



**M990990G**

ITEM NUMBER: 990990, 990991

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

## Owner's Manual

### Pressure Washer: Machine that cleans dirty surfaces with high pressure water.

#### Instructions for Installation/Set-up, Operation, Maintenance, & Storage

This pressure washer produces cold-water high-pressure spray. Cleaning chemicals may be incorporated into the spray if desired. The pressure pump for this equipment is powered by an electric motor.

#### **⚠ WARNING**

##### **SPECIAL HAZARDS**

- **Injection Injury:** High-pressure spray can pierce skin and underlying tissues, leading to serious injury and possible amputation. Such an injection injury can result in blood poisoning and/or severe tissue damage.
- **Flying Debris:** High-pressure spray can cause flying debris and possible surface damage.
- **Electric Shock:** Operating equipment in wet conditions or near water can cause electric shock.
- **Chemical Exposure:** Cleaning chemical vapors or contact with skin may be hazardous.
- **Fire/Explosion:** Motor sparking can ignite fuel or other flammable liquids or vapors in the vicinity.
- **Burns:** Pressure washer pump and motor are hot surfaces that can cause burn injuries.

Detailed safety information about these hazards appears throughout this manual.

#### **Equipment Protection Quick Facts**

**Inspect Upon Delivery:** FIRST! Inspect for missing or damaged components. See "Initial Set-Up" section for where to report missing or damaged parts.

**Pump:** Pump is shipped with oil. Check pump oil level before starting. Remove shipping plug and install vented fill cap.

**Water Flow Requirements:** Make sure your supply water flow rate is 20% higher than the pressure washer's flow rate (see "Operations" section for detail) and that your water is clean and particle free.

**Chemical Spraying:** Use only approved pressure washer chemicals designed for high-pressure use.

**Storage:** Do not allow water to freeze in the pump, hose, or spray gun(s). See "Storage" for more information.

**Maintenance Schedule:** Motor and pump require periodic inspection and servicing to keep pressure washer functioning efficiently. See "Maintenance Schedule Summary" for frequency of servicing.

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

***Call NorthStar Product Support 1-800-270-0810***

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## About Your Pressure Washer

Thank you for purchasing a NorthStar Pressure Washer! It is designed for long life, dependability, and top performance.

**Intended Use.** Produce a high-pressure water spray. Incorporate cleaning chemicals into a low-pressure water spray.

Note: Do not use for other purposes, as unforeseen hazards or equipment damage may result.

**Power Source.** The pressure washer is powered by an electric motor.

**Supplies Required.** Normal operation will require you to supply:

- Pressure Washer pump oil
- Electric supply
- Personal Protection Equipment

See “*Specifications*” section of this manual for more detail.

**Personal Protection.** Wear safety apparel during operation, including safety glasses with side and top protection. Ear protection is also recommended if working near any operating machine. Other safety apparel includes waterproof, insulated gloves and non-slip protective footwear. Cleaning chemicals may require the use of respiration mask; refer to the chemical label for further instruction.

**Adult Control Only.** Only trained adults should set up and operate the pressure washer. Do not let children operate the pressure washer.

**Under the Influence.** Never operate, or let anyone else operate, the pressure washer while fatigued or under the influence of alcohol, drugs, or medication.

Keep this manual for reference and review.

### **ATTENTION: Rental Companies and Private Owners who loan this equipment to others!**

All persons to whom you rent/loan this pressure washer to must have access to and read this manual. Keep this owner's manual with the pressure washer at all times and advise all persons who will operate the pressure washer to read it. You must also provide personal instruction on how to safely set-up and operate the pressure washer and remain available to answer any questions a renter/borrower might have. Owner's Manuals are available from NorthStar at 1-800-270-0810.

## Specifications

990990	
FLOW OUTPUT	
PSI (bar)	2000 (138)
GPM (l/min)	1.5 (5.7)
Max Water Temp	140° F (60°C)
MOTOR	
Motor Horsepower	2.0 HP
Ampere	20A
Voltage	120V
DIMENSIONS/COMPONENTS	
Length	34.00"
Width	21.00"
Height	38.00"
Pump Model	Cat 4DX
Pump Oil Capacity	8.5 oz
Nozzle orifice Size	#2.0
SUPPLIES REQUIRED (not included)	
Pump Oil (Shipped with oil but refills required)	SAE 30 Non-Detergent Oil or Cat Pump Oil (Part# 22158)

990991	
FLOW OUTPUT	
PSI (bar)	3000 (207)
GPM (l/min)	2.5 (9.4)
Max Water Temp	140°F (60°C)
MOTOR	
Motor Horsepower	5.0 HP
Ampere	30A
Voltage	230V
DIMENSIONS/COMPONENTS	
Length	34.00"
Width	21.00"
Height	38.00"
Pump Model	Cat 4DNX
Pump Oil Capacity	8.5 oz
Nozzle orifice Size	#3.0
SUPPLIES REQUIRED (not included)	
Pump Oil (Shipped with oil but refills required)	SAE 30 Non-Detergent Oil or Cat Pump Oil (Part# 22158)

## Component Identification

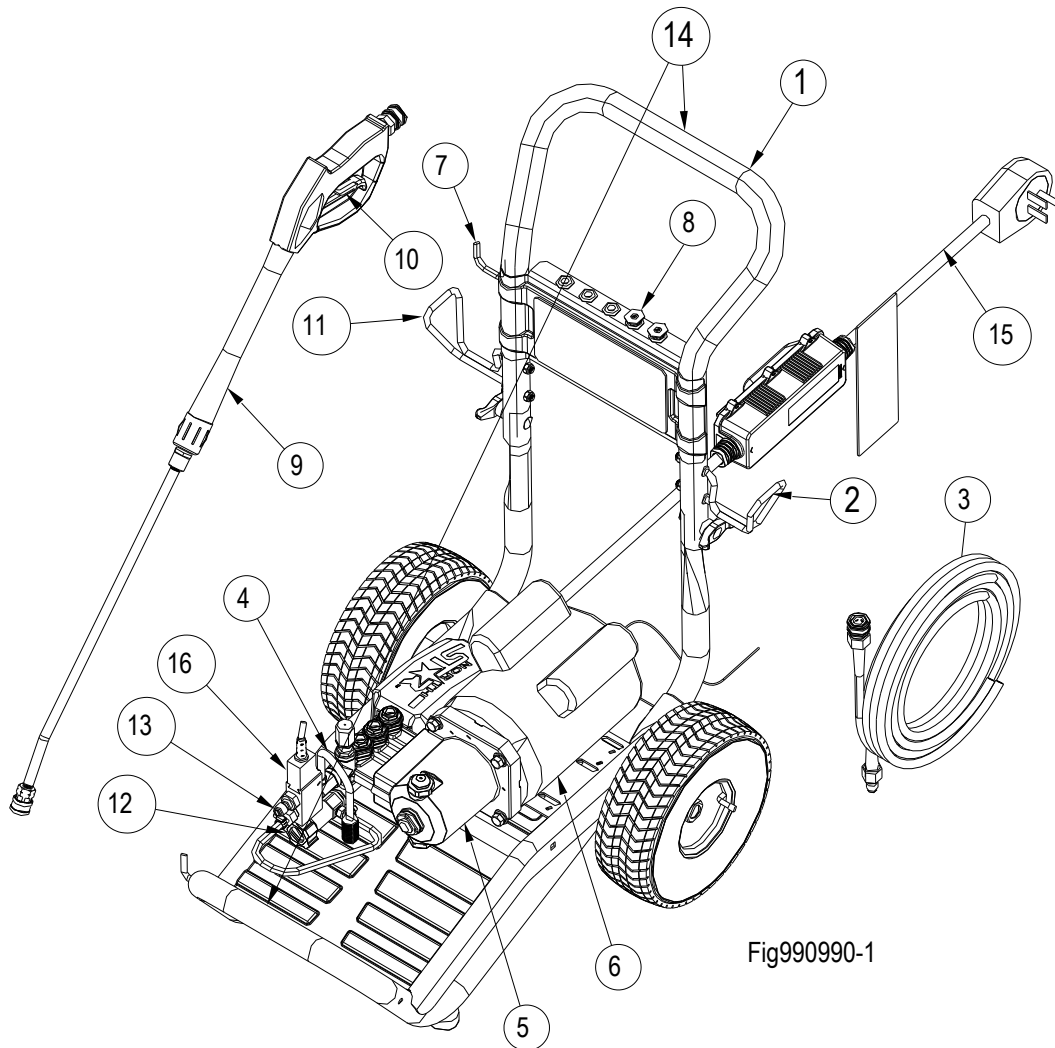


Fig990990-1

1. **Handle:** Designed for easy cart movement.
2. **Hose Hook:** Store hose on hook.
3. **Pressure Hose:** Attach quick couplers to gun and water outlet.
4. **Chemical Hose:** Submerge in cleaning solution.
5. **Water Pump:** Inspect for loose/broken parts prior to each use.
6. **Motor:** Premium motor provides years of reliable use.
7. **Gun Hook:** Store gun on hook.
8. **Nozzle:** Change nozzles for different spray pattern or cleaning chemical application.
9. **Spray Gun:** Always use two hands for safe operation.
10. **Trigger:** Actuate to allow pressurized water to flow out of spray gun.
11. **Cord Hook:** Store electrical cord on hook.
12. **Garden Hose Inlet:** Connect water supply for pump.
13. **High Pressure Outlet:** Connect your high-pressure hose.
14. **Lifting Points:** Lift the pressure washer from these points when transporting.
15. **GFCI cord:** For protected power supply.
16. **On Demand Flow Switch:** Automatically shuts motor off when not spraying

See "Parts Explosion" for more details

# Safety

## Hazard Signal Word Definitions



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.

DANGER (red) indicates a hazardous situation, which if not avoided, will result in death or serious injury.

WARNING (orange) indicates a hazardous situation, which if not avoided, could result in death or serious injury.

CAUTION (yellow) used with the safety alert symbol, indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.

CAUTION (yellow) without the safety alert symbol, is used to address practices not related to personal injury.

