



## **OPERATOR'S MANUAL**

NLH SERIES Electric Motor / Diesel fired

## READ THIS MANUAL

This manual contains important information for the use and safe operation of your Amazing Machinery® machine. FAILURE TO READ THIS MANUAL AND FOLLOW ITS INSTRUCTIONS PRIOR TO OPERATING OR ATTEMPTING ANY SERVICE OR MAINTENANCE PROCEDURE COULD RESULT IN SERIOUS INJURY OR DEATH TO YOU OR OTHER PERSONS; ALSO DAMAGE TO THE MACHINE OR TO OTHER PROPERTY.



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### **Unpacking Instructions**

#### **INSPECTION**

Carefully unpack your new Amazing Machinery equipment by removing the banding and cardboard box from pallet. Remove the pressure washer from the pallet and check for any physical damages that may have occurred during shipment. Check for all parts specified and shown below.



#### **INCLUDED PARTS**

- Pallet
- Packing Material Outer Crate
- NLH Series Machine
- Operator's Manual
- Wand / Trigger Gun
- Nozzle 15° (1)
- Hose 3/8" X 50'

#### **NOTICE**

Information in this operator's manual is subject to change without notice.

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#### Safety Guidelines



READ THIS FIRST! FAILURE TO READ AND OBSERVE ALL WARNING STATEMENTS COULD RESULT IN SEVERE BODILY INJURY OR DEATH, POSSIBLE INJURY TO OTHER PERSONS, DAMAGE TO MACHINE OR OTHER PROPERTY.

- DO NOT operate this machine in areas where open flames are not permitted. DO NOT store or use combustible materials on or near this machine. Use this equipment only in well ventilated areas. Failure to follow this warning may cause carbon monoxide build up, fire or explosion, and possible injury or death.
- DO NOT operate this machine while under the influence of alcohol, drugs or while fatigued.
- DO NOT direct discharge stream at yourself or others. Risk of injection or injury may occur. Never put your hand or fingers over the spray tip. Do not try to stop or deflect leaks with your hand or body. Always face nozzle and wand to the ground when testing.
- DO NOT operate this machine WITHOUT wearing protective Eye Wear. Gloves, Hard Hat, Mask, Ear Plugs & Steel Toe Work Boots are also recommended, DO NOT wear loose clothing. Keep your body and clothing clear of the engine and discharge stream when the machine is running.
- DO NOT tie back or block trigger gun in OPEN position. Never leave the pressure washer unattended once you have started it. If you leave, shut down machine completely.
- DO NOT overreach or stand on an unstable support while operating this machine. Maintain good footing and balance.
- DO NOT permit this machine to run while unattended or for extended periods of time with trigger gun closed. Damage to pump may occur.
- DO NOT operate this machine in an unsafe manner or around unsupervised children. Keep all other personnel clear while operating this machine. This product should only be operated by trained personnel.
- DO NOT alter original factory settings prior to operating this machine. Risk of injury to yourself or other persons may occur.
- DO NOT remove hoses, guns, nozzles or any components while this machine is still hot or while it is running.
- DO NOT attempt to service this machine before reading the service manual.
- DO NOT use water with a temperature over 140 degrees Fahrenheit
- DO NOT use any electrical outlet that is not properly grounded or does not comply with all federal, state, and local laws and/or electrical codes
- DO NOT put diesel fuel in to a gasoline tank or gasoline into a diesel tank. Observe correct markings on fuel tanks before filling.
- DO NOT operate this machine without knowing how to stop and bleed water pressures. Know all controls before using this machine.
- DO NOT spray caustic, acids or abrasive fluids through this machine.
- DO NOT permit water to freeze inside this machine. Pump and plumbing damage may occur.
- Use only recommended Amazing Machinery parts when servicing this machine.
- Amazing Machinery will not be held liable for any unauthorized modifications made to this machine. Any such action will void the warranty.

