OPERATOR'S MANUAL

FOR

HAGIE MODEL 8250 HI-TRACTOR

HAGIE MANUFACTURING COMPANY

BOX 273 CLARION, IOWA 50525 (515) 532-2861

COVERS MACHINE SERIAL NUMBERS:

1985
096958001 - 096958100

1986
060368001 - 060368100

1-85 493100

A WORD FROM HAGIE MANUFACTURING COMPANY

Congratulations on your selection of a Hagie Model 8250 sprayer. We recommend that you study this Operator's Manual and become acquainted with the adjustments and operating procedures before attempting to operate your new sprayer. As with any piece of equipment, certain operating procedures, service, and maintenance are required to keep it in top running condition. We have attempted herein to cover all of the adjustments required to fit varying conditions. However, there must be times when special care must be considered.

Hagie Manufacturing Company reserves the right to make changes in the design and material of any subsequent sprayer without obligation to existing units.

We thank you for choosing a Hagie sprayer and assure you of our continued interest in its satisfactory operation for you. If we might be of assistance to you, please call on us.

We are proud to have you as a customer.

TO THE OPERATOR

The following pages and illustrations will help you operate and service your new sprayer.

It is the responsibility of the user to read the Operator's Manual and comply with the safe and correct operating procedures and lubricate and maintain the product according to the maintenance schedule.

The user is responsible for inspecting the machine and having parts repaired or replaced when continued use of the product causes damage or excessive wear to other parts.

Keep this manual in a convenient place for easy reference when problems arise. If you require additional information or service, contact the Service Department at:

Hagie Manufacturing Company
P.O. Box 273
Clarion, Iowa 50525
(515)532-2861

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SAFETY PRECAUTIONS

Most accidents, whether they occur in industry, on the farm, at home, or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules. For this reason, most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that cannot be completely safeguarded against without interferring with reasonable accessability and efficient operation.

STUDY this Operator's Manual. Learn how to use the sprayer controls for safe operation.

DO NOT make modifications such as weldments, add-ons (adaptations or changes from the original design of sprayer). Such changes and/or modifications may become safety hazards to you and to others and will void all warranties.

ALWAYS select the widest tread setting to fit between the crop rows.

NEVER adjust the tread center on the sprayer until the wheels have been properly blocked and loosen the leg clamp bolts only enough for the leg to slide on the frame.

NEVER leave the sprayer in a raised position unattended.

NEVER adjust tire air pressure without knowing the proper recommendation. Do not attempt to dismount or mount a tire unless you have the proper equipment and experience to perform the job.

ALWAYS use the hand holds and steps to get on and off the sprayer.

BE SURE the ladder and operator's station are clean and dry to help prevent personal injuries.

NEVER bypass the safety start switch. Start engine from the operator's seat only.

NEVER run the sprayer engine in a closed building.

NEVER leave the sprayer unattended without applying the parking brakes.

BEFORE starting sprayer in motion, look carefully around to make sure no persons or obstructions are in the path of travel.

DO NOT permit passengers on the sprayer when it is moving.

NEVER operate the sprayer other than at recommended engine RPM settings to assure proper charge pressure for the hydrostatic drive system.

NEVER change factory engine RPM settings.

ALWAYS drive at a reasonable field speed.

NEVER drive near ditches, embankments, holes, mounds or other obstacles. Never drive on hills and slopes too steep for safe operation.

ALWAYS reduce the sprayer's speed before turning.

ALWAYS come to a complete stop before reversing direction.

ALWAYS stop sprayer and turn off engine before inspecting for damage after striking a foreign object. Damage should be repaired before restarting or operating the sprayer.

ALWAYS keep sprayer and attachments clean and in good operating condition.

ALWAYS inspect and keep all wheel lug nuts tightened to 85 foot pounds of torque.

NEVER operate the sprayer with loose lug nuts.

ALWAYS turn the engine off and allow it to cool before refueling. Do not smoke while refueling.

DO NOT fill fuel tank completely to the top; fuel will expand and run over. Wipe up spilled fuel; clean up spills with detergent and water before starting the engine.

ALWAYS keep a fire extinguisher handy.

DO NOT allow trash to build up on the sprayer.

NEVER remove radiator cap until engine has cooled.

ALWAYS keep all shields in place.

KEEP CLEAR of all moving parts and keep others away when operating.

DO NOT wear loose fitting clothing that may be blown or drawn into moving parts.

ALWAYS turn off engine and apply brakes before checking, adjusting, repairing, lubricating, or cleaning any part of the sprayer.

NEVER allow chemicals to come in contact with the skin or eyes. Always wear protective clothing recommended by the chemical manufacturer. Never pour chemicals into an empty tank; fill tank 1/2 full of water first.

ALWAYS dispose of empty chemical containers properly. Be sure to follow the chemical manufacturer's instructions for mixing chemicals. Always wash spilled chemicals or spray residue from sprayer to prevent corrosion and deterioration.

ALWAYS select a safe area to fill, flush, calibrate and clean sprayer where the chemicals will not drift or run off to contaminate people, animals, vegetation, or water supply.

NEVER place nozzle tips or other parts to one's lips in an attempt to unclog the spray tip.

DO NOT spray when wind is in excess of chemical manufacturer's recommendation.

FOLLOW the instructions given by the manufacturer when using or working with agricultural chemicals. The air filter in the cab will not filter out harmful chemicals.

ALWAYS store pesticides in their original containers with label intact. Store pesticides in a separate, locked building.

USE the flashing warning lights when traveling on public roads, day or night, unless prohibited by local law.

MAKE SURE the SMV emblem is in place and visible from the rear when traveling on public roads.

PLEASE refer to Page 32 for towing instructions if it ever becomes necessary to tow the sprayer.

SPRAYER IDENTIFICATION

Each Hagie sprayer is identified by means of a frame serial number. This serial number denotes the model, year in which it was built, and the number of the sprayer. As for further identification, the engine has a serial number, the hydrostatic pump has a serial number, the wheel motors have identification tags, and the planetary hubs have identification plates that describe the type of mount and gear ratio. To insure prompt, efficient service when ordering parts or requesting service repairs from Hagie Manufacturing Company, record the serial and identification numbers in the space provided below.

Note: Reference to left hand and right hand used throughout this manual refers to the position when seated in the operator's seat facing forward.

SPRAYER SERIAL NUMBER

_____

ENGINE SERIAL NUMBER (GASOLINE)

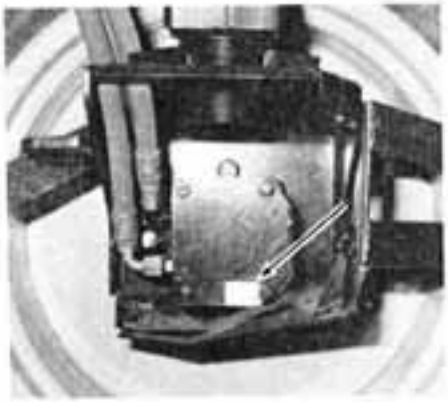
_____

ENGINE SERIAL NUMBER (DIESEL)

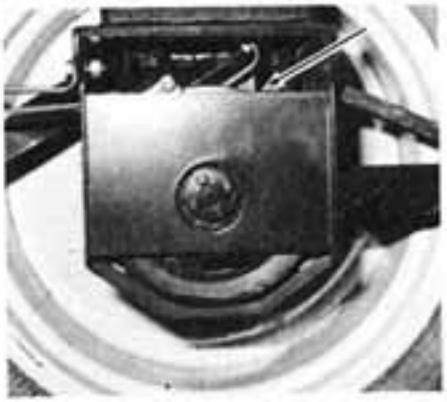
_____

PLANETARY HUB IDENTIFICATION NUMBERS

HYDROSTATIC PUMP SERIAL NUMBER



FRONT WHEEL MOTOR MODEL NUMBERS



REAR WHEEL MOTOR MODEL NUMBERS

ITEM	SPECIFICATIONS
Engine	
Manufacturer and model	Chrysler 318 gasoline
Tyoe	Industrial
Number of cylinders	Eight (8)
Horsepower	100, intermittent
Fuel system	Filtered
Slow idle	650 RPM
Fast idle	2850 RPM
Drive	
Hydrostatic pump	Sundstrand 23 series (variable displace.)
Speed Range	0 - 14 MPH
Planetary final drive	Torque hubs (24.85:1)
Basic Sprayer	
Frame	Terra Hug with adjustable tread
Clearance Frame	74" (6' 2")
Clearance Center	60-1/2" (5' 8-1/2")
Tread	Adjustable 78" to 120" (6' 6" to 10')
Wheel base	92-1/2" (7' 8-1/2")
Weight	6,900 Lbs.
Length	311" (25' 11")
Width	140" (11' 8")
Height	109" (9' 1")
Height with Cab or Canopy	126" (10' 6")
Brakes	
Type	Mechanically actuated rear wheel, caliper disc
Steering System	
Type	Hydraulic
Control	Full-time power
Electrical System	
Battery	12V
Alternator	55 AMP
Battery terminal ground	Negative

ITEM	SPECIFICATIONS
Hydraulic System	
Type	Open
Pump	Gear type
Maximum working pressure	1500 PSI
Tires	
Rear	11.2 X 24
Front TWD	9:00 X 24
FWD	11.2 X 24
Spraying System	
Solution tanks (two 250-gallon)	Polyethylene w/sump
Agitation	Jet
Pump	Centrifugal, hydraulic motor driven, variable speed
Boom Spray Control	
Type	Three-section electronic
Operation	Right, left and center
Pressure gauge	Glycerin filled
Boom	
Operation	Hydraulic; fold, lift, level
Width	60-foot; dry type
Row spacing	Variable
Hose (jumper)	1/2-inch EPDM
Hose (feeder)	3/4-inch EPDM
Operator's Station and Controls	
Seat	Bucket, adjustable
Lights and flashers	Standard
Speedometer	Solid state electronic
Hourmeter	Standard
Indicator lights	Oil pressure, alternator
Gauges	Temperature
Ladder	Standard

ITEM	SPECIFICATIONS
Capacities	
Fuel tank	30 gallons
Cooling system	Six (6) gallons
Hydraulic reservoir	20 gallons
Tires (rear and FWD)	20-26 PSI maximum
Tires (front and TWD)	20-24 PSI maximum
Solution tanks (two)	250 gallons each

OPTIONAL EQUIPMENT

Engine	
Manufacturer and model	Onan diesel LG34T
Type	Turbo charged
Number of cylinders	Six (6)
Horsepower	105, intermittent
Type of fuel	Number 1 or Number 2 diesel
Fuel system	Filtered, direct-injected
Slow idle	800 RPM
Fast idle	3000 RPM
Four-Wheel Drive	
Wheel motors	Sundstrand: 18 series rear, 15 series front
Planetary final drive	Torque hub ratios: 24.85:1 rear, 18.25:1 front
Speed Range	0 - 10 MPH
Spraying System	
Solution tanks (two 250-gallon)	Stainless steel w/sump
Agitation	Mechanical, hydraulic motor driven, variable Speed
Cab	
Air Conditioning	Standard
Glass	Safety, tinted
Windshield wiper	Standard
Mirrors	Rear view
Lights and flashers	Standard
Canopy	
Lights and flashers	Standard

WHEEL TREAD ROW SPACINGS

The new 8250 Sprayer has a patented Terra-Hug frame with adjustable tread spacings from 78" to 120". Knowing the row spacing of the field one intends to spray, follow the steps below to properly obtain the desired tread spacing.

