



M99902A.3

ITEM NUMBER: 99902

SERIAL NUMBER: _____

Owner's Manual

Instructions for Assembly and Operation

Broadcast Kit: For outdoor use with agricultural pesticides and other liquids**

WARNING

READ and UNDERSTAND the Owner's Manual completely before using this sprayer.

Assemble, test, and use only in accordance with the Owner's Manual instructions.

READ and FOLLOW chemical label instructions. Pesticides are hazardous chemicals.

KNOW emergency procedures BEFORE handling chemicals. Sprayer leaks, bodily chemical contact, poisoning, and spills require immediate response.

AVOID inhaling, ingesting, or coming into contact with any chemicals.

WEAR personal protective gear when filling, using, cleaning, and servicing the sprayer.

KEEP sprayer and spray materials away from children and pets. Pesticides are especially toxic to them.

EXERCISE CAUTION in vehicle handling when towing/hauling a filled sprayer to avoid loss of control or sprayer overturning.

DO NOT TURN ON POWER to sprayer until ready to spray in order to avoid unintentional spray release.

Improper use of the sprayer or handling of chemicals could result in serious injury or illness to the operator or nearby persons/animals, or could cause damage to the environment.

**This boom is recommended for use in spraying non-flammable liquids such as pesticides and water for dust control. The boom will be damaged and warranty voided if used to apply bleach, chlorine, ice control chemicals, or any petroleum based product (gasoline, diesel, kerosene, oil). The boom should not be used to transfer any product intended for human consumption. WE RECOMMEND THAT THE BOOM NOT BE USED FOR OTHER PURPOSES ONCE IT HAS BEEN USED FOR SPRAYING PESTICIDES. Any chemical will leave some residual in the boom components, even after the boom has been properly cleaned. These residual chemicals can have unexpected effects on future uses. For example, spraying water or other liquids that are contaminated with residual pesticide may result in unforeseen hazards to plant or animal life. This boom should not be used by people with reduced physical, sensory or mental capabilities or lack of experience and knowledge.

Any Questions, Comments, Problems, or Parts Orders

Call NorthStar Product Support 1-800-270-0810

Summary of Important Safety Information






	<p>This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.</p>
	<p>DANGER (red) indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</p>
	<p>WARNING (orange) indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p>CAUTION (yellow) indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p>CAUTION (yellow) used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.</p>

fig01453

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Summary of Important Safety Information

WARNING

Read and understand **this owner's manual** completely before using the sprayer. Read each **chemical label's instructions** before handling the chemical.

Improper use of the sprayer broadcast kit or handling of chemicals could result in serious injury or illness for the operator or nearby persons/animals, or cause damage to the environment.

LISTED BELOW is a summary of safety information of particular importance. See individual sections of this owner's manual for more details.

----- DURING ASSEMBLY -----

- **CHECK and TEST completed assembly** as directed in this manual. Serious injury could result from chemical leaks if sprayer is improperly assembled.
- **DO NOT MODIFY** sprayer design.

----- DURING OPERATION -----

General Chemical Safety

- **READ and FOLLOW** each chemical label's instructions and warnings.
- **AVOID** inhaling, ingesting, or coming into contact with any chemicals.
- **KNOW** applicable licensing and regulatory requirements for the chemical you plan to use.
- **KNOW** emergency procedures before handling chemicals. Carefully review "Chemical Accident Procedures" listed below and later in this manual. Also see First Aid instructions on the chemical label.
- **WEAR** protective clothing, eye protection, and chemical resistant gloves when filling, using and cleaning the sprayer. Wear additional protective gear, such as facemask or apron, as recommended on the chemical label.
- **EXERCISE EXTRA CAUTION** around children and pets. Pesticides are especially toxic to them. Keep sprayer and spray materials away from them at all times.
- **DO NOT MIX OR POUR** chemicals in an enclosed, unventilated area
- **DO NOT USE** flammable or corrosive chemicals in the sprayer.
- **FLUSH** the sprayer before switching chemicals in order to prevent dangerous chemical interactions.
- **STORE** pesticides in a correctly labeled container and in a secure location.
- **MONITOR** the health of operators frequently exposed to pesticides, as recommended by the chemical label or local/federal regulations.

Chemical Application Safety

Before Spraying

- **INSPECT and PREPARE** sprayer before each use as directed in this manual.
- **DO NOT TURN ON POWER** to sprayer until ready to spray in order to avoid unintentional spray release.
- **MAKE SURE BROADCAST NOZZLE IS ORIENTED** to spray straight down before starting the sprayer. An incorrectly positioned broadcast nozzle may spray chemicals on you or others.
- **DO NOT SPRAY** when wind speed exceeds 4 MPH in order to minimize spray drift.
- **CLEAR** work area of people/ pets and **POST** warning notices to restrict access for the period recommended on chemical label.
- **KEEP** sprayer and spray materials away from children/pets. Pesticides can be especially toxic to children and animals.
- **DO NOT ALLOW** anyone younger than 16 to operate sprayer since pesticides are especially toxic to children.

Summary of Important Safety Information

During Spraying

- **DO NOT OVERAPPLY pesticide.** Apply at rate recommended by chemical manufacturer. Excess pesticide can be dangerous to humans/animals, damage desirable plants, and contaminate soil and water sources.
- **DO NOT EAT, DRINK, SMOKE, RUB YOUR EYES, or TOUCH YOUR BARE SKIN while handling chemicals and spraying.**
- **NEVER POINT THE SPRAY GUN at people or animals.**
- **EXERCISE EXTRA CAUTION when spraying near areas accessible to children and pets.**
- **CLEAN up spills immediately** per instructions on the chemical label.
- **TURN OFF vehicle and set brake or block wheels, TURN OFF power to sprayer, and RELIEVE system pressure** before leaving sprayer unattended.
- **SEE Troubleshooting section in the sprayer manual before attempting any repairs.** Wear personal protective equipment and follow safety instructions.

