



OPERATOR'S MANUAL
FOR
HAGIE ALUMINUM 120ft BOOM
HAGIE MANUFACTURING COMPANY

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COVERS ALUMINUM 120ft BOOM ATTACHMENT OPTION NUMBERS: U90412 & U90512

12-11

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INTRODUCTION



A WORD FROM HAGIE MANUFACTURING COMPANY

Congratulations on your selection of a Hagie Model Aluminum 120ft Boom. 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 may 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 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 120ft Aluminum boom attachment. It is the responsibility of the user to read the Operator's Manual and comply with the safe correct operating procedures and lubricate and maintain the product according to the maintenance schedule.

The user is responsible for inspecting the attachment 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. This manual is considered a permanent fixture with this fixture. In the event of resale, this manual should accompany the boom. If you do not understand any part of the manual or require additional information or service, contact the Hagie Customer Support Department:

Hagie Manufacturing Company
721 Central Avenue West
Box 273
Clarion, Iowa 50525-0273
(515) 532-2861

The following symbols, found throughout this manual, alert you to situations that could be potentially dangerous conditions to the operator, service personnel, or the equipment.



This symbol indicates a hazardous situation which, if not avoided, will result in death or serious injury.



This symbol indicates a potentially hazardous situation, which if not avoided, could result in death or injury.



This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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SAFETY

NOTICE

The purpose of this manual is to guide you in operating the 120ft boom. Please be sure to read this manual along with the sprayer's manual and all other manuals that are included with the machine. This manual is only intended to cover the 120ft boom attachment and any differences in the operation of the sprayer's controls. It will not give complete instruction on the operation of the basic functions that are already discussed in the sprayer's manual.

Most accidents occur as the result of failure 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.

Many conditions cannot be completely safeguarded against without interfering with efficient operation and/or reasonable accessibility. Therefore, you must study this Operator's Manual and learn how to use the attachment safely. Likewise, do not let anyone operate without instruction.

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

Replace missing, faded, or damaged safety signs. See the operator's manual for correct sign and placement.




NOTICE

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




Operating Sprayer Booms

 **Warning:** When operating or positioning the booms observe the following safety items.

- Cradle booms when leaving sprayer unattended.
- Make sure booms are folded when cradled.
- Select a safe area before folding/unfolding booms.
- Clear area of personnel.
- Check for overhead obstruction.
- Do not fold or unfold booms near power lines. Contact with power lines can result in serious injury or death.



 **Caution:** When operating or positioning the booms observe the following safety items to avoid injury or equipment damage.

- Do not fold/unfold boom extensions when main boom is in the cradle.
- Do not operate sprayer with one boom out of cradle and other boom in cradle.

General Safety

- The hydraulic and electrical control systems are optimized for use with this attachment. Any modification to these systems may lead to unintended or uncontrolled motion. **DO NOT** install add-on control systems that are not approved by Hagie Manufacturing Company.
- Some conditions cannot be completely safeguarded against without interfering with efficient operation of the machine and/or reasonable accessibility. In these cases decals have been installed to provide the operator with information on the hazard. **DO NOT** remove the decals for any reason. If a decal is damaged, contact Hagie Customer Support Department for a replacement.



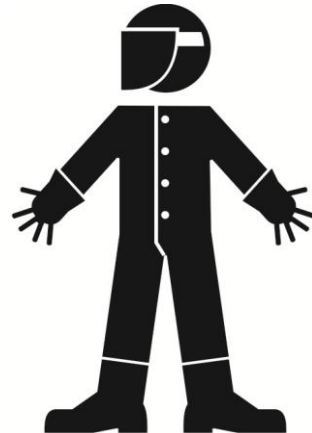
Boom Leveling System

- Unplug all cylinder sensors before welding on the machine or boom.



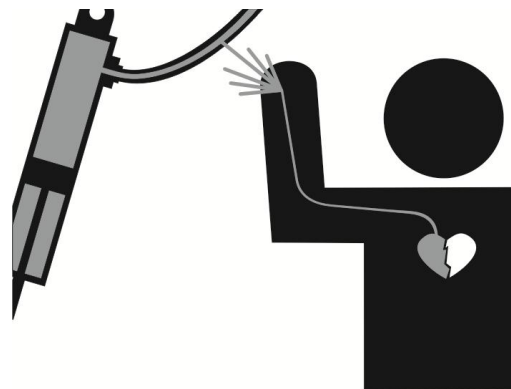
Wear Protective Clothing

- Do not wear loose fitting clothes that could get caught in moving parts. Wear safety equipment that is appropriate for the job.
- Do not store chemical soaked clothes in the cab. Clean off as much mud and dirt from your shoes as you can before entering the cab.



Safe Hydraulic Maintenance

- Always practice personal safety when performing service or maintenance on the hydraulic system.
- Use caution when working with hydraulic fluid under pressure. Escaping fluid can have sufficient force to penetrate your skin causing serious injury. This fluid may also be hot enough to burn.
- Always lower the load or relieve the pressure before repairing a hydraulic oil leak.



Avoid Heating Near Pressurized Lines

- Avoid torching, welding, and soldering near pressurized hydraulic lines. Pressurized lines may accidentally burst when heat goes beyond the immediate flame area.



Be Prepared

- Be prepared for an emergency. Keep a fire extinguisher handy. Keep a first aid kit and clean water in the cab also.
- Make sure to service the fire extinguisher regularly. Keep an accurate inventory of supplies in the first aid kit and dispose of anything that has expired.



General Repair/Maintenance Safety

- Turn off sprayer engine before checking, adjusting, repairing, lubricating, or cleaning any part of the attachment.
- Disconnect the battery ground cable and turn the main battery switch off before servicing electrical system or welding on attachment.



Power Lines

The 120ft boom is longer than any other boom offered by Hagie Manufacturing Company, we cannot stress enough that extreme caution must be observed when operating the equipment around power lines! Be absolutely sure that there is more than sufficient clearance when transporting, opening the boom, or spraying around power lines!



Warning: When operating or positioning the booms observe the following safety items.

- Cradle booms when leaving sprayer unattended.
- Make sure booms are folded when cradled.
- Select a safe area before folding/unfolding booms.
- Clear area of personnel.
- Check for overhead obstruction.
- Do not fold or unfold booms near power lines. Contact with power lines can result in serious injury or death.



Caution: When operating or positioning the booms observe the following safety items to avoid injury or equipment damage.

- Do not fold/unfold boom extensions when main boom is in the cradle.
- Do not operate sprayer with one boom out of cradle and other boom in cradle.

Handle Agricultural Chemicals Safely

Agricultural chemicals used in applications can be harmful to your health and the environment if not used carefully.

- Always follow the manufacturer's label directions for use.
- Never allow chemicals to come in contact with your skin or eyes.
- Never pour chemicals into an empty tank, fill tank half full of water first.
- Dispose of empty chemical containers properly.
- Wash spilled chemicals or spray residue from the sprayer to prevent corrosion and deterioration.
- Select a safe area to fill, flush, calibrate, and clean sprayer where chemicals will not run off to contaminate people, animals, vegetation, or water supply.
- Never place a spray nozzle to your lips in an attempt to unclog it.
- Do not spray when wind is in excess of chemical manufacturer's recommendation.
- Store chemicals in their original containers with the label intact.
- Store chemicals in a separate, locked building.
- Wear protective equipment as recommended by chemical manufacturer.



Disabling the Norac System

When using the Norac boom leveling system in auto mode it can be disabled to avoid a potentially hazardous situation. To disable the Norac system press “M” on the UC5 for manual or you can press any one of the following Hagie boom control switches: Lift (transom raise/ lower), or the left or right level up/down. If the Norac stops working the auto and manual fold functions will still work. For more information on the Hagie switches, refer to your sprayer manual. For more information on the Norac switches, refer to your Norac manuals. For detailed information on trouble shooting, refer to the Norac manual.



