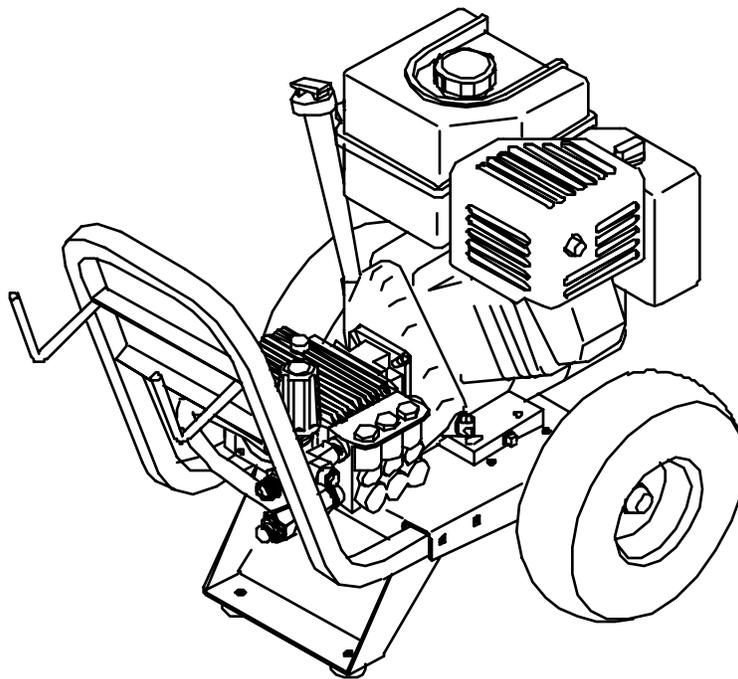




Item# 157551  
Pressure Washer

## *Owner's Manual*



00078



**Read and understand this manual before operating this machine.**

**Engine is shipped without oil. Use SAE 30 motor oil.**

**Pump is shipped with oil. Remove the shipping plug from the pump and replace it with the vented dipstick.**

To the Owner:

*Thank you for purchasing a North Star pressure washer. Your machine is designed for long life, dependability, and the top performance you demand! Take time now to read through this manual so you better understand the machine's operation, maintenance and safety precautions. Everyone who operates this machine must read and understand this manual. The time you take now will prolong your machine's life and prepare you for its safe operation. Enjoy the exceptional performance of your North Star pressure washer, the industry leader!*

**Important**

If this machine is used by anyone who is not the owner or is loaned or rented, make certain the operator(s) prior to operating:

- Is instructed in safe and proper operation of this machine
- Reads and understands the manual(s) pertaining to this machine

**Notice**

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.

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## **Safety Instructions**



**Read and understand these instructions because they deal with safety. Pay particular attention to this safety symbol throughout this manual. Failure to comply with these instructions may result in property damage, personal injury, or death.**

### **IMPORTANT**

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards, particularly the General Standards, Part 1910, and the Construction Standards, Part 1926, should be consulted whenever using airless spray equipment.

**NEVER** point the spray nozzle at people or animals. The high pressure the machine generates is very dangerous.

**ALWAYS** seek emergency medical care if any fluid penetrates the skin. The cut may be deeper and more serious than it appears.

**NEVER** put hands or fingers over the tip of the spray nozzle.

**NEVER** use your hands to stop or detect leaks.

**NEVER** spray flammable liquids or toxic chemicals such as weed killer or insecticide.

**NEVER** allow children to operate or play on or around the machine.

**ALWAYS** wear safety glasses and appropriate clothing when operating the machine.

**NEVER** operate the machine in or around an explosive environment.

**ALWAYS** locate the machine so it is protected from external damage.

**NEVER** operate gasoline powered machines indoors. Carbon monoxide fumes are deadly.

**ALWAYS** place the machine on a level surface.

**NEVER** operate the machine with broken or missing parts.

**NEVER** alter the machine from the manufacturer's original design.

**ALWAYS** keep all safety devices active on the machine.

**ALWAYS** follow the chemical manufacturer's instructions when using chemicals.

**ALWAYS** understand all safety precautions and first aid for any chemicals being used.

**NEVER** exceed the pressure or temperature ratings of the system. Be sure all accessory equipment used will withstand the system pressure.

**ALWAYS** keep the pressure hose connected to the machine and the spray gun while the system is pressurized.

**NEVER** move the machine by pulling on the hose.

**NEVER** secure the spray gun in the "ON" or "SQUEEZED" position.

## ***Safety Instructions***

**NEVER** use the machine when under the influence of alcohol or any other drug.

**NEVER** smoke while operating or fueling this machine. Only add fuel to the machine when the power is OFF.

**NEVER** attempt to clean the machine with its own spray. Cleaning should be done with a damp sponge with the power OFF.

**NEVER** leave an operating machine unattended. Always shut the engine OFF and relieve the pressure before leaving the machine.

**NEVER** let the pump run without water flowing through the machine.

**ALWAYS** respect and be alert to the potential hazardous high pressure spray.

**ALWAYS** keep machine decals clean and legible, replace any decals that become damaged or lost.

**NEVER** route hoses in a manner that will cause sharp bending, kinking, cutting, abrasion, or other damage from vehicles or falling objects.

