

NG
Hot Water Generator

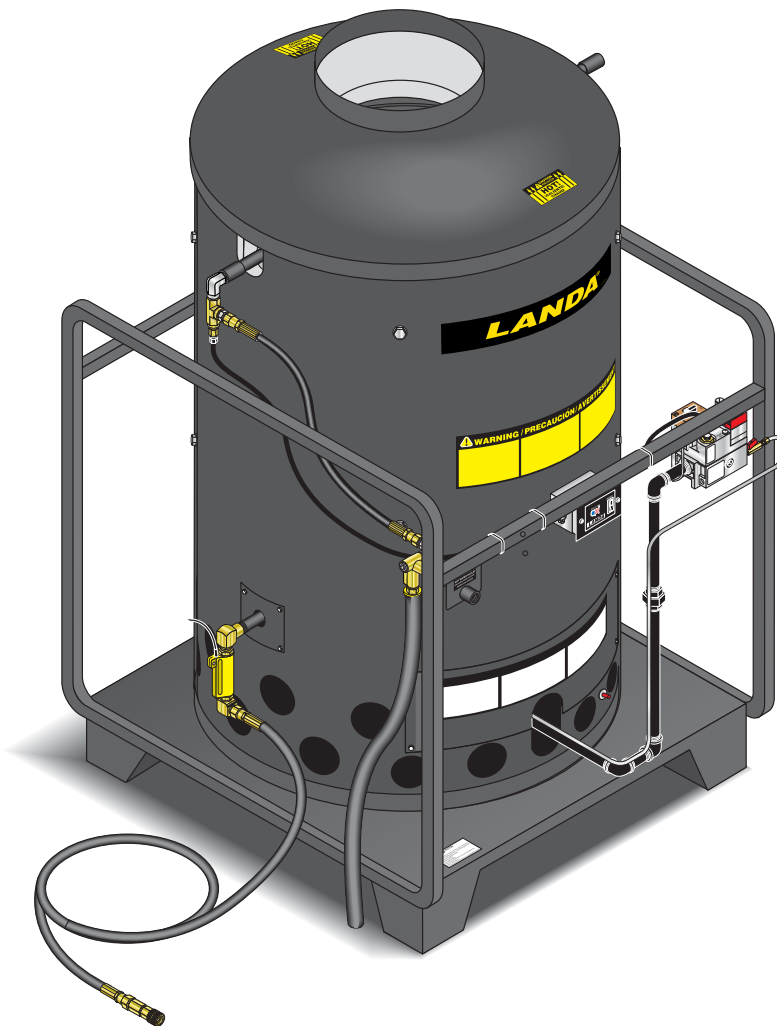
LANDA®

Operator's Manual

Heater Module

MODELS:

NG-3000
1.103-901.0



For the Landa Dealer nearest
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Intertek

8.913-942.0-E



08/20/21

Machine Data Label

Model: _____

Date of Purchase: _____

Serial Number: _____

Dealer: _____

Address: _____

Phone Number: _____

Sales Representative: _____

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How To Use This Manual

This manual contains the following sections:

- How to Use This Manual
- Safety
- Operations
- Maintenance
- Parts List

The HOW TO USE THIS MANUAL section will tell you how to find important information for ordering correct repair parts.

Parts may be ordered from authorized dealers. When placing an order for parts, the machine model and machine serial number are important. Refer to the MACHINE DATA box which is filled out during the installation of your machine. The MACHINE DATA box is located on the inside of the front cover of this manual.

Model:	_____
Date of Purchase:	_____
Serial Number:	_____
Dealer:	_____
Address:	_____
Phone Number:	_____
Sales Representative:	_____

The model and serial number of your machine is located on the back of the machine.

The SAFETY section contains important information regarding hazardous or unsafe practices of the machine. Levels of hazards are identified that could result in product damage, personal injury, or severe injury resulting in death.

The OPERATIONS section is to familiarize the operator with the operation and function of the machine.

The MAINTENANCE section contains preventive maintenance to keep the machine and its components in good working condition. They are listed in this general order:

- Winterizing Procedure
- High Limit Hot Water Thermostat
- Heating Coils
- Gas Valve Regulator
- Electrode Adjustment
- Pilot Burner Adjustment
- Pressure Relief Valve
- Propane Gas (Optional Conversion Kit)
- General Safety Precautions
- Gas Pressure Requirements
- Propane Cylinder Capacity
- Burner Features
- Burner Troubleshooting
- Troubleshooting

The PARTS LIST section contains assembled parts illustrations and corresponding parts list. The parts lists include a number of columns of information:

- **REF** – column refers to the reference number on the parts illustration.
- **PART NO.** – column lists the part number for the part.
- **QTY** – column lists the quantity of the part used in that area of the machine.
- **DESCRIPTION** – column is a brief description of the part.
- **NOTES** – column for information not noted by the other columns.

NOTE: If a service or option kit is installed on your machine, be sure to keep the KIT INSTRUCTIONS which came with the kit. It contains replacement parts numbers needed for ordering future parts.

NOTE: The manual part number is located on the lower right corner of the front cover.

Introduction & Safety Information

Thank you for purchasing a Landa Heater Module.

This manual covers the operation and maintenance of the NG-3000 heater module. All information in this manual is based on the latest product information available at the time of printing.

Landa, Inc. reserves the right to make changes at any time without incurring any obligation.

Owner/User Responsibility:

The owner and/or user must have an understanding of the manufacturer's operating instructions and warnings before using this pressure washer. Warning information should be emphasized and understood. If the operator is not fluent in English, the manufacturer's instructions and warnings shall be read to and discussed with the operator in the operator's native language by the purchaser/owner, making sure that the operator comprehends its contents.

Owner and/or user must study and maintain for future reference the manufacturers' instructions.

The operator must know how to stop the machine quickly and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.

SAVE THESE INSTRUCTIONS

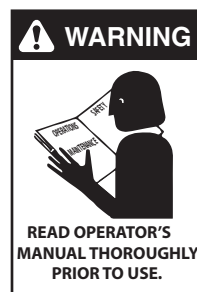
This manual should be considered a permanent part of the machine and should remain with it if machine is resold.

When ordering parts, please specify model and serial number. Use only identical replacement parts.

This machine is to be used only by trained operators.

Important Safety Information

NOTE: *This heater module NG-3000 is designed for connection to a pressure washer (not included). Read and follow WARNING and operating instructions of pressure washer connected to model NG-3000.*



WARNING: *To reduce the risk of injury, read operating instructions carefully before using.*

AVERTISSEMENT: *Pour réduire le risque de blessures, lire attentivement les instructions de fonctionnement avant l'utilisation.*

1. Read the owner's manual thoroughly. Failure to follow instructions could cause malfunction of the machine and result in death, serious bodily injury and/or property damage.
2. Know how to stop the machine and bleed pressure quickly. Be thoroughly familiar with the controls.
3. Stay alert — watch what you are doing.
4. Do not replace LP tank while machine is running.
5. All installations must comply with local codes. Contact your electrician, plumber, utility company or the selling dealer for specific details. If your machine is rated 250 volts or less, single phase a ground fault circuit interrupter (GFCI) will be provided. If rated more than 250 volts, or more than single phase this product should only be connected to a power supply protected by a GFCI.

Safety

WARNING: Must be plugged into properly wired three hole grounded outlet that accommodates plug on power cord. Failure to comply could result in electrical shock.

AVERTISSEMENT: Doit être raccordé dans une sortie à trois trous mise à la masse et correctement câblée qui peut accueillir une fiche sur un cordon d'alimentation. Le non-respect de cette consigne pourrait causer un choc électrique.

DANGER: Improper connection of the equipment-grounding conductor can result in a risk of electrocution. Check with a 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 of adapter with this product.

DANGER: Une mauvaise connexion du conducteur de terre de l'équipement peut entraîner un risque d'électrocution. Vérifier auprès d'un électricien qualifié ou du personnel d'entretien si vous avez des doutes quant à savoir si la sortie est correctement mise à la masse. **NE PAS** modifier la fiche fournie avec le produit - si elle n'entre pas dans la sortie, faire installer une sortie appropriée par un électricien qualifié.



WARNING: Keep wand, hose, and water spray away from electric wiring or fatal electric shock may result.

AVERTISSEMENT: Garder la lance, le boyau et le jet d'eau à l'écart de tout câblage électrique ou des chocs électriques mortels pourraient survenir. Lire l'étiquette d'avertissement sur le cordon élec-

trique

6. To protect the operator from electrical shock, the machine must be electrically grounded. It is the responsibility of the owner to connect this machine to a UL grounded receptacle of proper voltage and amperage ratings. Do not spray water on or near electrical components. Do not touch machine with wet hands or while standing in water. Always disconnect power before servicing.

WARNING: Flammable liquids can create fumes which can ignite, causing property damage or severe injury.

