |
| | 150 | 0.31 | 30.7 | 18.4 | 15.4 | 13.2 | 11.5 | 9.2 |
| | 220 | 0.37 | 36.6 | 22.0 | 18.3 | 15.7 | 13.7 | 11.0 |
| 1553-12 | 45 | 0.22 | 21.8 | 13.1 | 10.9 | 9.3 | 8.1 | 6.5 |
| 370031 | 70 | 0.28 | 27.7 | 16.6 | 13.9 | 11.9 | 10.4 | 8.3 |
| | 150 | 0.40 | 39.6 | 23.8 | 19.8 | 17.0 | 14.9 | 11.9 |
| | 220 | 0.49 | 48.5 | 29.1 | 24.3 | 20.8 | 18.2 | 14.6 |
| 1553-14 | 45 | 0.27 | 26.7 | 16.0 | 13.3 | 11.4 | 10.0 | 8.0 |
| 370042 | 70 | 0.35 | 34.7 | 20.8 | 17.4 | 14.9 | 13.0 | 10.4 |
| | 150 | 0.50 | 49.5 | 29.7 | 24.8 | 21.2 | 18.6 | 14.9 |
| | 220 | 0.62 | 61.4 | 36.8 | 30.7 | 26.3 | 23.0 | 18.4 |
| 1553-16 | 45 | 0.33 | 32.7 | 19.6 | 16.3 | 14.0 | 12.3 | 9.8 |
| 370053 | 70 | 0.43 | 42.6 | 25.5 | 21.3 | 18.2 | 16.0 | 12.8 |
| | 150 | 0.61 | 60.4 | 36.2 | 30.2 | 25.9 | 22.6 | 18.1 |
| | 220 | 0.75 | 74.3 | 44.6 | 37.2 | 31.8 | 27.8 | 22.3 |
| 1553-18 | 45 | 0.38 | 37.6 | 22.6 | 18.8 | 16.1 | 14.1 | 11.3 |
| 370064 | 70 | 0.49 | 48.5 | 29.1 | 24.3 | 20.8 | 18.2 | 14.6 |
| | 150 | 0.69 | 68.3 | 41.0 | 34.2 | 29.3 | 25.6 | 20.5 |
| | 220 | 0.84 | 83.2 | 49.9 | 41.6 | 35.6 | 31.1 | 25.0 |
| 1553-20 | 45 | 0.43 | 42.6 | 25.6 | 21.3 | 18.3 | 16.0 | 12.8 |
| 370075 | 70 | 0.56 | 55.4 | 33.3 | 27.7 | 23.8 | 20.8 | 16.7 |
| | 150 | 0.79 | 78.2 | 47.0 | 39.1 | 33.5 | 29.3 | 23.5 |
| | 220 | 0.97 | 96.0 | 57.6 | 48.0 | 41.2 | 36.0 | 28.8 |
| 1553-22 | 45 | 0.46 | 45.6 | 27.4 | 22.8 | 19.5 | 17.1 | 13.7 |
| 370086 | 70 | 0.60 | 59.4 | 35.6 | 29.7 | 25.5 | 22.3 | 17.8 |
| | 150 | 0.84 | 83.2 | 49.9 | 41.6 | 35.6 | 31.2 | 25.0 |
| | 220 | 1.03 | 102.0 | 61.2 | 51.0 | 43.7 | 38.2 | 30.6 |
| 1553-24 | 45 | 0.52 | 51.5 | 30.9 | 25.7 | 22.0 | 19.3 | 15.4 |
| 370097 | 70 | 0.67 | 66.3 | 39.8 | 33.2 | 28.4 | 24.9 | 19.9 |
| | 150 | 0.94 | 93.1 | 55.8 | 46.6 | 39.9 | 34.9 | 27.9 |
| | 220 | 1.16 | 114.5 | 68.9 | 57.3 | 49.2 | 43.0 | 34.5 |

## 1553 CONE NOZZLE with GREY Swirl Plate (370134) (contd.)

Nozzle Choice - US/GPA - Nozzle Spacing 20"
Recommended boom height 18" - 20"

| | | | MPH | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PSI | GPM | 3 | 5 | 6 | 7 | 8 | 10 |
| 1553-30 | 45 | 0.61 | 60.4 | 36.2 | 30.1 | 25.8 | 22.6 | 18.1 |
| 370101 | 70 | 0.78 | 77.2 | 46.3 | 38.6 | 33.1 | 29.0 | 23.2 |
| | 150 | 1.11 | 109.9 | 65.9 | 55.0 | 47.1 | 41.2 | 33.0 |
| | 220 | 1.36 | 134.6 | 80.8 | 67.3 | 57.7 | 50.5 | 40.4 |
| 1553-35 | 45 | 0.69 | 68.3 | 41.0 | 34.2 | 29.3 | 25.6 | 20.5 |
| 370112 | 70 | 0.90 | 89.1 | 53.5 | 44.6 | 38.2 | 33.4 | 26.8 |
| | 150 | 1.27 | 125.7 | 75.4 | 62.9 | 53.9 | 47.1 | 37.7 |
| | 220 | 1.55 | 153.5 | 92.1 | 76.8 | 65.8 | 57.5 | 46.1 |
| 1553-40 | 45 | 0.76 | 75.2 | 45.1 | 37.6 | 32.2 | 28.2 | 22.6 |
| 370123 | 70 | 0.98 | 97.0 | 58.2 | 48.5 | 41.6 | 36.4 | 29.1 |
| | 150 | 1.39 | 137.6 | 82.6 | 68.8 | 59.0 | 51.6 | 41.3 |
| | 220 | 1.70 | 168.2 | 101.0 | 84.2 | 72.1 | 63.1 | 50.5 |

## 1553 CONE NOZZLE with BLUE Swirl Plate (370156)

Nozzle Choice - US/GPA - Nozzle Spacing 20"
Recommended boom height 18" - 20"

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1553-08 | 45 | 0.06 | 5.9 | 3.5 | 2.9 | 2.5 | 2.2 | 1.8 |
| 370016 | 70 | 0.08 | 7.9 | 4.8 | 4.0 | 3.4 | 3.0 | 2.4 |
| | 150 | 0.12 | 11.9 | 7.1 | 5.9 | 5.1 | 4.5 | 3.6 |
| | 220 | 0.14 | 13.9 | 8.3 | 6.9 | 5.9 | 5.2 | 4.2 |
| 1553-10 | 45 | 0.08 | 7.9 | 4.7 | 3.9 | 3.3 | 2.9 | 2.3 |
| 370027 | 70 | 0.10 | 9.9 | 5.8 | 4.9 | 4.2 | 3.7 | 3.0 |
| | 150 | 0.15 | 14.9 | 8.9 | 7.4 | 6.4 | 5.6 | 4.5 |
| | 220 | 0.18 | 17.8 | 10.7 | 8.9 | 7.6 | 6.7 | 5.4 |
| 1553-12 | 45 | 0.10 | 9.9 | 6.0 | 5.0 | 4.3 | 3.8 | 3.0 |
| 370031 | 70 | 0.13 | 12.9 | 7.7 | 6.4 | 5.5 | 4.8 | 3.9 |
| | 150 | 0.18 | 17.8 | 10.7 | 8.9 | 7.6 | 6.7 | 5.4 |
| | 220 | 0.22 | 21.9 | 13.1 | 10.9 | 9.3 | 8.2 | 6.5 |
| 1553-14 | 45 | 0.12 | 11.9 | 7.1 | 5.9 | 5.1 | 4.5 | 3.6 |
| 370042 | 70 | 0.15 | 14.9 | 8.9 | 7.4 | 6.4 | 5.6 | 4.5 |
| | 150 | 0.21 | 20.8 | 12.5 | 10.4 | 8.9 | 7.8 | 6.2 |
| | 220 | 0.26 | 26.7 | 15.4 | 12.9 | 11.0 | 9.7 | 7.7 |

## 1553 CONE NOZZLE with BLUE Swirl Plate (370156) (contd.)

Nozzle Choice - US/GPA - Nozzle Spacing 20"
Recommended boom height 18" - 20"