**NEVER** use a hose if exterior damage is evident.

**NEVER** attempt field repairs through an unauthorized hydraulic hose repair shop. Replace any damaged hoses.

**ALWAYS** use water that is clear and free of particles.

**NEVER** run preheated water over 140° F into the machine.

**ALWAYS** check and maintain proper oil levels in the pump and engine.

**NEVER** operate the machine with insufficient water supply to the pump. Damage occurs to the pump if run with an insufficient water supply.

**ALWAYS** protect your machine from freezing during storage as described in this manual.

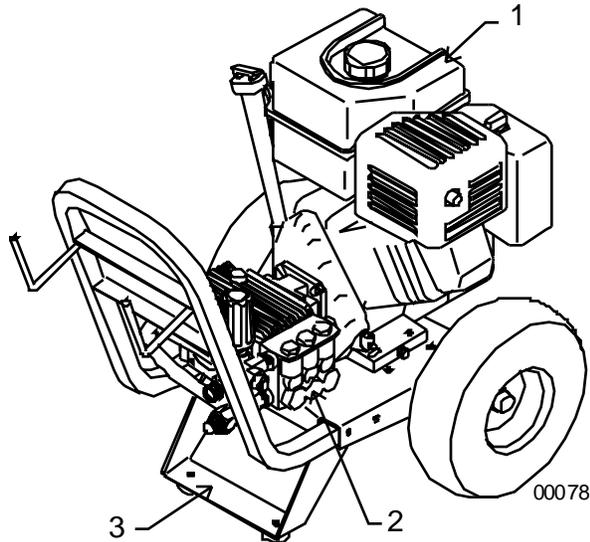
**ALWAYS** follow all other guidelines and safety instructions as described in this manual.

***Any Questions?  
Call 1-800-270-0810  
Customer Service***

## Specifications

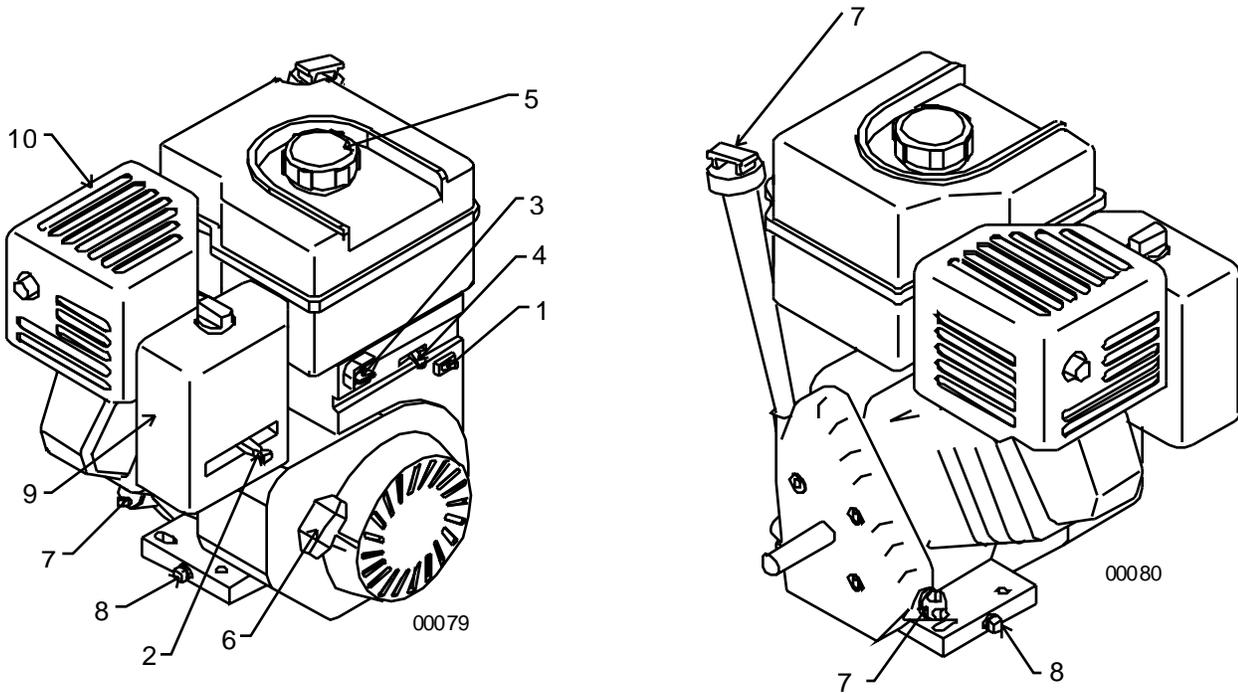
Item Number	#157551
Pressure Rating (psi)	2500
Flow Output (gpm)	3
Pump Type	Triplex Ceramic Plunger
Water Supply	Standard tap water @ 20-100psi
Engine Horsepower	5
Fuel Capacity (quarts)	3
Discharge Hose	3/8" x 30'
Dimensions	
Length	28"
Width	19.5"
Height	24"
Approximate Weight	88 lbs.

