



M157204B

ITEM NUMBER: 157204
 SERIAL NUMBER: _____

Installation, Operation, and Maintenance Manual

PRESSURE WASHER: *Cleans dirty surfaces with high pressure water.*

To the Owner:

Thank you for purchasing a NorthStar 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 NorthStar pressure washer, the industry leader! 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.

Quick Facts

Engine Oil	Engine is shipped without oil. Fill before starting. Use SAE 10W-30 motor oil.	
Pump Oil	Pump is shipped with oil. Remove the red shipping plug and install vented dipstick. Use SAE 30 Non-Detergent oil (item# 4043) for oil changes.	
Water	Make sure your water flow is 20% higher than the pressure washer's flow rate. Make sure your water is clean and particle free.	
Storage	Do not allow water to freeze in the pump, hose, or spray gun. Add fuel stabilizer to the fuel tank before long term storage.	
Spraying Chemicals	Use any North Star brand or equivalent pressure washer chemicals. Use black nozzle.	
Maintenance Schedule	Engine:	Oil: change after first 20 hours, then annually or every 100 hours. Spark Plug: clean every 100 hrs, replace annually or every 300 hrs. Air Filter: clean every 100 hours, replace annually or every 300 hrs.
	Pump:	Oil: change after first 40 hours, then every 3 months or 500 hours.

Read and understand all manuals before operating.

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

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Important Safety Instructions

- WARNING** -Risk of Injection or Injury to Persons - Do Not Direct Discharge Stream at Persons. - Do not use a hose if exterior damage is evident.
 -Risk of explosion. - Do not spray flammable liquids. - Do not operate in a flammable environment.
- CAUTION** -Risk of Asphyxiation - Exhaust fumes are deadly. For outdoor use only. Avoid inhaling exhaust fumes.
 -Risk of fire. Do not add fuel when the product is operating or hot.
 -Gun kicks back. Hold with both hands.
 -To reduce the risk of injury, read operating instructions carefully before use.

- WARNING** - When using this product basic precautions should always be followed, including the following:
- 1.) Read all the instructions before using the product.
 - 2.) To reduce the risk of injury, close supervision is necessary when the product is used near children. Do not allow irresponsible use by children. Always stop the product and bleed pressures before leaving unattended, disconnecting hoses, or servicing the pump.
 - 3.) Know how to stop the product and bleed pressures quickly. Be thoroughly familiar with the controls.
 - 4.) Stay alert - watch what you are doing.
 - 5.) Do not operate the product when fatigued or under the influence of alcohol or drugs. Never smoke while operating or fueling this machine.
 - 6.) Keep operating area clear of all persons.
 - 7.) Do not overreach or stand on unstable support. Keep good footing and balance at all times. Wear footwear capable of maintaining a good grip on wet surfaces - Do not place the machine on soft or unstable ground.
 - 8.) Follow the maintenance instructions specified in all manuals. Do not run machine without sufficient lubrication or sufficient water to cool the pump.
 - 9.) Wear safety glasses, gloves, face protection and appropriate clothing when operating the machine.
 - 10.) Do not operate this machine with broken or missing parts. - Never alter the manufacturer's original design or deactivate any safety device on the machine.
 - 11.) Risk of exposure to dangerous chemicals. Wear protective gloves when handling and cleaning with chemicals. Follow the chemical manufacturer's directions. Understand all safety hazards and first aid for all chemicals being used. Check whether dangerous chemicals have been used and take any precautions that may have been recommended by the supplier of these chemicals when cleaning filters. Do not pump highly abrasive fluids or use with incompatible chemicals or solvents.
 - 12.) Know the pressure and temperature limits of your machine. Be sure all high pressure accessories meet or exceed your machine's limits. Do not set the pressure relief valve above the machine's limit.
 - 13.) Do not move this machine by pulling on the hose. Do not use the pump to support other items of equipment that impose unacceptable loads on the pump. Do not attempt to use this machine as a prop.
 - 14.) To reduce risk of injury, do not secure the spray gun open. Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger release and potentially dangerous high pressure spray. Rotate the safety latch to the locked position when not spraying.
 - 15.) Do not clean this machine with its own spray. Cleaning should be done with a damp sponge with the engine OFF.

