



# M2827271B

ITEM NUMBER: 2827271, 2827272

SERIAL NUMBER: \_\_\_\_\_

## Owner's Manual

Instructions for Assembly, Testing, Operation, Servicing, and Storage

**Tow Behind Sprayer:** 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 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.

**ALWAYS keep a fire extinguisher rated "ABC" nearby**

**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 sprayer is recommended for use in spraying non-flammable liquids such as pesticides, water for plants/trees or dust control, and water-based non-flammable sealants or stains for outdoor wood surfaces. The sprayer 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 sprayer should not be used to transfer any product intended for human consumption. WE RECOMMEND THAT THE SPRAYER NOT BE USED FOR OTHER PURPOSES ONCE IT HAS BEEN USED FOR SPRAYING PESTICIDES. Any chemical will leave some residual in the tank liner or sprayer components, even after the sprayer 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 sprayer 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***

## Hazard Signal Word Definitions






	<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>

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## Intended Use

The sprayer is intended for use in spraying agricultural pesticides and other non-flammable liquids.

### **SPRAYING PESTICIDES:**

Pesticides are hazardous chemicals that must be handled with caution as directed throughout this manual and on the pesticide label. Pesticides are regulated by the United States Environmental Protection Agency (EPA) and defined as:

*Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest. Though often misunderstood to refer only to insecticides, the term pesticide is a comprehensive term that applies to insecticides, herbicides, fungicides, and various other substances used to control pests.*

The sprayer is intended for use in spraying pesticides in liquid form only. The sprayer is NOT intended for use in spraying pesticides in dry or aerosolized form, or for use with fumigants.

Some formulations of liquid pesticides do not remain in solution and should be agitated to maintain a uniform mix. This sprayer is equipped with an **agitator** that should be used when spraying pesticides classified as “flowable” (“F” or “L”), “wetttable powder” (“WP” or “W”), “emulsion” (“EC” or “E”), “microencapsulated” (“M”), or water dispersible granules (“WDG” or “DF”). (See pesticide label to determine its classification.)

This sprayer comes equipped with a spot spray gun and broadcast nozzles. Use the **spot spray gun** if you desire to apply pesticide only on specific plants. Use the **broadcast nozzles** if you wish to spray large ground areas.

### **SPRAYING OTHER LIQUIDS:**

In addition to spraying pesticides, this sprayer may be used to spray other **non-lammable** liquids. Example uses include: watering plants/trees or spraying water for dust control, or applying water-based, non-flammable sealant or stain to outdoor wood surfaces. **WE RECOMMEND THAT THE SPRAYER NOT BE USED FOR OTHER PURPOSES ONCE IT HAS ALREADY BEEN USED FOR SPRAYING PESTICIDES.** Any chemical will leave some residual in the tank liner or sprayer components, even after the sprayer 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.

**NOTE:** The sprayer will be damaged and warranty voided if used to apply bleach, chlorine, ice control chemicals, or any petroleum based product (gasoline, diesel, kerosene, oil).

**Contact NorthStar Product Support at 1-800-270-0810 for any questions about the appropriate use of the sprayer and/or optional accessories.**

# 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 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.
- **FOLLOW INSTRUCTIONS for SAFELY FUELING the engine.** Gasoline is flammable and can explode. Always use caution when handling gasoline.
- **DO NOT TURN ON POWER** to sprayer until ready to spray in order to avoid unintentional spray release.
- **MAKE SURE BROADCAST NOZZLES ARE 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 (continued)

### 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.**
- **ALWAYS HOLD THE SPRAY GUN FIRMLY when using it to spray at higher pressures** in order to prevent gun from whipping. Keep good footing and balance at all times.
- **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 of this 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.**

### Towing Safety

- **READ towing safety instructions** in your towing vehicle manual.
- **DO NOT ALLOW drivers younger than 16** to operate the towing vehicle with the filled sprayer attached.
- **MAKE SURE SPRAYER IS SECURELY ATTACHED to vehicle.**
- **EXERCISE CAUTION in vehicle handling when towing filled sprayer** to avoid loss of control or sprayer overturning.
  - **Keep speed to a minimum** so you can maintain control. Reduce speed prior to turns.
  - **Allow for wider turns** and for **more distance to stop.**
  - **Avoid any sudden** steering maneuvers, starts, or stops that could create sway.
- **SLOW DOWN and EXERCISE EXTRA CAUTION on sloped or uneven terrain.** Pick the most level route possible. Drive up and down slopes when necessary, rather than across. Use a vehicle equipped with a roll over protection system (ROPS) if you will be working on non-level terrain.
- **BE AWARE of the added length of the sprayer and that visibility may be reduced** when making turns or backing up.
- **DO NOT RIDE or TRANSPORT cargo on the sprayer.**
- **COMPLY WITH all local, state, and federal towing requirements if you will be towing on public roads.**
- **TURN OFF both sprayer and vehicle, and SET BRAKES or BLOCK WHEELS** before leaving unattended.

# Summary of Important Safety Information (continued)

## Chemical accident procedures

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

<b>Sprayer leak</b>	<b>If the sprayer develops a leak, <i>immediately stop spraying</i>.</b> Turn off power to the sprayer and follow directions below, as applicable.
<b>Bodily chemical contact</b>	<p><b>Personal contamination can occur when chemicals splash, spill, or spray directly onto a person.</b></p> <ol style="list-style-type: none"> <li>1. Immediately follow First Aid instructions on <u>chemical label</u>.  <u>General procedures can include:</u> <ol style="list-style-type: none"> <li>a) Eyes – immediately flush with water.</li> <li>b) Skin – wash all contaminated skin surfaces with soap and water.</li> <li>c) Clothing – remove contaminated clothing. Dispose of heavily contaminated clothing per chemical label instructions.</li> </ol> </li> <li>2. Seek medical advice if instructed on the label or the victim experiences symptoms of harmful effects. Bring the chemical label for reference.</li> </ol>
<b>Poisoning by ingestion or inhalation</b>	<p><b>In case of poisoning from ingestion or inhalation:</b></p> <p><i>If the victim has collapsed or is not breathing, <b>call 911</b>.</i> Otherwise:</p> <ol style="list-style-type: none"> <li>1. If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated.</li> <li>2. Immediately follow first aid instructions on <u>chemical label</u>.</li> <li>3. Call a poison control center for further advice. <b>In the U.S., call 1-800-222-1222.</b> Have the chemical label available for reference.</li> </ol>
<b>Chemical spills</b>	<p><b>Chemical spills must be quickly contained and properly cleaned up.</b></p> <p>Refer to the chemical label for any specific clean-up instructions.</p> <p><u>General procedures include:</u></p> <ol style="list-style-type: none"> <li>1. <b>Controlling</b> the spill by stopping the source of the spill.</li> <li>2. <b>Containing</b> the spill so that it does not spread and get into water sources.</li> <li>3. <b>Cleaning up</b> the spill immediately.</li> <li>4. <b>Seeking additional advice</b> from: <ul style="list-style-type: none"> <li>- <u>Chemical manufacturer</u>. See chemical label for contact information.</li> <li>- <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.</li> </ul> </li> </ol>

## ----- DURING STORAGE / TROUBLESHOOTING -----

- **PREPARE THE SPRAYER FOR STORAGE** according to the instructions in this manual.
- **SELECT a well-ventilated STORAGE AREA** away from sources of heat, flame, or sparks. Gasoline vapors can ignite and cause a fire.
- **READ and FOLLOW the safety rules for troubleshooting / servicing** the sprayer to avoid accidental exposure to chemical and risk of electric shock.

# Warning Label Location

## ⚠ 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 which must be handled carefully.

**KNOW emergency procedures BEFORE handling chemicals.** Sprayer leaks, bodily chemical contact, poisoning, and spills are all situations which require immediate response.

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

**EXERCISE CAUTION in vehicle handling.** Vehicle will be less stable and handle very differently with filled sprayer attached.

**DO NOT TURN ON power to sprayer until ready to spray** in order to avoid inadvertent 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.*

Replace this label if damaged or destroyed. Call 1-800-270-0810 to order replacement label.

©2005 K-Bar Industries 800-270-0810

Part No. 777499

**⚠ WARNING!**

DO NOT run engine past 3/4 throttle (2600 RPM). Running engine faster than 3/4 throttle can cause pump damage. See owner's manual.

**⚠ WARNING**

**BURN HAZARD**  
Do not touch hot muffler. ➡

PN 305546

**⚠ WARNING**

**POISONOUS GAS**

This product's use gives off carbon monoxide, an odorless gas that can kill you.

- ONLY use outdoors and away from air intakes.
- NEVER use inside homes, garages or sheds. EVEN IF you run a fan or open doors and windows.

See product manual for more details.

PN 39259

Part #	Description
ST08	Engine Warning
777499	Warning Decal
305546	Hot Muffler Decal
39259	CO Warning

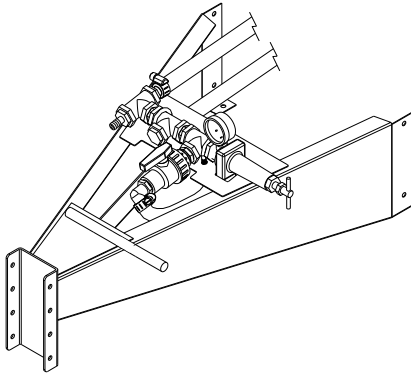


# Unpacking

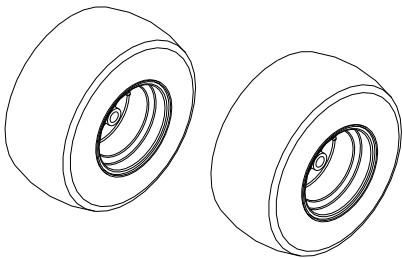
## **Closely inspect all contents in the shipping carton.**

Note that some parts are shipped inside the tank.

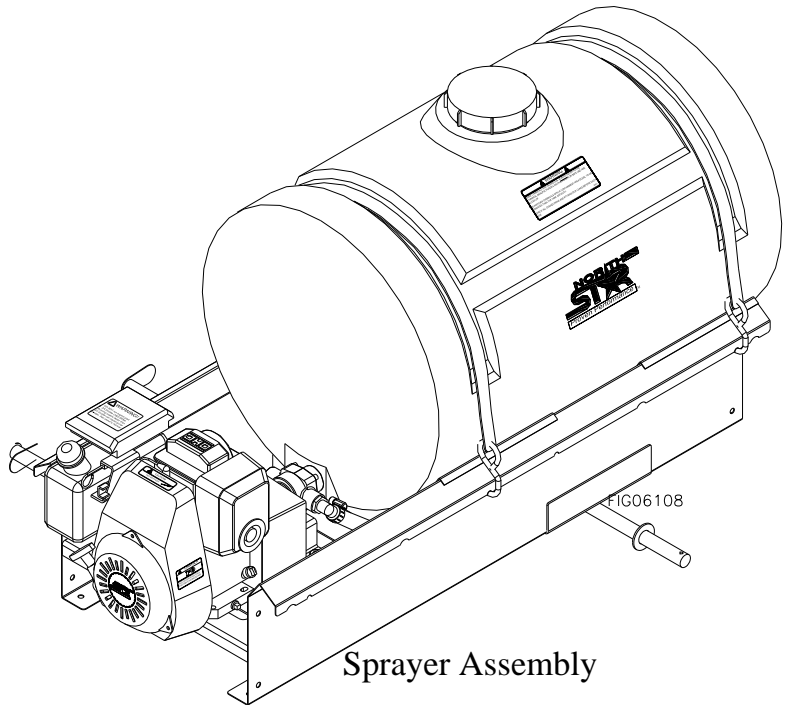
- If you have missing or damaged components, please contact NorthStar Product Support at 1-800-270-0810.



