



# MTBSL

ITEM NUMBER: 28517 or 28518

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.

**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, ice control chemicals, or water-based non-flammable sealants or stains for outdoor wood surfaces. However, 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.

**Any Questions, Comments, Problems, or Parts Orders**

Call NorthStar Customer Service 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><b>DANGER</b> (red) indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.</p>
	<p><b>WARNING</b> (orange) indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.</p>
	<p><b>CAUTION</b> (yellow) indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.</p>
	<p><b>CAUTION</b> (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. An optional **agitator** (Item #28520) accessory is available for use with this sprayer and should be used when spraying pesticides classified as “flowable” (“F” or “L”), “wettable 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 a broadcast boom. Use the spot spray gun if you desire to apply pesticide only on selected plants. Use the broadcast boom if you wish to spray large ground areas. An optional **extended broadcast boom** (Item #2820) is available to extend the broadcast spray to 15 feet.

### **SPRAYING OTHER LIQUIDS:**

In addition to spraying pesticides, this sprayer may be used to spray other non-flammable liquids. Example uses include: watering plants/trees or spraying water for dust control, applying ice control chemicals, or applying water-based, non-flammable sealant or stain to outdoor wood surfaces.

However, **WERECOMMEND 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.

**Contact NorthStar Customer Service 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 -----

- **EXERCISE CAUTION** when attaching remote switch to battery terminals. Follow the steps listed in the Assembly section of this manual *in exact sequence* when connecting the sprayer's remote switch battery clamps to the battery terminals. *Caution must be exercised to avoid contact with battery acid and to prevent sparking.*
- **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 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 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.

##### 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.

## Summary of Important Safety Information (continued)

- **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 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.

### **Chemical accident procedures**

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

<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. <u>Bring the chemical label for reference.</u></li> </ol>
<b>Poisoning by ingestion or inhalation</b>	<p><b>In case of poisoning from ingestion or inhalation:</b>  <b><i>If the victim has collapsed or is not breathing, call 911.</i></b> 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>  <u>Have the chemical label available for reference.</u></li> </ol>
<b>Chemical spills</b>	<p><b>Chemical spills must be quickly contained and properly cleaned up.</b>  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>

## 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.

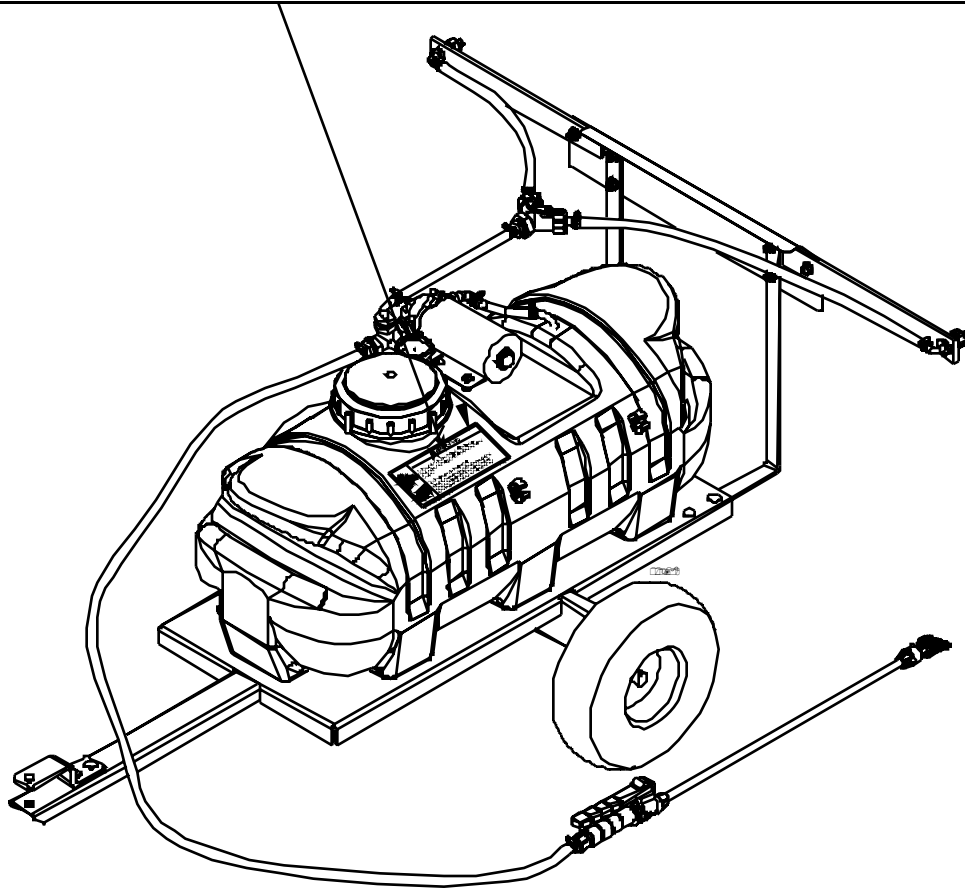
**KNOW emergency procedures BEFORE handling chemicals.** Sprayer leaks, bodily chemical contact, poisoning, and spills require immediate response.

**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 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.**

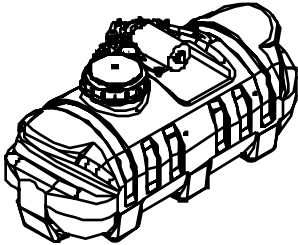


# Unpacking

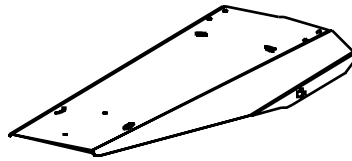
**Closely inspect all contents in the shipping carton.**

Note that some parts are shipped inside the tank.

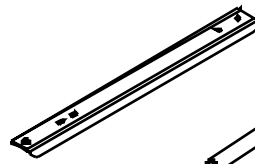
- **If you have damaged components:** Contact the freight company that delivered the unit and file a claim.
- **If you have missing components:** Contact NorthStar Customer Service at 1-800-270-0810.



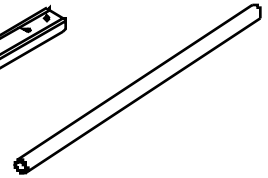
Sprayer



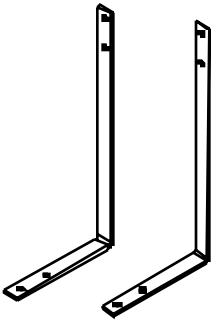
Cart Base



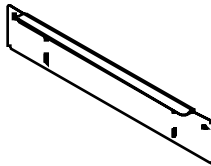
Tongue



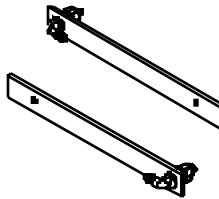
Axle



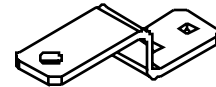
Boom Supports



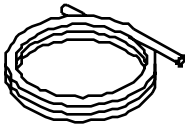
Boom Bracket



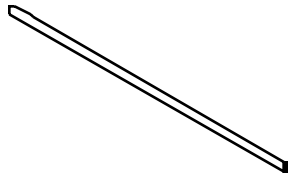
Boom Arms



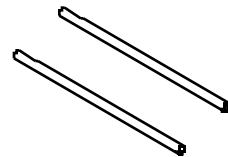
Hitch



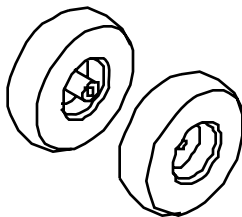
186" Gun Hose



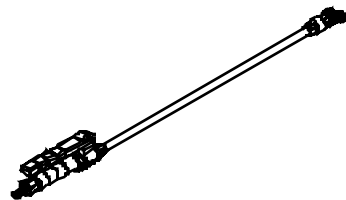
24" Hose



14" Hoses



Tires



Spot Spray Gun

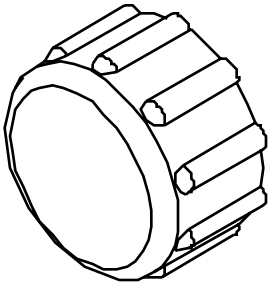


Manual Bag

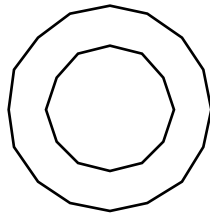


# Unpacking the Manual Bag

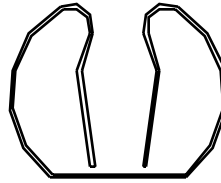
The following items are found in the manual bag.