Oil Over Air Scenarios

Initially when a new cylinder is run on the machine, it should NEVER be connected to the booms on both ends. Only one end should be connected and then the air should be bled out of the cylinder by activating the cylinder in both directions to completion at least two times. Then when initially connecting the cylinder to allow full operation of the boom, be aware of the changes that have taken place and be ready for possible rapid movement if some air would possibly still be trapped in the cylinder.



DO NOT ALLOW PEOPLE TO BE STANDING IN LOCATIONS WHERE THE BOOM COULD STRIKE THEM!

MAKE SURE NOTHING IS OBSTRUCTING THE UNPINNED END OF THE CYLINDER AS IT MAY MOVE SUDDENLY.

Cold Oil Scenarios

If the oil temperature is less than 50°F, the operator could experience some significant control loss on the 90ft & 120ft fold cylinders. These cylinders are the main cylinders affected by over-running loads due to the weight rotation of the boom during fold in/out situations. When the oil is cold, the valve response is not as fast or as accurate. So when having to lift the weight the cylinder will move slower, but in trying to suspend the weight, the weight may cause faster movement because the valve is not dampening the flow like it normally would. THIS SITUATION ALSO REQUIRES THE OPERATOR TO MAKE SURE NO ONE IS AROUND THE BOOM DURING OPERATION!



Boom Height During Transport

Refer to transport section of main manual. Hagie Manufacturing does not recommend any form of transportation other than driving the sprayer. Loading a sprayer on a trailer may result in sprayer tip-over.



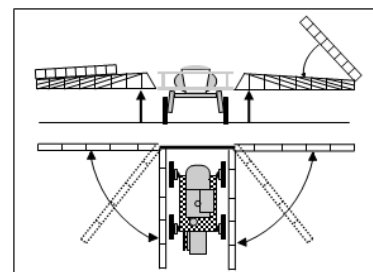
Warning: When transporting the sprayer observe the following safety items to avoid serious injury or death.

- Check for overhead clearance before driving under any overhead obstructions.
- Contact with power lines can result in serious injury or death.



Caution: When transporting the sprayer observe the following safety item to avoid injury or equipment damage.

- Do not transport machine without booms folded and in cradle.



DECALS

Warning Decals

Decals warning you of avoidable danger are located on various parts of the attachment. They are there for your personal safety and protection. DO NOT attempt to remove them. They will fracture upon attempted removal and therefore must be replaced.

Following are locations of important safety decals. Replace them if they are torn or missing. All warning decals and other instructional Hagie decals may be purchased through Hagie Customer Support Department. To replace decals, decide on exact position before you remove the backing paper.



650201

(2) One on each fold section.



650204

(2) One at each folding section along the boom.



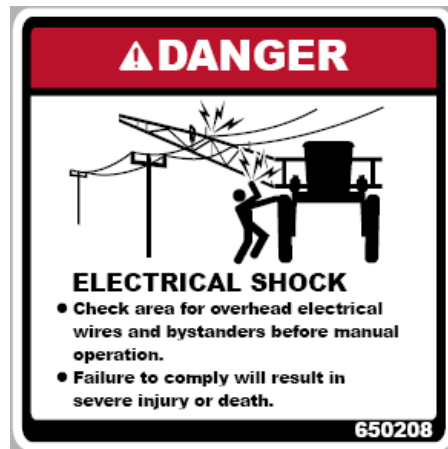
650203

(1) On the fixed transom.



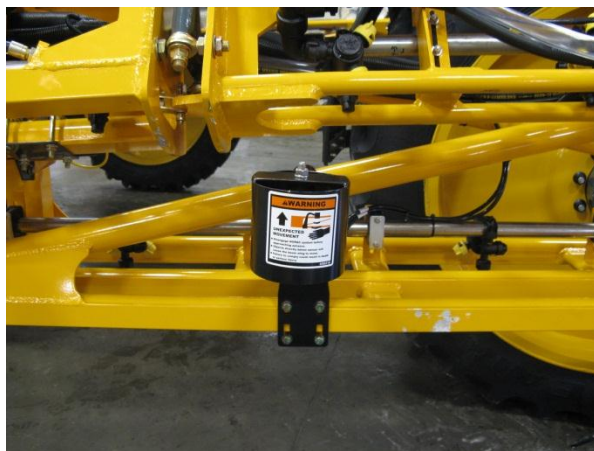
650208

(1) On the fixed transom.



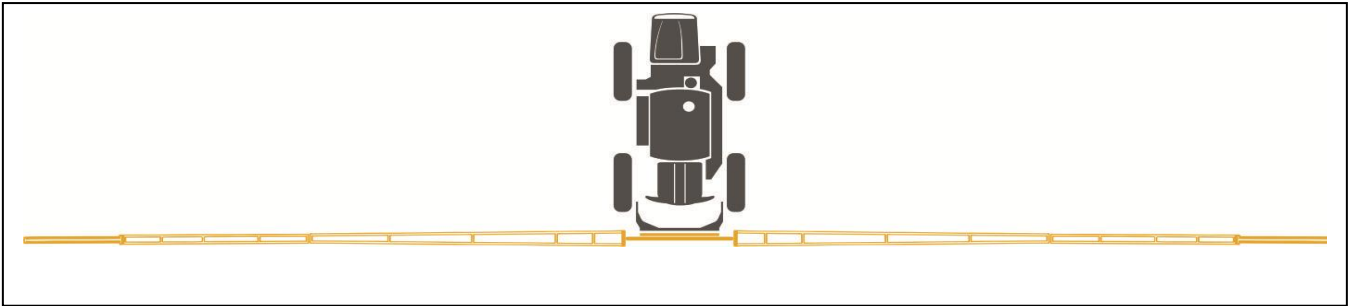
650210

(5) One on each Norac sensor.