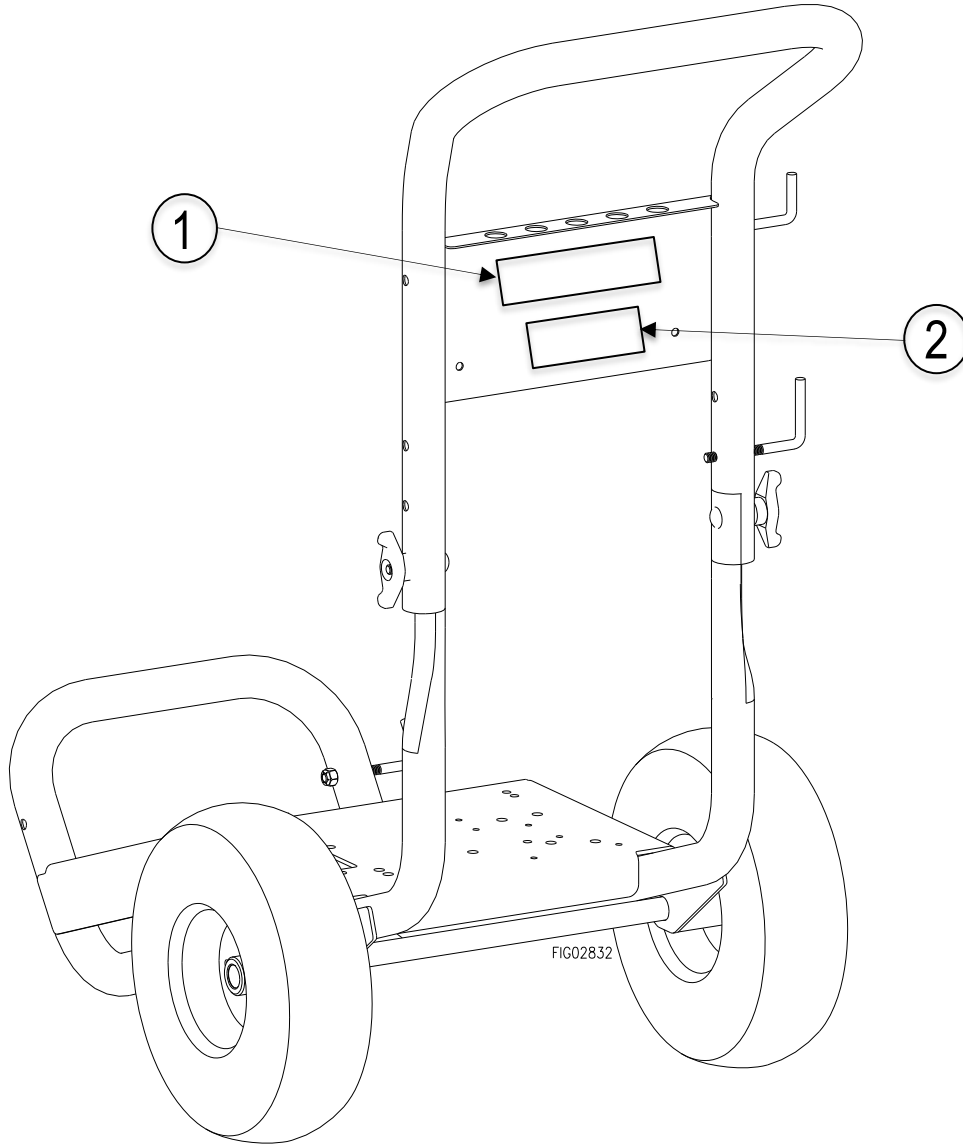
NOTICE is used to address practices not related to personal injury.

# Safety Labeling

## Safety Decal Locations

**! WARNING**

ALWAYS make sure safety labels are in place and in good condition. If a safety label is missing or not legible, order new labels from NorthStar Product Support at 1-800-270-0810.




On-Product Warning Labels		
Location	Part Numbers	Description
1	802050	Instruction Label
2	802049	Warning Label

# Safety Labeling



## Safety Decals

1

<i>START-UP INSTRUCTIONS</i>	<i>SHUT-DOWN INSTRUCTIONS</i>
<ol style="list-style-type: none"><li>1. Attach garden hose.</li><li>2. Attach pressure hose.</li><li>3. Attach gun and lance.</li><li>4. Turn water supply ON.</li><li>5. Squeeze trigger to purge air from pump.</li><li>6. Insert nozzle.</li><li>7. Plug in power cord, reset the GFCI, start motor.</li></ol>	<ol style="list-style-type: none"><li>1. Turn motor OFF.</li><li>2. Unplug the power cord.</li><li>3. Turn water supply OFF.</li><li>4. Squeeze trigger to relieve system pressure.</li><li>5. Remove garden hose.</li><li>6. Remove pressure hose.</li></ol>



2

<b>⚠ WARNING</b>	
 	<ul style="list-style-type: none"><li>•Gun kicks back. Hold with both hands.</li><li>•Risk of injection or injury to persons. Do not direct discharge stream at persons.</li><li>•Risk of fire and explosion. Do not spray flammable liquids.</li><li>•To reduce the risk of injury, read owner's manual carefully before using.</li></ul>

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

# Initial Set-Up

## Step 1. Inspect & Unpack

Upon receiving your item check for missing or damaged parts.

See “*Component Identification*” section of this manual for a diagram of the pressure washer and its components.

- For missing or damaged components, contact Product Support at 1-800-270-0810.
- If complete, fill out product serial number information. See “*Limited Warranty*” section of this manual.

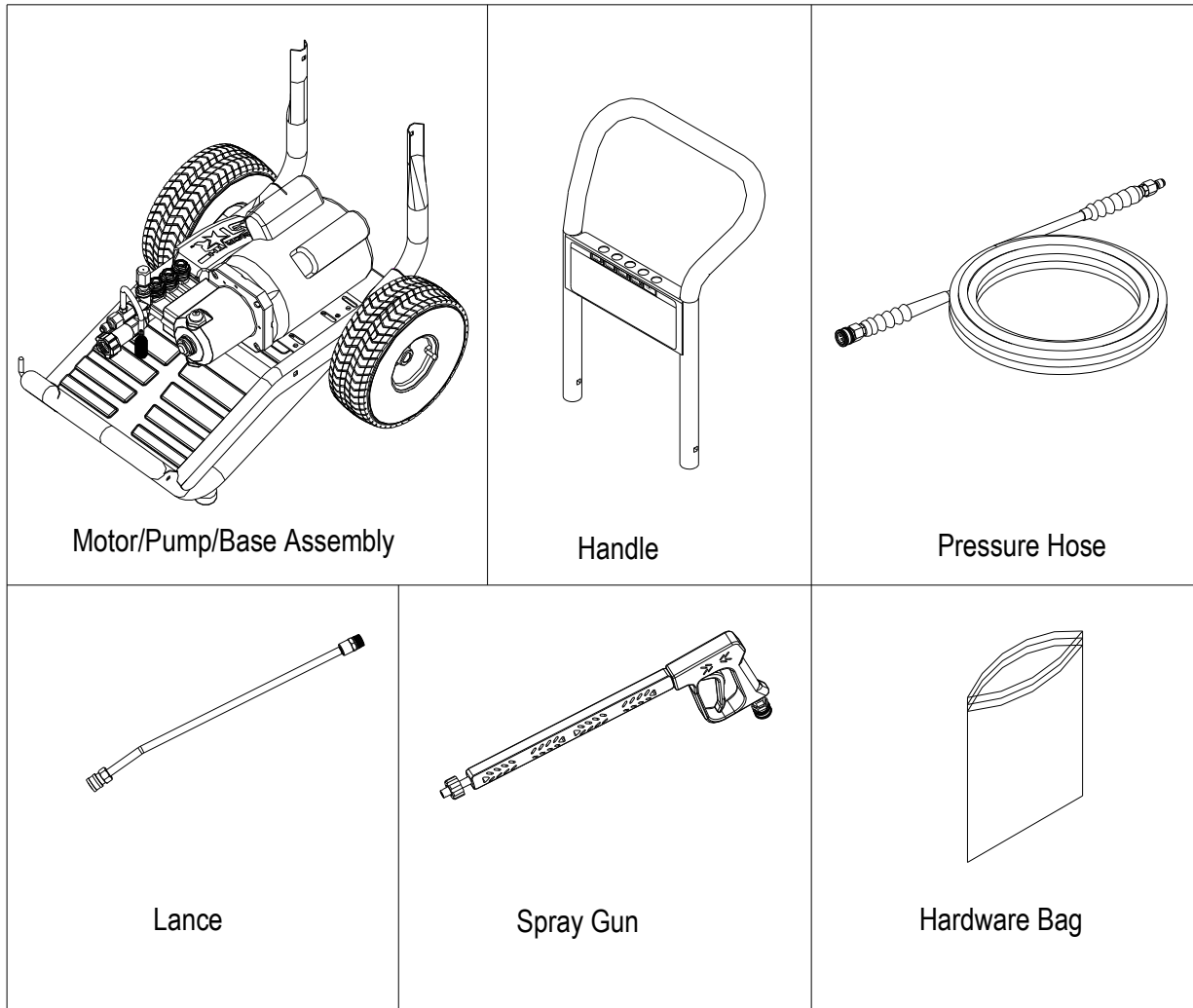
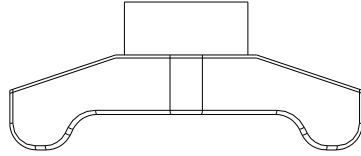


Fig.990990-2

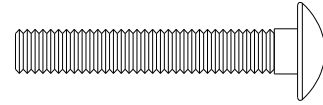
**Any Questions, Comments, Problems or Parts Orders call NorthStar Product Support at 1-800-270-0810.**

# Initial Set-Up

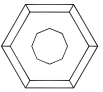
## Hardware Bag



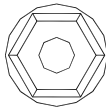
T-Handle Knob  
Part# 38578  
Qty-2



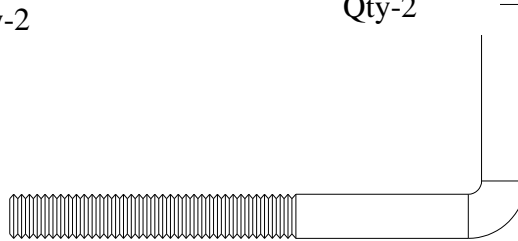
Carriage Bolt  
Part# 82233  
Qty-2



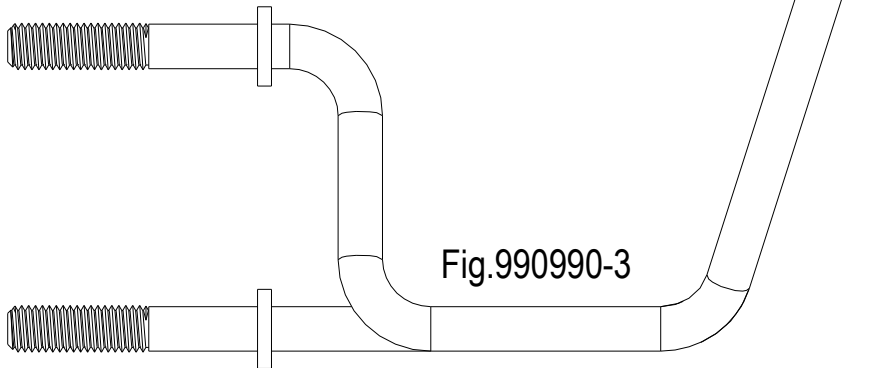
Nylon Lock Nut  
Part# 777495  
Qty-4



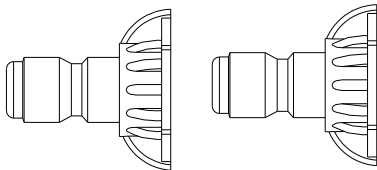
Flange- Nut  
Part# 82019  
Qty-2



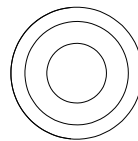
Gun Hook  
Part# 38509  
Qty-1



Hose Hook  
Part# 779761  
Qty-2



Nozzle  
Part# 778150 (Model# 990990)  
Part# 38530 (Model# 990991)



Grommet  
Part# 35198  
Qty-5

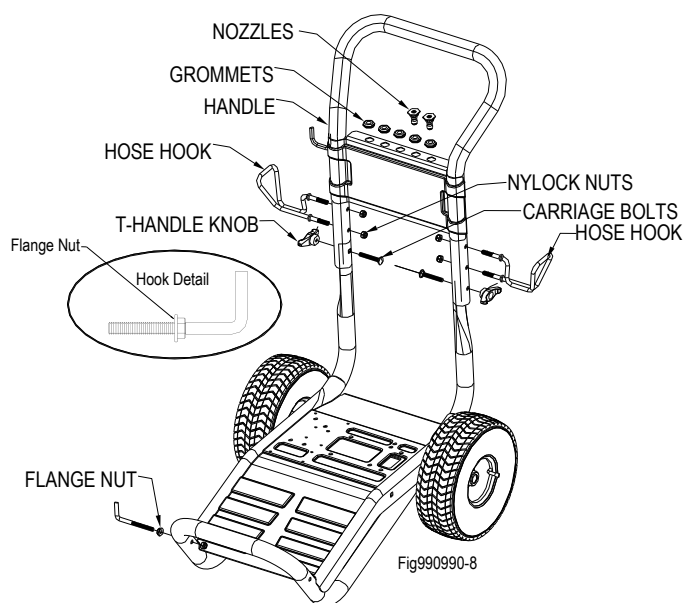
# Initial Set-up

## Step 2. Assembly

Note: Remove contents from packaging to begin assembly.

