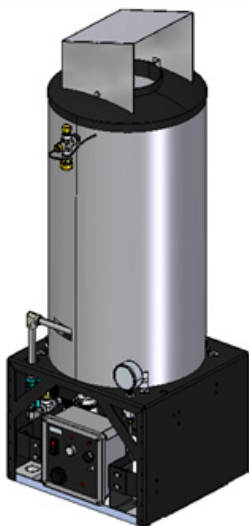




420K BTU Water Heater PN 72170

PRODUCT INSTRUCTIONS

PI-209



420K BTU water heater. 12VDC. Oil Fired. Operating pressure up to 5000 psi @ 20 gpm. Provided on Jetstream 75hp belt driven trailer or skid with 2000 series pump.

Read these instructions thoroughly before installing, connecting, or using the product. If any questions remain, call JETSTREAM at (800) 231-8192 or (832) 590-1300. Also read the yellow JETSTREAM SAFETY WARNING pamphlet included with the shipment of your new TBD and reproduced inside this publication. This product is sold with the understanding that the purchaser agrees to thoroughly train all operators and maintenance personnel in the correct and safe installation, operation and maintenance of the product and to provide adequate supervision of personnel at all times. Retain these instructions for future reference. If this product is resold or otherwise conveyed, purchaser must pass on the instructions to the new user.

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SECTION 1: SAFETY

DANGER

Incorrect Use of High Pressure Waterblast
Equipment May Cause Serious Injury
Read these instructions in their entirety
before using any JETSTREAM products.

This information was prepared to aid in the identification of potentially unsafe conditions when using high pressure waterblast equipment. It should be noted that other potential hazards may exist which might have not been mentioned in this brochure.

In all cases, JETSTREAM products are sold with the understanding that the purchaser agrees to thoroughly train all operating and maintenance personnel in the correct and safe installation, operation of maintenance of waterblast equipment and to provide adequate supervision of personnel at all times.

Read the following in its entirety before connecting, operating or repairing equipment. Purchasers and operators also should be familiar with the current version of the “Industry Best Practices for the Use of High Pressure Waterjetting Equipment” published by the Waterjet Technology Association, as well as any applicable OSHA regulations, standards and guidelines.

Should any questions arise concerning safe and proper procedure, contact JETSTREAM prior to the installation or use at (800) 231-8192 or (832) 590-1300.

GENERAL WATERBLAST

1. Use only clear, clean water in high pressure system.
2. Place barricades with warning signs or barricade tape around work area.
3. Outfit all operators with Personal Protective Equipment (PPE). Hard hat with plastic face shield, rainsuit, non-skid knee boots **with metatarsal protection**, gloves, ear protection and body armor rated for operating pressures are considered minimum safety equipment. Proper respiratory protection is required where dangerous fumes or dust is present or created by the waterblasting operation. Follow applicable OSHA regulations, standards and guidelines regarding the use of respiratory protection if harmful fumes or dust is present during, or created by the waterblasting operation.
4. Use products intended for high pressure waterblasting only.
5. **No product should be altered** without written consent of the manufacturer.
6. **Read and follow all manufacturer's instructions** prior to using any waterblast product. Contact manufacturer.
7. Thoroughly review alternative methods before initiating any potentially dangerous waterblasting operation. Fully automated, semi-automated, and/or mechanized methods should all be considered first. Contact the applicable waterblasting manufacturers for assistance and recommendations.
8. The operator handling the cleaning device (with nozzle) must always have control of water pressure. A surface cleaning operator should operate a trigger style control gun capable of instantaneously stopping pressure to nozzle. A tube cleaning lance operator should operate a foot gun capable of instantaneously stopping pressure to the lance.
9. Inspect the condition of all components prior to use. Use no items which are in questionable condition.
10. Check the condition of thread connections prior to the make-up of any high pressure connection. Use Teflon tape and anti-seize on male pipe (NPT) thread for sealing purposes. Do not let tape overlap the male pipe thread end. Tape fragments may enter system water stream and clog nozzle's orifices.

