



M1572210C

ITEM NUMBER: 1572210, 1572212,
1572213

SERIAL NUMBER: _____

Owner's Manual

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

Soft wash kit with bleach pump: For building a soft wash sprayer with tank for outdoor use with bleach**

WARNING

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

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

EXERCISE CAUTION when mixing chemicals as incorrect ratios or mixtures could release harmful gases.

READ and FOLLOW chemical label instructions.

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. Some chemicals are especially toxic to them.

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

SOAK vegetation in the area surrounding the work zone well prior to and after spraying bleach. Bleach can kill vegetation if not rinsed thoroughly.

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 bleach. The sprayer will be damaged, and warranty voided if used to apply any petroleum-based product (gasoline, diesel, kerosene, or 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 BLEACH. 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. 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 at 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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Table of Contents

| | |
|--|-------|
| Intended Use | 4 |
| Summary of Important Safety Information | 5-6 |
| During Assembly | |
| During Operation | |
| • General Chemical Safety | |
| • Chemical Application Safety | |
| • Chemical Accident Procedures | |
| Warning Label Locations | 7 |
| Component Inventory | |
| Unpacking the Manual Bag | 8-10 |
| Assembly | 11-13 |
| Features | 14 |
| Operation | |
| Important Safety Information - Operation | 15-18 |
| • General Chemical Safety | |
| • Chemical Application Safety | |
| • Chemical Accident Procedures | |
| Preparing the Sprayer for Each Use | 19 |
| Using the Sprayer | |
| Step One: Assess wind conditions and clear work area | 20 |
| Step Two: Mixing chemicals | 21 |
| Step Three: Operate the sprayer | 22-24 |
| Step Four: Clean sprayer and decontaminate after use | 25 |
| Storage | 26 |
| Preparing for storage | |
| Removing from storage | |
| Troubleshooting | 27 |
| Maintenance | 28 |
| Specifications | 29 |
| Exploded View and Parts Breakdown | 30 |
| Pump Exploded View | 31-32 |
| Limited Warranty | 33 |

Intended Use

The kit for building a sprayer is intended for use in spraying bleach concentrations of 3% or less.

SPRAYING CHEMICALS:

Hazardous chemicals must be handled with caution as directed throughout this manual and on the chemical label.

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

Always flush the sprayer after each use to clean the chemical out of the pump, hoses, and spray gun. The life of the sprayer will be shortened if it is not flushed after each use.

WE RECOMMEND THAT THE SPRAYER NOT BE USED FOR OTHER PURPOSES.

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.

NOTE: The sprayer will be damaged, and warranty voided, if used to apply any petroleum-based product (gasoline, diesel, kerosene, or oil).

NOTICE: Not for use on painted wood surfaces. Use only on hard, non-porous surfaces.

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** -----

- **EXERCISE CAUTION** when attaching wire harness to battery terminals. Follow the steps listed in the Assembly section of this manual in *exact sequence* when connecting the sprayer's wire harness 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's design.

----- **DURING OPERATION** -----

General Chemical Safety

- **READ and FOLLOW** all chemical label 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.** Some chemicals 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 chemicals** in the sprayer.
- **STORE chemicals in a correctly labeled container and in a secure location.**
- **MONITOR the health of operators frequently exposed to chemicals**, 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.
- **DO NOT SPRAY** when wind speed exceeds 5 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.
- **SOAK** vegetation in the area surrounding the work zone prior to spraying bleach. Bleach can kill vegetation if not soaked thoroughly.
- **KEEP sprayer and spray materials away from children/pets.** Some chemicals can be especially toxic to children and animals.
- **DO NOT ALLOW anyone younger than 16 to operate sprayer** since some chemicals are especially toxic to children.

During Spraying

- **DO NOT OVERAPPLY chemicals.** Apply at rate recommended by chemical manufacturer. Excess chemicals can be dangerous to humans and 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.

Summary of Important Safety Information (continued)

- **CLEAN up spills immediately** per instructions on chemical labels.
- **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

- **SOAK** vegetation in the area surrounding the work zone immediately after spraying bleach. Bleach can kill vegetation if not soaked thoroughly.
- **CLEAN sprayer immediately after use** according to the directions provided in this manual.
- **DECONTAMINATE yourself after you are done spraying** and have cleaned the sprayer. Wash all exposed areas of the body with soap and water and remove and launder clothing.
- **DISPOSE OF or STORE remaining chemicals in secure storage with correctly marked container.**

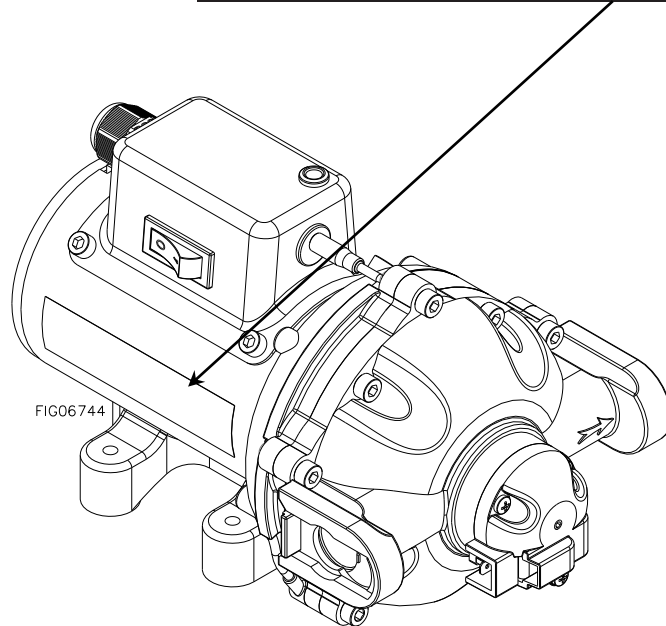
Chemical accident procedures

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

| | |
|---|--|
| Sprayer leak | If the sprayer develops a leak, <i>immediately stop spraying.</i> Turn off power to the sprayer and follow directions below, as applicable. |
| Bodily chemical contact | <p>Personal contamination can occur when chemicals splash, spill, or spray directly onto a person.</p> <ol style="list-style-type: none"> 1. Immediately follow First Aid instructions on chemical label. <u>General procedures for contact with bleach or surfactant includes:</u> <ol style="list-style-type: none"> a) Eyes – immediately rinse with water for 15 minutes. If irritation persists, contact a doctor. b) Skin – rinse all contaminated skin surfaces with water. If irritation persists, contact a doctor. c) Clothing – remove contaminated clothing. Dispose of heavily contaminated clothing per chemical label instructions. 2. Seek medical advice if instructed on the label or the victim experiences symptoms of harmful effects. Bring the chemical label for reference. |
| Poisoning by ingestion or inhalation | <p>In case of poisoning from ingestion or inhalation:</p> <p><i>If the victim has collapsed or is not breathing, call 911.</i> Otherwise:</p> <ol style="list-style-type: none"> 1. If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated. 2. Immediately follow first aid instructions on chemical label. <u>General procedures for ingestion or inhalation of bleach or surfactant includes:</u> <ol style="list-style-type: none"> a) For ingestion: Drink a glassful of water. Call a doctor or poison control center. DO NOT induce vomiting unless instructed to do so by a doctor or poison control center. b) For inhalation: Immediately move to fresh air. 3. Call a poison control center for further advice. In the U.S., call 1-800-222-1222. Have the chemical label available for reference. |
| Chemical spills | <p>Chemical spills must be quickly contained and properly cleaned up.</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"> 1. Controlling the spill by stopping the source of the spill. 2. Containing the spill so that it does not spread and get into water sources. 3. Cleaning up the spill immediately. 4. Seeking additional advice from: <ul style="list-style-type: none"> - <u>Chemical manufacturer.</u> See chemical label for contact information. - <u>State pesticide regulatory agency.</u> In the U.S., call the National Pesticide Info. Ctr. at 800-858-7378 for assistance in contacting your state's agency. |

Warning Label Location

⚠ WARNING
DO NOT PUMP FLAMMABLE FLUIDS. DO NOT USE PUMP IN AN EXPLOSIVE ENVIRONMENT. READ AND UNDERSTAND THE OWNER'S MANUAL COMPLETELY BEFORE USING. RELIEVE SYSTEM PRESSURE BEFORE PERFORMING MAINTENANCE.



⚠ 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.

EXERCISE CAUTION when mixing chemicals as incorrect ratios or mixtures could release harmful gases.

READ and FOLLOW chemical label instructions. Hazardous chemicals 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.

DO NOT TURN ON power to sprayer until ready to spray in order to avoid inadvertent spray release. RINSE vegetation in the area surrounding the work zone well prior to and after spraying chemical.

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. Consult Owner's Manual for ordering instructions.