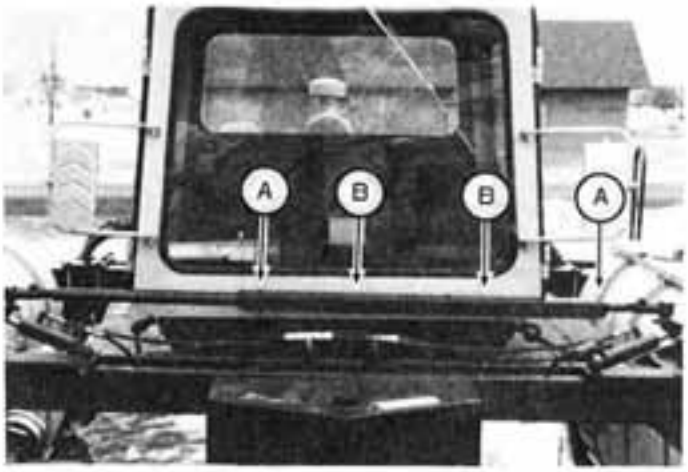


Figure 1

1. To adjust the legs, park the sprayer on level ground and shut off the engine. CAUTION: Firmly set the parking brake and to assure no possible movement, block the wheels on the opposite side, both front and rear.

2. Loosen bolts (Item A); remove bolt, nut and clamp (Item B) on the tie rod adjusting bar. See Figure 1.

3. Loosen the six leg mounting bolts on both the front and rear legs on one side only, as both legs must be moved at the same time. Refer to Figures 3 and 4; Page 14.
CAUTION: Loosen only enough to allow for free movement of the leg on the main frame. Do not remove the bolts under any condition.

4. Remove both fold cylinders with hoses attached.

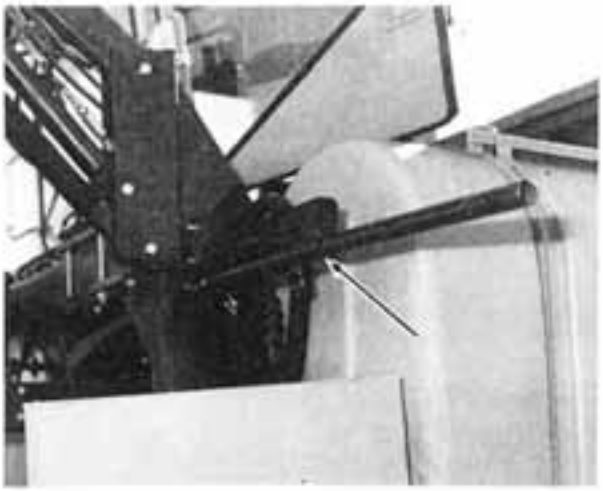


Figure 2

5. Attach leg adjusting brackets. See Figure 2.

6. To assure hoses will be long enough, place the fold cylinder from the side being moved to the rear position. The fold cylinder from the opposite side should be used on the front position.

7. Raise the sprayer until the tires on side being adjusted are just off the ground.
CAUTION: When raising the sprayer, be sure the solution tanks are empty, and avoid working under the sprayer when it is raised.

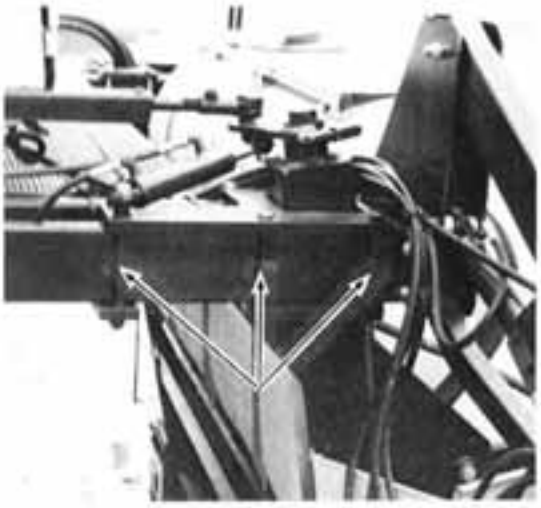


Figure 3

8. Start the engine and operate the fold control levers to push or pull legs to desired setting.

9. Carefully tighten all leg mounting bolts to 120-foot pounds of torque, following tightening procedures that ensure equal torque on all mounting bolts. See Figures 3 and 4.

10. Reverse the above steps to adjust and set the opposite side legs.

11. When all four legs have been moved to their desired row spacings, remove leg adjustment brackets and replace cylinders to their proper location.
NOTE: Care should be given to the correct routing of the hoses for longer life.

12. To adjust toe-in of 1/2" to 3/4", stand in front of the machine and align each front tire with the rear. Using a tape measure, check the tread setting of the front tires by measuring in front of the front tires and also in the rear of the front tires as shown. The measurement in front should be 1/2" to 3/4" less than the rear. To achieve this setting, one can simply move the front tire and wheel assembly until the proper setting is reached. See Figure 5.

13. Reinstall the tie rod locking bolt, nut and clamp and tighten all nuts firmly.

Figure 4

Figure 5

ATTACHING BOOMS AND SETTING NOZZLE SPACING

In shipment some of the sprayer components have been sent loose and need to be installed before operating. In order to insure proper installation of the components, please read and comply with the following instructions carefully. Always make sure you have proper equipment and/or help installing the components.

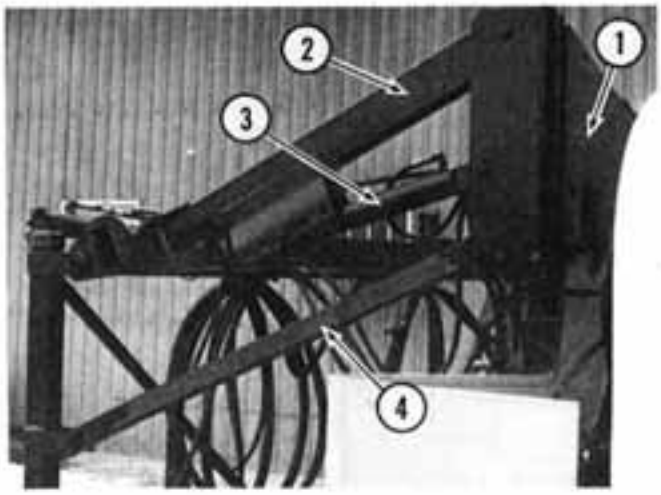


Figure 1

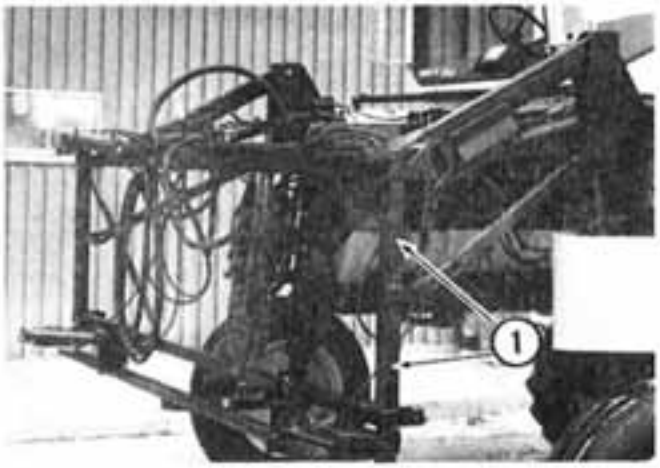


Figure 2

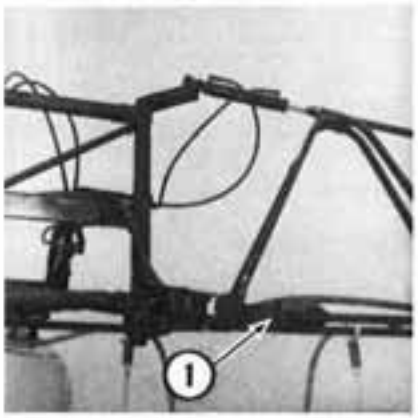


Figure 3

1. First, attach right hand (Item 1) and left hand (not shown) lift arm mounts; tighten all bolts. See Figure 1.

2. Install upper lift arm weldment (Item 2) to lift arm mounts (Item 1), using proper bushings and bolts provided. See Figure 1.