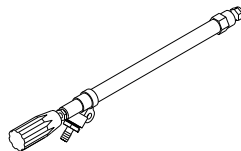
Tongue Assembly



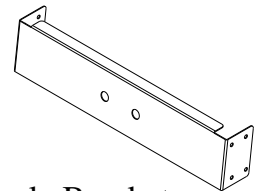
Tires



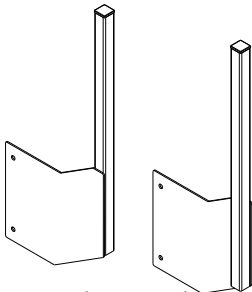
Sprayer Assembly



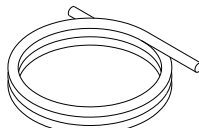
Spray Gun



Nozzle Bracket



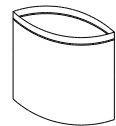
Nozzle Bracket  
Mounts



Gun hose



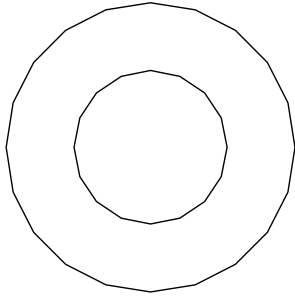
Hitch



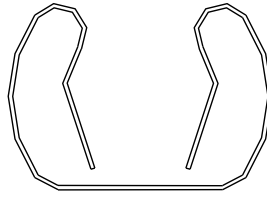
Manual Bag

## Unpacking the Manual Bag

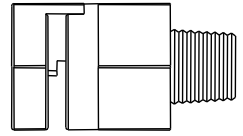
The following items are shipped in the manual bag.



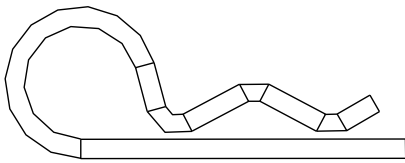
Axle Washer (2)



Gun Clip (2)



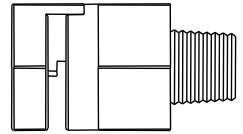
Right Broadcast  
Nozzle-1400PSR



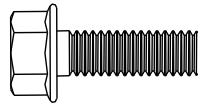
Axle Pin (2)



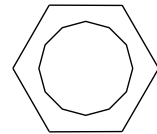
Gun Clip Screw (2)



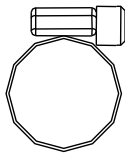
Left Broadcast  
Nozzle - 1400PSL



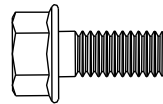
5/16 x 1" Bolt (4)



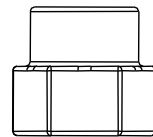
Nozzle Nut (2)



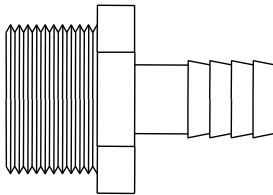
Hose Clamp (2)



5/16 x 3/4" Bolt (10)



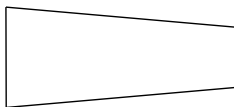
Nozzle Adapter (2)



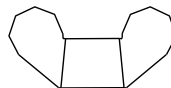
Gun Fitting



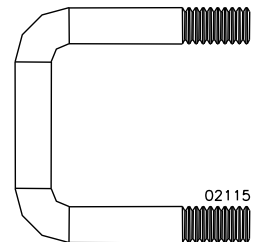
5/16 Nut (14)



Agitator Tip (4)



Wing Nut (8)

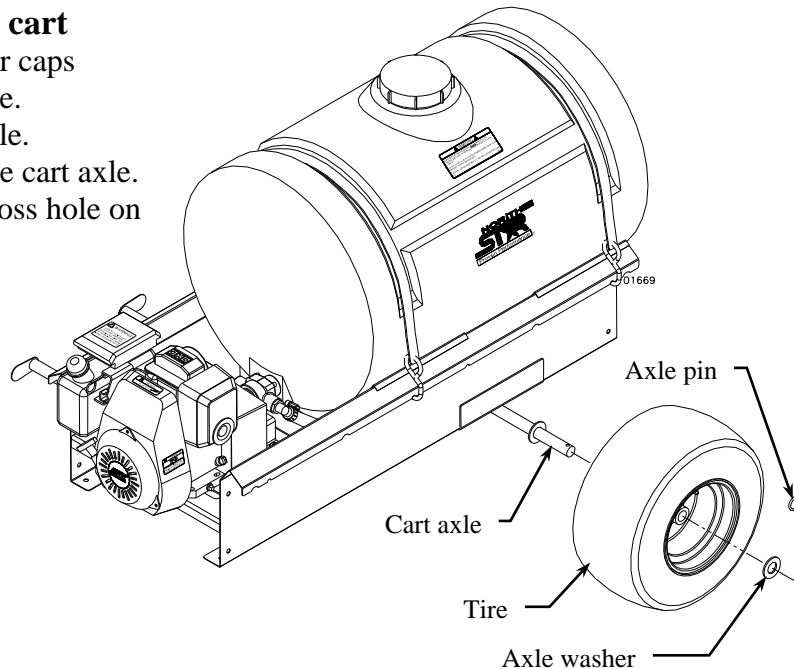


U-Bolt (4)

# Assembly

## **Step One: Attach wheels to cart**

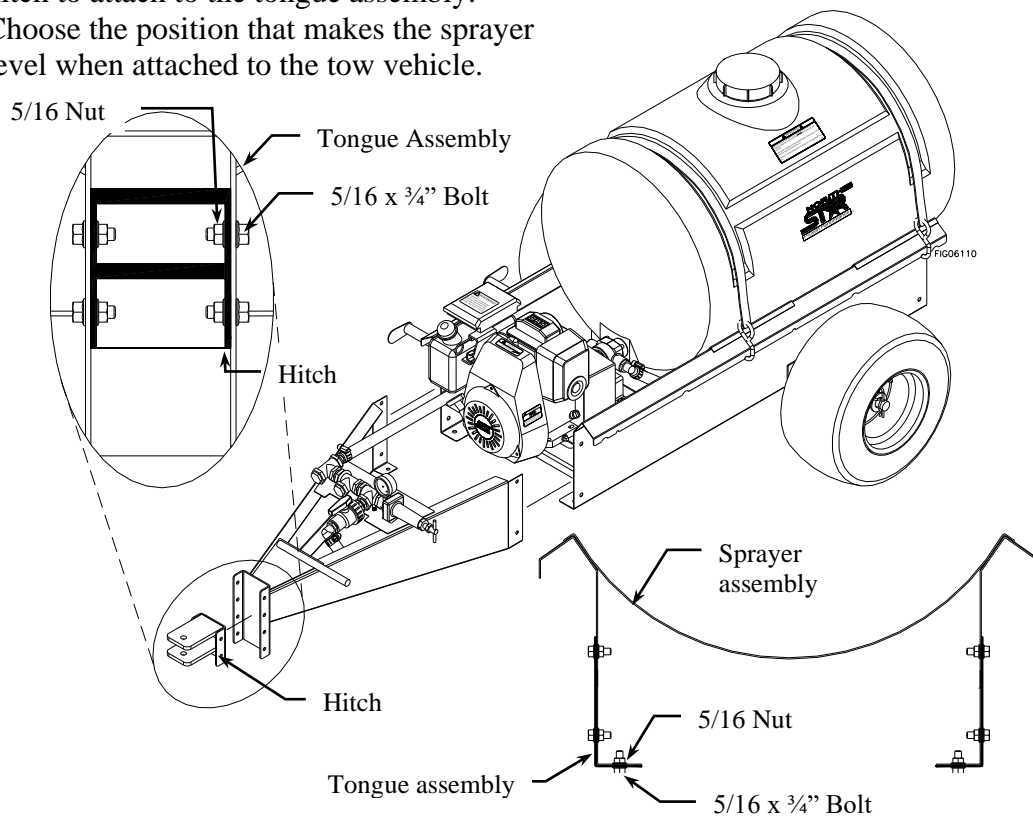
1. Remove the protective rubber caps from the ends of the cart axle.
2. Slide the tire onto the cart axle.
3. Slide the axle washer onto the cart axle.
4. Insert the axle pin into the cross hole on the cart axle.



## **Step Two: Attach tongue assembly to sprayer assembly**

1. Maneuver the tongue assembly into the position shown. Be careful not to pull the hoses.
2. Attach the tongue assembly to the sprayer assembly with (6) 5/16 x 3/4" bolts and nuts.
3. Attach the hitch to the tongue assembly with (4) 5/16 x 3/4" bolts and nuts.

Note: There are several positions for the hitch to attach to the tongue assembly. Choose the position that makes the sprayer level when attached to the tow vehicle.



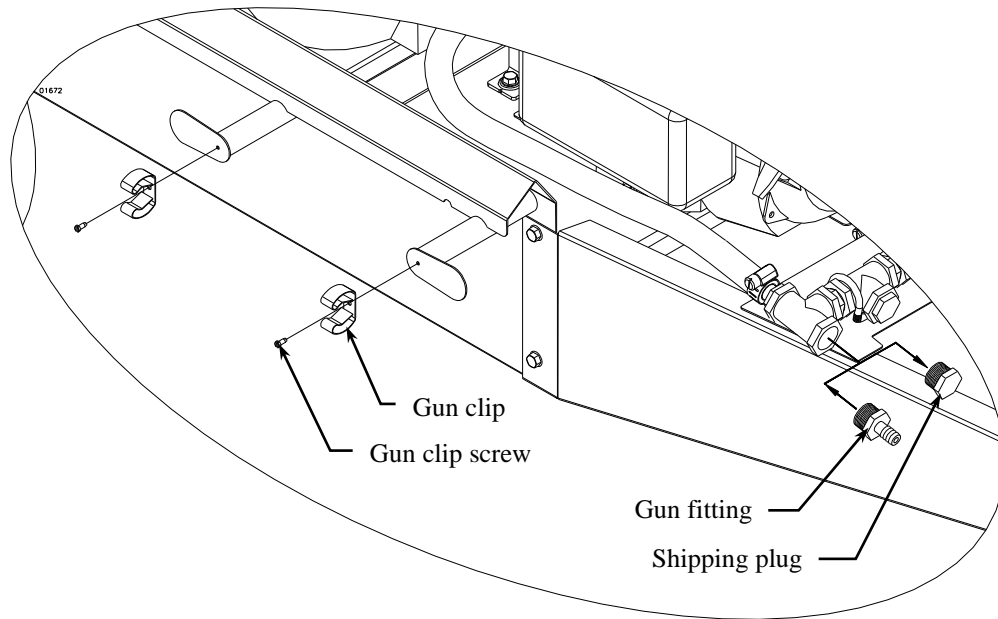
## Assembly (continued)

### **Step Three: Attach gun clips**

Attach the gun clips to the sprayer assembly with the gun clip screws.

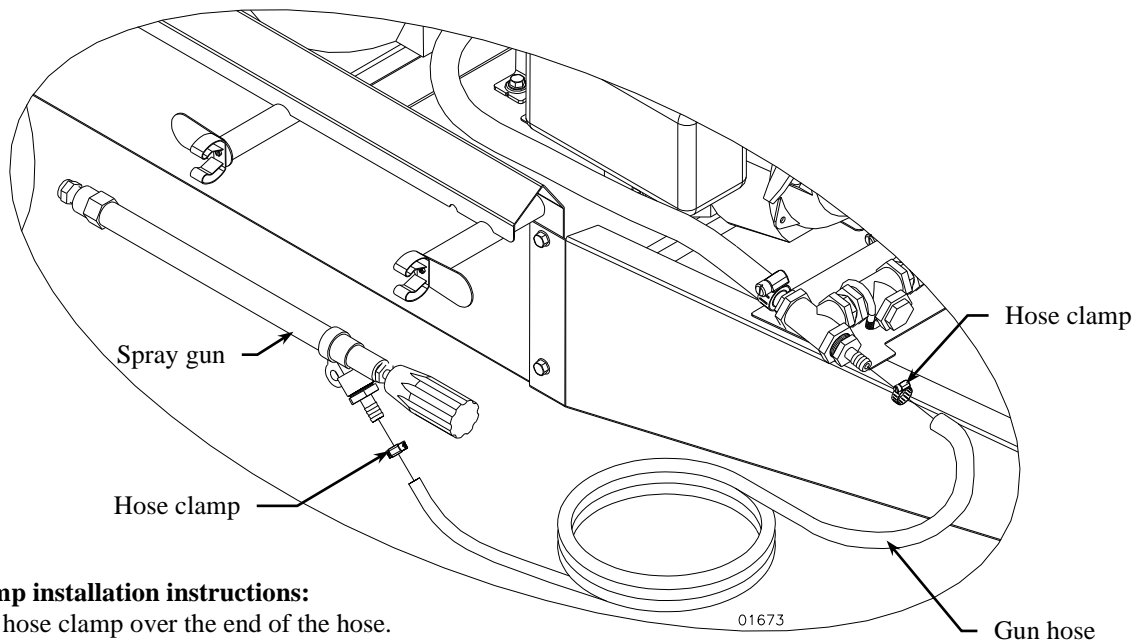
### **Step Four: Install gun fitting**

Remove the shipping plug and replace with gun fitting. Hand tighten, then 2 turns with wrench.