PN 799870

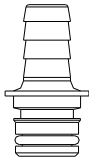
| Part# | Description | Model |
|--------|------------------------|-------|
| 793288 | Pump Warning Label | All |
| 799870 | Chemical Warning Label | All |

Always make sure safety labels are in place and in good condition. If a safety label is missing or not legible, order new labels or unsafe operation could result.

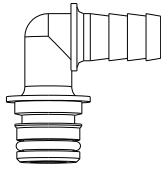
To order replacement safety labels, call NorthStar Product Support at: 1-800-270-0810.

Unpacking the Manual Bag

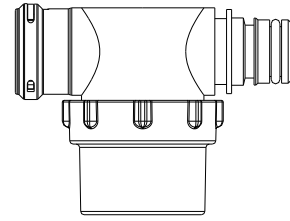
The following items are found in the 1572210 manual bag.



Fitting, QC x 1/2" HB, straight
787193
(Qty 2)



Fitting, QC x 1/2" HB, elbow
787197
(Qty 1)



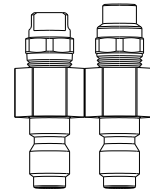
Inlet strainer
798855
(Qty 1)



Hose clamp
777119
(Qty 3)



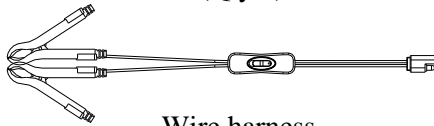
Screw, #10-24 x 1-1/4"
802176
(Qty 4)



Nozzle holder – 799883
25° Fan tip nozzle – 801851
Straight stream nozzle – 801852
(Qty 1 each)



Nut, #10-24 Nyloc
802008
(Qty 4)



Wire harness
793521
(Qty 1)

⚠ WARNING

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READ and FOLLOW chemical label instructions. Hazardous chemicals 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.

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

RINSE vegetation in the area surrounding the work zone well prior to and after spraying chemical.

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.

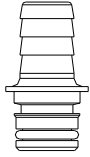
Replace this label if damaged or destroyed. Consult Owner's Manual for ordering instructions.

PN 799870

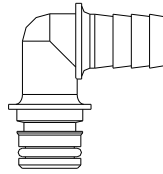
Decal, chemical warning
799870
(Qty 1)

Unpacking the Manual Bag

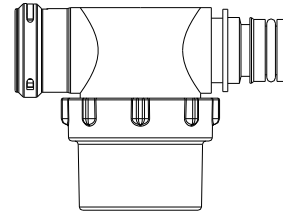
The following items are found in the 1572212 manual bag.



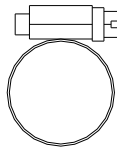
Fitting, QC x 5/8" HB, straight
801591
(Qty 2)



Fitting, QC x 5/8" HB, elbow
799878
(Qty 1)



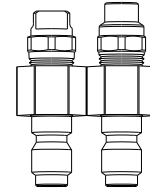
Inlet strainer
798855
(Qty 1)



Hose clamp
793231
(Qty 3)



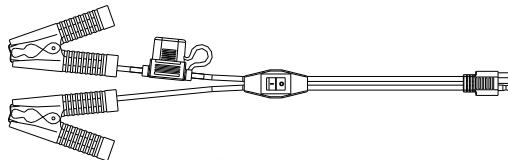
Screw, #10-24 x 1-1/4"
802176
(Qty 4)



Nozzle holder – 799883
25° Fan tip nozzle – 799939
Straight stream nozzle – 799940
(Qty 1 each)



Nut, #10-24 Nyloc
802008
(Qty 4)



Wire harness
797599
(Qty 4)

⚠ WARNING

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EXERCISE CAUTION when mixing chemicals as incorrect ratios or mixtures could release harmful gases.

READ and FOLLOW chemical label instructions. Hazardous chemicals 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.

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

RINSE vegetation in the area surrounding the work zone well prior to and after spraying chemical.

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.

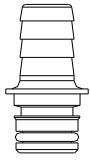
Replace this label if damaged or destroyed. Consult Owner's Manual for ordering instructions.

PN 799870

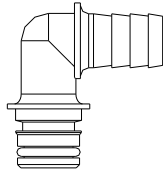
Decal, chemical warning
799870
(Qty 1)

Unpacking the Manual Bag

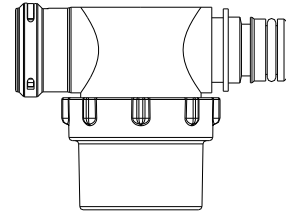
The following items are found in the 1572213 manual bag.



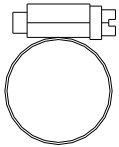
Fitting, QC x 5/8" HB, straight
801591
(Qty 2)



Fitting, QC x 5/8" HB, elbow
799878
(Qty 1)



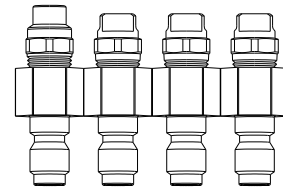
Inlet strainer
798855
(Qty 1)



Hose clamp
793231
(Qty 3)



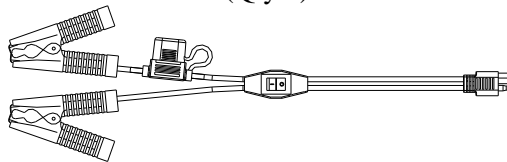
Screw, #10-24 x 1-1/4"
802176
(Qty 4)



Nozzle holder – 801240
Straight stream nozzle – 801859
25° Fan tip nozzle – 801858
40° Fan tip nozzle – 801241
60° Fan tip nozzle – 801242
(Qty 1 each)



Nut, #10-24 Nyloc
802008
(Qty 4)



Wire harness
797599
(Qty 1)

! 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.

EXERCISE CAUTION when mixing chemicals as incorrect ratios or mixtures could release harmful gases.

READ and FOLLOW chemical label instructions. Hazardous chemicals 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.

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

RINSE vegetation in the area surrounding the work zone well prior to and after spraying chemical.

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. Consult Owner's Manual for ordering instructions.

PN 799870

Decal, chemical warning
799870
(Qty 1)

Assembly

Step One: Mounting

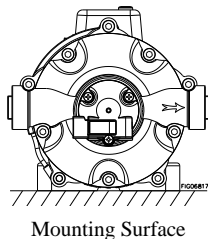
- This NorthStar pump is self-priming.
- The pump should be located in an area that is dry and provides adequate ventilation.

⚠ CAUTION

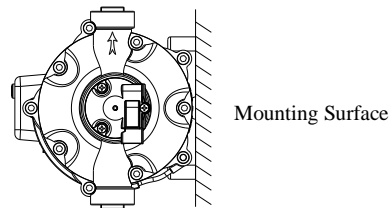
DO NOT locate the motor near low temperature plastics or combustible material. The surface temperature of the motor may exceed 250°F [121°C].

- The pump may be mounted in any horizontal position. **DO NOT** mount pump vertically, doing so will prevent the Motor Armor system from operating correctly.

Correct orientation



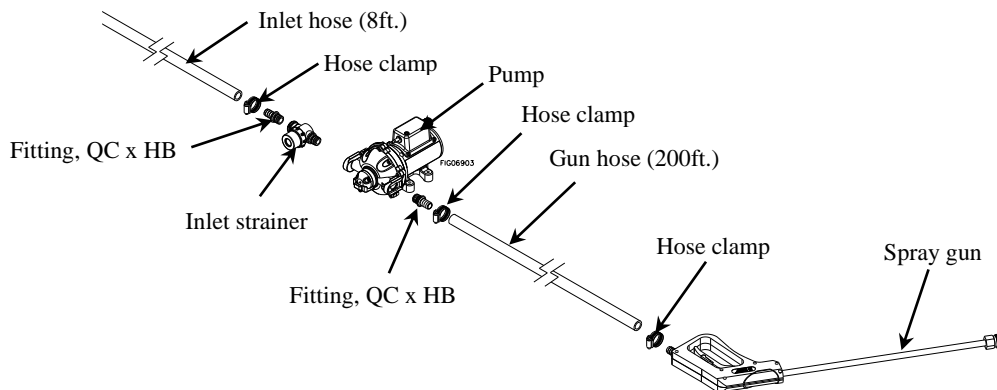
Incorrect orientation



- Secure the rubber base with #10 fasteners. **DO NOT** compress the base, as doing so will reduce the ability to isolate vibration and noise.
- See specifications section for the mounting pattern & dimensions.