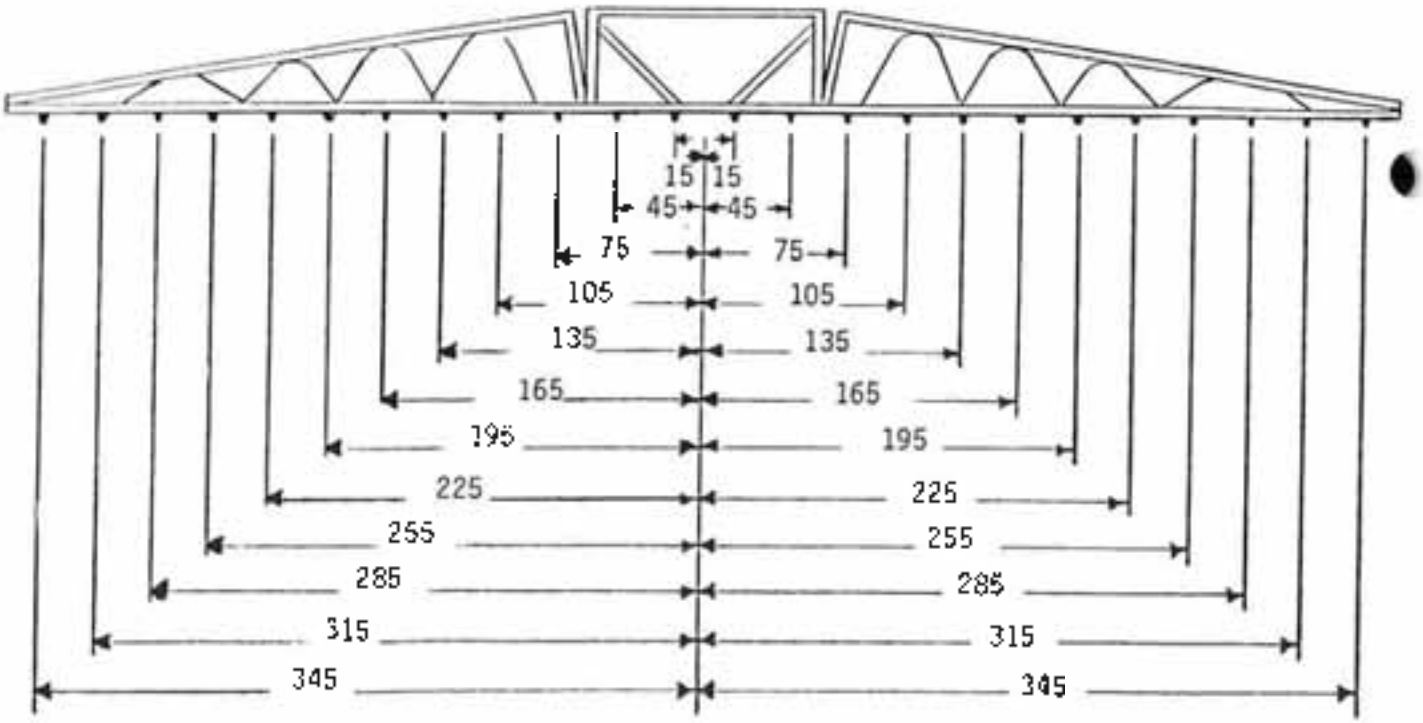
3. Install lift cylinders (Item 3), using correct bushings and bolts. See Figure 1.

4. After installing the lift cylinders, install two lower lift arm weldments (Item 4), using correct bushings and bolts. See Figure 1.

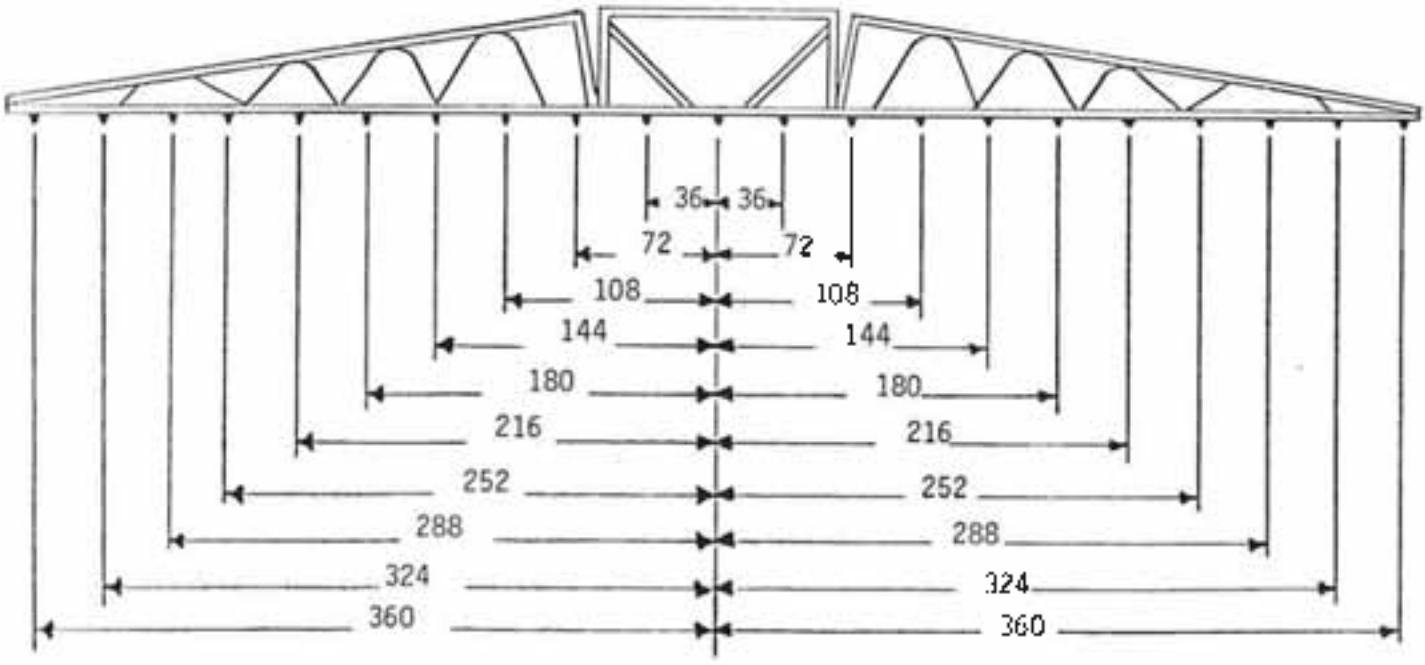
5. The transom weldment is the next item to be installed (Item 1; Figure 2). NOTE: An overhead hoist or fork lift is very useful when installing the transom.

6. After the transom is securely fastened, the next items to be installed are the outer boom weldments (Item 1; Figure 3). NOTE: Care should be taken not to overtighten the boom springs. A good rule of thumb when first starting out is to use half the adjustment thread on the eye bolt when tightening the boom springs.

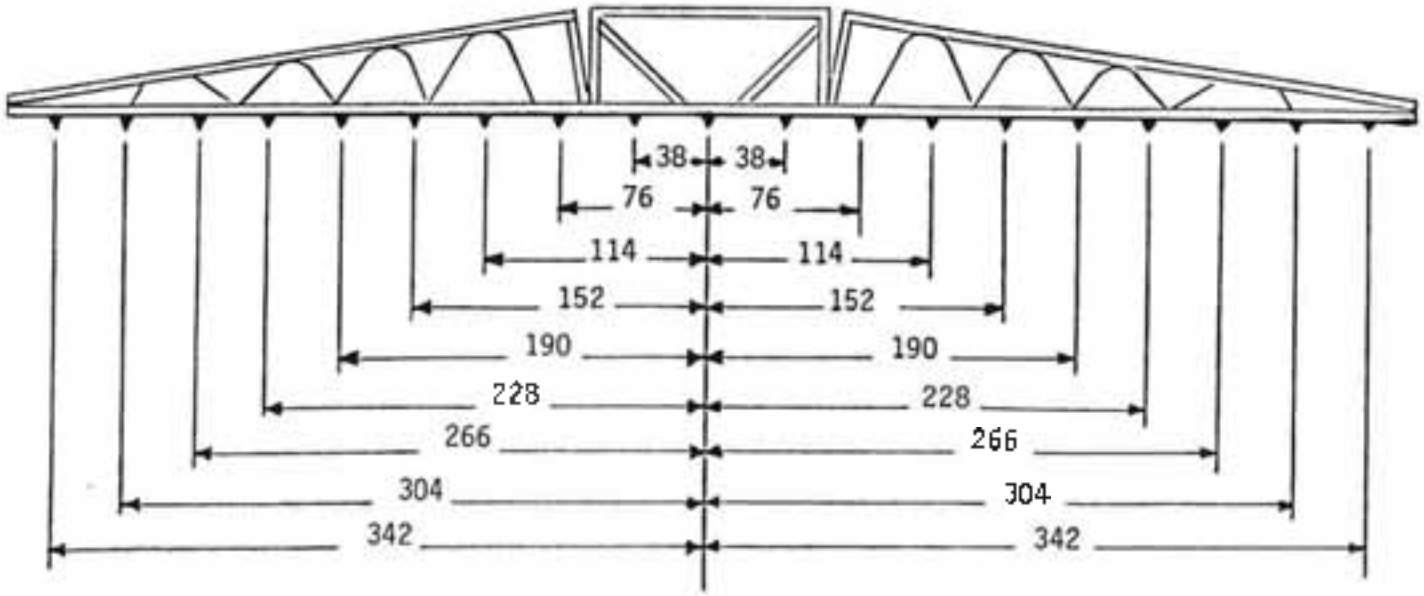
7. After Steps 1 through 6 have been completed, mount the nozzle spacings to the outer booms and transom. For proper setting of the nozzle spacings, please refer to the following pages and find the correct nozzle spacing that corresponds to your desired spacing. NOTE: For further information as to what bushings and bolts are used where, please refer to Pages 45 and 48 of the Parts Manual.



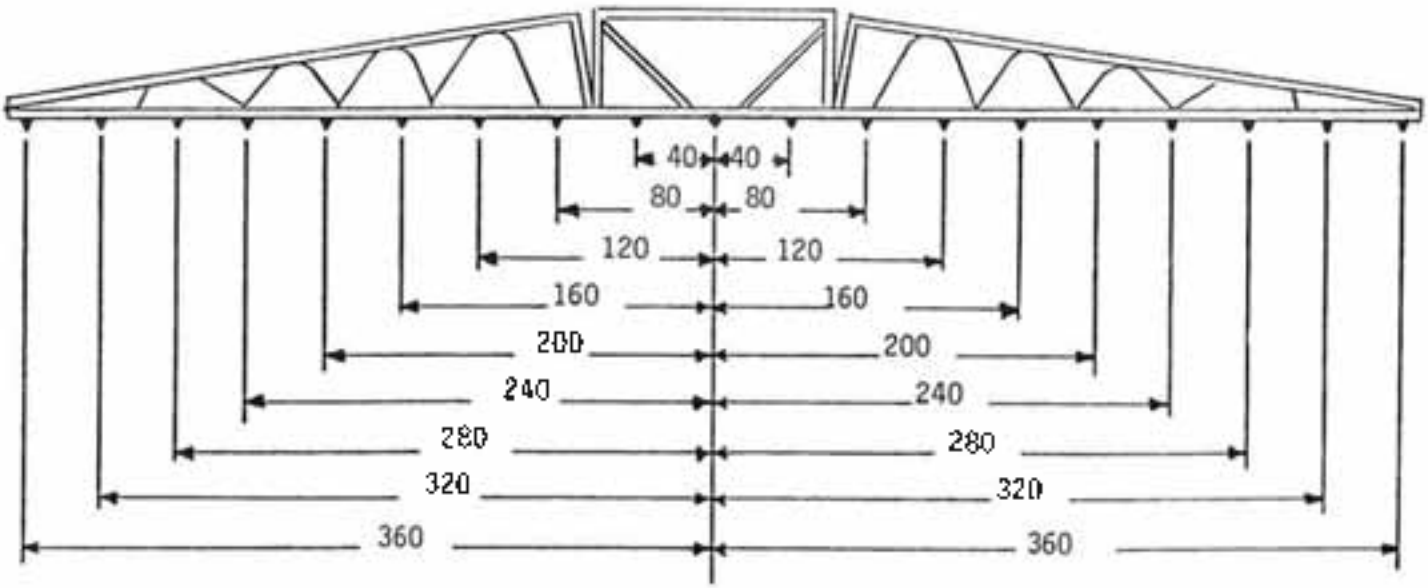
Center Line of Transom
Nozzle Location for 30" Spacing
With Machine Set on 90" Row Centers