#### **Operating Instructions**

#### **LOCATION GUIDELINES**

- Locate the machine on a solid and level surface so that engine and pump crankcase oil lubricate components properly. Avoid areas where water can build up in the working area. Possible injury can occur caused by the surface becoming slippery from water build up.
- Locate the machine in a well-ventilated area and away from flammable materials or fumes. Be sure ventilation warnings are observed. Keep pressure washer at least 18" away from flamable materials.
- Locate the machine so the operator has easy access to the pressure washer and its controls. Locate the machine so that it is protected from external damage.
- To prevent damage and excessive hose wear, locate the pressure washer so that the hose does not cross traffic areas

#### STARTING THE MACHINE

#### Following the steps below will insure successful operation:

- Read this manual completely before attempting to start the machine.
- Check that the Motor/Burner switches are in the "OFF" position
- Check the diesel tank and fill with a good grade of diesel fuel #1, #2 or kerosene.
- Check the pump oil level and fill with SAE 30w non-detergent oil if needed.
- Connect water hose to pump (or float tank if equipped). Turn on water source.
- Connect the power cord to a properly grounded power source.
- Attach high pressure hose to base of spray gun.
- Install water nozzle at the end of wand, making sure it is clear of any obstructions.
- Turn pump switch to "ON"
- Pull trigger on gun until a steady stream of water comes out the nozzle. This purges any air in the system.
- Check for leaks in the system and cycle trigger gun to insure bypass is adjusted correctly. Repair any leaks and correct unloader adjustment if needed. Turn off machine before attempting any repairs.
- Turn burner switch to "ON". Check gor buner ignition.
- Adjust thermostat to desired temperature appropriate to the task. Maximum temperature setting may not be needed.
- Insert detergent siphoning tube into a DOT approved container and open the metering valve for detergent application.

#### **WASHING TECHNIQUES**

- Washing from bottom up increases dwell time of soap and lessens vertical streaks.
- Turn soap metering valve "OFF" to purge system of soap
- Rinsing with cold water from top down will retard detergent reaction which will enhance the rinsing performance.
- Wash at 30 to 60 degree angles to prevent splashback.

#### STOPPING THE MACHINE

- Turn burner switch to "OFF". Allow water to discharge for a few minutes while cooling down.
- Turn pump switch to "OFF".
- Disconnect water source.
- Pull gun trigger to release water pressure from system.
- Disconnect wand & gun assembly.
- Wind up pressure hose on hose reel.

#### **Maintenance Instructions**

#### MAINTENANCE PRECAUTIONS

- Do not permit acidic, caustic or abrasive fluids to be pumped through system.
- Periodically clean detergent inlet screen. This will ensure proper flow of water to the pump.
- High mineral content in water may adversely affect your machine and may require the use of a water softener to ensure proper operation.
- NEVER run the pump dry under any circumtances. Doing so will cause externe damage to the pump.



FAILURE TO MAINTAIN HEAT EXCHANGER COIL MAY RESULT IN A STEAM EXPLOSION WHICH MAY CAUSE SERIOUS INJURY OR DEATH.

#### **HEAT EXCHANGER COIL MAINTENANCE**

- Hard water conditions may eventually cause clogging in the heat exchanger coil if left unattended.
   Scale deposits will compromise the heating efficiency and produce an unsafe condition over time.
   It may be necessary to descale coil.
- Scale buildup from certain detergents may eventually clog up the heat exchanger coil causing an unsafe condition. Use only recommended detergents for better cleaning efficiency.
- Black carbon deposits that collect on the outside wall of the heat exchanger coil may be a result of using a poor grade of fuel or improper burner operation. Heating fuel should be void of water and sediments to eliminate the possibility of sooting and compromising the efficiency of the coil.

#### **MOVING, STORAGE**

 Place machine in covered area when not in use to protect from elements. Protect machine from freezing in cold temperatures by storing in a heated location.

#### **WINTERIZING**

- Non-float Tank Machines: To protect the machine from freezing temperatures while storing or transporting, connect short length of garden hose (approximately 3 ft.) to water inlet connection on machine. Remove the pressure nozzle from the wand and insert the short garden hose end into a container of antifreeze. Place the wand into the antifreeze container and start engine running machine until antifreeze appears from the end of the wand. Turn engine "OFF" and replace pressure nozzle. Coil up hose and move machine to storage area.
- Float Tank Machines: Pour antifreeze into float tank and remove water nozzle from end
  of wand and carefully insert into opening of float tank. Start machine and run until
  antifreeze water mixture has circulated throughout the machine returning back to the
  float tank.