SAVE THESE INSTRUCTIONS

Machine Component Identification

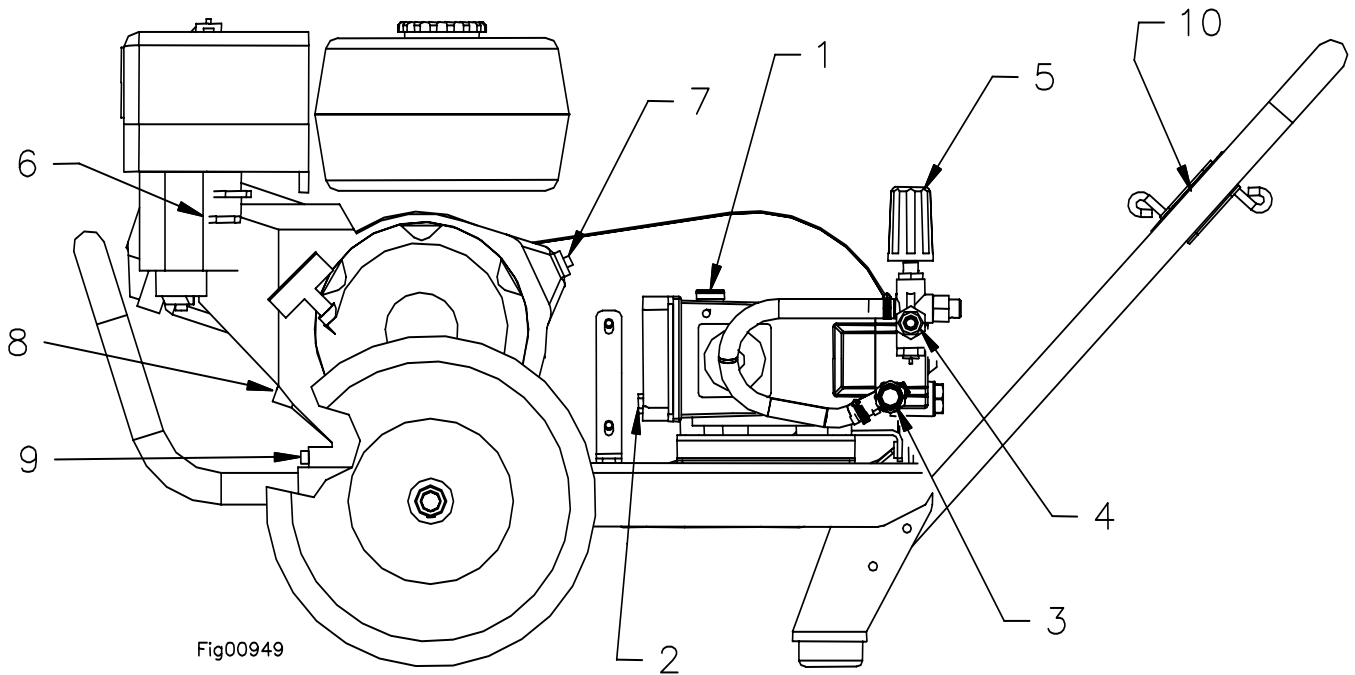


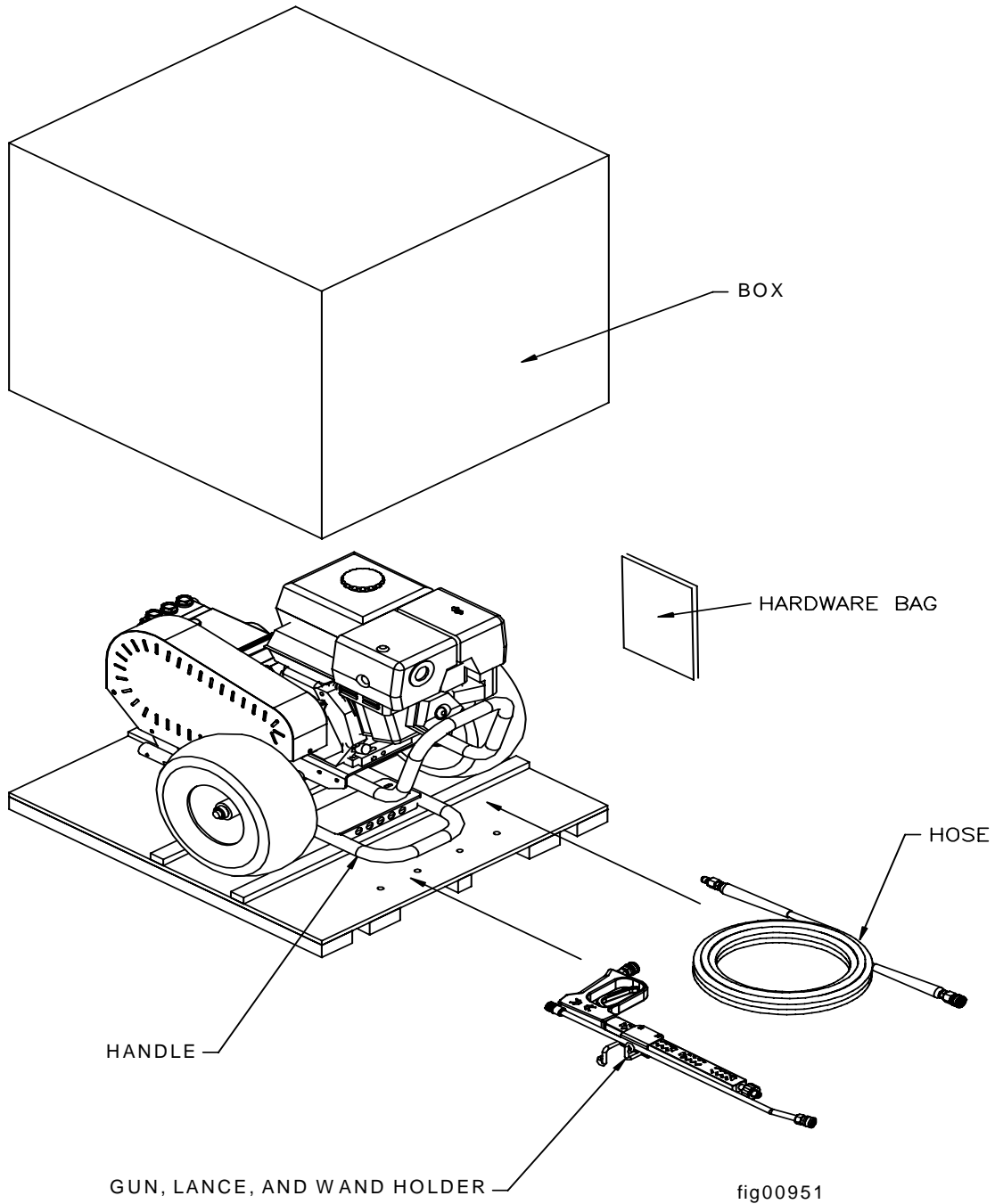
Fig00949

Ref #	Description	Ref #	Description
1	Pump Oil Fill	6	Engine Controls (see engine manual)
2	Pump Oil Drain	7	Engine Start/Stop Switch
3	Pump Inlet (Garden Hose)	8	Engine Oil Fill
4	Pump Outlet (Pressure Hose)	9	Engine Oil Drain
5	Pressure Adjustment (unloader)	10	Hose/Gun Holder

Installation Instructions

I.) Unpack

Your pressure washer is shipped in one box. Separate and identify the components found in the box. Use the assembly instructions in this manual for assembly.



Hardware Bag

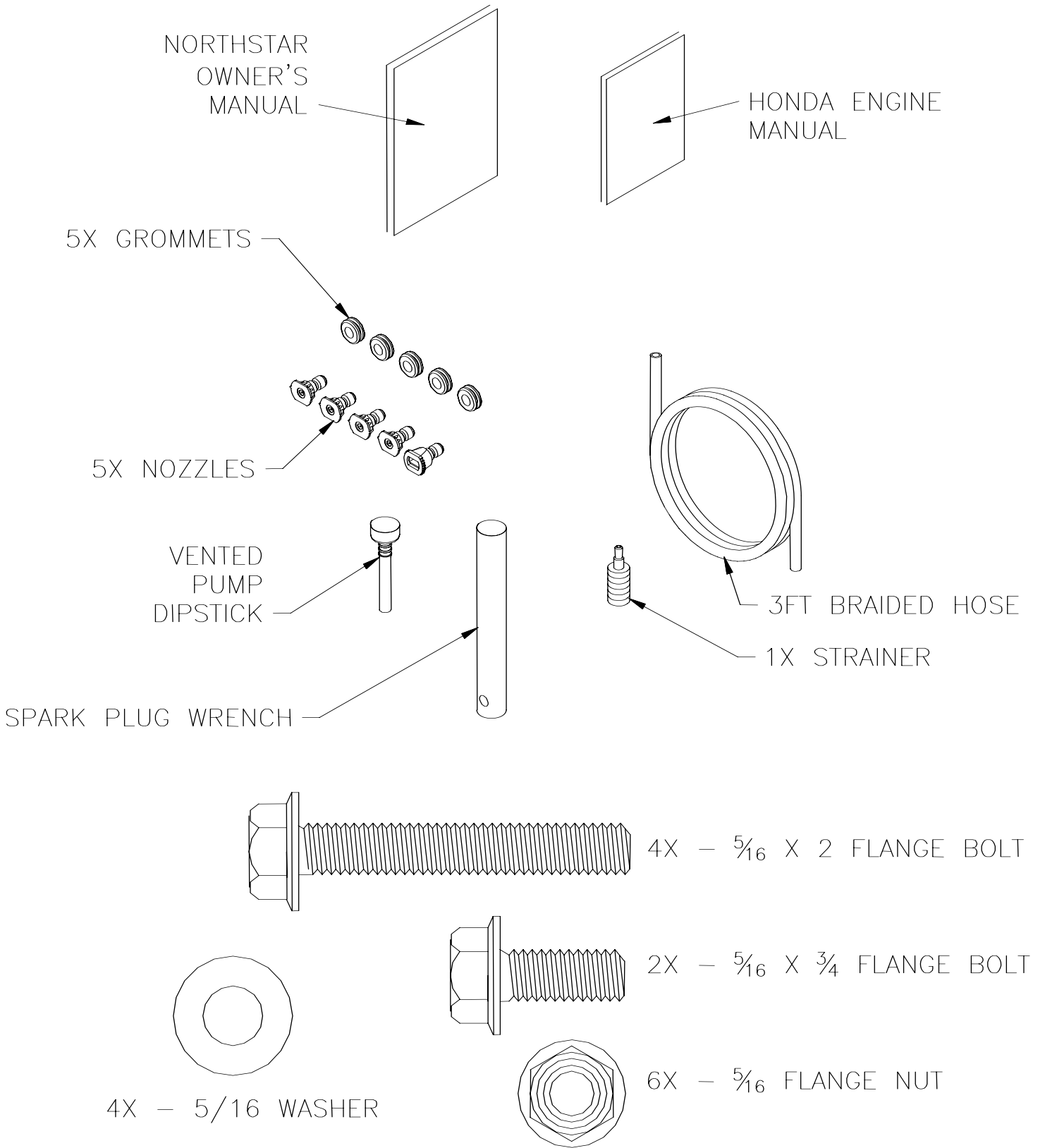
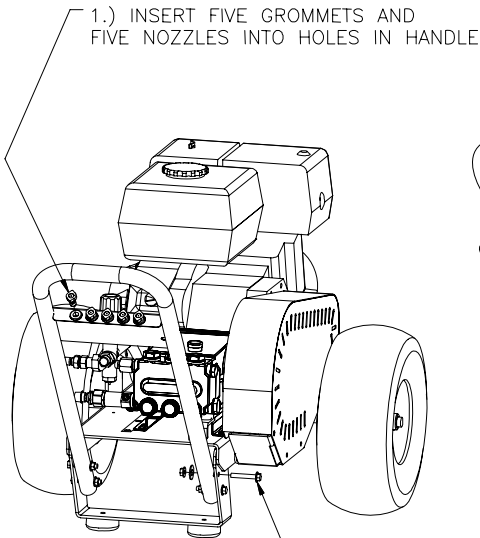
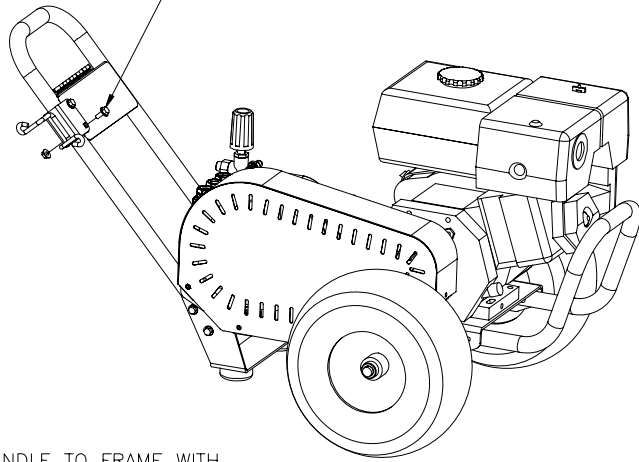