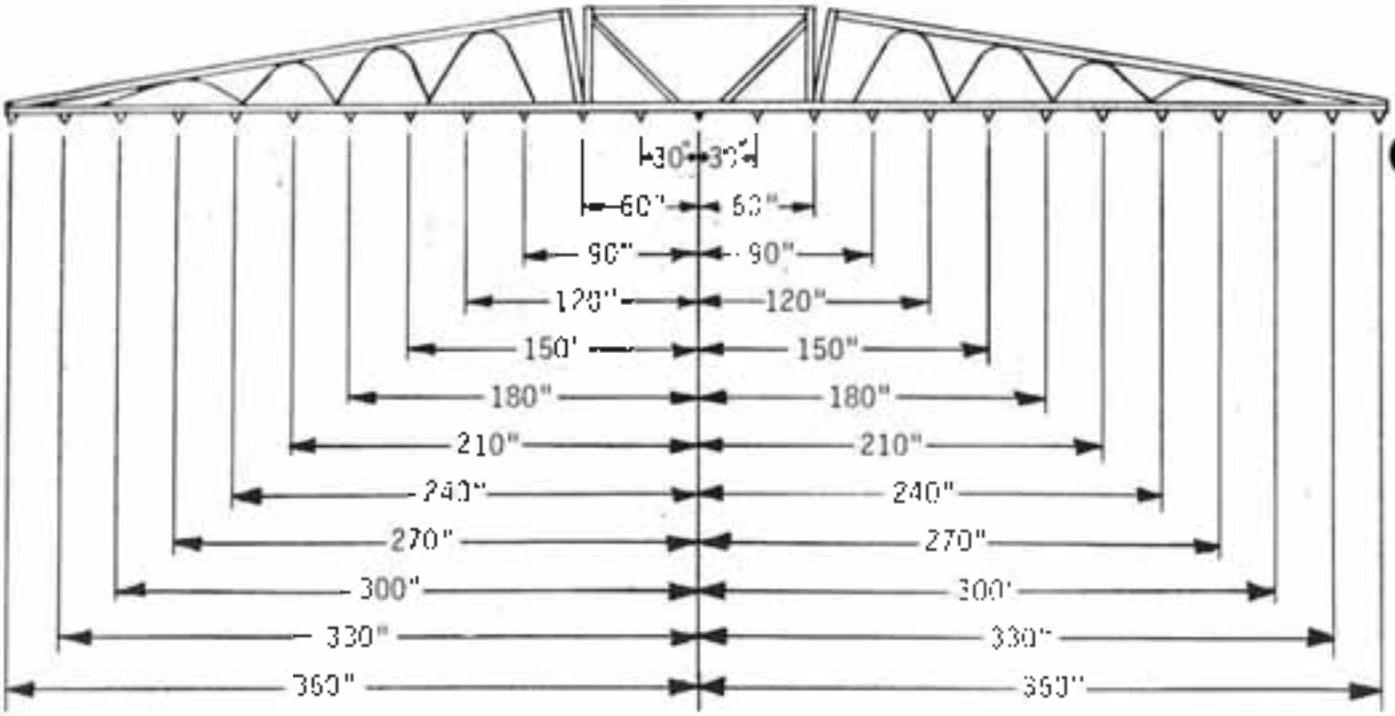
Center Line of Transom
Nozzle Location for 36" Spacing
With Machine Set on 72" Row Centers



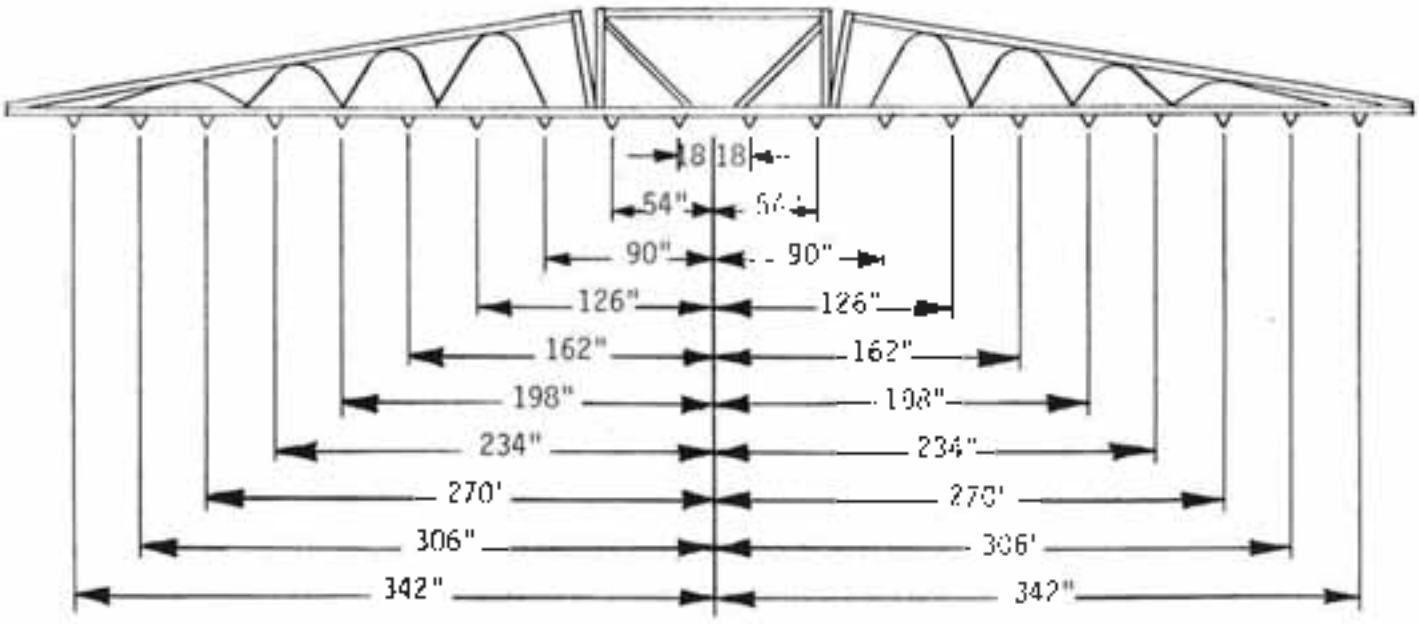
Center Line of Transom
Nozzle Location for 38" Spacing
With Machine Set on 76" Row Centers



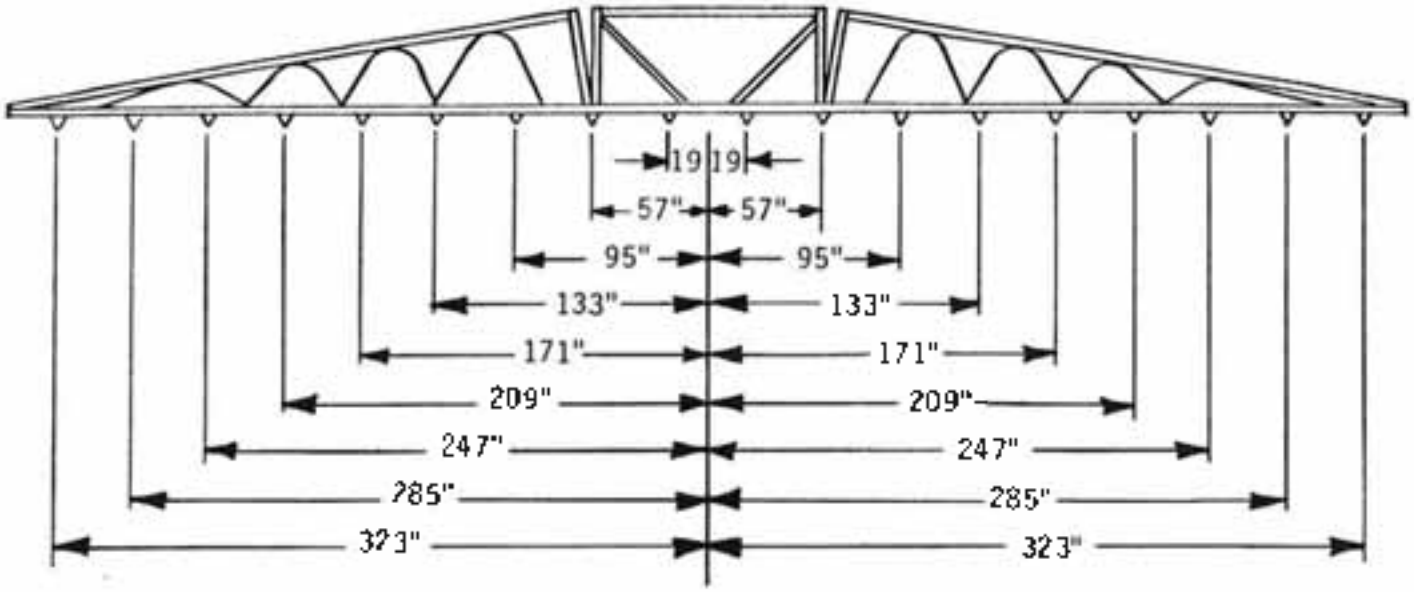
Center Line of Transom
Nozzle Location for 40" Spacing
With Machine Set on 80" Row Centers