Do Not use a component with missing or damaged threads on the high pressure connections.

11. Properly tighten all high pressure connections. All NPT connections must have a minimum engagement of four (4) threads. Pipe (NPT) connections should be made up hand tight plus two (2) full wrenched turns. Do not tighten NPT threads past two (2) wrenched turns.

⚠ CAUTION Use wrench flats (when available) or a properly adjusted smooth jaw plier wrench (JS PN 64119) for tightening components. Avoid using pipe wrench as wrench marks will cause high pressure components to crack and fail.

12. All high pressure hose connections require a hose restraint (whip check), including connection at fluid end discharge.

13. Before attaching a nozzle to the control gun or tube cleaning lance, **operate the pump at low speed to purge** dirt and debris from system. **Dirt and debris can clog nozzle orifice(s) and cause excessive system pressure which could lead to a lance failure.**

14. With nozzle installed, **operate the pump at a low speed (low pressure) for test.** Should system repairs or adjustments be necessary, stop pump and relieve all pressure before making required repairs or adjustments. The pump operator should watch the nozzle operator at all times in case any difficulty arises and it becomes necessary to depressurize system. If the pump operator does not have a clear line of sight to the nozzle operator, it may be necessary to have another employee available to communicate between the nozzle and pump operators.

15. With the system operating properly, **increase pump speed slowly until operating pressure is reached** and adjusted. Pressure adjustments should always be made slowly. The nozzle operator shall be warned before any pressure adjustment is made by the pump operator. A sudden change in reaction force may cause the nozzle operator to lose balance.

16. Use **minimum pressure required** for cleaning. Do not exceed the operating pressure of the system's lowest pressure-rated component. All equipment pressure rating markers and warning tags should be left intact.

17. Waterblast operators must be made aware that the **cleaning nozzle's discharge jets(s) can inflict serious body wounds.** Supervisors should demonstrate the potential danger of discharge jet(s) by showing all new operators the effect of a waterjet by cutting a scrap piece of wood such as a 2" x 4".

18. If equipment malfunctions or a system malfunction is suspected, immediately stop cleaning activity and relieve the pressure in the system before attempting any repairs. Always follow the manufacturer's repair instructions.

19. Only trained persons should be authorized to perform any maintenance or repair.

20. Following any repairs, the system should be operated at low pressure for test. Bring equipment up to operating pressure slowly.

21. For shutdown in freezing conditions, even for brief periods, drain water from all components. Prior to starting operations in freezing conditions, the operation of all equipment components must be checked carefully to make sure components are not frozen and can be operated.

22. Store components properly by protecting them from damage when not in use. Be sure all safety warning tags and markers remain intact.

PRESSURE RELIEF DEVICES

1. **Read General Safety** section prior to installing Relief Valve and/or Pressure Relief Devices.

2. A waterblast system should include both primary and secondary pressure relief protection:

A. For primary protection a primary rupture disc assembly or spring-loaded relief set at 1.2 times, maximum operating pressure is recommended (i.e. relief valve is set at 12,000 psi if maximum operating pressure is 10,000 psi)

B. For secondary protection a rupture disc assembly containing a manufacturer's approved disc having a burst rating of 1.4 times maximum operating pressure is recommended.

⚠ WARNING Only use a rupture disc holder which will NOT permit the use of coins or other objects in place of discs.

3. Relief devices should never be mounted so the discharge could strike personnel.

4. Never install a shut-off valve between the pump and relief device.

5. "Set pressure" must be prominently displayed on all relief devices. Never install or use a relief device unless its "set pressure" is known.

6. Do not attempt to correct a leaking relief valve by increasing spring tension as this will increase its set pressure.
7. Do not use a pressure relief valve as a combination relief and throttling device.
8. Keep relief valve dry during freezing conditions.