### **Step Five: Attach the spray gun to the gun hose**

1. Attach the gun hose to the gun fitting with a hose clamp. (Follow hose clamp instructions below.)
2. Attach the gun hose to the spray gun with a hose clamp. (Follow hose clamp instructions below.)
3. Wrap the gun hose around the hose wrap.



#### **Hose clamp installation instructions:**

1. Slide hose clamp over the end of the hose.
2. Push the hose onto the hose barb.
3. Slide the hose clamp over the hose barb.
4. Tighten the hose clamp.

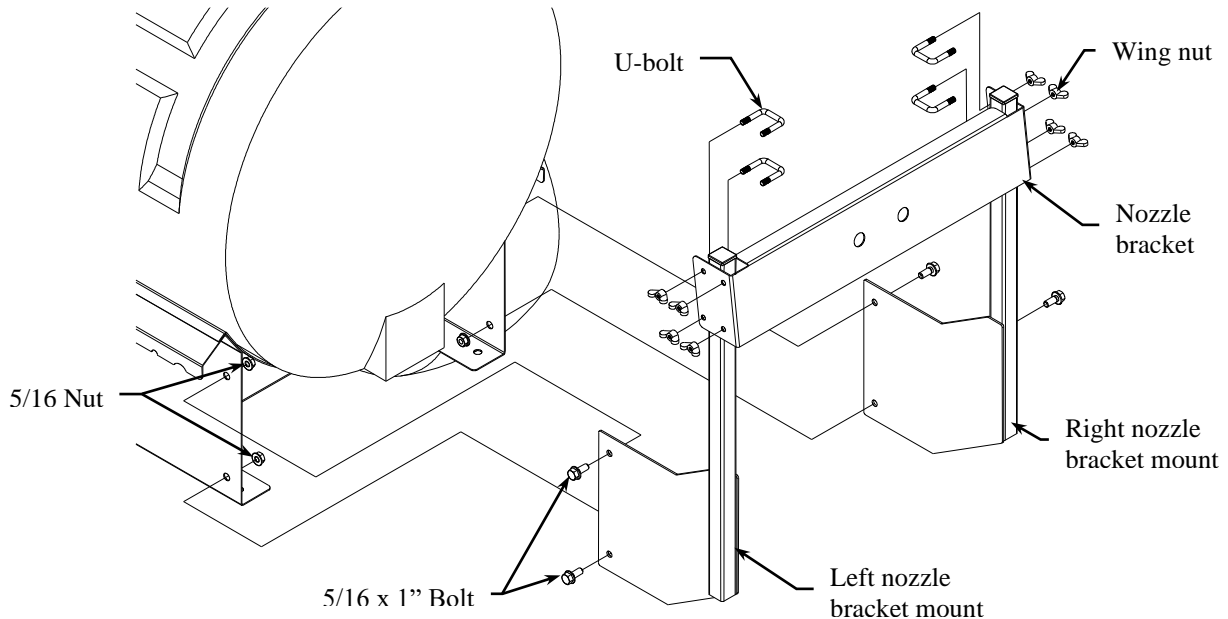
## Assembly (continued)

### **Step Six: Install nozzle bracket mounts to sprayer assembly**

Use (4) 5/16 x 1" bolts and (4) 5/16 nuts to attach nozzle bracket mounts. Tighten to 20 ft-lbs.

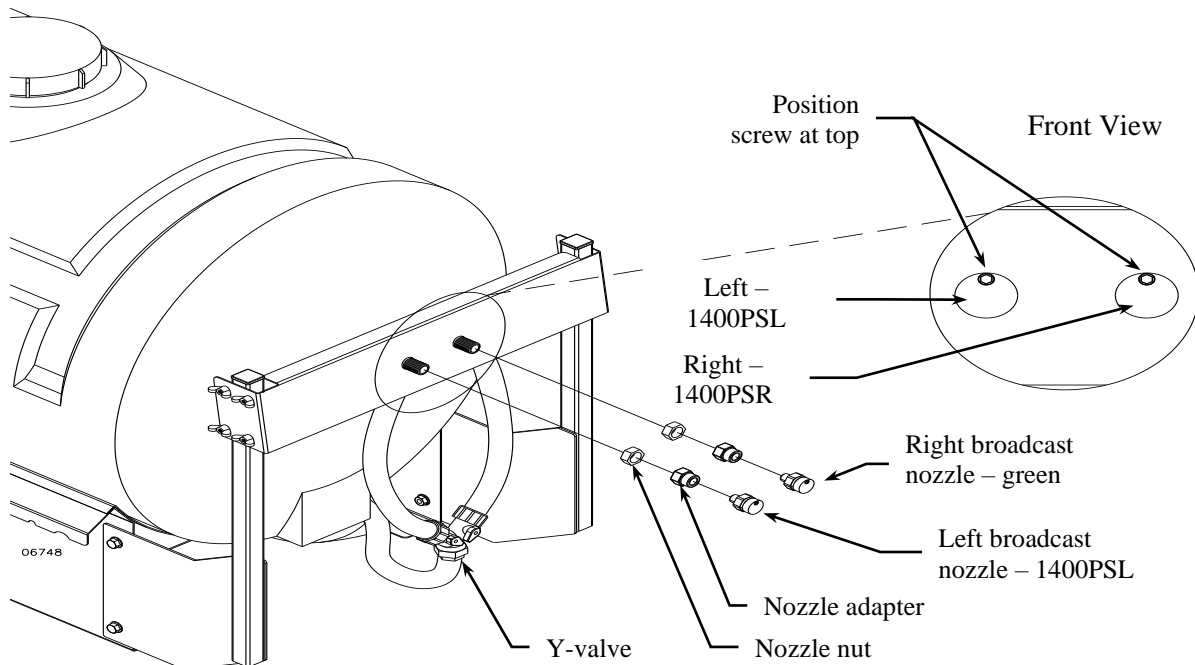
### **Step Seven: Attach nozzle bracket to nozzle bracket mounts**

Use (8) U-bolts and (8) wing nuts to attach nozzle bracket.



### **Step Eight: Install broadcast nozzles**

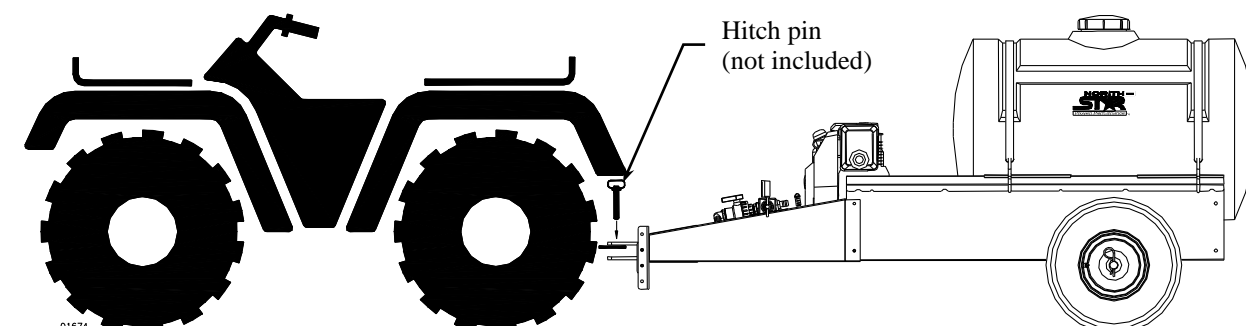
1. Insert fittings from Y-valve through holes in nozzle bracket. Use (2) nozzle nuts to secure.
2. Thread on (2) nozzle adapters.
3. Thread in the right and left broadcast nozzles. Orient as shown.



## Assembly (continued)

### **Step Nine: Attach sprayer to vehicle**

Secure the sprayer to the tow vehicle with a hitch pin (not included, call 800-270-0810 and order Item# 2501946).



### **Step Ten: Check and test completed assembly.**

#### **! WARNING**

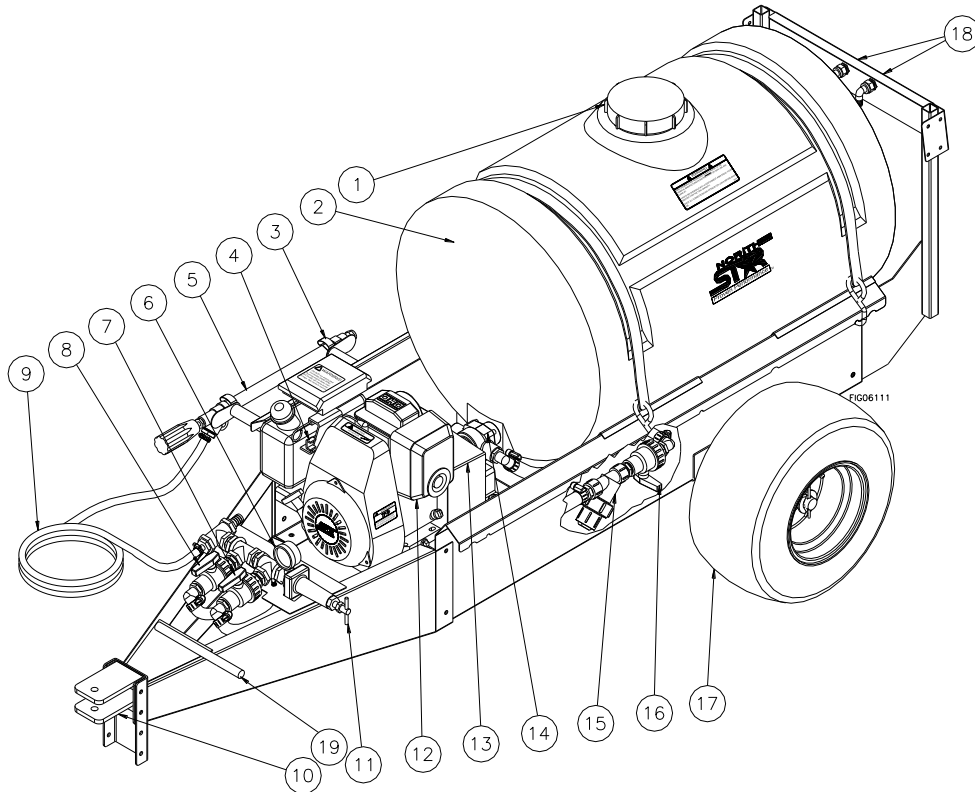
##### **Check and test completed assembly**

Serious injury could result from chemical leaks if sprayer is improperly assembled or the design of the sprayer is modified.

Follow the steps below to ensure the sprayer is properly assembled. Never modify the sprayer design.