Fig01273

II.) Assembly Instructions



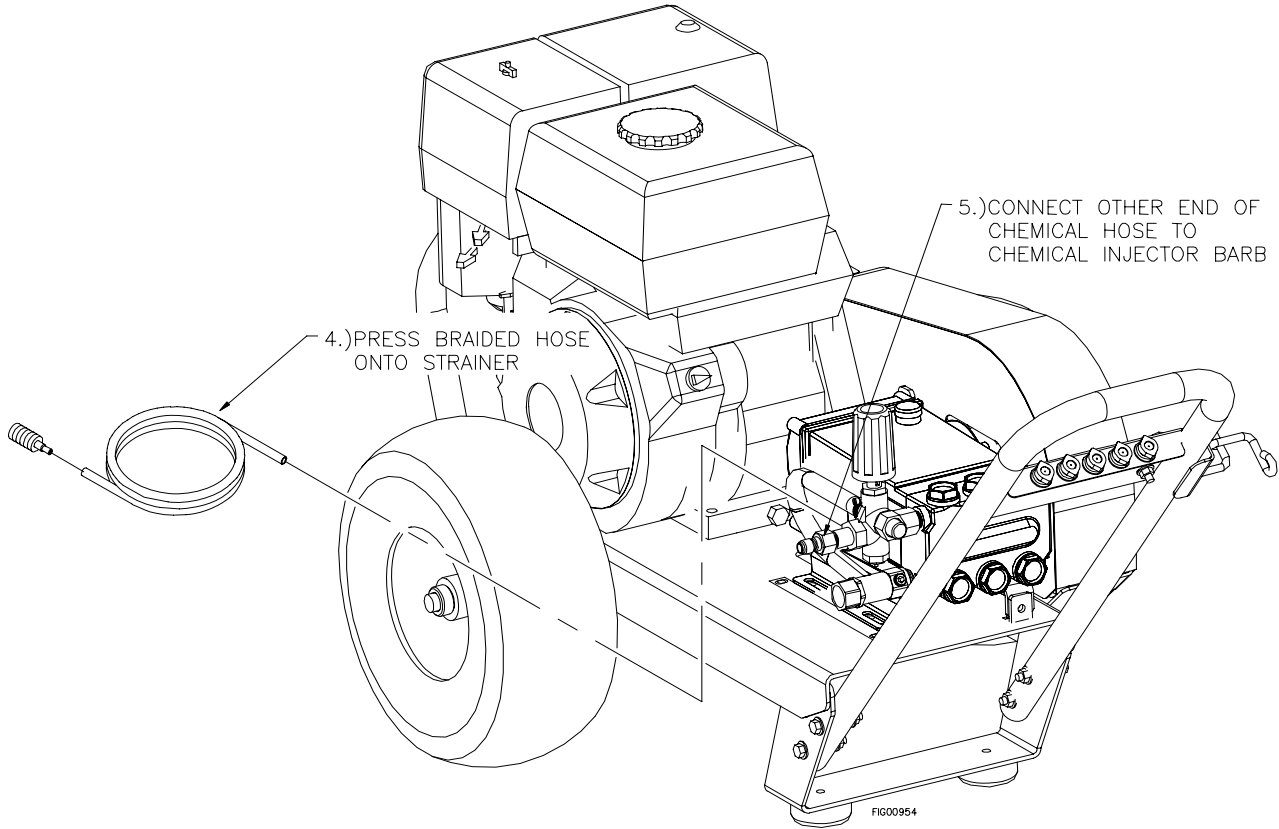
1.) INSERT FIVE GROMMETS AND FIVE NOZZLES INTO HOLES IN HANDLE



3.) FASTEN WAND HOLDER TO HANDLE WITH TWO 5/16 X 3/4 FLANGE BOLTS
TWO 5/16 FLANGE NUTS

2.) FASTEN HANDLE TO FRAME WITH FOUR 5/16 X 2 FLANGE BOLTS
FOUR 5/16 WASHERS
FOUR 5/16 FLANGE NUTS

FIG00953



4.) PRESS BRAIDED HOSE ONTO STRAINER

5.) CONNECT OTHER END OF CHEMICAL HOSE TO CHEMICAL INJECTOR BARB

FIG00954

III.) Pump Preparation

- A.) Remove red shipping plug from oil fill hole.
- B.) Install vented dipstick into oil fill hole.
- C.) Make sure the oil level is between the marks on the dipstick.

IV.) Engine Preparation

- A.) Fill engine with oil. (see chart below)
- B.) Fill fuel tank with unleaded gasoline, 86 octane min.

Quantities Of Fluid

Engine/Pump	Type of Fluid	QTY
Honda GX390 Engine	SAE 10W30	37.12oz (1.1L)
AR RK1528HN	SAE 30**	15.0oz (.44L)

**SAE Non-Detergent (Item# 4043)

Operating Instructions

Read and understand the entire manual before operating the pressure washer.
Follow these instructions every time you use the pressure washer.