Drain Cap



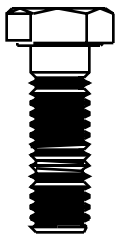
Rubber Washer



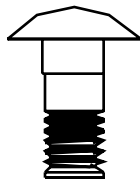
Gun Clip (2)



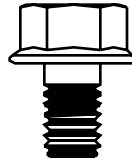
#10 x 1/4"  
Screw (2)



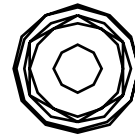
5/16 x 1"  
Bolt (2)



5/16 x 3/4"  
Carr. Bolt (12)



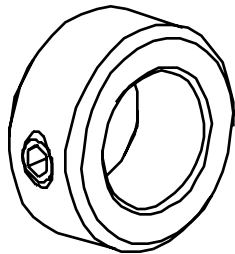
5/16 x 1/2"  
Flange Bolt (5)



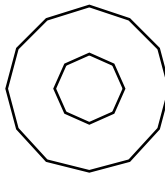
5/16 Flange  
Nut (12)



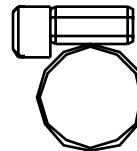
5/16 Nyloc  
Nut (2)



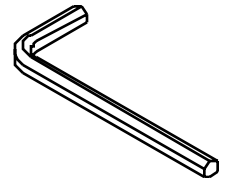
Wheel Retainers (2)



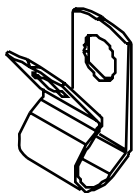
5/16 Flat  
Washer (8)



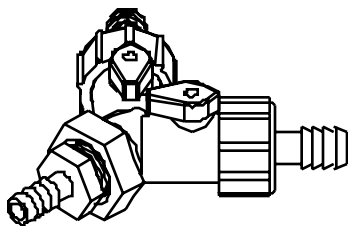
Hose Clamp (8)



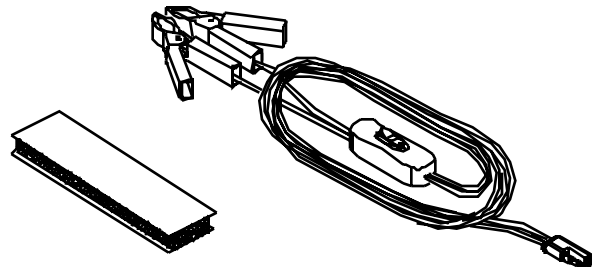
Hex Wrench



Hose Guide



Boom Valve



Velcro

Remote Switch

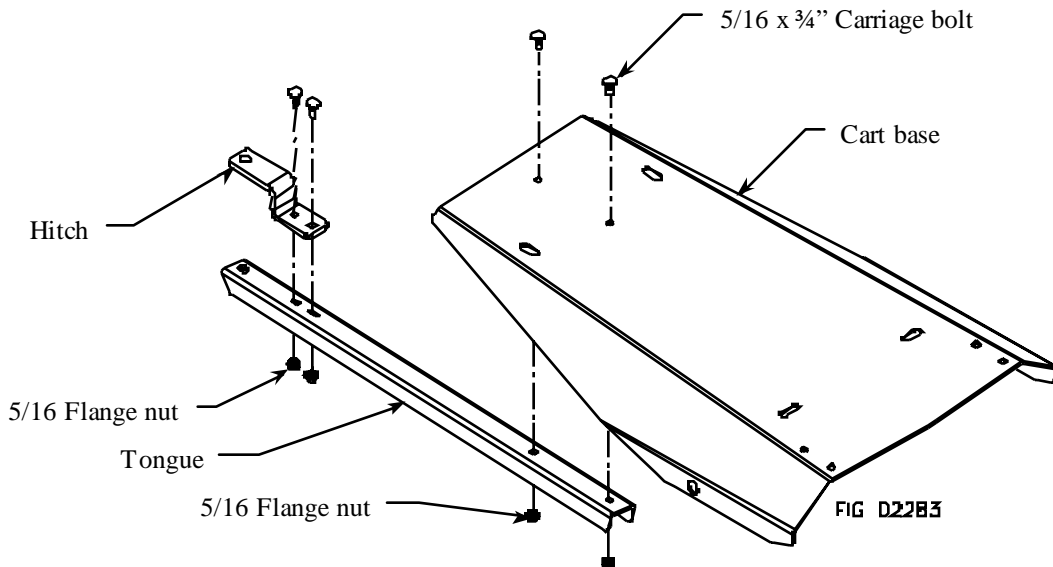
# Assembly

## **Step One: Attach the tongue to the cart base**

Fasten with (2) 5/16 x 3/4" carriage bolts and (2) 5/16 flange nuts. Tighten to 20 ft-lbs.

## **Step Two: Attach the hitch mount to the tongue**

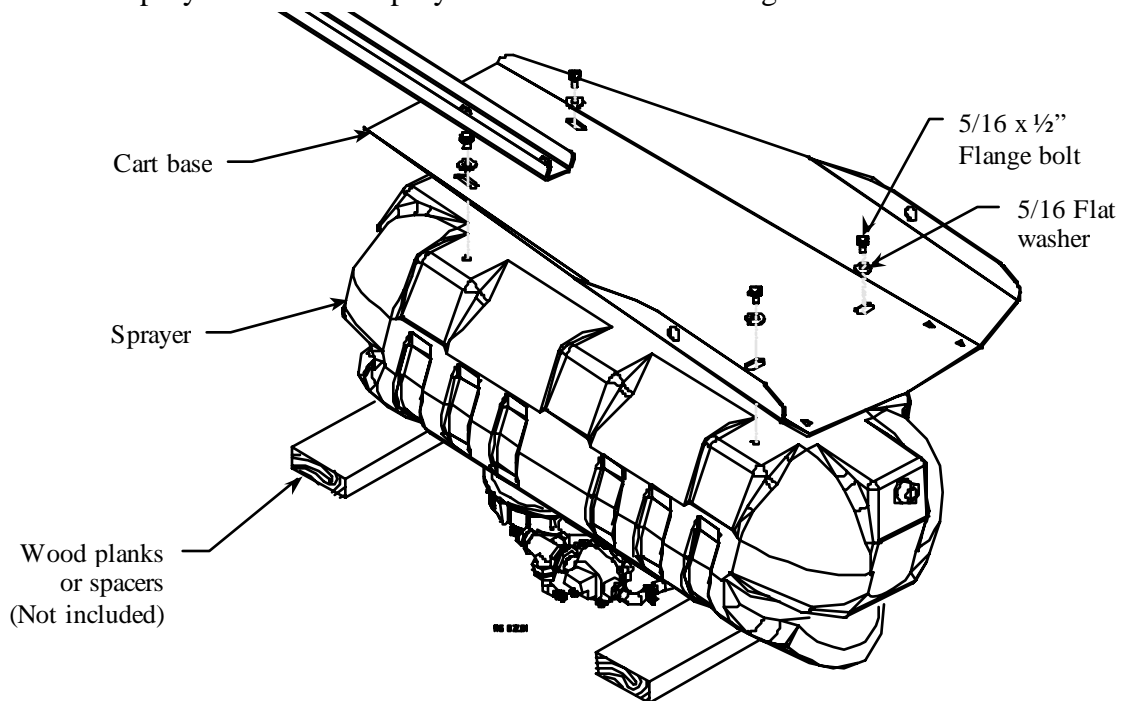
Fasten with (2) 5/16 x 3/4" carriage bolts and (2) 5/16 flange nuts. Tighten to 20 ft-lbs.



## **Step Three: Attach the cart base to the sprayer**

Note: To protect the pump from damage, place two wood planks or spacers under the sprayer to keep the pump from resting on the ground.

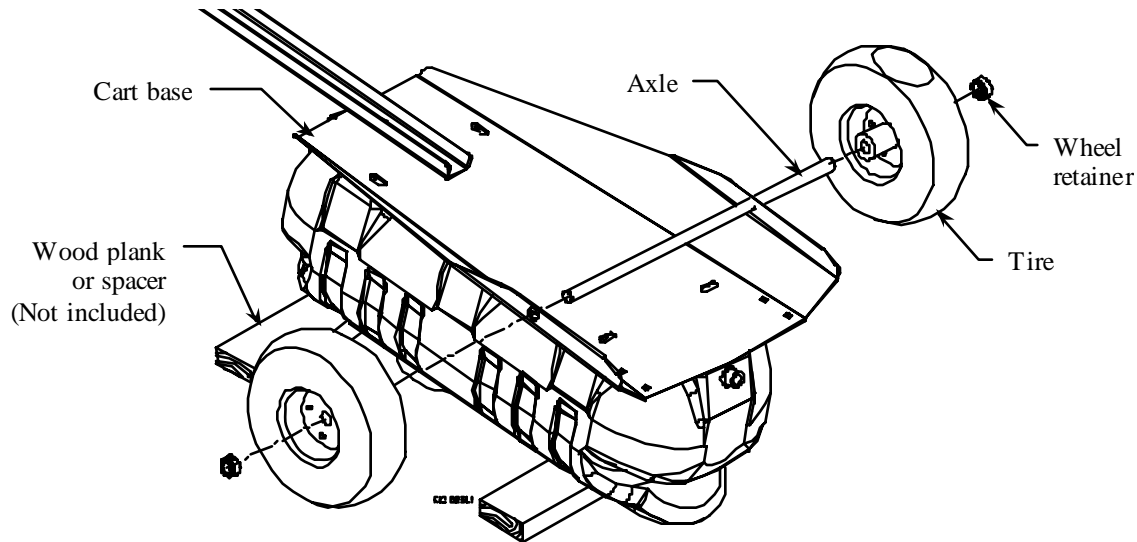
Using (4) 5/16 flat washers, loosely thread (4) 5/16 x 1/2" flange bolts into the inserts in the bottom of the sprayer. Center the sprayer on the cart base and tighten to 10 ft-lbs.



## Assembly (continued)

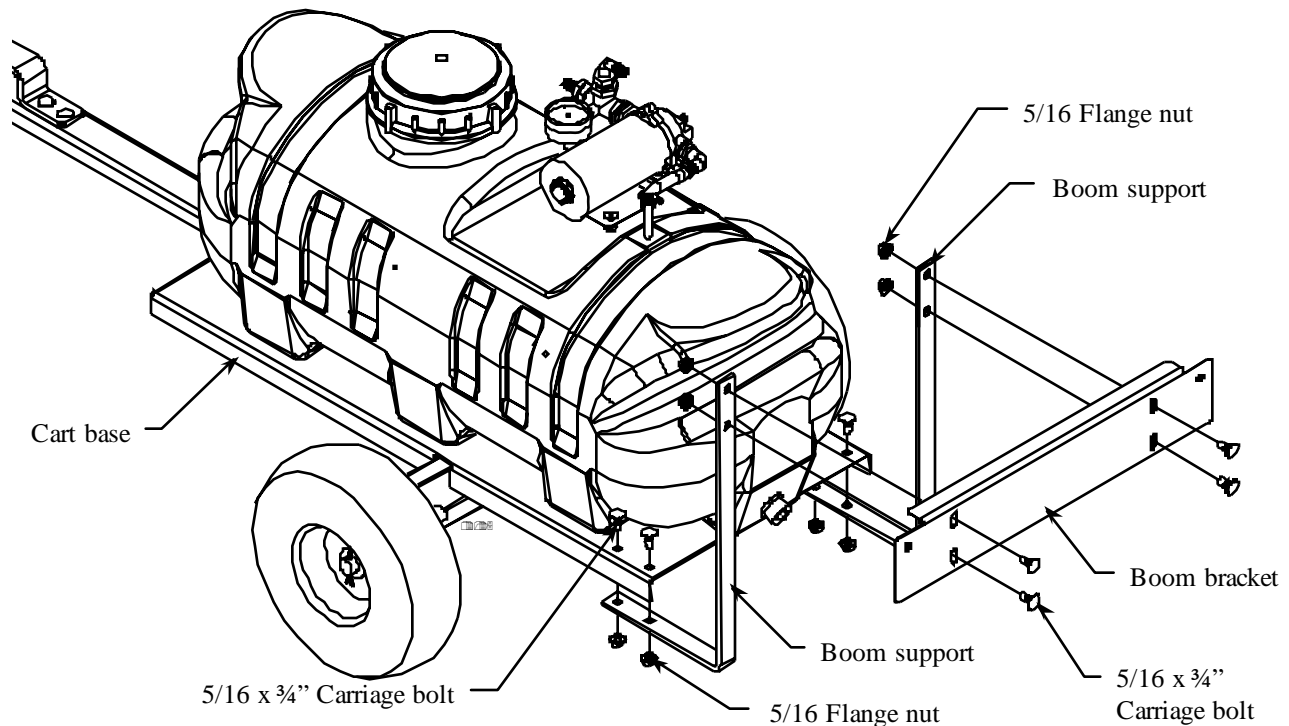
### **Step Four: Attach wheels to cart base**