AVERTISSEMENT: Des liquides inflammables peuvent produire des vapeurs qui peuvent

s'enflammer, causant ainsi des dommages à la propriété ou des blessures graves.



WARNING: Risk of explosion — Operate only where open flame or torch is permitted.

AVERTISSEMENT: Risque d'explosion - Utiliser uniquement dans des endroits où l'utilisation d'une flamme nue ou d'une torche est permise.



WARNING: Risk of fire — Do not change tanks when the product is operating or still hot.

AVERTISSEMENT: Risque d'incendie - Ne pas changer les réservoirs pendant que le produit est en marche ou encore chaud

WARNING: Use vapor fuel only.

AVERTISSEMENT: Utiliser des vapeurs de carburant seulement

7. Oil burning appliances shall be installed only in locations where combustible dusts and flammable gases or vapors are not present. Do not store or use gasoline near this machine.
8. Keep operating area clear of all persons.



WARNING: High pressure spray can cause paint chips or other particles to become airborne and fly at high speeds. To avoid personal injury, eye, face, hand and foot safety devices must be worn.

AVERTISSEMENT: Un jet haute pression peut écailler la peinture ou provoquer l'émission d'autres particules dans l'air et leur projection à hautes vitesses. Pour éviter les lésions corporelles, une protection des yeux, du visage, des mains et des pieds doit être portée lors de l'utilisation de cet équipement

9. Always wear properly rated eye protection such as safety goggles or face shield while spraying. (Safety glasses do not provide full protection.)



WARNING: Pressure washer connected to the NG-3000 may exceeds 85 db appropriate ear protection must be worn.

AVERTISSEMENT: La laveuse à pression connectée au NG-3000 peut excéder 85 dB; une protection de l'ouïe appropriée doit être portée.



CAUTION: Hot discharge fluid. Do not touch or direct discharge stream at persons or animals or severe injury or death will result.

ATTENTION: Liquide de décharge chaud. Ne pas toucher ou décharger directement le jet vers des personnes ou des animaux, car cela risquerait de causer des

blessures graves ou même la mort.

WARNING: This machine produces hot water and must have insulated components attached to protect the operator.

AVERTISSEMENT: Cette machine produit de l'eau chaude et doit comporter des composants isolés attachés pour protéger l'opérateur



WARNING: Risk of injury. Hot surfaces can cause burns. Use only designated gripping areas of spray gun and wand. Do not place hands or feet on non-insulated areas of the pressure washer.

AVERTISSEMENT: Risque de blessures. Les surfaces chaudes peuvent causer des brûlures.

Utiliser uniquement les zones de prise désignées du pistolet pulvérisateur et de la lance. Ne pas placer les mains ou les pieds sur des endroits non isolés de la laveuse à pression.

10. To reduce the risk of injury, close supervision is necessary when a machine is used near children. Do not allow children to operate the pressure washer. **This machine must be attended during operation. Stay alert - watch what you are doing. Keep operating area clear of all persons.**



WARNING: Grip cleaning wand securely with both hands before starting. Failure to do this could result in injury from a whipping wand.

AVERTISSEMENT: Agripper la lance de nettoyage avec les deux mains avant de commencer. Le non-respect de cette consigne pourrait mener à des blessures

causées par le mouvement violent de la lance

11. Never make adjustments on machine while in operation.
12. Be certain all quick coupler fittings are secured before using pressure washer.



WARNING: High pressure developed from the pressure washer connected to the NG-3000 will cause personal injury or equipment damage. Keep clear of nozzle. Use caution when operating. Do not direct discharge stream at people or animals, or severe injury or death will result.

AVERTISSEMENT: La haute pression générée par la laveuse à pression raccordée au NG-3000 causera des lésions corporelles ou des dommages à l'équipement. Se tenir à l'écart de la buse. Faire preuve de prudence lors de l'utilisation Ne pas décharger directement le jet vers des personnes ou des animaux, car cela risquerait de causer des blessures graves ou même la mort



WARNING: Protect machine from freezing.

AVERTISSEMENT: Protéger la machine contre le gel.

13. To keep machine in best operating conditions, it is important you protect machine from freezing. Failure to protect machine from freezing could

cause malfunction of the machine and result in death, serious bodily injury, and/or property damage. Follow storage instructions specified in this manual.

14. Inlet water must be clean fresh water and no hotter than 90°F.



DANGER: Risk of asphyxiation.
Use this product only in a well ventilated area.

DANGER: Risque d'asphyxie.
Utiliser ce produit uniquement dans un endroit bien ventilé.

15. Avoid installing machines in small areas or near exhaust fans. Adequate oxygen is needed for combustion or dangerous carbon monoxide will result.
16. Manufacturer will not be liable for any changes made to our standard machines or any components not purchased from us.
17. The best insurance against an accident is precaution and knowledge of the machine.



WARNING: Be extremely careful when using a ladder, scaffolding or any other relatively unstable location. The cleaning area should have adequate slopes and drainage to reduce the possibility of a fall due to slippery surfaces.

AVERTISSEMENT: Faire preuve d'une extrême prudence au moment d'utiliser une échelle, des

échafaudages ou toute autre surface relativement instable. La zone de nettoyage doit avoir une pente et un drainage adéquats pour réduire la possibilité d'une chute due à une surface glissante

18. Do not overreach or stand on unstable support. Keep good footing and balance at all times
19. Do not operate this machine when fatigued or under the influence of alcohol, prescription medications, or drugs.
20. Do not replace LP tank while machine is running. Serious injury could result.

WARNING: Use vapor fuel only.

AVERTISSEMENT: Utiliser des vapeurs de carburant seulement

21. The LP models are designed to run on vapor propane fuel. Do not use liquid fuel. Have a qualified serviceman install and service your equipment.
22. Never expose a spark or flame where there may be unburned gas present.

CAUTION: This product incorporates parts that produce sparks and therefore when located in a garage, it should be in a room or enclosure provided for the purpose, or should be 18" or more above the floor. Install on noncombustible flooring and have a 36" minimum working clearance.

ATTENTION: Cet équipement comprend des pièces qui produisent des étincelles et, par conséquent, lorsque l'appareil se trouve dans un garage, il devrait se trouver dans une pièce ou une enceinte prévue à cet effet ou devrait être installé à XX cm (XX po) ou plus du sol

23. When making repairs disconnect from electrical source and shut off gas valve.
24. Install this machine on non combustible flooring.
25. Do not allow acids, caustic or abrasive fluids to pass through the pump.
26. Never run pump dry or leave spray gun closed longer than 1-2 minutes.



WARNING: If connection is made to potable water supply, the system shall be protected against back flow.

AVERTISSEMENT: Si une connexion est établie avec un approvisionnement en eau potable, un dispositif de protection contre le retour d'eau doit être fourni.



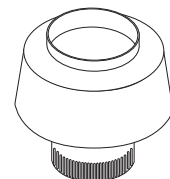
WARNING: Do not spray machine or any people, animals or electrical parts.

AVERTISSEMENT: Ne pas vaporiser sur la machine ou les gens, les animaux ou les pièces électriques