I.) Pre-Operation

- ☑ A.) Position the machine for easy access to all controls.
- ☑ B.) Position the machine on a solid surface, with less than a three degree slope, and so it is protected from external damage.
- ☑ C.) Position the machine so that ambient lighting is sufficient for the surface you are cleaning to be seen with ease. Use artificial light if needed.
- ☑ D.) Check hoses, fittings, wand, trigger gun and fuel connections for signs of wear, cracks and looseness, and replace as required.
- ☑ E.) Check and clean the nozzle orifice.
- ☑ F.) Check and clean the water inlet screen and filter.
- ☑ G.) Read entire manual, especially the important safety instructions listed on page 2.
- ☑ H.) Check and maintain proper oil levels in the pump and engine.

II.) Check Your Water Supply

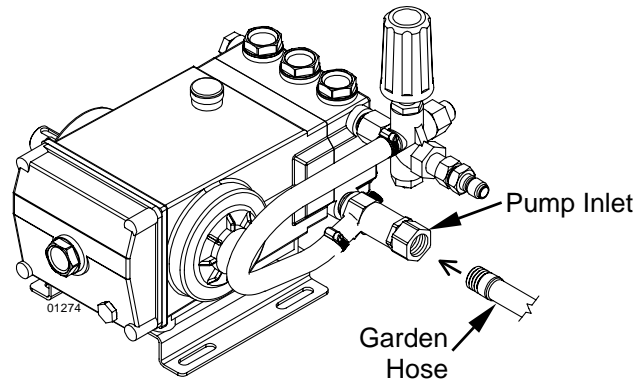
- ☑ A.) Make sure the water supply is clean. Debris can cause excess pump wear and reduce performance.
- ☑ B.) An insufficient water supply will damage your pump. Make sure the water supply is steady and is 20% over the rated flow of your pump. Use a stopwatch to time how long it takes to fill a 5 gallon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

Example: If the rated flow is = 3gpm
Then required flow = $3 \times 1.20 = 3.6\text{gpm}$
 $5\text{gallons} / 3.6\text{gpm} = 1.39\text{ minutes}$
 $1.39\text{min} \times 60\text{sec}/\text{min} = 83\text{ seconds}$
Therefore, you must be able to fill a 5 gallon bucket in 83 seconds or faster.

- ☑ C.) 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".
- ☑ D.) 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. However, the inlet pressure of the pump must not exceed 115 psi (8 bar).
- ☑ E.) Always use a flexible rubber hose for your water supply. Do not use rigid piping.
- ☑ F.) Do not pump flammable liquids or liquids containing incompatible chemicals or solvents.

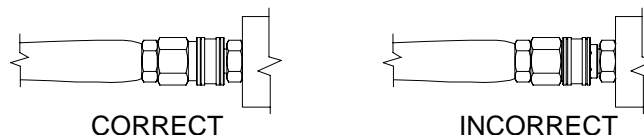
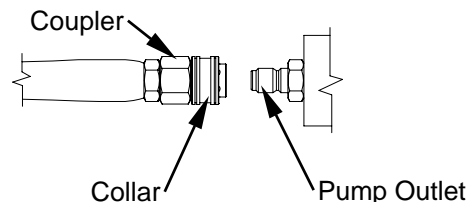
III.) Attach Garden Hose

Thread garden hose into pump inlet.



IV.) Attach High Pressure Hose

Your pressure washer hose is equipped with quick couplers. Simply pull the collar back and push the coupler onto the nipple. Make sure the collar slides over the ball bearings. Once the connection is made, pull on the hose to assure a positive connection.



V.) Turn 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.

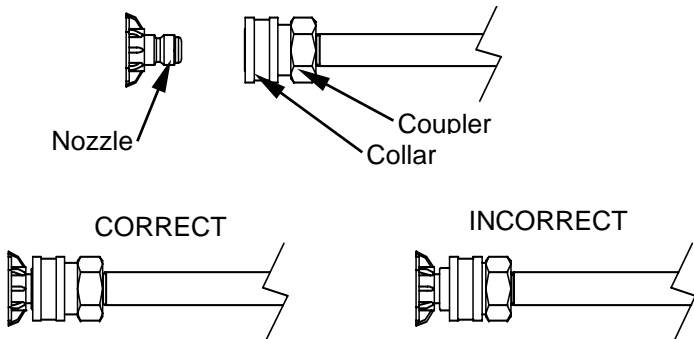
VI.) Squeeze Trigger

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.

VII.) Attach Nozzle

Color of Nozzle:	Spray Angle	Used For:
Red	0	Highest Impact
Yellow	15	Tough Stains/ Stripping
Green	25	General
White	40	Light Cleaning
Black	65	Applying Chemicals

Your pressure washer is equipped with five nozzles. To install a nozzle simply pull back the collar and push the nozzle into the coupler. Once the connection is made, pull on the nozzle to assure a tight connection



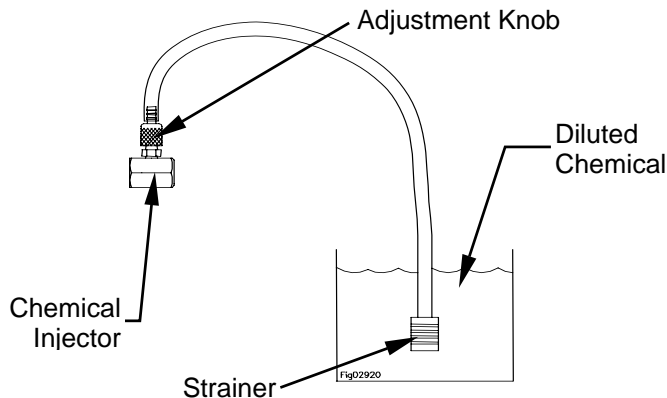
WARNING: Make sure the nozzle is correctly inserted. The nozzle may become a projectile if not inserted correctly. Do not attempt to use different types of nozzles that may not fit the coupler.

VIII.) Applying Chemicals

WARNING: Only use NorthStar pressure washer chemicals or chemicals specifically formulated for pressure washers. Follow the chemical manufacturer's recommendations. Understand all safety precautions and first aid for all chemicals.

NOTE: Your pressure washer is equipped with a low pressure chemical injector. The proper chemical used for the proper application can speed up cleaning jobs tremendously.

A.) Place the chemical injector hose barb onto the chemical injector hose and submerge the suction strainer into the chemical solution.



B.) You need to use the black nozzle to spray chemicals onto the cleaning surface.

C.) The amount of chemical applied can be changed by turning the chemical adjustment knob located on the chemical injector.

D.) Squeeze the spray gun trigger. The chemical injector will draw the chemical into the water stream

E.) Apply chemicals evenly to the cleaning surface. Allow the chemicals to react with the dirt, then clean at high pressure with green nozzle.

F.) Never use more chemical than is necessary to clean the surface.

IX.) Start Engine

***Refer to the engine manual to start your engine.**

IMPORTANT: The water must be turned on before starting. Running the pump dry will cause damage and void the warranty.

IMPORTANT: Make sure the fuel shutoff valve located under the fuel tank is in the ON position.

WARNING: Check that there are no leaks in the vicinity of the pump before starting 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.

WARNING: Do not inhale the exhaust from the engine. Do not point the lance at anyone even if the engine has stopped because there could be a release of water under retained pressure if the spray gun trigger is actuated.

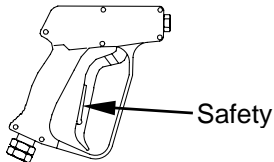
X.) Cleaning

WARNING: Wear eye, ear, hand, foot and skin protection at all times while operating this pressure washer.