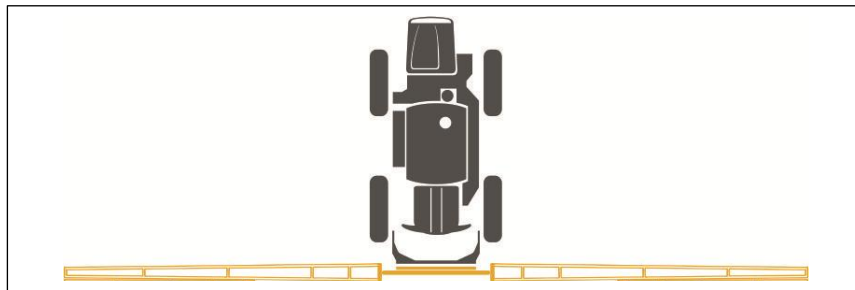


SPECIFICATIONS

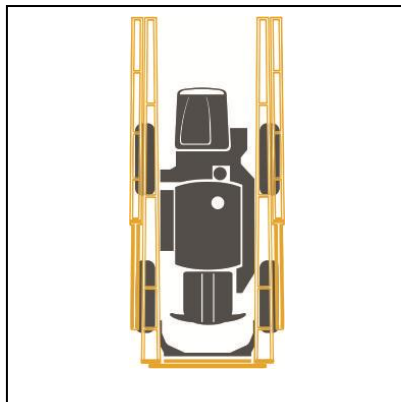
Boom Widths



120ft spray width with boom fully extended*

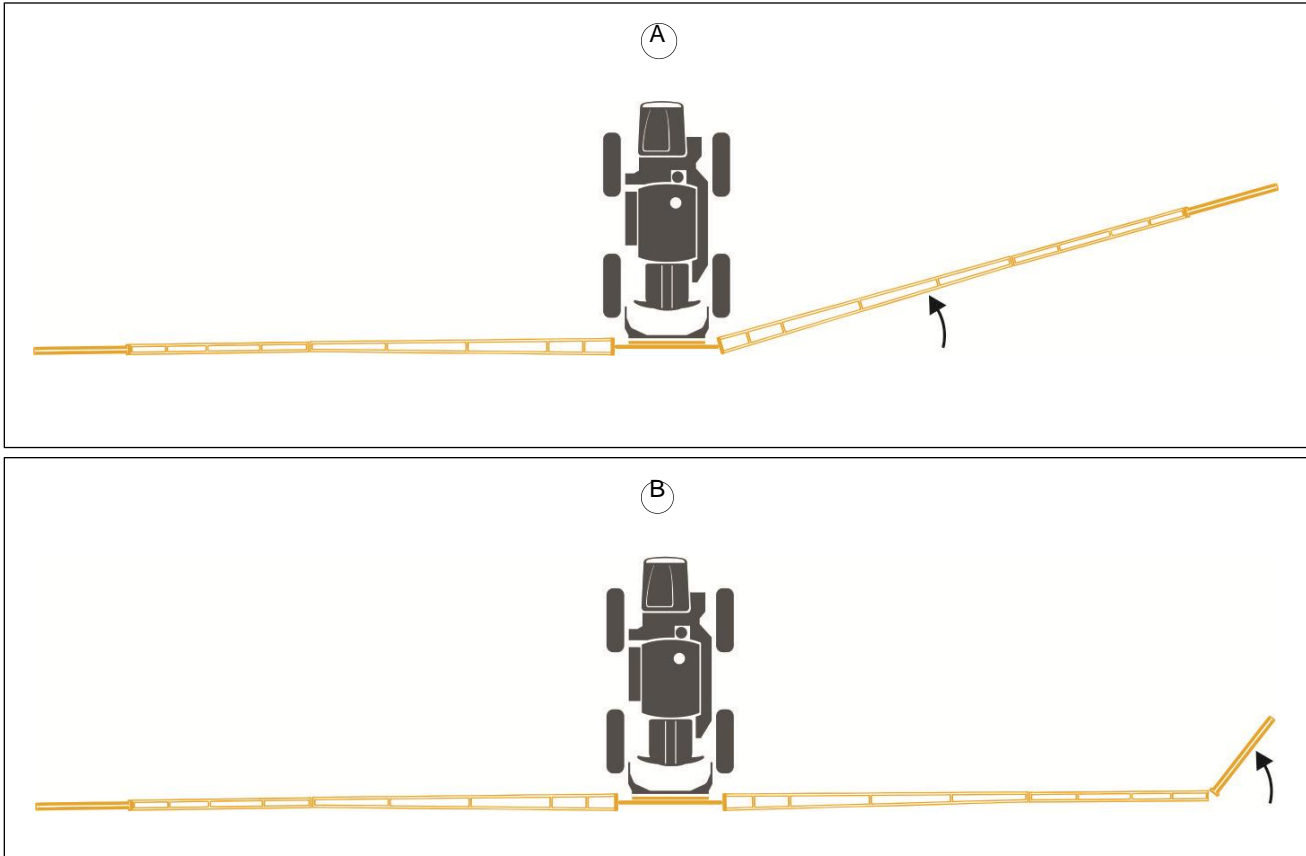


70ft spray width with boom folded at the 70/120 extension fold



Transport width. 14'-6"

*Recommended spray width



Break-Away Locations

The main pivot break-away (A) is a breakaway that will breakaway if something is contacted within the main boom sections. In case the boom hits an object, it will break away to only around 45 degrees back, in order to avoid hitting the sprayer.

Figure B shows the break-away at the tip giving you protection if you were to catch the tip of the boom or if the boom hits the ground.

| ITEM | SPECIFICATION |
|---------------------------|--|
| GENERAL | |
| Type | Standard wet boom with 15 or 20 inch row spacing |
| Standard | 120ft (9 spray sections) |
| Controls | Electro-hydraulic: fold/lift/level |
| Outer Boom Tip Break-Away | Self-actuated spring |
| Main Pivot Break-Away | Self-actuated, operator-reset hydraulic |
| Pressure Gauge | 100 PSI glycerin filled (2) |
| Fence Row Nozzles | Two position, remote activated |
| Lift Shock Absorber | Gas charged accumulators (2) |
| Level Shock Absorber | Gas charged accumulators (2) |
| Transoms | Passive roll |
| ELECTRICAL SYSTEM | |
| Auto-leveling Sensors | Norac sensors (5) |
| Proximity Sensors | (5) |
| Position Sensors | (5) |
| Highway Lights | Trapezoid glass (2) |
| Boom Indicator Lights* | Oval red LED (2) |
| Level Console | Norac UC5 |
| Solution Valves | Electric ball valves |

* In addition to the standard machine lights

OPERATOR'S STATION

Norac Console

The Norac console is mounted to the right of the Raven Spray console. The Norac console controls the automatic boom leveling system. Read the Norac manual for complete operator instruction and troubleshooting information.



Boom Solution Valve Switches

In the cab of a machine with the 120ft boom, there are nine spray section switches.

The switches operate the valves that control the flow of the solution through the boom. The boom is divided into nine spray sections that can be individually turned on or off.



120ft Boom Extension Switch

The 120ft boom switch (Headland assist switch) has another extension switch. It controls the extension cylinder at the 70/120ft vertical fold. It is recommended to use the Auto-fold feature if possible. This switch controls both the left and right boom and allows them to extend at the same time reducing the chance of an unbalanced load on the transom.



Warning: When operating or positioning the booms observe the following safety items.

- Cradle booms when leaving sprayer unattended.
- Make sure booms are folded when cradled.
- Select a safe area before folding/unfolding booms.
- Clear area of personnel.
- Check for overhead obstruction.
- Do not fold or unfold booms near power lines. Contact with power lines can result in serious injury or death.



Caution: When operating or positioning the booms observe the following safety items to avoid injury or equipment damage.

- Do not fold/unfold boom extensions when main boom is in the cradle.
- Do not operate sprayer with one boom out of cradle and other boom in cradle.

MD3

120 Boom Page

Machines with the 120ft boom option installed have changes to the display to allow for more feedback to the operator and to help the operator achieve some of the functions needed in certain operations.

The first change is the addition of an indicator light to alert the operator when the boom is folded out and the breakaway function is set and the boom is ready for operation. Fig. A shows a green indicator light showing operational status. If the light is not green, a breakaway situation has occurred. Observe boom to determine where breakaway occurred. Push corresponding horizontal extending out button on hydrostatic control handle, Fig. B. Right extend out will re-charge the breakaway circuit on the right side of the boom and left extend out will re-charge the breakaway circuit on the left side in the Auto-Fold state. To re-charge breakaway circuits in the manual state, each individual “out” direction will need to be activated.

Fig. C shows the Miscellaneous Page that contains the status of the NORAC communication, the activating buttons for changing the fold state of the boom, the roll commands for the boom, and the spray width for the boom. The N-Add and A-80 means that the NORAC system is communicating with the Hagie system correctly. If this reads N-Add and 0 state then the communication is not correct. See trouble-shooting section.



120 Boom Page

The boom will automatically align itself in the Auto-fold state. The F1 button along the bottom of the screen when on this page, changes the boom from Auto state to Manual state. If the boom is in Auto state, then the boom will position itself in all of the correct places to completely fold the boom out and in based on whatever spray width is selected. When the boom is in Auto state, the auto-fold is achieved by pressing both of the In/Out switches at the same time (same switch used to move the 70' section in manual state). Also in the Auto state each individual boom tip can be folded in or out by pressing the corresponding switch. In the Manual state each function can be performed individually by pressing the corresponding switch.



The roll command buttons will cause the boom to roll either clockwise (as viewed from the cab) or counter-clockwise. These buttons are only active when the main booms are folded almost all the way out. This helps prevent an operator from accidentally rolling the booms into the machine. Also the message, Fig.D, shows up when the operator is in manual state and the boom is not rolled to the proper position. The operator needs to be very careful when folding the boom in manual and pay attention to the boom roll angle.

The spray width selection allows the operator to select the width that they want the boom to fold to in the auto state. In manual state the operator can just fold to the width desired. In the auto state the boom will fold to the width selected from this page.