NOTE: Pressure relief devices are imperative for the protection of both operator and equipment from dangerous over-pressurization.

HIGH PRESSURE HOSE

1. **Read General Safety** section prior to connecting high pressure hose.
2. Do not use a high pressure hose with a burst rating less than 2.5 times the pressure at which it will operate. 10,000 psi operating pressure high pressure must have a minimum 25,000 psi burst rating. 8,000 psi operating hose must have a minimum 22,000 psi burst rating.
3. Do not use a high pressure hose that has an unknown burst rating or manufacturer's operating pressure rating.
4. Use of a Safety Shroud is strongly recommended for added safety where hose connects to control gun.
5. Use of hose restraint (whip check) is required at all hose connections, including connections at fluid end.
6. Always apply wrench to wrench flats when making threaded connections. Do not apply wrench on the end fitting ferrule (collar).
7. **Remove hose from service if:**
 - A. Cover is damaged and reinforcing wires are exposed to rust and corrosion;
 - B. Cover is loose, has blisters or bulges;
 - C. Hose has been crushed or kinked;
 - D. End fitting shows evidence of damage, slippage, or leakage.
 - E. Hose has been exposed to pressures greater than 50% of burst rating; or
 - F. Hose is three or more years old, regardless of condition.
8. Disconnect, drain, coil and store hose properly after use.

9. Never attempt to repair or recouple high pressure hoses in field. High pressure hose end fittings are the permanently crimped type and can only be properly installed with hydraulic crimping equipment.

NOZZLES

1. **Read General Safety** section.

2. Nozzle flow ratings must be compatible with pump discharge and pump pressure rating. (See Nozzle Flow Rating Chart on page 25.)

3. Use only nozzles with a manufacturer's pressure rating of at least the operating pressure or a burst rating or no less than 3.0 times the desired operating pressure.

4. Prior to installation, make sure the nozzle has no clogged orifices.

5. Apply 3 - 4 wraps of Teflon tape to male connection threads on the nozzle. Apply anti-seize compound over the sealant tape for additional protection against galling in connection threads. Wrench connection 1 1/2 - 2 turns past hand tight. A minimal thread engagement of four (4) threads should exist on all Jetstream NPT pipe connections.

6. **⚠ CAUTION** Use wrench flats (when available) or a properly adjusted smooth jaw plier wrench (JS PN 64119) to tighten nozzle. Avoid using pipe wrench as wrench marks will cause nozzles to crack and fail.

7. Blocked orifice(s) can cause excessive system pressure and failure. If orifice(s) appear clogged or partially blocked with dirt or debris, remove nozzle from J-Force and clean immediately.

8. **Remove nozzle from service if:**

- A. Nozzle is split or damaged;
- B. Nozzle sidewall is worn by more than 25% at any point;
- C. Nozzle's ability to hold pressure is questionable
- D. Threads are missing or damaged

FLEXIBLE TUBE CLEANING LANCES

1. **Read General Safety** section and Nozzle Safety Warnings prior to connecting flex lances.

2. **Do not** use a flex lance with a burst rating less than 2.25 times the pressure at which it will operate. 10,000 psi operating pressure flex lances **must** have a **minimum** 22,000 psi burst rating. 8,000 psi

operating pressure flex lances **must** have a **minimum** 18,000 psi burst rating.

3. Do not use a flex lance that has an unknown burst or unknown manufacturer's operating pressure rating.

4. Never use a lance which is kinked, worn, frayed or whose abilities to hold pressure is questionable.

5. Do not use a lance which has damaged or missing threads.

6. Clearance between lance and tube deposits **must be sufficient** to allow unrestricted backflow of water and debris. With tubes containing hard deposits this clearance should be 1/8" **minimum** on the diameter (or 1/16" per side) of the lance. With tubes containing soft, pliable deposits this clearance should be greater. **Insufficient side clearance may cause lance to blow back toward operator.**

7. ⚠ WARNING Serious injury may occur should a lance with live nozzle exit tube. Use anti-withdrawal device to prevent lance from exiting tube unexpectedly.