DANGER: Do not point the spray wand at yourself or at any person. Bodily injury may result from water under high pressure.

CAUTION: Be careful on painted or delicate surfaces, the pressure may damage the surface if the nozzle is too close.

IMPORTANT: Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger actuation and potentially dangerous high pressure spray. Rotate the safety latch to the locked position when not spraying.



00417

- A.) Hold the lance with two hands, have a sturdy stance.
- B.) Point lance at dirty surface and squeeze trigger.
- C.) 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.
- D.) Use the width of the spray pattern to wash in a wide path. Overlap spray paths for complete coverage.
- E.) The nozzle should be 12" to 24" from the work, closer for tough areas.
- F.) Small parts should be washed in a basket so the pressure does not push them away. Larger, light weight parts should be clamped down.
- G.) The pressure washer is set and locked to the maximum rated pressure when it leaves the factory. You can reduce the water pressure by rotating the black unloader knob or by reducing the engine speed.

XI.) Shut-Down Instructions

WARNING: Do not leave an operating machine unattended. Always shut the machine OFF and relieve the pressure before leaving the machine. 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.

- A.) Turn engine OFF.
- B.) Close engine fuel line valve.
- C.) Turn water supply OFF.
- D.) Actuate spray gun trigger to relieve system pressure.
- E.) Remove garden hose.
- F.) Remove pressure hose.

SAFETY FEATURES

I.) Safety Relief

The safety relief valve is a backup safety feature. If the unloader malfunctions, the safety relief valve will open and relieve system pressure.

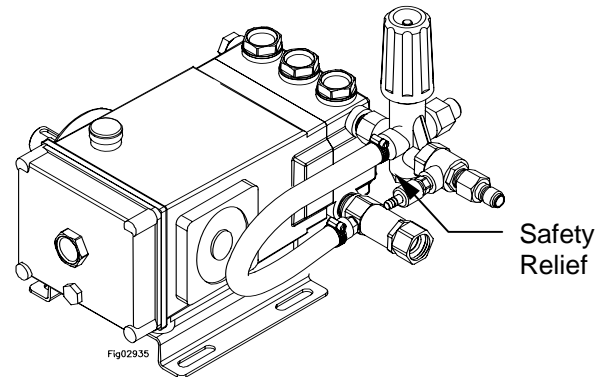


Fig02935

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

II.) Thermal Protector

The thermal protector protects your pump from overheated water. When the spray gun trigger is released, the pump **DOES NOT** stop pumping. Water is circulated through the unloader valve and pump. The circulating water heats up quickly. The thermal protector discharges water when it reaches 140°F preventing pump damage.

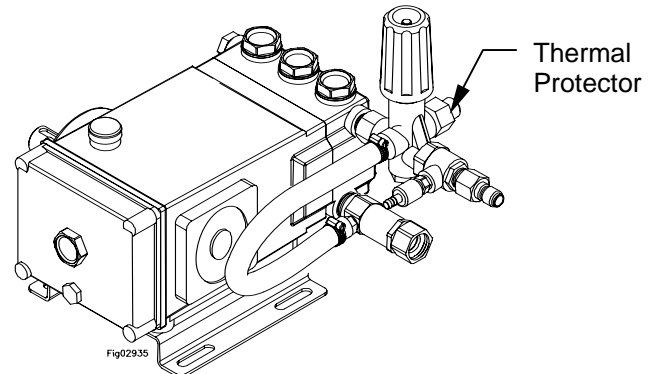


Fig02935

Maintenance Instructions

***Refer to the Honda Engine Owner's Manual for Engine Maintenance Instructions**

Maintenance Mode

Before performing any maintenance on the pressure washer, it must be placed in maintenance mode.

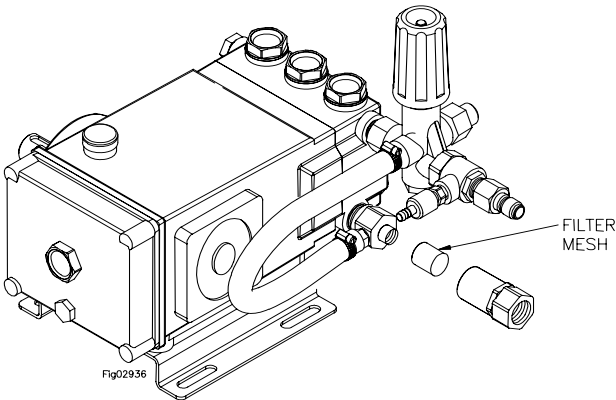
- A.) Turn off engine
- B.) Turn off water supply
- C.) Bleed water from system
- D.) Shut off fuel valve
- E.) Unplug spark plug wire from spark plug

Maintenance Schedule

What to Check	When To Check	What to Do
Inlet Filter	Each Use	Clean
Tires	Each Use	Check Pressure
Hoses	Each Use	Check for Wear
Bolts	Each Use	Check for Loose Bolts

Cleaning The Inlet Filter

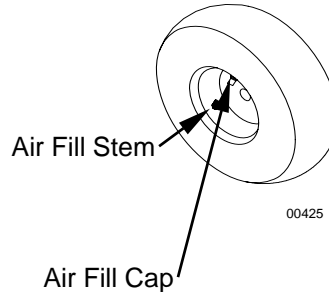
WARNING: Check whether dangerous chemicals have been used, and take precautions when handling filters.



- A.) Unscrew inlet filter cap
- B.) Remove Inlet filter mesh
- C.) Run water through to clean mesh

Checking the Tire Air Pressure

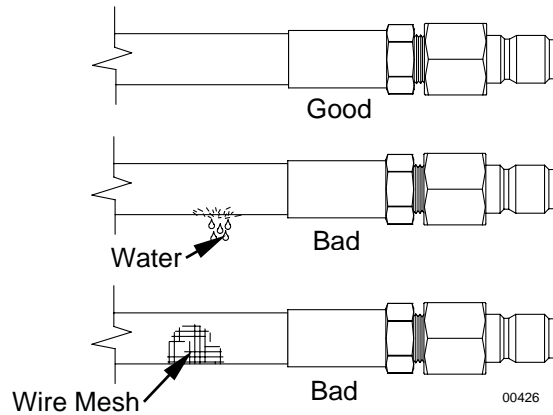
- A.) Remove air fill cap
- B.) Check tire side wall for correct pressure.
- C.) Replace air fill cap



Checking the Hoses

WARNING: Do not use a finger or skin to check for leaks. Escaping fluid under pressure has sufficient force to penetrate the skin, causing serious injury. Do not operate the pressure washer if the hose is cracked, worn, or leaking.

- A.) Check all hoses for leaks
- B.) Check all hoses of worn areas



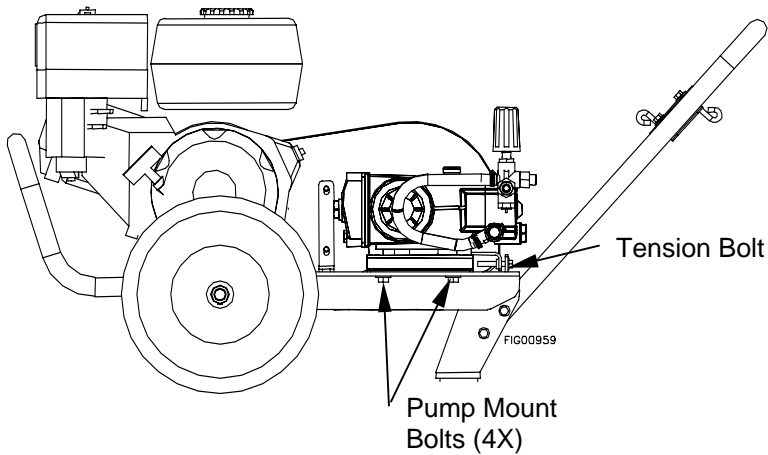
Belt Tension

Some general rules of belt tension are:

- 1.) Ideal tension is the lowest tension without belt slippage.
- 2.) Over tightening decreases belt and bearing life.
- 3.) Keep belts clean and free of foreign material that may cause slippage.
- 4.) Tighten belts when slipping.
- 5.) Never apply belt dressing. It will damage the belts and cause early failure.