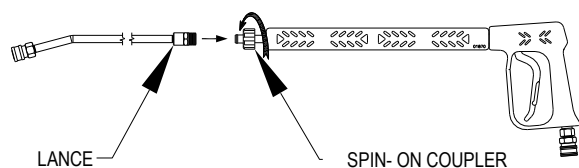
### Handle Assembly

1. Attach handle to bumper tube using:
  - a. (2) Carriage Bolts (82233)
  - b. (2) T-Handle Knobs (38578)
2. Spin a flange nut backwards onto gun hook.  
(See hook detail)
3. Mount the hose hooks onto the handle and gun hook onto the base as shown
4. Insert grommets into the holes on the handle nameplate.
5. Press nozzles into grommets according to the colors indicated on the handle decal.



### Spray Gun Assembly

Attach the Lance to Spray Gun



Tighten spin-on coupler hand tight.

Note: The O-rings create a seal so there is no need to tighten with a wrench.

## Step 3. Select Suitable Location

### Moving and Handling

#### ! WARNING

#### Lifting Hazard

The pressure washer is heavy. It can crush and cause serious injury if it rolls out of control or tips over. Follow the instructions below for safely moving the pressure washer.

Moving your pressure washer around

- Use the handles to manually move the pressure washer.
- Push the pressure washer in front of you as you walk.
- To turn, push down slightly on the handles and pivot the pressure washer on its wheels.

Elevating or lowering your pressure washer

- To reduce risk of injury, it is recommended that two adults lift the pressure washer.
- Only if the pressure washer by the bumper and Handle. Do not use the pump or motor as lifting point. See component identification for lifting point locations.

**Positioning:**

1. The pressure washer should be positioned on a firm, level (less than 3-degree slope), heat-resistant surface with good drainage and a nearby water supply.
2. The pressure washer should be placed within garden hose distance of a continuous water supply. Ensure that the pressure washer sits level and will not slide or shift during operation. If applicable, block the pressure washer's wheels to prevent movement.

**Airflow:**

1. Situate so there is adequate clearance around pressure washer to allow for airflow – at least 7 feet from any non-combustible wall or obstruction.
2. Do not operate with a tarp, blanket, or cover surrounding the pressure washer.
3. Do not place any objects against or on top of the pressure washer.
4. The pressure washer needs adequate, unobstructed flow of air to allow for adequate cooling. Cooling ventilation is required to prevent overheating of the pressure washer and possible fire.
5. Keep a fire extinguisher rated “ABC” nearby.

## Grounding Instruction

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electrical shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

### DANGER

Improper connection of the equipment - grounding conductor can result in a risk of electrocution. Check with qualified electrician or service personnel if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the product - if it will not fit the outlet; have a proper outlet installed by a qualified electrician. Do not use any type adapter with this product.

### WARNING

To reduce the risk of electrocution, keep all connections dry and off the ground. Do not touch plug with wet hands.

## *SAVE THESE INSTRUCTIONS*

### 1. For a product rated 125 volts or less:

#### **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION**

This pressure washer is provided with a ground fault circuit interrupter (GFCI) built into the plug of the power supply cord. This device provides additional protection from the risk of electric shock. Should replacement of the plug or cord become necessary, use only identical replacement parts that include GFCI protection.

### 2. For a product rated more than 125 volts:

#### **GROUND FAULT CIRCUIT INTERRUPTER PROTECTION**

To comply with the National Electric Code (NFPA 70) and to provide additional protection from the risk of electric shock, this pressure washer should only be connected to a receptacle that is protected by a ground fault circuit interrupter (GFCI).

## Extension Cords

Use only 3-wire extension cords that have 3 prong grounding-type plugs and 3-pole cord connectors that accept the plug from the product. Use only extension cords that are intended for outdoor use. These

extension cords are identified by a marking "Acceptable for use with outdoor appliances; store indoors while not in use." Use only extension cords having an electrical rating not less than the rating of the product. Do not abuse extension cord and do not yank on any cord to disconnect. Keep cord away from heat and sharp edges. Always disconnect the extension cord from the receptacle before disconnecting the product from the extension cord.

# Operation

## Follow Safety Rules for Operation

After you have checked the equipment and positioned it in a suitable worksite, it is time to start your pressure washer. The following are the procedures necessary for safe, successful operation of your pressure washer.



### WARNING

Failure to follow safety rules may result in serious injury or death to the operator or bystanders.

**Instruct Operators.** Owner must instruct all operators in safe set-up and operation. Do not allow anyone to operate the pressure washer who has not read the Owner's Manual and been instructed on safe use practices.

**Safety Equipment/Controls.** Always operate with all safety covers, guards, and barriers in place and in good working order, and all controls properly adjusted for safe operation.

**Moving Parts.** Keep hands, feet, hair, and apparel away from moving parts. Air vents may cover moving parts and should be avoided as well. Never remove any guards while the pressure washer is operating.

**Ear Protection.** Hearing can be damaged from prolonged, close-range exposure to the type of noise produced by this pressure washer. The use of ear plugs or other hearing protection devices is recommended for persons working within 15-20 feet of the running pressure washer for an extended period of time.

**Eye Protection.** Wear ANSI "Z87.1" required safety glasses when operating or servicing the pressure washer. Pressurized spray from this pressure washer can cause severe injury to the eyes. Small objects can become airborne as the spray contacts them.

### NOTE!

Before starting the pressure washer, review the following general safety rules for operation:

### Conditions for Use

**Know How to Stop.** Be thoroughly familiar with proper use of the equipment and all controls and connections. Know how to stop the pressure washer and depressurize the system quickly if needed.

**Instruct All Operators.** The pressure washer's owner must instruct all operators and potential renters in safe set-up and operation. Do not allow anyone to operate the pressure washer who has not read the Owner's Manual and been instructed on its safe use.

**Adult Control Only.** Only trained adults should set up and operate the pressure washer. Do not let children operate. Pressure washers can generate forces greater than children can control and require judgment beyond what can be expected of children.

**Under the Influence.** Never operate, or let anyone else operate, the pressure washer while fatigued or under the influence of alcohol, drugs, or medication.

**Safety Equipment / Controls in Place.** Do not operate the pressure washer unless all safety covers, guards, and barriers are in place and in good working order, and all controls are properly adjusted for safe operation.

**Damaged.** Do not operate the pressure washer with damaged, missing, or broken parts. Never attempt to repair a high-pressure hose or component. Always replace it with a part that is rated at or above the pressure rating of the pressure washer.

**Modifications.** Do not modify the pressure washer in any way or deactivate any safety device. Fire, explosion, or other serious safety hazards will also void the warranty.

### During Use

**Stay alert.** Watch what you are doing at all times.

**Clear work area.** Clear the work area of all bystanders.

**Keep children and pets away.**

**Keep spray away from electrical wiring.** Spray contact with electrical wiring will likely result in severe electrical shock or electrocution.

**Do not point gun at people or animal.** It may result in serious injury or death.

**Do not direct spray at this pressure washer.** Do not attempt to clean this pressure washer with its own spray. Motor damage will result. Cleaning should be done with a damp sponge with the motor OFF.

# Operation

**Never pull by hose.** Do not move this pressure washer by pulling on the hose. Hose or connections could fail and result in catastrophic high-pressure release of fluid as well as hose whipping.

**Avoid sharp objects.** Keep hose away from sharp objects. Bursting hoses may cause injury.

**No load bearing.** Do not use the pump to support other items of equipment that impose unacceptable loads on the pump. Do not attempt to use this pressure washer as a prop.

**Lock trigger safety latch when not spraying.** Spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger release. Rotate safety latch to the locked position when not spraying.

**Leaving unattended.** Always turn off the pressure washer and relieve system pressure before leaving the sprayer unattended.

## Prompt Emergency Response

**Seek medical aid for suspected injection injury.** If injured by high-pressure fluid, no matter how small the wound is, see a doctor at once. A typical injection injury may be a small puncture wound that does not look serious. However, severe infection or reaction can result if proper medical treatment is not administered immediately by a doctor who is familiar with injection injuries.

## Wear Personal Protective Gear

### WARNING

Wear personal protective gear to prevent:

- Eye and skin injection injury from high pressure spray
- Eye injury from flying debris

1. Wear waterproof gloves, ANSI Z87.1 compliant safety goggles, face protection, and protective clothing when operating the pressure washer. If spraying pressure washer specific chemicals, wear a respirator mask to avoid inhalation of vapors if directed on the chemical label.
2. Wear non-slip, protective footwear. Use of pressure washer can create puddles and slippery surfaces. Wear footwear capable of maintaining a good grip on wet surfaces.

## Preparing for Operation

Make sure that any regular maintenance has been performed as prescribed in “*Maintenance & Repair*” section.

## Check/Add Oil to Pump

### CAUTION

Pump	Model	Oil Type
Cat 4DX	990990	SAE 30 Non-Detergent Oil or Cat Pump Oil part # 22158
Cat 4DNX	990991	

Never run the pump without sufficient lubrication!

1. Remove shipping plug and install vented fill cap
2. Check oil level. Verify that oil level is halfway up the sight glass.
3. If oil level is low, use the oil type from above table.

# Operation

## Inspect Spray System

**Always inspect spray system for damage and leaks before each use.** Do not start pressure washer until all needed repairs have been completed.

### **⚠ WARNING**

#### **High Pressure Fluid Injection Hazard**

High-pressure fluid discharge from leaks (even pin-sized) or ruptured components can pierce skin and inject fluid into the body. Injection injury can result in blood poisoning and/or severe tissue damage leading to infection, gangrene, and possibly amputation.

- Never use a finger or skin to check for leaks.
- Never operate pressure washer with damaged or missing hoses/parts.
- Never attempt to repair a high-pressure hose or component – Always replace it with a part that is rated at or above the pressure rating of this pressure washer.

## Perform Scheduled Maintenance, As needed

Make sure that any other regular maintenance has been performed as prescribed in this manual in the "Maintenance Schedule Summary" section. Refer to the motor maintenance instructions.

## Connect Hoses, Water Supply, and Spray Nozzle

### Position Pressure Washer for Use

- For detailed instruction on positioning your pressure washer for use, turn to the "Initial Set-Up" section of this manual and reference "Step 3: Select Suitable Location".
- Where no flammable vapors, dusts, and gases are present.
- Where there is adequate, unobstructed ventilation airflow.
- With adequate clearance from combustible materials.
- On a firm, level, heat-resistant surface with good drainage and nearby access to a continuous water supply.