#### **PUMP MAINTENANCE**

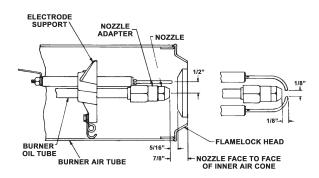
- Fill crankcase to dot on oil gauge window per specifications with the specific oil created by the pump manufacturer (i.e. **General Pump Oil**). Ensure the right oil for specific pump as it may vary.
- Change oil after 40 Hour Break-in Period.
- Change oil every Three Months or at 500 Hour Intervals thereafter.



#### **Maintenance Instructions**

#### **ELECTRODE SETTINGS**

■ Inspection of all wires, spring contacts and electrodes should be done periodically.



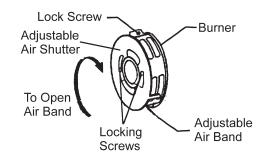


IF BLACK OR WHITE SMOKE VENTS FROM EXHAUST PORT UPON STARTING EQUIPMENT, DISCONTINUE USE AND ADJUST AIR BANDS BEFORE RESTARTING.

#### **OIL BURNER AIR BAND ADJUSTMENT**

Amazing Machinery® sets oil burners at sea level. Air bands may need adjustment at higher elevations to offer enhanced performance of the burner and extended life of the machine.

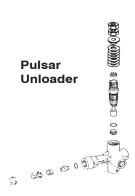
■ Adjustment of burner is done with pump motor and thermostat set to maximum. Loosen locking screw on air band, then close band until black smoke vents up exhaust vent. Take careful note of air band position when black smoke is first noticed. Slowly open air band until white smoke vents, then turn air band halfway back to where black smoke was first noted. Tighten air band locking screw. When properly set, the unit should NOT have either "black" smoke or "white" smoke during operation.



#### **UNLOADER ADJUSTMENT**

■ All Amazing Machinery machines have the unloader correctly set at the the factory. Setting an unloader is a difficult job without the proper equipment and training. Should the need arise to change the unloader settings, please contact your local distributor.

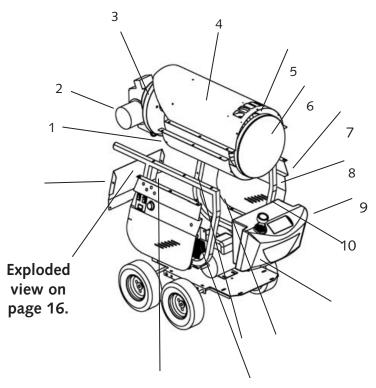




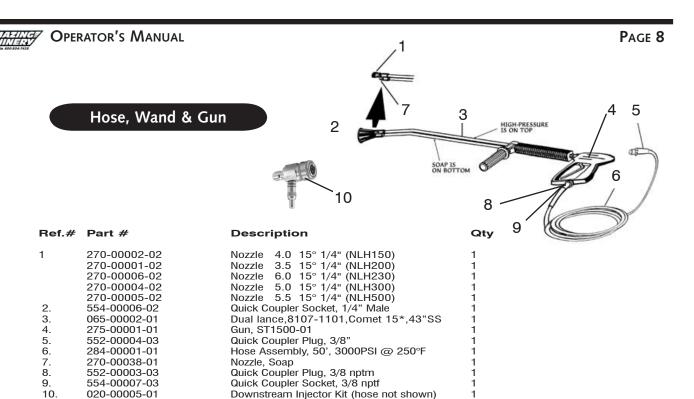


CHANGING THE UNLOADER SETTINGS WITHOUT THE PROPER EQUIPMENT AND TRAINING MAY RESULT IN NON-WARRANTY DAMAGE TO THE PUMP.