After Spraying

- **CLEAN sprayer immediately after use** according to the directions provided in this manual.
- **DECONTAMINATE yourself after you are done spraying** and have cleaned the sprayer. Wash all exposed areas of the body with soap and water, and remove and launder clothing.
- **DISPOSE OF or STORE remaining chemicals in secure storage with correctly marked container.**

Chemical accident procedures

Immediate response is necessary in the event of sprayer leaks, bodily chemical contact, poisoning, or spills. See instructions below:

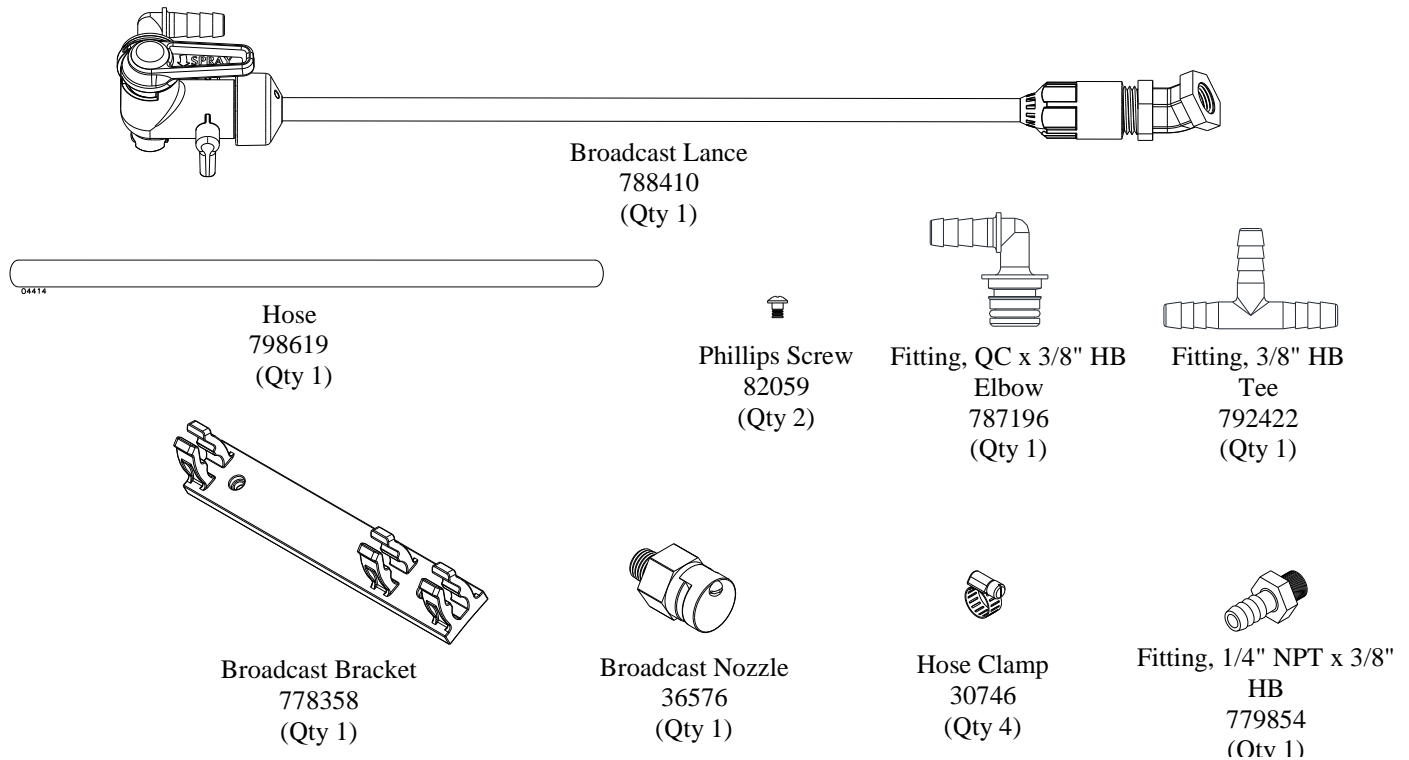
Sprayer leak	If the sprayer develops a leak, <i>immediately stop spraying</i>. Turn off power to the sprayer and follow directions below, as applicable.
Bodily chemical contact	Personal contamination can occur when chemicals splash, spill, or spray directly onto a person. 1. Immediately follow First Aid instructions on <u>chemical label</u> . <u>General procedures can include:</u> a) Eyes – immediately flush with water. b) Skin – wash all contaminated skin surfaces with soap and water. c) Clothing – remove contaminated clothing. Dispose of heavily contaminated clothing per chemical label instructions. 2. Seek medical advice if instructed on the label or the victim experiences symptoms of harmful effects. Bring the chemical label for reference.
Poisoning by ingestion or inhalation	In case of poisoning from ingestion or inhalation: <i>If the victim has collapsed or is not breathing, call 911.</i> Otherwise: 1. If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated. 2. Immediately follow first aid instructions on <u>chemical label</u> . 3. Call a poison control center for further advice. In the U.S., call 1-800-222-1222. Have the chemical label available for reference.
Chemical spills	Chemical spills must be quickly contained and properly cleaned up. Refer to the chemical label for any specific clean-up instructions. <u>General procedures include:</u> 1. Controlling the spill by stopping the source of the spill. 2. Containing the spill so that it does not spread and get into water sources. 3. Cleaning up the spill immediately. 4. Seeking additional advice from: - <u>Chemical manufacturer</u> . See chemical label for contact information. - <u>State pesticide regulatory agency</u> . In the U.S., call the National Pesticide Info. Ctr. at 800-858-7378 for assistance in contacting your state's agency.

Assembly

Step 1: Unpack and inspect parts

Note that some parts are shipped inside the tank.