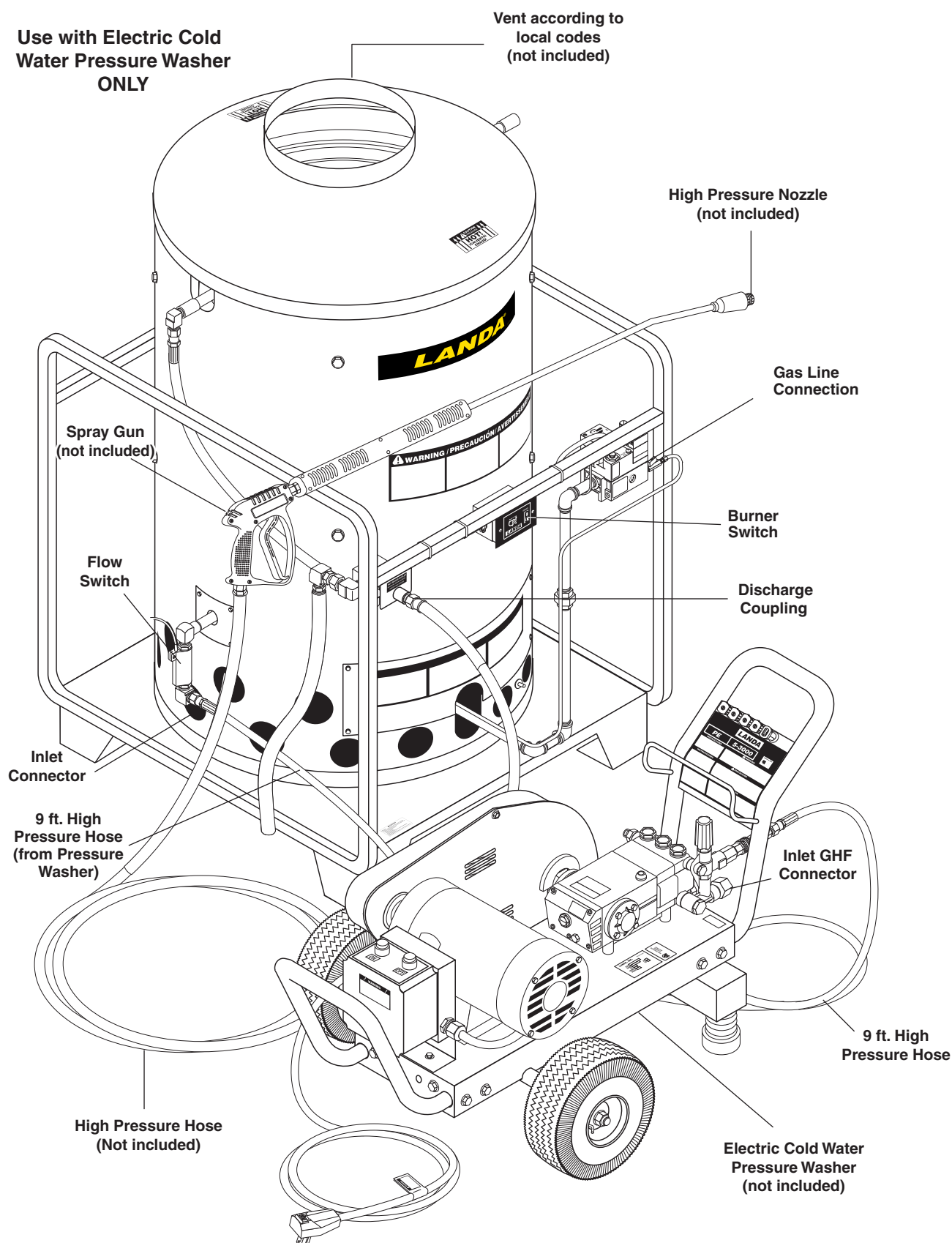


Follow the maintenance instructions specified in the manual.

Example Of Down Draft Diverter For Gas Fired Machines



Component Identification



Installation

Place machine in a convenient location providing ample support, drainage and room for maintenance.

Location

The location should protect the machine from damaging environmental conditions, such as wind, rain and freezing.

1. The cleaner should be run on a level surface where it is not readily influenced by outside sources such as strong winds, freezing temperatures, rain, etc. The machine should be located considering accessibility for the replacing of components, adjustments and maintenance. Normal precautions should be taken by the operator to prevent excess moisture from reaching this power machine or electrical controls.
2. It is recommended that a partition be made between the wash area and the NG to prevent direct spray from the spray gun from coming in contact with the NG. Excess moisture reaching the NG's gas valve will reduce the life of the gas valve and may cause electrical shorts.
3. During installation, beware of poorly ventilated locations or areas where exhaust fans may cause an insufficient supply of oxygen. Sufficient combustion can only be obtained when there is a sufficient supply of oxygen available for the amount of fuel being burned. If it is necessary to install this machine in a poorly ventilated area, outside fresh air may have to be piped to the burner and a fan installed to bring air into the machine.
4. Do not locate near any combustible material. Keep all flammable material at least 20 feet away. Allow enough space for servicing. Local code will require certain distances from floor and walls. (Two feet away should be adequate).

WARNING: Avoid small areas or near exhaust fans.

AVERTISSEMENT: Éviter les petites superficies ou les surfaces à proximité des ventilateurs d'extraction.

Gas Codes

Confer with local gas company and with proper municipal officials regarding any specific code or regulations governing the installation. The installation must conform to local codes.

The gas pressure coming out of the regulator and going to the burner ring has been factory set for elevations of 0 to 2000 ft. Altitudes greater than 2000 ft will require

adjustments to the gas manifold pressures. Consult your local service dealer for high altitude adjustments. In Canada, certification for installation at altitudes over 4500 feet above sea level is the jurisdiction of local authorities. You should not readjust the burner ring gas pressure. If you replace your gas valve, you will need to adjust the new valve. Refer to your machine's specification plate for the correct pressure setting. Follow the installation and adjustment instructions provided with your replacement valve.

NOTE: Air for combustion and ventilation along with exhaust flue sizing must conform to methods outlined in current American Standard (ANSI-Z223.1) National Fuel Gas Code or National Standard of Canada CSA-149.1 and CSA-149.2 "Installation Code for Gas Burning Appliances".

Electrical

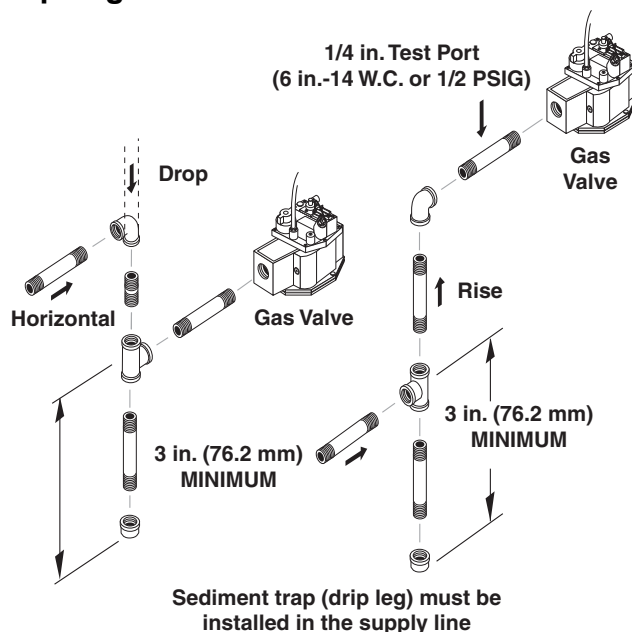
The heating module runs on a self-generating millivolt thermopile and does not require electrical AC power. The pressure washer you attach to this heating module must be electrically grounded in accordance to local codes. Check for proper power supply using a volt meter; check the serial plate and specifications for the correct requirements.

Gas Piping

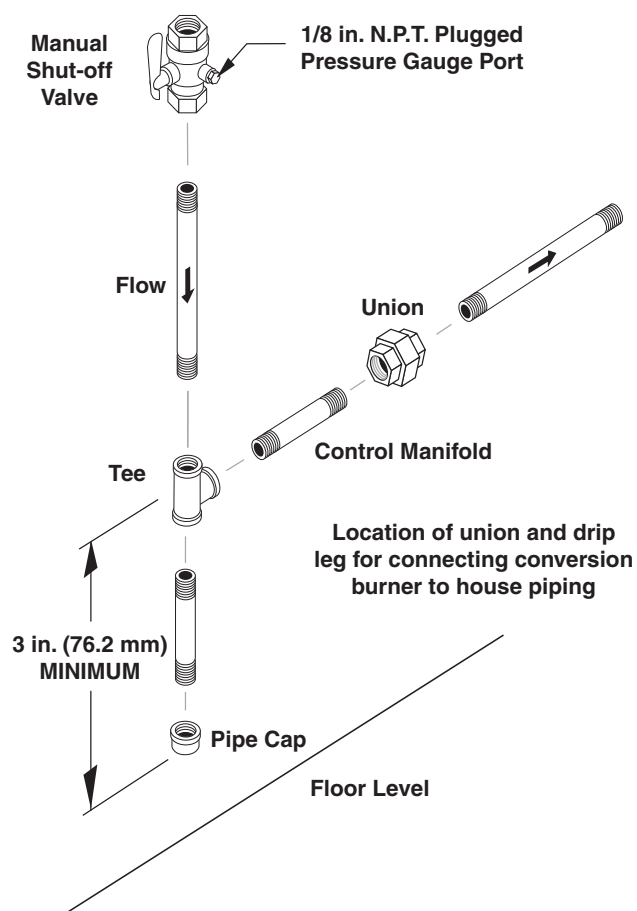
All piping must comply with local codes and ordinances of the National Fuel Gas Code: A sediment trap or drip leg must be installed in the supply line to the burner.

A union shall be installed in the gas line adjacent to and upstream from the control manifold and downstream from the manual main shut-off valve.

Drip Leg



Union Location



A 1/8" N.P.T. plugged tapping accessible for test gauge connection shall be installed immediately upstream of the gas supply connection for the purpose of determining gas supply pressure to the burner, and to prevent damage to gas valve.

If a manual gas shut off valve is not in the gas supply line within six feet of the machine and in an accessible location, one shall be installed.

A manual shut-off valve shall be installed in the gas supply line external to the appliance. See Figure 2. The gas line should be a separate supply direct from the meter to the burner. It is recommended that new pipe be used and located so that a minimum amount of work will be required in future servicing. The piping should be so installed as to be durable, substantial and gas tight. It should be clear and free from cutting burrs and defects in structure of threading. Cast iron fittings or aluminum tubing should not be used for the main gas circuit. Joint compounds (pipe dope) should be used sparingly on male threads only and be approved for all gases.