Step Two: Plumbing

- Remove shipping plugs from pump ports.
- Insert inlet strainer to the inlet quick connect port of the pump.
NOTE: To insert quick connect fittings, lubricate O-ring with water and twist fitting while inserting into pump port.
- Insert one quick connect fitting to the inlet strainer, and one quick connect fitting to the outlet port of the pump.
- Attach inlet hose (8ft. piece of hose) to the hose barb on the inlet side. Install with hose clamp. The other end of the inlet hose should be routed to a nearby water supply (i.e. water tank).
NOTE: Restrictions on the inlet may cause a loss in performance. Inlet pressure must not exceed 30 psi [2.1 bar]
- Attach one end of the gun hose (200ft. hose) to the hose barb on the outlet side of pump. Attach the other end of the gun hose to the spray gun.
NOTE: An additional elbow fitting is included for different plumbing configurations on either the inlet or outlet.



Assembly

Step Three: Connect to battery or 12V DC supply.

⚠ 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 wire harness to the battery terminals.

1. Preparatory safety

Preparatory safety steps:

- ALWAYS use eye protection.
- NEVER smoke or work near sparks or other sources of ignition.
- NEVER touch both battery terminals at the same time or with any non-insulated tools.
- If battery acid contacts skin or clothing, flush immediately with water and neutralize with baking soda.

2. Electrical requirements

- The pump should be on a dedicated (individual) circuit. Do not use wires longer than those provided in the kit.
- The pump is protected with a fuse. Use an approved wire of the size specified or heavier.

| Voltage | Model | Fuse (amp) | Fuse Type |
|---------|---------|------------|------------|
| 12V DC | 1572210 | 15.0 | Mini blade |
| 12V DC | 1572212 | 15.0 | Mini blade |
| 12V DC | 1572213 | 20.0 | Mini blade |

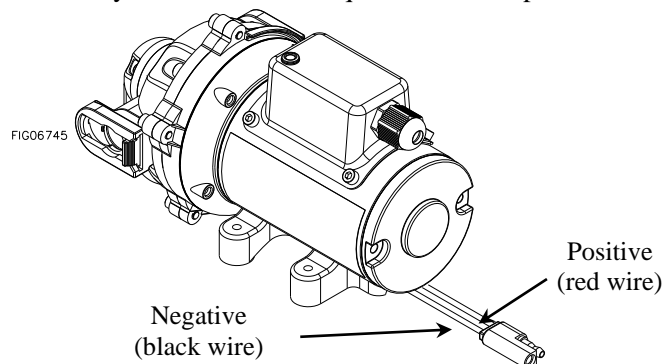
3. Connect pump to battery

Connect the pump to a 12V DC battery using the following procedure:

- a) Disconnect the vehicle battery ground wire.
- b) Connect the pump's red wire to the **positive (+)** terminal of the battery.
- c) Connect the pump's black wire to the **negative (-)** terminal of the battery.
- d) Reconnect the vehicle battery ground wire.

Note: Skip steps (a) and (d) if battery is not in a vehicle.

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



Assembly

| | |
|--------------------------------|--|
| 4. Verify connection | Verify a complete connection has been made by checking with a DC voltmeter, or by <i>briefly</i> turning the ON/OFF switch on the pump and on the wire harness to the ON position and listening for pump activation. |
| 5. Disconnect after use | <p>AFTER EACH USE, disconnect power to the pump using the following procedure:</p> <ol style="list-style-type: none"> a) Disconnect the vehicle battery ground wire. b) Disconnect the <u>pump's</u> black wire from the negative (-) terminal of the battery. c) Disconnect the <u>pump's</u> red wire from the positive (+) terminal of the battery. d) Reconnect the vehicle battery ground wire. <p>Note: Skip steps (a) and (d) if battery is not in a vehicle.</p> <p>WARNING: Always disconnect in this sequence to avoid possible shock.</p> <p><i>NOTE: It is important to disconnect power to the pump when not in use for safety reasons. ALWAYS verify that the power has been disconnected before adding chemicals or servicing.</i></p> |

Step Four: Affix chemical warning decal.

- Peel chemical warning decal off of paper backing
- Attach chemical warning decal to supply tank or other visible surface on the soft wash system.

Step Five: Check and test completed assembly.

⚠ WARNING

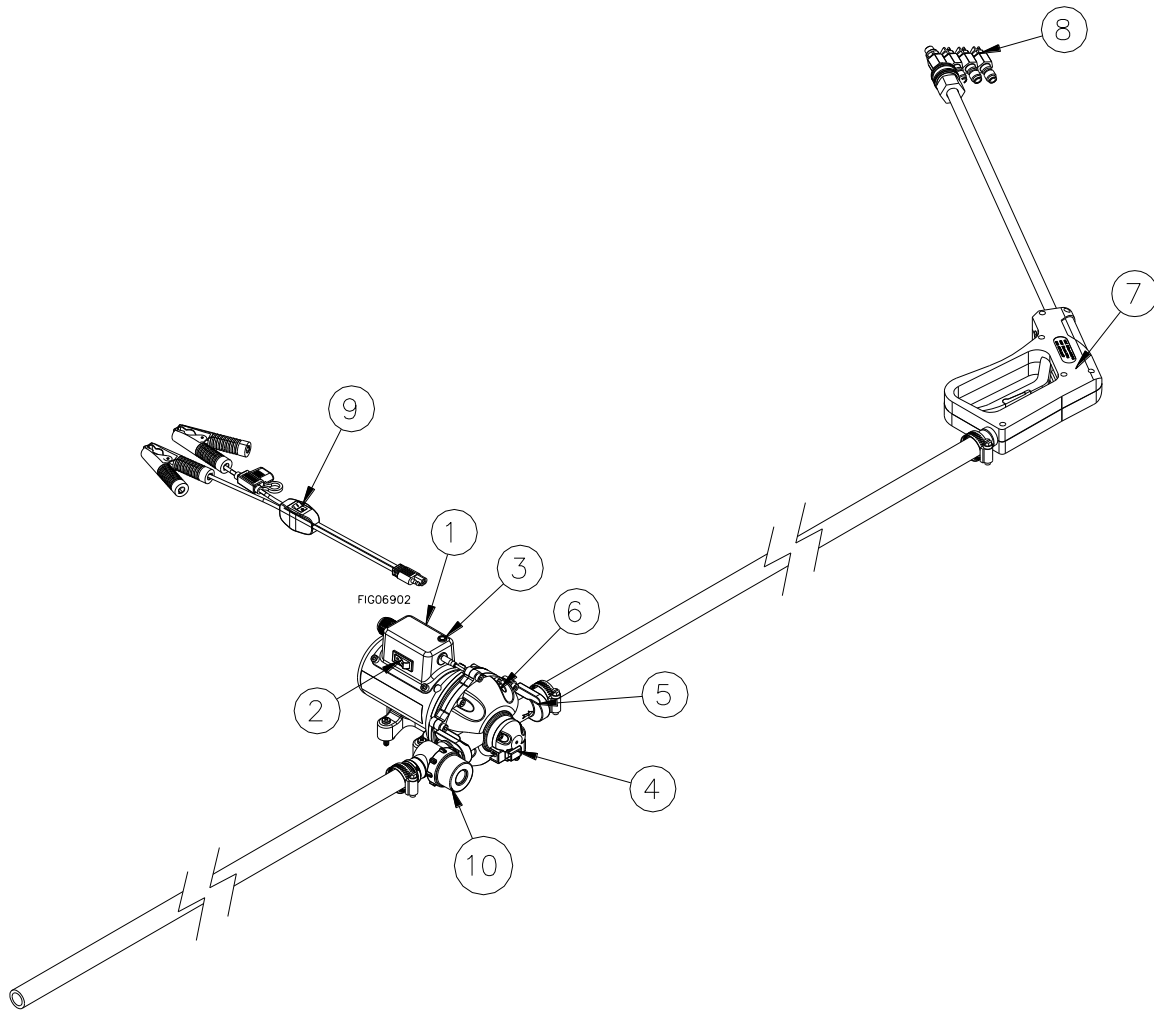
Check and test completed assembly

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's design.

| | |
|---------------------------|--|
| 1. Check assembly | Check assembly to assure the pump is properly assembled and in safe working condition: |
| 2. Test with water | <p>Test the system for leaks with water:</p> <ol style="list-style-type: none"> a) Fill the tank with water. b) The pump is an “on demand” pump. When turned on, the pump will prime itself, then turn off once reaching pressure. When the flow continues, the pump will automatically re-start. c) Check for leaks throughout the system. If a leak is detected, fix the leak and re-test the system with water. |

Features



1. **Motor Armor System.** This system will shut the pump off in the event of a leak inside the pump cartridge to prevent damage to the motor.
2. **ON/OFF Switch.** Allows the operator to turn the pump on and off.
3. **LED.** Red LED illuminates when there is a fluid leak inside the pump cartridge.
4. **Pressure Switch.** The pressure switch reacts to pressure, and interrupts power at the preset shut-off pressure indicated on the pump label. When outlet pressure drops below a predetermined limit, the switch will close, and the pump operates until the shut-off pressure is achieved. The shut-off pressure is set to factory calibrated standards.
5. **Quick Connect Ports.** Allows quick and easy fitting removal.
6. **Pump Cartridge.** The portion of the pump that moves fluid. Quickly and easily replace the low-cost consumable pump cartridge once it is worn or leaking.
7. **Spray Gun.** Use the spray gun to apply chemical to specific areas. When the pump ON/OFF switch is in the ON position, the spray gun trigger is the pump ON/OFF control. Squeeze the trigger and the pump turns on, let go and the pump turns off.
8. **Spray Nozzle.** Quick connect allows easy change to different nozzle tips.
9. **Wire Harness.** The wire harness connects the battery to the pump. The in-line switch allows the operator to turn the pump on and off.
10. **Suction Strainer.** The suction strainer protects the pump from debris and has a clear removable bowl for easy cleaning.