THE BOOM

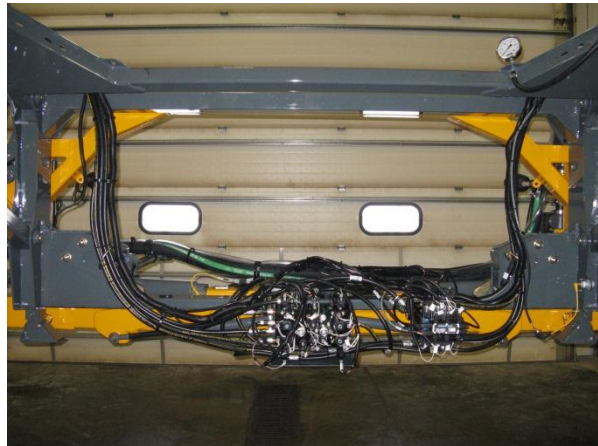
Rocking Transom

The pivot transom houses 2 work lights, 2 solution valve, the main fold cylinders, and the solution plumbing.



Fixed Transom

The fixed transom and lift arm house the flow meter, lift cylinders, pressure gauge, 2 roll lock cylinders, Hagie modules, NORAC center sensor, boom stands, the fold control manifold, and the lift/level NORAC hydraulic manifold.



Level Cylinders

The level cylinders, located on the left and right side of the transom, are responsible for the up and down movements of the boom when the level controls are activated.



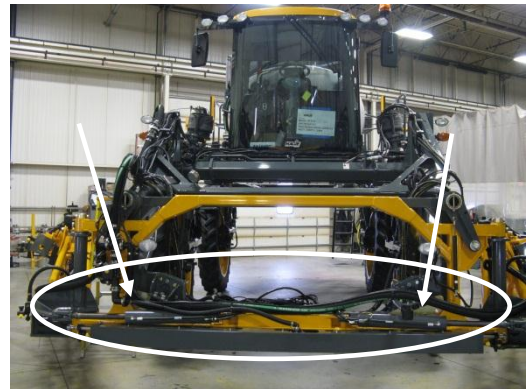
Throttling Valve (only for HV)

The throttling valve is required to maintain back-pressure on the pump and keep the flow meter full if spraying at low flow rates and to aid in issues with precise flow control at low flow rates. If you require more assistance, contact Hagie Customer Service Department.



Main Pivot/ Break-Away Cylinders

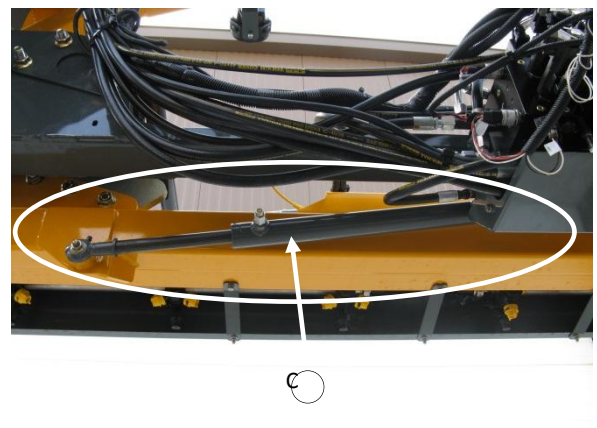
The main pivot/ break-away cylinders are responsible for the horizontal extension of the booms to the spray position. They also provide the break-away protection of the boom. These break-away cylinders will move backward to 45 degrees in order to prevent collision with the sprayer.



Roll Cylinder

The roll cylinders (C, left shown) extend and retract to provide the “roll” functions to help re-center boom for transport. These cylinders are activated automatically.

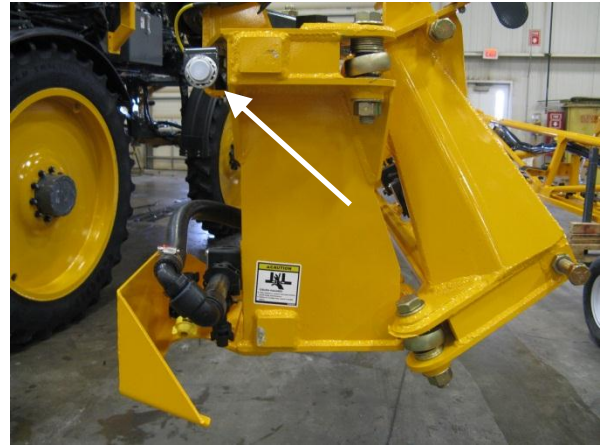
The roll cylinders are automatically placed into a passive roll state when the main booms are unfolded. This means that the booms will be free to move on the pendulum pieces at this point—the hydraulic valves and cylinders will not be stopping this from happening.



Proximity Sensors

There are external proximity sensors located at the 70ft fold. The motions of the boom (folding and unfolding) are guided by the measured position of the different cylinders.

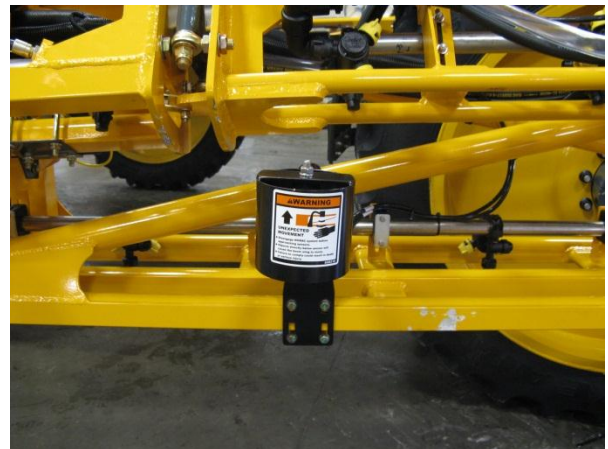
The sensors are positioned at the factory and should not require any calibration. If you experience any issues with boom positioning, contact Hagie Customer Service for assistance.



Norac Sensors

The boom is equipped with five Norac sensors that track the boom's position to the ground. They send signals to the hydraulic system allowing for position corrections to keep the boom parallel to the ground and the crop giving you a more consistent spray pattern.

Placing an object under the sensors when the Norac system is in automatic mode may cause the boom to move up.

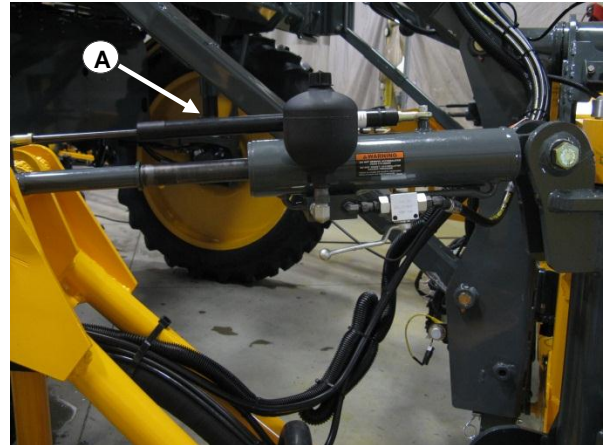


Position Sensors

The level cylinders and main fold cylinders are equipped with position sensors. These sensors measure the linear stroke of the cylinder and position the boom to the correct height of the main cradles in the auto fold mode.

The required specific motions exist to provide smooth, efficient operation. The programmed positions help prevent mechanical damage to the boom due to severe imbalance, unintended contact with the ground, or improper fold sequence.

The sensors are positioned at the factory and should not require any calibration. If you experience issues with the positioning of the boom, contact Hagie Customer Service for assistance.



Break-Away

There is a spring break-away at the tip of the boom, which goes forward or backwards. The break-away provides protection to the boom by allowing the boom to fold forward or backwards if it were to come into contact with another object.



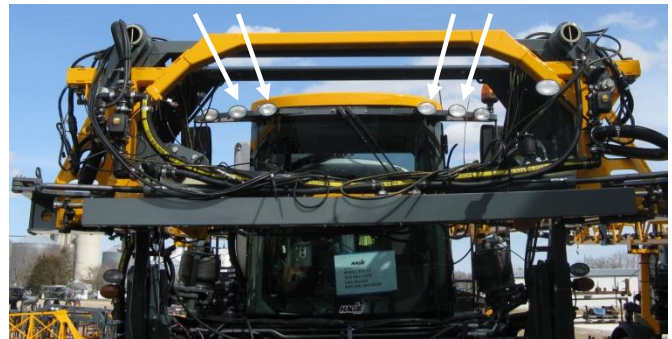
Highway Lights

The highway lights are located on the rocking transom. These lights come on when the HIGHWAY LIGHT switch is activated on the steering console.