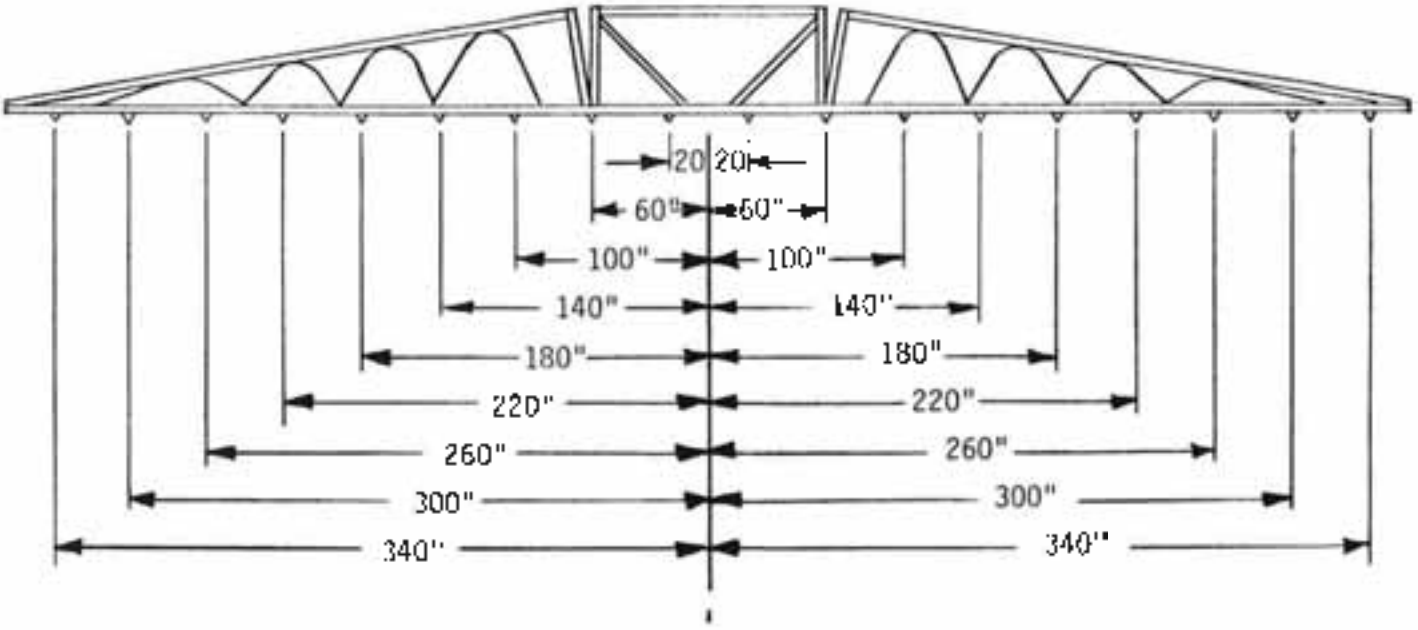
Center Line of Transom
Nozzle location for 30" Spacing
With Machine Set on 120" Row Centers



Center Line of Transom
Nozzle Location for 36" Spacing
With Machine Set on 108" Row Centers



Center Line of Transom
Nozzle Location for 38" Spacing
With Machine Set on 114" Row Centers



Center Line of Transom
Nozzle Location for 40" Spacing
With Machine Set on 120" Row Centers

STARTING THE ENGINE

CAUTION: Start the engine from the operator's seat only. When starting the engine in a building, be sure there is plenty of ventilation.

Figure 1

Figure 2

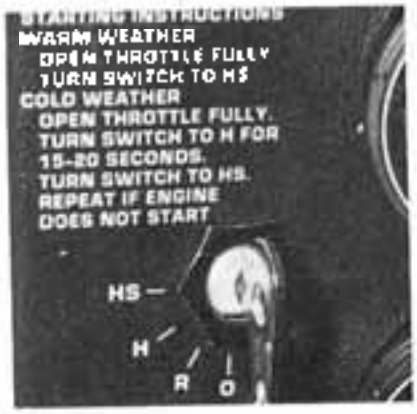


Figure 3

1. Perform these maintenance checks before starting the engine.
   a. Engine oil level.
   b. Radiator coolant level.
   c. Hydraulic oil level.
   d. Air filter condition.
   e. Clean air intake screens and inspect outside of radiator core.
   f. Correct all oil or fuel leaks.
2. Position hydrostatic control lever in N (neutral) position. See Figure 1.
3. Make sure all control levers are in the neutral setting or in the off position.
4. Set parking brake.
5. Move the throttle lever to a fast idle position. See Figure 2.
6. Turn key to the on position to check instruments and indicator lights.
7. When the gas engine is cold, pull the choke knob completely out before trying to start. With the Onan diesel, the manual advance knob (which looks like a choke knob) has to be pulled out when the temp is 70^{0} and below. Also the key has to be turned to H position. This activitates the glow plugs and glow plug indicator light. When this light goes out, the engine is ready to start. If the glow plug light should fail to work, hold the key in the H position about 30 seconds, then try to start. Once the Onan has started, leave the manual advance on about a 5-minute warm-up period.
   For the Perkins diesel, follow starting directions shown in Figure 3.
8. Turn key to start position and hold hydrostatic control lever against neutral safety switch (see Figure 1). If engine does not start after 15-20 seconds of cranking, wait two minutes before cranking again to allow starter to cool.
9. When engine starts, immediately reduce throttle lever setting to 1/3 and push choke knob all the way in.
10. Inspect indicator lights and gauges for correct operation. If any lights or gauges do not operate, shut off engine and determine cause.

11. Always allow at least a five-minute warm-up period before operating the engine at high RPM or engaging the hydrostatic pump. This means the engine must reach operating temperature and oil pressure must stabilize in the normal operating range before it is run faster than an idle (1000 RPM or less).
NOTE: Cold oil may not flow in quantities adequate to prevent pump cavitation, thus causing damage to the pump which will lead to pump failure.

12. When starting the sprayer using booster battery with jumper cables, follow these steps.

a. Attach one end of red jumper cable to positive terminal of booster battery and other end to positive terminal of vehicle battery connected to starter.

b. Attach one end of black jumper cable to negative terminal of booster battery and the other end to sprayer frame away from battery.

c. To avoid hazards of fire, remove booster cable clamp from sprayer frame before removing positive booster battery clamp.

HYDROSTATIC DRIVE

The Hagie 8250 Sprayer's power is derived from a Chrysler V-8 engine (or an optional diesel). The hydrostatic power system consists of a variable displacement, over center swashplate, axial piston pump (Item 1; Figure 1) and fixed displacement, and axial piston motors. The system also includes a charge pump, check valves, filter, heat exchanger, reservoir, and associated plumbing. The manual control lever that the driver adjusts when sitting in the driver's seat is directly connected to the pump swashplate. When this lever is moved either forward or backward, the swashplate responds accordingly and that controls the amount and direction of oil that flows to the wheel motors which, in turn, determines the speed and direction of the machine.

Figure 1

Figure 2

Figure 3

1. Open the throttle slowly to the maximum recommended engine speed setting. CAUTION: Never operate the sprayer at anything less than full recommended throttle.
2. To move forward, slowly push the hydrostatic control lever forward. The farther the control lever is moved, the faster the sprayer will travel. Item 1; Figure 2.
3. To stop, slowly pull the hydrostatic control lever to the N (neutral) position.
4. To move backwards, slowly pull the hydrostatic control lever backwards. The farther the control lever is moved, the faster the sprayer will travel. Item 1; Figure 2.
5. To stop, slowly push the hydrostatic control lever to the N (neutral) position.
6. Close the throttle to reduce engine speed and allow the engine to idle for a short period of time.
7. To shut the engine off, turn the ignition key to the "off" position. This will stop the engine on all gas models and most diesels. However, there are a few diesels that the throttle will have to be closed all the way to shut the engine off.
8. Set the brakes when parking the sprayer on a hill or slope.
9. To engage the hydrostatic system in four-wheel drive, move the control lever (Item 1; Figure 3) to its extreme engagement. Four-wheel drive - to the left
   Two-wheel drive - to the right

THE SPRAY SYSTEM

IMPORTANT: The solution pump is not self-priming. To facilitate priming, a vent line is attached to the pump and leads back to one of the tanks. The purpose of this line is to let trapped air escape from the pump's housing. Be advised that because of this line, the solution tanks are integrated. To aid in priming, always fill the tanks through the bottom fill. Before attempting to run the solution pump, water in the tanks must be above the pump's inlet. To operate the spray system in an efficient way and prolong its life, follow these steps closely:

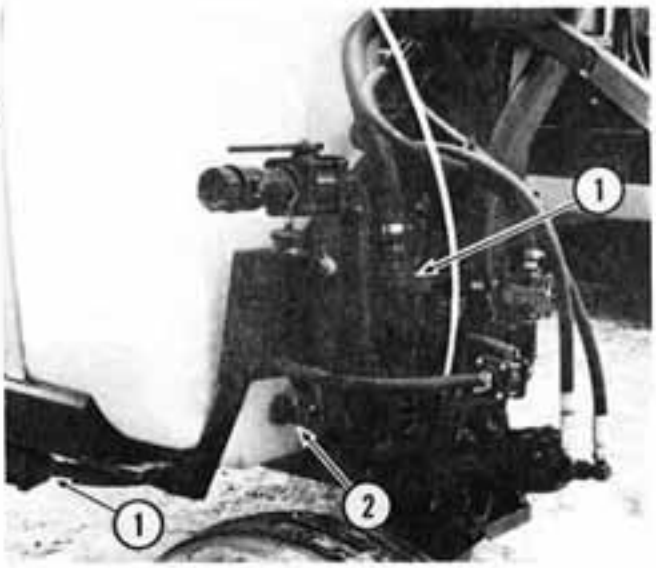


Figure 1

1. Check contents and quantity in spray tanks.
   CAUTION: Never attempt to operate the spray system with no solution in the spray tanks.

2. Completely open the tank valves. See Item 1; Figure 1.
   NOTICE: If uneven drainage from the tanks occurs, partially close the valve on the fastest draining tank.

3. Open the jet agitation control flow valves.
   NOTICE: Shipped with the machine are three different nozzles that can be used for more or less agitation activity. See Item 2; Figure 1.

4. Start engine and maintain a relatively slow engine RPM setting (1,000).

5. Turn the pump and jet agitation system on by slowly moving the solution pump variable flow control lever.
   NOTICE: If a great amount of agitation is desired, do not fill both tanks completely full.
   WARNING: Operating the solution pump dry will void all warranties on the spray system.