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.

WARNING

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

General Chemical Safety:

WARNING

- 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.** Some chemicals 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.
- **Chemical interaction.** ALWAYS flush the sprayer before switching chemicals. Different chemicals may interact dangerously with each other.
- **Chemical storage.** ALWAYS store chemicals 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 chemicals, 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

- **Soak.** ALWAYS soak vegetation in the area surrounding the work zone before spraying bleach. Bleach can kill vegetation if not soaked thoroughly.
- **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.
- **Wind speed.** NEVER spray when wind speed exceeds 5 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. Some chemicals are especially toxic to children.

During Spraying

- **Over application.** DO NOT over-apply chemicals. Apply at a rate recommended by chemical manufacturer. Excess chemical 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 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

- **Soak.** ALWAYS soak vegetation in the area surrounding the work zone after spraying bleach. Bleach can kill vegetation if not soaked thoroughly.
- **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)

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 | <p>In the event that the sprayer develops a leak while spraying chemicals, you must <i>immediately stop spraying</i>.</p> <p style="padding-left: 20px;">Turn off power to the sprayer and follow the directions below, as applicable.</p> <p>If the leak is internal in the pump cartridge, the pump will automatically shut off, and the indicator light will turn on.</p> <p style="padding-left: 20px;">The pump will not turn back on until the pump cartridge has been replaced and there is no leaking present.</p> |
| Bodily chemical contact | <p>Personal contamination can occur when chemicals splash, spill, or spray directly onto a person.</p> <ol style="list-style-type: none"> 1. Follow the emergency first aid instructions on the chemical label listed in the First Aid or Statements of Practical Treatment sections. <u>General procedures for contact with bleach or surfactant includes:</u> <ol style="list-style-type: none"> a) Eyes – immediately rinse with water for 15 minutes. If irritation persists, contact a doctor. b) Skin – rinse all contaminated skin surfaces with water. If irritation persists, contact a doctor. c) Clothing – remove contaminated clothing. Dispose of heavily contaminated clothing per chemical label instructions. 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. |
| Poisoning by ingestion or inhalation | <p>In case of poisoning from ingestion or inhalation:</p> <p>IF THE VICTIM HAS COLLAPSED OR IS NOT BREATHING, <u>CALL 911</u>. Otherwise:</p> <ol style="list-style-type: none"> 1. If you are the victim, immediately seek assistance from nearby personnel because you may become incapacitated. 2. Follow the emergency first aid instructions on the chemical label in the First Aid or Statement of Practical Treatment sections. <u>General procedures for ingestion or inhalation of bleach or surfactant includes:</u> <ol style="list-style-type: none"> c) For ingestion: Drink a glass of water. Call a doctor or poison control center. DO NOT induce vomiting unless instructed to do so by a doctor or poison control center. d) For inhalation: Immediately move to fresh air. 3. Call a poison control center for further advice. In the U.S., call 1-800-222-1222 to be automatically linked to the nearest certified poison control center. Have the chemical label available for reference. |

Operation – Important Safety Information (continued)

Chemical spills

Chemical spills must be quickly contained and properly cleaned up.

Refer to the chemical label for any specific clean-up instructions with regard to the chemical spilled.

General procedures include:

1. **Control** 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.
2. **Contain** 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.
3. **Clean up** the spill immediately. Absorbent materials like ground corncobs or pet litter should be spread on the spill area to soak up the chemical. 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.
4. **Seek additional advice** from the chemical manufacturer and your state's pesticide regulatory agency regarding decontamination of the spill site:
 - *Chemical manufacturer.* The chemical label provides contact information for the chemical manufacturer.
 - *State pesticide regulatory agency.* 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.

Operation – Preparing the Sprayer for Each Use

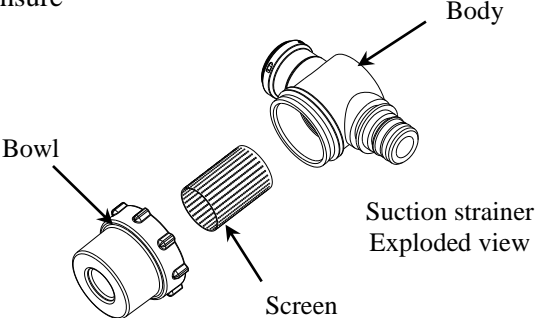
If the sprayer has been used previously, it must be prepared BEFORE EACH SUBSEQUENT USE.

⚠ 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.

| | |
|----------------------------------|--|
| 1. Ensure clean system | Ensure the pump has been thoroughly flushed and drained of all residual chemicals from prior uses. |
| 2. Clean suction strainer | <p>Clean the suction strainer of any chemical residue.</p> <p>It is important to clean the suction strainer before and after each use to ensure it is not clogged and to prevent residual chemicals from contaminating sprayer contents.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin-right: 20px;"> <p>a) USING RUBBER GLOVES, remove strainer bowl.</p> <p>b) Run the suction strainer under fresh water to remove debris.</p> <p>c) Replace the suction strainer bowl.</p> </div>  </div> <p style="text-align: right; margin-right: 50px;">Suction strainer Exploded view</p> |
| 3. Inspect & repair | <p>Inspect and test the system thoroughly:</p> <p>a) Inspect hoses for exposed mesh and holes. Replace all worn or damaged hoses.</p> <p>b) Inspect fittings for cracks and leaks. Replace all damaged fittings with original NorthStar parts.</p> <p>c) Partially fill tank with plain water and spray to test for leaks. Repair as needed.</p> <p><i>IMPORTANT: 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 1: 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 5 MPH or if there are bystanders in the intended spray area.

| | |
|-----------------------------|--|
| 1. Assess wind speed | <p>Assess weather conditions to ensure that it is not too windy to spray.</p> <p>DO NOT SPRAY if wind speeds are greater than 5 MPH.</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> |
| 2. Clear work area | <p>Clear the work area of all bystanders and pets.</p> <p>Restrict access by the public for the period recommended on chemical labels.</p> |
| 3. Prep work area | <p>Complete the following before spraying:</p> <ul style="list-style-type: none"> a) Cover all electrical outlets and light fixtures on surfaces to be sprayed. b) Remove any decorations in proximity to spray area. c) Using fresh water from a garden hose, soak any vegetation that may come into contact with soft wash mix. If cleaning roof with gutters, soak area around downspouts with fresh water. |


Operation - Using the Sprayer (continued)

Step 2: Mixing chemicals.

⚠ WARNING

- ALWAYS wear personal protective equipment as directed on the chemical labels when handling chemicals.
- Long pants and sleeves, chemical resistant gloves, and eye protection are strongly recommended. Additional protective gear may be required depending on the particular chemical.