Work Lights


The work lights are located on the rocking transom. These lights come on when the HIGHWAY LIGHT switch is activated on the steering console.



Accumulators

The level and lift cylinders located on the transom are equipped with accumulators (4). The accumulators act as a “shock absorber” for the booms.



 **Warning:** Do NOT remove accumulators from the transom. If the accumulators are removed by non-Hagie personnel, the warranty will be voided and catastrophic failure will occur.

OPERATING INSTRUCTIONS



Warning: When operating or positioning the booms observe the following safety items.

- Cradle booms when leaving sprayer unattended.
- Make sure booms are folded when cradled.
- Select a safe area before folding/unfolding booms.
- Clear area of personnel.
- Check for overhead obstruction.
- Do not fold or unfold booms near power lines. Contact with power lines can result in serious injury or death.



Caution: When operating or positioning the booms observe the following safety items to avoid injury or equipment damage.

- Do not fold/unfold boom extensions when main boom is in the cradle.
- Do not operate sprayer with one boom out of cradle and other boom in cradle.

Auto-Fold

Auto-fold is the preferred method for the most effective spraying operations.

Auto-fold is a feature that makes operation of the machine easier for the operator. During this operation the controller will position all boom sections automatically with the push of one button.

On the MD3 module, from startup/home page press the down arrow twice to get to the display shown in Fig. A. Push the F1 button on the MD3 to switch between manual and auto-fold states.

When the boom state reads Auto, the boom will operate with the auto-fold switches, see Fig. B.

When extending the booms in Auto-fold the controller will take the boom out of the cradles and unfold them to the desired spray width.

Press **both** out buttons on the auto-fold switch to move the boom to the fully out position on all sections.

When retracting in the booms in Auto-fold the controller will fold the booms in and set them back in the cradle.

Press **both** in buttons on the auto-fold switch to move the boom to the fully folded position on all sections.

In Fig. A, the F4 button allows the operator to select the maximum spray width. This setting controls the maximum auto-fold width of the boom.



Manual Fold, Out

To fold the booms out the MD3 module needs to be in the manual state. See Fig. A, push F1 button to toggle between manual and auto states.

Raise the level cylinders up all the way using left and right raise switches on control handle. Fig. B.

Fold out main boom sections using left and right out switches on control handle until boom sections stop moving. Fig. B.

Lower the level cylinders until the boom is parallel with the ground.

Then push the corresponding OUT switch to fold the outer section all the way out. Fig. C.

DO NOT lower main lift while boom is in the cradles.

(A)



(B)



(C)



Manual Fold, In

To fold the booms in the MD3 module needs to be in the manual state. See Fig. A, push F1 button to toggle between manual and auto states.

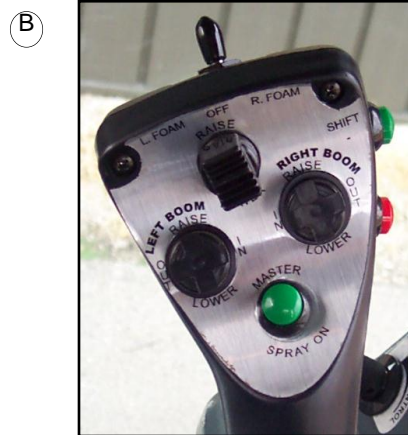
Lower the level cylinders until the boom is parallel with the ground. Fig B.

Push the corresponding IN button to fold the outer section in. Fig. C.

Raise the level cylinders up all the way using left and right raise switches on control handle. Fig. B.

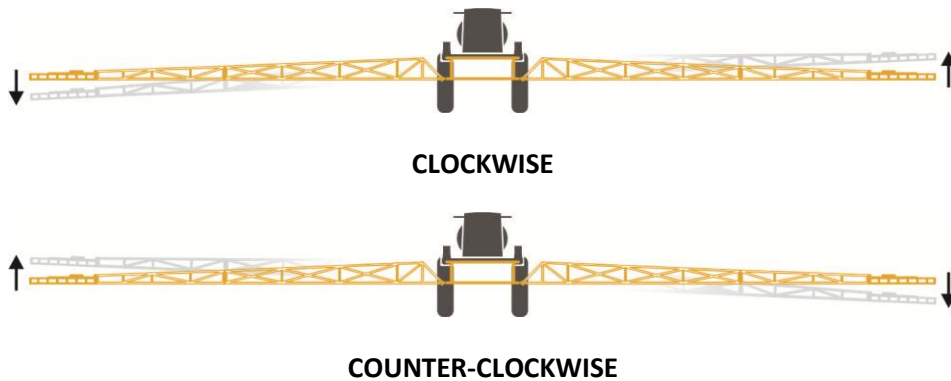
Fold IN main boom sections using left and right in switches on control handle until boom sections stop moving. Fig. B.

Lower the level cylinders until the boom sections are resting in the boom cradles. Fig B.



Rolling boom

The roll command buttons will cause the boom to roll either clockwise (as viewed from the cab) or counter-clockwise. These buttons are only active when the main booms are folded almost all the way out. This helps prevent an operator from accidentally rolling the booms into the machine.



Re-charging breakaway circuit

Auto/Manual

To re-charge breakaway circuits in the auto/manual state, push the corresponding horizontal extending out button on hydrostatic control handle. Right extend out will re-charge the break-away circuits on the right side of the boom and left extend out will re-charge the break-away circuits on the left side in the auto/manual fold state.

QUICK-TACH

The boom can be removed for various reasons including, but not limited to maintenance or attaching to another Hagie manufactured attachment. The following steps must be followed when removing the boom from the machine to prevent personal injury or damage to the machine.



Warning: When removing or attaching the booms observe the following safety items.

- Select a safe area before folding/unfolding booms.
- Clear area of personnel.
- Check for overhead obstruction.
- Do not fold or unfold booms near power lines. Contact with power lines can result in serious injury or death.



Caution: When removing or attaching the booms observe the following safety items to avoid injury or equipment damage.

- Do not fold/unfold boom extensions when main boom is in the cradle.
- Do not operate sprayer with one boom out of cradle and other boom in cradle.



WARNING: Turn the engine OFF before disconnecting any hoses or electrical lines! Failure to do so may result in serious injury or death.

1. Locate the boom on a level, flat, hard surface.

To prevent stress on the boom frame and joints, it is best that the boom be placed on a surface that is fairly level and flat. To prevent the boom from sinking into the ground the surface should be solid.

Remember that the boom must be partially open while off the machine! Choose an area that will not be an inconvenience to get around and still protect the boom from the damage.



2. Remove the boom extensions from the cradles.

The booms only need to be opened far enough to be able to lower them; they do not need to be fully opened into the spray position.



3. Position the boom extensions slightly open.

The main extensions need to be opened between 7 and 12 inches of cylinder stroke viewable on the MD3. This is the best position for the boom to be in while it is not attached to the machine because it provides the necessary support while conserving space.



4. Lower the boom to access the boom stands.

Lower the boom to access the boom stands (inside of fixed transom). The transom must be close to the ground when you disengage the quick-tach lock pins later in the process.



5. Remove the fastener and lower the leg.

Remove the bolt to allow the lag stands to lower. Re-insert the bolt through the lower hole to keep the leg stand from sliding back up.



6. Lower the legs to the ground.

If necessary, place blocks under the stands where the legs will rest on the ground. This will help to keep them from sinking into a soft surface such as grass or soil.