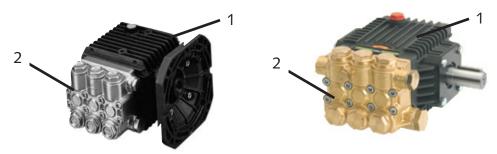


Ref.	# Part #	Description	Qty
2	170-00006-01	Wheel, Pneumatic	2/4
3	175-00001-01	Axle, Two and Four Wheel Configuration	1/2
4	516-00001-01	Bushing, Wheel Collar, 5/8"	2/4
	170-00001-01	Wheel, Solid Core	2/4
5a	180-00171-01	Chassis, NLH Series, Pneumatic / Pnuematic	1
5b	180-00171-02	Chassis, NLH Series, Pneumatic / Caster	1
6a	250-00001-01	Burner Assy, Oil, 115v, Vertical (NLH150, NLH200, NLH230)	1
6b	250-00008-01	Burner Assy, Oil, 230v, Vertical (NLH300, NLH500)	1
7	180-00173-01	Universal Wand Bracket	1
8	180-00004-01	Handle	1
9	567-00015-01	Grommet, Rubber Wand Holder	1
10a	155-00001-01	Coil, Schedule 80 (NLH150, NLH200, NLH230)	1
10b	155-00002-01	Coil, Schedule 80 (NLH300, NLH500)	1
11a	191-00006-01	Insulation, Blanket 1" Thick #4	5.5 ft.
11b	191-00007-01	Insulation, Blanket 1/2" Thick #4	1.5 ft.
12a	180-00015-01	Shell, SS, Removable, 16", Short (NLH150, NLH200, NLH230)	1
12b	180-00015-02	Shell, SS, Removable (NLH300, NLH500)	1
13	191-00003-01	Insulation, Cap, 16" X 10"	1
14	180-00071-01	Cap, Coil, 16"OD x 10"ID W/Ring, Painted	1
15a	180-00016-01	Shell, SS, Stationary, 16" Short (NLH150, NLH200, NLH230)	1
15b	180-00016-02	Shell, SS, Stationary (NLH300, NLH500)	1
16	180-00152-01	Plate, Burner, LH Series	1
17a	200-00001-01	Motor,1.5hp 115/60/1,Baldor PCL1319M (NLH150)	1
17b	200-00002-01	Motor,2.0hp 115/60/1,Baldor PCL1322M (NLH200,NLH230)	1
17c	200-00003-01	Motor, 3.0hp 208/230/60/1, BaldorPCL1326M(NLH 300)	1
17d	200-00014-01	Motor, 5.0hp 208/230/60/1, (NLH 500)	1
18a	220-00001-01	Pump, General T9051EBF (NLH150, NLH200)	1
18b	220-00052-01	Pump, General TT9111EBF (NLH230)	1
18c	220-00002-01	Pump, General TT9071 (NLH300)	1
18d	220-00005-01	Pump, General TT2035 (NLH500)	1
21	180-00174-01	Plate, Power	1
22	567-00001-01	Grommet, Nozzle Holder	1
23	140-00001-01	Cap, Fuel Gauge, Diesel, Black	1
24	190-00002-01	Fuel Tank, 9 Gallon Green	1
25	170-00002-01	Wheel, Caster	1
	Not Shown		
	439-00001-01	Power Cord, 36' GFCI 20amp (NLH150, NLH200,NLH230)	1
	439-00001-01	Power Cord, 36' GFCI 30amp (NLH300, NLH500)	1
	305-00005-01	Label, Fuel-Diesel	1
	305-00004-01	Label, Operating Instructions, Vertical	1
	305-00002-01	Label, Warning, Electrical, Vertical	1
	223 00002 01	,,,, vertical	•



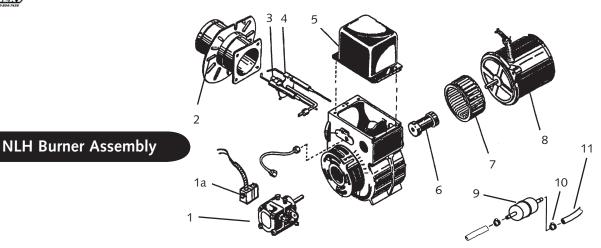
#### **NLH Direct Drive & Belt Drive Pumps**

General Pump TC1509S17, TC1809S17, TC91811S17 Belt Drive Triplex Pump General Pump TT9111EBF, T9051EBF, TT9071EBF, TT2035EBF Direct Drive Triplex Pump