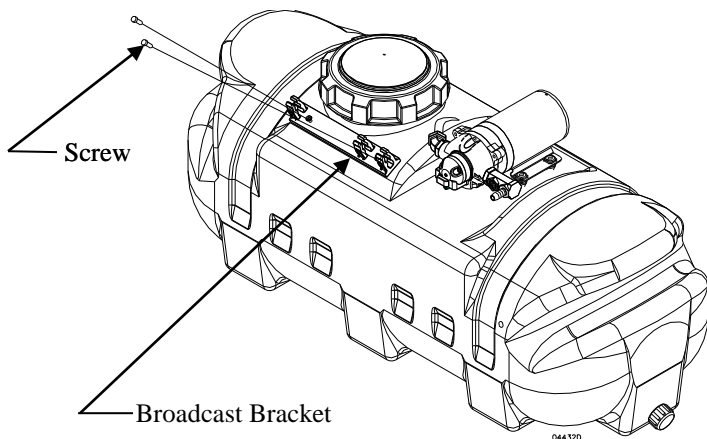
- If you have missing or damaged components: Contact NorthStar Product Support at 1-800-270-0810.



Step 2: Attach broadcast bracket to tank

Attach broadcast bracket to tank using (2) Phillips screws. (Note orientation of clips on bracket.)

Sprayer item# 2681022, 26810011, 2681201, 99916, 99917



Sprayer item# 99918, 99919, 99920, 99921, 99908, 99909

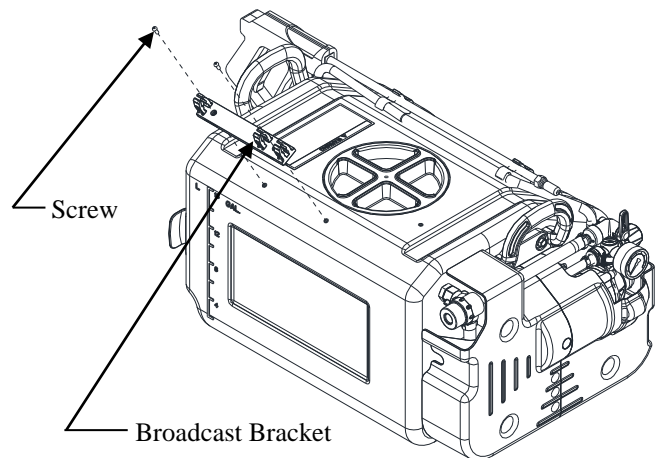


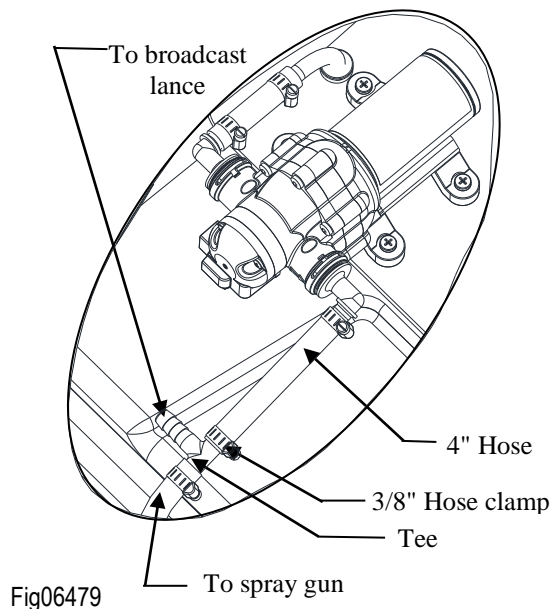
Fig06478

Assembly (continued)

Step 3: Prepare pump outlet

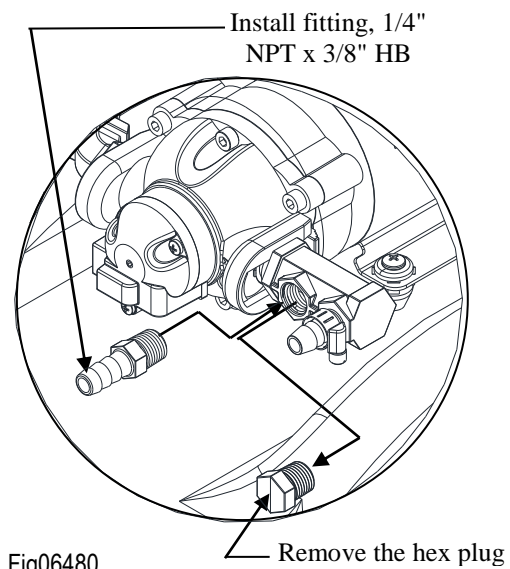
Sprayer Item# 2681022

Cut gun hose approximately 4" from pump outlet fitting & add tee.

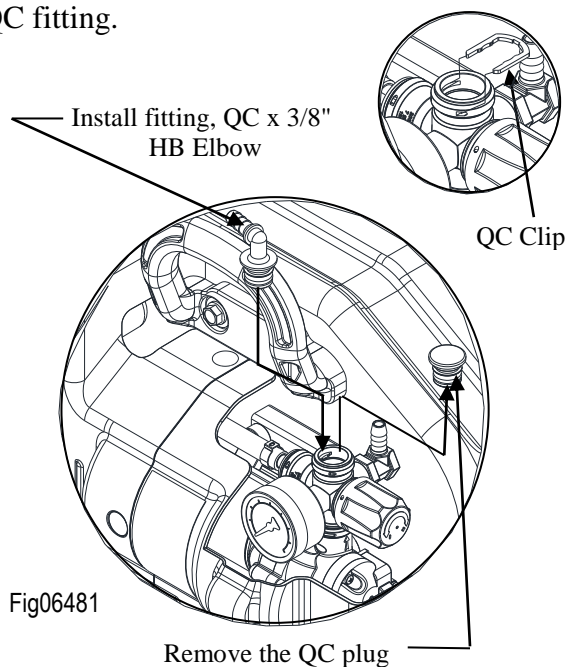


Sprayer Item# 26810011, 2681201, 99916, 99917

Remove hex plug from pump outlet and install fitting, 1/4" NPT x 3/8" HB.