7. Lower the LH and RH wings onto an elevated object.

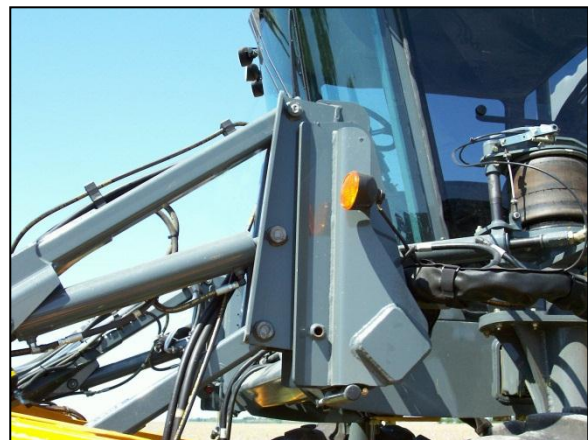
Use the right and left level functions to lower the wings to an elevated object such as a saw horse, drum (A) or timber (B).



8. Lower the transom to raise the quick-tach hooks off of the quick-tach pins.

Lower the transom until the hooks have cleared the pins.

You may notice a “bounce back” effect when the weight of the boom has been relieved from the machine. Once the airbags have cycled the machine will adjust to the new weight.



****Shut off the hand valves for the level cylinders. If the valve is not closed, the level cylinder may retract causing the boom to tilt back while in storage position. ****



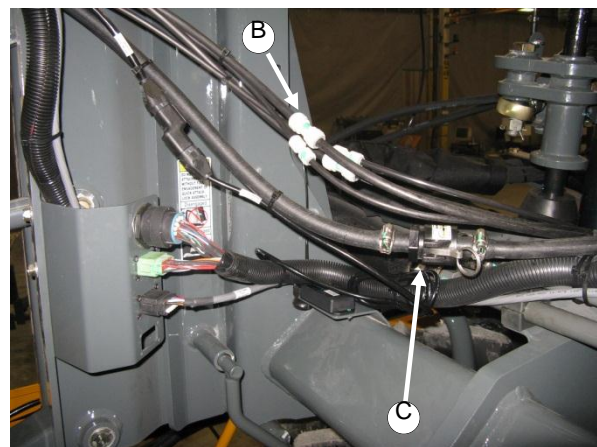
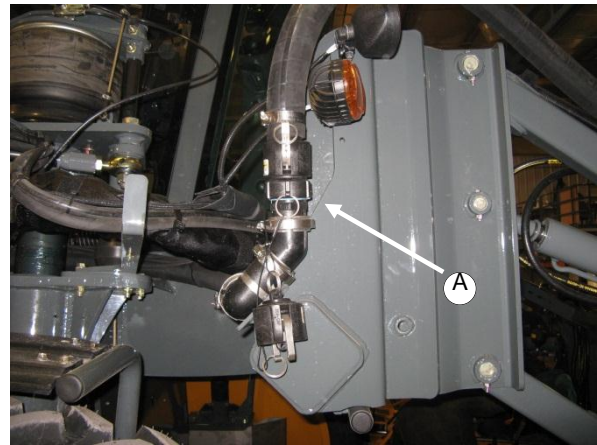
9. Disconnect solution and foam marker hoses.

Disconnect the solution hose (A) on the right side of the machine. Disconnect the foam marker hoses (B) and the rear nozzles (C) at the right of the machine.

Be sure to cap the hoses with the supplies caps. If the caps are missing, cover the opening with plastic and tape until a replacement can be obtained from Hagie Customer Service.

The foam marker hoses are capable of being connected to each other. Do not attempt to connect hoses from different systems together.

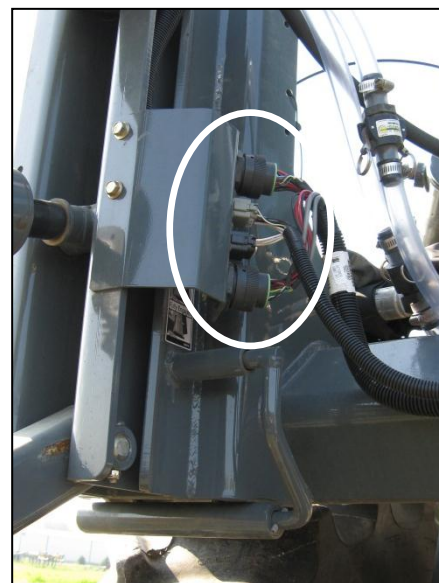
NOTE: If there is too much tension on the hoses when trying to disconnect them at this point, they can be disconnected while shutting off the level cylinders or unlocking the quick-tach lock assemblies.



10. Disconnect the electrical connections at the right front of the machine.

Disconnect the electrical pigtails at the right front of the machine. Check the pigtails for any damage such as broken connectors or loose wires.

Make sure that the harness is not left in a position that it could be damaged while the boom is not connected.



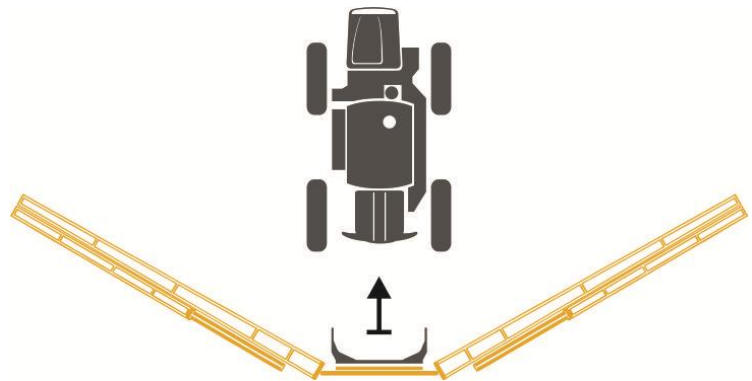
11. Disconnect the hydraulic connection on the left front of the machine.

The hydraulic lines equipped with quick couplers do not have caps. Care must be taken when reconnecting the hoses to ensure that no foreign material enters the hydraulic system.



12. Slowly back the machine away from the boom attachment.

Once all the connections have been disconnected, you may back away from the attachment.

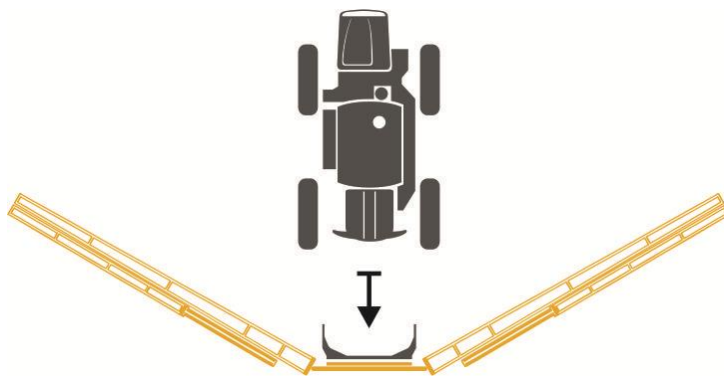


To re-connect the boom, everything is done in reverse from taking it off. Make sure that before you lift the boom from the ground, all of the hydraulic connectors are securely fastened and so are the quick-tach lock pins. If attaching anything other than the 120 boom, make sure to read the operator manual for the attachment before attaching or using it.

1. Pull squarely into the boom attachment.

Slowly pull into the boom attachment until the quick-tach hooks are in line above the quick-tach pins.

The machine may be too high to fit under the quick-tach hooks. In this case you need to release air from the air bags.



If your machine is not equipped with relief valves, you may order them from Hagie Customer Service.

NOTE: You may find it easier to use the speed control knob instead of the hydrostatic lever when trying to control your movement into the boom attachment.

2. Connect the hydraulic connection on the left front of the machine.

Before connecting the hydraulic hoses, check to see that all openings on both the machine and the boom are clean. Pull the coupler's collar back to inspect for foreign material also.

The introduction of foreign material to the hydraulic system can cause filters and orifices to become plugged and disrupt oil flow.