Fill the sprayer using the following steps:


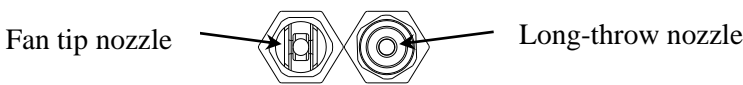
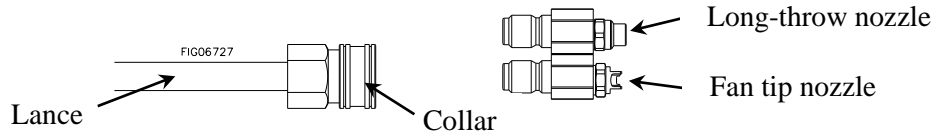
| 1. Review safety information | Review the Operation – Important Safety Information section related to <u>General Chemical Safety</u> and <u>Chemical Accident Procedures</u> provided in this manual. | | | | | | | | | | | | | | | | | | | | |
|--|---|------------------|-----------------------|------------------|---------------------|-------|----|---------------------------|-----------|----------|------------|----|-----------------|-----------|----------|-----------|----|--|-----------|----------|-----------|
| 2. Choose safe mixing/ loading area | <p>Choose a safe mixing and loading area.</p> <p>- Choose an outdoor, well-ventilated area away from unprotected people, animals, food, and other items that might become contaminated.</p> | | | | | | | | | | | | | | | | | | | | |
| 3. Wear personal protective equipment | <p>Wear personal protective equipment as directed on the chemical label. Goggles, gloves, long sleeves, and pants are recommended while mixing chemicals.</p> <p>NOTE: Clothes may be damaged by bleach.</p> <div style="text-align: center;">  </div> | | | | | | | | | | | | | | | | | | | | |
| 4. Mixing chemicals | <p>a) Add to tank in this order:</p> <ol style="list-style-type: none"> 1. Household bleach (6% sodium hypochlorite concentration) 2. NorthStar Max Cling Soft Wash Surfactant (NTE #81297 or #81298) 3. Water <p>b) Recommended mix ratios</p> <table border="1" style="width: 100%; border-collapse: collapse; margin: 10px 0;"> <thead> <tr> <th style="text-align: center;">Soft Wash Mix</th> <th style="text-align: center;">Surface to be Cleaned</th> <th style="text-align: center;">Household Bleach</th> <th style="text-align: center;">NorthStar Max Cling</th> <th style="text-align: center;">Water</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1%</td> <td>Siding, screen enclosures</td> <td style="text-align: center;">2 gallons</td> <td style="text-align: center;">8 ounces</td> <td style="text-align: center;">10 gallons</td> </tr> <tr> <td style="text-align: center;">2%</td> <td>Fences, decking</td> <td style="text-align: center;">4 gallons</td> <td style="text-align: center;">8 ounces</td> <td style="text-align: center;">8 gallons</td> </tr> <tr> <td style="text-align: center;">3%</td> <td>Roofs, brick, stone, stucco, concrete, driveways</td> <td style="text-align: center;">6 gallons</td> <td style="text-align: center;">8 ounces</td> <td style="text-align: center;">6 gallons</td> </tr> </tbody> </table> <p>NOTICE: Never spray undiluted bleach. It must be mixed with water and NorthStar Max Cling Soft Wash Surfactant. Failure to do so could result in unforeseen damage to vegetation or the cleaning surface. Always test soft wash mix in an inconspicuous area to confirm compatibility.</p> <p>NOTICE: Not for use on painted wood surfaces. Use only on hard, non-porous surfaces.</p> <p>WARNING: Never exceed 3%, higher concentrations will increase the risk of damage to the sprayer. For difficult stains, repeat applications may be required.</p> | Soft Wash Mix | Surface to be Cleaned | Household Bleach | NorthStar Max Cling | Water | 1% | Siding, screen enclosures | 2 gallons | 8 ounces | 10 gallons | 2% | Fences, decking | 4 gallons | 8 ounces | 8 gallons | 3% | Roofs, brick, stone, stucco, concrete, driveways | 6 gallons | 8 ounces | 6 gallons |
| Soft Wash Mix | Surface to be Cleaned | Household Bleach | NorthStar Max Cling | Water | | | | | | | | | | | | | | | | | |
| 1% | Siding, screen enclosures | 2 gallons | 8 ounces | 10 gallons | | | | | | | | | | | | | | | | | |
| 2% | Fences, decking | 4 gallons | 8 ounces | 8 gallons | | | | | | | | | | | | | | | | | |
| 3% | Roofs, brick, stone, stucco, concrete, driveways | 6 gallons | 8 ounces | 6 gallons | | | | | | | | | | | | | | | | | |

Operation - Using the Sprayer (continued)

Step 3: 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 chemical.

| | |
|--|--|
| 1. Review safety information | Review the Operation – Important Safety Information section related to <u>Chemical Application Safety</u> provided in this manual. |
| 2. Wear personal protective equipment | <p>Wear personal protective equipment as directed on the chemical label. Goggles, gloves, long sleeves, and pants are recommended while mixing chemical.</p> <p>NOTE: Clothes may be damaged by bleach.</p> <div style="text-align: center;">  </div> |
| 3. Turn on power | <p>Turn on the power to the sprayer.</p> <ol style="list-style-type: none"> 1. Verify the battery wire harness is connected to the pump power cord. 2. Turn both switches (one on the pump and one on the wire harness) to the ON position. <p><i>Note: The pump will start automatically when power is turned on. The pump will cycle on and off as needed to retain pressure in the hose.</i></p> |
| 4. Selecting nozzle | <p>1572210 and 1572212 come with two nozzles to select from: fan tip and long-throw. 1572213 comes with four nozzles to select from: 25°, 40°, 60° fan tip and one long-throw. The fan tip nozzles produce a large swath to cover large areas quickly. The long-throw nozzle is used to reach second story peaks and soffits.</p> <div style="text-align: center; margin-top: 10px;">  </div> |
| 5. Attach nozzle to spray gun | <p>To attach spray nozzle to spray gun:</p> <ol style="list-style-type: none"> 1. Make sure the pump is off and the hose is depressurized. 2. To install the nozzle, pull the collar back and twist the nozzle firmly into the coupler on the end of the spray gun lance. 3. Release the collar, making sure it springs back and re-seats to its original (non-retracted) position. Check the connection by pulling on the nozzle to ensure a tight connection. If correctly inserted, nozzle will rotate but not pull out. <div style="text-align: center; margin-top: 10px;">  </div> |
| 6. Before spraying | <p>Follow the steps below before spraying:</p> <ol style="list-style-type: none"> 1. Cover all electrical outlets and light fixtures and remove any decorations on surfaces to be sprayed. 2. Using fresh water from a garden hose, soak any vegetation that may come into contact with soft wash mix. If cleaning roof with gutters, soak area around downspouts with fresh water. <p>NOTE: To eliminate the need for a ladder for difficult to reach places, such as tall roofs, use the NorthStar telescoping wand (NTE #81140). To reduce fatigue, improve spray precision, and improve productivity while using a telescoping wand, use with NorthStar tripod (NTE #157143).</p> |

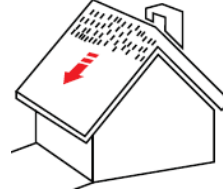
Operation - Using the Sprayer (continued)

7a. Spraying roofs with soft wash mix

Follow the steps below for spraying a roof:

- Using a 3% mix (see table), spray roofs from top to bottom.

| Soft Wash Mix | Household Bleach | NorthStar Max Cling | Water |
|---------------|------------------|---------------------|-----------|
| 3% | 6 gallons | 8 ounces | 6 gallons |



- Spray in 10-foot-wide sections, only applying enough to get the surface wet.
- Let the chemical dwell for approx. 10 minutes, but do not let the chemical dry on the surface. While the chemical is dwelling, the previous section can be rinsed.

7b. Spraying siding with soft wash mix

Follow the steps below for spraying siding:

- Using a 1% mix (see table), spray siding from bottom to top.

| Soft Wash Mix | Household Bleach | NorthStar Max Cling | Water |
|---------------|------------------|---------------------|------------|
| 1% | 2 gallons | 8 ounces | 10 gallons |



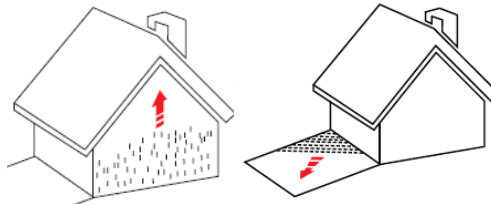
- Spray in 10-foot-wide sections, only applying enough to get the surface wet.
- Let the chemical dwell for approx. 10 minutes, but do not let the chemical dry on the surface. While the chemical is dwelling, the previous section can be rinsed.

7c. Spraying fences and decking with soft wash mix

Follow the steps below for spraying fences or decking:

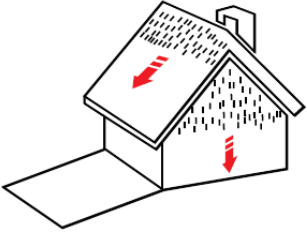
- Using a 2% mix (see table), spray fences from bottom to top; spray flat surfaces (decking floor) starting on the far side and working back towards the sprayer.

| Soft Wash Mix | Household Bleach | NorthStar Max Cling | Water |
|---------------|------------------|---------------------|-----------|
| 2% | 4 gallons | 8 ounces | 8 gallons |



- Spray in 10-foot-wide sections, only applying enough to get the surface wet.
- Let the chemical dwell for approx. 10 minutes, but do not let the chemical dry on the surface. While the chemical is dwelling, the previous section can be rinsed.