| | | | MPH | | | | | |
|---|---|---|---|---|---|---|---|---|
| | PSI | GPM | 3 | 5 | 6 | 7 | 8 | 10 |
| 1553-16 | 45 | 0.14 | 13.9 | 8.3 | 6.9 | 5.9 | 5.2 | 4.2 |
| 370053 | 70 | 0.18 | 17.8 | 10.7 | 8.9 | 7.6 | 6.7 | 5.4 |
| | 150 | 0.26 | 26.7 | 15.4 | 12.9 | 11.0 | 9.7 | 7.7 |
| | 220 | 0.32 | 31.7 | 19.0 | 15.8 | 13.6 | 11.9 | 9.5 |
| 1553-18 | 45 | 0.16 | 15.9 | 9.5 | 7.9 | 6.8 | 6.0 | 4.8 |
| 370064 | 70 | 0.20 | 19.8 | 11.9 | 9.9 | 8.5 | 7.4 | 5.9 |
| | 150 | 0.29 | 28.7 | 17.2 | 14.3 | 12.3 | 10.8 | 8.6 |
| | 220 | 0.35 | 34.7 | 20.8 | 17.3 | 14.9 | 13.0 | 10.4 |
| 1553-20 | 45 | 0.18 | 17.8 | 10.7 | 8.9 | 7.6 | 6.7 | 5.4 |
| 370075 | 70 | 0.22 | 21.9 | 13.0 | 10.9 | 9.3 | 8.2 | 6.5 |
| | 150 | 0.32 | 31.7 | 19.0 | 15.8 | 13.6 | 11.9 | 9.5 |
| | 220 | 0.39 | 38.6 | 23.1 | 19.3 | 16.5 | 14.5 | 11.6 |
| 1553-22 | 45 | 0.19 | 18.8 | 11.3 | 9.4 | 8.1 | 7.1 | 5.7 |
| 370086 | 70 | 0.24 | 23.8 | 14.2 | 11.9 | 10.2 | 8.9 | 7.1 |
| | 150 | 0.33 | 32.7 | 19.6 | 16.3 | 14.0 | 12.2 | 9.8 |
| | 220 | 0.41 | 40.6 | 24.4 | 20.3 | 17.4 | 15.2 | 12.2 |
| 1553-24 | 45 | 0.20 | 19.8 | 11.9 | 9.9 | 8.5 | 7.4 | 5.9 |
| 370097 | 70 | 0.25 | 24.8 | 14.9 | 12.4 | 10.6 | 9.3 | 7.4 |
| | 150 | 0.36 | 35.6 | 21.4 | 17.8 | 15.3 | 13.4 | 10.7 |
| | 220 | 0.44 | 43.6 | 26.1 | 21.8 | 18.7 | 16.3 | 13.1 |
| 1553-30 | 45 | 0.24 | 23.8 | 14.3 | 11.9 | 10.2 | 8.9 | 7.1 |
| 370101 | 70 | 0.30 | 29.7 | 17.8 | 14.8 | 12.7 | 11.1 | 8.9 |
| | 150 | 0.42 | 41.6 | 24.9 | 20.8 | 17.8 | 15.6 | 12.5 |
| | 220 | 0.52 | 51.5 | 30.9 | 25.7 | 22.1 | 19.3 | 15.4 |
| 1553-35 | 45 | 0.26 | 25.8 | 15.5 | 12.9 | 11.0 | 9.6 | 7.7 |
| 370112 | 70 | 0.33 | 32.7 | 19.6 | 16.3 | 14.0 | 12.2 | 9.8 |
| | 150 | 0.47 | 46.5 | 27.9 | 23.3 | 19.9 | 17.5 | 14.0 |
| | 220 | 0.58 | 57.4 | 34.5 | 28.7 | 24.6 | 21.5 | 17.2 |
| 1553-40 | 45 | 0.28 | 27.7 | 16.6 | 13.8 | 11.8 | 10.3 | 8.2 |
| 370123 | 70 | 0.35 | 34.7 | 20.8 | 17.3 | 14.9 | 13.0 | 10.4 |
| | 150 | 0.50 | 49.5 | 29.7 | 24.8 | 21.2 | 18.6 | 14.9 |
| | 220 | 0.61 | 60.4 | 36.2 | 30.2 | 25.9 | 22.7 | 18.1 |

# 5. EC-SC ELECTRIC BOOM CONTROL ADJUSTMENT

The electric control box is a 12 volt system protected with a 6 amp fuse inside the box itself. Brown wire is positive (+); blue wire is negative (-).

The switches below the boom control the individual sections of the boom. The switch above the diagram of the boom shuts the entire boom on or off.

The switch above the gauge lowers the pressure. The switch below the gauge raises the pressure.

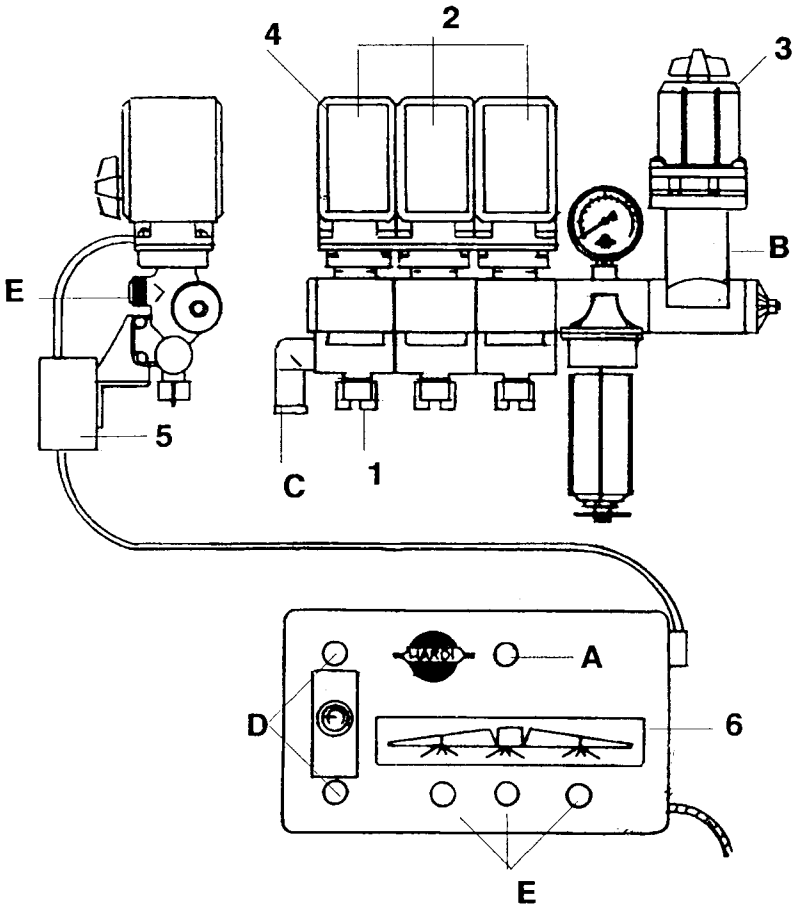
**PROCEDURE to adjust the constant pressure (water only)**

1. Start tractor and engage PTO to operating speed.
2. Bring sprayer to operating pressure.
3. Shut off right hand section of the boom. Adjust red knob (1) either in or out to bring pressure back to operating pressure. Leave boom section turned off.
4. Repeat this procedure with the other sections of the boom

1) Constant pressure adjustment
2) Main on/off for boom
3) Pressure regulator
4) Individual boom control motor
5) Junction box
6) Control box

a) Boom on/off switch
b) 1-1/4" pressure hose from pump
c) 1" return to tank constant pressure
d) Pressure switches
e) Boom sections

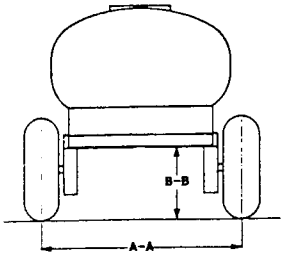
# EC-SC CONTROLS



# 6. AXLE ADJUSTMENTS

### WHEEL TRACK AND CLEARANCE ADJUSTMENTS

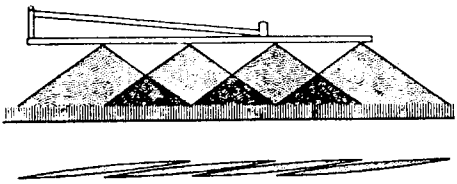
Track width is measured from center to center on tires (A-A). Clearance is measured from ground level to bottom of the frame (B-B).



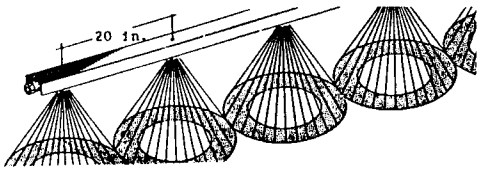

| | ESC500/SA | ESC500/TA | ESC800/TA | ESC1000/TA |
|---|---|---|---|---|
| A-A | 60"-82" | 60"-85" | 60"-100" | 60"-100" |
| B-B | 27"-32" | 26"-32" | 28"-34" | 28"-34" |

# 7. BOOM HEIGHT

Correct boom height is important to ensure even spray distribution. While flat spray nozzles may be used at a boom height above target of 20" (110°) or 24" (80°), the best distribution occurs when the boom height is adjusted to the overlap shown below using 110° nozzles.



Cone spray nozzle patterns should not overlap. The spray patterns should just meet at the target surface. Height will be about 22".



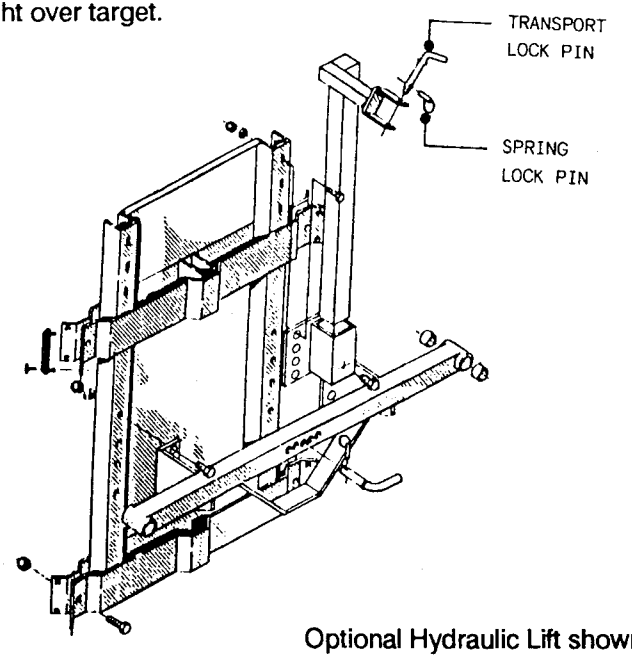
# 8. MANUAL FOLDING BOOM OPERATION

Remove transport lock pins and swing boom around into operation position. Lift outer boom section up and over to horizontal position. CAREFULLY CHECK THAT FEED HOSES TO NOT INTERFERE WITH SPRAY PATTERN.

Re-install transport lock pins in original location so that they don't get lost.

Make absolutely sure boom transport securing pin is installed COMPLETE WITH spring lock pin BEFORE transporting the sprayer between operations.

Before spraying, carefully check that spray boom is set at correct height over target.




Optional Hydraulic Lift shown here

# 9. MAINTENANCE

## A) FILTERS

Filters and screens should be cleaned daily or more often if pressure variation is observed.

Filters should be cleaned by rinsing in clean water. A soft brush can be used if necessary. Never use a sharp object to clean the filters.

## B) TANK

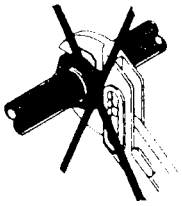
The sprayer tank should be emptied and flushed at the end of EVERY day of sprayer.