Propane Gas

The following pipe and stack sizes are just recommendations. Always consult a local plumber and venting contractor for local codes and regulations during installation.

The following tables are maximum capacity of final stage pipe in thousands of Btu/hr of commercial propane

From first stage regulator (at tank) to second stage regulator

The chart below is based on incoming gas pressure of 10 PSI and a pressure drop of 1 PSI. Numbers are for straight schedule 40 pipe; fittings further reduce capacity.

Length of Pipe (ft.)	Iron Pipe Size	
	1/2"	3/4"
10	3339	6982
20	2295	4799
30	1843	3854
40	1577	3298
50	1398	2923
60	1267	2649
70	1165	2437
80	1084	2267
90	1017	2127
100	961	2009
150	772	1613
200	660	1381
250	585	1224
300	530	1109
350	488	1020
400	454	949
450	426	890
500	402	841

Operations

From second stage regulator to machine.

This is based on incoming gas pressure of 11" WC and a pressure drop of .5" WC. Numbers are for straight schedule 40 pipe; fittings further reduce capacity.

Length of pipe (ft.)	Iron Pipe Size		
	1/2"	3/4"	1"
10	291	608	1146
20	200	418	788
30	161	336	632
40	137	287	541
50	122	255	480
60	110	231	435
70	102	212	400
80	94	198	372
90	87	185	349
100	84	175	330

The chart below is based on gas pressure in the range 0-.5 PSI, specific gravity of .6, and pressure loss of .5WC. Numbers are for straight schedule 40 pipe; fittings further reduce capacity.

Length of Pipe (ft.)	Iron Pipe Size				
	3/4"	1"	1 1/4"	1 1/2"	2"
10	360	680	1400	2100	3950
20	250	465	950	1460	2750
30	200	375	770	1180	2200
40	170	320	660	990	1900
50	151	285	580	900	1680
60	138	260	530	810	1520
70	125	240	490	750	1400
80	118	220	460	690	1300
90	110	205	430	650	1220
100	103	195	400	620	1150
150	84	160	325	500	950
200	72	135	280	430	800

Venting

If the machine is used indoors, regulations or ventilation concerns may call for a chimney or furnace pipe.

When venting, if the heating module is to be in an enclosed area with a chimney on it, be sure the chimney is the same size as the stack on the module. Poor draft will cause the machine to soot and not operate efficiently. When installing, keep in mind that the machine should be positioned in such a manner that the stack will be as straight as possible and protrude through the roof of the building at a proper location and at sufficient height to eliminate downdraft. The chimney should be installed with a down draft diverter.

Input - BTU Per Hour Draft Hood & Flue Pipe Size

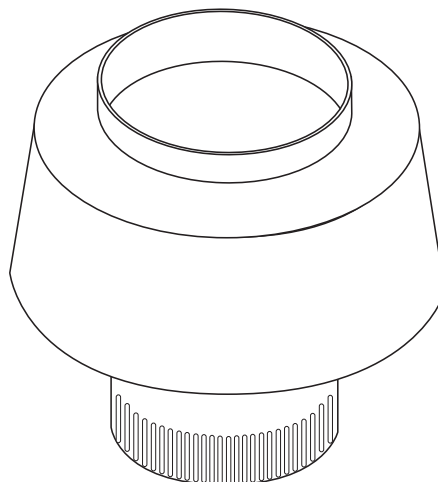
250,000 - 320,000	8 inch
320,000 - 410,000	9 inch

NOTE: If the flue pipe exceeds 10 ft. in length, or contains more than two elbows, use next size larger pipe and draft hood, or burner will not ignite. No movable flue pipe damper should be used on any installation.

Draft Diverter

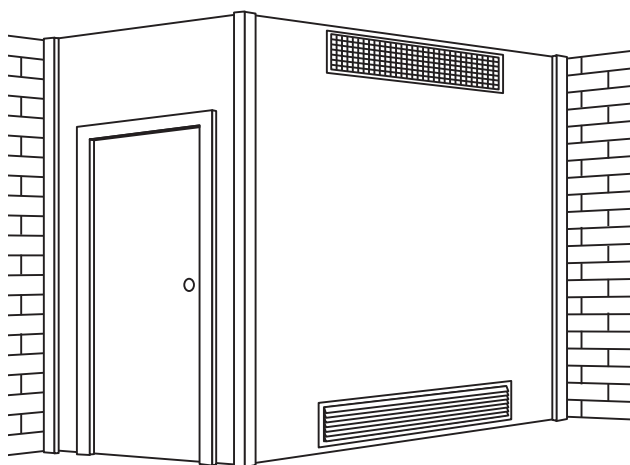
The draft diverter shall be installed at least three (3) feet above the heating coil. The diverter serves to sever the chimney effect created in all sections of furnace pipe positioned below to enhance the draft through the burner. It also helps prevent freezing of the coil due to wind chill factors.

Draft Diverter (Optional)



When a room is of unusually tight construction and has a kitchen and/or bathroom ventilating fan, which may be used for exhausting air to outdoors - or has a vented fireplace - it is recommended that combustion air be supplied to the enclosed room through intakes extending to the outside of the building and terminating in down turned fittings, suitably arranged to prevent obstruction from snow or rain, and including a protecting screen not smaller than 1/4 inch mesh.

Illustration showing air openings necessary to supply air for combustion when heating appliance is installed in an enclosed room.



Ventilating air openings - 1 square inch for each 1000 BTU per hour input.

Water Source

The heating module was designed to accept a cold water electric pressure washer. The water source for the attached pressure washer should be supplied by a 5/8" I.D. garden hose with a city water pressure of not less than 30 psi. If the water supply is inadequate, or if the garden hose is kinked, the machine will run very rough and the burner will not fire.

Water Connection

Connect the 9' high pressure hose by pulling the coupler collar back and then inserting it onto the discharge nipple. Secure it by pushing the collar forward. **NOTE:** If quick couplers do not match pressure washer couplers, replace with free flow couplers and nipples.

Attach the wand, trigger spray gun, and high pressure nozzle as recommended by your pressure washer manufacturer. Secure the pressure washer hose from your electric cold water pressure washer to the discharge coupling.

Inspection and Testing Gas Piping

The building structure should not be weakened by installing the gas piping. The piping should not be supported by other piping, but should be firmly supported with gas hooks, straps, bands or hangers. Butt or lap welded pipe should not be run through or in an air duct or clothes chute.

Before turning gas under pressure into piping, close all openings from which gas can escape. Check system for leaks immediately after turning gas on. This can be done by watching the 1/2 cubic foot test dial and allowing 5 minutes to show any movement, or by soaping each pipe connection and watching for bubbles. If a leak is found, make the necessary repairs and repeat the above test.

Defective pipes or fittings should be replaced and not repaired. Never use a flame or fire in any form to locate gas leaks; use a soap solution.

After the piping and meter have been checked completely, purge the system of air. **DO NOT** bleed the air inside an enclosed room.

The appliance and its individual shut-off valve must be disconnected from the gas supply piping system during the pressure testing of that system at test pressure in excess of 1/2 psig or damage to the gas valve will occur.

Gas Pressure

The ideal incoming gas pressure is 11 w.c.i. (minimum 6 w.c.i., maximum 14 w.c.i. or 1/2 psig). The correct operating manifold pressure for natural gas is 3.5 w.c.i. The operating manifold pressure for propane gas is 11 w.c.i. By adjusting the gas valve pressure regulator between 3 and 4 w.c.i. for the NG and 6 and 11 w.c.i. for the LPG, a side range can be achieved.

If the desired input rating cannot be obtained within the above manifold pressure adjusting range, the next size larger or smaller burner orifice should be used.

Warnings & Check List



1. Installation or servicing of gas appliances and controls must only be performed by qualified personnel. After installation or servicing, test manual valve, operating valves, pressure regulation, and automatic shut-off valve for proper operation.
2. Install in a suitable dry location. The machine must be located in an area properly protected from the weather.
3. Shut off gas and electricity before starting installation or service. Turn back on to test or operate.
4. **DO NOT** connect appliances before pressure testing the gas piping. Damage to gas valve may result. (6 - 14 w.c.i. or 1/2 psig)
5. **DO NOT** insert any object other than suitable pipe or tubing in the inlet or outlet of the gas valve. Internal damage may occur and result in a hazardous condition.
6. **DO NOT** grip gas valve body with a pipe wrench or vise. Damage may result causing gas leakage. Use inlet or outlet bosses or a special body wrench.
7. **DO NOT** short the gas valve terminals.
8. **DO NOT** allow any flame to impinge on the regulator vent tubing if supplied. It may clog and cause gas valve malfunction.
9. **DO NOT** use the gas cock to adjust gas flow.
10. If main burner fails to shut off, turn off gas supply.
11. Keep all combustible materials away from gas appliances. **DO NOT** allow lint or dust to collect in burner area.
12. Dials must only be operated by hand. Never use pliers, wrenches or other tools to turn dials.
13. After installation or servicing, test for leaks with a soap solution. With the main burner on, coat pipe and tubing joints, gaskets, etc. Bubbles indicate leaks.
14. If the machine is installed in an enclosed room, care should be taken to ensure that an adequate supply of air is available for combustion and ventilation. (1 sq. inch per 1000 BTU)

FOR YOUR SAFETY READ BEFORE LIGHTING

If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

A. This appliance has a pilot which must be lighted by hand. When lighting the pilot, follow these instructions exactly.

B. Before lighting, smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

FOR YOUR SAFETY "WHAT TO DO IF YOU SMELL GAS"

- Do not try to light any appliance
- Do not touch any electrical switch, do not use any phone in your building.
- Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- If you cannot reach your gas supplier, call the fire department.