Tightening belts

- 1.) Loosen pump mount bolts (4 places).
- 2.) Tighten tension bolt.
- 3.) Re-tighten pump mount bolts.



Changing The Pump Oil

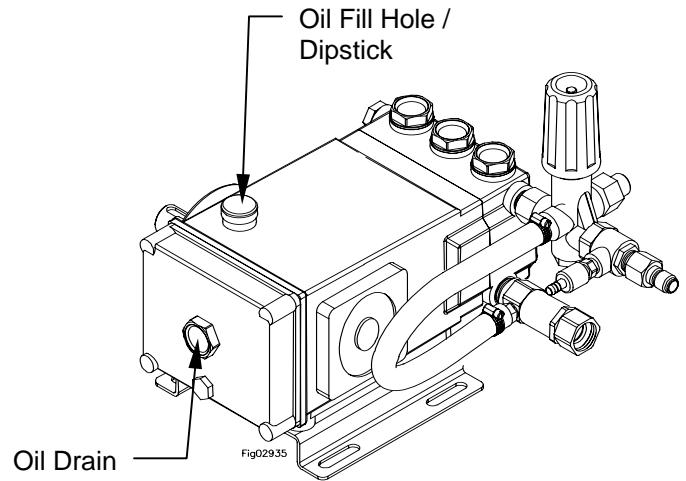
*Change oil after first 40 hours, then every 3 months or 500 hours.

- 1.) Remove oil drain plug
- 2.) Drain pump oil
- 3.) Replace oil drain plug
- 4.) Fill pump with pump oil.
- 5.) Fill with oil until level is between marks on dipstick.

Quantities Of Fluid

Pump	Type of Fluid	Qty. (oz./L)
AR RK1528HN	SAE 30**	15.0oz (.44L)

**SAE Non-Detergent Oil (Item #4043)



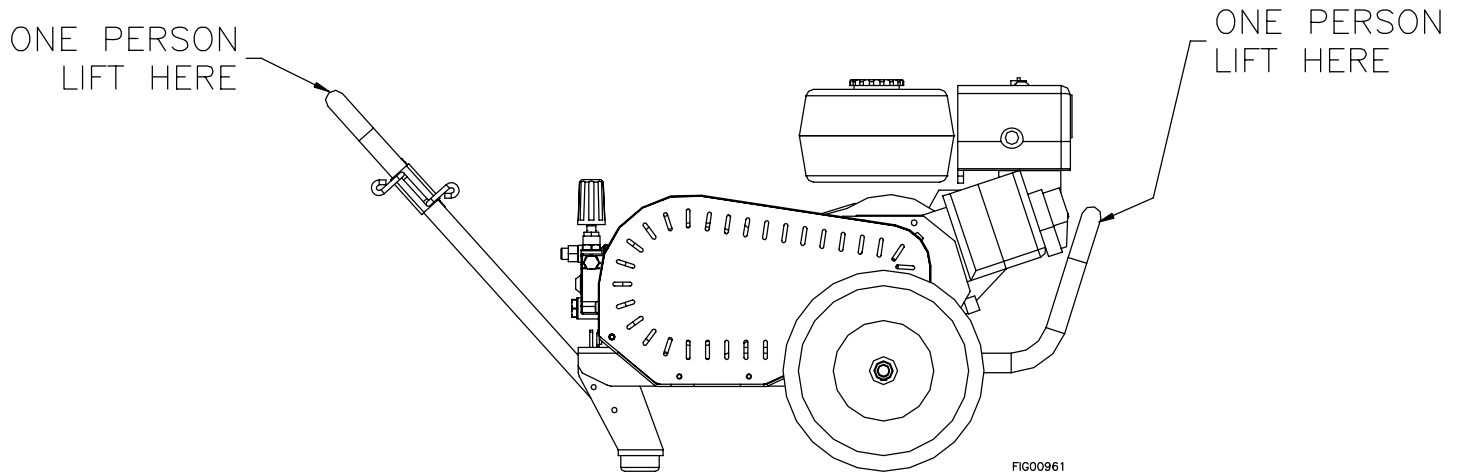
Moving and Handling Instructions

Maneuvering Your Pressure Washer

- 1.) Pull the handle up with both hands.
- 2.) Pull the pressure washer behind you as you walk.

Lifting Your Pressure Washer

- 1.) To reduce risk of injury, it is recommended that two adults lift the pressure washer.
- 2.) Only lift the pressure washer by the bumper and handle. Do not use the pump or engine as a lifting point.



Storage

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

Storage:

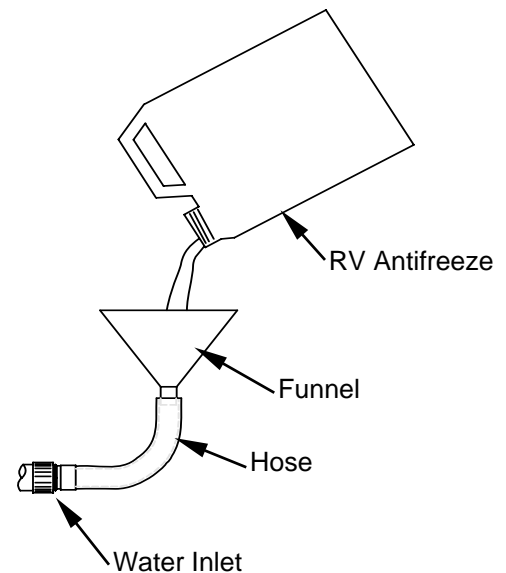
Before you store the pressure washer, make sure you do the following:

- 1.) Remove gasoline from engine or add fuel stabilizer to the gasoline to prevent gumming.
- 2.) If adding stabilizer, run pressure washer with high pressure hose for five minutes.
- 3.) Shut down pressure washer by turning engine start switch OFF.
- 4.) Disconnect high pressure and garden hose.
- 5.) Remove spark plug, turn engine start switch OFF, and turn fuel valve OFF.
- 6.) Pour one teaspoon of engine oil into spark plug hole. Cover the spark plug hole with a rag and turn engine over several times to lubricate cylinder.
- 7.) Replace spark plug.

Winter Storage:

Items needed: 12" piece of garden hose or equivalent, funnel and RV antifreeze (approximately 6 oz.)

- 1.) Follow the storage instructions listed above.
- 2.) Disconnect spark plug cable. Make sure the engine start switch is OFF, and the fuel valve is OFF.
- 3.) Attach the garden hose with funnel to the pump inlet (see illustration).
- 4.) Pour RV antifreeze into the funnel, turn the engine over until antifreeze comes out the pump outlet.
- 5.) Drain all water from the high pressure hose. Depress trigger on gun and drain all water out of gun/lance.