<b>1. Check assembly</b>	<p><b>Check assembly to assure the sprayer is properly assembled and in safe working condition:</b></p> <ul style="list-style-type: none"> <li>a) Check that the gun clip screws are tight, hose clamps are secure, and tank straps are properly fastened.</li> <li>b) While it is unlikely that factory assembled components become loose, they should also be checked to make sure they are tight.</li> </ul>
<b>2. Test with water</b>	<p><b>Test the system for leaks with water:</b></p> <ul style="list-style-type: none"> <li>a) First read the instructions in this Owner's Manual for Operation of the sprayer.</li> <li>b) Fill the tank with water per the instructions in this manual. <b><u>Important:</u></b> The sprayer should NOT be running when you fill the tank.</li> <li>c) Check for leaks throughout the system by operating the sprayer per the instructions in this manual: <ul style="list-style-type: none"> <li>i) Turn the sprayer ON. (See Operation Instructions)</li> <li>ii) Operate the spray gun. (See Operation Instructions)</li> <li>iii) Adjust the pressure through its full range – to maximum and back. (See Operation Instructions)</li> </ul> </li> <li>d) If a leak is detected, fix the leak and re-test the system with water.</li> </ul>

# Machine Components



- 1.) **Fill Cap.** The fill cap is vented to allow air to enter the tank as the chemical is used, but doesn't allow chemical to escape the tank.
- 2.) **Sprayer Tank.** The sprayer tank holds the chemical.
- 3.) **Gun Clips.** Use the gun clips to store the spray gun.
- 4.) **On/Off Control.** Use the on/off control to start or stop engine.
- 5.) **Spray Gun.** Use the spray gun to apply chemical to specific areas. The spray pattern is adjustable from cone to stream by twisting the handle (see Operation Instructions).
- 6.) **Pressure Gauge.** The gauge is an indicator of the system pressure.
- 7.) **Agitation Valve.** When open, the agitation valve will send flow from the pump to the agitator inside the tank.
- 8.) **Broadcast Valve.** When open, flow will be directed to the broadcast nozzles for broadcast spraying.
- 9.) **Gun Hose.** The gun hose transfers the chemical from the sprayer to the spray gun.
- 10.) **Hitch.** The hitch connects the vehicle hitch to the sprayer.
- 11.) **Pressure Regulator.** Turn the pressure regulator until the sprayer is running at the desired pressure. Do not exceed 150 PSI.
- 12.) **Engine.** The air-cooled engine powers the pump.
- 13.) **Guard.** The guard protects the operator from the moving parts of the system.
- 14.) **Pump.** The pump makes the chemical flow to the spray gun.
- 15.) **Strainer.** The strainer prevents debris from entering the pump.
- 16.) **Suction Line Ball Valve.** The suction line ball valve allows the operator to shut off the fluid from the tank to clean the strainer.
- 17.) **Tires.** The tires have a wide tread to prevent turf damage.
- 18.) **Broadcast Nozzles.** The two broadcast nozzles deliver a broadcast spray width of 32 feet.
- 19.) **Lifting Handle.** The handle provides a convenient location to lift the sprayer.

## Operation – Important Safety Information

Now that you have completed and tested your assembly, there is some important safety and health information you need to know with regard to handling and spraying chemicals, as well as vehicle handling with the sprayer attached.

### WARNING

Carefully read and make sure you understand the following safety information before using the sprayer.

### General Chemical Safety:

### WARNING

Pesticides are hazardous chemicals.  
Heed the warnings below and follow all instructions carefully.  
Improper handling of chemicals can result in serious injury or illness, or cause damage to the environment.

- **Chemical label.** ALWAYS READ and FOLLOW all chemical label instructions.
- **Licensing/regulation.** Refer to any applicable licensing restrictions or state/federal regulations with regard to the application of the particular chemical you plan to use.
- **Emergency procedures.** Before handling chemicals, carefully review the “Chemical Accident Procedures” listed later in this section, as well as the “Statement of Practical Treatment” on the chemical label.
- **Inhalation/contact.** ALWAYS take precautions to avoid inhaling or coming into contact with the chemical.
- **Personal protective equipment.** ALWAYS 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.
- **Children/pets.** Pesticides can be especially toxic to children and animals. ALWAYS exercise extra caution around children. Keep sprayer and all spray materials away from children and animals.
- **Ventilation.** ALWAYS ensure there is adequate ventilation when mixing, pouring, or spraying.
- **Flammables.** NEVER use any flammable chemicals in the sprayer.
- **Corrosives.** DO NOT use corrosive chemicals in the sprayer. They can weaken the sprayer and its parts, resulting in leaks. Check with the chemical manufacturer to ensure chemical is compatible with all components of the sprayer.
- **Chemical interaction.** ALWAYS flush the sprayer before switching chemicals. Different chemicals may interact dangerously with each other.
- **Chemical storage.** ALWAYS store pesticides in a properly labeled container and in a secure location per the manufacturer’s recommendations.
- **Health monitoring.** Monitor the health of operators who are frequently exposed to pesticides, as recommended by the chemical label or local/federal regulations.



## Operation – Important Safety Information (continued)

### Chemical Application Safety:

#### **WARNING**

Caution must be used when spraying chemicals to avoid unsafe exposure to humans and the environment.

Heed the warnings below and follow all instructions carefully.

#### Before Spraying

- **Sprayer prep.** ALWAYS inspect and prepare the sprayer before use according to the directions provided in this manual.
- **Fueling.** Follow instructions in this manual for safely fueling the engine. Gasoline is flammable and can explode. Always use caution when handling gasoline.
- **Keep sprayer off.** Do not turn on power to the sprayer until ready to spray in order to avoid unintentional spray release.
- **Broadcast nozzles down.** Make sure broadcast nozzles are oriented to spray straight down before starting the sprayer. An incorrectly positioned broadcast nozzle may spray chemicals on you or others.
- **Wind speed.** NEVER spray when wind speed exceeds 4 MPH in order to minimize spray drift.
- **Clear area/post.** ALWAYS keep the work area clear of people and pets. POST warning notices to restrict access by the public for the period recommended on chemical label.
- **Operator age.** You must be 16 years of age or older to operate this sprayer. Pesticides are especially toxic to children.

#### During Spraying

- **Over application.** DO NOT over apply pesticide. Apply at a rate recommended by chemical manufacturer. Excess pesticide can be dangerous to humans, damage desirable plants, and contaminate soil and water sources.
- **Never point gun.** NEVER point the spray gun at people or animals.
- **Use firm grip.** ALWAYS hold the spray gun with a firm grip when using it to spray at higher pressures in order to prevent gun from whipping. Keep good footing and balance at all times.
- **Children/pets.** ALWAYS exercise extra caution when spraying near areas accessible to children and pets.
- **Eating/smoking.** DO NOT eat, drink, smoke, rub your eyes, or touch any part of your bare skin while handling chemicals and spraying.
- **Heat/flames.** DO NOT spray near open flames or sources of heat.
- **Spills.** ALWAYS clean up spills immediately per instructions on the chemical label.
- **Unattended.** ALWAYS turn off vehicle and set brake or block wheels, turn off power to sprayer, and relieve system pressure before leaving sprayer unattended.
- **Troubleshooting.** ALWAYS refer to the safety instructions in the Troubleshooting Section before attempting any repairs.

#### After Spraying

- **Clean sprayer.** ALWAYS clean the sprayer immediately after use according to the directions provided in this manual.
- **Decontaminate.** ALWAYS decontaminate yourself immediately after you are finished spraying and handling chemicals. Wash all exposed areas of the body with soap and water and remove and launder clothing.
- **Chemical disposal/storage.** ALWAYS dispose of or store remaining chemicals properly as recommended on the chemical label.

## Operation – Important Safety Information (continued)

### Towing Safety:

#### **WARNING**

The filled sprayer is very heavy. It can crush and cause serious injury if it rolls out of control or tips over.

Follow the instructions below for safely towing the sprayer.

- **Read vehicle instructions.** Review towing safety instructions in your towing vehicle manual.
- **Driver age.** You must be 16 years of age or older to operate the towing vehicle with the filled sprayer attached.
- **Securely attached.** Be sure sprayer is securely attached to the towing vehicle before towing.
- **Tires.** Make sure sprayer tires are fully inflated and in good repair before towing. Do not over inflate. Serious injury could occur if tire explodes. Keep wheel and lug nuts tightened to specified torque.
- **Vehicle handling.** Be aware that vehicle handling will be affected when towing the filled sprayer. Exercise caution to avoid loss of control or sprayer overturning:
  - **Keep speed to a minimum** so you can maintain control at all times. Reduce speed prior to turns.
  - **Allow for wider turns** and for **more distance to stop**.
  - **Avoid any sudden** steering maneuvers, starts, or stops that could create sway.
- **Rough or sloped terrain.** Slow down and exercise extra caution on rough or sloped terrain in order to reduce risk of rollover. Pick the most level route possible when transporting across fields. Drive up and down slopes that cannot be avoided, rather than across. Use a vehicle equipped with a Roll Over Protection System (ROPS) if you will be operating on non-level terrain.
- **Added length.** Be aware of the added length of the sprayer.
- **Reduced visibility.** Be aware that visibility may be reduced with sprayer attached. Be extra cautious when backing up or turning.
- **Ride / transport.** Never ride or transport cargo on the sprayer.
- **Under the influence.** Never tow or operate this sprayer while under the influence of alcohol, drugs, or medication
- **On public roads.** If towing on a public road, make sure to comply with all local, state, and federal towing requirements. It is the sole responsibility of the purchaser to obtain licensing, trailer lights, safety chains or signage as needed to comply.
- **Unattended.** Turn off both the sprayer and the towing vehicle, and set the brake or block the wheels, before leaving the sprayer unattended.

### Chemical accident procedures:

#### **WARNING**

Before you fill the sprayer, review the following information with regard to handling accidents.

Chemical spills, sprayer leaks, personal contamination, and poisoning are accident situations which you may encounter. **All require an immediate response – See instructions below.**

#### **Sprayer leak**

**In the event that the sprayer develops a leak while spraying chemicals, you must *immediately stop spraying*.**

Turn off power to the sprayer and follow the directions below, as applicable.

## Operation – Important Safety Information (continued)

<b>Bodily chemical contact</b>	<p><b>Personal contamination can occur when chemicals splash, spill, or spray directly onto a person.</b></p> <ol style="list-style-type: none"> <li>Follow the emergency first aid instructions on the chemical label listed in the “First Aid” or “Statements of Practical Treatment” section.</li> </ol> <p><u>General procedures include:</u></p> <ol style="list-style-type: none"> <li>Eyes – immediately flush with water or follow other directions as specified on the chemical label.</li> <li>Skin – immediately wash all contaminated skin surfaces with soap and water, or follow directions as specified on the chemical label.</li> <li>Clothing – remove contaminated clothing immediately. Dispose of heavily contaminated clothing per the instructions on the chemical label for safe chemical/container disposal.</li> </ol> <ol style="list-style-type: none"> <li>Seek medical advice if instructed on the label, or if the victim experiences symptoms of harmful effects such as burning, swelling, nausea, chest pain, difficulty breathing, dizziness or confusion. When seeking medical advice, be sure to bring the chemical product label.</li> </ol>
<b>Poisoning by ingestion or inhalation</b>	<p><b>In case of poisoning from ingestion or inhalation:</b></p> <p>IF THE VICTIM HAS COLLAPSED OR IS NOT BREATHING, <b><u>CALL 911</u></b>.</p> <p>Otherwise:</p> <ol style="list-style-type: none"> <li>If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated.</li> <li>Follow the emergency first aid instructions on the chemical label in the “First Aid” or “Statement of Practical Treatment” section.</li> <li>Call a poison control center for further advice. <b>In the U.S., call 1-800-222-1222 to be automatically linked to the nearest certified poison control center.</b> Have the chemical label available for reference.</li> </ol>
<b>Chemical spills</b>	<p><b>Chemical spills must be quickly contained and properly cleaned up.</b></p> <p>Refer to the chemical label for any specific clean-up instructions with regard to the chemical spilled.</p> <p><u>General procedures include:</u></p> <ol style="list-style-type: none"> <li><b>Control</b> the spill by stopping the source of the spill. If the source of the spill is a container leak, place the leaking container in a larger, watertight container. Keep unprotected people away from the spill site.</li> <li><b>Contain</b> the spill so that it does not spread and get into water sources. Use a shovel or other tool to make a dike around the spill with soil, sod, or absorbent material.</li> <li><b>Clean up</b> the spill immediately -- Absorbent materials like ground corncobs or pet litter should be spread on the spill area to soak up the pesticide. The contaminated material should then be shoveled into a leak proof container. Do not flush the spill area with water until you receive advice as directed below.</li> <li><b>Seek additional advice</b> from the chemical manufacturer and your state’s pesticide regulatory agency regarding decontamination of the spill site: <ul style="list-style-type: none"> <li>- <i>Chemical manufacturer.</i> The chemical label provides contact information for the chemical manufacturer.</li> <li>- <i>State pesticide regulatory agency.</i> In the U.S., call the National Pesticide Information Center at 1-800-858-7378 for assistance in determining how to contact your state’s pesticide regulatory agency.</li> </ul> </li> </ol>

# Operation – Preparing the Sprayer for Each Use

## Step One. Inspect/Repair

If the sprayer has been used previously, it must be prepared BEFORE EACH SUBSEQUENT USE.