C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it; call a qualified service technician. Forced or attempted repair may result in a fire or explosion.

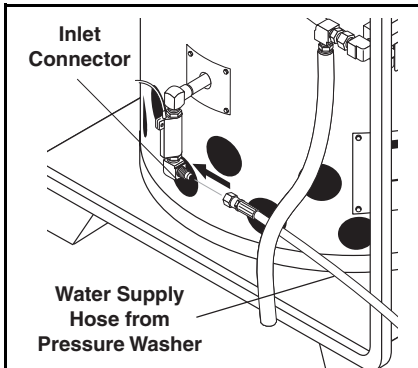
D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

Installation Checklist	YES	NO
Has gas supply been inspected by an authorized contractor to meet local codes?		
Is machine protected from downdraft and excessive wind?		
Is machine shielded from moisture or water spray?		
Is the voltage correct and are the circuit breaker and supply cord adequate according to specifications and serial plate notation?		
Is the machine electrically grounded?		
Is there ample water supply?		
Have all flammable liquids or gases been removed from installation location?		
Is there adequate gas supply for the BTU rating of the burner?		
Is incoming gas supply pressure to the machine between 6" - 14" water column inches or 1/2 PSIG?		
Has the proper gas regulator been installed for pressure and volume?		
Is the machine properly vented to allow adequate air flow?		
Are the propane tanks large enough, according to rating of the machine, to prevent freezing?		
Have gas lines been checked for gas leaks?		
Have gas lines been checked with local codes?		
Have all operators using this machine been instructed properly & have they read the manual?		
Has the machine been installed according to operator's manual instructions?		

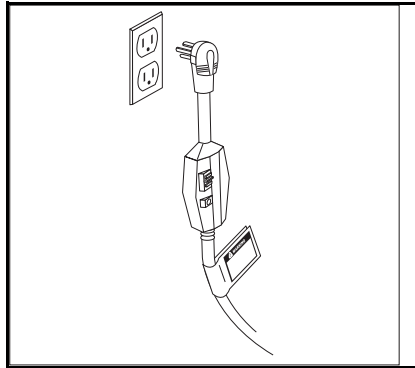
CAUTION! If "NO" has been checked on any of the above questions, do not operate this machine.

ATTENTION: Si la réponse à l'une des questions ci-dessus est « NON », ne pas utiliser la machine.

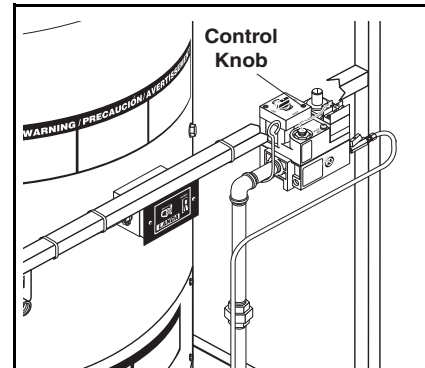
Operation Instruction



STEP 1: Failure to read operation and warning instructions may result in personal injury or property damage. Turn all switches off and review installation and operating instructions for attached pressure washer before connecting the water supply hose from the pressure washer to the inlet connector on the NG and turning the water on. Check for water leaks and tighten as needed.



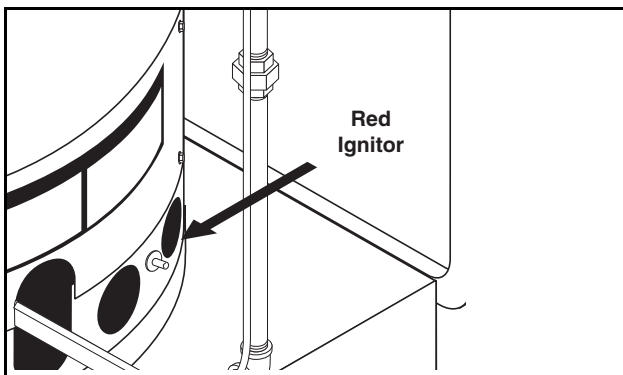
STEP 2: Connect the power cord from the attached electric cold water pressure washer to the proper electrical outlet according to the specifications and serial plate information from the manufacturer.



STEP 3: Review the installation instructions and then turn on the main gas supply.

Partially depress and turn control knob to the "OFF" position.

STEP 4: Wait five minutes to allow gas which may have accumulated in the main burner compartment to escape then turn control knob to "PILOT" position.

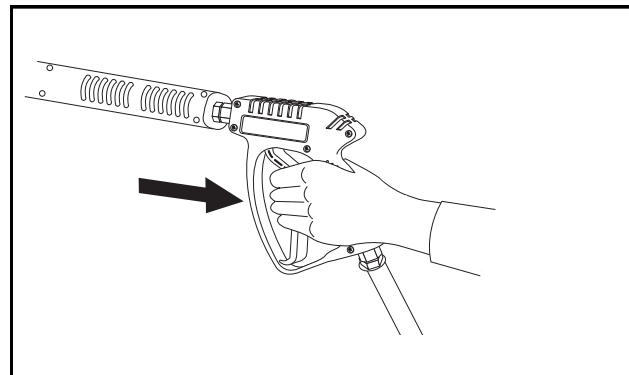


STEP 5: Depress control knob all the way and hold it in. After five (5) seconds, depress the red ignitor until you hear a loud click. Repeat 3 or 4 times if necessary until pilot is lit. If pilot does not remain lit, repeat the operation allowing a longer period of time before releasing the control knob. **NOTE:** Burner may not ignite on initial start up until air has been emitted from the gas supply lines.

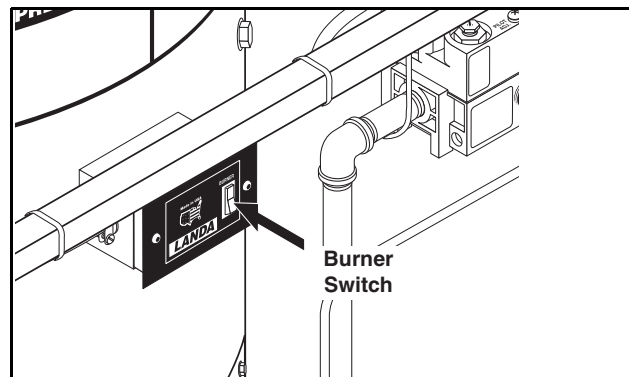
After the pilot lights, continue to hold the control knob down for about one (1) minute before releasing.

NOTE: Sufficient time must be allowed for a proper size pilot flame to heat the thermocouple and hold the safety magnet in a locked-up position. Also, time must be allowed for air to escape from the lines during the first operation.

Release control knob from pilot position and turn to full or "ON" position.



STEP 6: Start the attached pressure washer according to the manufacturer's instructions. Pull the trigger on the spray gun allowing cold water to flow.



STEP 7: For hot water, push the burner switch to the "ON" position and pull the trigger on the spray gun, to activate the gas control valve.

General Cleaning Techniques

Cleaning Techniques

Pre-rinse cleaning surface with fresh water. Place detergent suction tube directly into cleaning solution and apply to surface at low pressure (for best results, limit your work area to sections approximately 6 feet square and always apply detergent from bottom to top). Allow detergent to remain on surface 1-3 minutes. Do not allow detergent to dry on surface. If surface appears to be drying, simply wet down surface with fresh water. If needed, use brush to remove stubborn dirt. Rinse at high pressure from top to bottom in an even sweeping motion keeping the spray nozzle approximately 1 foot from cleaning surface. Use overlapping strokes as you clean and rinse any surface. For best surface cleaning action spray at a slight angle.

Recommendations:

- Before cleaning any surface, an inconspicuous area should be cleaned to test spray pattern and distance for maximum cleaning results.
- If painted surfaces are peeling or chipping, use extreme caution as pressure washer may remove the loose paint from the surface.
- Keep the spray nozzle a safe distance from the surface you plan to clean. High pressure wash a small area, then check the surface for damage. If no damage is found, continue to pressure washing.