## Machine Component Identification



- |    |        |
|----|--------|
| 1. | Engine |
| 2. | Pump   |
| 3. | Cart   |

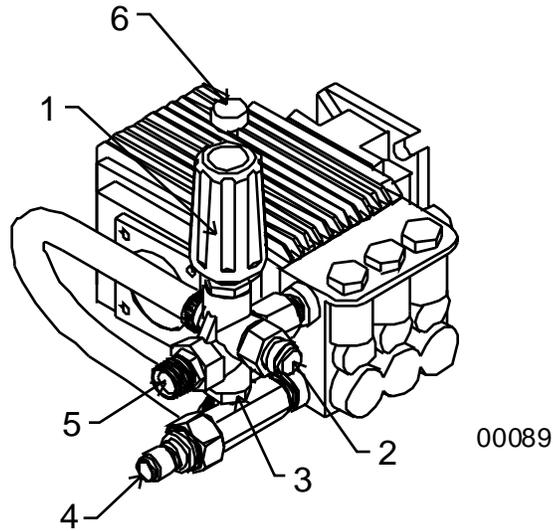
# Machine Component Identification



1.	Engine ON-Off Switch
2.	Choke
3.	Fuel Shut-OFF
4.	Throttle
5.	Fuel Tank Fill
6.	Recoil
7.	Oil Fill
8.	Oil Drain
9.	Air Filter
10.	Muffler (Caution Hot!)

Engine Features	Benefits
<ul style="list-style-type: none"> <li>• Overhead Valves (OHV)</li> </ul>	<ul style="list-style-type: none"> <li>• <i>More fuel efficient</i></li> <li>• <i>More powerful</i></li> </ul>
<ul style="list-style-type: none"> <li>• Cast Iron Cylinder Sleeve</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Less wear, longer life</i></li> </ul>
<ul style="list-style-type: none"> <li>• Low Oil Shutdown</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Won't run without oil</i></li> </ul>

# Machine Component Identification



- |    |                     |
|----|---------------------|
| 1. | Unloader Valve      |
| 2. | Thermal Protector   |
| 3. | Safety Relief Valve |
| 4. | Inlet               |
| 5. | Outlet              |
| 6. | Dipstick            |

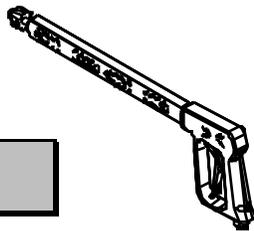
Pump Features	Benefits
•Triplex ceramic plungers	•Long life, no corrosion
•Triplex design	•Less vibration
•Industrial crankshaft	•Dependable, proven design
•Thermal protector	•Protects pump from hot water
•Safety relief valve	•Prevents pump from overpressurizing

# Assembling the Machine

## Step 1

Your pressure washer is shipped in two boxes. Separate and identify the components found in both boxes. Use the assembly instructions found in the cart box to assemble the cart. The components shown below will be in the same box as the engine/pump.

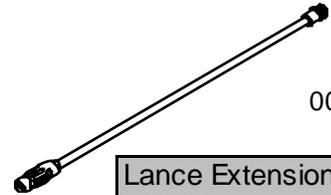
Gun & Grip  
Qty-1



Garden Hose Quick  
Couple Socket  
Qty-1

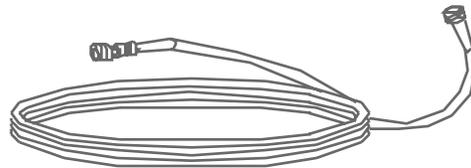


Lance Extension  
with Idrojet  
Qty-1



00073

Hose, Quick Couple  
Qty-1

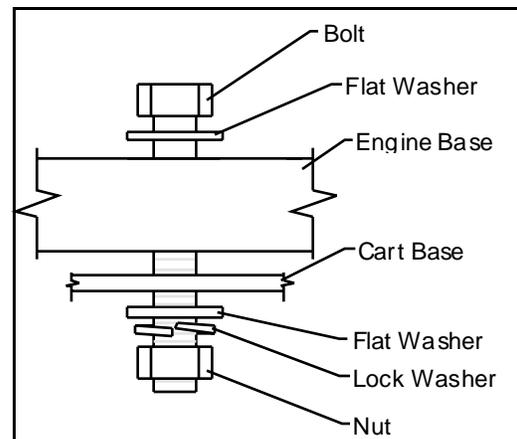
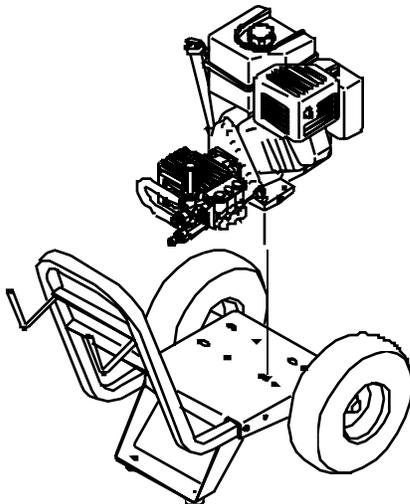


## Step 2

You will need the following tools to fasten the pump/engine to the cart.

1. 1/2" socket with ratchet
2. 1/2" open end wrench

The cart comes with (4) 5/16" x 1 1/2" bolts, (4) 5/16" nuts, (8) 5/16" flat washers, and (4) 5/16" lock washers to be used to fasten the cart to the engine. Use the slotted holes in the base to mount the engine.