### Attach Garden Hose to Water Inlet

1. Make sure the water supply is clean. Debris can cause excess pump wear and reduce performance.
2. An insufficient water supply will damage your pump. Make sure the water supply is steady and is 20% over the rated flow of your pump. Use a stopwatch to time how long it takes to fill a 5-gallon bucket with

your garden hose. The bucket must fill faster than the times listed in the table below.

Model#	Time to Fill 5 Gallon Bucket
990990	160 sec
990991	100 sec

3. The water supply garden hose must have an inside diameter of at least 5/8". If the hose is more than 100 ft. long, the diameter must be at least 3/4".
4. Never use a reservoir tank as a water source. Drawing water out of a tank may cause pump cavitation and damage to your pump. This pressure washer is designed for a pressurized water source such as a city water faucet. However, the water source pressure must not exceed:

Model#	Max. Inlet psi
990990	60 psi
990991	60 psi

5. Always use a flexible rubber hose for your water supply. Do not use rigid piping.

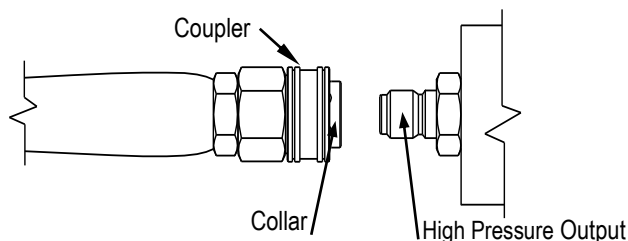
## Attach High Pressure Hose to Spray Gun and Water Outlet

### **⚠ WARNING**

#### **High Pressure**

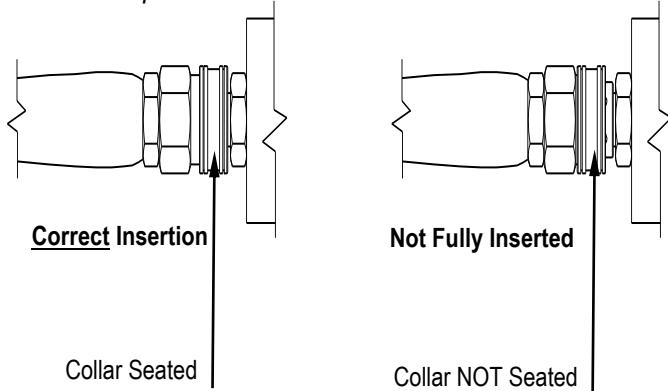
NEVER operate this pump with components (such as hose, connections, and spray gun) rated for lower pressure and/or temperature limits than the pressure washer's maximum rated pressure and temperature, or component could rupture and cause serious personal injury from escaping high pressure fluids.

1. See "Component Identification" section of this manual for location of the pressure washer's water outlet.
2. Your pressure washer hose is equipped with quick couplers. Simply pull the collar back and push the coupler onto the water outlet nipple. The collar should slide over the ball bearings



## Operation

- Release the collar, making sure it springs back and re-seats to its original (non-retracted) position. *Check the connection by pulling on the hose to ensure a positive connection.*



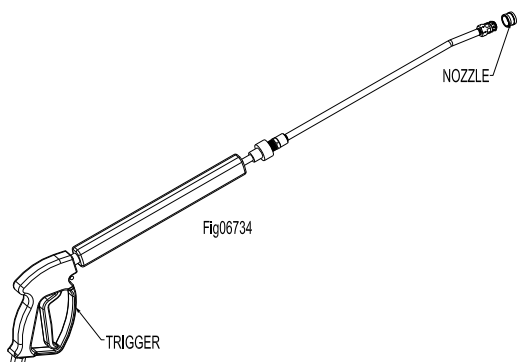
### Select Nozzle for Spray Gun

Your pressure washer is equipped with one high-pressure nozzles and one low-pressure nozzle. Additional nozzles can be purchased by following the Nozzle Orifice size in the specification. Generally, the wider the spray angle of the nozzle, the lower the spray impact produced. Select the appropriate nozzle for the job based on the following table:

Color of Nozzle:	Spray Angle	Used For
Yellow	15	Tough Stains/Stripping
Green	25	General
White	40	Light Cleaning
Black (Low Pressure)	65	Chemicals

NOTE: You must use the low-pressure black nozzle for spraying chemicals.

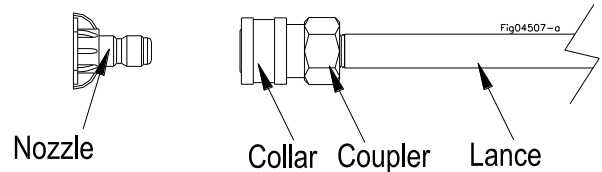
### Attach Nozzle to Spray Gun



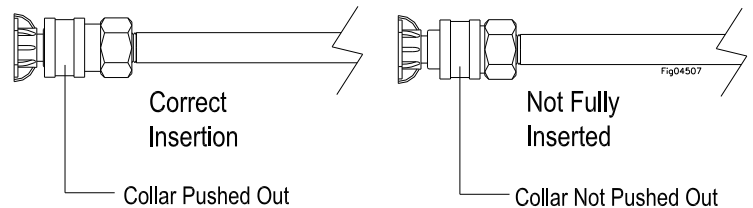
### **WARNING**

#### Depressurize First

Any time you remove/install/change a nozzle, you must depressurize hose line by squeezing the spray gun trigger while the motor is off. Even if the motor has been off for a long period of time, the hose may remain dangerously pressurized.



- Make sure the motor is off and the hose line is depressurized.
- To install the nozzle, pull the collar back and twist the nozzle firmly into the coupler on the end of the wand.
- 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.*



### Prime the Water Supply

#### Turn On Water Supply and Squeeze the Trigger

#### **CAUTION: Water Pressure**

Never run the pump without the water supply connected and turned on. Operating the pressure washer without sufficient incoming flow of water will damage the pump.

- Turn on the water supply. Make sure the water supply is steady and flowing at a rate 20% over the rated flow of your pump. (Reference the flow rate table under the "Connect Hoses, Water Supply, and Nozzle" section.)
- Purge air from the water supply hose by squeezing the trigger until a steady stream of water flows out of

## Operation

the nozzle at low pressure. (Air in the hoses can cause damage to the pump, so always make sure all the air is out of the hoses before starting the pressure washer motor.)

- Make sure the water supply hose is not kinked. A kinked hose will provide insufficient water supply to the pump and reduce its life. Make sure the hose remains unkinked after moving the pressure washer.

### Set Up for Chemical Spray (if desired)

#### Prepare for Chemical Spray (if planning to use)

Using the proper cleaning chemical for the application can speed up cleaning jobs tremendously.

Your pressure washer is equipped with a chemical injection point on the downstream side of the pump for introducing cleaning chemicals into the water stream. A braided chemical hose is provided to connect at this point. Suction pressure at this connection automatically draws the chemical solution in through the hose, mixing in 1-part chemical to 15 parts water. Adequate suction pressure is created only when the low pressure (black) spray nozzle is used.

The introduction of cleaning chemicals via the chemical injection point affords the following advantages:

- It protects the pump from damage because no chemical passes through the pump.
- It mixes the cleaning chemical into a low-pressure spray. Cleaning chemicals applied under low pressure adhere better to the surface being cleaned, allowing the formula time to react and remove dirt more effectively.

Note: An external *upstream chemical injector* is not recommended for use with this pressure washer, and if used would obviously alter the 15-to-1 dilution ratio and may cause pump damage.

### CAUTION

#### Chemicals Containing Muriatic Acid

Certain chemicals, such as bleach or those containing muriatic acid, will cause pump damage if introduced upstream through the pump's water inlet. Use of chemicals not intended for pressure washers will void pump warranty.

### WARNING

#### Chemical Spraying

- Never spray acids, corrosives, or abrasive or flammable liquids. Breathing hazards, surface burns/corrosion, or fire/explosion could result.
- Follow the chemical manufacturer's label instructions for proper use and handling of the chemical. Understand all safety hazards and first aid for all chemicals being used. Always wear protective gloves when handling and cleaning with chemicals, and wear other protective gear as directed by chemical manufacturer. Always dispose of hazardous fluids per local, state, and national guidelines.

#### Acquire Cleaning Chemical

Use only approved pressure washer chemicals or chemicals specifically formulated for use with pressure washers.

### CAUTION

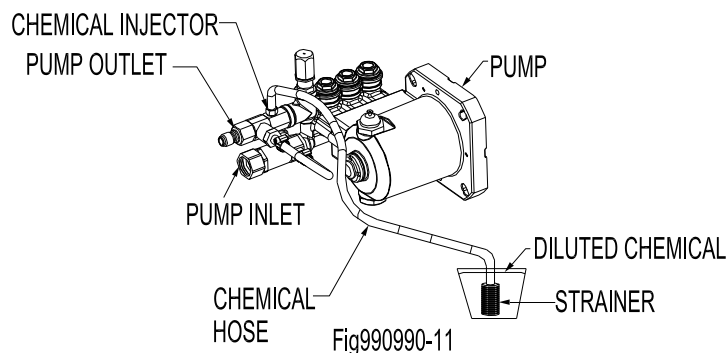
#### Non-approved Chemicals

Non-approved chemicals can damage pressure washer components (seals, wand, hoses, pump, etc.) and be harmful to the environment.

#### Prepare for Chemical Spray (If Planning to Use)

Prepare the pressure washer for chemical spraying using the following steps:

1. Prepare (dilute) chemical cleaning solution as required for the job.  
Note: the chemical solution will be automatically mixed with the water at a ratio of 15 parts water to 1-part chemical solution.
2. Press the braided chemical hose over the chemical injector on the pump.
3. Submerge the suction strainer connected to the braided chemical hose into a bucket containing the chemical solution.



# Operation

## Start-Up Procedures

### Start the Motor to Power the Pump

1. Make sure water supply is connected and primed.

#### CAUTION

#### Warranty Void

Running the pump dry will cause damage and void the warranty.

2. To prevent accidental spraying, engage the safety latch on spray gun trigger by rotating it to the locked position.

### Apply Cleaning Chemical (if desired)

1. Make sure the chemical injector is properly set up according to the instructions. Reference “Set Up for Chemical Spray” on the previous page.
2. Make sure the low-pressure BLACK nozzle is attached before beginning to spray chemicals. *Only the low-pressure black nozzle will allow chemicals to be drawn through the chemical injector into the water stream.*
3. Apply chemicals by squeezing the spray gun trigger. The chemical injector will draw the chemical into the water stream.
4. Apply chemicals evenly to the cleaning surface. Never use more chemical than is necessary to clean the surface.
5. Allow the chemicals time to react with the dirt before rinsing.
6. Prepare to rinse by changing to a high-pressure nozzle. Changing the nozzle from the low-pressure black nozzle to a high-pressure nozzle will stop the flow of chemicals into the water stream.

Instructions for selecting a nozzle can be referenced in the “Connect Hoses, Water Supply, and Spray Nozzle” section. See the subsection “Select Nozzle for Spray Gun”.