Operation - Using the Sprayer (continued)

| | |
|--|--|
| 8. Rinsing | <p>After spraying rinse all surfaces and vegetation</p> <ol style="list-style-type: none"> 1. Using fresh water from a garden hose, rinse any vegetation that may have come into contact with soft wash mix. 2. Rinse surfaces from top to bottom. Rinse until there are no visible suds on the cleaned surface. <div style="text-align: center; margin: 10px 0;">  </div> <p>To extend the life of the bleach pump system's replaceable pump cartridge:</p> <ol style="list-style-type: none"> 1. Fill tank with fresh water. 2. Remove spray nozzle from gun and pump fresh water through the system, discharging spray onto a hard surface such as a driveway. 3. Do not let the pump/sprayer freeze. <p>NOTE: The pump cartridge is a wear item and will fail in time. There are two failure modes: 1.) Decreased performance or 2.) An internal leak (red LED light on motor illuminates). See instructions in the Maintenance section for replacing the pump cartridge.</p> |
| 9. Leaving sprayer unattended | <p>If the sprayer must be left unattended at any time:</p> <ol style="list-style-type: none"> a) Disconnect power to the sprayer. b) Relieve system pressure by depressing the gun trigger. |
| 10. Discontinue use if clogged or inoperative | <p>If the sprayer becomes clogged or inoperative during use, <i>discontinue use immediately.</i></p> <ul style="list-style-type: none"> - DO NOT attempt to service while chemicals are in the sprayer and power is connected. - Return to service area to review instructions for troubleshooting before attempting to service. |

Operation - Using the Sprayer (continued)

Step 4: Clean sprayer and decontaminate after use.

When finished 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 chemical | <p>If there is excess chemical remaining:</p> <ol style="list-style-type: none"> a) Disconnect power to the system and relieve system pressure by depressing the gun trigger. b) Find a suitable container in which to drain the unused chemical. Place it under the tank drain hole. c) While wearing rubber gloves, eye protection, and all other required personal protective equipment, allow chemical to drain into container. |
| 2. Chemical disposal | <p>Properly store or dispose of unused chemical:</p> <ol style="list-style-type: none"> a) <u>If the unused chemical is to be stored for future use:</u> Store all unused chemical in its original, or a suitably marked, container in a secure location out of the reach of children and animals. b) <u>If remaining chemical is to be disposed:</u> Properly dispose of the remaining chemical and its container per the chemical manufacturer's recommendation and according to local hazardous waste disposal regulations. |
| 3. Flush pump | <p>A general procedure is as follows:</p> <ol style="list-style-type: none"> a) Add fresh water to the system. b) Reconnect power to the pump. c) Operate the pump and discharge all rinse water onto a hard surface such as a driveway. d) After flushing, disconnect power to the pump and be sure all system pressure is relieved. e) Remove inlet strainer screen from pump inlet and thoroughly rinse with fresh water. |

Storage

When not in use, store indoors. For long term or winter storage, prepare by running **RV antifreeze** (DO NOT USE automotive antifreeze) through the system. This will keep internal parts lubricated, protect against corrosion, and keep the unit from freezing.

CAUTION

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

Preparing for storage:

| | |
|----------------------------|--|
| 1. Flush with water | Fill the pump with fresh water and run through the system. Operate the pump system until the system is completely flushed. DO NOT add antifreeze before flushing the system as bleach can react with antifreeze. |
| 2. Add antifreeze | Pour RV antifreeze (DO NOT USE automotive antifreeze) into the pump system. <i>Note: RV antifreeze is non-toxic and biodegradable and generally safer for the environment than automotive antifreeze.</i> |
| 3. Spray briefly | Turn on the pump and run the pump system briefly until fluid sprays. |

Removing from storage:

| | |
|----------------------------|--|
| 1. Drain | Drain the antifreeze left in the pump system into a suitable container. |
| 2. Flush with water | Fill pump system with fresh water and run through the system. Operate the pump until the system is completely flushed. Be sure to set up containers to capture the antifreeze flush water. DO NOT add bleach back into the sprayer before flushing the system as bleach can react with antifreeze. |
| 3. Disposal | 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 should be kept for use when the sprayer tank needs to be emptied temporarily for repairs. It is advisable to purchase a reserve tank from Northern Tool and Equipment for use in these circumstances. The container should be properly labeled as to its contents if it is used. In addition, it may be advisable to empty the tank contents using a transfer pump if the tank drain hole is inaccessible.

Before attempting to service the sprayer:

| | |
|---|--|
| 1. Personal protective equipment | Wear personal protective equipment as directed on the chemical label while servicing your sprayer. |
| 2. Review troubleshooting table | Review the troubleshooting table below for the type of problem you are experiencing. However, DO NOT attempt to repair until the steps listed below are followed. |
| 3. Empty and flush | If the cause listed for your problem is clogged intake tube, clogged suction strainer, or worn spray gun nozzle: empty the tank and flush the sprayer with water as directed in the section, Operation – Step 4. <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> |
| 4. Disconnect power/relieve pressure | Disconnect power to the sprayer and be sure all system pressure is relieved by squeezing the gun trigger. |
| 5. Perform repairs | Follow the directions provided in the troubleshooting table to repair the sprayer. See the Maintenance section for instructions to replace pump cartridge. <i>NOTE: Never try to unclog the sprayer nozzle by blowing through it.</i> |
| 6. Test after servicing | After servicing, ALWAYS test the sprayer for leaks with plain water before using. |

| PROBLEM | CAUSE | SOLUTION |
|---|-------------------------------|--|
| Pump will not turn on | Pressure switch failure | Replace pressure switch |
| | Bad electrical connection | Check battery connections |
| | ON/OFF switch in Off position | Check that both switches are ON |
| | Fuse blown | Replace fuse |
| | Short in wires | Check condition of wires |
| | Low voltage | Check voltage with battery monitor |
| Pump will not turn on and LED light is on | Leak inside pump cartridge | Replace pump cartridge |
| Low pressure | Worn spray gun nozzle | Replace spray gun |
| | Worn pump cartridge | Replace pump cartridge |
| Low flow | Clogged intake tube | Remove obstruction |
| | Clogged suction strainer | Clean suction strainer |
| | Low voltage | Check voltage with battery monitor |
| | Worn pump cartridge | Replace pump cartridge |
| Poor spray distribution | Clogged intake tube | Remove obstruction |
| | Suction strainer clogged | Clean suction strainer |
| | Worn spray gun nozzle | Replace spray gun |
| | Worn pump cartridge | Replace pump cartridge |
| Pump cycles while not spraying | Leak in the system | Tighten leaking hose clamps or fittings, replace spray gun |

Maintenance

In the event of an internal pump cartridge leak, the pump will shut off to protect the motor and the LED light will turn on to indicate the problem.

To repair the pump, use the replacement pump cartridge number corresponding with the model number.

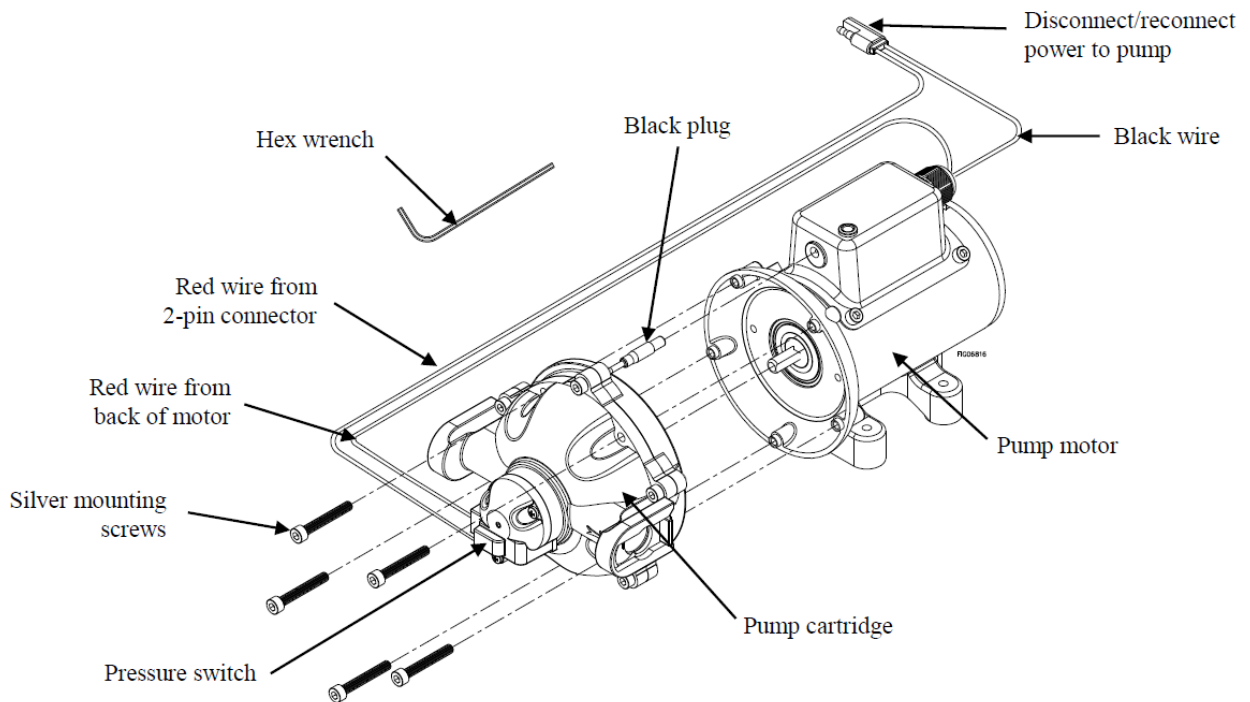
| Model number | 1572210 | 1572212 | 1572213 |
|-----------------------|---------|---------|---------|
| Pump Cartridge Number | A157145 | A157147 | A157153 |