**Fastener Detail**

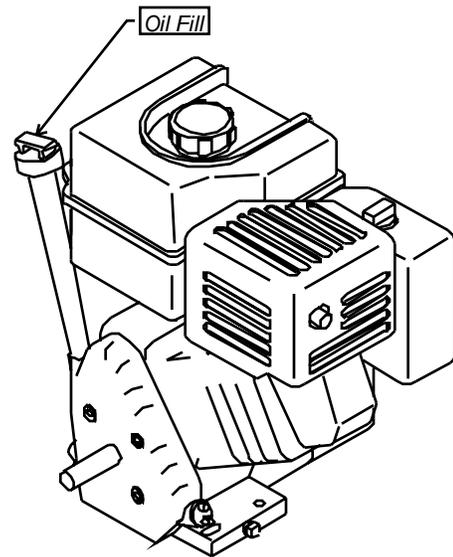
## **Before Using the Machine the First Time**



Follow these instructions before you use the pressure washer the first time.

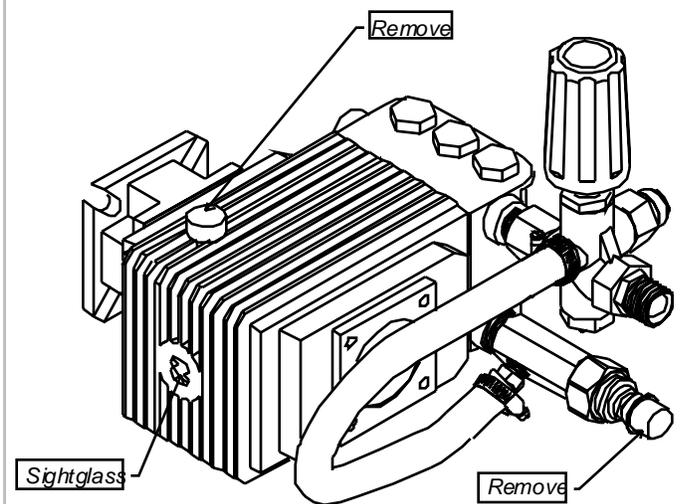
### **Fill engine with oil.**

1. The engine is shipped without oil.
2. Use SAE 30 motor oil.
3. Fill oil to top of fill neck.



### **Remove pump shipping plugs.**

1. Remove the red plugs from the water inlet and the oil vent hole and discard them.
2. Check oil level in the pump. Make sure it is half way up the sight glass.
3. Insert the vented dipstick into the oil fill hole.



## **Setting-Up the Machine**



**Read and understand the entire manual before operating the pressure washer.**

**Follow the checklists below every time you use the pressure washer.**

### **Pre-Operation Checklist**

- 1.) Position the machine for easy access to all controls, power, and water supply.
- 2.) Position the machine outdoors on a solid level surface.
- 3.) Fill gas tank with gasoline.
- 4.) Check engine oil. Use SAE 30 motor oil.
- 5.) Check the pump oil. Make sure it is to the full mark on the dipstick. Use a NON-DETERGENT SAE 30W oil (Item# 4043).
- 6.) Check for worn or damaged equipment. Replace if necessary.
- 7.) Check and clean the nozzle orifice.
- 8.) Check and clean the water inlet screen and filter.

### **Water Supply Checklist**

- 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 more than 3 gpm. If you can fill a 1 gallon bucket in less than 20 seconds, you have a sufficient water supply.
- 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. This pressure washer is designed for a pressurized water source such as a city water faucet. Sucking water out of a tank may cause pump cavitation and damage to your pump.
- 5.) Always use a flexible rubber hose for your water supply. Do not use rigid piping.

# Start-Up Instructions

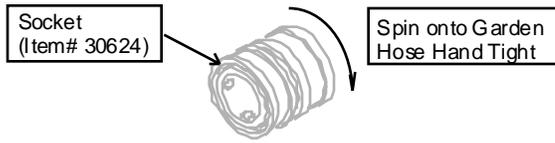


Make sure to follow the pre-operation checklist and water supply checklist on the previous page before proceeding.

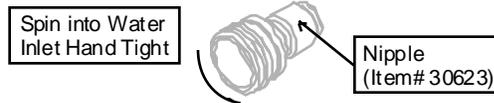
## I.) Attach a Garden Hose

Your pressure washer is equipped with a garden hose quick couplers. Follow these steps to use the quick couplers.

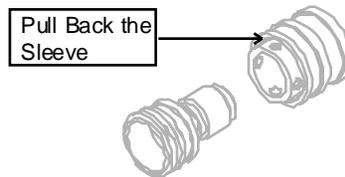
- A.) Spin the socket onto your garden hose.



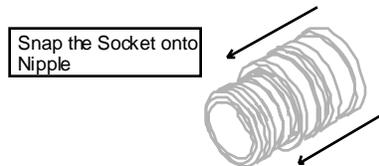
- B.) Spin the nipple into the machine's water inlet (the nipple may already be spun into your water inlet).



- C.) Pull back the sleeve on the socket.



- D.) Snap the socket onto the nipple.