7. Rinse with high-pressure spray as instructed below:

## Begin High Pressure Spray

#### ⚠ WARNING

### High - Pressure Spraying Safety

- **Keep spray away from people.** Never direct discharge stream at or near any person. Do not allow any part of the body to come in contact with the fluid stream. High-pressure spray can cause serious skin, eye, or falling injuries. Injection injury will occur if high-pressure spray pierces the skin, injecting liquid under the skin. Injection injury can result in blood poisoning and/or severe tissue damage leading to infection, gangrene and possibly amputation. Seek medical attention.
- **Do not secure trigger open.** To reduce risk of injury, do not attempt to secure the spray gun open by blocking or tying the spray gun in the open position.
- **Prevent slips / loss of balance.** High-pressure spray could cause you to lose balance from kickback forces, and wet surfaces can be slippery.
  - Keep good footing and balance at all times. Do not overreach.
  - Do not stand on unstable support when spraying.
  - If spraying from an elevated surface, use fall protection because spray gun kickback can propel you off the elevated surface. When spraying from a ladder or scaffolding, ensure it is firmly anchored from sway or tip-over.
  - Be aware of puddles and slippery surfaces. Ensure there is adequate drainage to prevent pooling of water.
- **Prevent surface damage & flying debris.** Surfaces being sprayed must be strong enough to withstand high-pressure spray or damage may result. In addition, high-pressure spray will dislodge unsecured objects as well as surface chips and debris, resulting in hazardous flying objects that can cause personal injury or property damage. Do not spray brittle surfaces or breakable, fragile, or unsecured objects such as:
  - stucco or laminar flagstone
  - some painted surfaces
  - windows or glass doors, or mailboxes they may break)
  - light fixtures, flowerbeds, mailboxes
  - unsecured, lightweight objects

# Operation

## Procedure:

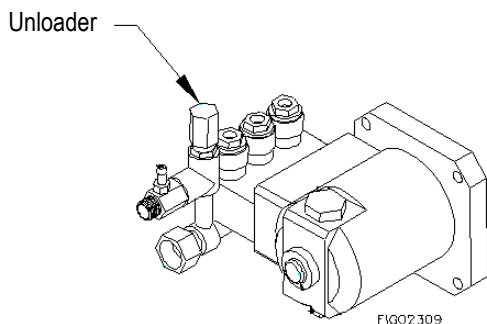
1. Install the high-pressure spray nozzle (always relieve system pressure first and follow instructions for attaching a nozzle).

### **WARNING**

#### **Injury**

This pressure washer is equipped with an On-Demand feature. This feature will shut-off the motor when the operator is not spraying and may appear as if the pressure washer is off if left unattended. Always turn off the motor and relieve system pressure when finished spraying or when leaving sprayer unattended. Serious injury could result from unintentional release of high-pressure spray.

2. Clear the cleaning area of all persons. Keep children and pets away.
3. Hold the spray gun firmly with two hands and a sturdy stance -- Gun kicks back when triggered.
4. Wash from the bottom to the top, using side-to-side motions. This washes away heavy dirt and allows the detergent to soak as you work toward the top.
5. Use the width of the spray pattern to wash a wide path. Overlap spray paths for complete coverage.
6. The nozzle should be 12" to 24" from the work, closer for tough areas.
7. Small parts should be washed in a basket, so the pressure does not push them away. Larger, lightweight parts should be clamped down.
8. The pressure washer is set and locked to the maximum rated pressure when it leaves the factory. To reduce the pressure, turn the unloader knob counterclockwise. To return to maximum pressure turn knob clockwise.



9. If temporarily interrupting spraying, rotate trigger safety latch downward to the locked position to guard against accidental trigger release

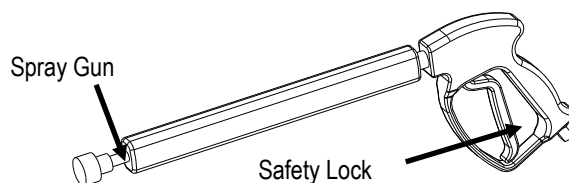
### **WARNING**

#### **Warranty Void**

Do not attempt to alter the unloader valve's maximum pressure. Excess pressure could cause serious injury from escaping high-pressure fluids and/or pump damage. Any alteration other than turning the adjustment knob will void your warranty.

#### **Spray Gun Safety Lock**

When not spraying, use the spray gun safety lock to prevent accidental high-pressure discharge.



10. Always turn off the motor and activate spray gun trigger to relieve system pressure when:
  - the sprayer is unattended, or
  - disconnecting hoses, installing/cleaning nozzles, or servicing the pump.

### **WARNING**

#### **Injury**

Always turn off the motor and relieve system pressure when finished spraying or when leaving sprayer unattended. Serious injury could result from unintentional release of high-pressure spray.

## **Shutdown**

### **WARNING**

#### **Injury**

Never disconnect the high-pressure hose from the pump or spray gun while the system is pressurized. Relieve pressure by squeezing the spray gun trigger after the motor is turned OFF.

#### **Stop the motor using the following steps:**

1. Turn motor OFF.
2. Unplug the power cord.
3. Turn water supply OFF.
4. Squeeze trigger to relieve system pressure.
5. Remove garden hose.
6. Remove pressure hose.

## Storage

When you are finished using the pressure washer, you must prepare the pressure washer for storage and store it in a proper location.

### Between Use Storage

**Perform periodic maintenance** as directed in this manual to keep the pressure washer in safe working condition.

**Choose a storage location that is:**

- Clean and dry.
- Away from sources of heat, open flames, sparks, or pilot lights, even if the pressure washer's motor is off.

Away from extreme high or low temperatures. Do not store the pressure washer in freezing conditions unless it is prepared as directed below for those conditions.

*Note:*

- **If you will be storing the pressure washer in freezing conditions**, follow the instructions for preparing the sprayer for storage in freezing conditions.
- **If you will not be using the pressure washer again for 30 days or more**, follow the instructions for preparing for long-term storage.

### Prepare Pressure Washer for Freezing Conditions

**If you will be storing the pressure washer in freezing temperatures, you must properly prepare the pressure washer to prevent water from freezing in the system.**

#### ⚠ WARNING

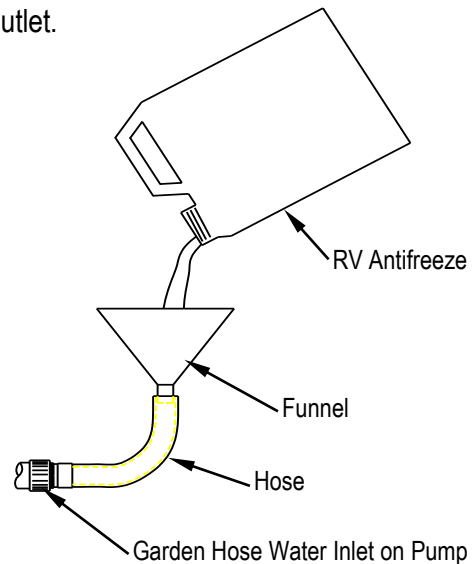
#### Freezing Conditions

Do not allow water to freeze in the pressure washer, high pressure hose, or spray gun. Freezing water can cause damage to the equipment and cause the spray gun to fail in the open position. A spray gun that has failed in the open position can whip around and cause personal injury when the pressure washer is started.

1. Drain the water from the high-pressure hose and spray gun by depressing the trigger on the spray gun until all water drains out.
2. Disconnect the plumbing that connects to the pump outlet.
3. Obtain the materials you will need:

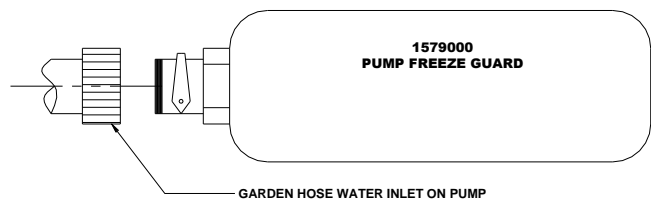
- 12" piece of garden hose or equivalent, Funnel, and
- approximately 6 oz. of RV antifreeze.

4. Attach the 12" garden hose piece with the funnel to the pump inlet.
5. Pour RV antifreeze into the funnel, then pull the recoil a few times until antifreeze comes out of the pump outlet.



OR

1. Obtain the materials you will need:
  - 1579000 NorthStar Pressure Washer Pump Freeze Guard.
2. Attach bottle of freeze guard to pump inlet.
3. Squeeze freeze guard bottle until antifreeze comes out of the pump outlet.



### Prepare Pressure Washer for Storage

1. Make sure the motor start switch is OFF.
2. Disconnect the motor power cord if you haven't already done so.
3. Disconnect the high-pressure hose, garden hose, and spray gun.

#### Move Pressure Washer to Storage Location

Let motor cool for 5 minutes before moving the pressure washer to its storage location.

## Maintenance & Repair

### WARNING

#### Maintenance Hazards

ALWAYS shut off water supply, bleed water pressure, and turn off motor before cleaning, adjusting, or servicing the pressure washer. After servicing, make sure all guards and cover shields are replaced before using.

## Maintenance Schedule Summary

Item	Frequency
Remove dust/debris accumulation	As needed
Inspect spray system	Each use
Clean inlet filter	Each use
Check pump oil level	Each use
Change pump oil	<ul style="list-style-type: none"><li>• After first 50 hours of use</li><li>• Every 3 months or 500 hours of use after that</li></ul>

See detailed instructions for each maintenance item below.

(Note: For end-of-the-season storage instructions, see the "Storage" section of this manual.)

## Detailed Instructions – Maintenance & Repair

**No modifications.** Never modify or alter the pressure washer in any way. Modifications can create serious safety hazards and will also void the warranty.

### Follow Safety Rules

Read and follow these safety rules whenever you will be servicing the pressure washer:

- **Turn off / relieve pressure first.** Always turn off pressure washer and relieve system pressure before inspection or maintenance.
- **Replace guards.** Make sure all guards and cover shields are replaced after servicing the pressure washer.
- **Major repair.** Major service, including the installation or replacement of parts, should be performed only by a qualified service technician. Obtain factory approved parts from NorthStar Product Support at 1-800-270-0810.
- **Replacement parts.** If a part needs replacement, only use factory approved repair parts. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the pressure washer and will void the warranty.

### Keep Pressure Washer Clean

If dust or debris accumulates on the pressure washer, clean the pressure washer with a damp cloth or soft bristle brush. Do not allow air intakes to become blocked.

### CAUTION

Do not spray pressure washer with a garden hose or pressure washer. Water may enter the pressure washer and cause damage.

### Inspect Spray System

**Inspect spray system for damage and leaks before each use.**

Do not start pressure washer until all needed repairs have been completed.

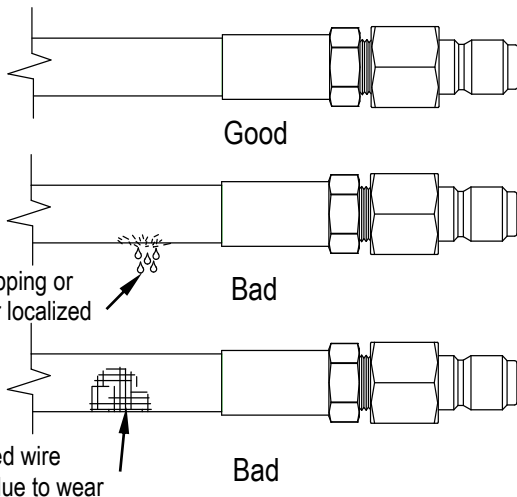
# Maintenance & Repair

## ⚠ WARNING

### High Pressure Fluid Injection Hazard

High pressure fluid discharge from leaks (even pin-sized) or ruptured components can pierce skin and inject fluid into the body. Injection injury can result in blood poisoning and/or severe tissue damage leading to infection, gangrene, and possibly amputation.