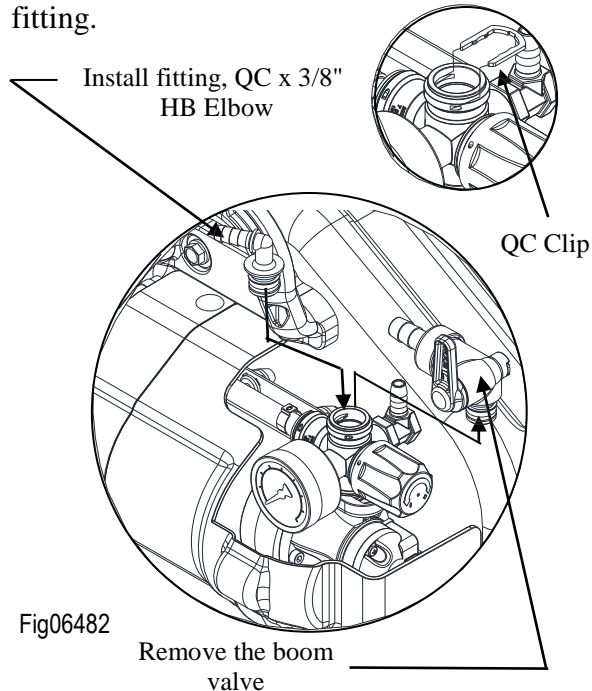


Sprayer Item# 99918, 99919, 99920, 99921
Remove QC plug from regulator and install QC fitting.



Note:- Remove QC clip first to remove QC plug in detail shown.

Sprayer Item# 99908, 99909
Remove QC boom valve and install QC fitting.



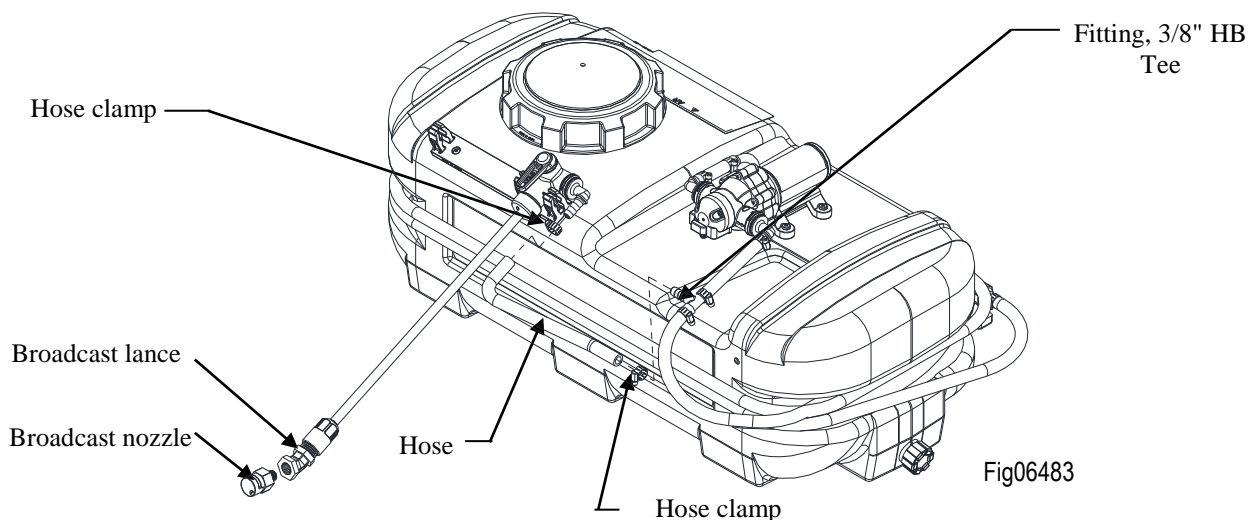
Note:- Remove QC clip first to remove boom valve in detail shown.

Assembly (continued)

Step 4: Install broadcast lance and make final connections

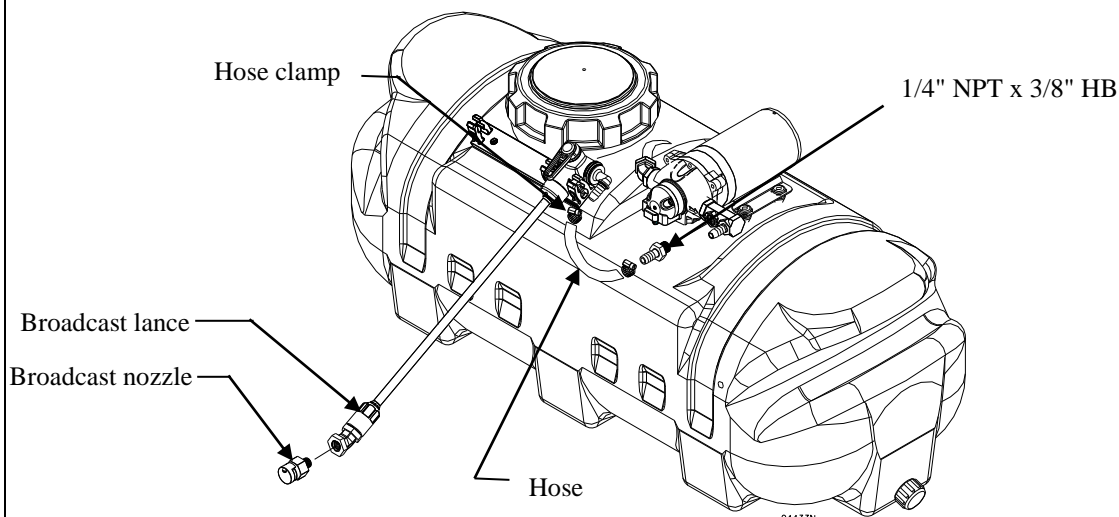
Sprayer Item# 2681022

1. Push broadcast lance into broadcast bracket. Note orientation.
2. Connect hose from open port on tee to broadcast lance using two hose clamps.
3. Thread broadcast nozzle hand tight onto the end of the lance, then orient with a 7/8" wrench so screw is at 12 o'clock position.