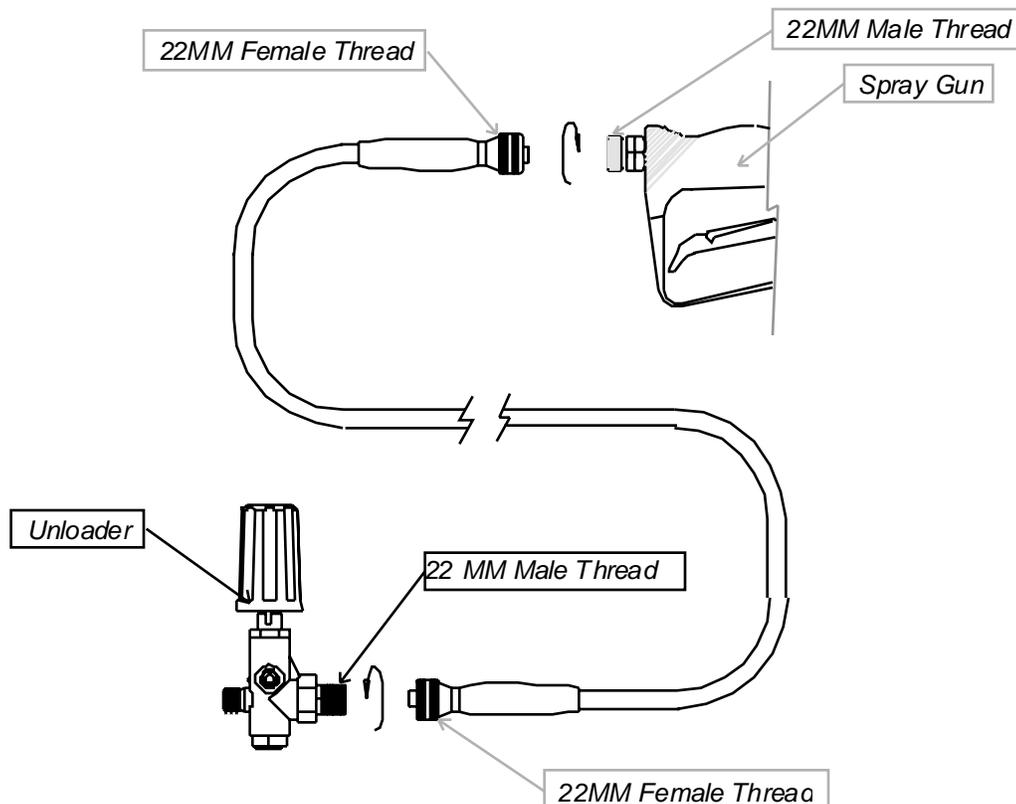
# Start-Up Instructions

## II. Attach the Pressure Hose

Specifications:

Length	30 feet
Inside Diameter	3/8 inch
Maximum Pressure	3000 psi
Reinforcement	1 wire
Bend Radius	6 inches
Material	Neoprene

Your pressure hose is equipped with 22MM thread-on quick couplers on both ends. One end threads onto the water outlet on the unloader and the other threads onto the gun inlet. The o-ring seals the connection so you only have to tighten the quick coupler hand tight.



### We use 22MM thread-on quick couplers for a number of reasons:

- 1.) It is an industry standard so they will work with many other machines.
- 2.) They handle side torque better resulting in fewer leaks.
- 3.) The o-rings last longer so they require less maintenance.
- 4.) They are safer because they provide a more definite connection.

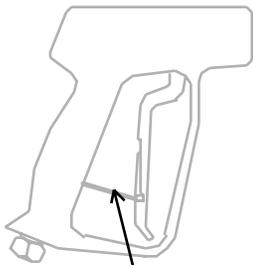
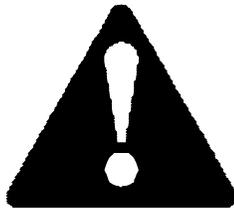
## Start-Up Instructions

### III.) Connect the Lance

Your spray lance has the following features and benefits:

Features	Benefits
•4 foot length	• <i>Longer reach</i> • <i>Meets UL safety standard</i>
•Splits in the middle	• <i>Quick accessory changes</i> • <i>Ships in smaller box</i> • <i>Less shipping damage</i>
•Vented grip	• <i>More Comfortable</i>

Connect the lance together using the 22MM thread-on quick coupler. The o-rings seal the connection so you only have to tighten the quick coupler hand tight.



*trigger safety latch*

**NEVER** point the nozzle or lance at people or animals. The high pressure the machine creates is very dangerous.

**ALWAYS** keep the high pressure hose connected to the machine and the spray gun while spraying water.

*Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger release and potentially dangerous high pressure spray. Fold the latch in the full down position when not spraying.*

## **Start-Up Instructions**

### **IV.) Turn the Water Supply ON**

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

### **V.) Squeeze the Trigger**

Squeeze the trigger until a steady flow of water sprays out the nozzle. Make sure all the air is out of the hoses before running the pressure washer. This step is very important, it will prolong the pump’s life. NEVER run the pump dry.

You can change between high and low pressure by pushing or pulling the adjustable nozzle. Pull the nozzle back for high pressure. Push the nozzle forward for low pressure. Low pressure is used for spraying chemicals.



### **VI.) Start the Engine**

Refer to the engine manual to start your engine. Once the engine is started, begin cleaning.

If the engine doesn’t start on the first pull, pressure may build up in the pump. Relieve the pump pressure by squeezing the spray gun trigger. This will make starting easier.

## **Shut-Down Instructions**

**I.) Turn the engine OFF.**

**II.) Turn the water supply OFF.**

**III.) Squeeze the spray gun trigger to relieve the system pressure.**

**IV.) Remove the water supply garden hose from the pump inlet.**

**V.) Remove the high pressure hose from the pump outlet.**



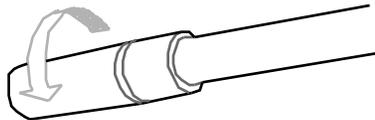
**NEVER** disconnect the high pressure hose from the pump or spray gun while the system is pressurized. Depressurize the system by squeezing the spray gun trigger after the engine is turned OFF.