When changing from one chemical to another, it is important to thoroughly clean the sprayer tank and hoses. After rinsing the sprayer with clean water, fill the tank 1/4 to 1/3 full with a 1% solution of household ammonia and water. Re-circulate the ammonia solution throughout the sprayer and spray some through the boom. Let stand overnight if possible. Drain the sprayer and rinse thoroughly with clean water again, spraying some through the boom.

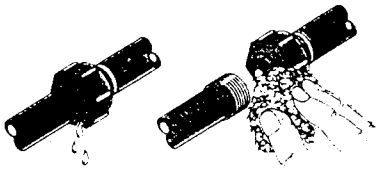
It is difficult to completely remove all chemical traces, especially from the inside of hoses. Sometimes a chemical may pick up traces of a previous material when first sprayed through the boom lines. Consult your chemical supplier for any special washing instructions.

Be sure that all spray residue is drained where it cannot create a health hazard.

Always read chemical label for exact rinsing procedure.

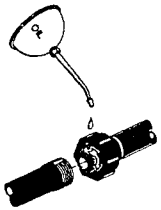


NEVER USE A WRENCH TO TIGHTEN LEAKING HOSE CONNECTIONS OF THE TYPE SHOWN HERE



INSTEAD, DISCONNECT COUPLING AND WASH OFF.

# 9. MAINTENANCE (contd.)

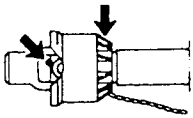


LIGHTLY OIL COUPLING AND O-RING

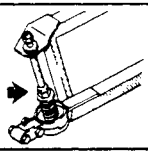
RECONNECT AND TIGHTEN BY HAND

## C) LUBRICATION

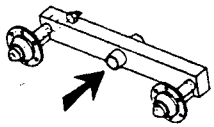
Grease the following with a good quality lithium grease.



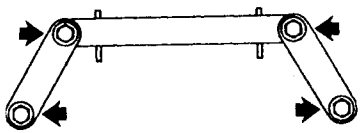
PTO SHAFT YOKE BEARINGS AND SHIELD Be careful not to overgrease and ruin bearing seals.



BOOM BREAKAWAY CASTING
Grease daily.



TANDEM AXLE PIVOT BUSHING
Grease daily.



MB TRAPEZE
Grease daily.

REPACK WHEEL BEARINGS ONCE ANNUALLY.

# 10. WINTER STORAGE

1. Thoroughly clean sprayer system.
2. Wash off outside of sprayer.
3. Lubricate sprayer
4. Carefully inspect sprayer for damaged components or worn hoses.
5. Apply touch-up paint where necessary.
6. Drain as much water as possible from sprayer. Pour in a mixture of ethylene glycol base anti-freeze and water at the ratio for the desired temperature protection. (Volume of anti-freeze should be about 1% of tank volume) Run the sprayer and circulate the anti-freeze. Briefly turn on the boom until anti-freeze sprays through the nozzles. Shut off sprayer leaving anti-freeze in the pump, controls and boom lines.

**Never use oil, diesel fuel or alcohol based anti-freeze in a sprayer.**

7. Remove nozzles and screens. Clean and store in a safe, dry location.
8. Turn pressure regulator valve counter-clockwise until all spring tension is released. Turn boom section valves off.
9. Store sprayer in safe, dry location, away from children and animals. Protect from direct sunlight.
10. Remove pressure gauges and store upright in a warm dry location.

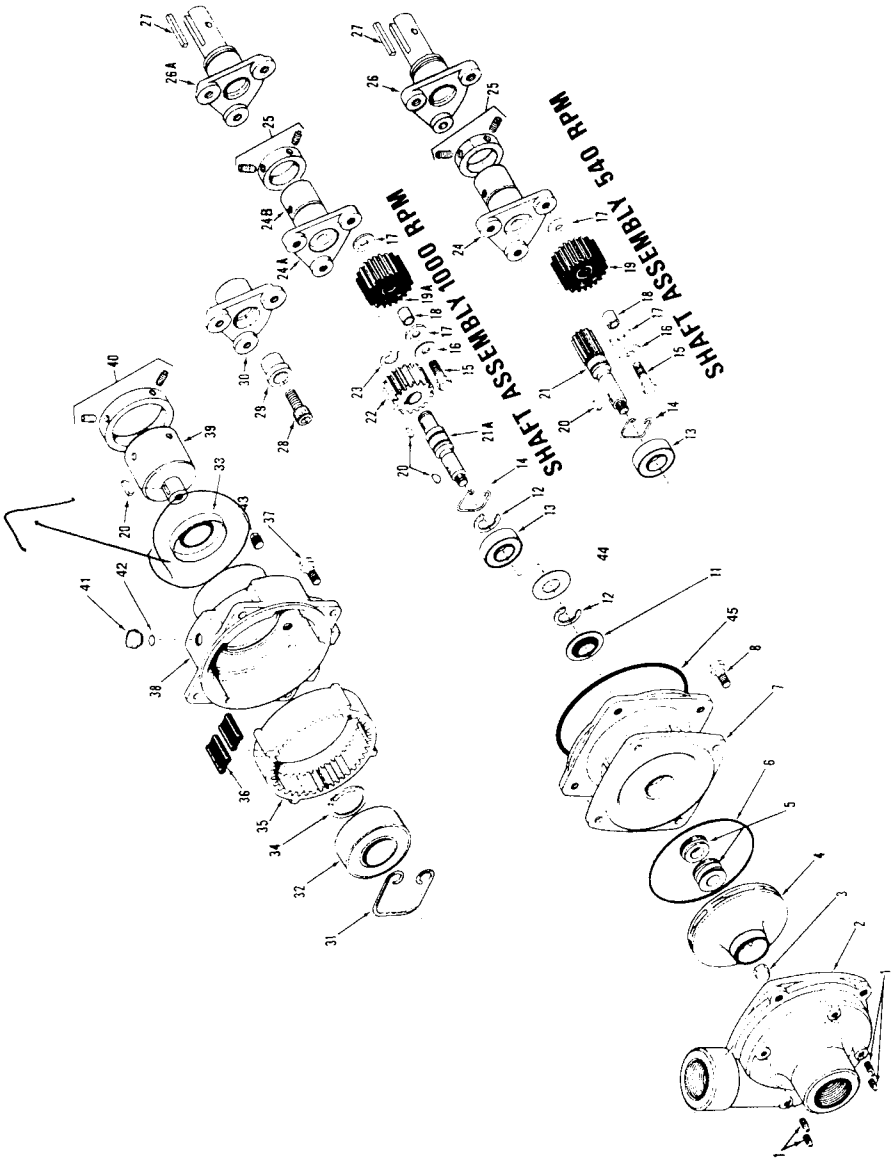
# 11. TROUBLE SHOOTING

| PROBLEM | PROBABLE CAUSE | REPAIR |
|---|---|---|
| NO SPRAY WHEN SPRAY IS TURNED ON | ¤ Air leaks | • Check hose for loose clamps, etc. |
| | ¤ Air in system | • Remove hose between pump and control - fill with water to prime. |
| | ¤ Suction or nozzle filter plugged | • Clean filters. |
| | ¤ Tank outlet plugged | • Clean outlet. |
| | ¤ Faulty pump system | • Repair pump |
| PRESSURE DROPPING | ¤ Filter plugging | • Clean filters |
| | ¤ Nozzles wearing | • Replace nozzles. |
| | ¤ Dirty water supply | • Use clean water.<br>• Ensure screen is on suction hose of filling pump. |
| | ¤ Tank is airtight | • Clean tank vent |
| | ¤ Faulty pump | • Repair pump |
| LESS OUTPUT FROM SOME NOZZLES | ¤ Nozzle filters starting to plug | • Clean filters |
| | ¤ Mismatched nozzles | • Check nozzle numbers |
| | ¤ Nozzles worn | • Check output from each nozzle. Replace if worn. |
| LESS SPRAY FROM ONE BOOM SECTION THAN OTHERS | ¤ Manual control lever not fully open | • Open lever fully. |
| | ¤ Hose kinked or pinched | • Straighten hose. |

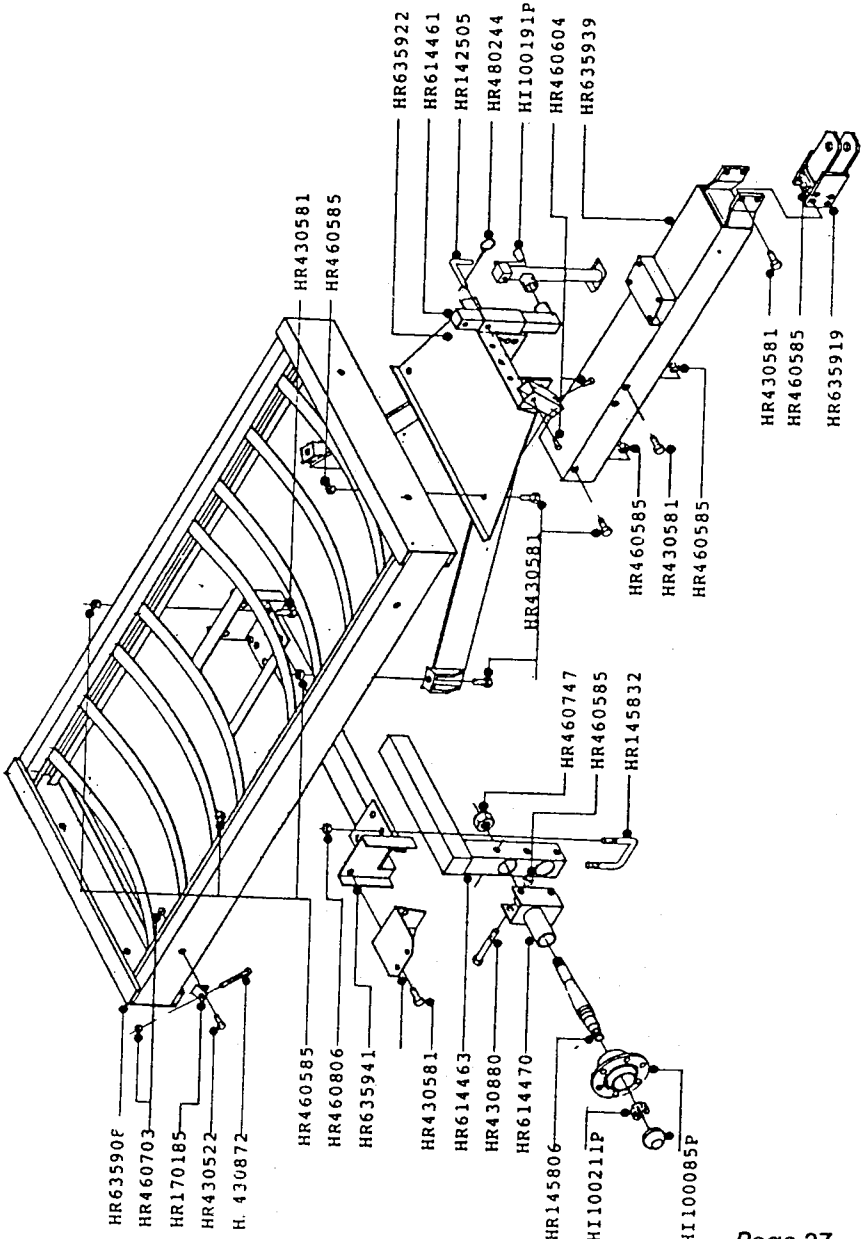
# 11. TROUBLE SHOOTING (contd.)