Sprayer Item# 26810011, 2681201, 99916, 99917

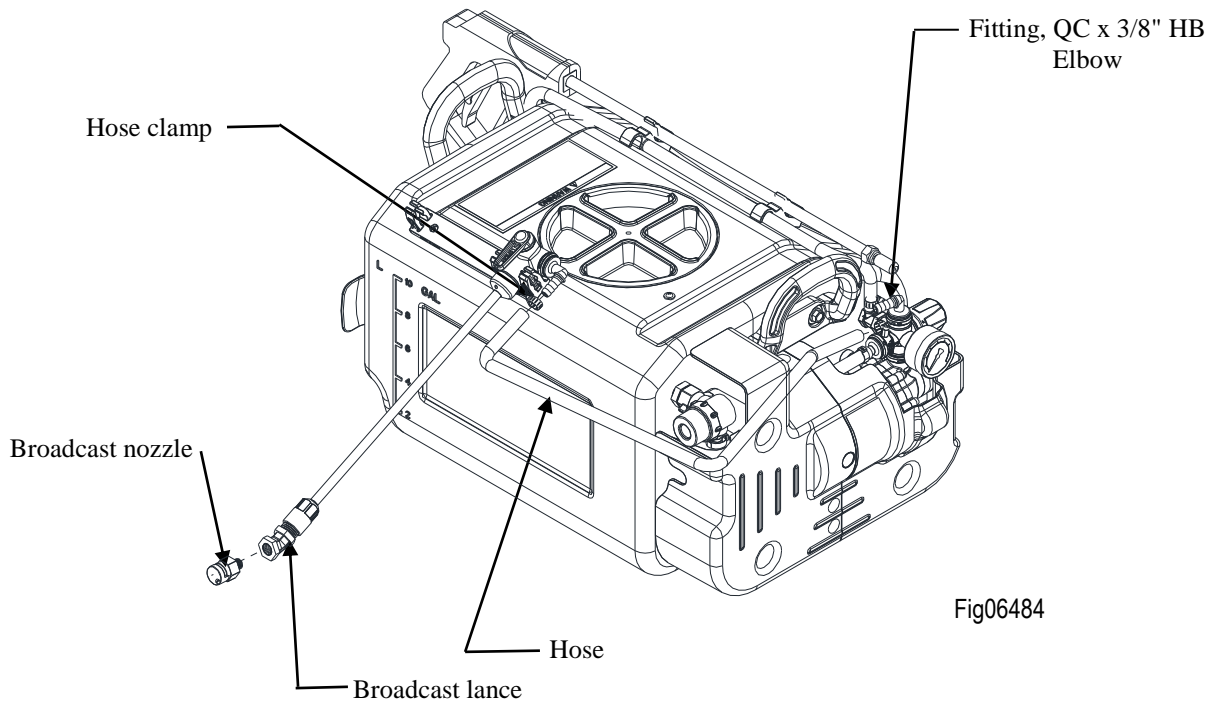
1. Push broadcast lance into broadcast bracket. Note orientation.
2. Connect hose from pump to broadcast lance using two hose clamps.
3. Thread broadcast nozzle hand tight onto the end of the lance, then orient with a 7/8" wrench so screw is at 12 o'clock position.



Assembly (continued)

Sprayer Item# 99918, 99919, 99920, 99921, 99908, 99909

1. Push broadcast lance into broadcast bracket. Note orientation.
2. Connect hose from Fitting, QC x 3/8" HB elbow to broadcast lance using two hose clamps.
3. Thread broadcast nozzle hand tight onto the end of the lance, then orient with a 7/8" wrench so screw is at 12 o'clock position.



Operation

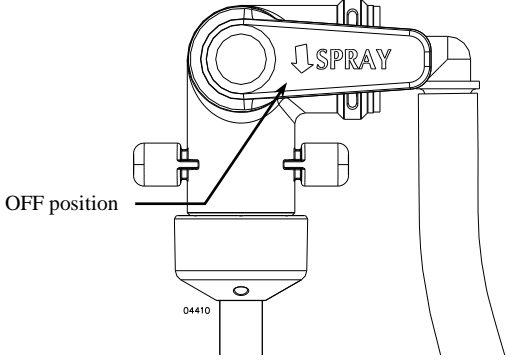
Step 1: Operate the broadcast kit

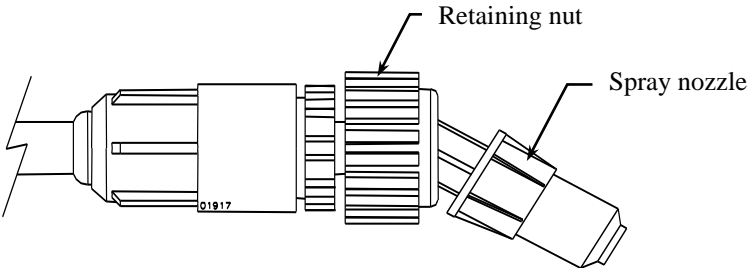
Note: See sprayer owner's manual for sprayer operating instructions

⚠ WARNING

ALWAYS wear personal protective equipment as directed on the chemical label when spraying.

Long pants and sleeves, chemical-resistant gloves, and eye protection are strongly recommended. Additional protective gear may be required depending on the particular pesticide.