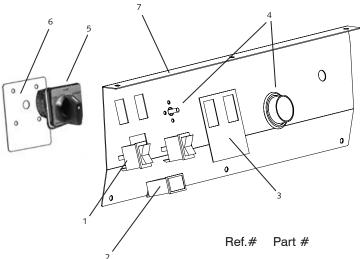


Ref.#	Part #	Description	Qty
1	220-00001-01	T9051EB-F Triplex Plunger Pump Complete (NLH150, NLH200)	1
1a	220-00052-01	TT9111EB-F Triflex Plunger Pump Complete (NLH230)	1
1b	220-00002-01	TT9071EB-F Triplex Plunger Pump Complete (NLH300)	1
1c	220-00005-01	TT2035EB-F Triplex Plunger Pump Complete (NLH500)	1
2	221-00001-07	Manifold, Alum Head (T9051/TT9071)	1
2	221-00001-01	Manifold, Brass Head (TT2035EF-B)	1
1a	220-00105-01	TC1509S17 Triplex Plunger Pump Complete (NLH150, NLH200)	1
1b	220-00106-01	TC1809S17 Triflex Plunger Pump Complete (NLH200, NLH300)	1
1c	220-00107-01	TC1811S17 Triplex Plunger Pump Complete (NLH500)	1
2a	221-0000XX-X	Manifold, Brass Head (TC1509S17 & TC1811S17)	1
2b	221-0000XX-X	Manifold, Brass Head (TC1809S17)	
Pump I	Repair Kits		
	221-00002-01	Check Valve Assembly Kit #1 (All NLH Series)	1 kit
	221-00003-01	Oil Seal Kit #83 (All NLH Series)	3
	221-00004-01	Oil Ring and Valve Cap	6
	221-00006-01	Head Packing Complete, One Cylinder Kit #96 (All NLH Series)	1
	221-00021-01	Check Valve Assembly Kit #123 (All TC Pumps)	1 kit
	221-00003-01	Oil Seal Kit #83 (All TC Pumps)	1 kit
	221-0000X-XX	Seals, HP, 15mm Kit #196 (TC1509S17 & TC1811S17)	1 kit
	221-0000X-XX	Seals, HP, 18mm Kit #197 (TC1809S17)	1 kit
	221-0000X-XX	Rings, 15mm Kit #198 (TC1509S17 & TC1811S17)	1 kit
	221-0000X-XX	Rings, 18mm Kit #199 (TC1809S17)	1 kit
	221-0000X-XX	Seals, LP, 15mm Kit #200 (TC1509S17 & TC1811S17)	1 kit
	221-0000X-XX	Seals, LP, 18mm Kit #225 (TC1809S17)	1 kit
	221-0000X-XX	Packing, 15mm Kit #226 (TC1509S17 & TC1811S17)	1 kit
	221-0000X-XX	Packing, 18mm Kit #227 (TC1809S17)	1 kit

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Ref.#	Part #	Description	Qty
1a-1 1a-2 2 3 3b 3c 4 5 5a 6 7 8 89 10	252-00002-01 252-00002-01 256-00001-01 245-00006-11 245-00006-12 245-00001-02 258-00001-06 252-00001-07 253-00001-01 254-00001-01 254-00001-01 254-00001-01 257-00002-01 557-00002-01 280-00003-01	Fuel Pump Solenoid (NLH150,NLH200, NLH230) Fuel Pump Solenoid (NLH300, NLH500) Main Burner Gasket Nozzle, Fuel 1.35/125psi (NLH150, NLH200, NLH230) Nozzle, Fuel 1.65/140psi (NLH300) Nozzle, Fuel 1.50/125psi (NLH500) Electrode Pair (RH & LH) Transformer 115v (NLH150, NLH200, NLH230) Transformer 230v (NLH300, NLH500) Coupling Fan Wheel 3.44" X 4.25" Motor 115v/60/1 (NLH150, NLH200, NLH230) Motor 208/230v/60/1 (NLH300, NLH500) Filter, Fuel Inline Clamp, Hose Hose, Inlet/Outlet Fuel Line	111111111121
Burner	Assembly Complete		
	250-00001-01 250-00008-01	Wayne Burner Vertical 115v Wayne Burner Vertical 230v	1 1