| PROBLEM | PROBABLE CAUSE | REPAIR |
|---|---|---|
| NOZZLES AT END OF BOOM HAVE LOW OUTPUT | ¤ Inadequate pump size | • Fit larger pump. |
| | ¤ Nozzle size too large | • Fit smaller nozzles. |
| POOR AGITATION | ¤ Agitator valve off | • Ensure valve fully on |
| | ¤ Inadequate pump size | • Fit larger pump. |
| | ¤ Nozzle size too large | • Fit smaller nozzles. |
| | ¤ Agitator nozzles plugged | • Clear nozzles. |
| PRESSURE GRADUALLY INCREASING | ¤ Nozzle filters plugging | • Clean filters. |
| SPRAY ANGLE TOO NARROW | ¤ Pressure too low | • Increase pressure and recalibrate. |
| | ¤ Boom too low | • See boom height, page 19 |
| | ¤ Nozzle partially plugged | • Clear nozzles |
| TOO MUCH WIND DRIFT | ¤ Pressure too high | • Decrease pressure and recalibrate. |
| | ¤ Boom too high | • See boom height, page 19 |

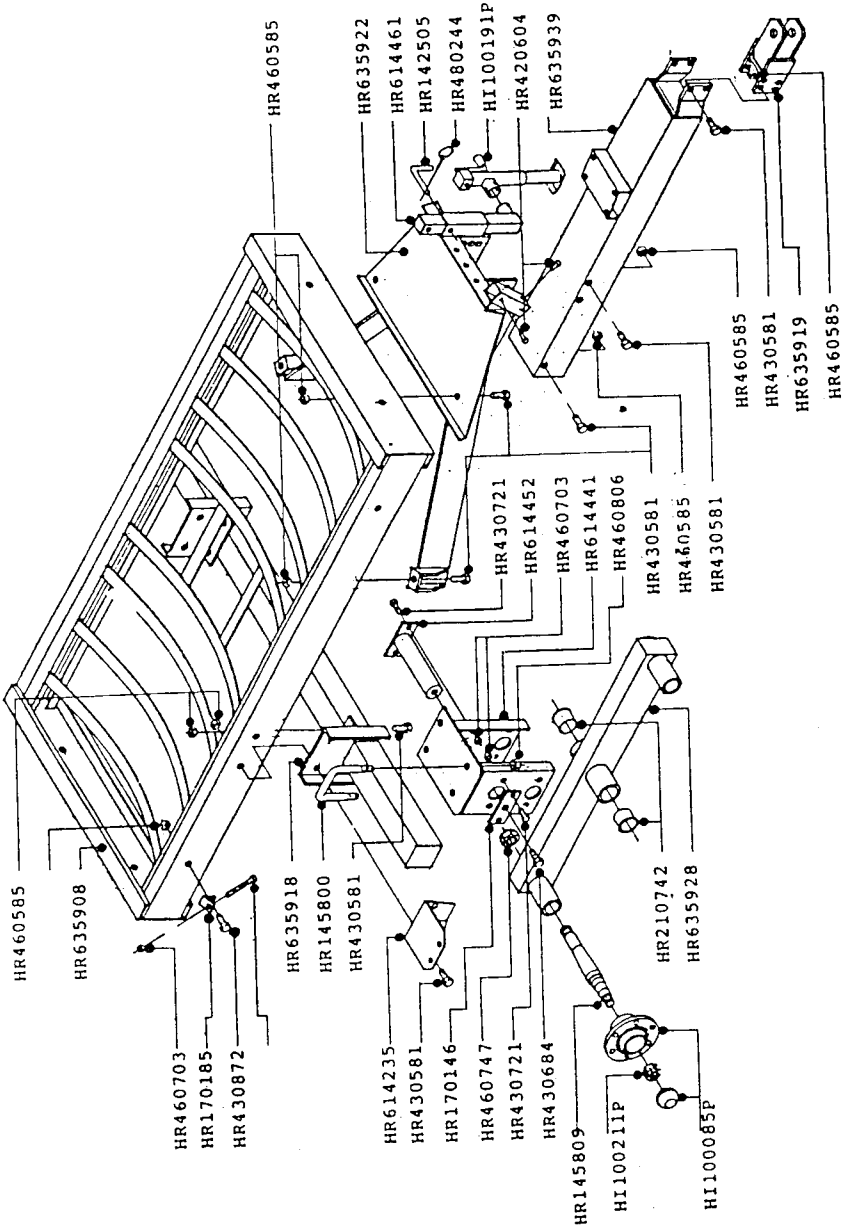
# HYPRO PUMP ASSEMBLY



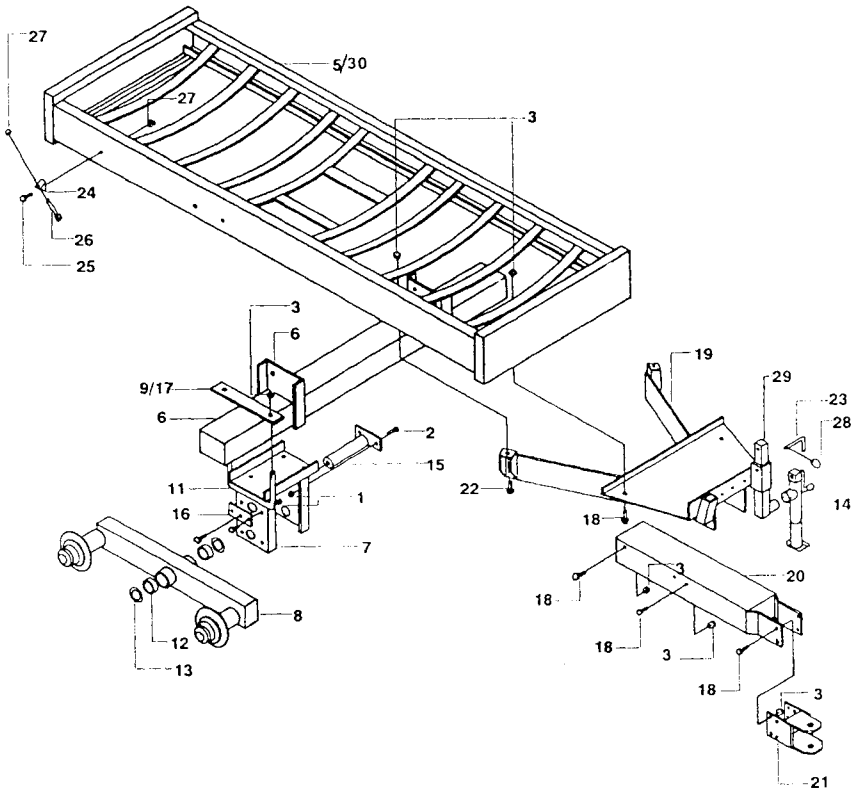
# ESC500 SINGLE AXLE FRAME ASSEMBLY



# ESC500 TANDEM AXLE FRAME ASSEMBLY

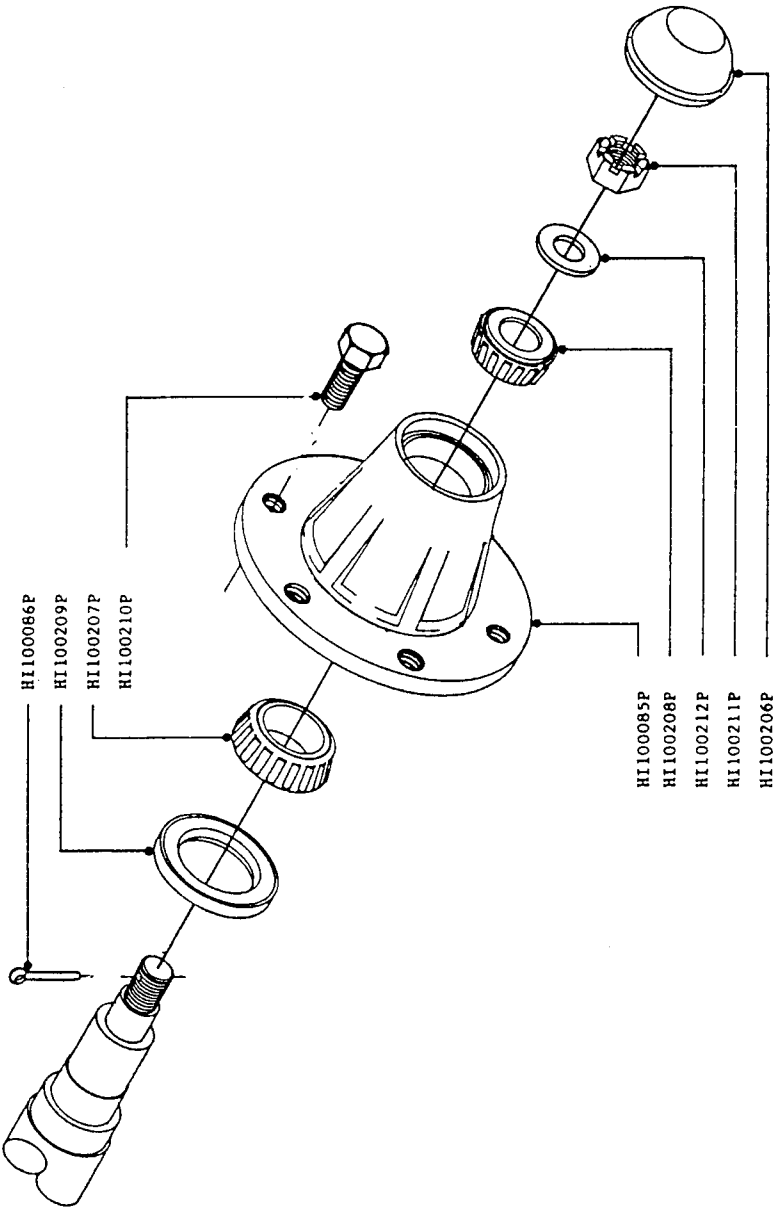


# ESC800/1000 TANDEM AXLE FRAME ASSEMBLY

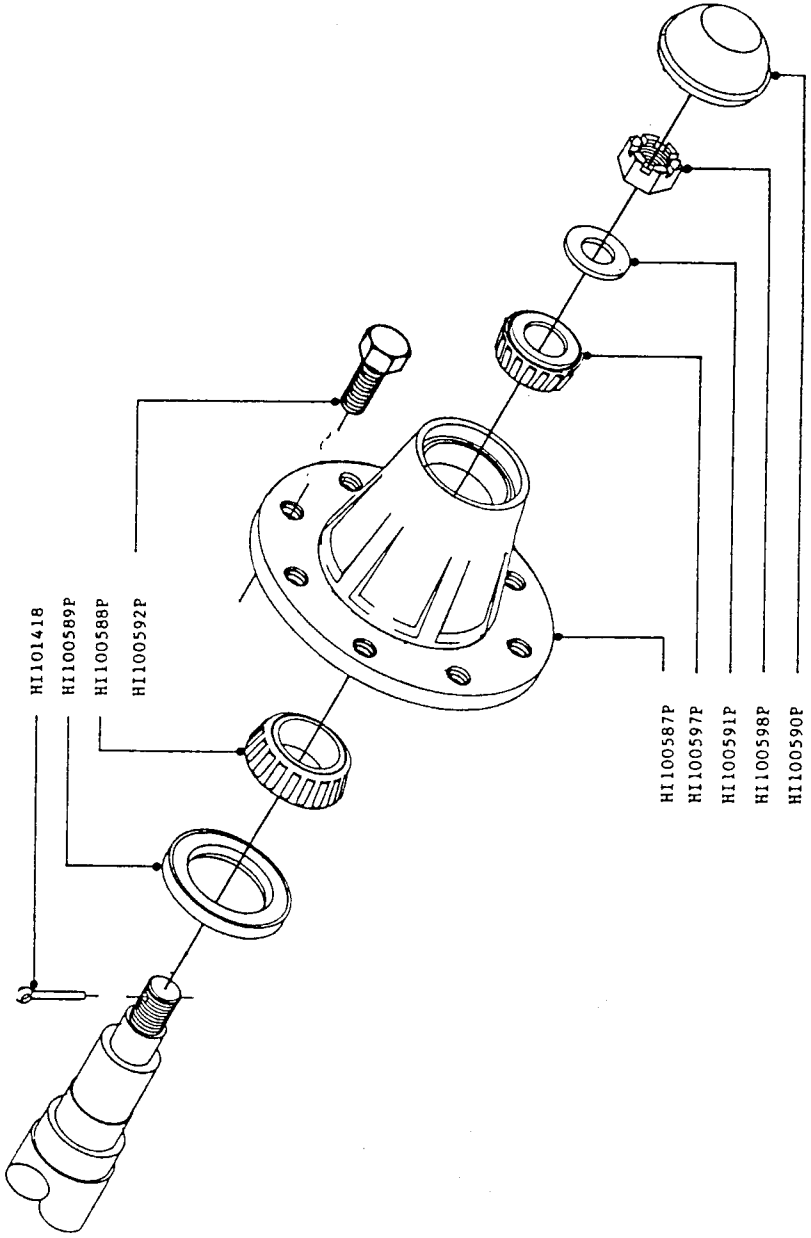



| KEY | ORDER # | DESCRIPTION | | | |