6. Open the throttle slowly to the maximum engine RPM setting.

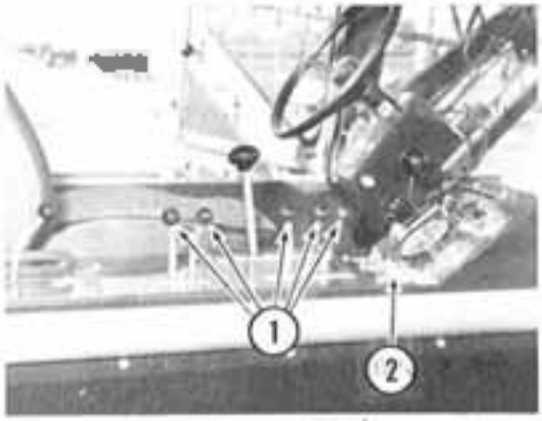


Figure 2

7. Observe solution pressure gauge and adjust solution pump variable flow control lever if necessary.

8. Adjust booms if necessary. See Item 1; Figure 2.

9. Place individual solution valve switches to the "on" position. See Item 2; Figure 2.

10. Turn on main solution valve switch. See Item 1; Figure 3.

11. Slowly move the hydrostatic control lever forward to obtain the desired ground speed.

12. Adjust spray pressure to the desired setting by using solution pump variable flow control lever.

Figure 3

13. Frequently observe the pressure gauge and speedometer in order to apply the desired amount of chemical determined when calibrating the sprayer.

14. When pressure gauge drops to zero, or spray pattern quits, shut off main solution valve switch, solution pump, and agitation system until refilling solution tanks. WARNING: Operating the spray system with no solution in the tanks will cause severe damage and void all warranties.

HYDRAULICS

The hydraulic system is a direct drive system in conjunction with the hydrostatic pump. When the engine is running, the hydraulic system is ready for operation.

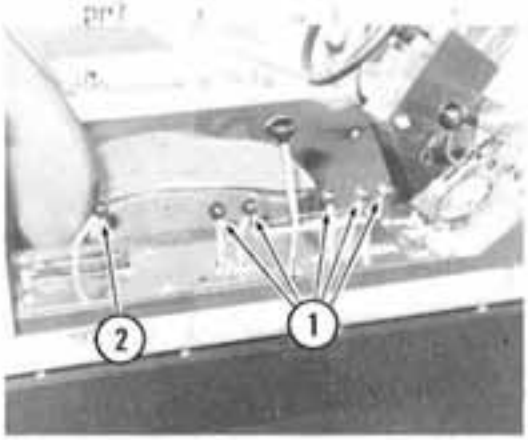


Figure 1

1. Boom control levers operate the lift, leveling, and fold cylinders Item 1; Figure 1.
   CAUTION: Be sure everyone is a safe distance away from the sprayer before operating levers.
2. The solution variable flow control lever operates the solution pump hydraulic motor for spray pressure and jet agitation. The more solution pressure desired, the farther the lever needs to be moved forward. Item 2; Figure 1.

AIR CONDITIONER

The cab is equipped with an air conditioner. The controls for the air conditioner are located overhead and toward the front of the cab.

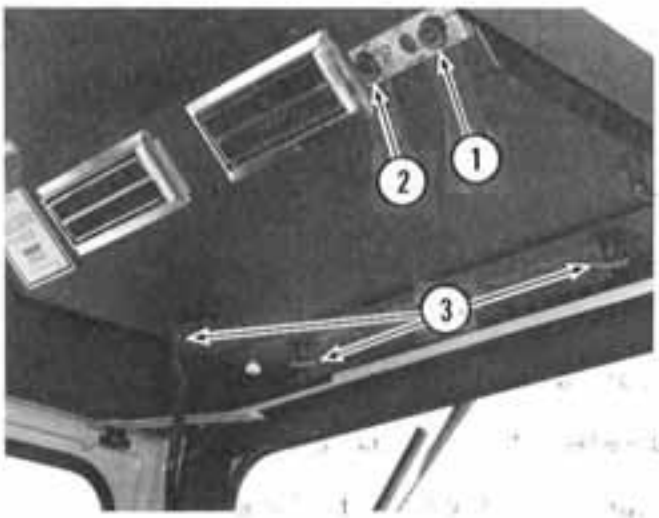


Figure 2

1. Fan switch (Item 2; Figure 2) controls the amount of air that is to be circulated throughout the cab; this switch has three settings.
2. Temp switch (Item 1; Figure 2) controls the coolness of air to be circulated.
3. Vent knob (Item 3; Figure 2) - this knob can be adjusted to control the amount of outside air needed for proper ventilation.
4. CAUTION: To prevent air conditioner compressor damage and condensor freezing, inside and/or outside, air intake vents must be open.

CALIBRATION

It is important to apply chemicals as recommended by the manufacturers of the chemical products. In order to do so, one must calibrate the sprayer using the steps outlined below.

Determine the speed at which the sprayer will be driven while applying chemicals. To select the best speed, consider the lay of the land, the condition of the soil, the type of crops, the height of the crops, etc.

Calibrate (measure the actual speed of) the speedometer to the desired speed. Test the speedometer by driving along a pre-measured distance. For example, if one wishes to spray at a speed of five miles per hour (MPH), one should drive one mile in 12 minutes, and then note the actual location of the speedometer needle in relation to five MPH on the dial.

Select the nozzle spacing (distance between each nozzle on the spray boom) best suited for the intended spraying job.

NOTE: For help in determining the nozzle spacing and height of boom, refer to the spray product catalog that accompanies this manual.

There are several types and sizes of nozzles. Select and install the type and size of nozzles that are best for the intended spraying job and for the speed that one intends to travel while spraying. The type and size of nozzles selected will depend upon the speed the sprayer will travel, the nozzle spacing, and the number of gallons that one intends to apply per acre.

NOTE: When selecting the type and size of nozzles, refer to the spray product catalog.

EXAMPLE: Assume that one intends to spray at five MPH, with 40-inch nozzle spacing, using "flooding spray" nozzles for broadcasting a herbicide, at the rate of 10 gallons per acre. In order to select the best nozzles, use the Hagie calibration tube. Select a chart near the bottom of the tube by

using "tip (nozzle) spacing" and "miles per hour". Using 40-inch spacing, at five MPH, the corresponding number (.336) on that chart is the "flow rate". The flow rate is the amount of liquid that is applied from one nozzle in one minute, measured in thousandths of a gallon (based on a rate of 10 gallons per acre). Use the chart in the spray product catalog that covers flooding spraying nozzles (tips). Read down the column marked "capacity 1-nozzle (GPM)" until number ".35" is found, the number that is nearest to the desired flow rate of .336. Then read left to the column marked "D tip". Thus, the proper nozzle (tip) would be a "D-2", a nozzle having a delivery rate within the desired spraying pressure.

Test and calibrate (measure the actual flow rate) the spray system.

Fill the solution tank with clean water. DO NOT ADD CHEMICALS UNTIL CALIBRATION IS COMPLETED.

Apply the brakes, start the engine of the sprayer, and remain parked. Turn on the main, right, center, and left solution switches. Move the solution pump's variable flow control lever until the pressure gauge reads the desired level (for the example above, the pressure gauge should read approximately 28 PSI.) The spraying system is now spraying water.

Make sure that there are no leaks and that all nozzles are spraying a desirable pattern. Continue spraying in the stationary position for at least 10 minutes for proper warm-up of the sprayer and its system.

Use the calibration tube to catch one nozzle's spray for one minute. (If the flow rate is more than the tube will hold, catch the spray in a larger container and then pour it into the tube. For the example given above, a larger container will have to be used.)

The numbered marks on the side of the calibration tube show the flow rate. The measured flow rate should be the same as the flow rate shown on the chart near the bottom of the calibration tube - .336.

If the measure flow rate is not the same as that on the calibration tube's chart, move the solution pump's variable flow control lever to increase or decrease (as required) the pump's pressure. Use the calibration tube and again measure the flow rate. Continue adjusting the variable flow control lever and continue measuring the flow rate until the proper flow rate is reached. At this time note the exact pressure gauge reading and maintain this pressure setting while spraying in the field.

All nozzles should be spraying at about the same flow rate.

If one drives the sprayer at the proper speed and maintains the right pressure setting while spraying, the desired gallons per acre will be applied.

A. Driving

When driving the sprayer on a public road or highway, drive carefully and follow these steps:

1. Fold the booms in and tie them to the sprayer.
2. CAUTION: Flashing hazard warning lights have been placed on the sprayer to warn other drivers. Use them (if legal)!
3. A SMV (Slow Moving Vehicle) emblem has been mounted on the sprayer to warn other drivers that one is moving slowly. Keep it properly displayed!
4. Know and obey all state laws for driving farm equipment on a public road or highway.
5. Adjust the sprayer's speed to suit the conditions.
6. Slow down and use turn signals before turning.
7. Keep a proper lookout, and maintain control of the sprayer.
8. Do not drive under trees, bridges, wires, or other obstructions unless there is clearance.
9. Use extra care before entering or leaving a public road or highway.

B. Trailer

When moving the sprayer onto a trailer, follows these steps completely:

WARNING: Never load or unload a sprayer with solution in the tanks.

1. Be sure to read and understand the trailer owner and operator manual.

2. Hitch the trailer to the pulling vehicle as shown in the trailer owner and operator manual.

3. Loading:

   NOTE: Extra care should be taken when loading the sprayer onto any trailer. Consider whether it is best to back the sprayer on or drive forward onto the trailer.

   a. Pull the trailer to flat ground. Apply the pulling vehicle parking brake and turn off the engine. Use tire blocks to hold trailer from moving.

   b. Fold in the sprayer's booms and tie them to the sprayer.

   c. The loaded height and width of the trailer must conform to the law of the state in which it is being used.

   d. Lower the trailer ramps and set the ramp spacing for the sprayer's tread setting.

   e. Get someone to help guide onto the trailer. Keep this individual at a safe distance from the sprayer.

   f. WARNING: Stopping the sprayer on the trailer loading ramps may result in sprayer tipover.

   g. Allow enough room between the sprayer and the pulling vehicle for turning.

   h. Secure the sprayer to the trailer. See the trailer owner and operator manual for instructions.

   i. Cover or remove the SMV (Slow Moving Vehicle) emblem when traveling over 25 miles per hour.