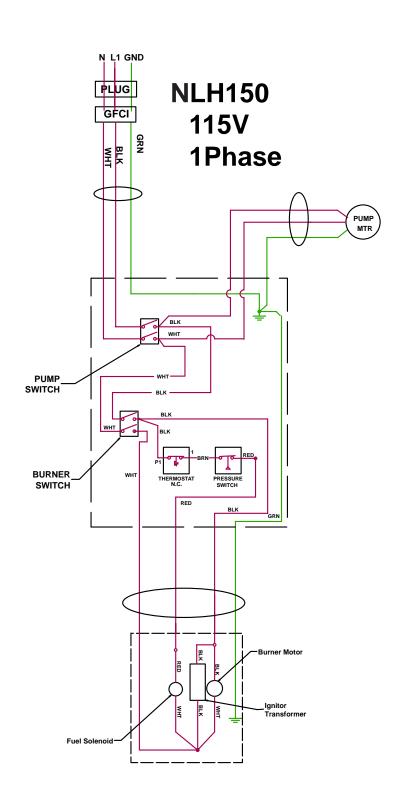


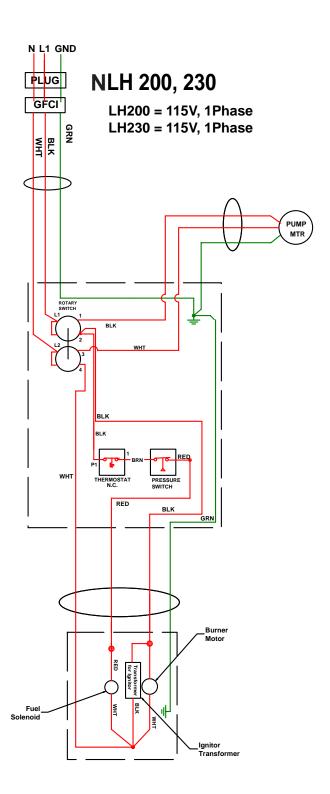
## NLH Control Box Assembly

Ref.#	Part #	Description	Qty
1	450-00001-01	Rocker Switch	2
2	571-00002-01	Hourmeter	1
3	305-00040-01	Label, Controls	1
4	573-00001-01	Thermostat Assembly	1
5	573-00001-01	Rotary Cam Switch (instead of rocker switches)	1
6	180-00295-01	Cam Switch Plate	1
7	180-00357-01	Control Panel Closeout Plate (upgrades only)	1