|---|---|---|---|---|---|
| 1 | 100025P | NUT HEX NC 1/2 | 16 | 100717M | BRACKET - PIN W/M |
| 2 | 100045P | BOLT HEX 1/2 NC GR 2 01.50" | 17 | 101063 | U BAR 1000 GAL |
| 3 | 100197P | NUT HEX NC 3/4 | 18 | 102333 | BOLT 3/4 X 2 |
| 4 | 100223P | BOLT HEX 5/8 NC GR 2 01.00" | 19 | 102336 | A FRAME + STEP |
| 5 | 100547W | TR 1000 FRAME ASSEMBLY | 20 | 102337 | TONGUE 800/1000 |
| 6 | 100553W | AXLE W/M TR 1000 | 21 | 102338 | HITCH 800/1000 |
| 7 | 100554W | UPRIGHT W/M TR 1000 | 22 | 102385 | BOLT 3/4 X 2-1/2 |
| 8 | 100557A | TANDEM BEAM & HUB ASSEMBLY | 23 | 142505 | LOCK PAWL 016 X 65 |
| 9 | 100558M | U BOLT PLATE | 24 | 170185 | ANGLE HINGE FOR CLAMP |
| 10 | 100568P | BOLT HEX 5/8 NC GR 5 01.50 | 25 | 430522 | M12 X 25 MACH SCREW GALV |
| 11 | 100572P | BOLT U 3/4 NCX8 - 7/8 WX8 - 1/4 X 11/2 | 26 | 430872 | CAP SCREW M12 X 100 ELZ |
| 12 | 100586P | GARLOCK 40 DU 40 TR 800/1000 | 27 | 460703 | M12 SELF LOCK NUT MFC 840 |
| 13 | 100602P | MACH BUSH 2 - 9/16 X 3 - 1/2 X 1/8 | 28 | 480244 | SPRING PIN 4.5 MIN GALV |
| 14 | 100619P | ADJ. JACK C/W PIN/CHAIN 5000LB | 29 | 614461 | JACK STAND ATTACHMENT |
| 15 | 100714W | PIN W/M TR 1000 | 30 | 100551W | 800 GAL. FRAME |