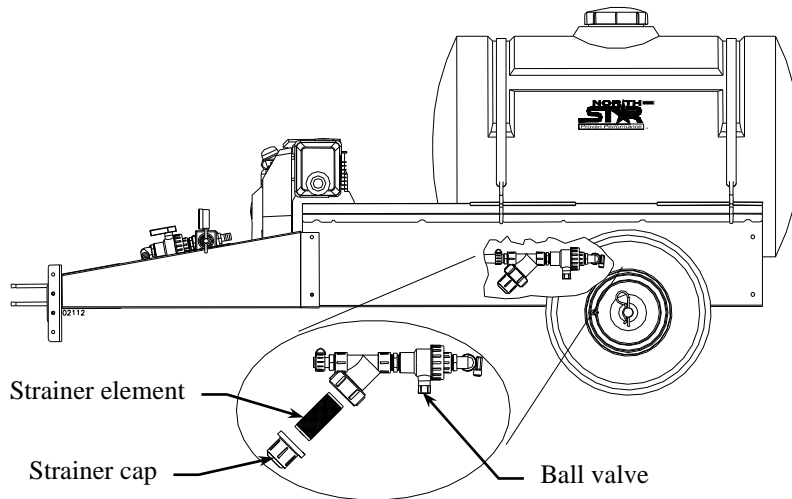
### WARNING

Read instructions below carefully for inspecting and preparing the sprayer.  
Damaged or clogged equipment could result in leaks or uncontrolled spray.  
Leaks could result in injury to the operator or bystanders from chemical exposure, or cause damage to the environment.

#### Important safety rules:

- **Power off.** Make sure all power is OFF before cleaning, inspecting, or servicing the sprayer.
- **Guards / shields.** Make sure all guards and shields are replaced after servicing the sprayer.
- **Replacement parts.** If a part needs replacement, only use parts that meet the manufacturer's specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the sprayer.

1. Ensure sprayer attached	Ensure the sprayer is securely attached to the vehicle.
2. Ensure tank empty	Ensure the sprayer has been thoroughly flushed and drained of all residual chemical from prior uses.
3. Clean suction strainer	<p><b>Clean the suction strainer of any chemical residue.</b></p> <p>It is important to clean the suction strainer before each use to ensure it is not clogged and to prevent residual chemical from contaminating sprayer contents.</p> <p><i>Note: It is not unusual for the operator to be exposed to chemical residue while cleaning the strainer – wear chemical resistant gloves.</i></p> <ol style="list-style-type: none"> <li>Close the suction line ball valve</li> <li>USING CHEMICAL RESISTANT GLOVES unscrew the strainer cap and remove the strainer element.</li> <li>Run the strainer element under fresh water to remove debris.</li> <li>Replace the strainer element and reinstall the strainer cap.</li> </ol>




## Operation – Important Safety Information (continued)

<b>4. Inspect &amp; repair</b>	<p><b>Inspect and test the sprayer thoroughly:</b></p> <ul style="list-style-type: none"> <li>a) Inspect hoses for exposed mesh and holes. Replace all worn or damaged hoses.</li> <li>b) Inspect fittings for cracks and leaks. Replace all damaged fittings with original NorthStar parts.</li> <li>c) Inspect tank for cracks.</li> <li>d) Check to be sure all nuts, bolts, and screws are tight.</li> <li>e) Check wheels and tires. Make sure that wheel lugs are tight and tires are inflated.</li> <li>f) Check for fuel leaks. Any fuel leak is a fire hazard. Fix any fuel leaks before starting engine.</li> <li>g) <i>Partially fill tank with plain water and spray to test for leaks.</i> Repair as needed.</li> </ul> <p><b>IMPORTANT:</b> <i>After any repair work has been done, ALWAYS test for leaks with water one final time before using.</i></p>
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### Step Two. Fueling

#### **⚠ WARNING**

Gasoline is highly flammable and explosive. You can be burned or seriously injured when handling fuel. Use extreme care when handling gasoline.

<b>1. Engine off / cool</b>	<p><b>The engine must be off and allowed to cool at least two minutes before adding fuel.</b></p> <p><b>WARNING:</b> A running engine is hot enough to ignite fuel. Never add fuel or remove gas cap if engine is running or still hot.</p>
<b>2. Outdoor location</b>	<p><b>Fill fuel tank outdoors – never indoors.</b></p> <p><b>WARNING:</b> Gasoline vapors can ignite if they collect inside an enclosure. Explosion can result.</p>
<b>3. Remove gas cap</b>	<p><b>Remove engine gas cap.</b></p>
<b>4. Add gasoline</b>	<p><b>Add gasoline through fill opening from a UL-approved container.</b></p> <p><b>Important Safety Instructions:</b></p> <ul style="list-style-type: none"> <li>• <b>Use approved container.</b> NEVER pump fuel directly into engine at gas station. Static charge can build and ignite fuel. Use a UL approved fuel container to transfer gas to the engine.</li> <li>• <b>Don't overfill.</b> DO NOT overfill the gas tank. Allow at least 1/2" of empty space below the fill neck to allow for fuel expansion</li> <li>• <b>Heat / flames / sparks.</b> Stay away from sources of heat, flame, or sparks while adding fuel.</li> </ul> <div style="border: 2px solid black; padding: 5px; margin-top: 10px;"> <p style="text-align: center; font-weight: bold; font-size: 1.2em;">WARNING</p> <p style="font-size: 0.8em;">FEDERAL LAW prohibits the use of E15 in small engines. Per the EPA, E15 should <b>ONLY</b> be used in 2001 and newer passenger vehicles.</p> <div style="text-align: center;">  </div> <p style="text-align: right; font-size: 0.6em;">790134</p> </div>
<b>5. Spills / splashes</b>	<p><b>Clean up fuel spills /splashes immediately.</b></p> <ul style="list-style-type: none"> <li>1. Move sprayer away from spilled fuel on the ground.</li> <li>2. Wipe fuel off engine and wait 5 minutes for excess fuel to evaporate before starting engine.</li> <li>3. Gas soaked rags are flammable and should be disposed of properly.</li> <li>4. If gasoline is spilled on your skin or clothes, change clothes and wash skin immediately.</li> </ul>
<b>6. Replace gas cap</b>	<p><b>Replace gas cap securely before starting engine.</b></p>
<b>7. Gasoline storage</b>	<p><b>Store gasoline in a cool, dry place in a UL approved, tightly sealed container.</b></p>

# Operation – Using the Sprayer

## **Step One: Assess wind conditions and clear work area.**

Before you decide to spray, you must determine whether wind conditions are suitable. You must also restrict access to the work area to ensure the safety of bystanders.

### **WARNING**

Do not spray if wind speeds are greater than 4 MPH or if there are bystanders in the intended spray area.

<b>1. Assess wind speed</b>	<p><b>Assess weather conditions to ensure that it is not too windy to spray.</b></p> <p><b>DO NOT SPRAY if wind speeds are greater than 4 MPH.</b></p> <p><i>Visible indication of wind speed:</i> If leaves are in constant motion or there is any branch movement, DO NOT spray because the wind is too strong.</p>
<b>2. Clear work area</b>	<p><b>Clear the work area of all bystanders and pets.</b></p> <p>Restrict access by the public for the period recommended on chemical label.</p>

## **Step Two: Fill the sprayer.**

### **WARNING**

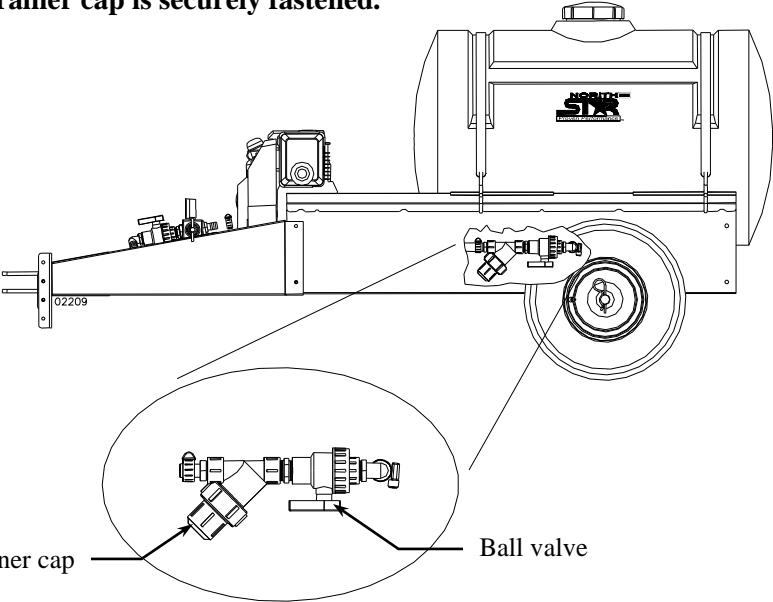
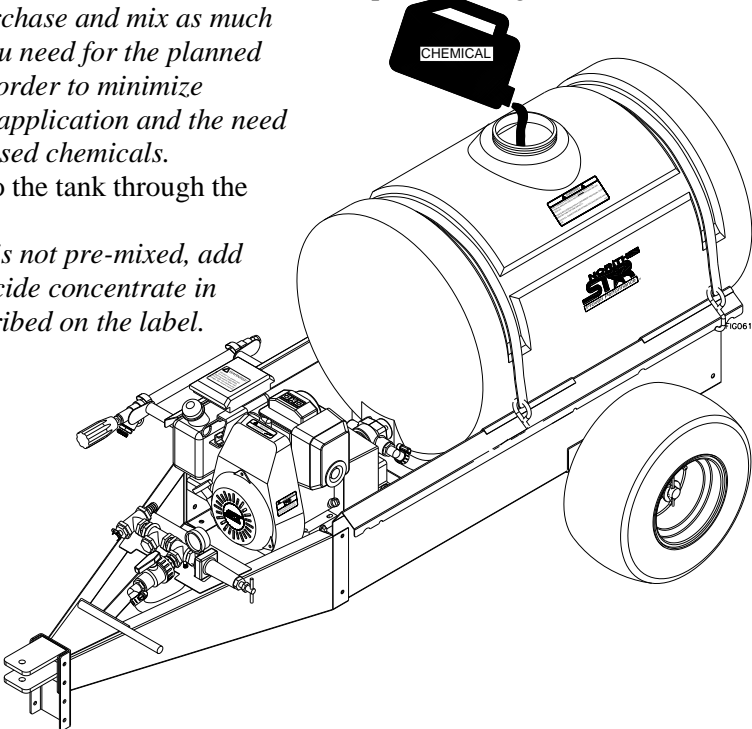
ALWAYS wear personal protective equipment as directed on the chemical label when handling pesticides.