# Operation Instructions

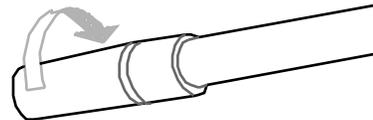
## I.) Spray Angle

Your pressure washer is equipped with a 0 to 80° adjustable nozzle designed to tackle a variety of cleaning jobs. Generally, narrow spray angles have greater cleaning impact, wider angles cover large areas in less time. Use small angles for the toughest cleaning jobs. Use wide angles for rinsing large surfaces and water sweeping.

Change the spray angle by turning the adjustable nozzle counter-clockwise for narrow angles and clockwise for wide angles.



narrow angles



wide angles

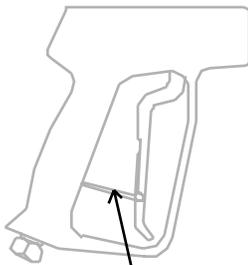
## II.) General Cleaning

- a.) Adjust the nozzle's spray angle for your application
- b.) Hold the nozzle 6" to 12" from the cleaning surface.
- c.) Use long, slow, deliberate strokes from side to side similar to using a paint sprayer. This technique will provide the most effective cleaning impact and minimize streaks and skips in the cleaning surface.



**NEVER** point the nozzle or lance at people or animals. The high pressure the machine creates is very dangerous.

**ALWAYS** keep the high pressure hose connected to the machine and the spray gun while spraying water.



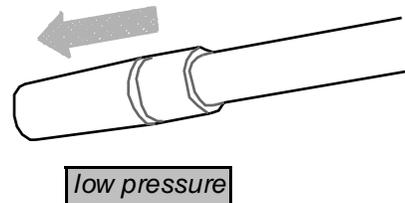
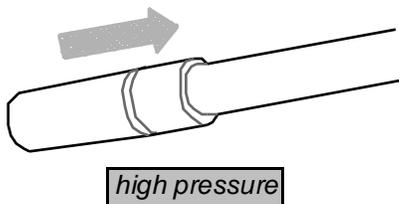
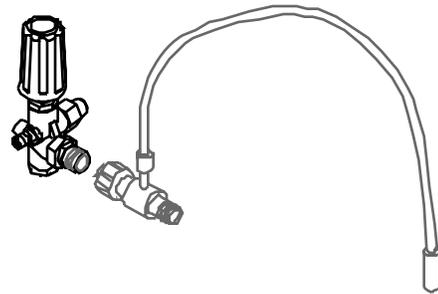
trigger safety latch

*Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger release and potentially dangerous high pressure spray. Fold the latch in the full down position when not spraying.*

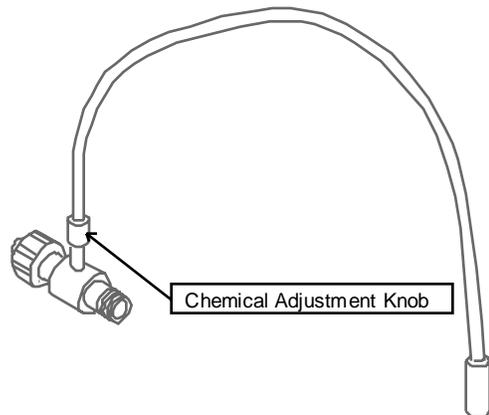
# Operation Instructions

## III.) Applying Chemicals

- a.) Spin the quick couple chemical injector onto the pump outlet hand tight.
- b.) Submerge the suction strainer in a chemical solution.
- c.) Adjust the nozzle holder to low pressure by pushing the adjustable nozzle out. You need to change to low pressure if you want to spray chemicals onto the cleaning surface.



- d.) Squeeze the spray gun trigger. The chemical injector will draw the chemical into the water stream.
- e.) Turn the chemical adjustment knob to increase or decrease the chemical concentration.
- f.) Apply chemicals evenly to the cleaning surface. Allow the chemicals to react with the dirt, then rinse at high pressure.
- g.) Never use more chemical than is necessary to clean the surface.



**ALWAYS** follow the chemical manufacturer's recommendations when using chemicals in the chemical injector.  
**ALWAYS** understand all safety precautions and first aid for the chemicals being used.

## Operation Instructions

### IV.) Adjusting the Unloader Valve

The unloader valve determines the operating pressure of the pump. You can adjust the pressure by turning the black knob. However, the unloader is factory pre-set to the maximum system pressure.



**NEVER** alter the unloader valve from the manufacturer's design. Excess pressures could cause serious injury and/or pump damage. Any alteration other than turning the black knob will void your warranty.

### V.) Safety Relief Backup

The safety relief or "pop-off" valve is a backup safety feature located at the bottom of the unloader valve. In the unlikely event the unloader malfunctions, the safety relief valve is designed to be the weak link in the system and will open before the pressure reaches a dangerous level.