# ESC500 HUB ASSEMBLY

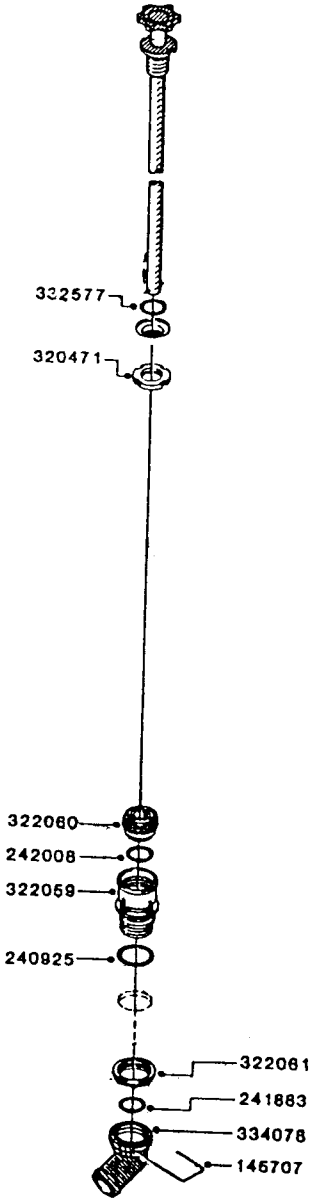


# ESC800/1000 HUB ASSEMBLY

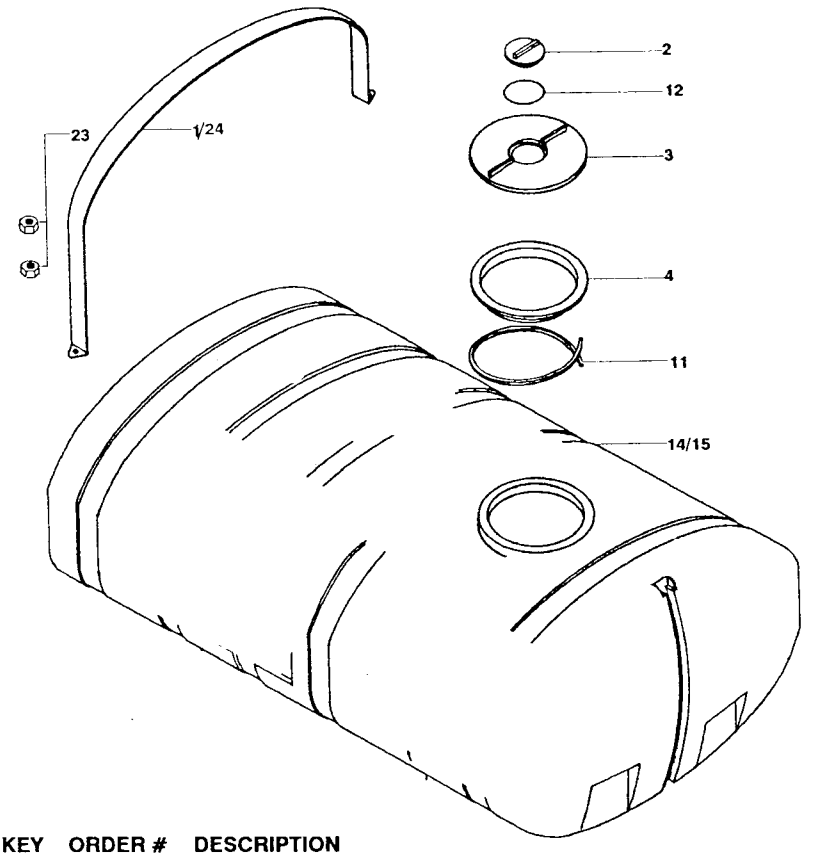


# TOP DRAIN ASSEMBLY

# OPTIONAL

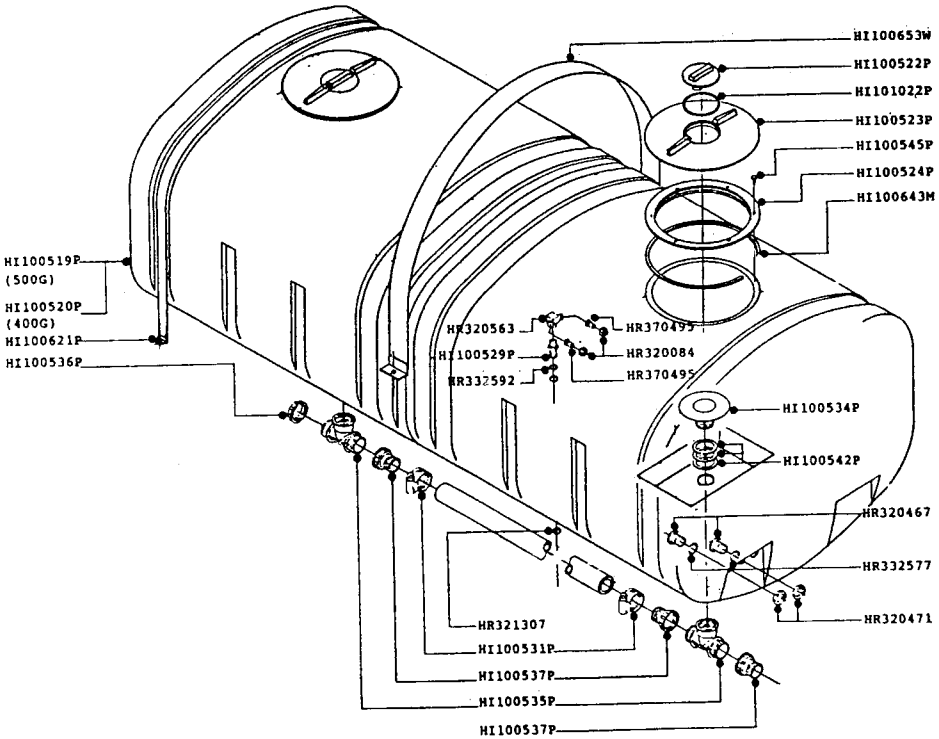


# ESC 300/500 TANK ASSEMBLY

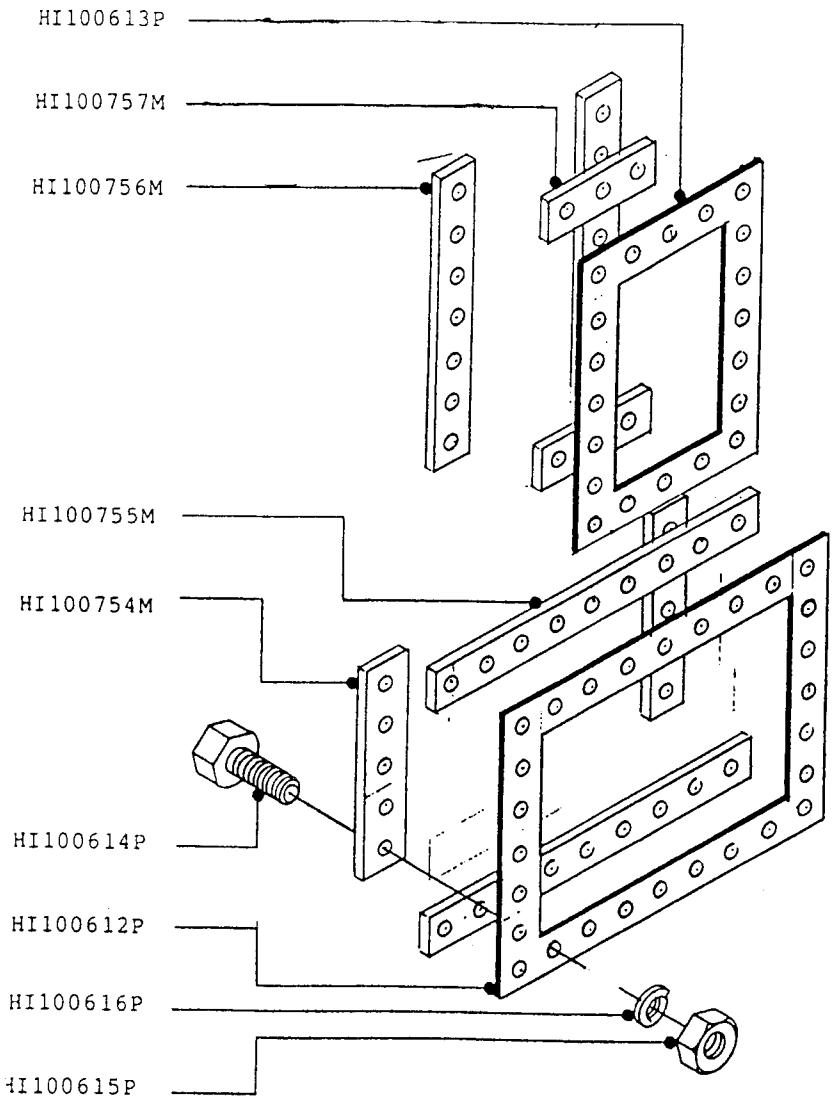



| KEY | ORDER # | DESCRIPTION |
|---|---|---|
| 1 | 100182P | TANK STRAP 2 X 93 ESC500 |
| 2 | 100522P | LID VENT ASSEMBLY |
| 3 | 100523P | SCREW-ON LID |
| 4 | 100524P | THREADED LID HOUSING |
| 11 | 100643M | RUBBER LID SEAL GASKET |
| 12 | 101022P | TANK LID BREATHER GASKET |
| 14 | 101363 | 300 GAL. TANK DRILLED |
| 15 | 101366 | 500 GAL. TANK DRILLED |
| 23 | 460703 | M12 SELF LOCK NUT MFC840 |
| 24 | 100020P | TANK STRAP 2 X 81 ESC300 |