1. Slide axle into holes on bottom of cart base.
2. Slide the tires and wheel retainers onto the axle.
3. Tighten wheel retainers down with supplied hex wrench.



### **Step Five: Attach boom supports and boom bracket to cart base**

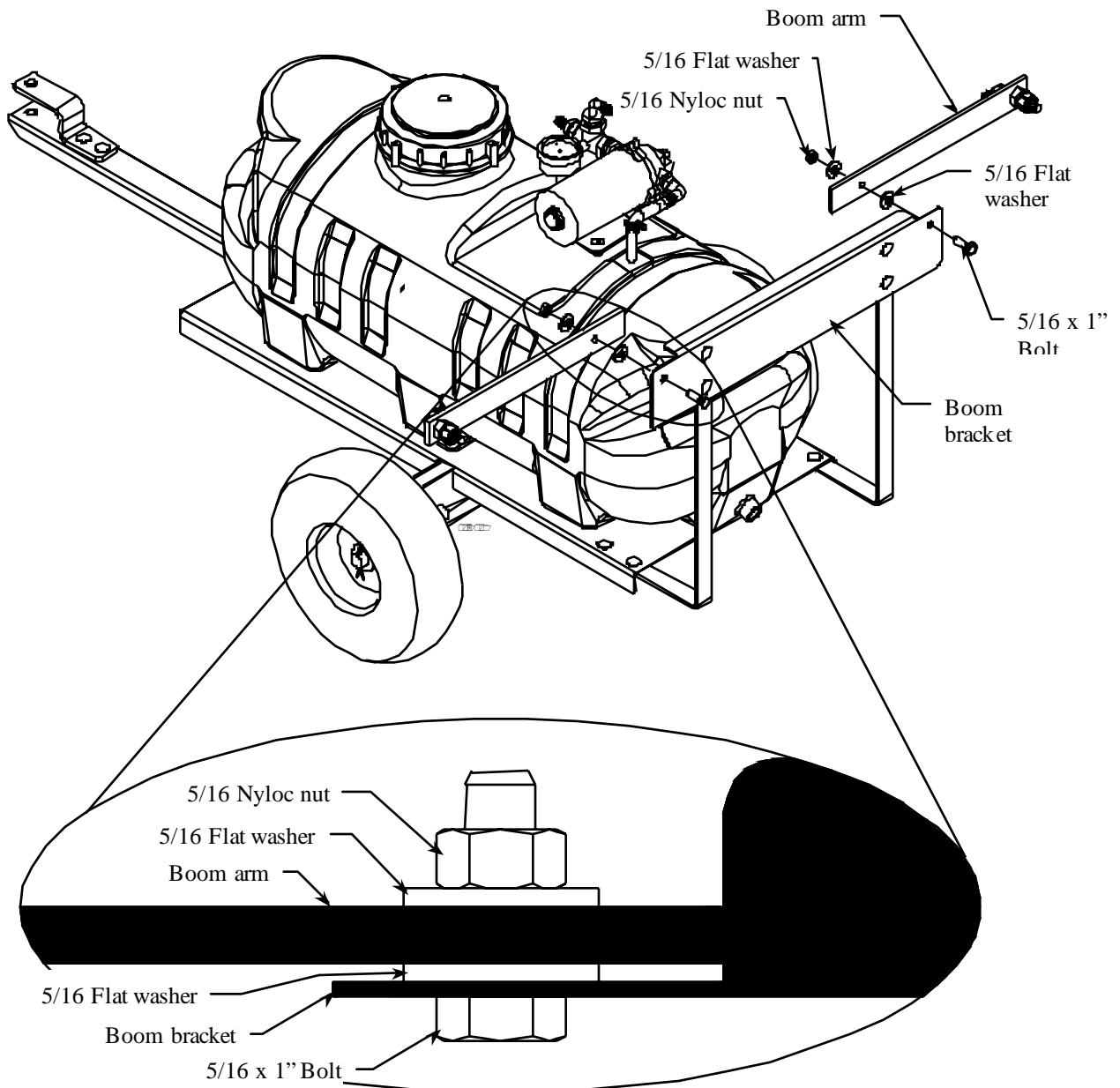
1. Fasten the boom supports to the cart base with (4) 5/16 x 3/4" carriage bolts and (4) 5/16 flange nuts. Tighten to 20 ft-lbs.
2. Fasten the boom bracket to the boom supports with (4) 5/16 x 3/4" carriage bolts and (4) 5/16 flange nuts. Tighten to 20 ft-lbs.



## Assembly (continued)

### Step Six: Attach boom arms to the boom bracket

1. Attach the boom arms to the boom bracket with (2) 5/16 x 1" bolts, (2) 5/16 nyloc nuts, and (4) 5/16 flat washers.
2. Tighten nuts until the boom arms do not move freely. (They should still be loose enough to move up and down.)



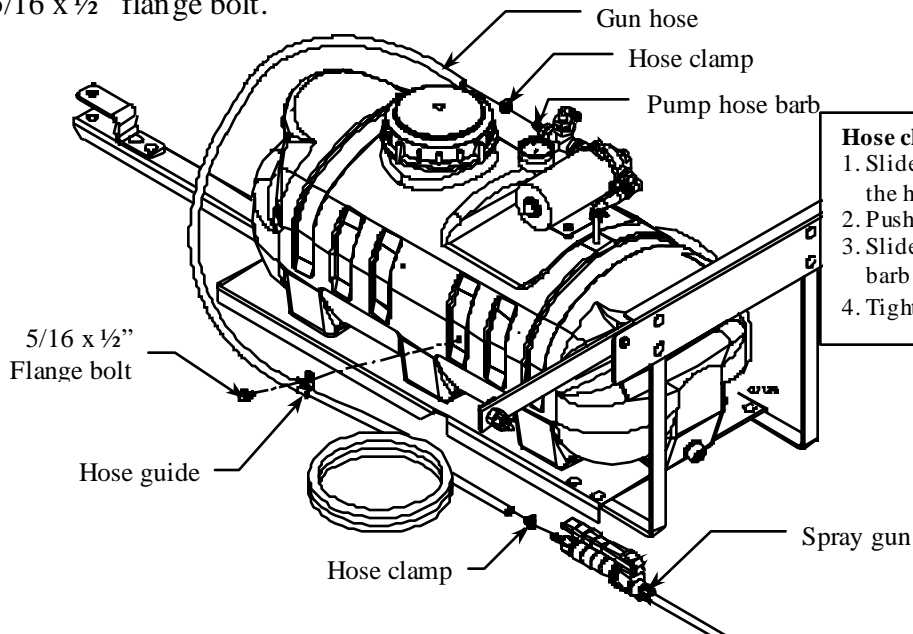
## Assembly (continued)

### **Step Seven: Attach gun hose to spray gun and pump**

1. Attach one end of gun hose to the pump hose barb. Follow hose clamp installation instructions.
2. Attach the other end of gun hose to the spray gun. Follow hose clamp installation instructions.

### **Step Eight: Attach hose guide to tank**

Route gun hose around sprayer and through hose guide, then attach hose guide to tank with (1) 5/16 x 1/2" flange bolt.



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

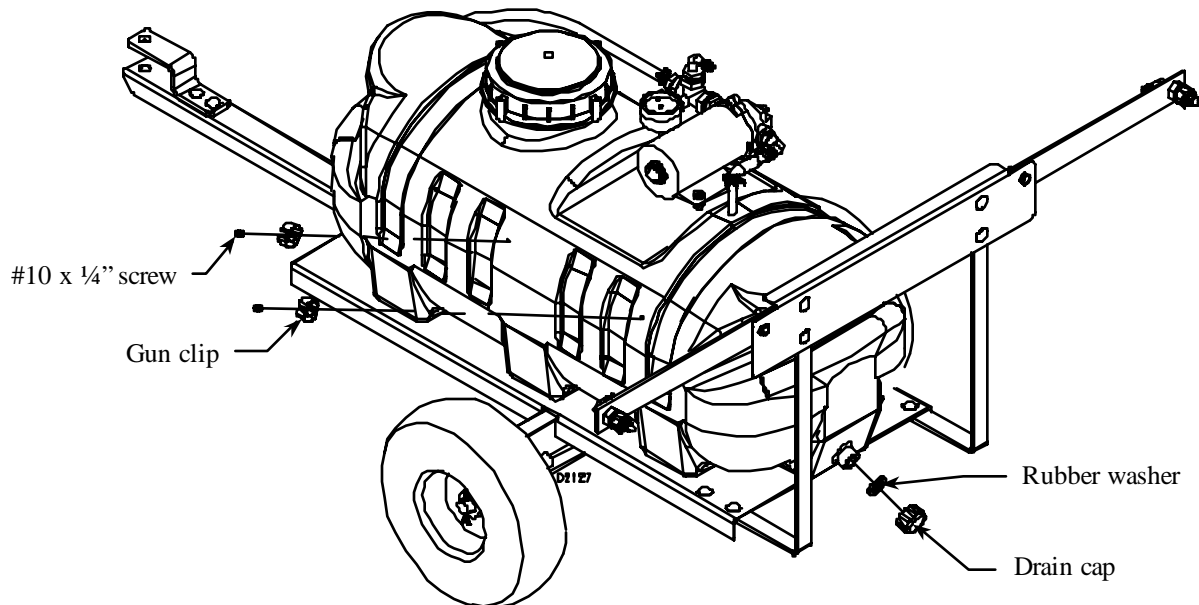
1. Slide hose clamp over the end of the hose
2. Push the hose onto the hose barb
3. Slide the hose clamp over the hose barb
4. Tighten the hose clamp

### **Step Nine: Attach gun clips to tank**

Fasten the gun clips to the sprayer tank with (2) #10 x 1/4" screws.