*If the safety relief valve ever discharges water, turn the engine off and do not use the machine. See a dealer or call Customer Service at 1-800-270-0810.*

### VI.) Thermal Protector

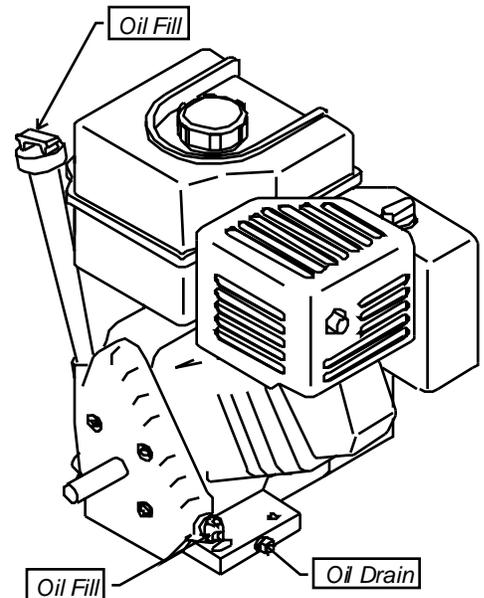
The thermal protector or "pump saver" valve protects your pump from overheated water. When the spray gun trigger is released, the pump **DOES NOT** stop pumping. Water is recirculated through the unloader valve and by-pass hose. The recirculating water heats up quickly. The thermal protector senses the temperature of the water and discharges it at 140°F preventing pump damage.

# Routine Maintenance

## I.) Changing the Engine Oil

*Refer to the engine manual for complete maintenance schedule and engine component identification.*

- 1.) Place an oil pan or container beneath the pressure washer cart.
- 2.) Drain the old oil by removing the oil plug found near the base of the engine. There is a hole in the cart to allow the oil to drain through.
- 3.) Replace the oil plug.
- 4.) Remove the oil fill cap and fill with oil.
- 5.) Use SAE 30 high detergent motor oil for general all-temperature use. For extremely hot climates, refer to the engine manual.
- 6.) Replace the oil fill cap.



## II.) Pump Maintenance

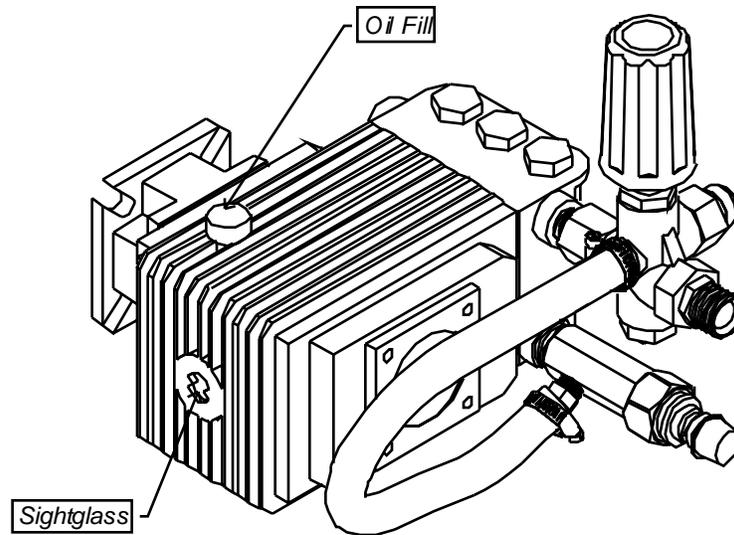
*Refer to the pump manual for complete maintenance schedule and pump component identification.*

ITEM	SERVICE PERIOD		
	EACH USE	FIRST 40 HRS	EVERY 3 MO. OR 500 HRS
PUMP OIL-CHECK LEVEL	X		
PUMP OIL-CHANGE		X	X
INLET SCREENS-CHECK & CLEAN	X		
FITTINGS-CHECK FOR LEAKS	X		
NOZZLE-CHECK & CLEAN*	X		

\*Use a pin to dislodge any debris in the nozzle orifice.

### **III.) Changing the Pump Oil**

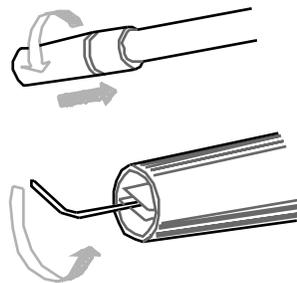
- 1.) Place an oil pan or container beneath the pressure washer cart.
- 2.) Drain the old oil by removing the oil plug found under the pump.
- 3.) Replace the oil plug.
- 4.) Remove the vented dipstick and fill with oil until half way up the sight glass.
- 5.) Use a NON-DETERGENT SAE 30W oil (Item# 4043).
- 6.) Replace the vented dipstick.



### **IV.) Cleaning and Changing the Nozzle Orifice**

The nozzle orifice has a small hardened stainless steel body. It is located inside the adjustable nozzle between the two thin metal plates. Follow these steps to remove the nozzle orifice.

- 1.) Pull the adjustable nozzle back and turn counter-clockwise spreading the metal plates.
- 2.) Remove the nozzle orifice by unscrewing with a 2mm allen wrench.
- 3.) Clean the nozzle by blowing with air.
- 4.) Replace the nozzle orifice if it is worn.