To remove the old pump cartridge from the motor:

1. Disconnect power to the pump and be sure all system pressure is relieved.
2. Disconnect quick connect fittings from pump ports.
3. Disconnect both red wires from the pressure switch.
4. Disconnect black plug from the pump motor.
5. Using the supplied hex wrench, unthread the **silver** mounting screws (black screws can remain installed).
6. Slide the pump cartridge off the shaft of the motor. Discard the pump cartridge.
7. Dry any wet areas of the motor before installing new pump cartridge.

To install the new pump cartridge:

1. Line up the holes in the pump cartridge to the holes in the motor face.
2. Slide the pump cartridge onto the shaft of the motor.
3. Using the supplied hex wrench, secure the pump cartridge using the new mounting screws supplied with the pump cartridge.
4. Attach the red wire from the back of the motor to the back spade of the pressure switch.
5. Attach the red wire from the 2-pin connector to the front spade of the pressure switch.
6. Attach the black plug from the pump cartridge to the pump motor.
7. Reconnect power to the pump and reconnect quick connect fittings.
8. Test system for leaks with water.



Specifications

| Model number | Electrical connection | Maximum amp draw | Maximum flow | Maximum pressure | Ports | Overall dimensions | Weight |
|--------------|-----------------------|------------------|-----------------------|---------------------|-----------------------|---|------------------------|
| 1572210 | 12V DC | 8 Amps | 2.2 GPM [8.3 LPM] | 70 PSI [4.8 bar] | 3/4" Quick connect | 9" x 4" x 5" [230mm x 102mm x 127mm] | 5.26 lbs. [2.39 kg] |
| 1572212 | 12V DC | 13 Amps | 4.0 GPM [15.1 LPM] | 60 PSI [4.1 bar] | 3/4" Quick connect | 9" x 5.5" x 5" [230mm x 140mm x 127mm] | 7.26 lbs. [3.29 kg] |
| 1572213 | 12V DC | 17 Amps | 5.5 GPM [20.8 LPM] | 60 PSI [4.1 bar] | 3/4" Quick connect | 9" x 5.5" x 5" [230mm x 140mm x 127mm] | 7.26 lbs. [3.29 kg] |

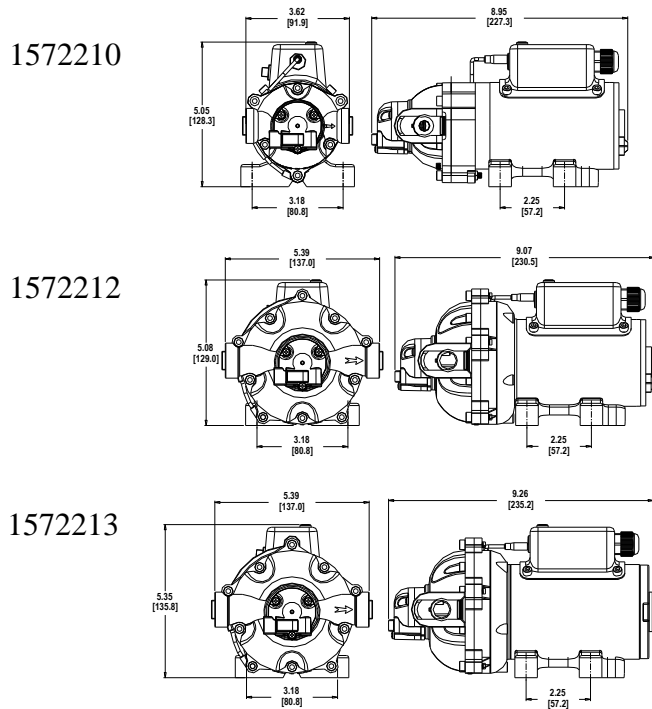


FIG06900

Component Materials*

- Pump Cartridge..... Polypropylene, Viton®, Stainless Steel
- Diaphragm..... Santoprene™
- Valves..... Viton®, Polypropylene

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

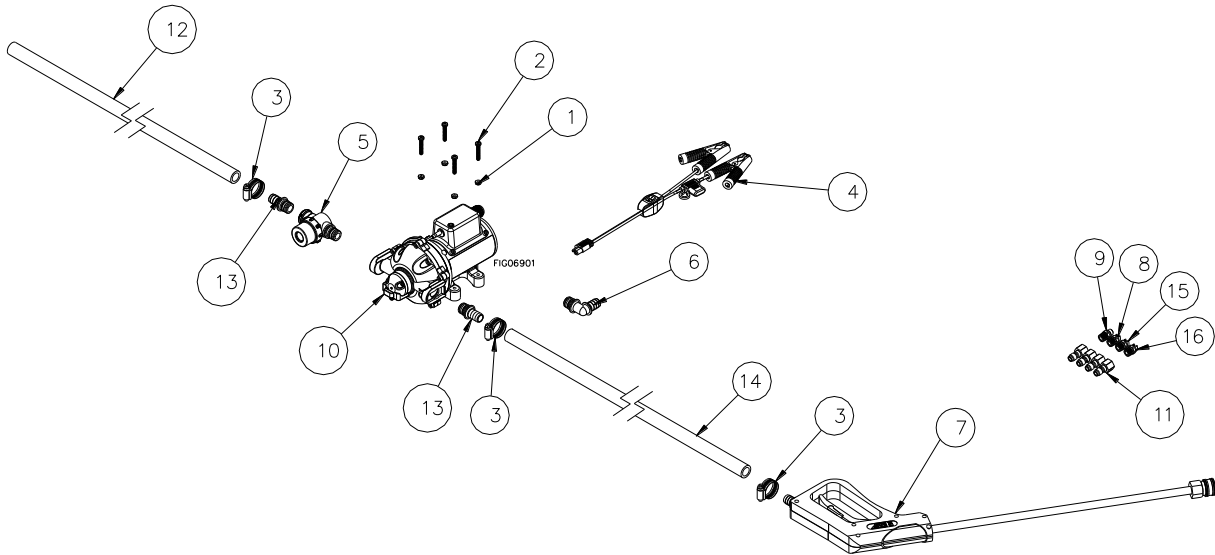
The noise emissions from this product do not exceed 70 dB(A).

Note: Pumping any petroleum-based fluid (gasoline, diesel, kerosene, or oil) will severely damage the pump.

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.

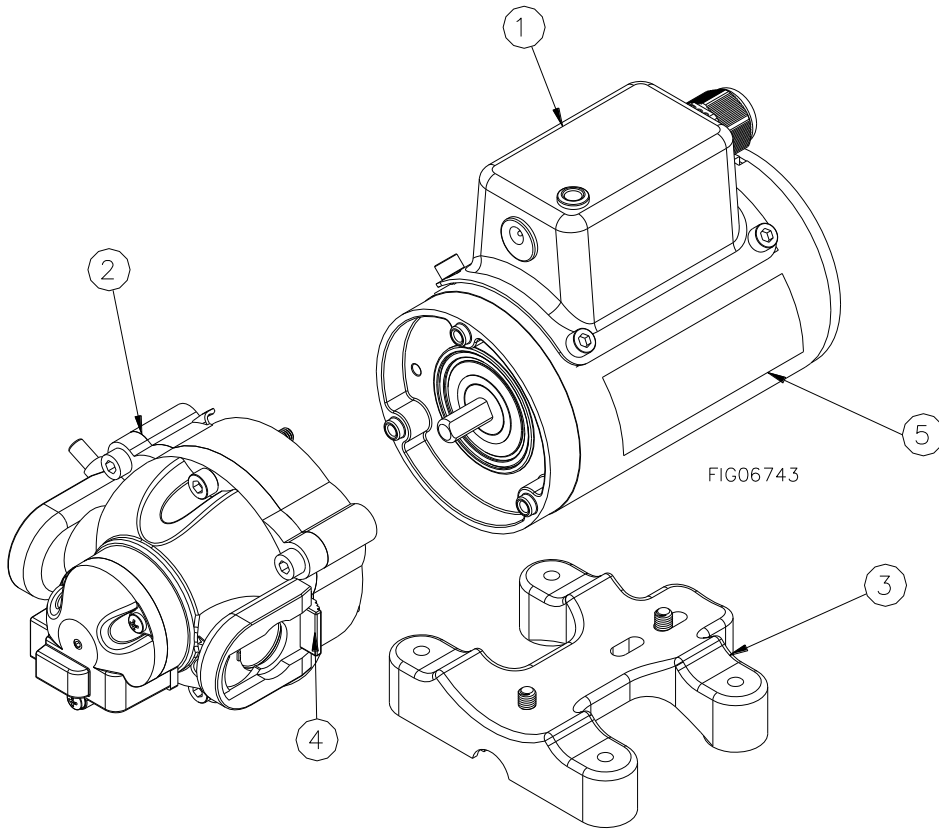
Any Questions, Comments, Problems, or Parts Orders
Call NorthStar Product Support at 1-800-270-0810