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

## **Fill the sprayer using the following steps:**

<b>1. Review safety information</b>	<b>Review the “Operation – Important Safety Information” related to <u>General Chemical Safety</u> and <u>Chemical Accident Procedures</u> provided in this manual.</b>
<b>2. Choose safe mixing/loading area</b>	<p><b>Choose a safe pesticide mixing and loading area.</b></p> <ul style="list-style-type: none"> <li>- Choose an outdoor, well-ventilated area away from unprotected people, animals, food, and other items that might become contaminated.</li> </ul>
<b>3. Wear personal protective equipment</b>	<p><b>Wear personal protective equipment as directed on the chemical label.</b></p> <ul style="list-style-type: none"> <li>- Note that additional equipment may be specified for mixing and loading activities.</li> </ul>
<b>4. Turn off sprayer and vehicle</b>	<p><b>Turn OFF the sprayer before filling.</b></p> <ul style="list-style-type: none"> <li>- The vehicle should also be off, with brake set or wheels blocked to prevent unintended movement.</li> </ul>
<b>5. Remove fill cap</b>	<b>Remove the fill cap located on top of the sprayer.</b>
<b>6. Ensure tank flushed</b>	<p><b>Ensure tank is flushed of all chemicals from prior uses.</b></p> <ul style="list-style-type: none"> <li>- Chemicals can interact dangerously when mixed, and residue chemicals are also a health hazard.</li> </ul>

## Operation - Using the Sprayer (continued)

<b>7. Check strainer cap</b>	<p><b>Ensure strainer cap is securely fastened.</b></p>  <p>The diagram shows a side view of a sprayer tank. A callout circle highlights the strainer cap and ball valve assembly. Labels point to the 'Strainer cap' and 'Ball valve'.</p>
<b>8. Fill tank</b>	<p><b>Add pesticide to tank through fill cap:</b></p> <ol style="list-style-type: none"> <li>Confirm the chemical/water dilution ratios specified on the chemical label.</li> <li>Determine chemical and water volumes needed for the planned application, taking into consideration that maximum tank capacity is 55 gallons.  <i>Note: Only purchase and mix as much chemical as you need for the planned application in order to minimize chemical over application and the need for storing unused chemicals.</i></li> <li>Add chemical to the tank through the fill cap.  <i>If the chemical is not pre-mixed, add water and pesticide concentrate in the order prescribed on the label.</i></li> </ol>  <p>The diagram shows a side view of a sprayer tank. A black container labeled 'CHEMICAL' is pouring liquid into the fill cap on top of the tank. The sprayer pump and nozzle assembly are visible at the front.</p>
<b>9. Ensure chemical mixed</b>	<p><b>Ensure chemical is thoroughly mixed in tank.</b></p> <ul style="list-style-type: none"> <li>- Stirring device should be made of metal or plastic, non-chemical absorbing material, and then properly cleaned and stored after use.</li> </ul>
<b>10. Replace fill cap</b>	<p><b>Replace fill cap and tighten securely.</b></p>

## Operation - Using the Sprayer (continued)

### Step Three: Operate the sprayer.

#### **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.

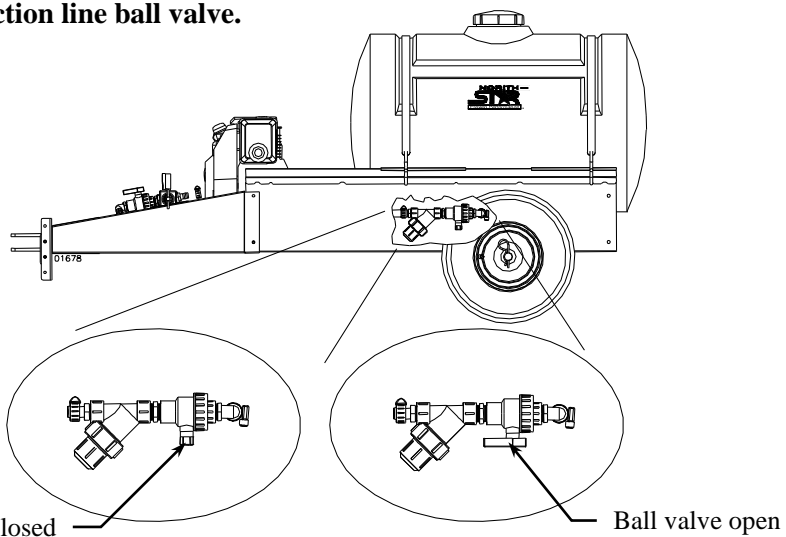
<b>1. Review safety information</b>	<b>Review the “Operation – Important Safety Information”</b> related to <u>Chemical Application Safety</u> and <u>Towing/Driving Safety</u> provided in this manual.
<b>2. Wear personal protective equipment</b>	<b>Wear personal protective equipment as directed on the chemical label.</b>
<b>3. Engine operation precautions</b>	<p><b>Heed the following safety rules with regard to running the sprayer engine:</b></p> <ul style="list-style-type: none"> <li>• <b>Hot muffler.</b> If you are starting a warm engine, stay clear of muffler. It may still be hot enough to burn you.</li> <li>• <b>Hot exhaust.</b> Hot exhaust fumes from engine can cause fire. Position muffler at least 7’ from combustible objects during operation.</li> <li>• <b>Fire extinguisher.</b> Have a Class ABC fire extinguisher available as a precautionary measure when operating the sprayer engine in dry areas.</li> <li>• <b>Carbon monoxide.</b> The running engine gives off carbon monoxide, a poisonous gas that can kill you. You CANNOT smell it, see it, or taste it. ONLY run the sprayer engine OUTDOORS and at least 20 feet from the home, away from windows, vents and air intakes, to allow proper ventilation. NEVER run sprayer engine inside homes, garages, sheds, or other semi-enclosed spaces. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. If you start to feel sick, dizzy, or weak while using the sprayer, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.</li> </ul>



## Operation - Using the Sprayer (continued)

### 4. Open ball valve

Open the suction line ball valve.



### 5. Start engine

Consult the engine Owner's Manual for starting the engine.

# Operation - Using the Sprayer (continued)

## 6. Begin agitation if needed

### 1. Decide if agitation is required

Some formulations of liquid pesticides do not remain in solution and should be agitated to maintain a uniform mix.

This sprayer is equipped with an **agitator** that 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.)

### 2. Operation principle

The nozzle design creates a venturi effect, speeding up the flow of the fluid as it exits the nozzle. This increase in velocity creates a low-pressure area (a vacuum) which draws in additional fluid from the tank, multiplying the outlet flow for increased agitation.

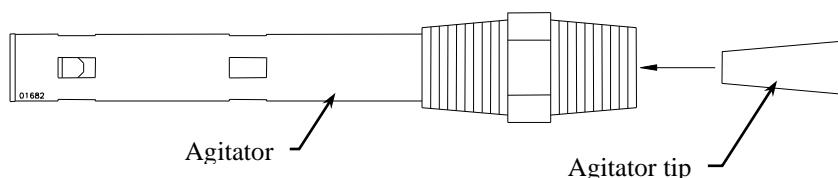
### 3. Tuning the agitator

The four colored nozzles in the manual bag are used to tune your agitator. The following chart outlines the sizes, flows and pressures with each tip. A higher inlet flow for a given tip will create a higher pressure in the agitator.

Orifice	Color Code	Pressure	Inlet Flow	Outlet Flow
1/8	Yellow/Black	30 PSI	2.9 GPM	9.5 GPM
5/32	Red	30 PSI	4.1 GPM	13.2 GPM
3/16	Blue	30 PSI	5.3 GPM	15.4 GPM
1/4	Natural	30 PSI	6.5 GPM	19.5 GPM

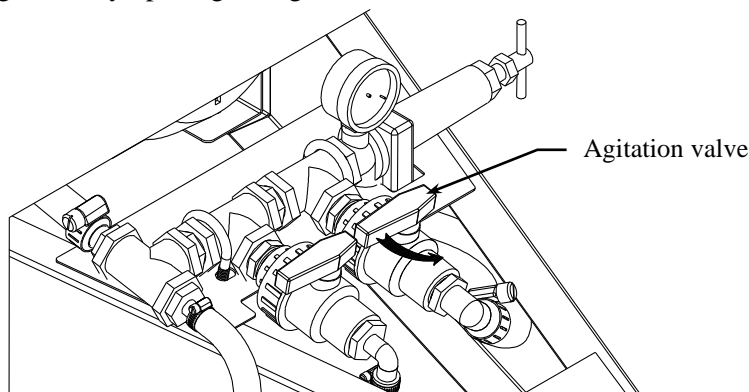
**\*Note:** With the 1/8 orifice tip you will have more pressure to the gun or broadcast nozzles and a less effective agitator. With the 1/4 orifice tip you will have less pressure to the gun or broadcast nozzles and a more effective agitator. Insert the tip that gives you the desired amount of pressure and agitation.

- Unscrew the agitator from the bulkhead fitting on the inside of the tank.
- Insert the desired nozzle as shown.
- Screw the agitator back into the bulkhead fitting.



### 4. Operate the agitator

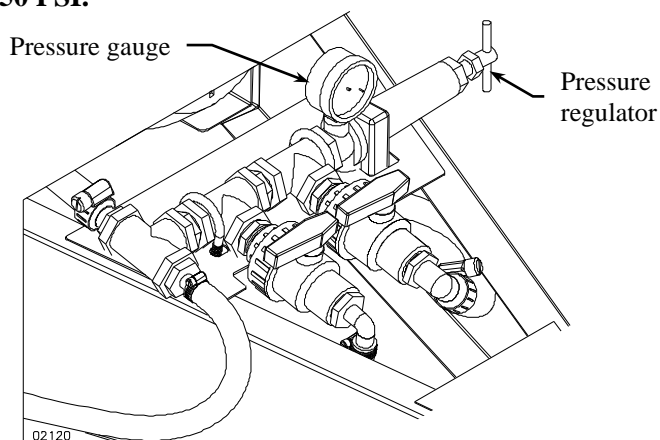
Begin agitation by opening the agitation valve.



## Operation - Using the Sprayer (continued)

7. Adjust pressure as needed

Turn the pressure regulator until the desired pressure is achieved. Do not exceed 150 PSI.

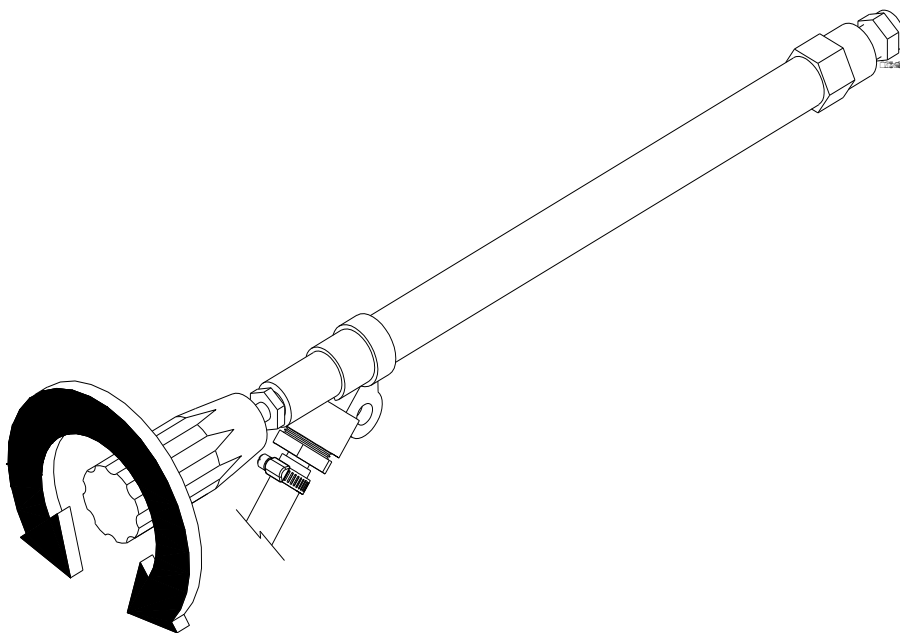


8. Operate spray gun (as needed for application)

To spray, rotate the handle of the spray gun.