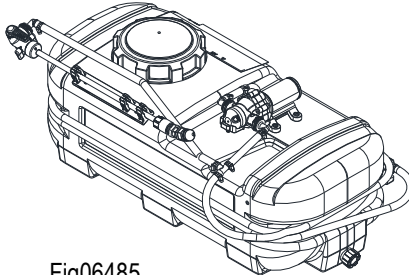
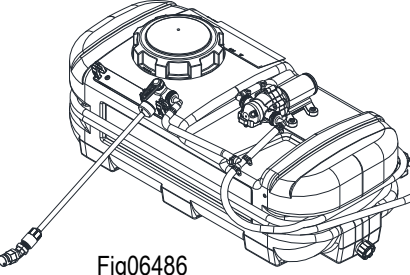
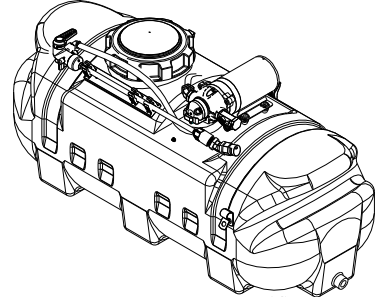
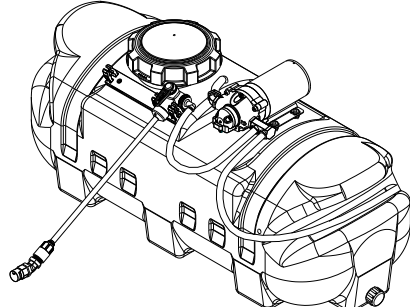
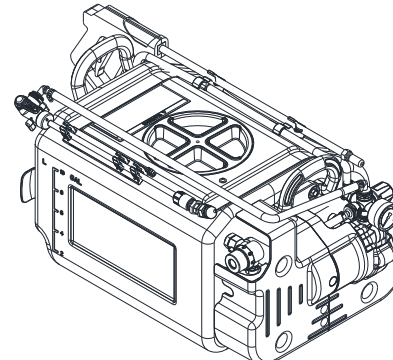
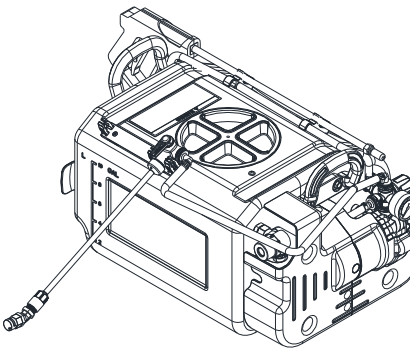
1. Review safety information	Review the “Operation – Important Safety Information” related to <u>Chemical Application Safety</u> and <u>ATV Vehicle Handling Safety</u> provided in this manual.
2. Wear personal protective equipment	Wear personal protective equipment as directed on the chemical label.
3. Close broadcast valve	Turn the broadcast nozzle to the off position. 
4. Turn on power	Turn on the power to the sprayer. <ol style="list-style-type: none"> 1. Verify the remote switch is connected to the pump power cord. 2. Turn the remote switch to the “ON” position. <p><i>Note: The pump will start automatically when power is turned on. The pump will cycle on and off as needed to retain pressure in the hose.</i></p>

<p>5. Begin agitation if needed</p>	<p>Some formulations of liquid pesticides do not remain in solution and should be agitated to maintain a uniform mix.</p> <p>Sprayer item#'s 99918, 99919, 99920, 99921, 99908 and 99909 are equipped with a pressure regulator/ agitator. Open the regulator bypass to circulate water back to in the tank to keep chemicals well-mixed. An optional pressure regulator/ agitator kit (#2681032) is available for sprayer item#'s 2681022, 26810011, 2681201, 99916 & 99917.</p> <p>Agitation should be used when spraying pesticides classified as “flowable” (“F” or “L”), “wetable powder” (“WP” or “W”), “emulsion” (“EC” or “E”), “microencapsulated” (“M”), or water dispersible granules (“WDG” or “DF”). (See pesticide label to determine its classification.)</p> <p>Contact NorthStar Product Support at 1-800-270-0810 for any questions about the appropriate use of the sprayer and/or optional accessories.</p>
<p>6. Squeeze trigger & adjust nozzle</p>	<p>To spray, squeeze the gun trigger.</p> <ul style="list-style-type: none"> - Twist the spray nozzle to adjust from a straight stream to hollow cone spray pattern, as recommended on the chemical label for proper delivery rate. <p><i>Note: It is not unusual for the operator to be exposed to chemical drips while adjusting the nozzle – wear chemical resistant gloves.</i></p>  <p>The diagram shows a side view of a spray gun assembly. On the left is the main body of the gun. In the center is a threaded section with a 'Retaining nut' indicated by an arrow. To the right of the nut is a 'Spray nozzle' also indicated by an arrow. The nozzle is shown at an angle, suggesting it can be rotated. A small number '01917' is visible on the main body of the gun.</p>

**7. Operate
broadcast
spraying system**

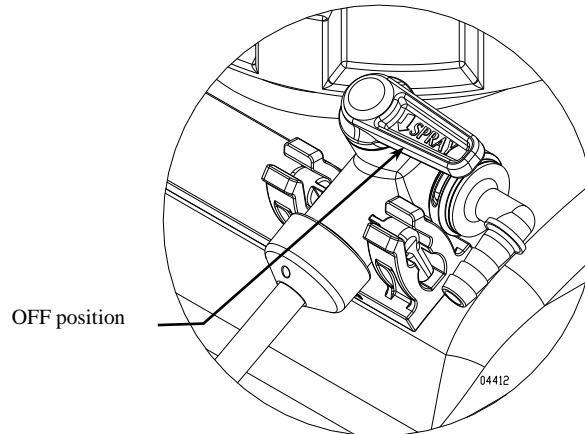
A. Move broadcast lance into the broadcast position

Ensure power to the pump is off, then lift the broadcast lance out of its stored position and click the lance into its broadcast position.