### **Step Ten: Attach drain cap to tank**

Press the rubber washer into the drain cap, then thread the drain cap onto the tank.



## Assembly (continued)

### **Step Eleven: Install boom valve to pump**

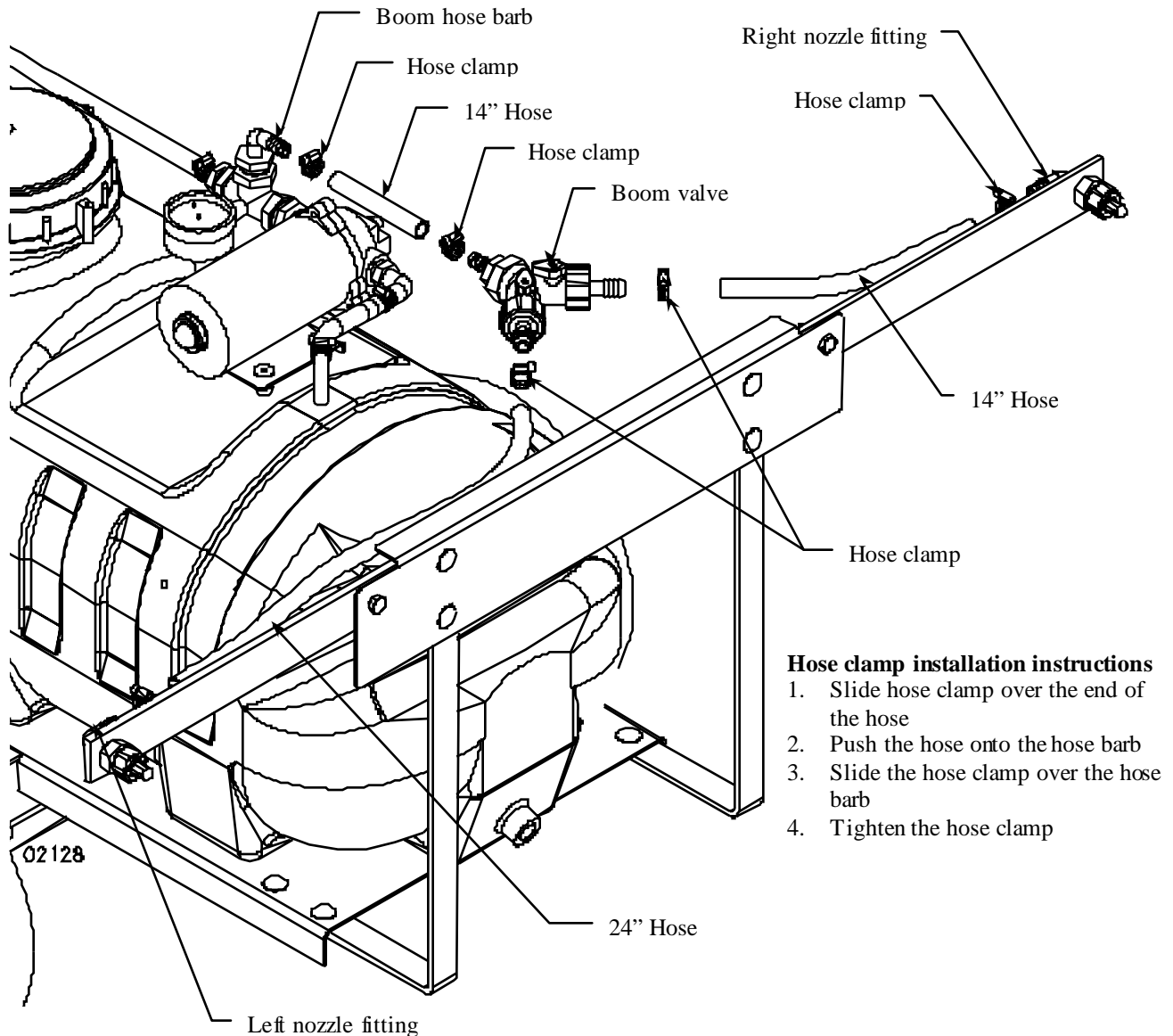
Install the boom valve with (2) hose clamps and (1) 14" hose. Follow hose clamp installation instructions below.

1. Attach one end of the 14" hose to the boom hose barb on the pump.
2. Attach the other end of the 14" hose to the boom valve.

### **Step Twelve: Connect boom valve to boom nozzles**

Connect with (4) hose clamps, (1) 14" hose, and (1) 24" hose. Follow hose clamp installation instructions below.

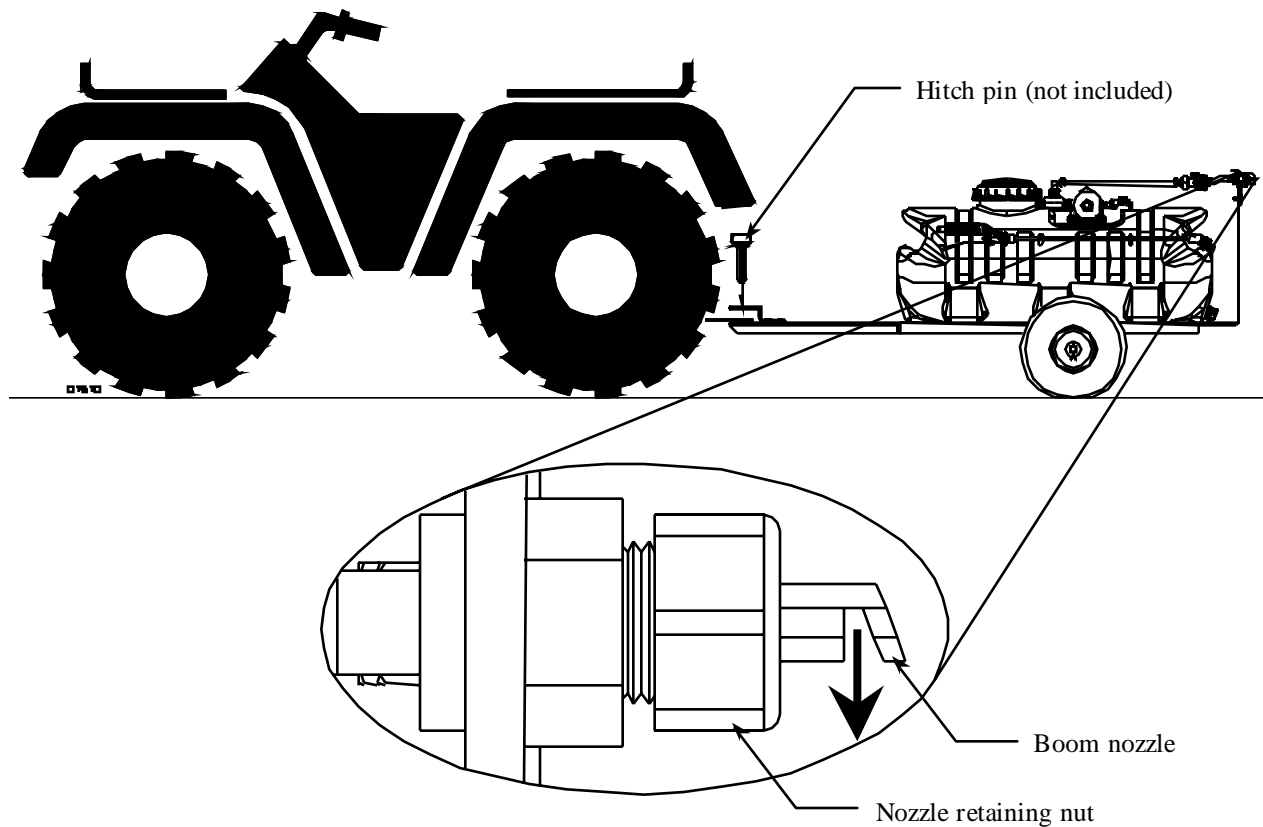
1. Attach one end of the 14" hose to the boom valve.
2. Attach the other end of the 14" hose to the right nozzle fitting.
3. Attach one end of the 24" hose to the boom valve.
4. Attach the other end of the 24" hose to the left nozzle fitting.



## Assembly (continued)

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

1. Secure the sprayer to the tow vehicle with a hitch pin (not included, call 800.270.0810 and order Item# 2501946).
2. Make sure both boom nozzles are pointed toward the ground. If they are not, loosen the nozzle retaining nut, orient the opening of the boom nozzle to point straight down, then retighten the nozzle retaining nut.