CAUTION - Never use:

- Bleach, chlorine products and other corrosive chemicals
- Liquids containing solvents (i.e., paint thinner, gasoline, oils)
- Tri-sodium phosphate products
- Ammonia products or acid-based products



ATTENTION: Ne jamais utiliser :

- Eau de Javel, produits à base de chlore et autres produits chimiques corrosifs
- Liquides contenant des solvants (c.-à-d. diluant à peinture, essence, huiles, etc.)
- Produits à base de tripolyphosphate de sodium
- Ammoniac ou produits à base d'acide

These chemicals will harm the machine and will damage the surface being cleaned.

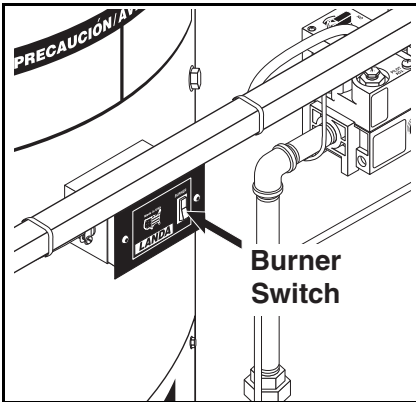
Rinsing

It will take a few seconds for the detergent to clear. Apply safety latch to spray gun. Select and install desired high pressure nozzle.

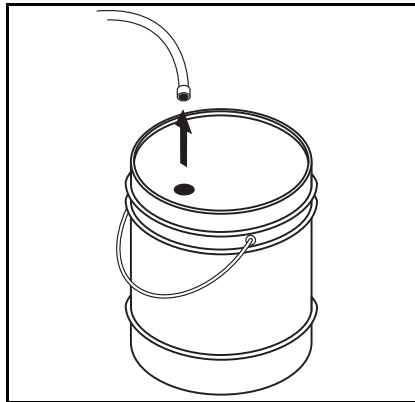
NOTE: You can also stop detergent from flowing by removing detergent siphon tube from bottle.

Operations

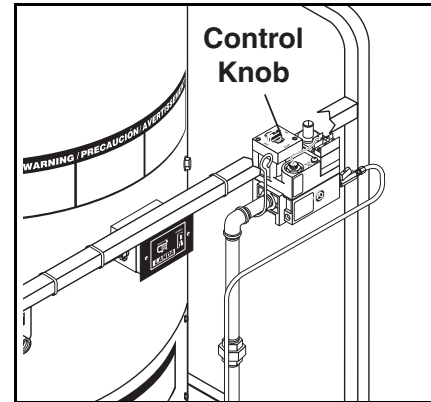
Shutdown Instructions



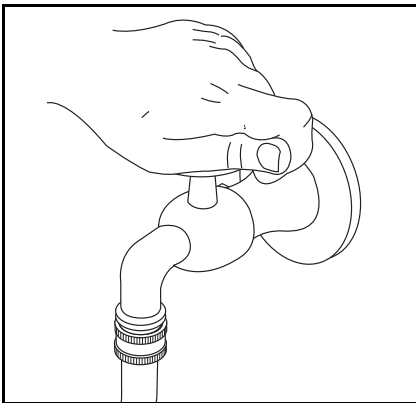
STEP 1: Turn the burner switch off. If detergent was run through the heating module, flush with fresh water, open spray gun and allow burner to cool. Otherwise coil damage will result.



STEP 2: Rinse detergent with fresh water if attached pressure washer is able to apply detergent.



STEP 3: After water has cooled, turn the attached pressure washer off. If the machine is going to be off for an extended period of time, put the control knob on the gas valve into the "OFF" position.



STEP 4: Turn water off. Drain water from coil to prevent freezing.

Preventative Maintenance

1. Follow Winterizing Procedures to prevent freeze damage to the pump and coils.
2. Always neutralize and flush detergent from system after use.
3. If water is known to be high in mineral content, use a water softener in your water system or de-scale as needed.
4. Do not allow acidic, caustic or abrasive fluids to be pumped through system.
5. Always use high grade quality Landa cleaning products.
6. Always cool the heating module.
7. Periodically descale coils per instructions.

It is advisable, periodically, to visually inspect the burner. Check air inlet to make sure it is not clogged or blocked. Wipe off any oil spills and keep this equipment **clean and dry**.

The areas around the Landa washer should be kept clean and free of combustible materials, gasoline and other flammable vapors and liquids.

The flow of combustion and ventilating air to the burner must not be blocked or obstructed in any manner.

Maintenance & Service

Winterizing Procedure

Damage due to freezing is not covered by warranty. Follow these cold weather procedures whenever the washer must be stored or operated outdoors under freezing conditions.

If the water heater will be exposed to freezing weather, an anti-freeze solution should be circulated through the coils by whatever means are available for the particular system the water heater is used on. If compressed air is available, an air fitting can be screwed into the discharge coupling fitting and by injecting compressed air, all water will be blown out of the system. The use of a draft diverter will prevent the wind chill factor from freezing the coil.

High Limit Hot Water Thermostat

For safety, each machine is equipped with a high limit control switch. In the event the temperature of the water should exceed its operating temperature, the high limit control will turn the burner off until the water cools.

Heating Coils

To Check Water Heater Coil for Leaks

With the main burners "OFF" start the pumping machine and allow it to run for a few minutes. Check into the burner compartment with a drop light or flashlight. If no leaks are visible, then water dripping from coil is from condensation in the flue gases when the burner is on.

Condensation from Heating Coil

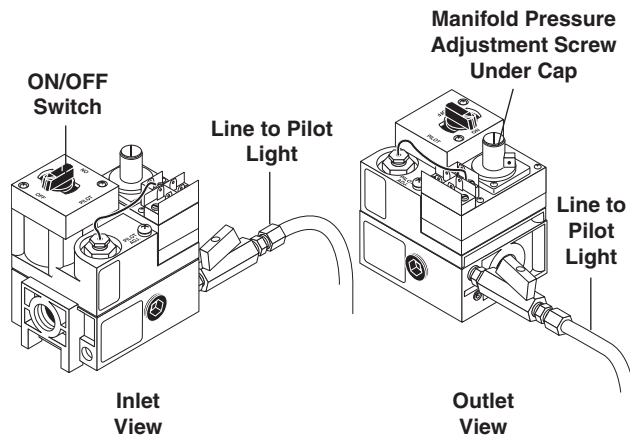
When cold water is being pumped into the water heater coils, and the burner is on, condensation will form on the coil and drip down into the burner compartment, giving the appearance of a leaking coil, particularly on cold humid days.

Descaling Coils

In alkaline water areas, lime deposits can accumulate rapidly inside the coil pipes. This growth is increased by the extreme heat build up in the coil. The best prevention for liming conditions is to use high quality cleaning detergents. In areas where alkaline water is an extreme problem, periodic use of Landa Coil Descaler (part #8.914-296.0) will remove lime and other deposits before coil becomes plugged

Periodic descaling of the heating coil is recommended so please consult your local Landa Dealer for instructions.

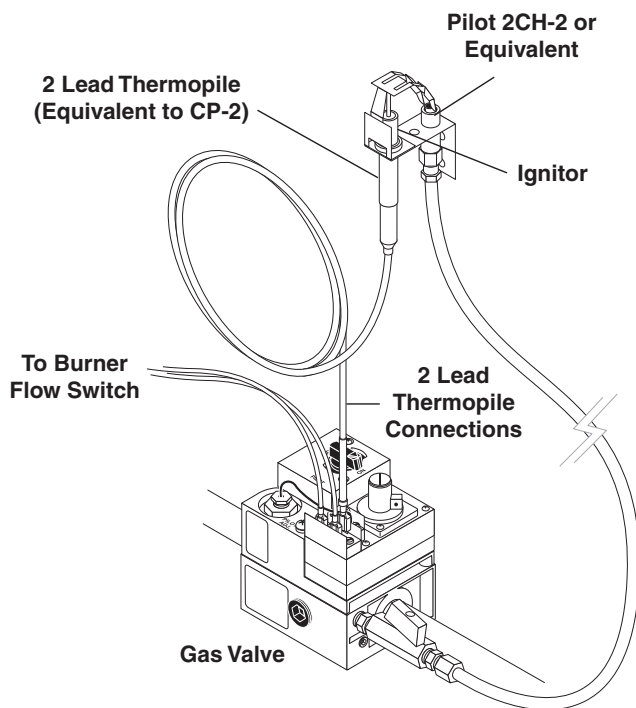
Gas Valve Regulator



Gas Valve Regulator Adjustment

Adjustment of the built-in regulator isn't normally necessary, since it is preset at the factory. However, field adjustment may be accomplished as follows:

1. Attach manometer at pressure tap port.
2. Remove regulator adjustment screw cap.
3. With small screwdriver, rotate adjustment screw clockwise to increase or counterclockwise to decrease gas pressure.
4. Replace regulator adjustment screw cap.