Stored position	Broadcast Position
Sprayer Item# 2681022	
 <p>Fig06485</p>	 <p>Fig06486</p>
Sprayer Item# 26810011, 2681201, 99916, 99917	
 <p>04430N</p>	 <p>FIG04430N</p>
Sprayer Item# 99918, 99919, 99920, 99921, 99908, 99909	
 <p>Fig06487</p>	 <p>Fig06488</p>

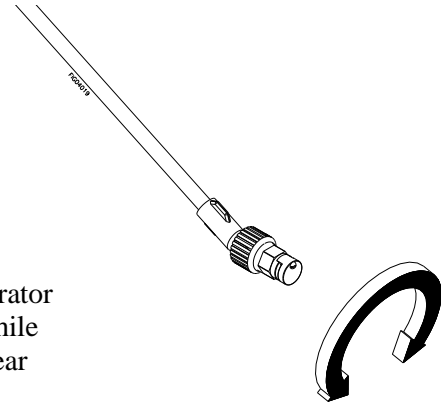
B. Locate broadcast lance valve

Ensure the valve is in the off position.



C. Ensure correct spray pattern

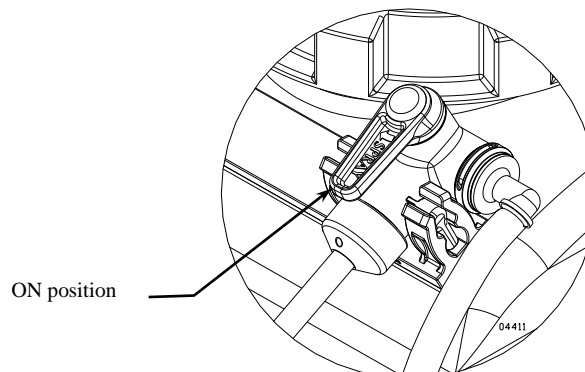
Rotate the broadcast nozzle, if needed, so that the spray pattern is pointed down and evenly distributed.



Note: It is not unusual for the operator to be exposed to chemical drips while adjusting the broadcast nozzle. Wear chemical resistant gloves.

D. Begin to spray

Turn the power ON, turn broadcast lance valve to the on position.

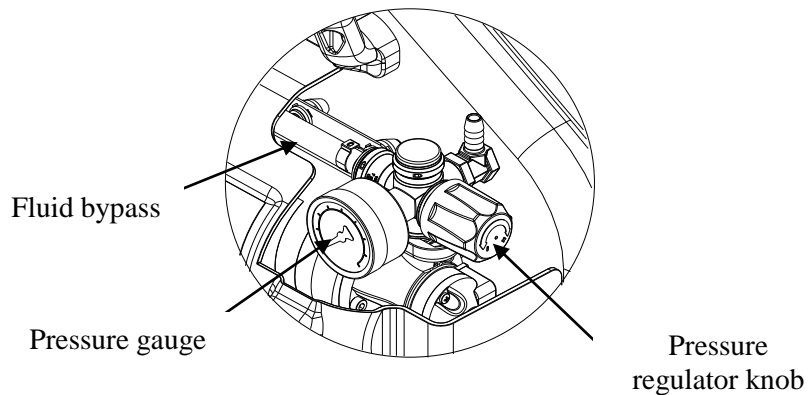


E. Adjust pressure regulator (if equipped)

Turn pressure regulator knob to adjust outlet pressure

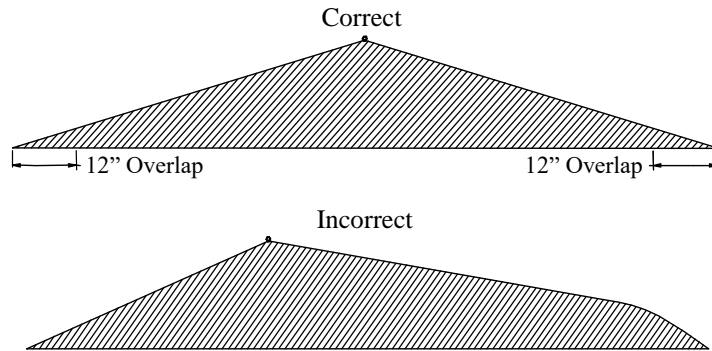
1. Turn knob clockwise to increase pressure.
2. Turn knob counter-clockwise to decrease pressure

Note: If the pressure regulator knob is completely tightened, the pressure setting will be higher than the pressure switch on the pump. This allows the pump to operate as a demand pump and turn on only when spraying.



F. Ensure uniform coverage

To ensure proper coverage, overlap the ends of the spray pattern 12". Use the tables in Appendix A to determine what speed to drive your vehicle for the desired application rate.



IMPORTANT: Make sure broadcast nozzle is oriented to spray straight down before you start. An incorrectly positioned broadcast nozzle may spray chemicals on you or others.

NOTE!!

Broadcast lance and spot spray gun can be used simultaneously. Use the spot spray gun if you desire to apply pesticide only on selected plants. Use the broadcast nozzle if you wish to spray large ground areas.

7. Leaving unattended	If the sprayer must be left unattended at any time: <ul style="list-style-type: none"> a) Disconnect power to the sprayer. b) Relieve system pressure by depressing the gun trigger. c) Turn off the vehicle. Set brake or block the wheels.
8. Discontinue use if clogged or inoperative	If the sprayer becomes clogged or inoperative during use, <i>discontinue use immediately.</i> <ul style="list-style-type: none"> - DO NOT attempt to service while chemicals are in the sprayer and power is connected. - Return to service area to review instructions for troubleshooting before attempting to service.

Note: A reserve, clean container capable of holding at least 10 gallons (Model # 99918, 2681022), 16 gallons (Model # 99908, 99916, 99919, 26810011) or 26 gallons (Model # 99909, 99917, 99920, 99921, 2681201) should be kept for use when the sprayer tank needs to be emptied temporarily for repairs. It is advisable to purchase a reserve tank suitable for pesticide storage from Northern Tool + Equipment for use in these circumstances. The container should be properly labeled as to its contents if it is used.