- Never use a finger or skin to check for leaks.
- Never operate pressure washer with damaged or missing hoses/parts.
- Never attempt to repair a high-pressure hose or component – Always replace it with a part that is rated at or above the pressure rating of this pressure washer.
- Check hoses, fittings, wand, trigger gun and connections for signs of wear, cracks, looseness, or leaks. Replace as required.
- Check and clean the nozzle orifice.



## Clean Inlet Filter

Clean the inlet filter before each use.

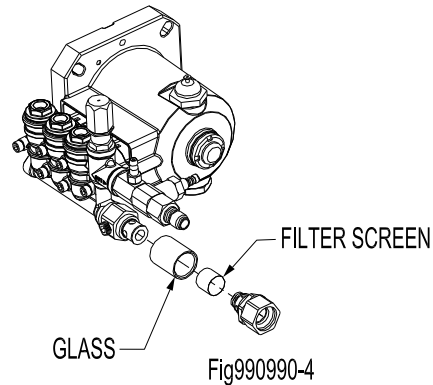
## ⚠ WARNING

### Filter Disposal

When cleaning filters, check whether dangerous chemicals have been used with the filter and take any precautions that may be recommended by the manufacturer of these chemicals. Always dispose of hazardous fluids per local, state, and national guidelines.

1. Unscrew garden hose from water inlet (if connected).

2. Unscrew inlet filter.
3. Remove filter screen.
4. Run water through filter screen to clean.
5. Reassemble.



Do not start pressure washer until all needed repairs have been completed.

## Maintenance & Repair

### Change Pump Oil

Change the pump oil after the first 50 hours of use, and then after every 3 months or 500 hours of use after that.

1. Remove drain plug from pump.
2. Drain pump oil into suitable container and dispose of responsibly.
3. Reinstall oil drain plug.
4. Make sure pressure washer is sitting level.
5. Reference the "Specifications" section of this manual to determine the oil type and quantity needed for your pump model.
6. Replace oil fill cap.

capable of making minor repairs and performing all preventative maintenance procedures.

- Keep a stock of recommended service parts for maintenance and minor repairs.

#### IMPORTANT: Replacement Parts

If a part needs replacement, only use parts that meet the manufacturer's part number specifications. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the pressure washer.

**Contact NorthStar Product Support at  
1-800-270-0810 for any  
questions, problems, or parts orders.**

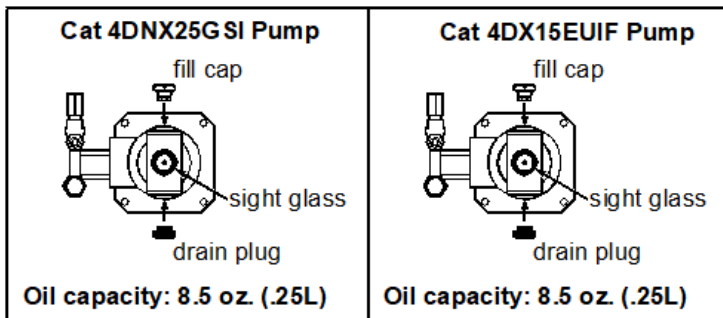


FIG05038

#### NOTICE:

Dispose of used motor and pump oil in a manner that is compatible with the environment and in accordance with local, state, and federal laws and regulations.

- Take used oil in a sealed container to your local recycling center or service station for reclamation.
- Do not throw it in the trash, pour it on the ground, or pour it down a drain.

#### NOTE TO COMMERCIAL USERS:

All mechanical equipment, no matter how well designed, will need maintenance and repairs. A NorthStar pressure washer is no exception. At times, a NorthStar pressure washer may become inoperable because repairs are required. NorthStar Product Support will assist in these repairs as needed, but if an inoperable pressure washer creates a major expense to your business, then we strongly recommend the following:

- Have a staff person become familiar with the mechanical operation of the pressure washer and

## Troubleshooting

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.

Problem	Solution
Motor will not start	SOLUTION: A,B, M, N, O
Low/Surging pressure or no water flow	SOLUTION: C,D,E,F,G,H
No chemical injection	SOLUTION: I,J,K,L
Cause	Solution
<b>A-</b> Tripped GFCI cord	Reset GFCI cord
<b>B-</b> Tripped motor relay	Reset motor
<b>C-</b> Insufficient water supply	See water supply section of this manual
<b>D-</b> Plugged pump inlet filter	See maintenance section of this manual
<b>E-</b> Wrong nozzle	Make sure high-pressure nozzle is being used
<b>F-</b> Plugged nozzle	Remove nozzle, check for blockage
<b>G-</b> Worn nozzle	Replace nozzle
<b>H-</b> Leak in pressure hose	Replace pressure hose
<b>I-</b> Wrong nozzle	Make sure chemical nozzle is being used
<b>J-</b> Back pressure from extra-long discharge hose	Try shorter hose
<b>K-</b> Leak in chemical siphon hose	Replace hose – use hose clamps if necessary
<b>L-</b> Chemical strainer not submerged	Make sure strainer is completely submerged
<b>M-</b> Tripped circuit breaker	Make sure breaker is rated to 120V/20A (990990 only) Make sure breaker is rated to 230V/30A (990991 only)
<b>N-</b> Extension cord too long	Use extension cord with an appropriate rating for distance
<b>O-</b> Debris in flow switch	Clean flow switch