### **Step Fourteen: Connect remote switch to vehicle battery**

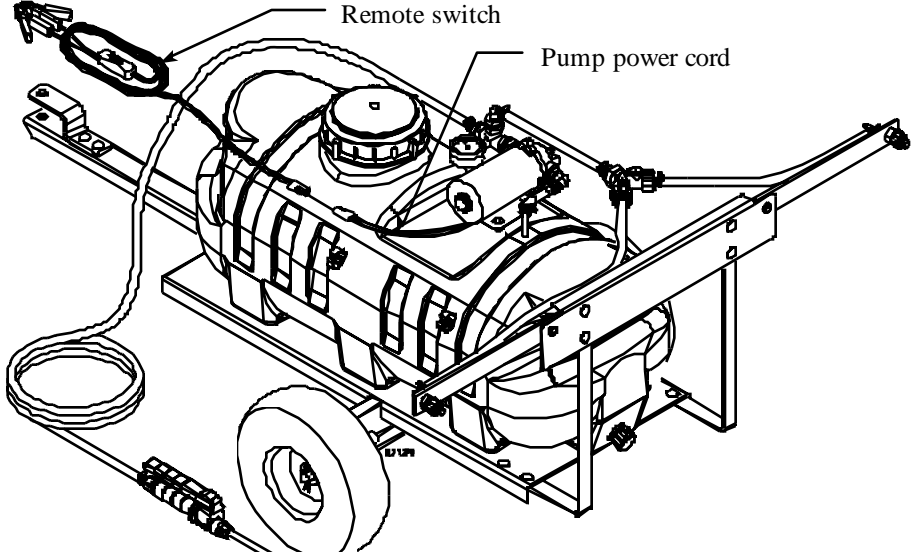
#### **⚠ WARNING**

Batteries are hazardous because they contain caustic acid, can emit explosive gases, and can cause electric shock.

*Caution must be exercised when making connections to a battery to avoid shock and contact with the acid, and to prevent any sparking that could lead to an explosion.*

ALWAYS follow the safety instructions and steps listed below *in exact sequence* when connecting the sprayer's remote switch to the battery terminals.

## Assembly (continued)

<b>1. Preparatory safety</b>	<p><b>Preparatory safety steps:</b></p> <ul style="list-style-type: none"> <li>• ALWAYS use eye protection</li> <li>• NEVER smoke or work near sparks or other sources of ignition.</li> <li>• NEVER touch both battery terminals at the same time or with any non-insulated tools.</li> <li>• If battery acid contacts skin or clothing, flush immediately with water and neutralize with baking soda.</li> </ul>
<b>2. Connect remote switch to battery</b>	<p><b>Connect the sprayer's <u>remote switch</u> to the vehicle battery using the following procedure:</b></p> <ol style="list-style-type: none"> <li>a) Disconnect the vehicle battery ground wire.</li> <li>b) Connect the <u>remote switch's red</u> battery clamp to the <i>positive(+)</i> terminal of the battery.</li> <li>c) Connect the <u>remote switch's black</u> battery clamp to the <i>negative(-)</i> terminal of the battery.</li> <li>d) Reconnect the vehicle battery ground wire.</li> </ol> <p><b>WARNING:</b> Always connect in this sequence to avoid possible shock.</p>
<b>3. Connect remote switch to pump power cord</b>	<p><b>Connect the remote switch to the pump power cord:</b>          Note: Make sure the power switch is in the OFF position on the remote switch.</p> <div style="text-align: center;">  <p>The diagram shows a sprayer unit with a pump and a tank. A remote switch is connected to the pump power cord. Labels indicate the 'Remote switch' and the 'Pump power cord'. The sprayer is mounted on a frame with a wheel.</p> </div>
<b>4. Verify connection</b>	<p><b>Verify a complete connection has been made</b> by checking with a DC voltmeter, or by <i>briefly</i> turning the <u>remote switch</u> to the ON position and listening for pump activation.</p>
<b>5. Attach remote switch to vehicle</b>	<p><b>Using supplied velcro pad, affix remote switch to vehicle in a position that is easily reached from the driver's seat.</b></p>
<b>6. Disconnect after use</b>	<p><b>AFTER EACH USE, disconnect power to the sprayer</b> by disconnecting the sprayer's <u>pump cord</u> from the <u>remote switch</u> – <i>the remote switch may remain connected to the battery.</i></p> <p><i>NOTE: It is important to disconnect power to the sprayer when not in use for safety reasons. ALWAYS verify that the power has been disconnected or the remote switch is in the OFF position before adding chemicals or servicing.</i></p>



## Assembly (continued)

### 7. To disconnect permanently

When it is necessary to disconnect the sprayer's remote switch from the battery, use the following procedure:

1. Disconnect sprayer's pump cord from the remote switch.
2. Disconnect the remote switch from the vehicle battery as follows:
  - a) Disconnect vehicle battery ground wire.
  - b) Disconnect the remote switch's black battery clamp from the *negative(-)* terminal of the vehicle battery.
  - c) Disconnect the remote switch's red battery clamp from the *positive(+)* terminal of the vehicle battery.
  - d) Reconnect the vehicle battery ground wire.

**WARNING:** Always connect in this sequence to avoid possible shock.

*(Remember that on some vehicle models, you may need to remove the sprayer to access the battery)*

### **Step Fifteen: 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.

### 1. Check assembly

**Check assembly to assure the sprayer is properly assembled and in safe working condition:**

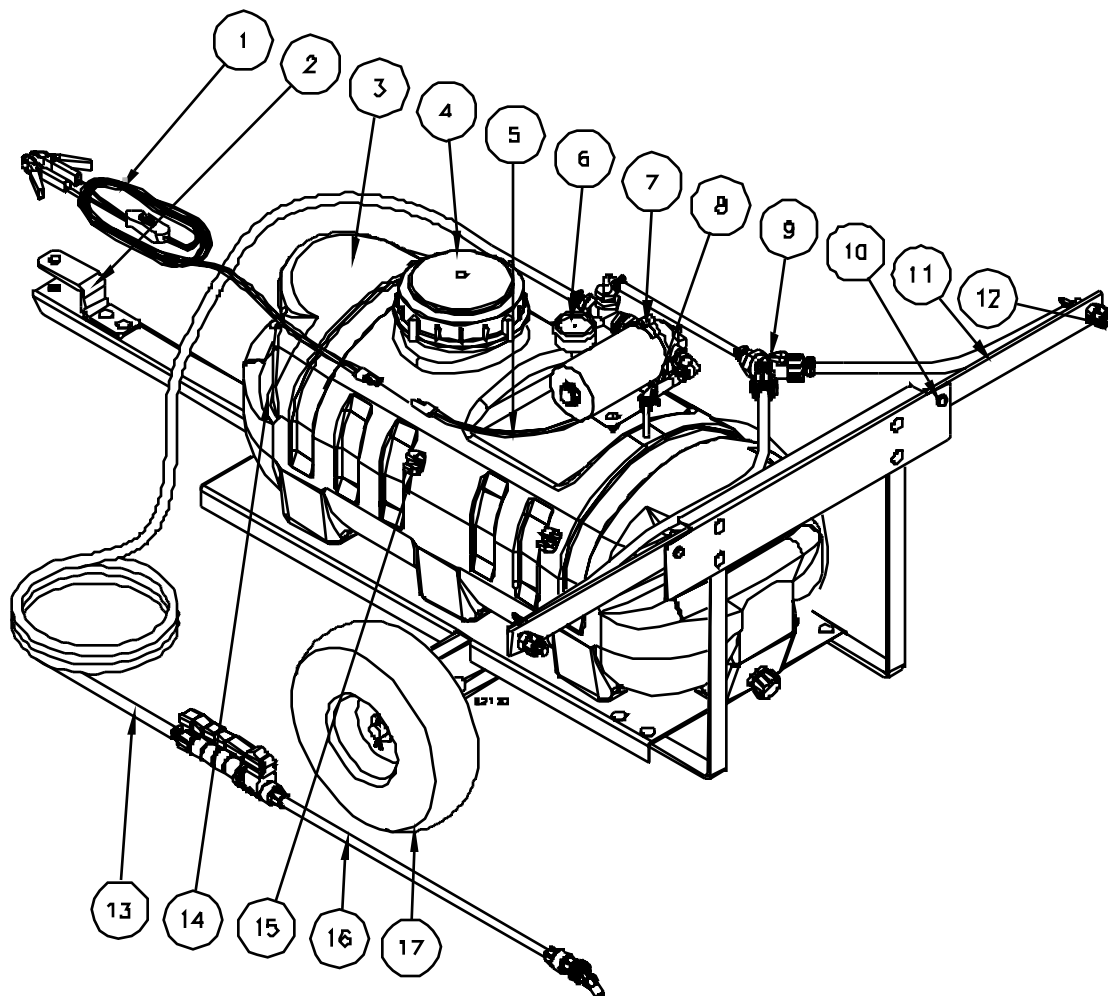
- a) Check that the gun clip screws are tight, hose clamps are secure, and tank straps are properly fastened.
- b) While it is unlikely that factory assembled components become loose, they should also be checked to make sure they are tight.

### 2. Test with water

**Test the system for leaks with water:**

- a) Fill the tank with water.
- b) Connect the remote switch to the pump power cord and turn the remote switch ON. The pump is an "on demand" pump. When turned on, the pump will prime itself, then turn off. When the gun trigger is squeezed, the pump will automatically start.
- c) Operate the spray gun by squeezing the gun trigger.
- d) Check for leaks throughout the system. If a leak is detected, fix the leak and re-test the system with water.

## Machine Components



- 1.) **Remote Switch.** The remote switch connects the battery to the pump power cord and allows the operator to turn the sprayer pump on and off.
- 2.) **Hitch Mount.** The hitch mount connects the vehicle hitch to the sprayer.
- 3.) **Sprayer Tank.** The sprayer tank holds the chemical.
- 4.) **Fill Cap.** The fill cap has a ball check to allow air to enter the tank as the chemical is dispensed, but does not allow chemical to escape the tank.
- 5.) **Pump Power Cord.** The pump power cord connects the remote switch to the pump.
- 6.) **Pressure Gauge.** The pressure gauge is an indicator of the pressure in the system.
- 7.) **Sprayer Pump.** The sprayer pump makes the chemical flow to the spray gun and the nozzle.
- 8.) **Suction Tube.** The suction tube is the inlet line for the pump. The suction tube has a suction strainer to prevent debris from entering the pump.
- 9.) **Boom Valve.** The boom valve shuts off chemical to the left, right, or both boom nozzles.
- 10.) **Pivot.** The pivot allows the boom arms to fold up for easy storage.
- 11.) **Boom Arm.** The boom arm holds the nozzle. They fold for easy storage.
- 12.) **Nozzles.** The nozzles meter and distribute the chemical to a large area.
- 13.) **Gun Hose.** The 186" gun hose transfers chemical from the pump to the spray gun.
- 14.) **Hose Wrap.** The built-in hose wrap provides a storage location for the gun hose on the tank.
- 15.) **Gun Clips.** Use the gun clips to store the spray gun.
- 16.) **Spray Gun.** Use the spray gun to apply chemical to specific areas.
- 17.) **Tires.** The tires have a wide tread to prevent turf damage.