4. When unloading the sprayer from the trailer, follow these steps:

a. Park the trailer on level ground for unloading.

b. Place in gear or park, turn off engine in pulling vehicle. Apply parking brake, use tire blocks to keep the trailer from moving.

c. Lower the trailer ramps and set ramp spacing for the sprayer's tread setting.

d. Release securing chains carefully.

e. Get help to guide off the trailer. Keep everyone at a safe distance from the sprayer.

f. Uncover or replace the SMV (Slow Moving Vehicle) emblem.

C. Towing

It is not recommended that the sprayer be towed, but if it should ever be necessary, follow these steps carefully.

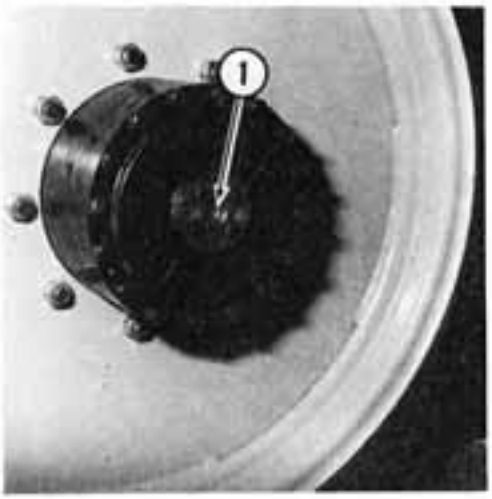


Figure 1

1. Fold the booms in; tie them to sprayer.

2. Disengage the torque hubs by removing two outer cap bolts, turning the outer cap with the extended center in toward the hub and reinstalling the two outer cap bolts. This process pushes on a spring-loaded splined shaft, disengaging the torque hub. See Item 1; Figure 1.
WARNING: Wheel motors will be ruined if these steps are not taken.
CAUTION: When re-engaging the torque hubs, make sure the spring-loaded spline shaft has returned to its extended position.

3. Turn on the flashing hazard warning lights (if legal).

4. Check to be sure the SMV emblem is in place and visible from the rear.

5. When towing, it is necessary that two vehicles of sufficient size and weight for adequate pulling and braking ability are used. One of these vehicles is used for pulling the sprayer; the second vehicle for braking if the sprayer starts to overtake the towing vehicle, such as going downhill. The reason for this is the sprayer, once the torque hubs have been disengaged, has no braking power of its own. Use extreme caution.
WARNING: Take steps to insure that the items used between the towing vehicle and braking vehicle (chain, etc.) are safely secured to prevent them from disconnecting.

6. Do not exceed 5 MPH.

7. Always reduce towing speed well in advance of any anticipated turns.

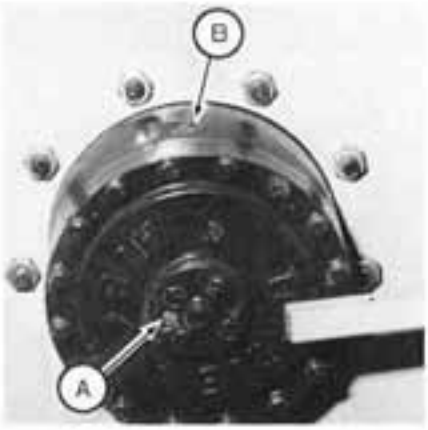
8. Know and obey the state laws for towing farm equipment on public roads and highways.

Perform these 10-hour services at 5-hour intervals whenever unusually severe or dusty operating conditions prevail.

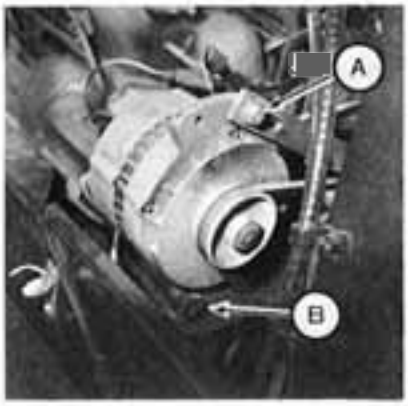
1. Check crankcase oil level.

   a. Add oil if necessary.
   b. CAUTION: Lubricating oil should meet the requirements of U.S. ordinance specifications SE MIL-L-21048. Viscosity grades will vary according to anticipated temperature.

2. Check radiator coolant level and add if necessary. A mixture of 50-50 water and permanent type anti-freeze is recommended.

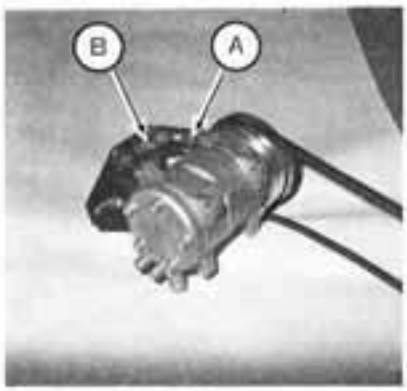


3. Check oil level in torque hubs. Position hubs with check level plugs in level position. Remove check plug a; if 90 weight grease is needed, remove fill plug b, fill to proper level and re-install plugs.



4. Inspect and tighten all belts.

a. To tighten alternator fan drive belt, loosen bolts a and b and pivot alternator outward. Tighten bolts.



b. To tighten air conditioner compressor drive belt, loosen mounting bolts a and tighten bolts b. Tighten mounting bolts.

5. Remove and clean line strainer screen.

6. Lubricate and check all pivoting points.

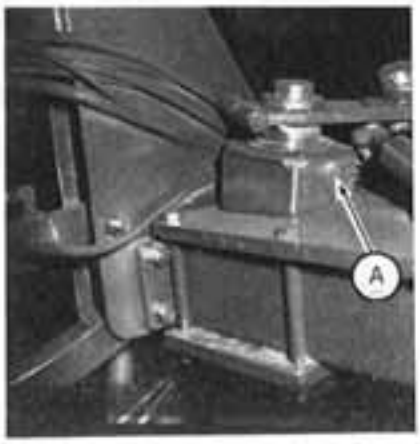
   a. Upper front leg bearings.

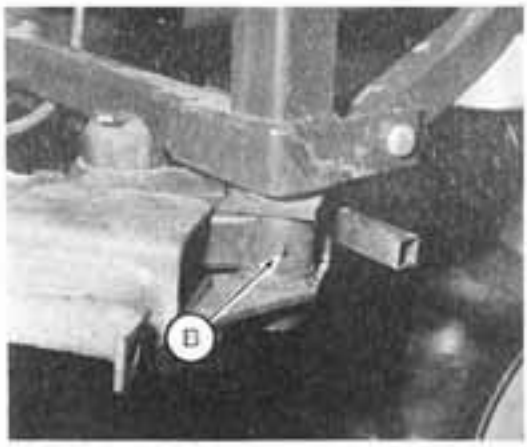
   b. Boom positioning pivot.

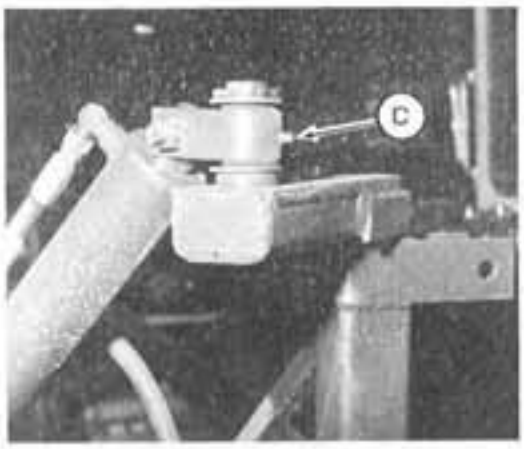
   c. Leveling cylinder mount pivot.

   d. Tie rod ball sockets.

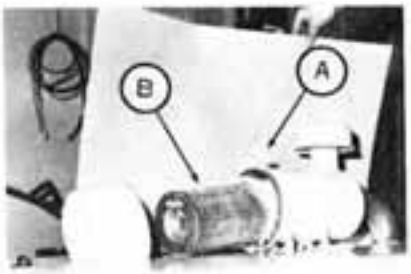
   e. Front wheel bearings.





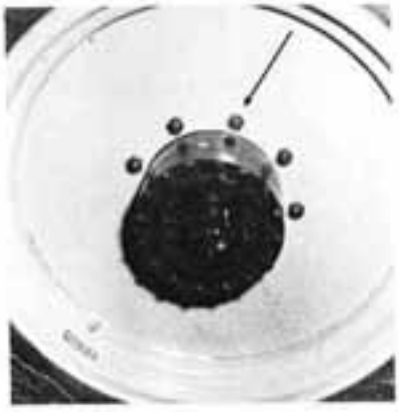


7. Inspect and clean air intake screens and outside of radiator core.



8. Loosen air cleaner clamp a. Remove air cleaner element b and replace with new element.

9. Check hydraulic oil level (a)in reservoir and add if necessary; (b) hydraulic oil must conform to one of the following types: anti-wear hydraulic oil, type F automatic transmission fluid, or agriculture hydraulic transmission fluid.



10. Check wheel lug nuts; torque to 85 foot pounds.
CAUTION: Damage will occur to rim and torque hub if lug nuts are not checked often and kept tight.

Perform these service and maintenance checks every fifty (50) hours of use.

Figure 1

1. Remove and install a new hydrostatic pump suction filter at the end of the first 50 hours of use and every 200 hours thereafter. See Figure 1.
CAUTION: Never install anything other than a 10 Micron filter.

Figure 2

2. Inspect and clean, if necessary, all battery connections if corrosion is present and check tension of battery hold down bracket. See Figure 2.

3. Check leg mounting bolts; be sure they are tight.

4. Check the steering tie rod ball sockets; be sure they are tight. See Figure 3.

5. Check parking brake tension and adjust if necessary.

Figure 3

6. Check to maintain an adequate neutral setting of the hydrostatic pump.

Every 100 hours of use, perform these service and maintenance checks.

Figure 4

1. Drain engine crank case oil and replace it with recommended oil; see Page 33 for proper specifications. See Figure 4.

2. Remove engine oil filter and replace with new.

Figure 5

3. Inspect oil (Figure 5) in hydraulic reservoir for any foreign material (contamination) and replace with approved oil if necessary - see Page 34.
Replace the oil in the hydraulic reservoir every 500 hours or at the beginning of each spray season, whichever comes first.

STORAGE

A. Preparing the 8250 Sprayer for storage.

1. Drain the coolant from the engine and radiator. Probe the drain holes during draining to insure they are not clogged by sludge, scale, or other deposits. Fill the cooling system to the top with a 50 - 50 water-anti-freeze mixture. Run engine to operating temperature and re-check level.