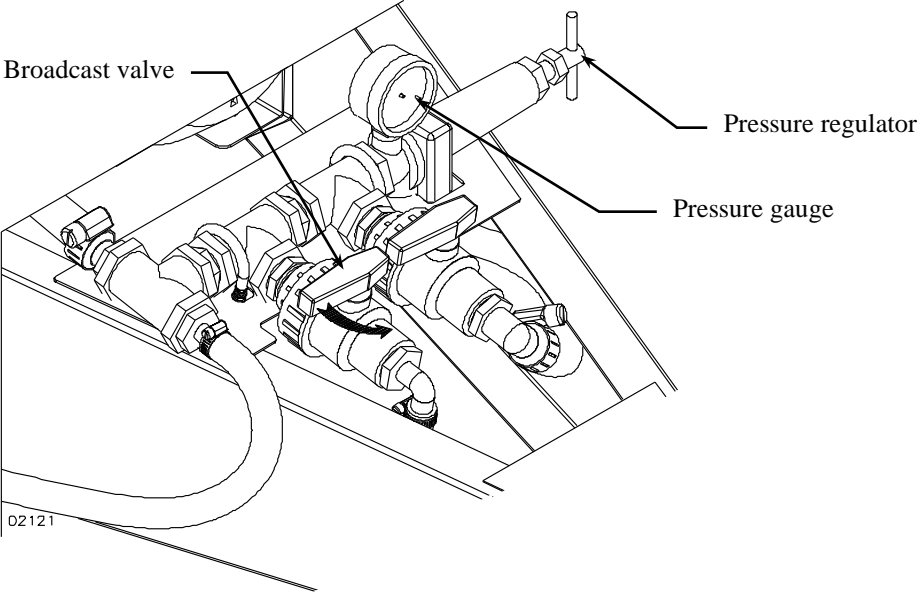
-Rotating the handle will change the spray pattern from OFF, to cone, to stream.

*Note: It is not unusual for the operator to be exposed to chemical while operating the spray gun— gloves should be chemical resistant.*



**IMPORTANT:** ALWAYS hold the spray gun with a firm grip when spraying at higher pressures in order to prevent gun from whipping. Keep good footing and balance at all times.

## Operation - Using the Sprayer (continued)

<b>9. Operate broadcast boom/nozzles</b>	<ol style="list-style-type: none"> <li><b>1. Open broadcast valve to send flow to the broadcast nozzles.</b></li> <li><b>2. Adjust pressure regulator for desired pressure.</b></li> </ol> <div style="text-align: center; margin: 20px 0;">  </div> <ol style="list-style-type: none"> <li><b>3. To ensure proper coverage, overlap the ends of the spray pattern 24". Use the tables in Appendix A to determine what speed to drive your vehicle for the desired application rate.</b></li> </ol> <p><b>IMPORTANT:</b> Make sure broadcast nozzles are oriented to spray straight down before you start. An incorrectly positioned broadcast nozzle may spray chemicals on you or others.</p>
<b>10. Leaving unattended</b>	<p><b>If the sprayer must be left unattended at any time:</b></p> <ol style="list-style-type: none"> <li>a) Turn off power to the sprayer.</li> <li>b) Relieve system pressure by depressing the gun trigger.</li> <li>c) Turn off the vehicle. Set brake or block the wheels.</li> </ol>
<b>11. Discontinue use if clogged or inoperative</b>	<p><b>If the sprayer becomes clogged or inoperative during use, <i>discontinue use immediately.</i></b></p> <ul style="list-style-type: none"> <li>- DO NOT attempt to service while chemicals are in the sprayer and engine is running.</li> <li>- Return to service area to review instructions for troubleshooting before attempting to service.</li> </ul>

***Note:** A reserve, clean container capable of holding at least 55 gallons 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 and Equipment for use in these circumstances. The container should be properly labeled as to its contents if it is used.*

## Operation - Using the Sprayer (continued)

### **Step Four: 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.

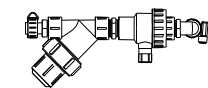
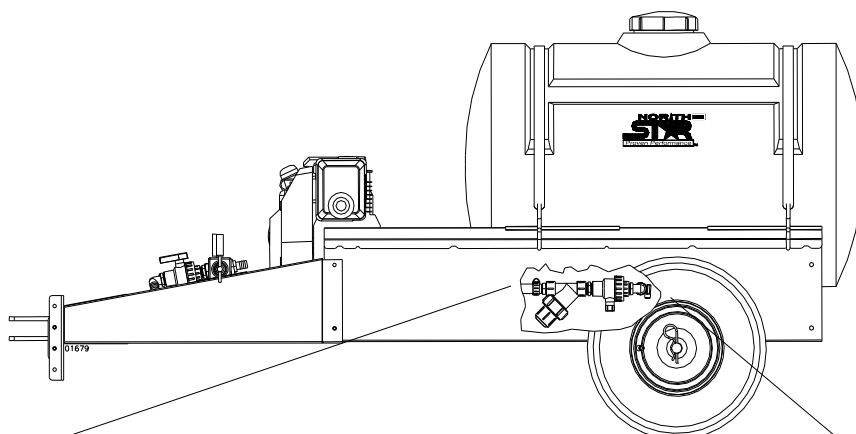
Improper equipment clean up and disposal of chemicals can result in dangerous chemical exposure to humans and the environment, as well as equipment damage.

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

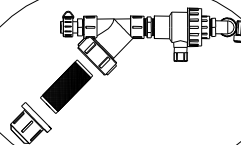
#### **1. Drain tank**

##### **If there is excess pesticide left in the tank, drain the tank:**

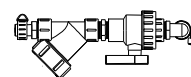
- Turn off the engine and relieve system pressure by operating the spray gun.
- Find a suitable container in which to drain the unused pesticide. Place it under the strainer cap.
- While wearing rubber gloves, eye protection, and all other required personal protective equipment, close the suction line ball valve and remove strainer cap and strainer element.
- Open suction line ball valve and drain tank into the suitable container.
- When tank stops draining, replace strainer element and tighten strainer cap securely.



Close suction line ball valve



Remove strainer cap and strainer element



Open suction line ball valve to drain tank

## Operation - Using the Sprayer (continued)

<b>2. Unused chemical</b>	<p><b>Properly store or dispose of unused chemical:</b></p> <p>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 &amp; animals.</p> <p>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.</p>
<b>3. Flush sprayer</b>	<p><b>Flush the sprayer per the chemical manufacturer's recommendations.</b> A general procedure is as follows:</p> <p>a) Add fresh water to the tank.</p> <p>b) Start the engine.</p> <p>c) Operate the spray gun and discharge all rinse water onto an area that can accept dilute pesticide application.</p> <p>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.</p> <p>e) After flushing, turn off the engine and be sure all system pressure is relieved by operating the gun.</p> <p>f) Dispose of cleaning solution discharge as recommended by the manufacturer of the solution.</p>
<b>4. Decontaminate &amp; launder</b>	<p><b>Decontaminate yourself after you are finished handling chemicals:</b></p> <p>a) Remove all clothing worn during spraying and chemical handling.</p> <p>b) Wash all exposed parts of the body with soap and water.</p> <p>c) Launder clothing separately from other wash.</p>

## Storage

Prepare the sprayer for end-of-season storage by running RV antifreeze through the system. This will keep internal parts lubricated, protect against corrosion, and keep the unit from freezing.

### **WARNING**

Gasoline vapors can ignite and cause a fire. Select a well-ventilated storage area away from sources of heat, flame, or sparks.

### **CAUTION**

The sprayer will be damaged if it freezes.  
Protect the sprayer from freezing during storage by following the instructions below.

### **Preparing for storage:**

<b>1. Add antifreeze</b>	<p>Pour 1 gallon of RV antifreeze into the tank.</p> <p><i>Note: RV antifreeze is non-toxic and biodegradable and generally safer for the environment than automotive antifreeze.</i></p>
<b>2. Spray briefly</b>	Turn on the pump motor and squeeze the gun trigger briefly until fluid sprays.
<b>3. Engine manual</b>	<p><b>Refer to the engine manual for proper engine storage instructions.</b></p> <ul style="list-style-type: none"> <li>- Always disable the engine for storage by unplugging the spark plug wire.</li> </ul> <p><b>CAUTION:</b> Gasoline will oxidize and deteriorate in storage. Old gasoline in the engine will cause hard starting and leave gum deposits that can clog the fuel system. Deterioration problems may occur within a few months, or even less if gasoline was not fresh when you filled the fuel tank.</p> <p><b><u>Short-Term Storage:</u></b> Consider adding a fuel stabilizer to extend fuel storage life.</p> <p><b><u>Long Term Storage:</u></b> (between infrequent uses and at end of season) Drain the fuel tank and carburetor as instructed in the engine owner's manual.</p> <p><b><u>Important Safety Instructions:</u></b></p> <ul style="list-style-type: none"> <li>• Always drain fuel from tank in outdoor, well-ventilated area.</li> <li>• Stay away from sources of heat, flame, or sparks while handling fuel.</li> <li>• Clean up fuel spills/splashes immediately.</li> </ul>
<b>4. Sprayer storage location</b>	<p><b>Store the sprayer in a location away from corrosive material, sources of heat, open flames, sparks or pilot lights.</b></p> <p><b>WARNING:</b> Never store sprayer inside where there is a source of heat or an open flame, spark, or pilot light as on water heaters, space heaters, furnaces, clothes dryers, or other gas appliances EVEN IF the sprayer's gas tank is empty.</p>
<b>5. Gasoline storage</b>	<p><b>Store gasoline in a cool, dry place in a UL approved, tightly sealed container.</b></p> <p><b>WARNING:</b> Gasoline vapors can ignite if they collect inside an enclosure and explosion can result.</p>

### **Removing from storage:**

<b>1. Drain</b>	Drain the antifreeze left in tank. (See cleaning section of Operation Instructions.)
<b>2. Flush with water</b>	Fill the tank with fresh water and run through the system. Operate the spray gun until the system is completely flushed. Be sure to set up containers to capture the antifreeze flush water.
<b>3. Disposal</b>	Dispose of the antifreeze and flush water properly.

# Troubleshooting

## **WARNING**

Before troubleshooting or attempting to service, read the following safety rules to avoid accidental exposure to chemical and also risk of electric shock.