Exploded View and Parts Breakdown – Rev C



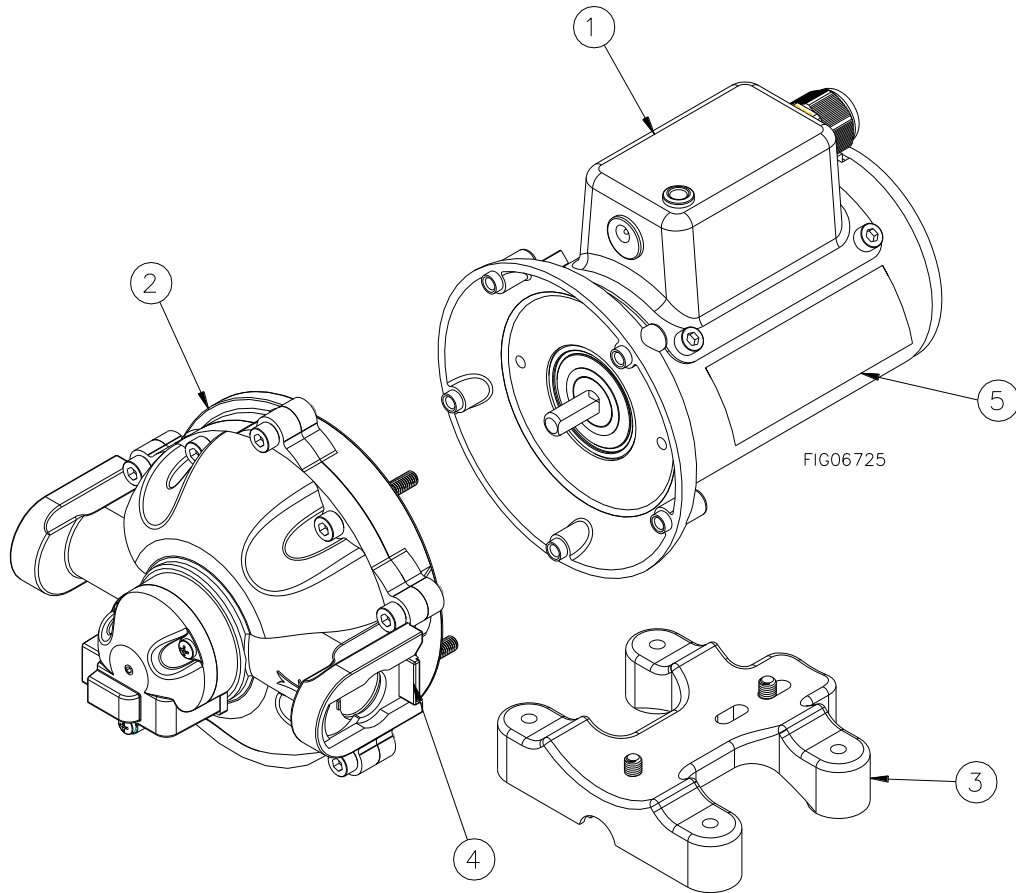
| Ref # | Part # | Description | Qty | Model |
|-------|--------|---|-----|------------------|
| 1 | 802008 | Nut, #10-24 Nyloc | 4 | All |
| 2 | 802176 | Screw, #10-24 x 1-1/4" PPHM | 4 | All |
| 3 | 777119 | Hose clamp, 1/2" | 3 | 1572210 |
| | 793231 | Hose clamp | 3 | 1572212, 1572213 |
| 4 | 793521 | Wire harness w/ switch & battery clamps | 1 | 1572210 |
| | 797599 | Wire harness w/ switch & battery clamps | 1 | 1572212, 1572213 |
| | 787381 | Fuse, 15A | 1 | 1572212 |
| | 793243 | Fuse, 20A | 1 | 1572213 |
| 5 | 798855 | Inlet strainer | 1 | All |
| 6 | 787197 | Fitting, QC x 1/2", elbow | 1 | 1572210 |
| | 799878 | Fitting, QC x 5/8", elbow | 1 | 1572212, 1572213 |
| 7 | 801769 | Spray gun | 1 | All |
| 8 | 801851 | Nozzle, 25°, #25 orifice | 1 | 1572210 |
| | 799939 | Nozzle, 25°, #40 orifice | 1 | 1572212 |
| | 801858 | Nozzle, 25°, #60 orifice | 1 | 1572213 |
| 9 | 801852 | Nozzle, straight stream, #25 orifice | 1 | 1572210 |
| | 799940 | Nozzle, straight stream, #40 orifice | 1 | 1572212 |
| | 801859 | Nozzle, straight stream, #60 orifice | 1 | 1572213 |
| 10 | 157145 | NorthStar pump w/ motor armor, 2.2gpm | 1 | 1572210 |
| | 157147 | NorthStar pump w/ motor armor, 4.0gpm | 1 | 1572212 |
| | 157153 | NorthStar pump w/ motor armor, 5.5gpm | 1 | 1572213 |
| 11 | 799883 | 2-nozzle quick connect holder | 1 | 1572210, 1572212 |
| | 801240 | 4-nozzle quick connect holder | 1 | 1572213 |
| 12 | 801230 | Hose, 1/2" x 8' PVC | 1 | 1572210 |
| | 801237 | Hose, 5/8" x 8' PVC | 1 | 1572212, 1572213 |
| 13 | 787193 | Fitting, QC x 1/2", straight | 2 | 1572210 |
| | 801591 | Fitting, QC x 5/8", straight | 2 | 1572212, 1572213 |
| 14 | 801231 | Hose, 1/2" x 200' PVC | 1 | 1572210 |
| | 801238 | Hose, 5/8" x 200' PVC | 1 | 1572212, 1572213 |
| 15 | 801241 | Nozzle, 40° fan, #60 orifice | 1 | 1572213 |
| 16 | 801242 | Nozzle, 60° fan, #60 orifice | 1 | 1572213 |

Pump Exploded View - 1572210



| Ref # | Part # | Description | Qty |
|-------|---------|---------------------------|-----|
| 1 | 802275 | Motor Assembly | 1 |
| 2 | A157145 | Pump Cartridge | 1 |
| 3 | 800428 | Base Plate Assembly | 1 |
| 4 | 784449 | Quick Connect Clip, Black | 2 |
| 5 | 800088 | Decal, Pump Branding | 1 |
| N/A | 787381 | Replacement Fuse, 15A | 1 |

Pump Exploded View – 1572212 & 1572213



| Ref # | Part # | Description | Qty | Model |
|-------|---------|---------------------------|-----|---------|
| 1 | 802274 | Motor Assembly | 1 | 1572212 |
| | 802273 | | 1 | 1572213 |
| 2 | A157147 | Pump Cartridge | 1 | 1572212 |
| | A157153 | | 1 | 1572213 |
| 3 | 800428 | Base Plate Assembly | 1 | All |
| 4 | 784449 | Quick Connect Clip, Black | 2 | All |
| 5 | 800090 | Decal, Pump Branding | 1 | 1572212 |
| | 800092 | | 1 | 1572213 |
| N/A | 787381 | Replacement Fuse, 15A | 1 | 1572212 |
| | 791416 | Replacement Fuse, 20A | 1 | 1572213 |

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 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, such as flushing the system after each use. 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 pump cartridges, hoses, spray guns, nozzles, filter elements, 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: _____



Manufactured by
Northern Tool & Equipment Company, Inc.
Burnsville, Minnesota 55306
www.northerntool.com
Assembled in Mexico with foreign components