## ***Winterizing the Pressure Washer***



**Follow these instructions to prevent the pump from freezing during storage. During cold weather, store the pressure washer indoors and move it outdoors before starting the engine.**

- 1.) Disconnect the high pressure hose. Make sure all water is drained from the hose, gun, and lance.
- 2.) Combine 1 gallon of water with one gallon of antifreeze in a pail. Elevate the pail so it is higher than the pump.
- 3.) Attach a short garden hose (4-5 ft. long) to the pump inlet. Submerge the other end in the antifreeze solution.
- 4.) Point the water outlet away from people or animals. Run the pressure washer until antifreeze discharges from the pump outlet. Immediately turn the engine OFF. The pressure washer is ready for storage.
- 5.) After storage, run clean water through the pressure washer until the antifreeze is removed. Spray the antifreeze where it will not be harmful to the environment, people, or animals.

## **Troubleshooting**

### **LOW/SURGING PRESSURE**

<b>Causes</b>	<b>Solutions</b>
Plugged nozzle	Remove nozzle, check for blockage and clean if necessary
Worn nozzle	Replace nozzle (#3.5)
Plugged inlet screen	Pull screen out carefully and clean
Unloader valve malfunction	Repair/replace unloader
Restrictive water supply	Use larger diameter water supply hose and/or hose fittings
Insufficient flow of water to the pump	Increase water flow. Check for kinked or pinched water supply hose.
Leak in high pressure hose	Check connections. Replace if cracked or punctured.

### **NO CHEMICAL INJECTION**

<b>Causes</b>	<b>Solutions</b>
Operating at high pressure	Push nozzle forward for low pressure
Back pressure from extra long hose	Don't use additional hose. Use larger chemical nozzle.
Chemical injector turned off	Turn chemical adjustment knob ON
Chemical injector plugged	Remove injector and soak in bucket of water to dissolve blockage
Leak in clear chemical hose	Replace hose. Use hose clamps to seal the hose around hose barbs
Chemical strainer not submerged in chemical solution	Make sure strainer is completely submerged in solution.

### **Excess Vibration**

<b>Causes</b>	<b>Solutions</b>
Tire pressure	Increase or decrease the tire pressure to 20 psi.
Loose bolts	Tighten bolts

**For Customer Service Call 1-800-270-0810**

# Accessories

## 3/8 High Pressure Hose

- 3000 psi rating
- Neoprene
- One-wire braid reinforcement
- Bend restrictors prolong hose life

Item#	Length	Ship Wt.
2203	30'	7 lbs.
156992	50'	10 lbs.
156993	100'	20 lbs.

## High psi Screw-Type Quick Couplers

- Quick Coupler #2211 quickly spins onto Brass Plug #2210

Item #	Description	Ship Wt.
2210	Brass Plug	1 lb.
2211	Quick Coupler	1 lb.

## Dual Lance Spray Wand

- Turn hand grip to switch from high to low psi
- 1/4" Male Pipe threads into spray gun
- Two 1/4" Female openings for nozzles or quick coupler (ordered separately)

Item# **2228** Ship Wt. 4 lbs.

## Telescoping Wands

- Accepts 1/4" Male thread nozzle (order separately)
- Choose from 12 ft, 18 ft, and 24 ft. models
- Wand is made from aluminum and fiberglass

Item #	Length	Ship Wt.
22771	4 to 12 ft.	10 lbs
22703	7 to 18 ft.	14 lbs.
22702	9 to 24 ft.	18 lbs.

## Rotating Turbo Nozzle

- Rotating 0° nozzle gives your pressure washer twice the cleaning performance
- Quick couples to spray gun after the grip

Item# **2830** Ship Wt. 6 lbs.

## Chemical Nozzle w/ 1/4" Male Thread

- Fits Dual Lance #2228

Item# **2229** Ship Wt. 1 lb.

## Pressure Washer Pump Oil

- SAE-30 weight non-detergent oil
- One quart resealable plastic container

Item# **4043** Ship Wt. 3 lbs

## Low psi Garden Hose Quick Coupler

- Set includes nipple and mating ball coupler
- Nipple screws into inlet on pump
- Brass coupler screws onto garden hose

Item# **50400** Ship Wt. 1 lb.

## High Pressure Sand Blast Kit

- Quick couples to spray gun after the grip
- Includes steel nozzle, 18" sand probe, 20" lance extension, and 1 1/2" sand suction hose

Item# **2260** Ship Wt. 5 lbs.

## Chemicals for Pressure Washers

- All North Star chemicals are biodegradable
- All concentrated chemicals sold in one gallon containers

Item#	Description	Mix Ratio	Ship Wt.
22201	Liquid Detergent	256:1	10 lbs.
22207	Degreaser/Cleaner	128:1	10 lbs.
22209	Carnauba Wax/Rinse	100:1	10 lbs.
22213	Vehicle Wash	128:1	10 lbs.

## Nozzle Quick Couplers

- Accept all quick couple nozzles
- 3500 psi max. rating
- #2308 fits dual lance #2228

Item#	Thread Style	Ship Wt.
2307	1/4" Female	1 lb.
2308	1/4" Male	1 lb.

## High psi Quick Couple Nozzles

- Hardened stainless steel orifice
- Fit #2307 and #2308 Quick Couplers

Item #	Angle	Size	Ship Wt.
25200	0°	#3.5	1 lb.
25202	15°	#3.5	1 lb.
252002	25°	#3.5	1 lb.
252001	40°	#3.5	1 lb.

## Chemical Quick Couple Nozzle

- Lowers Pressure for Chemical Application
- Fits #2307 and #2308 Quick Couplers

Item# **2306** Ship Wt. 1 lb.

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