## 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.
- **Keep sprayer off.** Do not turn on power to the sprayer until ready to spray in order to avoid unintentional spray release.
- **Broadcast nozzle down.** 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.
- **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

- **Overapplication.** DO NOT overapply 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.
- **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 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 overinflate. 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>1. 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>a) Eyes – immediately flush with water or follow other directions as specified on the chemical label.</li> <li>b) Skin – immediately wash all contaminated skin surfaces with soap and water, or follow directions as specified on the chemical label.</li> <li>c) 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>2. 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>1. If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated.</li> <li>2. Follow the emergency first aid instructions on the chemical label in the “First Aid” or “Statement of Practical Treatment” section.</li> <li>3. 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>1. <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>2. <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>3. <b>Clean up</b> the spill immediately -- Absorbent materials like ground comcobs or pet litter should be spread on the spill area to soak up the pesticide. The contaminated material should then shoveled into a leakproof container. Do not flush the spill area with water until you receive advice as directed below.</li> <li>4. <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

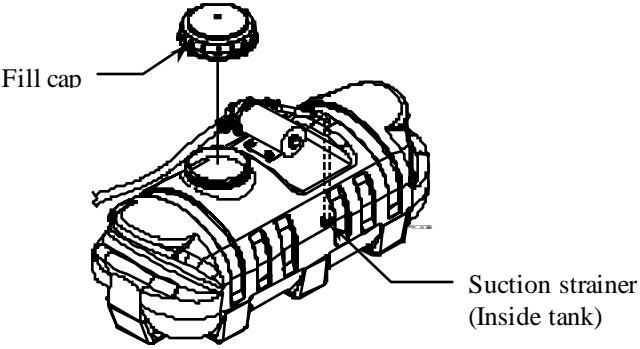
If the sprayer has been used previously, it must be prepared BEFORE EACH SUBSEQUENT USE.

**⚠ 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.

<b>1. Ensure sprayer attached</b>	<b>Ensure the sprayer is securely attached to the towing vehicle.</b>
<b>2. Ensure tank empty</b>	<b>Ensure the sprayer has been thoroughly flushed and drained of all residual chemical from prior uses.</b>
<b>3. Clean suction strainer</b>	<p><b>Clean the suction strainer of any chemical residue.</b> 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><b>IMPORTANT:</b> The strainer must be accessed by reaching into the tank, so the <i>tank must be empty</i> to avoid immersing your hand in chemicals.</p> <ol style="list-style-type: none"> <li>a) Open fill cap on top of tank.</li> <li>b) USING RUBBER GLOVES, reach into the tank and pull the suction strainer off the end of the suction tube. (See figure below.)</li> <li>c) Run the suction strainer under fresh water to remove debris.</li> <li>d) Replace the suction strainer onto the end of the suction tube.</li> </ol> <div style="text-align: center; margin: 10px 0;">  <p style="margin-left: 100px;">Fill cap</p> <p style="margin-right: 100px;">Suction strainer (Inside tank)</p> </div>
<b>4. Inspect &amp; repair</b>	<p><b>Inspect and test the sprayer thoroughly:</b></p> <ol style="list-style-type: none"> <li>a) Inspect hoses for exposed mesh and holes. Replace all worn or damaged hoses.</li> <li>b) Inspect tank and fittings for cracks and leaks. Replace all damaged fittings with original NorthStar parts.</li> <li>c) Check to be sure retaining nut on gun nozzle is tight.</li> <li>d) Check to be sure all other nuts, bolts, and screws are tight.</li> <li>e) Check wheels and tires. Make sure wheel lugs are tight and tires are inflated.</li> <li>f) <i>Partially fill tank with plain water and spray to test for leaks.</i> Repair as needed.</li> </ol> <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>

# 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>	<b>Assess weather conditions to ensure that it is not too windy to spray.</b> <b>DO NOT SPRAY if wind speeds are greater than 4 MPH.</b>  <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.
<b>2. Clear work area</b>	<b>Clear the work area of all bystanders and pets.</b> Restrict access by the public for the period recommended on chemical label.



## Operation - Using the Sprayer (continued)

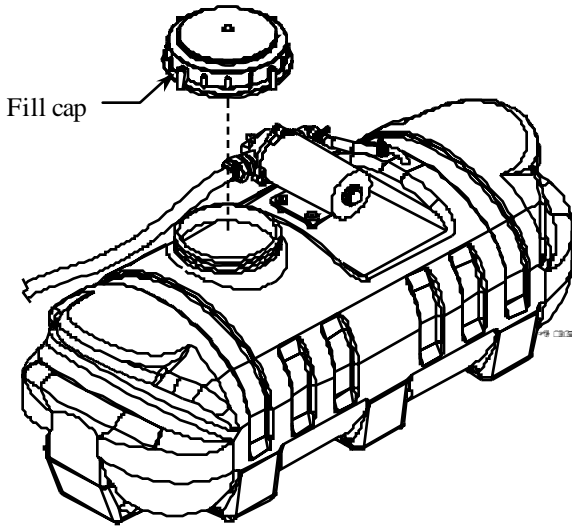
### Step Two: Fill the sprayer.

#### ⚠ WARNING

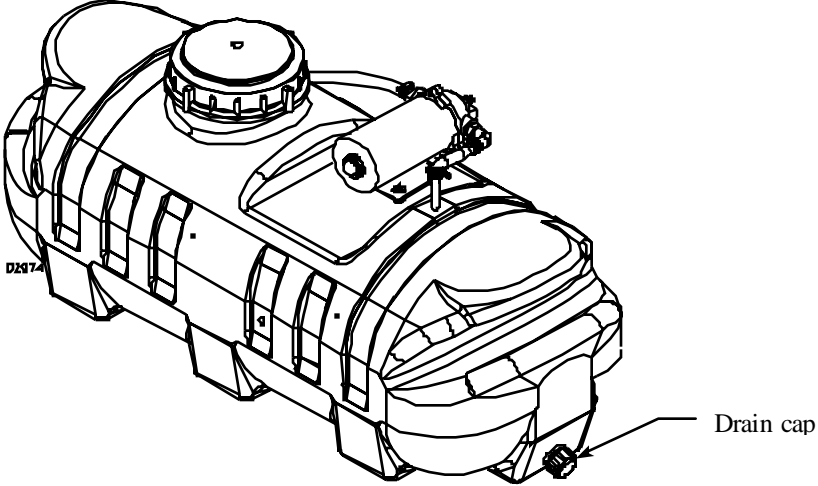
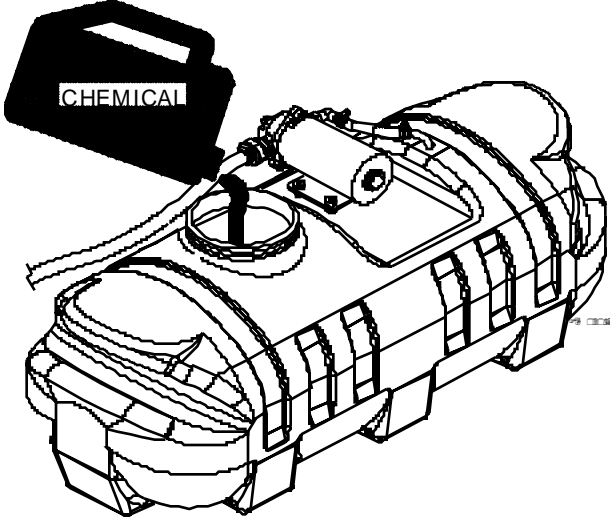
ALWAYS wear personal protective equipment as directed on the chemical label when handling pesticides.

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”</b> related to <u>General Chemical Safety</u> and <u>Chemical Accident Procedures</u> provided in this manual.
<b>2. Choose safe mixing/loading area</b>	<b>Choose a safe pesticide mixing and loading area.</b> - Choose an outdoor, well-ventilated area away from unprotected people, animals, food, and other items that might become contaminated.
<b>3. Wear personal protective equipment</b>	<b>Wear personal protective equipment as directed on the chemical label.</b> - Note that additional equipment may be specified for mixing and loading activities.
<b>4. Turn off sprayer and vehicle</b>	<b>Turn OFF power to the sprayer before filling.</b> - The vehicle should also be off, with brake set or wheels blocked to prevent unintended movement.
<b>5. Remove fill cap</b>	<p><b>Remove the fill cap located on top of the sprayer.</b></p> <div style="text-align: center;">  <p style="margin-left: 100px;">Fill cap</p> </div>
<b>6. Ensure tank flushed</b>	<b>Ensure tank is flushed of all chemicals from prior uses.</b> - Chemicals can interact dangerously when mixed, and residue chemicals are also a health hazard.