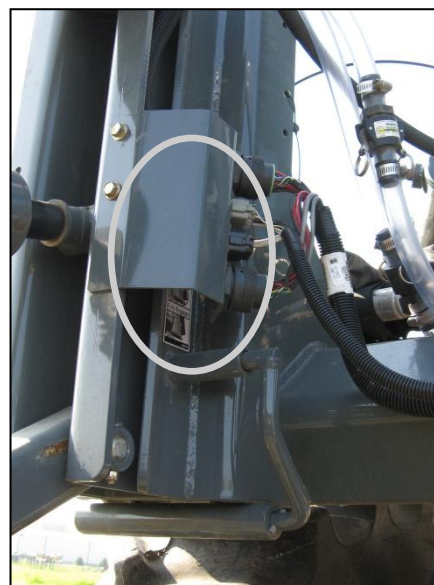
Open the hand valve on the level cylinders.



3. Connect the electrical pigtails on the right front of the machine.

Inspect the pins, wires, and ports before connecting the electrical pigtails. Using an electrical connector that is damaged may result in erratic functions or a fire. Call Hagie Customer Service for replacement of damaged parts.

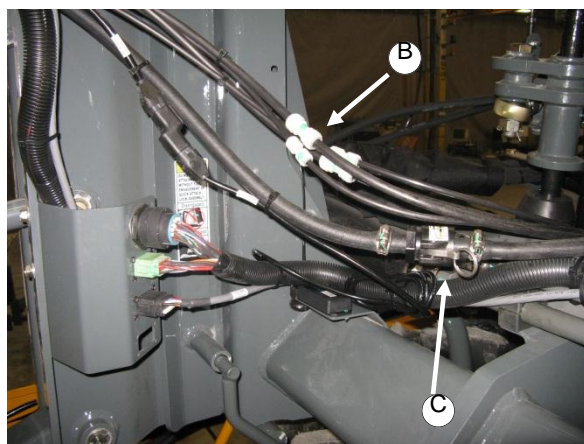
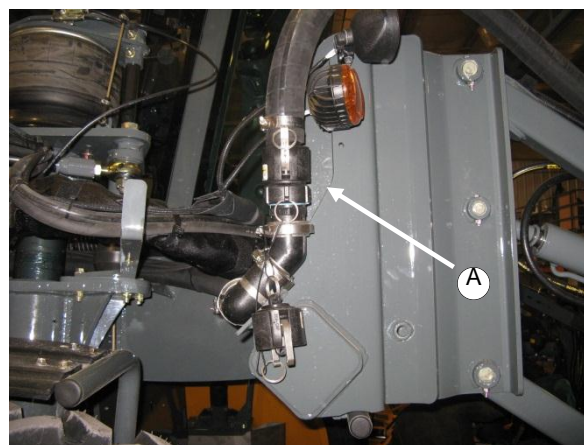
NOTE: The hydraulic hoses and electrical lines must be connected before proceeding.



4. Connect solution and foam marker hoses.

Connect the solution hose (A) on the right side of the machine. Connect the foam marker hoses (B) and the rear nozzles (C) at the right of the machine.

NOTE: If there is too much tension on the hoses when trying to disconnect them at this point, they can be disconnected while shutting off the level cylinders or unlocking the quick-tach lock assemblies.



5. Open the quick-tach lock assemblies.

Make sure that the quick-tach lock assemblies are open before you proceed with connecting the boom attachment. Pull the lock assembly out until it is fully extended and it stays open.



6. Raise the transom so that the quick-tach hooks engage the lock pins.

Raise the transom only high enough that the hooks go over the pins. DO NOT raise the transom all the way up until you have checked to see that the quick-tach lock assemblies are fully engaged.



7. Close the lock assemblies.

Be sure that the lock assemblies are closed all the way before proceeding with attachment process.



8. Raise the right hand and left hand extensions to level.

Raise the extensions using the level switches on the hydrostatic lever.



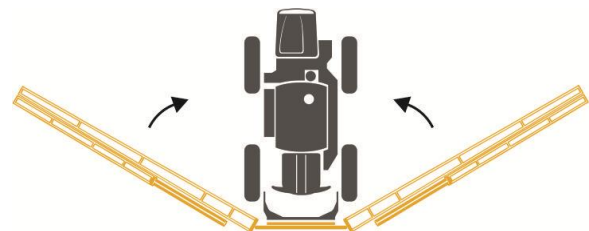
9. Raise the transom to allow the stands to be slid back up into the transom.

Raise the transom to access the boom stands (inside of fixed transom). Slide the stands back up into the transom. Install lock pins.



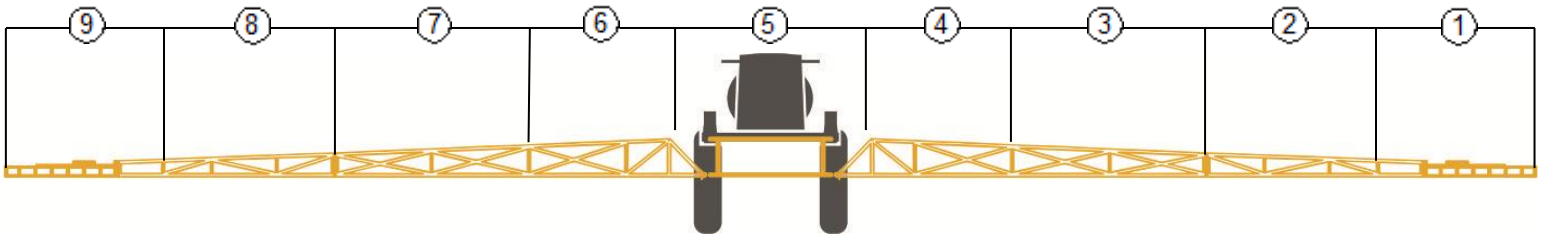
10. Fold the boom either in or out to allow the position sensors to readjust.

The horizontal fold will need to be activated in either direction to reset the position sensors and the main pivot break-away.



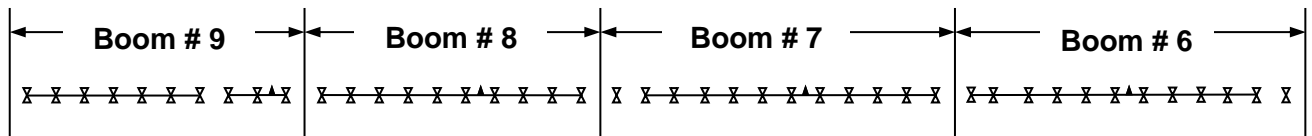
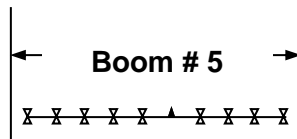
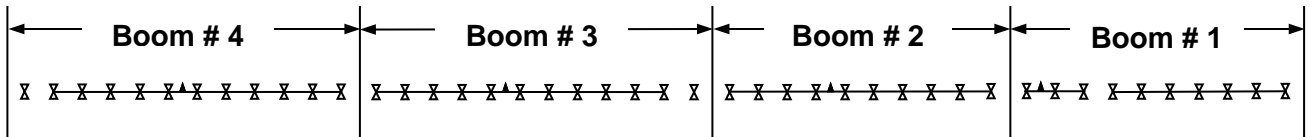
CALIBRATION

Follow the instructions in the Hagie sprayer operator's manual to calibrate the wet boom. There are just a few things different in the set up: the boom lengths and the number of boom sections. The diagram shows how the 120ft boom is broke down into sections.




Representation of 15 inch wet boom

- x Nozzles body
- ▲ Feeder hose




TRANSPORTING


Driving the Machine

 **WARNING**

NEVER operate the machine on a public roadway with solution in the tank!


 **WARNING**

DO NOT operate the machine at speeds exceeding 20 mph with solution in the tank. Operating at speeds exceeding 20 mph with a fully loaded tank may result in tire blow out or wheel hub damage and void the warranty.


 **Warning:** When transporting the sprayer observe the following safety items to avoid serious injury or death.

- Check for overhead clearance before driving under any overhead obstructions.
- Contact with power lines can result in serious injury or death.



 **Caution:** When transporting the sprayer observe the following safety item to avoid injury or equipment damage.

- Do not transport machine without booms folded and in cradle.
- Do not transport machine with transom higher than the top of the cab.

 Hagie Manufacturing does not recommend any form of transportation other than driving the sprayer. Loading a sprayer on a trailer may result in sprayer tip-over.