***Note:** A reserve, clean container capable of holding at least 55 gallons 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 and Equipment for use in these circumstances. The container should be properly labeled as to its contents if it is used.*

### **Before attempting to service the sprayer:**

<b>1. Personal protective equipment</b>	<b>Wear personal protective equipment as directed on the chemical label while servicing your sprayer.</b>
<b>2. Review troubleshooting table</b>	<b>Review the Troubleshooting Table below for the type of problem you are experiencing.</b> However, DO NOT attempt to repair until the steps listed below are followed.
<b>3. Empty and flush</b>	<b>If the cause listed for your problem is Clogged intake tube, Clogged suction strainer, or Worn spray gun nozzle:</b> empty the tank and flush the sprayer with water as directed in the section, “Operation – Step Four”.  <i>- In order to avoid accidental exposure to chemicals, never attempt to unclog the intake tube or suction strainer, or service the spray gun nozzle, until the tank has been emptied and the sprayer flushed with water.</i>
<b>4. Disconnect power/relieve pressure</b>	<b>Stop the engine and be sure all system pressure is relieved by operating the spray gun.</b>
<b>5. Perform repairs</b>	<b>Follow the directions provided in the troubleshooting table to repair the sprayer.</b>  <i>NOTE: Never try to unclog the sprayer nozzle by blowing through it.</i>
<b>6. Test after servicing</b>	<b>After servicing, ALWAYS test the sprayer for leaks with plain water before using.</b>

<b>PROBLEM</b>	<b>CAUSE</b>	<b>SOLUTION</b>
Engine will not start	Engine will not start	See engine owner’s manual
Low pressure	Agitation not tuned properly	Tune agitator with desired agitator tip
	Pressure regulator not adjusted	Adjust pressure regulator
	Worn spray gun nozzle	Replace spray gun nozzle
	Worn broadcast nozzles	Replace broadcast nozzles
Low flow	Suction line ball valve closed	Open suction line ball valve
	Agitation valve is open	Close agitation valve
	Agitation not tuned properly	Tune agitator with desired agitator tip
	Strainer clogged	Remove strainer and clean
	Clogged suction line	Remove obstruction
Poor spray distribution	Worn spray gun nozzle	Replace spray gun nozzle
	Worn broadcast nozzles	Replace broadcast nozzles
Pump is locked up	Chemicals left in the pump	Send pump to service center



## Specifications

### Sprayer Specifications

Engine.....	Kohler CH255 (2827271) Honda GX160 (2827272)
Pump.....	Hypro 4101XL
Tank Maximum Capacity.....	55 Gallons
Maximum GPM.....	7.0 GPM
Maximum Pressure.....	150 PSI
Overall Dimensions.....	83”L x 39”W x 40”H
Dry Weight.....	238 lbs.
Weight full of water.....	Approx. 678 lbs.

### Available Accessories

Remote switch for broadcast spray... Item# 22851

### Component Materials\*

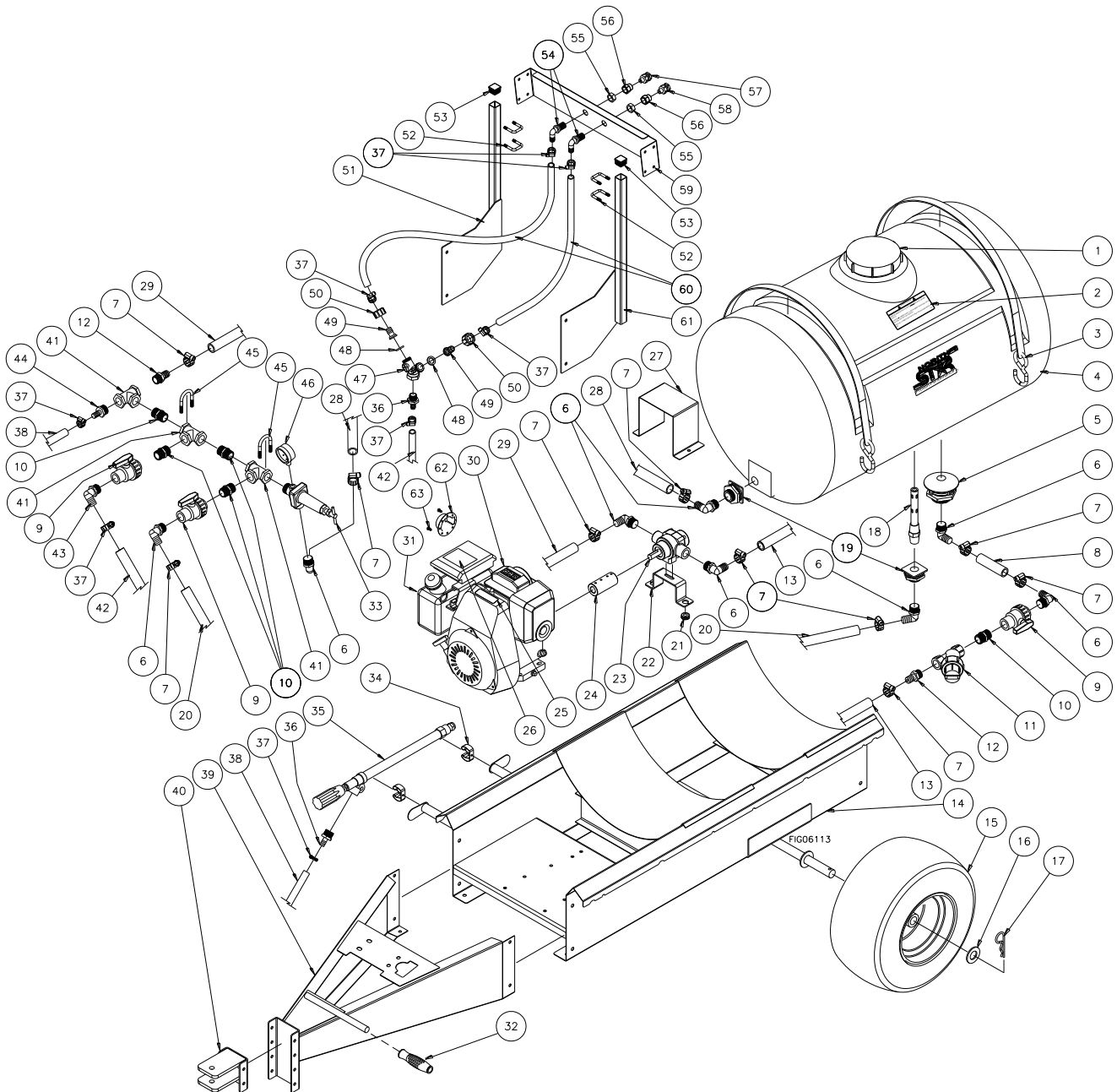
Tank.....	Polyethylene, EPDM
Suction Tube.....	Polypropylene, Stainless Steel
Hose.....	PVC
Pump.....	Stainless Steel, Viton®
Gun and Nozzle.....	Aluminum, Nylon, Polyacetal

\*Before using any chemical, check to ensure the chemical is compatible with all materials in the system.

The manufacturer reserves the right to make improvements in design and/or changes in specifications at any time without incurring any obligation to install them on units previously sold.

**Any Questions, Comments, Problems or Parts Orders**  
***Call NorthStar Product Support 1-800-270-0810***

# Exploded View – Rev B



## Exploded View – Rev B

Item	Part#	Description	Qty	Model
1	SNY343047	Tank Lid	1	All
2	777499	Warning Decal	1	All
3	5262	Tie Down Straps	2	All
4	796779	Tank Assembly (includes items 2, 18, and 19)	1	All
5	SNY34300005	Bulkhead Fitting, 3/4"	1	All
6	50NBR12	3/4" Hose Barb Elbow	8	All
7	17141	Large Hose Clamp	10	All
8	30289	3/4" Hose, 4"	1	All
9	52101	Ball Valve	3	All
10	5318	Hex Nipple	5	All
11	797209	Strainer, 3/4" Y-Line	1	All
12	5267	3/4" Hose Barb	2	All
13	30289	3/4" Hose, 16"	1	All
14	777260	Cart	1	All
15	777917	Tire	2	All
16	82129	Washer	2	All
17	30313	Bridge Pin	2	All
18	777843	Agitator with Tips	1	All
19	5370	Bulkhead Fitting	2	All
20	30289	3/4" Hose, 60"	1	All
21	777111	Grommet	2	All
22	37731	Pump Bracket	1	All
23	777259	Pump	1	All
24	797026	Coupler	1	All
25	305546	Hot Muffler Decal	1	All
26	39259	CO Warning	1	All
27	777265	Guard	1	All
28	30289	3/4" Hose, 33"	1	All
29	30289	3/4" Hose, 22"	1	All
30	803751	Kohler CH255	1	2827271
	60590	Honda GX160	1	2827272
31	ST08	Engine Warning	1	All
32	778459	Handle Grip	1	All
33	5374	Pressure Regulator	1	All
34	52035	Gun Clip	2	All
35	777845	Spray Gun	1	All
36	5222	1/2" HB x 3/4" GHT	2	All
37	777119	Small Hose Clamp	8	All
38	30160	Gun Hose, 240"	1	All
39	37719	Tow Bar	1	All
40	799426	Hitch	1	All
41	5333	3/4" Tee	3	All
42	30160	1/2" Hose, 90"	1	All
43	779269	1/2" Hose Barb Elbow	1	All
44	779268	1/2" Hose Barb	1	All
45	82220	U-Bolt	2	All
46	5372	Gauge	1	All
47	777849	Y-Valve	1	All
48	5232	Rubber Washer	2	All
49	5212	1/2" Hose Barb	2	All
50	777850	Garden Hose Swivel	2	All
51	38185	Right Mount Arm	1	All
52	82145	U-Bolt, 1/4-20	4	All
53	777657	Plug	2	All
54	777851	1 1/16" Elbow	2	All
55	5230	Retaining Nut	2	All
56	38545	Nozzle Adapter	2	All
57	777459	Right Nozzle-1400PSR	1	All
58	777460	Left Nozzle-1400PSL	1	All
59	777458	Nozzle Bracket	1	All
60	30160	1/2" Hose, 11"	2	All
61	38186	Left Mount Arm	1	All
62	804123	Exhaust deflector, Kohler CH255	1	2827271
	786549	Exhaust deflector, Honda GX160	1	2827272
63	785907	Screw, exhaust deflector	2	2827272

**Any Questions, Comments, Problems or Parts Orders**  
**Call NorthStar Product Support 1-800-270-0810**

## Appendix A – Broadcast Spray Application Tables

Below are some guidelines to calibrate a North Star boom sprayer with DT3.0 (777359) spray nozzles. This is a very important step in operating the boom sprayer so the right amount of chemical is applied.

1. Use the suggested application rate from the chemical manufacturer (i.e. gallons per Acre, 1000 sq.ft., or 100 sq.ft.)
2. Using **Table 1**, find the application rate that most closely matches the chemical manufacturer's suggested application rate and pressure at which the sprayer is operating.
3. Follow this application rate up the chart to find the speed at which to drive the vehicle.

**TABLE 1**

Spray Height	Pressure (PSI)	Flow (GPM)	GALLONS PER ACRE - based on 32 foot spray pattern						
			1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	6 MPH	7 MPH
32"	20	1.7*	56	28	19	14	11	9	8
32"	30	2.0*	66	33	22	16.5	13	11	9.5
32"	40	2.5*	82.5	41	27.5	20.5	16.5	13.5	12

Spray Height	Pressure (PSI)	Flow (GPM)	GALLONS PER 1000 SQUARE FEET – based on 32 foot spray pattern						
			1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	6 MPH	7 MPH
32"	20	1.7*	1.29	.64	.44	.32	.25	.21	.18
32"	30	2.0*	1.52	.76	.51	.38	.30	.25	.22
32"	40	2.5*	1.90	.94	.63	.47	.38	.31	.28

Spray Height	Pressure (PSI)	Flow (GPM)	GALLONS PER 100 SQUARE FEET – based on 32 foot spray pattern						
			1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	6 MPH	7 MPH
32"	20	1.7*	.129	.064	.044	.032	.025	.021	.018
32"	30	2.0*	.152	.076	.051	.038	.030	.025	.022
32"	40	2.5*	.190	.094	.063	.047	.038	.031	.028

\* Approximate flow from one nozzle

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

**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
7	9.5	19	29

5. The coverage area can be found by dividing a full tank (ie; 55 gals) by the application rate.  
**Example:** 55 gallons divided by 15 gallons/acre = 3.67 acres of coverage per tank.

## 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 2 years for noncommercial/nonrental use and a period of 90 days for commercial/rental use from the date of purchase by user.

NorthStar shall warranty any wear item, including, but not limited to, valves, seals, pump diaphragms, hoses, and filter elements to be free from defects in material or workmanship for a period of 90 days 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 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 on a warranty claim.

Customer Number: \_\_\_\_\_

Date of Purchase: \_\_\_\_\_

NorthStar Serial Number: \_\_\_\_\_

Item Number: \_\_\_\_\_

**⚠ WARNING:** This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer, and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm.

For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



Manufactured by  
Northern Tool + Equipment Co.,  
2800 SouthCross Drive West  
P.O. Box 1499 Burnsville, MN 55337-0499