Parts Explosion- Model #990990, 990991 REV-G

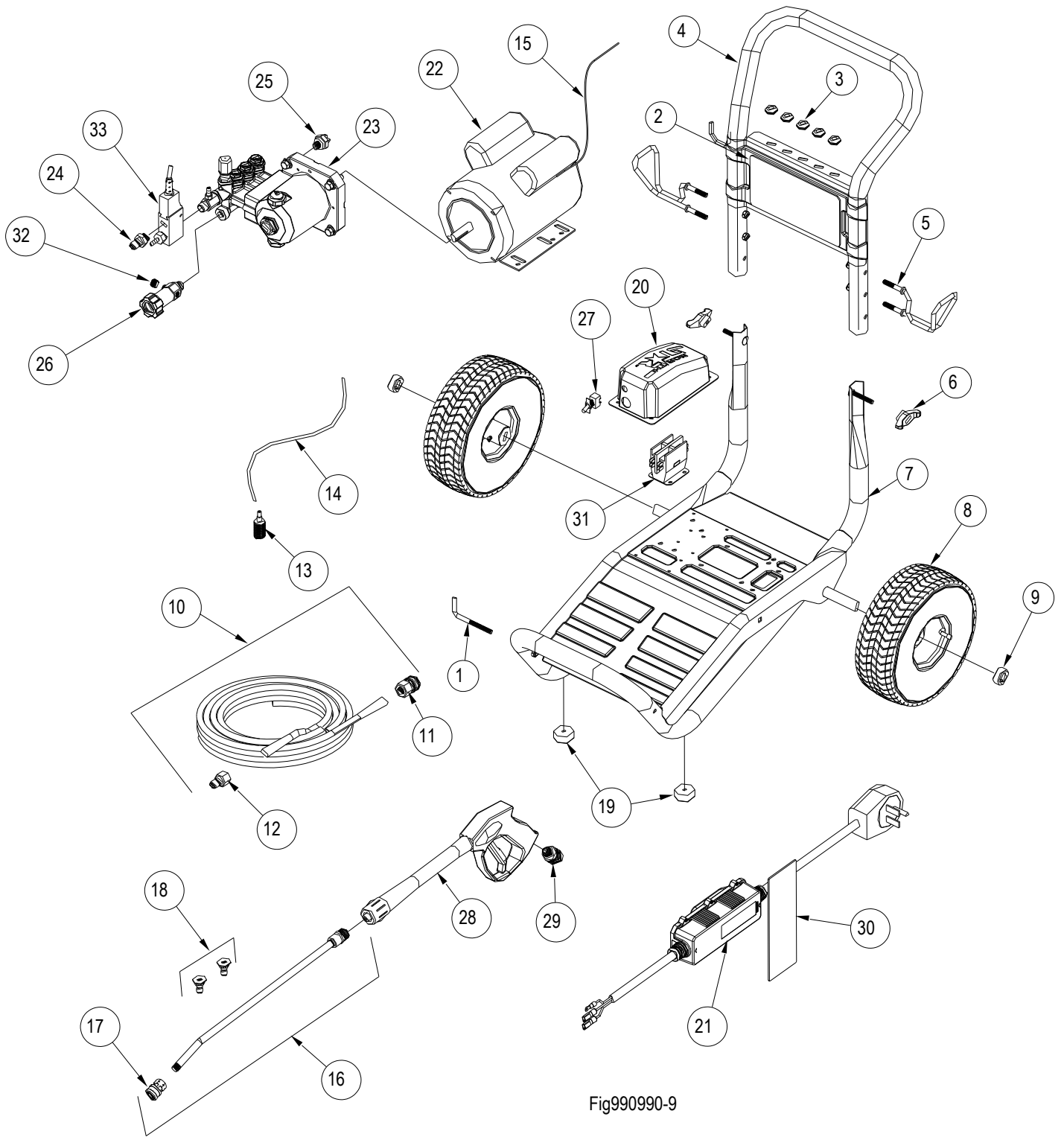


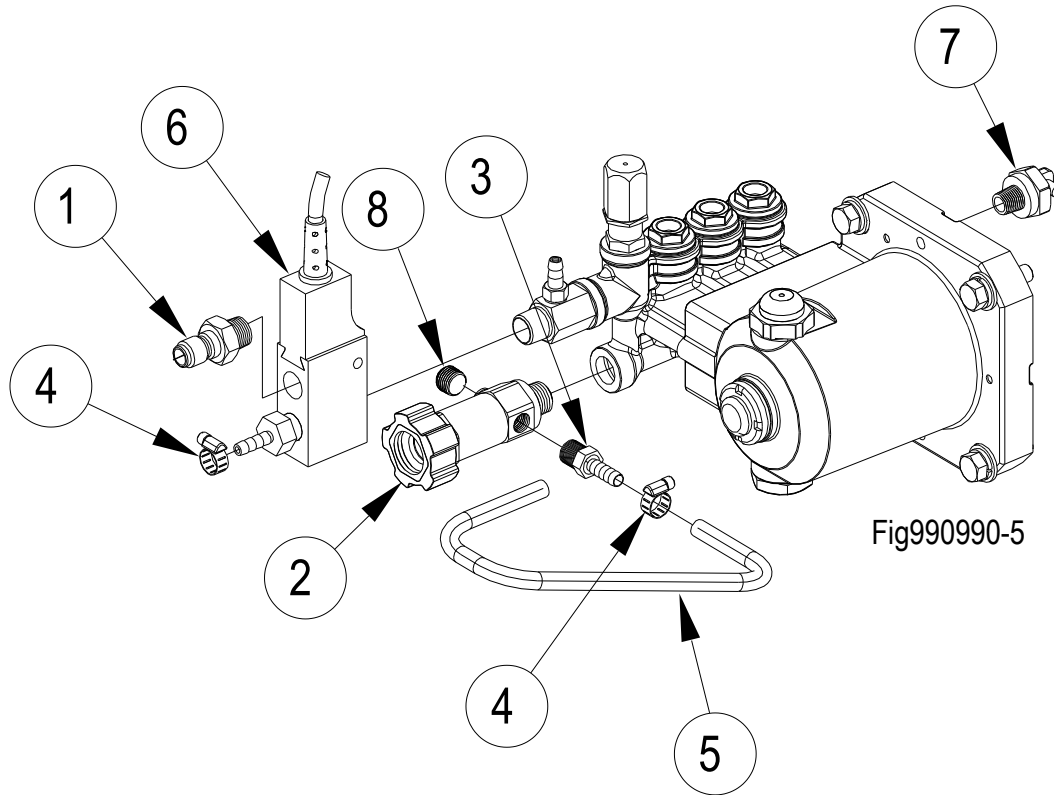
Fig990990-9

\*990990 Shown

**Parts List - Model #990990, 990991 REV-G**

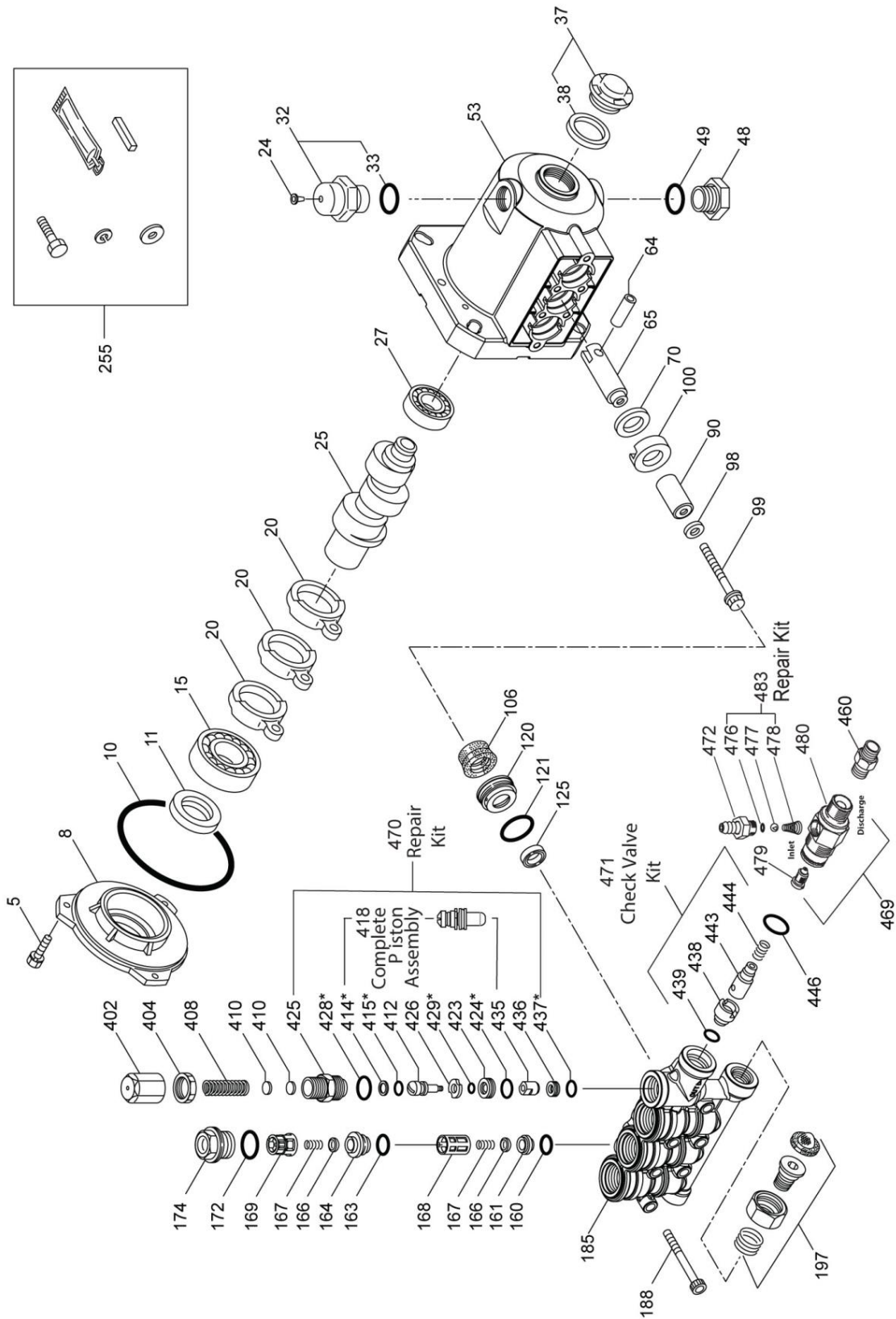
ITEM #	PART #	DESCRIPTION	QTY	MODELS
1	38509	Threaded Gun Hook	1	All
2	802037	NorthStar Decal	1	All
3	35198	7/16 ID Grommet	5	All
4	802038	Handle	1	All
5	779761	Hose/Cord Hook	2	All
6	38578	T-Handle Knob	2	All
7	802039	Base	1	All
8	800402	Tire Wheel Assembly	2	All
9	305200	Wheel Retainer	2	All
10	38524	5/16 x 25' Gray Hose	1	All
11	777915	3/8" Quick Connect Nipple	1	All
12	777914	3/8" Quick Connect Coupler	1	All
13	221222	Chemical Strainer	1	All
14	777165	1/4" Braided Chemical Hose	3 ft.	All
15	778147	Motor Cord, 12-2 AWG SJTW	1	990990
	802409	Motor Cord, 12-2 AWG SJTW	1	990991
16	791309	18.5" Lance	1	All
17	791308	1/4" Quick Connect	1	All
18	778150	Nozzle 2 pack #2.0	1	990990
	38530	Nozzle 2 pack #3.0	1	990991
19	2215	Rubber Feet	2	All
20	802096	Electric Control Box Cover	1	All
21	803215	GFCI Cord 120V/ 20A With Decal	1	990990
	803216	GFCI Cord, 240V/30A With Decal	1	990991
22	803226	Motor, 2.0 HP WEG	1	990990
	802303	Motor, 5.0 HP WEG	1	990991
23	792420	Pump, Cat 4DX	1	990990
	789205	Pump, Cat 4DNX	1	990991
24	777913	3/8 QC NIPPLE X 3/8" NPT-MALE	1	All
25	35918	Thermal Protector	1	All
26	800985	Filter, Inlet, 3/8" NPT X 3/4" FGH	1	All
27	777855	Toggle Switch	1	All
	5260	On-Off Plate	1	All
28	38527	Gun, Consumer, QC	1	All
29	780455	3/8" Male NPT Coupler	1	All
30	778070	Cord Warning	1	All
31	778151	DP Contactor 120V/25A	1	990990
	778152	DP Contactor 230V/30A	1	990991
32	777838	1/4" Hex Plug Counter Sunk	1	All
33	802097	On Demand Flow Switch	1	All

## Pump Assemblies – 4DX, 4DNX



Ref#	Part#	Description	Qty	Model#
1	777913	3/8 QC NIPPLE X 3/8" NPT-MALE	1	Both
2	800985	3/8" INLET FILTER	1	Both
3	777340	1/4" X 1/4" HOSE BARB FITTING	1	Both
4	777834	1/4" HOSE CLAMP	2	Both
5	777165	1/4" PVC HOSE (SOLD BY FOOT)	1.17 ft	Both
6	802097	ON DEMAND FLOW SWITCH	1	Both
7	35918	THERMAL VALVE	1	Both
8	777838	1/4" NPT PLUG	1	Both

# Pump Exploded View – Cat 4DX

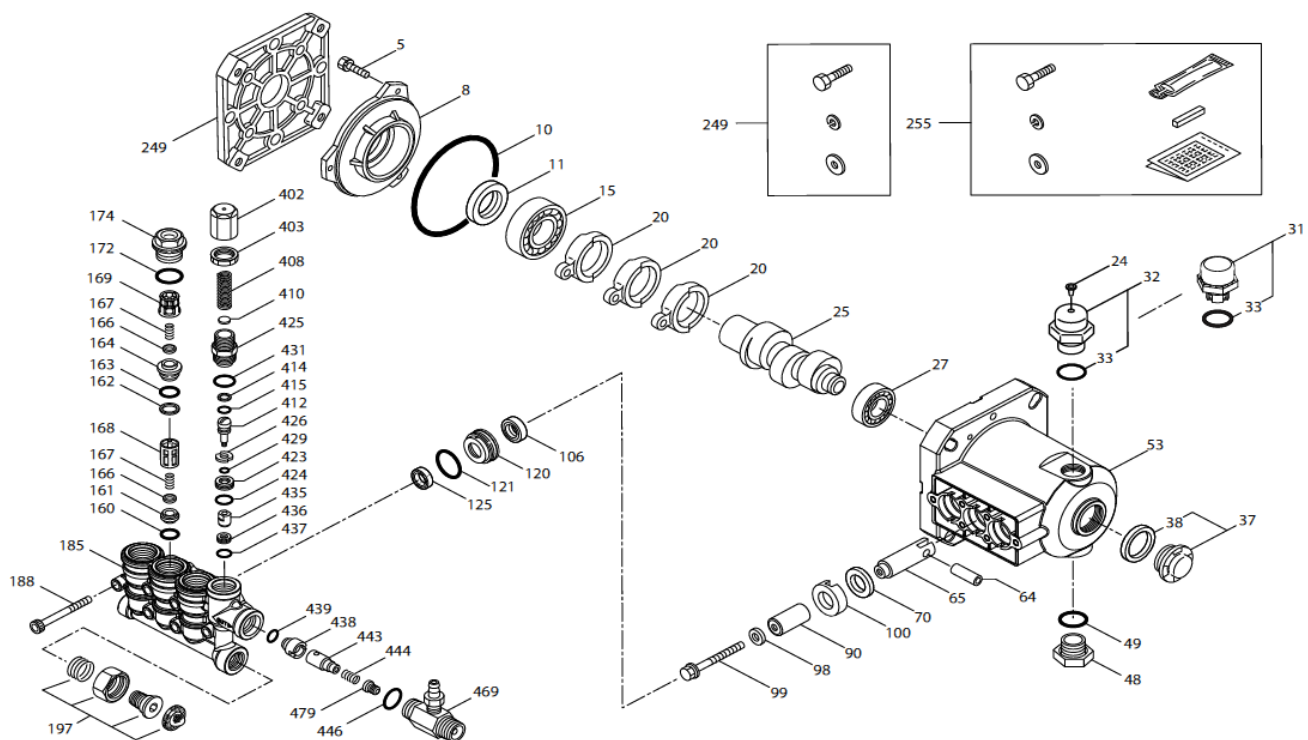


## Pump Parts List – Cat 4DX

Ref#	P/N	DESCRIPTION	QTY
5	<i>Not Available</i>	Screw	3
8	CA547153	Bearing Cover	1
10	CA14041	O-Ring, Bearing Cover	1
11	CA55337	Oil Seal	1
15	CA14488	Inner Ball Bearing	1
20	CA547048	Connecting Rod	3
24	<i>Not Available</i>	Oil Plug Cap	1
25	<i>Not Available</i>	Crankshaft	1
27	CA15710	Ball Bearing	1
32	CA547961	Cap	1
33	CA14179	O-ring for Oil Filter Cap	1
37	CA92241	Gauge, Bubble Oil w/Gasket	1
38	CA44428	Gasket, Flat Flex Oil Gauge	1
48	CA44842	Drain Plug	1
49	CA14179	O-Ring for Drain Plug	1
53	<i>Not Available</i>	Crankcase	1
64	CA46229	Crosshead Pin	3
65	CA132190	Plunger Rod	3
70	CA47215	Oil Seal	3
90	CA542403	Plunger	3
98	CA46730	Washer	3
99	CA542405	Retainer, Plunger	3
100	CA46233	Retainer, Seal	3
106	CA48222	Seal	3
120	CA547357	Seal Case	3
121	CA13976	O-Ring for Seal Case	3
125	CA46240	Seal	3
160	CA13965	O-Ring, Inlet	3
161	CA545177	Seat, Inlet	3
163	CA19285	O-Ring	3
164	CA545178	Seat, Discharge	3
166	CA46764	Valve	6
167	CA46865	Spring	6
168	CA543988	Retainer, Spring, Inlet	3
169	CA49764	Retainer, Spring, Discharge	3
172	CA142807	O-Ring for Plug	3
174	CA547104	Plug, Valve w/O-ring	3
185	<i>Not Available</i>	Head, Manifold w/Unloader Body	1
188	<i>Not Available</i>	Screw	6