Troubleshooting

ENGINE WILL NOT START

<i>Causes</i>	<i>Solutions</i>
Low Oil Shutdown	Fill engine with the adequate amount of oil
Cold Engine	Choke engine to start
No Fuel	Add gas to engine - Make sure fuel shutoff valve is open
Pressure build-up from initial use	Trigger spray gun to relieve pressure
Engine not turned ON	Place ON/OFF switch in the ON position
Spark plug wire not attached	Attach spark plug wire to spark plug

LOW / SURGING PRESSURE

<i>Causes</i>	<i>Solutions</i>
Insufficient water supply	Increase water flow - Check for kinked or pinched hose
Plugged inlet screen	Pull out and clean screen carefully
Need to use high pressure nozzle	Change to the green nozzle
Plugged nozzle	Remove nozzle, check for blockage
Worn nozzle	Replace nozzle
Leak in high pressure line	Fix leaks

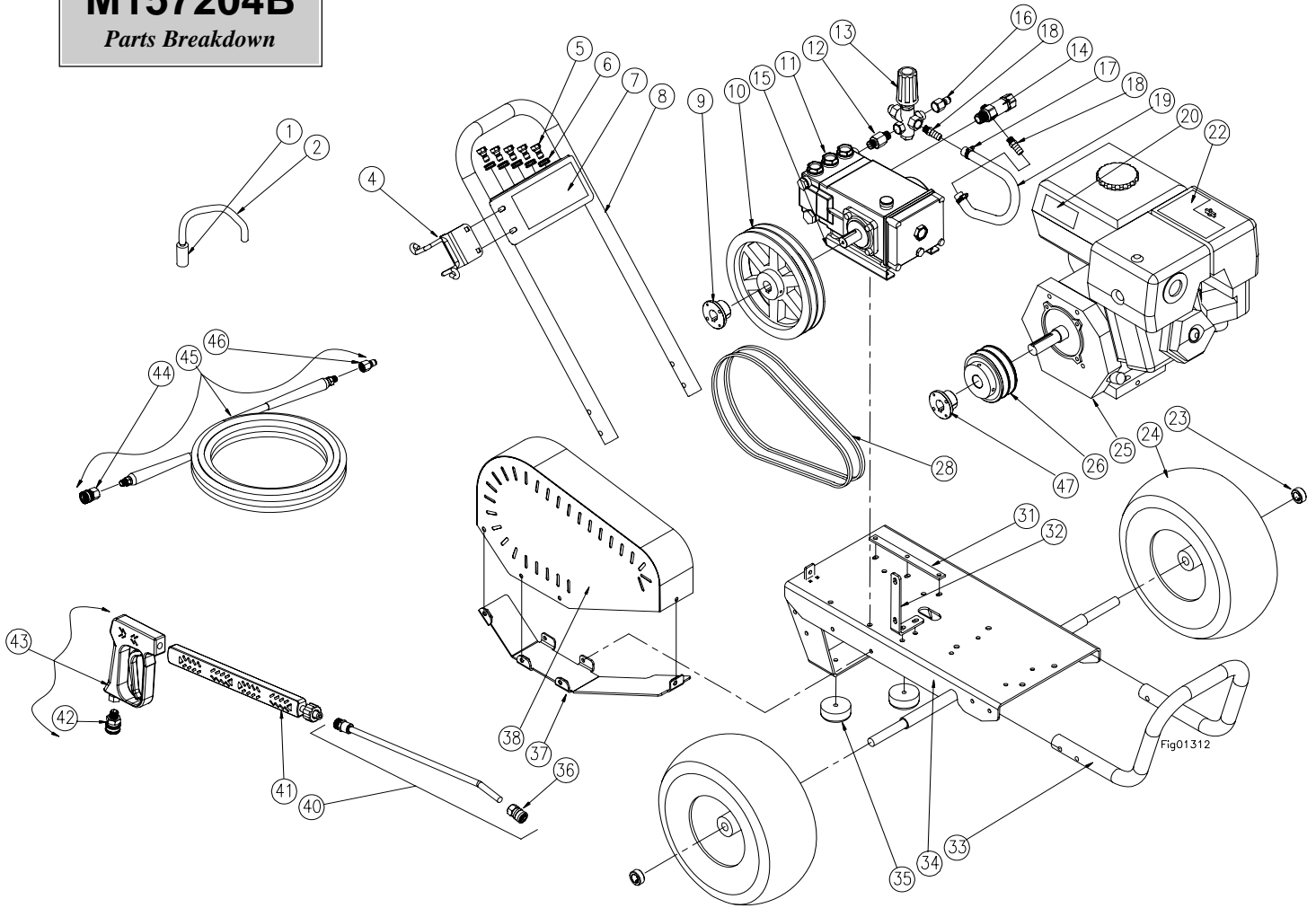
NO CHEMICAL INJECTION

<i>Causes</i>	<i>Solutions</i>
Adjustment knob turned OFF	Rotate adjustment knob counter-clockwise
Need to use different nozzle	Change to the black nozzle
Back pressure from extra long hose	Try shorter hose
Leak in clear chemical hose	Replace hose. Use hose clamps if necessary
Chemical strainer not submerged	Make sure strainer is completely submerged in solution

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

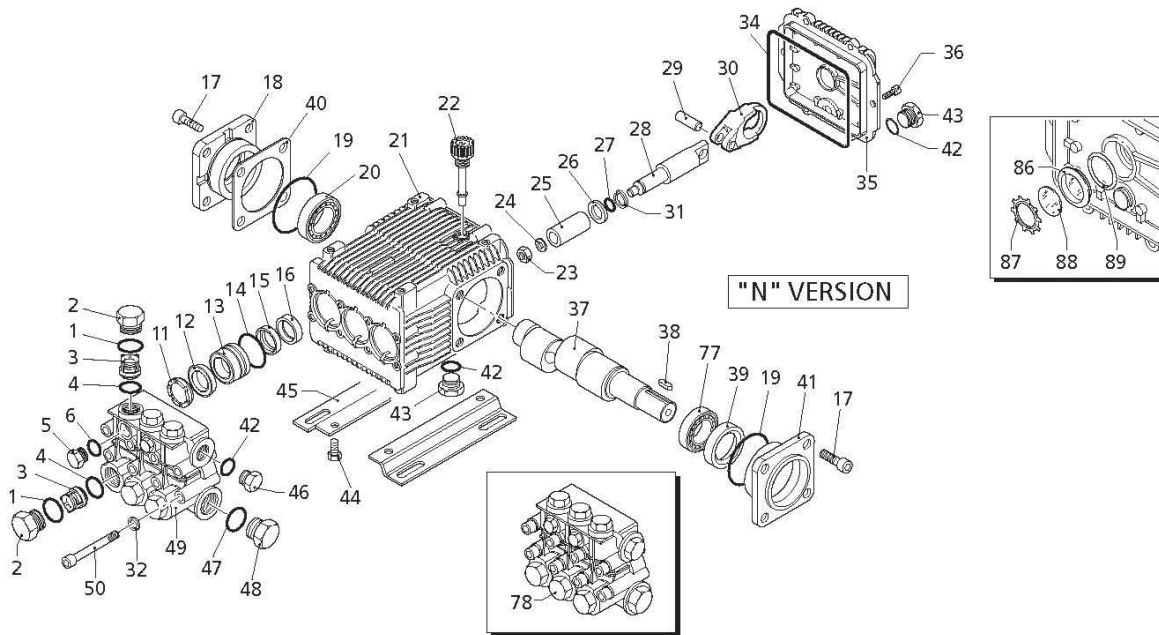
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Parts Breakdown