## Operation - Using the Sprayer (continued)

<p><b>7. Check drain cap</b></p>	<p>Before filling tank, ensure drain cap is securely tightened.</p> <div style="text-align: center;">  <p style="text-align: right; margin-right: 50px;">Drain cap</p> </div>
<p><b>8. Fill tank</b></p>	<p><b>Add pesticide to tank through fill cap:</b></p> <ol style="list-style-type: none"> <li>a) Confirm the chemical/water dilution ratios specified on the chemical label.</li> <li>b) Determine chemical and water volumes needed for the planned application, taking into consideration that maximum tank capacity is 16 gallons for Item# 28517 and 26 gallons for Item# 28518.  <i>Note: Only purchase and mix as much chemical as you need for the planned application in order to minimize chemical overapplication and the need for storing unused chemicals.</i></li> <li>c) 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> <div style="text-align: center;">  </div>
<p><b>9. Ensure chemical mixed</b></p>	<p><b>Ensure chemical is thoroughly mixed in tank.</b></p> <p>- Stirring device should be made of metal or plastic, non-chemical absorbing material, and then properly cleaned and stored after use.</p>
<p><b>10. Replace fill cap</b></p>	<p><b>Replace fill cap and tighten securely.</b></p>

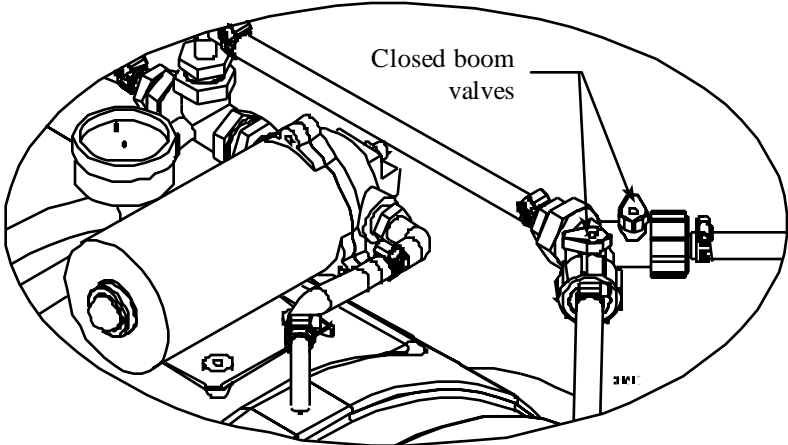
# Operation - Using the Sprayer (continued)

## 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>ATV Vehicle Handling 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. Close boom valves</b>	<p><b>Close boom valves to prevent accidental spray release.</b></p> <div style="text-align: center;">  </div>
<b>4. Turn on power</b>	<p><b>Turn on the power to the sprayer.</b></p> <ol style="list-style-type: none"> <li>1. Verify the remote switch is connected to the pump power cord.</li> <li>2. Turn the remote switch to the “ON” position.</li> </ol> <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>
<b>5. Begin agitation if needed</b>	<p><b>Some formulations of liquid pesticides do not remain in solution and should be agitated to maintain a uniform mix.</b></p> <p>An optional <i>agitator</i> (Item #28520) accessory is available for use with this sprayer and should be used when spraying pesticides classified as “flowable” (“F” or “L”), “wettable 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><b>Contact NorthStar Customer Service at 1-800-270-0810 for any questions about the appropriate use of the sprayer and/or optional accessories.</b></p>

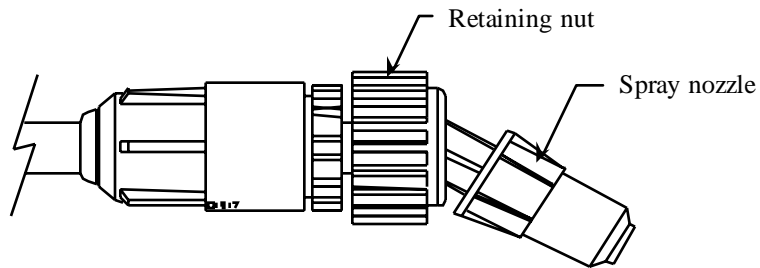
## Operation - Using the Sprayer (continued)

### 6. Squeeze trigger & adjust nozzle

To spray, squeeze the gun trigger.

- 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.

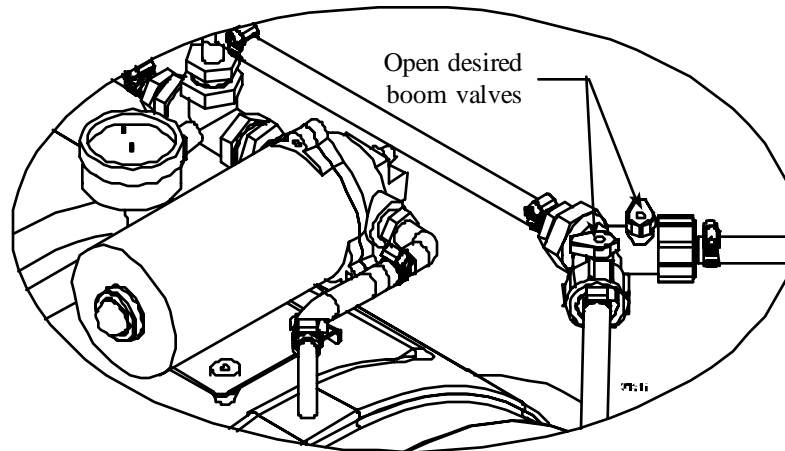
*Note: It is not unusual for the operator to be exposed to chemical drips while adjusting the nozzle – gloves should be chemical resistant.*



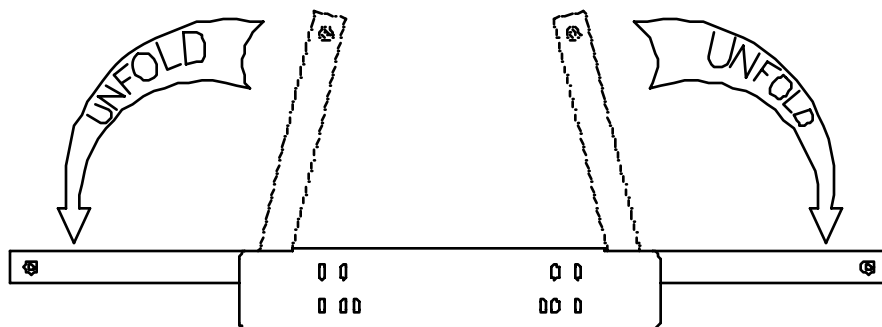
### 7. Operate broadcast boom

#### A. Open boom valves

Open the left, right, or both boom valves as desired.



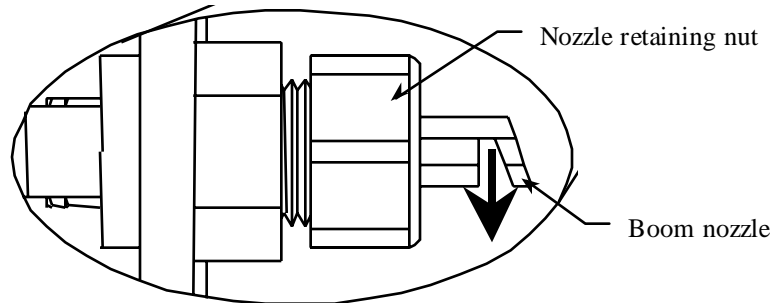
#### B. Unfold one or both boom arms as required



## Operation - Using the Sprayer (continued)

### C. Ensure correct spray pattern

Make sure both boom nozzles are pointed toward the ground. If they are not, loosen the nozzle retaining nut, orient the opening of the boom nozzle to point straight down, then retighten the nozzle retaining nut.



**IMPORTANT:** 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.

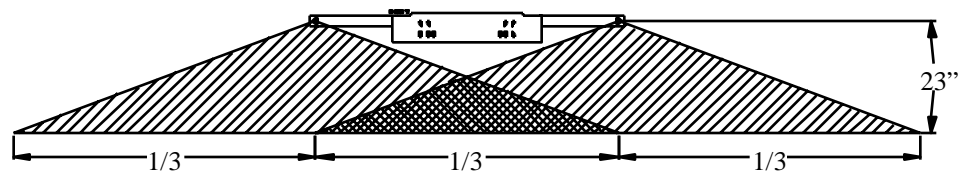
**Note:** It is not unusual for the operator to be exposed to chemical drips while adjusting the broadcast nozzle. Chemical resistant gloves should be worn.

### D. Ensure uniform coverage

To ensure proper coverage, the height of the unfolded boom nozzles should be about 23" from the ground. The sprayer must be level with the ground to get this height.

The overall spray width is 120", but 1/3 or 40" of the overall spray pattern must be overlapped to get equal coverage throughout the spray area.

Use the tables in Appendix A to determine what speed to drive your vehicle for the desired application rate



### E. Begin to spray

Turn the remote switch ON to begin spraying.

<b>8. 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) Disconnect 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>9. Discontinue use if clogged or inoperative</b>	<p><b>If the sprayer becomes clogged or inoperative during use, discontinue use immediately.</b></p> <ul style="list-style-type: none"> <li>- DO NOT attempt to service while chemicals are in the sprayer and power is connected.</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 16 gallons (Item# 28517) or 26 gallons (Item# 28518) 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.

<b>1. Drain tank</b>	<p><b>If there is excess pesticide left in the tank, drain the tank:</b></p> <ul style="list-style-type: none"> <li>a) Disconnect power to the sprayer and relieve system pressure by depressing the gun trigger.</li> <li>b) Find a suitable container in which to drain the unused pesticide. Place it under the tank drain hole.</li> <li>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.</li> <li>d) When tank stops draining, replace drain cap. Tighten securely.</li> </ul>
<b>2. Unused chemical</b>	<p><b>Properly store or dispose of unused chemical:</b></p> <ul style="list-style-type: none"> <li>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.</li> <li>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.</li> </ul>
<b>3. Flush sprayer</b>	<p><b>Flush the sprayer per the chemical manufacturer's recommendations.</b> A general procedure is as follows:</p> <ul style="list-style-type: none"> <li>a) Add fresh water to the tank.</li> <li>b) Reconnect power to the sprayer.</li> <li>c) Operate the spray gun and discharge all rinse water onto an area that can accept dilute pesticide application.</li> <li>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.</li> <li>e) After flushing, disconnect power to the sprayer and be sure all system pressure is relieved by squeezing the gun trigger.</li> <li>f) Dispose of cleaning solution discharge as recommended by the manufacturer of the solution.</li> </ul>
<b>4. Decontaminate &amp; launder</b>	<p><b>Decontaminate yourself after you are finished handling chemicals:</b></p> <ul style="list-style-type: none"> <li>a) Remove all clothing worn during spraying and chemical handling.</li> <li>b) Wash all exposed parts of the body with soap and water.</li> <li>c) Launder clothing separately from other wash.</li> </ul>

## 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.

### 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>	Pour 1 gallon of RV antifreeze into the tank. <i>Note: RV antifreeze is non-toxic and biodegradable and generally safer for the environment than automotive antifreeze.</i>
<b>2. Spray briefly</b>	Turn on the pump motor and squeeze the gun trigger briefly until fluid sprays.