   NOTE: If anti-freeze is added, make sure the engine is run to operating temperature to assure proper mixing of solution.

2. Add a fuel stabilizer to the fuel and fill fuel tank.

3. Run the engine until it is at operating temperature, then drain the engine oil. Refill with new engine oil and install a new lubricating oil filter element.

4. Run the engine until it reaches normal operating temperature. Cycle all hydraulic functions including the steering.

5. Release tension on all belts.

   FOR MORE DETAILED INFORMATION, SEE THE ENGINE MANUFACTURER'S HANDBOOK.

6. Use plastic bags and water resistant adhesive tape to seal the air intake opening, the exhaust manifold orifice, and the air vent on the fuel tank.

7. Disconnect and remove battery or batteries. Completely clean and charge the battery. Coat the terminals with petroleum jelly and store battery in cool, dry place.

8. Thoroughly clean the sprayer. Touch up any painted surfaces that are scratched or chipped.

9. Replace worn decals. Contact Hagie Manufacturing Company, Box 273, Clarion, Iowa 50525, for replacement decals.

10. Use a multi-purpose grease to coat exposed hydraulic cylinder rods.

11. To winterize the spray system, use a premixed solution of 50-50 permanent type anti-freeze and water. Run this mixture through the spray system until it comes out all boom openings.

12. Use a plastic bag and water resistant adhesive tape to seal the engine oil filler cap and the hydraulic oil tank breather cap.

13. If the sprayer must be stored outside, cover it with a waterproof cover.

B. Removing the 8250 Sprayer from Storage.

1. Check the condition and air pressure of all the tires. Check the section on specifications for proper pressure.

2. Unseal all openings that were sealed in the storage procedures.

3. Clean and install the batteries. Be sure to attach the battery cables to proper terminals.

4. Tighten all belts. Replace any worn belts.

5. Check levels of engine oil, hydraulic oil and engine coolant. Add, if necessary. Remember, a mixture of 50-50 anti-freeze and water will cool adequately in summer as well as protect in winter.

6. Completely clean the sprayer (NOTE: protective compounds such as grease can harden under exposure to weather conditions.)

7. Perform all needed services as instructed under "Maintenance" in the Operator manual.

8. For starting instructions, see section on Operating Information on Page 20.

TROUBLE SHOOTING

A. ENGINE

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Engine won't crank	Dead battery	Recharge or replace battery
	Poor connections	Clean, tighten battery connections
	Neutral safety switch	Replace or adjust setting
	Starter or starter relay	Test - rebuild or replace
Engine will not start	Fuel shut-off valve in stop position (diesel only)	Move throttle control to the "Run" position
	Out of fuel	Fill fuel tank
	Clogged fuel filters	Replace fuel filters
	Cold weather	Use cold weather starting aid - choke on gas unit ignitor on diesel unit
	Low starter speed	Check starter & batteries
Engine misfires; runs uneven, low power	Water in fuel	Drain, flush, replace filter, fill system
	Dirty air cleaner element	Replace element
	Poor grade of fuel	Drain system; change to good grade
	Fuel tank vent clogged	Open fuel tank vent in cap
Engine overheats	Engine overloaded	Reduce load
	Dirty radiator core or intake screens	Remove all foreign material and clean all items
	Low coolant level	Refill to proper level with recommended coolant
	Faulty radiator cap	Replace cap
	Loose or faulty fan belt	Tighten or replace
	Faulty thermostat	Replace thermostat

ENGINE - Continued

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Engine knocks	Low oil level in crankcase	Add oil to full mark
	Cold engine	Allow proper warm-up period
	Burned out cold starting aid (this pertains to diesel engines with igniters)	Replace with new

For additional engine information, see the engine owners handbook.

B. THE SPRAY SYSTEM

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Solution pump will not prime	Low water level	Fill solution tanks to level that is higher than the suction port of solution pump. Solution pumps are normally self-priming after once filled
	Air leak in suction line	Inspect; tighten all fittings on suction line
	Solution valves turned off	Turn solution valves to open position, allowing air to leave system
	Clogged fitting or pinched off vent line	Unclog or replace vent line
Solution pump not producing normal pressure	Clogged line strainer screer	Remove screen; clean thoroughly and replace screen; tighter strainer cap to avoid air leak
	Air leak in suction line	Inspect and tighten all corrections
	Restricted solution flow to pump	Main solution tank shut-off valve or valves not completely open
	Suction hose collapsed	Obstruction at inlet end of hose, causing high vacuum on hose
	Faulty hydraulic pump	Replace hydraulic pump
	Faulty hydraulic motor on solution pump	Replace rotor

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Malfunction of electric solution valve	Internal restriction of diaphram	In case of a build-up of chemical, disassemble; inspect; clean; reassemble
	Electrical	Check fuse; check ground; clean contact terminals; check continuity of wires; check switches; short in solenoid coil
		Replace valve
No reading on pressure gauge	Orifice in back of gauge clogged	Remove gauge; clean orifice; reinstall.
	Faulty gauge	Replace gauge
Erratic reading on pressure gauge	Air leak in suction line	Inspect; tighten all fittings in suction line
	Loss of glycerin from gauge	Glycerin acts as a damper to stablize needle reading. If it leaks out, replace gauge.

C. HYDROSTATIC SYSTEM

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Machine won't move in either direction	Engine speed too low	Set engine at operating RPM before trying to move machine
	Oil level in reservoir low	Fill reservoir to proper level w/approved oil-see chapter on Service and Maintenance
	Control linkage	Check - repair or replace
	Clogged filter	Replace filter
	Hydrostatic pump not turning	Check drive coupling
	Faulty hydrostatic pump	Replace pump
	Air in suction line	Inspect & tighten all connections
	Torque hubs not engaged	Re-engage torque hubs
Machine will move in only one direction	Faulty high pressure relief valve	Switch relief valves from side to side. If problem reverses itself, replace faulty relief valve
Hydrostatic system responding slowly	Engine speed too low	Set engine at operating RPM before trying to move machine
	Low oil level in reservoir	Fill reservoir to proper level with approved oil
	Cold oil	Always allow system to warm up before operating
	Partially restricted suction line	Filter - replace; inspect for collapsed suction hose
	Internal damage - hydrostatic pump or motor	Replace

HYDROSTATIC SYSTEM - Continued

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Noisy hydrostatic system	Cold oil	Allow for adequate warm-up period
	Low engine speed	Set engine at operating speed
	Low oil level in reservoir	Fill to proper level with approved oil
	Air in system	Inspect, tighten fittings on suction line
	Internal damage to pump	Replace pump
External oil leaks	Loose or faulty fittings	Tighten or replace
	Damaged O-Ring	Inspect; if damaged, replace
	Faulty hose	Replace hose

D. HYDRAULIC SYSTEM

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Entire hydraulic system fails to function	Low oil level in reservoir	Fill reservoir to proper level w/approved oil
	Oil not reaching pump	Remove suction hose from reservoir; hold the far end higher than pump; hand feed two quarts approved oil through suction hose by turning engine w/starter. Re-install hose; tighten all fittings; pull up on throttle control; start engine.
	Faulty hydraulic pump	Replace hydraulic pump
Noisy hydraulic pump	Cold oil	Allow for adequate warm-up period
	Low oil level in reservoir	Fill to proper level with approved oil
	Air leak in suction line	Inspect and tighten all fittings on suction hose
	Collapsed suction hose	Cold oil; let system warm up before increasing engine speed

E. ELECTRICAL

PROBLEM	PROBABLE CAUSE	SUGGESTED REMEDY
Entire electrical system is dead	Battery or connections	Check battery - charge or replace Clean, tighten battery connections
	Low charging rate	Tighten alternator belt
	No charging rate	Replace alternator
All lights on instrument panel	Blown fuse	Replace fuse
	Dead battery	Charge or replace battery
	Battery connection	Clean, tighten battery connection
Speedometer not working	Blown fuse	Check & replace fuse
	Loose connections at sensor	Tighten connections at sensor
	Sensor clearance	Adjust sensor to clear speedometer disc about 1/8"
	Faulty sensor	Replace sensor
	Faulty speedometer head	Replace speedometer head
	Faulty toggle switch	Replace switch
Electric solution valve	Fuse	Check and replace fuse
	Faulty ground	Clean, tighten ground
	Separation in wire	Check continuity; repair or replace wire
	Short within solenoid coil	Replace coil
Light system does not function	Faulty fuse	Replace fuse
	Poor ground	Clean, tighten ground
	Burned out bulb	Replace bulb
	Separation or short in wire	Check continuity
	Faulty switch	Replace switch

LIMITED WARRANTY

A. HAGIE MANUFACTURING COMPANY NEW EQUIPMENT WARRANTY

1. THE WARRANTY

a. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.

b. Hagie makes this warranty only to the original purchaser of its new equipment.

c. The warranty period ends 12 months from the date of delivery of the equipment to the original purchaser. When requesting warranty service, the original purchaser must present evidence of the date of delivery of the equipment. (See Paragraph B below.)

d. Parts or rebuilt assemblies furnished under the terms of this warranty are not warranted beyond the original warranty period.

e. Exceptions to this warranty must be covered by separate warranty agreements.

2. ITEMS NOT COVERED BY HAGIE WARRANTY

a. Used equipment.

b. Tires, tubes, engines and batteries. The manufacturers of those parts may provide warranties.

c. Depreciation or damage caused by normal wear, accident, improper maintenance, improper storage, or improper use.

d. Service calls and transporting the equipment to and from the place where the warranty work is performed.

3. UNAPPROVED SERVICE OR MODIFICATION

NOTICE: All obligations of Hagie Manufacturing Company under this warranty shall be terminated:

a. If service is performed by someone other than Hagie authorized personnel; or

b. If the equipment is modified or altered without Hagie approval.

4. NO COMMERCIAL LOSS COVERAGE

a. Hagie shall not be liable for incidental or consequential damages or injuries (damage and repairs of equipment itself, loss of profits, rental of substitute equipment, loss of good will, etc).

b. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

5. MERGER CLAUSE

a. The entire warranty agreement is included in this writing.

b. Any oral statements that are made by the selling persons about the equipment are not warranties, and are not to be relied upon by the purchaser.

6. NO REPRESENTATIONS OR IMPLIED WARRANTY

The parties agree that the implied warranties of MERCHANTABILITY and fitness for a particular purpose and all other warranties, express or implied, are EXCLUDED from this transaction and shall not apply to the equipment sold.