Step 2: Clean sprayer and decontaminate after use.

When done using the sprayer, it is important to clean the sprayer and decontaminate yourself. Do not store the sprayer with chemicals in the tank, as it is unsafe and could also result in damage to the equipment.

WARNING

Clean-up and decontamination procedures must be followed after each use.

Improper equipment clean-up and disposal of chemicals can result in dangerous chemical exposure to humans and the environment, as well as equipment damage.

Personal decontamination is required after spraying to minimize unsafe exposure to chemicals and potential illness.

1. Drain tank	If there is excess pesticide left in the tank, drain the tank: <ul style="list-style-type: none">a) Disconnect power to the sprayer and relieve system pressure by depressing the gun trigger.b) Find a suitable container in which to drain the unused pesticide. Place it under the tank drain hole.c) While wearing rubber gloves, eye protection, and all other required personal protective equipment, remove the drain cap and allow pesticide to drain into container.d) When tank stops draining, replace drain cap. Tighten securely.
2. Unused chemical	Properly store or dispose of unused chemical: <ul style="list-style-type: none">a) <u>If the unused pesticide is to be stored for future use:</u> Store all unused pesticide in its original, or a suitably marked, container in a secure location out of the reach of children & animals.b) <u>If remaining pesticide is to be disposed:</u> Properly dispose of the remaining chemical and its container per the chemical manufacturer's recommendation and according to local hazardous waste disposal regulations.
3. Flush sprayer	Flush the sprayer per the chemical manufacturer's recommendations. A general procedure is as follows: <ul style="list-style-type: none">a) Add fresh water to the tank.b) Reconnect power to the sprayer.c) Operate the spray gun and discharge all rinse water onto an area that can accept dilute pesticide application.d) Add 5 gallons of the chemical manufacturer's recommended cleaning solution. Operate the spray gun, collecting the discharged solution if recommended by the manufacturer.e) After flushing, disconnect power to the sprayer and be sure all system pressure is relieved by squeezing the gun trigger.f) Dispose of cleaning solution discharge as recommended by the manufacturer of the solution.
4. Decontaminate & launder	Decontaminate yourself after you are finished handling chemicals: <ul style="list-style-type: none">a) Remove all clothing worn during spraying and chemical handling.b) Wash all exposed parts of the body with soap and water.c) Launder clothing separately from other wash.

Appendix A – Broadcast Spray Calibration Tables

Below are some guidelines to help you calibrate your broadcast sprayer. This is a very important step in operating the broadcast sprayer such that too much or too little chemical may be applied.

1. Using **Table 1**, find a table that corresponds with the chemical manufacturer's suggested application rate (gallons per acre, gallons per 1000 sq. ft., or gallons per 100 sq. ft.).
2. Find the application rate that is closest to the chemical manufacturer's recommendations.
3. The speed to drive your tractor is listed below the application rates.

TABLE 1

Gallons per Acre (based on 36" spraying height and 14ft spray pattern)					
Application rate for 2.1 & 2.2 gpm pumps	49.5	25	16.5	12	10
Application rate for 1.0 & 1.1 gpm pumps	35	18	12	9	7
Speed To Drive	1 MPH	2 MPH	3 MPH	4 MPH	5 MPH

Gallons per 1000 Sq.Ft. (based on 36" spraying height and 14ft spray pattern)					
Application rate for 2.1 & 2.2 gpm pumps	1.14	.57	.38	.28	.23
Application rate for 1.0 & 1.1 gpm pumps	.83	.41	.27	.21	.16
Speed To Drive	1 MPH	2 MPH	3 MPH	4 MPH	5 MPH

Gallons per 100 Sq.Ft. (based on 36" spraying height and 14ft spray pattern)					
Application rate for 2.1 & 2.2 gpm pumps	.114	.057	.038	.028	.023
Application rate for 1.0 & 1.1 gpm pumps	.083	.041	.027	.021	.016
Speed To Drive	1 MPH	2 MPH	3 MPH	4 MPH	5 MPH

4. Use **Table 2** to choose the throttle setting on your tractor.

TABLE 2

Speed (MPH)	Time required in seconds to travel a distance of:		
	100 ft.	200 ft.	300 ft.
1	68	136	205
2	34	68	102
3	23	45	68
4	17	34	51
5	14	28	41
6	11	23	34
7	9.5	19	29

5. The coverage area can be found by dividing tank size by the application rate.

Example: 55 gallons divided by 12 gallons/acre = 4.58 acre of coverage per tank.

Finding the MPH to run your vehicle for desired performance.

$$MPH = \frac{\text{GALLONS PER MINUTE} \times 136}{\text{SPRAY WIDTH IN INCHES} \times \text{GAL. PER 1000 FT}^2}$$

$$MPH = \frac{\text{GALLONS PER MINUTE} \times 5940}{\text{SPRAY WIDTH IN INCHES} \times \text{GALLONS PER ACRE}}$$

Limited Warranty

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability.

Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product.

Limited Warranty

NorthStar shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of 1 year from the date of purchase by user. This warranty applies to the original purchaser of the equipment and is non transferable. Verification of purchase is the responsibility of the buyer. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar.

NOTE: Some services performed by parties other than NorthStar may void warranty.

This warranty covers parts only. It will not provide for replacement of complete products due to defective parts. Components not manufactured by NorthStar such as engines are guaranteed by their manufacturer and can be serviced at factory-authorized locations near you. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. NorthStar can supply you with the service center location in your area.

This warranty specifically excludes the following; failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use.

Warranty does not cover items subject to normal wear such as tires, receptacles or any part subject to direct physical contact by the public. This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part.

This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

Please fill in the following information and have it on hand when you call in a warranty claim.

Customer Number: _____

Date of Purchase: _____

NorthStar Serial Number: _____

Item Number: _____

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Manufactured by
Northern Tool & Equipment Company, Inc.
Burnsville, MN 55306
NorthernTool.com
Made in China