#### Removing from storage:

<b>1. Drain</b>	Drain the antifreeze left in the tank through the tank drain hole into a suitable container.
<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 16 gallons (Item# 28517) or 26 gallons (Item# 28518) 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>Disconnect power to the sprayer and be sure all system pressure is relieved by squeezing the gun trigger.</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>

PROBLEM	CAUSE	SOLUTION
Pump will not turn on	Bad electrical connection	Check battery connections
	Short in wires	Check condition of wires
	Low voltage	Check voltage
Low pressure	Worn spray gun nozzle	Replace spray gun
	Worn boom nozzle	Replace boom nozzle
Low flow	Clogged intake tube	Remove obstruction
	Clogged suction strainer	Clean suction strainer
	Low voltage	Check voltage
Poor spray distribution	Clogged intake tube	Remove obstruction
	Suction strainer clogged	Clean suction strainer
	Worn spray gun nozzle	Replace spray gun
Pump cycles while not spraying	Leak in the system	Tighten leaking hose clamps or fittings, replace spray gun



## Specifications

### Electrical System Requirements

Electrical connection.....	12 VDC
Amp draw from pump.....	7.0 Amps

### Sprayer Specifications

Maximum GPM.....	1.8 GPM
Continuous Pressure.....	60 PSI
Tank Maximum Capacity.....	16 Gallons (Item #28517) 26 Gallons (Item #28518)

### Overall Dimensions

Item #28517.....	34.0”L x 14.5”W x 20.5”H
Item #28518.....	34.0”L x 14.5”W x 24.5”H
Dry Weight / Weight full of water	
Item #28517.....	60 lb. / 188 lb.
Item #28518.....	65 lb. / 273 lb.

### Broadcast Nozzle Specifications

Overall Spray Width	120 in.
Recommended Overlap	40 in.

### Component Materials\*

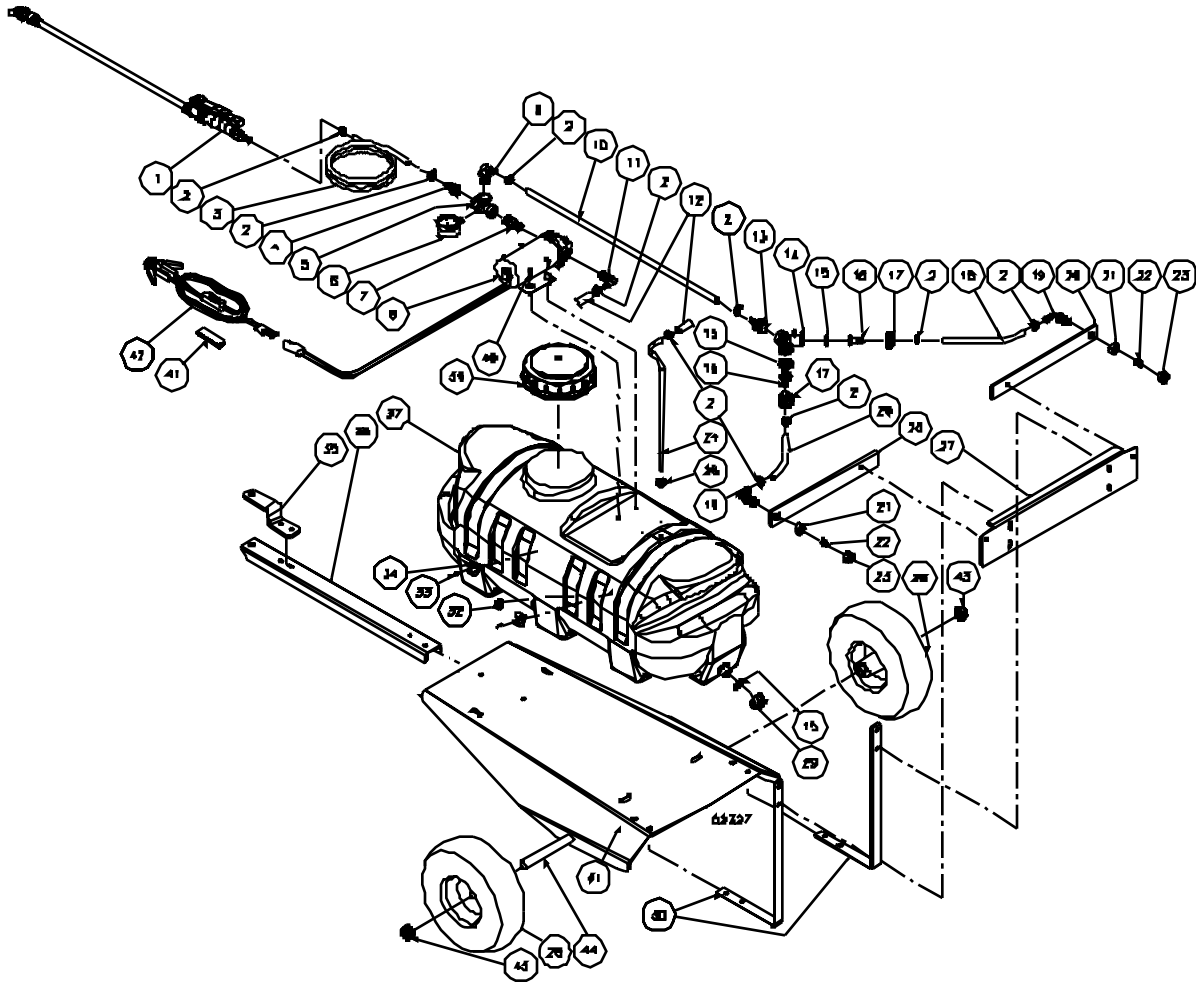
Tank.....	Polyethylene, EPDM
Suction Tube.....	Polypropylene, PVC, Stainless Steel
Hose.....	PVC
Pump.....	Polypropylene, Viton, Sanoprene
Valves.....	PVC, Buna-N
Gun and Nozzle.....	Nylon, Polyacetal

\*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 Customer Service 1-800-270-0810***

## Exploded View – 28517/28518 – Rev. L



Item	Part#	Description	Model	Qty
1	39265	Spray gun	All	1
2	30746	Hose clamp	All	10
3	30290	Gun hose	All	186"
4	5286	Hose barb	All	1
5	5377	Tee w/ gauge port	All	1
6	777848	Pressure gauge	All	1
7	5239	Pump fitting	All	1
8	37690	Sprayer pump	All	1
9	35082	Hose barbelbow	All	1
10	30290	14" Hose	All	1
11	34115	Hose barbelbow	All	1
12	30290	4.5" Suction hose	All	1
13	5387	Hose barb	All	1
14	777849	Boom valve	All	1
15	5232	Rubber washer	All	3
16	5380	3/8" Flat seat hose barb	All	2
17	777850	Swivel nut	All	2
18	30290	14" Hose	All	1
19	5383	Nozzle hose barb	All	2
20	30172	Boom arm	All	2
21	5230	Nozzle nut	All	2
22	777359	Nozzle	All	2

Item	Part#	Description	Model	Qty
23	777853	Swivel nut	All	2
24	38579	16 Gallon suction tube	28517	1
	38580	26 Gallon suction tube	28518	1
25	37689	Suction strainer	All	1
26	30290	24" Hose	All	1
27	37697	Boom bracket	All	1
28	2278	Tire	All	2
29	37680	Drain cap	All	1
30	37698	Boom support	All	2
31	778190	Cart base	All	1
32	777110	Hose guide	All	1
33	82057	#10 x 1/4" Screw	All	2
34	52034	Gun clip	All	2
35	778036	Hitch mount	All	1
36	778038	Tongue	All	1
37	777468	16 Gallon tank	28517	1
	777469	26 Gallon tank	28518	1
39	778143	Tank Lid	All	4
40	82061	#10 x 1" Screw	All	1
41	35363	Velcro	All	1
42	777493	Remote Switch	All	1
43	305200	Wheel Retainer	All	2
44	778039	Axle	All	1

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

# 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 ATV is listed below the application rates.

**TABLE 1**

Spray Height	Pressure (PSI)	GALLONS PER ACRE – based on water at 40” spacing						
		1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7 MPH	10 MPH
23”	15	54.4	27.2	18.2	13.6	10.9	7.8	5.45
23”	25	70.4	35.2	23.5	17.6	14.1	10.1	7.05
23”	35	83.2	41.6	27.8	20.8	16.7	11.9	8.35

Spray Height	Pressure (PSI)	GALLONS PER 1000 SQUARE FEET – based on water at 40” spacing						
		1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7 MPH	10 MPH
23”	15	1.25	.624	.418	.312	.250	.179	.125
23”	25	1.62	.808	.539	.404	.324	.232	.162
23”	35	1.91	.767	.638	.478	.383	.273	.192

Spray Height	Pressure (PSI)	GALLONS PER 100 SQUARE FEET – based on water at 40” spacing						
		1 MPH	2 MPH	3 MPH	4 MPH	5 MPH	7 MPH	10 MPH
23”	15	.125	.062	.042	.031	.025	.018	.013
23”	25	.162	.081	.054	.040	.032	.023	.016
23”	35	.191	.077	.064	.048	.038	.027	.019

\* Approximate flow from one nozzle

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

**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:** 26 gallons divided by 12 gallons/acre = 2.16 acre of coverage per tank.

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