Electrode Adjustment

Pilot Burner Adjustment

1. Remove Pilot Adjustment Cap.
2. Adjust pilot key to provide properly sized flame.
3. Replace Pilot Adjustment Cap.

Pressure Relief Valve

Each machine is equipped with a relief valve to relieve pressure in the system when higher than normal operating pressures are encountered. Unusually high pressures come from an object plugging the spray nozzle. This problem can easily be remedied by removing the obstruction. If operating pressure of machine is found to be normal and relief valve continues to leak, repair or replace the valve.

CAUTION: Open this valve annually to prevent blockage.

Propane Gas (Optional Conversion Kit)

General Safety Precautions

Have a qualified gas service person assist in any gas burner installation or service. Few maintenance people or mechanics are knowledgeable in gas controls or related safety practices. Propane gas is heavier than air, unburned propane gas will gravitate to the floor rather than rise out of the stack. Hence, adequate floor space and good ventilation are especially important with propane systems.

Gas Pressure Requirements

All propane fired machines operate on gas phase only. They are designed to operate at a pressure of 11 water column inches (between 1/3 and 1/2 of one PSI), and are often operated at even higher pressures when extra heat is needed.

Exterior regulators are needed to control the system. Propane bottles are not included with machine. A high pressure regulator should be installed on propane bottle and a low pressure regulator attached to the pressure washer.

Propane Cylinder Capacity

An important consideration with propane systems is the capacity of the supply cylinder relative to the needs of the burner. The burner operates on propane as a gas. As gas is used from the propane cylinder, the liquid in the cylinder boils to maintain gas pressure. This boiling process cools the liquid, and in a heavy, continuous-demand situation, the liquid temperature can fall to the point at which it cannot provide gas as rapidly as is needed. In this case, it may be necessary to warm the PROPANE CYLINDER by directing a warm spray, not over 120°, on the cold cylinder, or by manifolding two propane bottles together to increase total vaporization capacity. It is recommended that a minimum 100 lb. propane bottle be used on the machine, depending on the length of running time desired.

Burner Features

Operated Automatic Valve

This machine is equipped with a thermopile self-powered combination gas control. This system is designed as a constant burning pilot. Lighting of the pilot is accomplished by manually lighting the pilot. A thermostat and flow switch control the main solenoid valve.

Care of Main Burner

Due to condensation from heater coils dripping down on the burners, scale build-up may occur in the burner jet orifices.

1. To Remove Burner Manifold From Water Heater Coil:

Turn off the gas at the main burner by turning the knob to the "OFF" position on the gas valve and main gas supply.

Disconnect the pilot and ignition lines from the gas valve. Disconnect union in main burner line. Slide burner manifold out through shell opening.

2. To Clean Burner Jets:

Select proper size drill for type of gas involved. Use pine vise to hold drill and then ream out each jet orifice.

CAUTION: Do not ream out orifices to a larger size.

Burner Troubleshooting

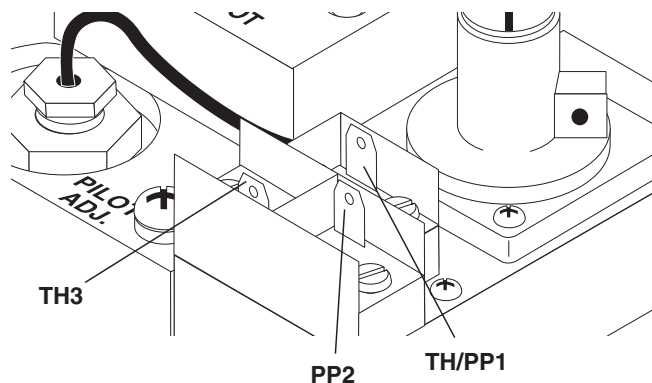
Millivolt Check

This machine has a thermopile self-powered combination gas control. Before checking the millivolt system, the following operations should be performed and observations made:

1. Inspect system for proper wiring.
2. The switch leads and all wire connections should be cleaned and tightened to eliminate all unnecessary resistance.
3. Clean and/or adjust pilot for maximum flame impingement on the thermopile.
4. If pilot will not remain lit when gas cock dial is released, check automatic pilot (Step D).

The millivolt system and individual components may be checked with a DC millivolt meter having a 0-1000MV range. Conduct each check as shown in the chart below by connecting the meter test leads to terminals as indicated. All readings are closed circuit.

Troubleshooting Gas Valve



Check Test	To Test	Connect Meter Leads to Terminals	Switch Flow & Burner Contacts	Meter Reading Should Be:
A	Complete System	2 & 3	Closed	100 MV or More
B	Thermopile Output	1 & 2	Open	Greater than 250
C	System Resistance	1 & 3	Closed	Less than 35
D	Auto/Pilot Dropout	1 & 2	Open	Between 120-30 MV

A. Complete Millivolt System Check

("A" Reading = Switch contacts CLOSED - Gas Cock Dial "ON" - Main burner should come ON).

5. If the reading is more than 100 millivolts and the automatic valve still does not come on, replace the automatic valve operator.
6. If the closed circuit reading ("A" Reading) is less than 100 millivolts, determine cause for low reading - proceed as follows:

B. Thermopile Output Reading Check

("B" Reading = Switch contacts OPEN - Main burner OFF).

If the minimum 250 millivolt reading is not obtainable, readjust pilot for maximum millivolt output. If millivolt reading is still below minimum specified, replace thermopile.

C. System Resistance Check

("C" Reading = Switch contacts CLOSED - Gas Cock "ON" - Main burner should be ON)

If the "C" Reading is more than that specified for the system being checked, this indicates the resistance in the system is excessive and must be reduced. To correct:

- a. Clean and tighten switch leads and connections.
- b. Shorten switch lead wires and/or replace with heavier gauge wire.
- c. Cycle switch rapidly to clean contacts.

D. Automatic Pilot Dropout Check

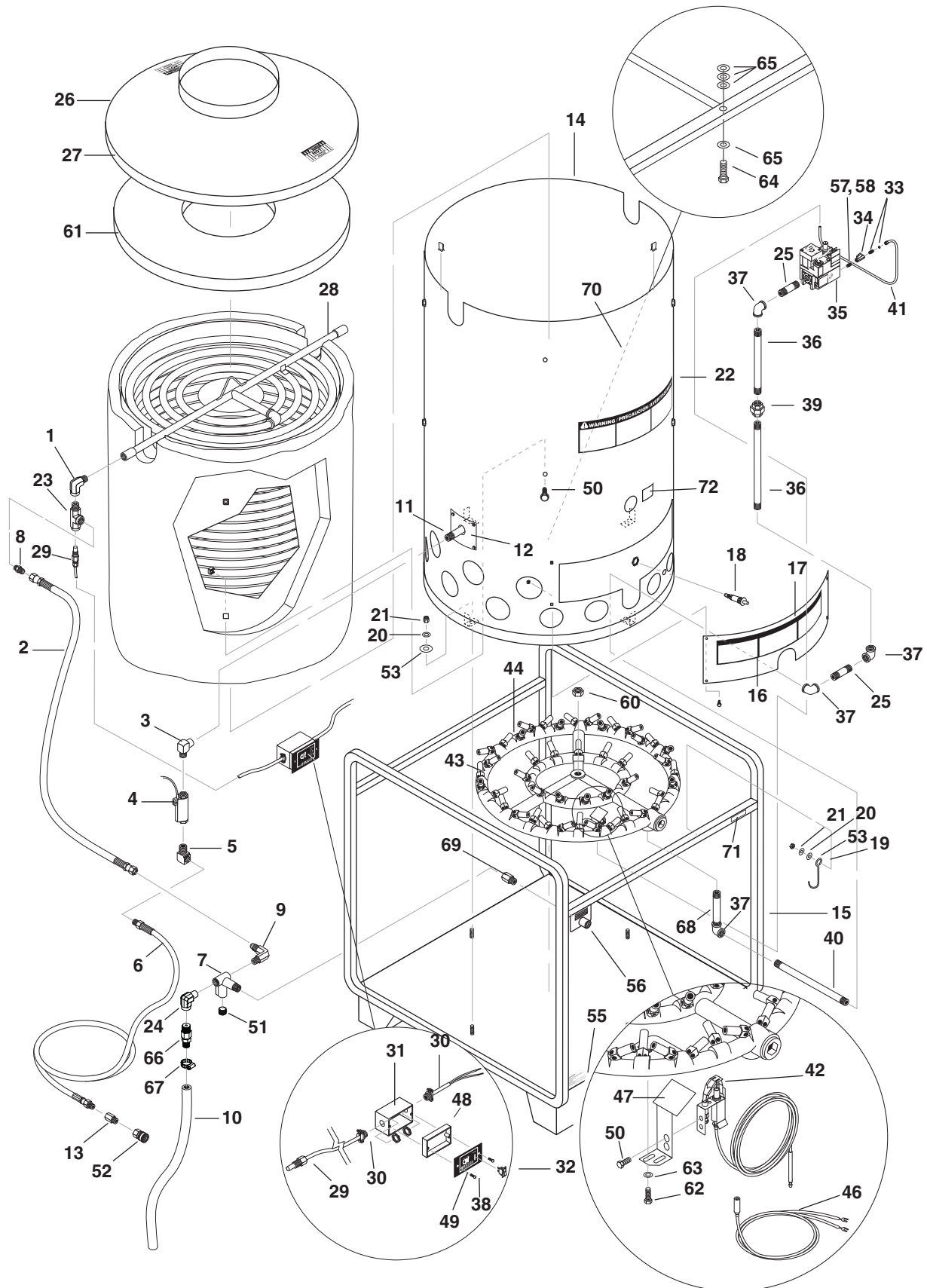
1. Hold gas cock dial depressed in pilot position until maximum output is observed. Then extinguish pilot and observe meter.
2. Dropout of automatic pilot magnet (sound should be audible) should occur between 120 millivolts and 30 millivolts. If dropout occurs outside these limits, change the automatic pilot magnet assembly.

Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
NO SPARK -- NO PILOT GAS	No main power	Restore power.
	Faulty limit switch	Test/replace.
	Faulty wiring	Test wiring.
NO PILOT LIGHT	No gas supplied to pilot valve	Check for availability of gas.
	Manual valves in "OFF" position	Turn manual valve and gas cock to full "ON". Check pilot key adjustment.
	Faulty pilot valve	Test gas valve.
	Faulty wiring	Test wiring.
	Restricted pilot line or clogged pilot orifice	Clean pilot tubing and orifices.
PILOT LIT, BUT MAIN BURNER WON'T COME ON	Faulty wiring	Test wiring.
	Low pilot flame	Check inlet pressure, pilot orifice position. Adjust with pilot key.
	Faulty main gas operator in gas control	Test gas valve. Repair/replace.
PILOT CYCLES OFF AND ON BY ITSELF	Faulty pilot valve	Test pilot valve.
	Faulty wiring	Test wiring.
MAIN BURNER SHUTS DOWN	Low pilot flame	Check inlet pressure, pilot orifice position. Adjust pilot.
	Faulty main gas operator in gas control	Test gas valve. Repair/replace.

Parts

LANDA NG-3000



REF	PART NO.	QTY	DESCRIPTION	NOTES
1	9.706-208.0	1	ELBOW, 1/2" STREET, 90°	
2	8.918-424.0	1	HOSE, 3/8" X 25", 2 WIRE, PRESSURE LOOP	
3	9.802-024.0	1	ELBOW, STREET, 3/8" X 1/2", STEEL	
4	8.933-006.0	1	SWITCH, FLOW, MV-60	
5	8.706-207.0	1	ELBOW, 3/8" MALE X 3/8" FEMALE	
6	8.918-204.0	1	HOSE, 3/8" X 5', 2 WIRE, REEL CONNECTOR	
7	9.149-003.0	1	MANIFOLD DISCHARGE,	
8	9.802-038.0	1	NIPPLE, 1/2" JIC X 1/2" MPT	
9	9.802-039.0	1	ELBOW, 1/2" JIC X 3/8" MPT	
10	9.802-260.0	30"	HOSE, 5/8", PUSH-ON	
11	9.802-015.0	1	NIPPLE, 1/2" X 4", GALV., SCH. 80	
12	9.803-132.0	1	INSULATION RETAINER PLATE	
13	8.706-302.0	1	ADAPTER, 1/2" X 3/8", STEEL	
14	8.917-568.0	1	WRAP, OUTER ASSY, 20" COIL	
15	8.912-688.0	1	CAGE, ASSEMBLY, 20" COIL	
16	9.802-975.0	1	COVER, BURNER ACCESS, 20" COIL	
17	8.932-962.0	1	LABEL, BURNER INSTRUCTIONS	
18	9.802-678.0	1	IGNITOR, PIEZO	
19	8.719-968.0	1	HOLDER, WAND, ZINC PLATED	
20	9.802-807.0	9	WASHER, 3/8", SAE, FLAT	
21	9.802-779.0	8	NUT, 3/8", ESNA	
22	9.800-031.0	1	LABEL, PILOT LIGHT WARNING	
23	8.706-236.0	1	TEE, 1/2" STREET	
24	9.802-024.0	1	ELBOW, 3/8" MPT x 1/2" FPT STREET, STEEL	
25	9.802-019.0	2	NIPPLE, 3/4" X 2"	
26	9.802-976.0	1	TOP, BURNER WRAP, 20"	
27	8.930-140.0	1	INSULATION, TANK HEAD	
28	9.803-135.0	1	COIL, DURA, 20" DIA., SCH. 80	
29	8.712-185.0	1	SWITCH, SNAP, 225 DR HI-LIMIT	
30	9.802-519.0	2	STRAIN RELIEF, 1/2" METAL, TWO SCREW	
31	8.716-321.0	1	BOX, JUNCTION, 3 HOLE, 1/2"	
32	9.802-453.0	1	SWITCH, CURVETTE, CARLING	
33	9.802-159.0	1	CONNECTOR, 1/4" TUBE X 1/4" MPT	
34	9.802-178.0	1	VALVE, BALL, 1/4" X 1/4" FEM.	
35	9.803-615.0	1	VALVE, GAS, VS820A	
36	9.802-018.0	2	NIPPLE, 3/4" X 3", BLACK PIPE	
37	9.802-027.0	4	ELBOW, 3/4", BLACK, 90°	
38	8.718-733.0	2	SCREW, 6/32" X 5/8", RND HB MCH	
39	9.802-049.0	1	UNION, 3/4", BLACK PIPE	
40	8.706-110.0	1	NIPPLE, 3/4" X 8", BLACK	
41	9.802-911.0	36"	TUBING, ALUMINUM, 600"/RL, 1/4" DEAD SOFT	
42	9.803-617.0	1	PILOT, PIEZO	

REF	PART NO.	QTY	DESCRIPTION	NOTES
43	8.718-055.0	1	BURNER RING ASSY, X44 W/#54 JETS	
-	8.718-060.0	1	BURNER RING ASSY, X44 W/#63 JETS	(LP OPTION)
44	8.710-216.0	44	GAS JET, NG, #54	
-	8.717-377.0	44	GAS JET, LP, #63	
45	8.912-332.0	1	SWITCH PLATE	
46	9.803-611.0	1	THERMOPILE, 47"	
47	8.719-957.0	1	SPLASH GUARD, PILOT LIGHT	
48	8.900-312.0	1	LABEL, SWITCH PLATE, NG-3000/MG	
49	8.900-313.0	1	LABEL, ASSEMBLED IN USA	
50	9.802-772.0	2	SCREW, 10/32" X 1/4", HEX	
51	8.706-248.0	1	PLUG, 3/8"	
52	9.802-166.0	1	COUPLER, 3/8" FEMALE BRASS	
53	9.802-811.0	4	WASHER, FENDER, 3/8" X 1-1/2" SAI	
54	8.724-844.0	1	SWITCH, REED REPLACEMENT, MV60	
55	9.800-049.0	1	LABEL, MANUFACTURER'S CLEANING SOLUTION	
56	9.800-021.0	1	LABEL, HOT WATER OUTLET	
57	9.803-563.0	1	CONNECTOR, 1/4" TUBE X 1/8" MPT	
58	8.706-910.0	1	BUSHING, 1/4" X 1/8" PIPE	
59	9.802-682.0	1	TAB, GROUND	
60	9.802-781.0	1	NUT, 3/8", NC, WHIZ-LOC	
61	8.719-940.0	1	RETAINER RING, INSULATION	
62	9.802-700.0	2	BOLT, 1/4-20 X 3/4", NC HH (612937)	
63	9.802-802.0	2	WASHER, 1/4", FLAT	
64	9.802-769.0	1+	BOLT, 3/8" X 1-3/4", NC WHIZ-LOC	
65	9.802-807.0	4	WASHER, 3/8", FLAT	
66	8.707-381.0	1	RUPTURE DISC ASSY, 8500#	
67	9.803-559.0	1	CLAMP, SCREW, 9/16"W, 1-1/4"OD, SS	
68	8.706-087.0	1	NIPPLE, 3/4" X 4", BLACK PIPE	
69	8.706-302.0	1	ADAPTER, 3/8" MPT X 1/2" FPT STEEL	
70	8.916-090.0	1	LABEL, LANDA LOGO	
71	8.932-964.0	1	LABEL, NATURAL GAS ONLY	
-	8.932-963.0	1	LABEL, LP GAS VAPOR FUEL	(LP OPTION)
72	9.800-028.0	1	LABEL, PILOT LIGHT HOLE, VNG	

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