# ESC800/1000 TANK ASSEMBLY



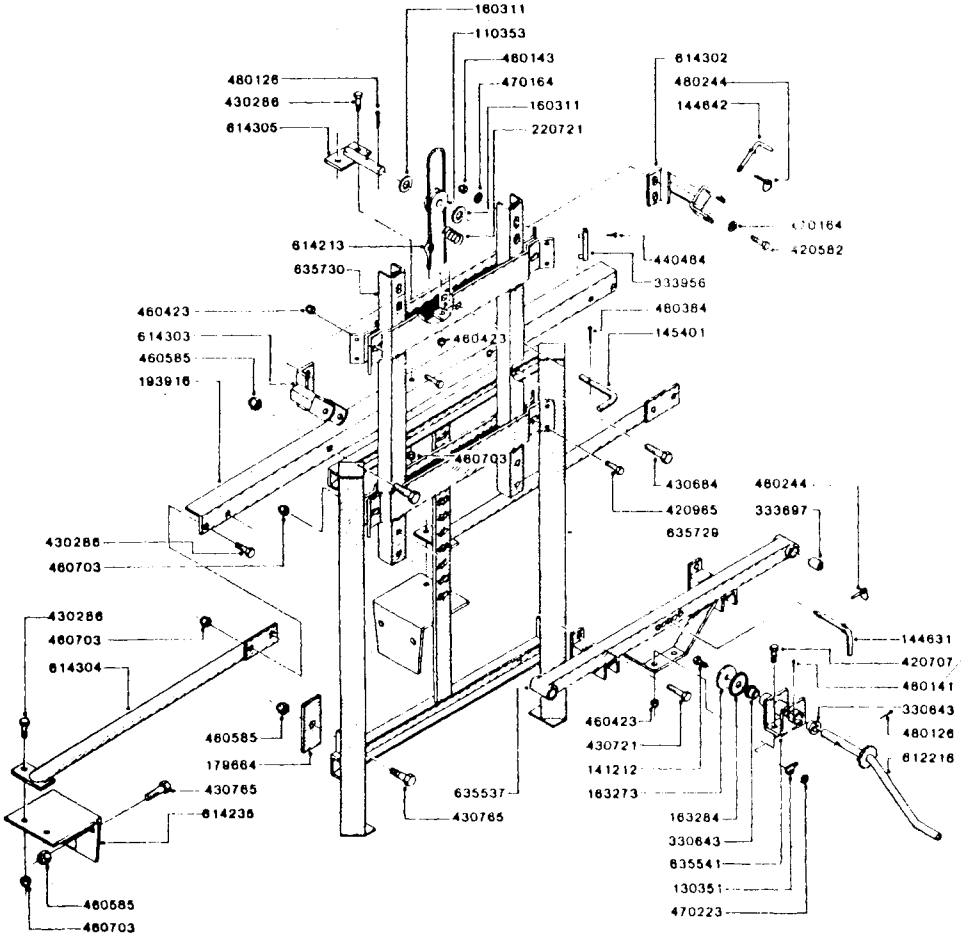
# TANK BAFFLE SEAL ASSEMBLY



# HYDR. H-FRAME ASSEMBLY

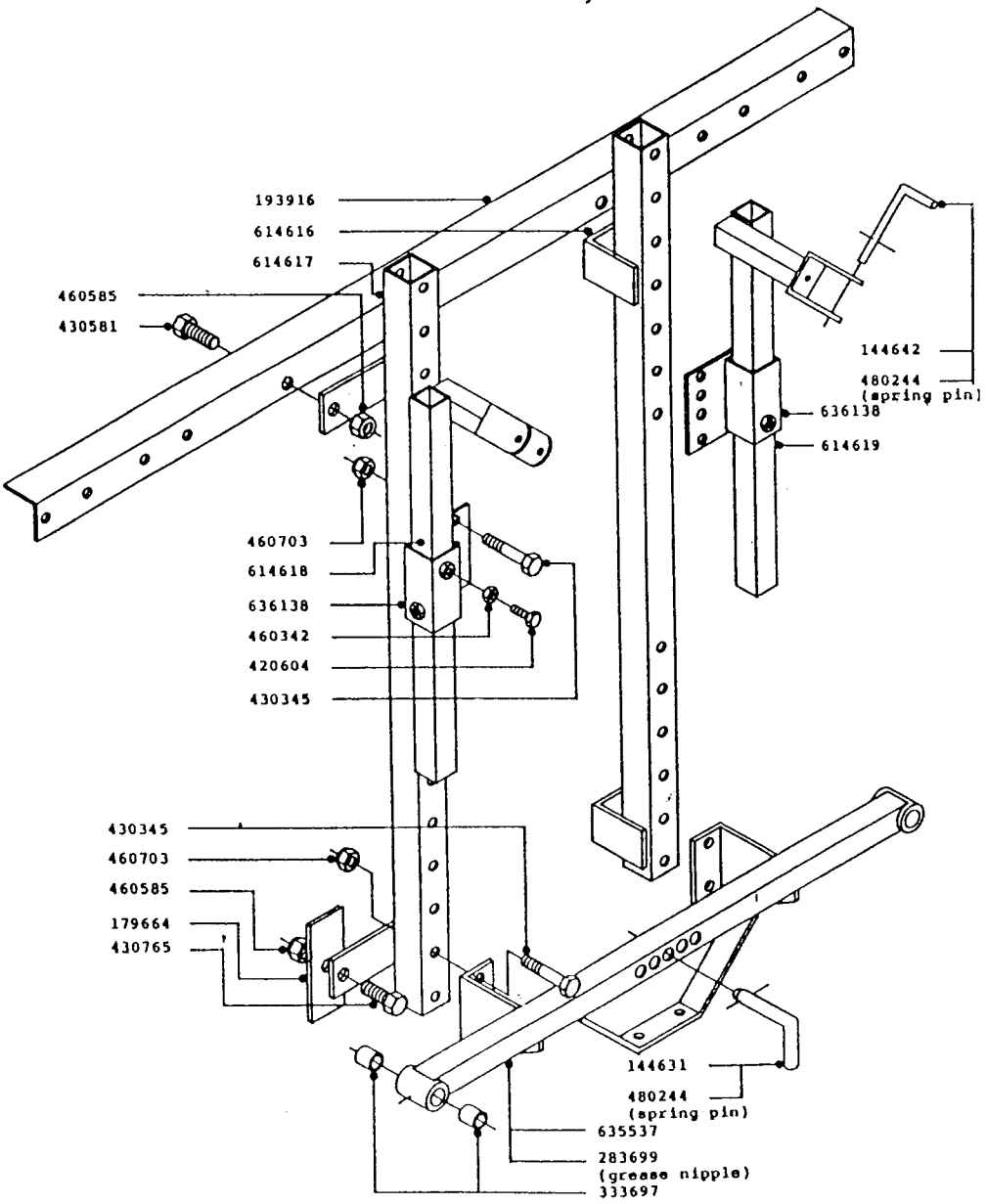
## STANDARD ON 45', 50'

## OPTIONAL ON 35',40', 42'

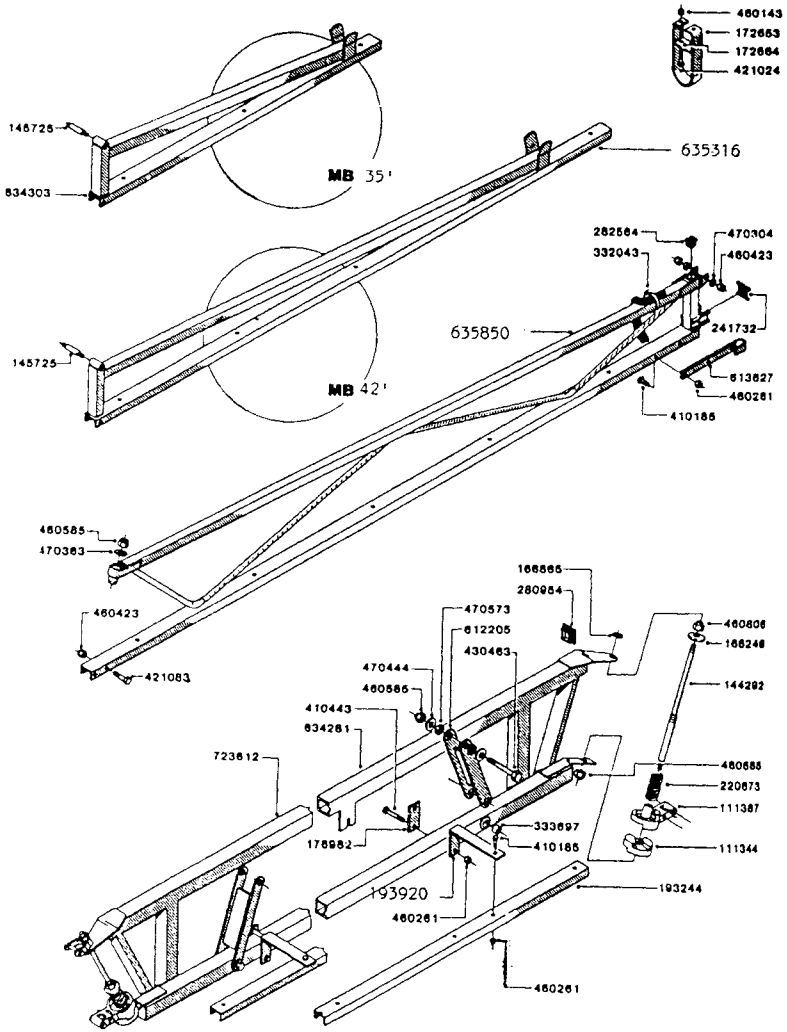


# H-FRAME ASSEMBLY

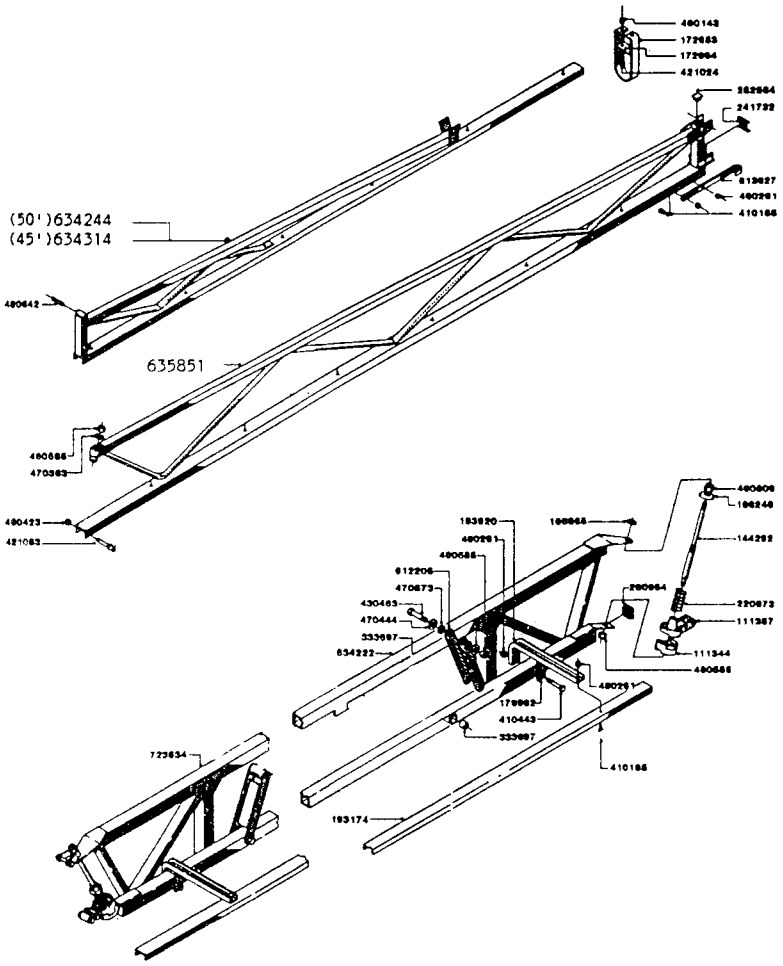
## STANDARD ON 35', 40' 42'



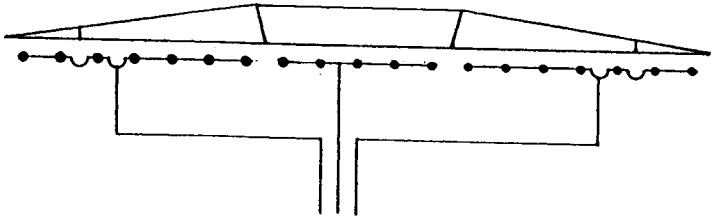
# 35' & 42' MB BOOM ASSEMBLY



# 45' & 50' MB BOOM ASSEMBLY



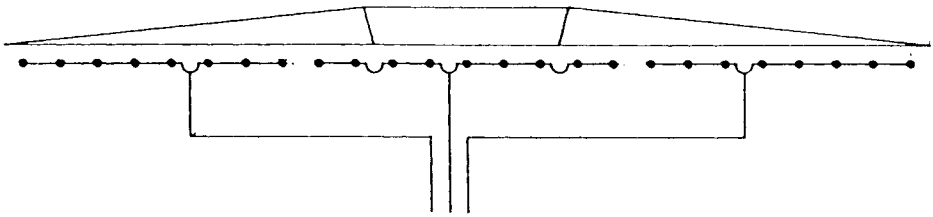
# 35' MB PLUMBING SCHEMATIC - 20" FIXED NOZZLE SPACING