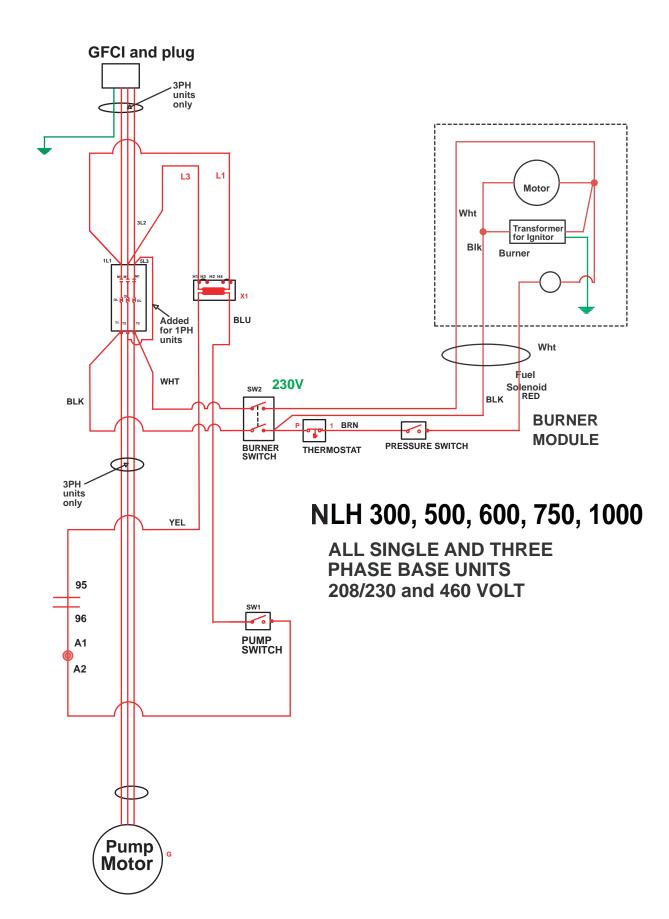


### **LH Wiring Diagrams**

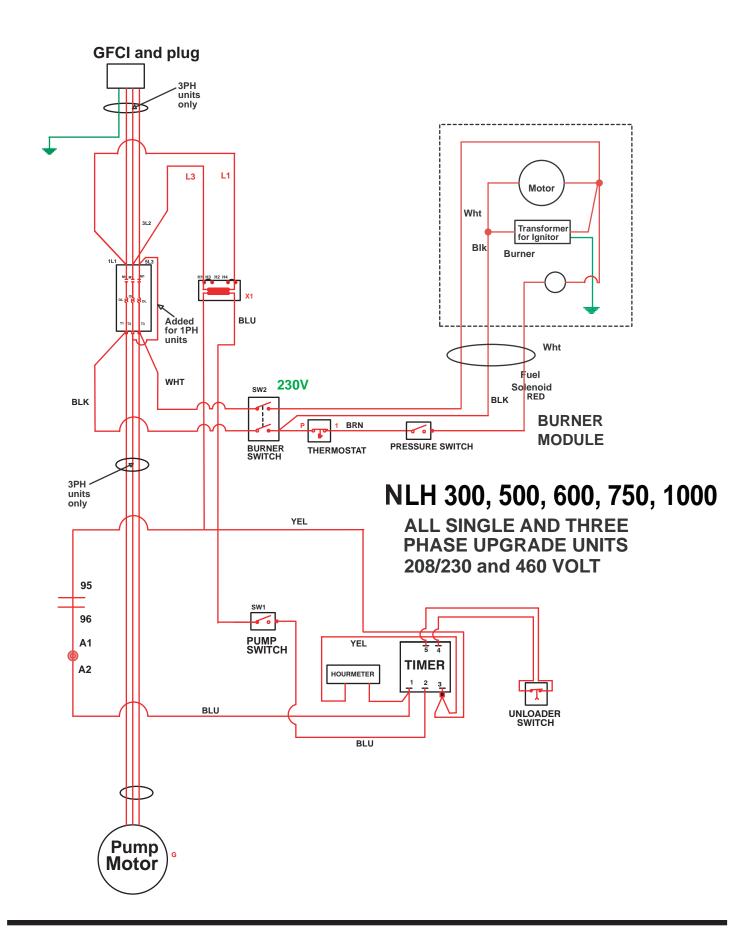












## Troubleshooting

problem	cause	action
Low Water Pressure	Insufficient water source Old or incorrect nozzle Plumbing or hose leak Obstruction in spray nozzle Chemical valve open Unloader valve worn Pump valves dirty or worn	Check hose size/water source Replace nozzle Tighten, repair or replace leak Clean or replace nozzle Close valve or submerge hose Replace unloader Clean or replace packing/valves
No Chemical Flow	Detergent valve closed Low detergent level Chemical screen dirty	Open detergent valve Fill detergent container Clean detergent screen
Burner Not Igniting	No fuel Burner switch turned off Thermostat set too low Clogged fuel filter Defective pressure switch Clogged burner nozzle Fuel pump malfunction Improper electrode setting	Fill fuel tank with proper fuel Turn burner switch on Reset thermostat Replace fuel filter Replace pressure switch Replace burner nozzle Replace fuel pump Clean/reset to specifications
Excessive Burner Smoke	Improper fuel being used Water contamination in fuel Improper air band adjustment Low fuel pressure Air leaks in fuel lines Soot on coils/burner assembly Misaligned electrodes Dirty burner nozzle	Use Diesel #1/#2 or Kerosene Drain fuel and replace with new Readjust air band/altitude Adjust to specifications Check for air leaks or bubbles Clean coils/burner assembly Realign to specifications Clean or replace burner nozzle
Pressure Relief Valve Leaks	Nozzle is dirty Defective relief valve Unloader adjusted incorrectly Restriction on discharge hose Scale restricting flow in coil	Clean or replace nozzle Replace relief valve Adjust unloader valve Remove nozzle and flush line Clean coil
Pump Motor Not Running	Pump motor switch off GFCI tripped No voltage to machine Clogged water nozzle Insufficient voltage/amperage	Turn on pump motor switch Reset and test GFCI Check power source Clean water nozzle Use proper drop cord
Pump Noisy	Air in suction line Pump valves dirty Check valve springs worn Low pump oil Pump bearings are worn Incoming water too hot	Check inlet water fittings Clean/replace pump valves Replace check valves Add SEA 30wt. non-detergent Replace/rebuild pump Reduce temperature/ambient
Water In Oil	High humidity environment Oil seal worn Plunger packing worn	Change oil frequently Check and replace oil seal Check and replace packing
Water Dripping/Pump	Plunger packing is worn Plunger retainer oil ring worn Cracked ceramics	Install new packing kit Replace oil ring Replace ceramics
Oil Dripping	Oil seal worn Cracked manifold	Check and replace oil seals Replace manifold
Fluctuating Pressure	Unloader not adjusted Valves worn Dirt or blockage in valves Pump sucking air Worn plunger packing	Adjust to specifications Replace with valve kit Clean or replace valve Check water/detergent supply Replace packing kit
Pump Head Overheating	Extended period in bypass	Pull trigger gun for water flow