Ref#	P/N	DESCRIPTION	QTY
197	CA941516	Inlet Fitting Assembly	1
255	CA30516	Bolt Mount Assembly	1
401	CA32088	Handle Adjustable (Not Shown)	1
402	CA46570	Adjusting Cap	1
404	CA45070	Lock Nut	1
408	CA33394	Pressure Spring	1
410	CA549352	Spring Retainer	1
412	CA46251	Piston Stem	1
414	CA28338	Back Up Ring	1
415	CA22056	O-Ring, Piston Stem	1
418	<i>Not Available</i>	Piston Assy (Included in # 470)	1
423	CA46249	Retainer Valve	1
424	CA13966	O-Ring, Valve Retainer (Outer)	1
425	CA46248	Piston Retainer	1
426	CA46250	Washer	1
428	CA26133	O-Ring	1
429	CA17399	O-Ring, Valve Retainer	1
435	CA548193	Valve	1
436	CA46253	Seat	1
437	CA13963	O-Ring, Seat	1
438	CA46254	Seat, Check Valve	1
439	CA13963	O-Ring, Check Valve Seat	1
443	CA541060	Valve, Check	1
444	CA45924	Spring	1
446	CA26133	O-Ring	1
460	CA107681	Discharge Fitting	1
469	CA7231	Chemical Fixed Injector	1
470	CA76031	Unloader Repair Kit Includes: 418, 428, 436, 437	1
471	CA76146	Check Valve Kit Includes: 438, 439, 443, 444, 446	1
472	CA46630	Barb	1
476	<i>Not Available</i>	Barb O-Ring	1
477	<i>Not Available</i>	Ball	1
478	<i>Not Available</i>	Spring	1
479	<i>Not Available</i>	Orifice	1
480	<i>Not Available</i>	Body	1
483	CA76176	Repair Kit	1
Kit #1	CA33053	Seal Kit Includes: 98, 106, 121, 125	1
Kit #2	CA76978	Valve Kit Includes: 160, 161, 162, 163, 164, 166, 167, 168, 169, 172	1
*	CA76754	O-ring Kit Includes: 414, 415, 424, 428, 429, 437	1

# Pump Exploded View – Cat 4DNX



Ref#	P/N	DESCRIPTION	QTY
5	Not Available	Screw	3
8	CA547153	Bearing Cover	1
10	CA14041	O-Ring, Bearing Cover	1
11	CA55337	Oil Seal	1
15	CA14488	Inner Ball Bearing	1
20	CA547048	Connecting Rod	3
24	Not Available	Oil Plug Cap	1
25	Not Available	Crankshaft	1
27	CA15710	Ball Bearing	1
32	CA547961	Cap	1
33	CA14179	O-ring for Oil Filter Cap	1
37	CA92241	Gauge, Bubble Oil w/Gasket	1
38	CA44428	Gasket, Flat Flex Oil Gauge	1
48	CA44842	Drain Plug	1
49	CA14179	O-Ring for Drain Plug	1
53	Not Available	Crankcase	1
64	CA46229	Crosshead Pin	3
65	CA542402	Plunger Rod	3
70	CA47215	Oil Seal	3
90	CA547091	Plunger	3
98	CA46730	Washer	3
99	CA542405	Retainer, Plunger	3
100	CA46233	Retainer, Seal	3

Ref#	P/N	DESCRIPTION	QTY
106	Kit #1	Seal	3
120	Not Available	Seal Case	3
121	CA13976	O-Ring for Seal Case	3
125	Kit #1	Seal	3
160	CA17428	O-Ring, Inlet	3
161	CA547077	Seat, Inlet	3
162	CA48361	Back-up Ring	3
163	CA43358	O-Ring	3
164	CA547076	Seat, Discharge	3
166	CA547098	Valve	6
167	CA46865	Spring	6
168	CA543988	Retainer, Spring, Inlet	3
169	Kit #2	Retainer, Spring, Discharge	3
172	CA142807	O-Ring for Plug	3
174	CA547104	Plug, Valve w/O-ring	3
185	Not Available	Head, Manifold w/Unloader Body	1
188	Not Available	Screw	6
197	CA941516	Inlet Fitting Assembly	1
249	CA30520	Adapter Mount Assembly	1
255	CA30516	Bolt Mount Assembly	1
403	CA45070	Lock Nut	1
469	CA7332	Chemical Fixed Injector	1

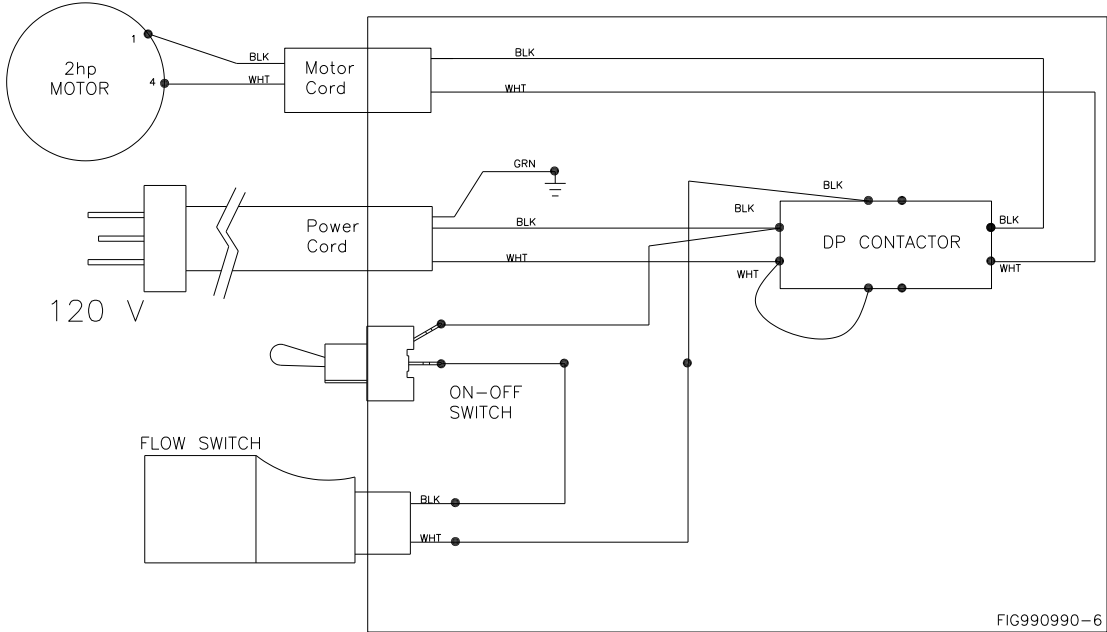
### KITS

Kit#1	CA76975	Seal Kit: Includes: 98, 106, 121, 125	1
Kit#2	CA76976	Valve Kit: Includes: 160, 161, 162, 163, 164, 166, 167, 168, 169, 172	1

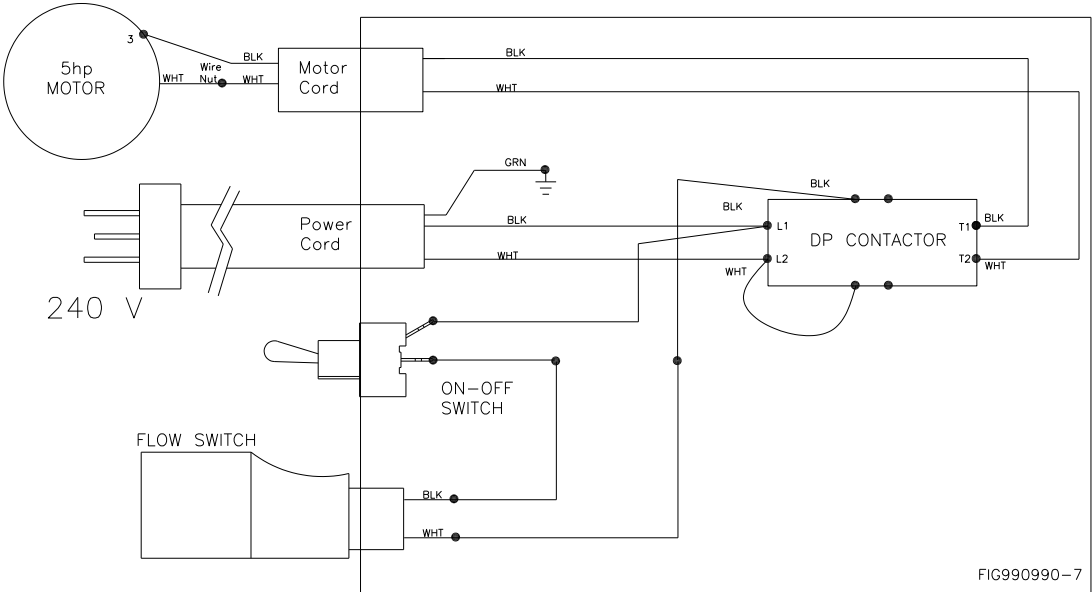
\*One Kit will Complete One Pump\*

# Wiring Diagram

## Model# 990990



## Model# 990991



# 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. Always contact NorthStar Product Support at 1-800-270-0810 prior to having any service or warranty work performed, as some services performed by parties other than NorthStar approved service centers may void this warranty. 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.

## 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:

Item #	Warranty Period
990990, 990991	2 years from date of purchase by user

“Consumer use” means personal residential household use by a consumer. “Commercial use” means all other uses, including use for commercial, income producing or rental purposes or when purchased by a business.

This warranty applies to the original purchaser of the equipment (verification of purchase, in the form of a receipt, is the responsibility of the buyer), is non-transferable, and covers parts and labor. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. If a part is no longer available, the part may be replaced with a similar part of equal function. 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. NorthStar will not provide for replacement of complete products due to defective parts. 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. Transportation costs to and from service center is the responsibility of the customer.

In addition to the normal warranty, NorthStar shall warrant any normal wear item from defects in material or workmanship for a period of 90 days from the date of purchase by user. Normal wear items include, but are not limited to, nozzles, quick connect fittings, valves, seals, hoses, O-rings, unloader valves, flow switch and filter elements.

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, damage related to rodent and/or insect infestation 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. Also, Outdoor Power Equipment needs periodic parts and service to perform well, and this warranty does not cover instances when normal use has exhausted the life of a component or the engine.

This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part. Repair or replacement of parts does not extend the warranty period.

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

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

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

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

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

**⚠ WARNING:** This product can expose you to soots, tars, and mineral oils (untreated and mildly treated oils and used engine oils), which are known to the state of California to cause cancer.

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



Assembled by  
Northern Tool & Equipment Company, Inc.  
Burnsville, MN 55306  
NorthernTool.com