**FEED**

SINGLE SNAPFIT NOZZLE CARTON - 828453
TRIPLET SNAPFIT NOZZLE CARTON - 828454

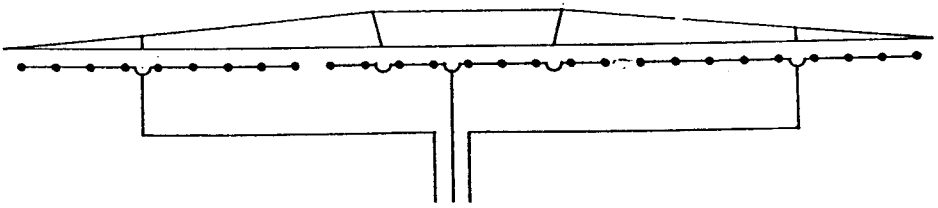
# 42' MB PLUMBING SCHEMATIC - 20" FIXED NOZZLE SPACING



**FEED**

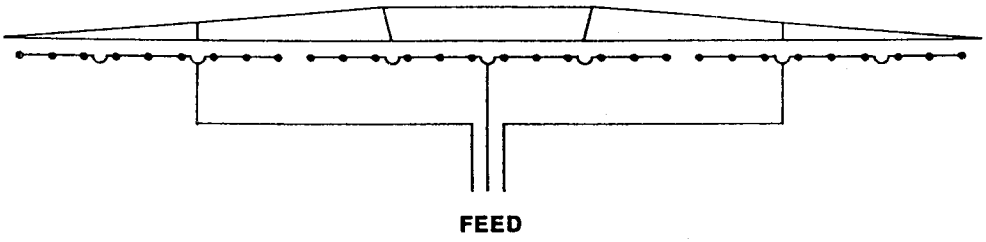
SINGLE SNAPFIT NOZZLE CARTON - 828455
TRIPLET SNAPFIT NOZZLE CARTON - 828456

# 45' MB PLUMBING SCHEMATIC - 20" FIXED NOZZLE SPACING



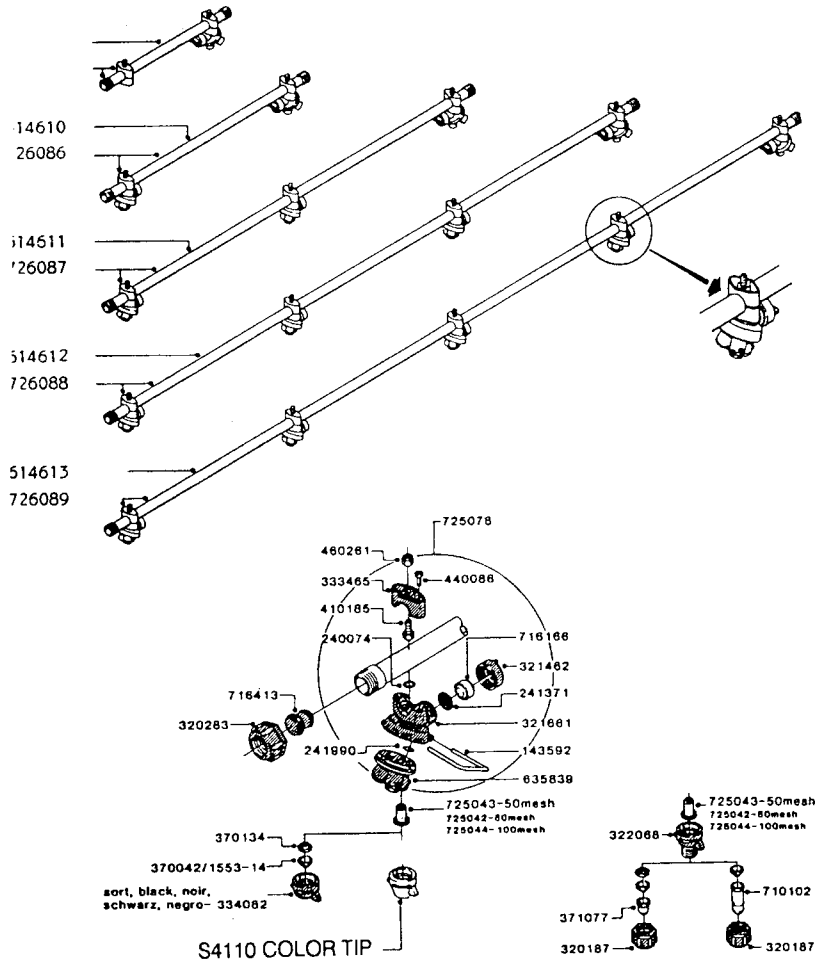

INGLE SNAPFIT NOZZLE CARTON - 828457
RIPLET SNAPFIT NOZZLE CARTON - 828458

# 50' MB PLUMBING SCHEMATIC - 20" FIXED NOZZLE SPACING




TRIPLET SNAPFIT NOZZLE CARTON - 828451

# TRIPLET SNAPFIT NOZZLE ASSEMBLY



# 13. WARRANTY POLICY AND CONDITIONS

HARDI INC., 290 Sovereign Road, London, Ontario, Canada and 1500 West 76th Street, Davenport, Iowa, USA (hereinafter called "HARDI", offers the following limited warranty in accordance with the provisions below to each original retail purchaser of HARDI new equipment of its own manufacture, from an authorized HARDI dealer, that such equipment is at the time of delivery to such purchaser, free from defects in material and workmanship and that such equipment will be warranted for a period of one year from the date of delivery to the end user providing the machine is used and serviced in accordance with the recommendations in the Operators Manual and is operated under normal farm conditions.

1. This limited warranty is subject to the following exceptions:

a) Parts of the machine which are not manufactured by HARDI, i.e. engines, tires, tubes, electronic controls, and other components or trade accessories, etc. are not covered by this warranty but are subject to the warranty of the original manufacturer. Any claim falling into this category will be taken up with the manufacturer concerned.

b) This warranty will be withdrawn if any equipment has been used for purposes other than for which it was intended or if it has been misused, neglected or damaged by accident, let out on hire or furnished by a rental agency. Nor can claims be accepted if parts other than those manufactured by HARDI have been incorporated in any of our equipment. Further, HARDI shall not be responsible for damage in transit or handling by any common carrier and under no circumstances within or without the warranty period will HARDI be liable for damages for loss of use, or damages resulting from delay or any consequential damage.

2. We cannot be held responsible for loss of livestock, loss of crops, loss because of delays in harvesting, or any expense or loss incurred for labour, supplies, substitute machinery, rental for any other reason, or for injuries either to the owner or to a third party, nor can we be called upon to be responsible for labour charges, other than originally agreed, incurred in the removal or replacement of components.

3. The customer will be responsible for and bear the costs of:

a) Normal maintenance such as greasing, maintenance of oil levels, minor adjustments, etc.

b) Transportation of any HARDI product to and from where the warranty work is performed.

c) Dealer travel time to and from the machine or to deliver and return the machine from the service workshop for repair.

d) Dealer travelling costs.

4. Parts defined as normal wearing items, i.e. tires and V-belts are not in any way covered under this warranty.

5. This warranty will not apply to any product which is altered or modified without the express wrriten permission of HARDI and/or repaired by anyone other than Authorized Service Distributors or Authorized Service Dealers.

6. Warranty is dependent upon the strict observance by the purchaser of the following provisions:

a) That this warranty may not be assigned or transferred to anyone.

b) That the Warranty Registration Certificate has been correctly completed by dealer and purchaser with their names and addresses, dated, signed and returned to the appropriate address as given on the Warranty Registration Certificate.
c) That all safety instructions in the operators manual shall be followed and all safety guards regularly inspected and replaced where necessary.

7. No warranty is given on second-hand products and none is to be implied.

8. Subject to the following terms, conditions and contributions, HARDI extends the warranty on polyethylene tanks (excluding fittings, lids and gaskets) to FIVE YEARS. To qualify for this extended warranty, the tank must be drained and flushed with fresh water after each day of use. HARDI's liability is limited to replacement of the tank, FOB our plant at no cost to the purchaser during the first twelve months; at 20% of the then current price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This five year extended warranty is subject, in each instance, to the tank being inspected and approved for replacement or repair by HARDI personnel before HARDI will accept any liability hereunder.

9. Subject to the following terms, conditions and contributions, HARDI extends the warranty on HARDI diaphragm pumps (excluding wearing parts such as diaphragms, valves, etc.) to FIVE YEARS. To qualify for this extended warranty, the pump must be drained and flushed with fresh water after each day of use. HARDI's liability is limited to replacement of defective parts, FOB our plant in London, Ontario, Canada at no cost to the puchaser during the first twelve months after date of purchase, at 20% of the then current retail price during the second year; at 40% during the third year; at 60% during the fourth year; and at 80% during the fifth year. This five year extended warranty is subject, in each instance, to the tank being inspected and approved for replacement or repair by HARDI personnel before HARDI will accept any liability hereunder.

10. HARDI reserves the right to incorporate any change in design in its products without obligation and to make such changes on units previously manufactured.

11. The judgement of HARDI in all cases of claims under this warranty shall be final and conclusive and the purchaser agrees to accept its decisions on all questions as to defect and to the exchange of any part or parts.

12. No employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of HARDI at its head office.

DISCLAIMER OF FURTHER WARRANTY

THERE ARE NO WARRANTIES, EXPRESSED OR IMPLIED, EXCEPT AS SET FORTH ABOVE. THERE IS NO WARRANTY OR MERCHANTABILITY. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION OF THE PRODUCT CONTAINED HEREIN. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES (SUCH AS LOSS OF ANTICIPATED PROFITS) IN CONNECTION WITH THE RETAIL PURCHASER'S USE OF THE PRODUCT.