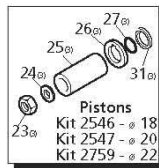


ITEM	PN	DESCRIPTION	QTY
1	221222	Chemical Strainer	1
2	777165	1/4" Braided Chemical Hose	3ft
4	36003	Gun Holder	1
5	38532	Nozzle 5 Pack 3.5	1
6	777111	Grommet	5
7	36004	Decal, Handle	1
8	777253	Handle	1
9	777419	24MM Bushing	1
10	2006	Pulley 2BK90H	1
11	780382	AR RK1528HN Pump	1
12	2296	3/8" Steel Hex Nipple	1
13	782572	Unloader Valve	1
14	35169	Inlet Filter	1
15	780349	Pump Riser	1
16	777915	QC 3/8" Male Nipple	1
17	777119	1/2" Hose Clamp	2
18	777840	1/2" HB x 1/4" MNPT	2
19	2264	1/2" Black Hose	12in
20	35189	Decal, Rotating Parts	1
22	32585	Decal, Warnings	1
23	305200	Wheel Retainer	2

ITEM	PN	DESCRIPTION	QTY
24	778295	Turf Tire	2
25	601091	Honda GX390	1
26	2005	Pulley 2BK36H	1
28	777115	BX42 Grip notch Belt	2
31	35997	Pump Guide	1
32	36758	Guard Mount Bracket	1
33	35990	Bumper Tube	1
34	780343	Belt Drive Cart Base	1
35	15431	Rubber Foot	2
36	777904	1/4" Nozzle QC Coupler	1
37	36763	Belt Guard Bottom	1
38	36761	Belt Guard	1
40	779167	28" Lance Extension	1
41	22622	Lance Grip	1
42	780455	3/8" Male QC Coupler	1
43	779168	Spray Gun	1
44	777914	3/8" Female QC Coupler	1
45	38525	3/8" x 50' High Pressure Hose	1
46	777915	3/8" Female QC Nipple	1
47	777790	1" Bushing	1



Repair Kits



Special Parts / Kits

Code	Description	Qty.
2809	Viton water seals ø18	1
2810	Viton water seals ø20	1
2811	Viton water seals ø22	1
2819	Kit for up to 180° F ø18 High Temp	1
2820	Kit for up to 180° F ø20 High Temp	1
1837	Rail Kit 5/8" - 2 Rails & 4 Bolts	1
2633	Rail Kit 1-3/4" - 2 Rails & 4 Bolts	1
2633H	Rail Kit 2-5/8" - 2 Rails & 4 Bolts	1

Pos	Code	Description	Qty.	Pos	Code	Description	Qty.	Pos	Code	Description	Qty.		
1	960160	O-Ring ø17.86x2.62	6	26	1380950	Spacer	3	77	840370	Bearing	1		
2	960090	Valve cap - Brass (478 in/lbs)	6	27	600180	O-Ring ø7.66x1.78	3	1389270	Complete pump head ø18 H	1			
3	960850	Valve cap - SS (478 in/lbs)	6	28	1380920	Guiding piston	3	1389272	Complete pump head ø18 H	1			
4	1380740	Valve cap - NP (478 in/lbs)	6	29	1380060	Piston pin	3	1389271	Complete pump head ø18 H	1			
5	960090T	Valve cap - 1/4" threaded - Brass (478 in/lbs)	1	30	1383020	Con rod - Bronze > 3000 PSI	3	1389212	Complete pump head ø20 H	1			
6	960850T	Valve cap - 1/4" threaded - SS (478 in/lbs)	1	31	1383050	Con rod - Aluminum < 3000 PSI	3	1389220	Complete pump head ø22 H	1			
7	1389051	Complete valve	6	32	1080401	Back-up ring	3	86	1260250	Oil sight glass	1		
8	880830	O-Ring ø15.54x2.62	6	33	1381850	Washer	8	87	1260430	Snap ring	1		
9	880581	Plug 1/4" G - Brass	2	34	1780510	O-Ring	1	88	1780690	Contrast disc	1		
10	1380690	Plug 1/4" G NP	2	35	1789010	Complete cover	1	89	1140450	O-Ring ø20.24x2.62	1		
11	820510	O-Ring ø10.82x1.78	2	36	1343510	Bolt M6x14 (89 in/lbs)	6	AR64516	Oil	1			
12	960110	Support ring ø18	3	37	2280070	Crankshaft 24mm	1	OIL CAPACITY - 15 OZ					
13	840300	Support ring ø20	3	38	2280060	Crankshaft 24mm	1	Legend					
14	840320	Support ring ø22	3	39	1380520	Key	1	ø 18	For ■	ø 20	For □	ø 22	For ★
15	880320	High pressure packing ø18	3	40	180340	Oil seal	1	RK15.15		RK18.20H		RK21.20H	
16	840290	High pressure packing ø20	3	41	1380120	Shim 0.10 mm	1-3	RK15.20H		RK18.28H			
17	840330	High pressure packing ø22	3	42	1380130	Shim 0.20 mm	1-3	RK15.28H					
18	1380090	Piston guide ø18	3	43	1380530	Shim 0.25 mm	1-3						
19	1380150	Piston guide ø20	3	44	1382810	Shim 0.05 mm	1-3						
20	1380160	Piston guide ø22	3	45	1380040	Open bearing support (217 in/lbs)	1						
21	961240	O-Ring ø31.47x1.78	3	46	1380141	Rail 5/8"	2						
22	880330	Low pressure seal ø18	3	47	Z-Bracket 1-3/4"	2							
23	840280	Low pressure seal ø20	3	48	Z-Bracket 2-5/8"	2							
24	840340	Low pressure seal ø22	3	49	1980740	Plug 3/8" G	1						
25	1383130	Oil seal	3	50	1981180	Plug 3/8" G NP	1						
	17	850370	Bolt M8x16 (217 in/lbs)	8		180101	O-Ring ø17.5x2	1					
	18	1380050	Closed bearing support	1		820361	Plug 1/2" G	1					
	19	640030	O-Ring ø59.99x2.62	2		960870	Plug 1/2" G NP	1					
	20	2280240	Bearing	1		1381070	Pump head - NP ø18	1					
	21	1382770	Pump housing	1		1381071	Pump head - Brass ø18	1					
	22	880130	Vented oil cap	1		1380020	Pump head - Brass ø20-22	1					
	23	962010	Nut M8 (106 in/lbs)	3		1380680	Pump head - NP ø20-22	1					
	24	962000	Washer ø8.1	3		820150	Head bolt M8x70 (217 in/lbs)	8					
	25	1380940	Ceramic piston ø18	3									
		1380930	Ceramic piston ø20	3									
		1382360	Ceramic piston ø22	3									

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Limited Warranty

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability.

Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product.

Limited Warranty

NorthStar shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of 2 years from the date of purchase by user. This warranty applies to the original purchaser of the equipment and is non transferable. Verification of purchase is the responsibility of the buyer. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar.

NOTE: Some services performed by parties other than NorthStar may void warranty.

This warranty covers parts only. It will not provide for replacement of complete products due to defective parts. Components not manufactured by NorthStar such as engines are guaranteed by their manufacturer and can be serviced at factory-authorized locations near you. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. NorthStar can supply you with the service center location in your area.

This warranty specifically excludes the following; failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use.

Warranty does not cover items subject to normal wear such as tires, receptacles or any part subject to direct physical contact by the public. This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part.

This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

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

Customer Number: _____

Date of Purchase: _____

NorthStar Serial Number: _____

Item Number: _____



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