Trailer

If the sprayer must be transported on a trailer, the transom must be at max height. Be sure to read and understand the trailer manufacture's operating and loading instructions. Refer to specification page for machines dimensions.



- Extend boom far enough to clear the boom stands and sprayer.
- Raise the transom to full height
- Reposition the boom wings into their cradles.
- Deflate air bags on suspension to increase clearance.



Hagie Manufacturing does not recommend any form of transportation other than driving the sprayer. Loading a sprayer on a trailer may result in sprayer tip-over.

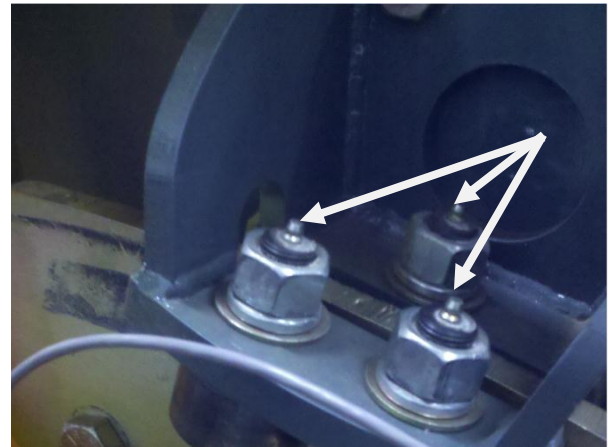
SERVICE

| Page | Service Point | Daily | Weekly | As Reg | 500 hrs* |
|------|---|-------|--------|--------|----------|
| | | | | | |
| 65-2 | Grease zerks for rollers (6- 3 each side) | • | | | |
| 65-3 | Clean Norac sensor foam pads | • | | | |
| 65-2 | Check friction plates for wear | • | | | |
| 65-3 | Replace Norac sensor pads | | | • | |
| 65-2 | Replace worn friction plates | | | • | |
| 65-2 | Change Norac manifold hydraulic filter | | | | • |
| 65-3 | Grease zerks on level pin adapter plate | | • | | |

* 500 hours or yearly whichever comes first.

Rollers

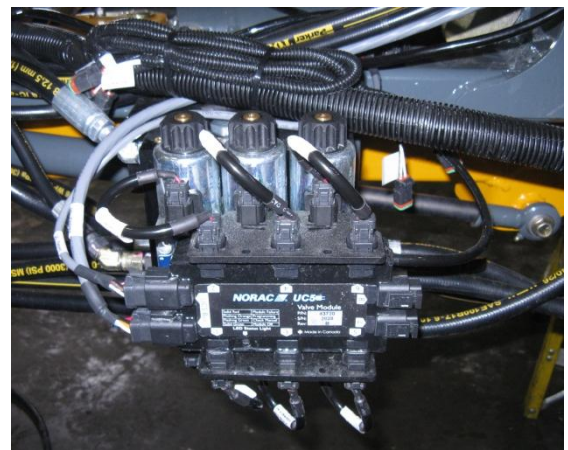
Each roller has a zerk in the middle of the bolt that needs to be greased daily. Failure to keep the rollers properly lubed may result in roller seizure.



MAIN TRANSOM HYDRAULIC MANIFOLD

The hydraulic manifold filter needs to be changed at the end of every season to maintain peak performance by the Norac system.

To access the filter, remove the connection from the “P” port. Take every precaution to ensure that there is no contamination of the hydraulic system.



Friction Plates

The friction plates, located in the bottom corners between the fixed transom and the rolling transom, need to be checked daily. Check the plates for uneven wear and other damage. The plates must be replaced immediately if they are damaged. Failure to replace the plates may cause the boom to catch during roll functions and cause serious damage to the system.



Norac Sensor Foam Pads

Inspect the foam insert of each sensor daily. Remove the foam from the sensor and blow it out with an air compressor and reinsert. Foam pads should be replaced as necessary. Replacement pads can be ordered through Hagie Customer Service Department.

DO NOT blow the foam pad out while it is still on the sensor. To avoid damage, always remove the foam pad before cleaning.



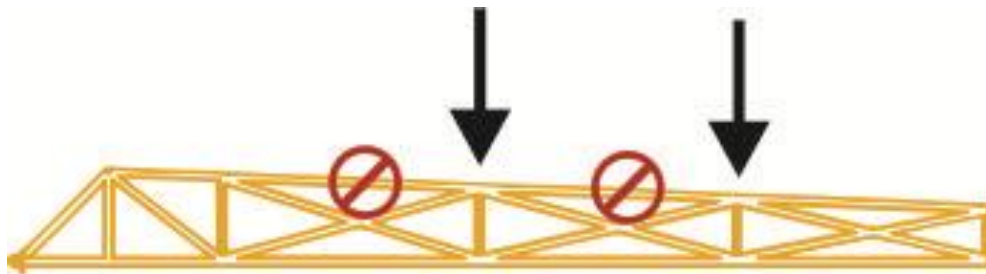
Level pin adapter plate

Grease the two zerks at the level pin adapter plate on each side of the boom weekly.



Replacement of boom sections

When using a hoist to assist in the replacement of boom sections refer to the diagram show proper placement of lifting straps. Failure to use designated location will damage the boom.



STORAGE

Preparing for Storage

1. Perform daily and weekly lubrication and maintenance inspections as required.
2. With the engine at normal operating temperature, cycle all the hydraulic functions.
3. Thoroughly rinse the spray system. To winterize the spray system, it is recommended that you use an environmentally safe type of antifreeze and water mixture that will give you adequate protection to -30° . Drain any remaining solution in the spray system and run the antifreeze mixture through the system until it comes out all boom openings. Repeat the above procedure with the foam marker and the rinse systems.
4. Refer to the Raven manual for detailed information on storage procedures for the monitor and flow meters.
5. Thoroughly wash/dry the boom and touch up any chipped or damaged paint. For touch up paint recommendations, contact Hagie Customer Service.
6. Replace any damaged or missing decals. Warning decals and all other Hagie decals are available through Hagie Customer Service.
7. Use multi-purpose grease to coat exposed hydraulic cylinder rods.
8. If the boom will be stored separately from the sprayer, be sure that all hole openings are capped or covered with a suitable covering.
9. Make sure there is enough clearance for the boom sections' stop blocks before attempting to move a machine indoors.

Removing from Storage

1. Remove any dried grease from cylinder rods and reapply if necessary.
2. Completely clean the booms.
3. Carefully unseal any openings that were sealed in the storage process.
4. Attach boom to sprayer and manually cycle the hydraulics 2 or 3 times to thoroughly lubricate components. Test the Norac system and all of its functions according to the Norac manual.

TROUBLE SHOOTING

| PROBLEM | POSSIBLE CAUSE | SUGGESTED REMEDY |
|--|--|--|
| 120' boom position sensor error message is on the MD3 screen | <ul style="list-style-type: none"> • Sensor or wire failure • Sensor mis-calibration | <ul style="list-style-type: none"> • Contact Hagie |
| One of the boom sections will not fold in. | <ul style="list-style-type: none"> • Trying to use manual switches but boom is in Auto-state. • There is a position sensor error and Auto-fold will not work- operator will need to use manual fold switches | <ul style="list-style-type: none"> • Check what boom state is and use proper switches. • Contact Hagie if problem persists or there is a position sensor error coming on the screen. |
| Boom will not re-charge | <ul style="list-style-type: none"> • Proximity/position sensor error • Software bug | <ul style="list-style-type: none"> • Check for error on display • Use manual state to fold each section out. If no change, call Hagie |
| Boom will not move even though one of the manual switches is being pressed | <ul style="list-style-type: none"> • Need to acknowledge power line warning | <ul style="list-style-type: none"> • Call Hagie if problem persists |
| Boom up/down functions will not work | <ul style="list-style-type: none"> • Norac not functioning properly or communication error | <ul style="list-style-type: none"> • Check Norac status or misc page should read A-80 or A-81 • Try to restart machine • If problem persists call Hagie |

TROUBLE SHOOTING NOTES

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