# WARRANTY

#### MANUFACTURER LIMITED WARRANTY

#### **ENGINES**

Honda GC Series Engines; ONE Year from date of purchase Honda will repair or replace any manufacturer defect at their expense. To be handled directly by Honda Service Centers. See owners manual for details.

Honda GX Series Engines; TWO years from date of purchase Honda will repair or replace any manufacturer defect at their expense. To be handled by Honda Service Centers. See owners Manual for details.

Vanguard Series Engines; TWO years from date of purchase Briggs and Stratton will repair or replace any manufacturer defect at their expense. To be handled by Briggs and Stratton Service Centers. See owners Manual for details.

Robin Series Engines; TWO years from date of purchase Robin/Subaru will repair or replace any manufacturer defect at their expense. To be handled by Robin/Subaru Service Centers. See owners Manual for details.

Yanmar Diesel Engines; TWO years from date of purchase Yanmar will repair or replace any manufacturer defect at their expense. To be handled by Yanmar Service Centers. See owners Manual for details.

#### **ELECTRIC MOTORS**

Marathon and Baldor brand electric motors have a manufacture limited warranty of one year from purchase date to repair or replace the motor, at their options, any manufacturing defects.

The limited warranty does not include damage from low voltage or amperage use, high voltage or amperage use, water, or any other operator incurred damage.

Pump manufacturers offer a "one and five" limited warranty on tri-plex ceramic plunger type pumps, from date

The body, head and power train of the pump is warranted for 5 years from date of purchase against manufacturer defects. See owners manual for details. The valves, packings and "o"rings are warranted for one year from date of purchase against manufacturer defects. See owners manual for details. Pump manufacturers offer a one year limited warranty on Axial Type pumps from date of purchase. See owners manual for details. NOTE - Over Heated Pumps void all warranties.

#### ACCESSORY PARTS

Including, but not limited to; unloader valve, thermal relief valve, reels, easy start valve, chemical injector, rotating nozzles, spray tips, spray guns, wand extensions, telescoping wands, ball valves, sand injectors, quick couplers, high pressure hose, ground fault interrupter; all burner electronics and wiring, flow switches, diesel fuel injectors are warranted for repair or replacement by Equipment Manufacturer for a period of 90 days from date of purchase. Including, but not limited to; Surface Cleaners, Becket or Wayne Burners, Burner Fans and Heater Coils warranted against manufacture defects for repair or replacement by Equipment Manufacturer for a period of one (1) year from date of purchase. Including, but not limited to; Cart or Frame warranted against manufacture defects for repair or replacement by Equipment Manufacturer for a period of one (1) year from date of purchase. date of purchase.

#### LIMITATION OF LIABILITY

Amazing Machinery and Equipment Manufacturer liability for special, incidental, or consequential damages is expressly disclaimed. In no event shall any liability exceed the purchase price of the product in question. The warranty contained herein is in lieu of all other warranties express or implied, including any implied warranty of fitness for particular purpose.

NOTE - It is understood that a manufacturers limited warranty pertains to equipment used in it's prescribed manner, without abuse, and does not include wear and tear.

**NOTE** - All freight charges incurred on warranty situations are the responsibility of the customer.

Specifications, Warranties and Pricing are subject to change without notice.

\*Refund does not include shipping/handling fees. No refund will be given for installation kits. Customer is responsible for lost or misdirected packages. It is recommended that the customer insure the package for its full retail value. This warranty does not cover or include any damage as a result of acts of God, improper installation, alteration, negligence or abuse.