8. The following JETSTREAM lance accessories are strongly recommended for safer lance operation:

A. Lance Strain Relief –Helps prevent lance inlet end fitting failure.

B. Lance Stinger - Affords the operator greater control of nozzle. Establishes a "safety zone" so operator knows when nozzle is about to exit tube; will eliminate possibility of nozzle and lance "double back" toward operator within large diameter pipe.

C. Anti-withdrawal device prevents the lance from exiting the tube or pipe. Contact JETSTREAM for additional information regarding these products.

9. Use only nozzles designed for use with flex lances (i.e. nozzle drilled with sufficient rearward orifices so nozzle pulls lance through tube.)

10. If lance end fittings do not have wrench flats, use properly adjusted smooth jaw plier wrench (JS PN 64119) to connect lance to pressure source and nozzle onto lance. Apply wrench on lance and fitting directly behind end fitting thread (not on fitting ferrule or collar) when installing nozzle on lance. Do not clamp on the lance hose itself with vise when installing nozzle.

11. Avoid rough handling, stretching or straining of lance.

12. Never attempt to “ramrod” flex lance through blockages or to repair or recouple lances.

13. After use, drain, coil and store lance properly. Be sure safety tags remain intact.

RIGID TUBE CLEANING LANCES

1. **Read General Safety** section and Nozzle Safety Warnings prior to connecting rigid lances.

2. Do not use a rigid lance with a burst rating less than 3.0 times the pressure at which it will operate. 10,000 psi operating pressure rigid lances must have a minimum 30,000 psi burst rating. Do not use a rigid lance that has an unknown burst or unknown manufacturer's operating pressure rating.

3. Clearance between lance and tube must be sufficient to permit the unrestricted backflow of water and debris. With tubes containing hard deposits this clearance should be 1/8" minimum on the diameter (or 1/16" per side) of the lance. With tubes containing soft, pliable deposits this clearance should be greater. Insufficient side clearance may cause lance to blow back toward operator.

4. Be sure nozzle, lance and adapter thread sizes are compatible before installing nozzle and adapter on lance. Do not use a rigid lance that has damaged or missing threads.

5. Use wrench flats (when available) or a properly adjusted smooth jaw plier wrench (JS PN 64119) to connect lance. Do not use pipe wrench as wrench marks will cause high pressure components to crack and fail.

6. A rigid lance over 4 ft long requires two men for support and safe operation. Operator at tube should use a foot control gun so he can instantly relieve system pressure in case of emergency.

7. When using and moving lance, support it in a manner to avoid stress and possible breakage at inlet end connection.

8. Never “ramrod” lance into tube blockage.

9. Transport and store lances in tubes or racks to avoid bending, corrosion or other damage. Damaged lances (bends, mars) should be removed from service.

HIGH PRESSURE FITTINGS

1. **Read General Safety** section prior to installing fittings in system.
2. Use non-brass or non-cast iron fittings which are made for high pressure waterblast use.
3. Use only high pressure fittings which are clearly marked with the operating pressure.
4. High pressure fittings should have a known burst rating of not less than 3.0 times system operating pressure. Never use a damaged or corroded fitting or one with damaged or missing threads.
5. Use only high pressure rated fittings and hose in the waterblast system. For 10,000 psi waterblast service all fittings and hose should have a minimum burst rating of 25,000 psi; for 15,000 psi service they should have a minimum burst rating of 37,500 psi; for 20,000 psi service they should have a minimum burst rating of 50,000 psi.
6. Use wrench flats (when available) or a properly adjusted smooth jaw plier wrench (JS PN 64119) to tighten fittings. Avoid using pipe wrench as wrench marks will cause high pressure fittings to crack and fail.

REPLACEMENT PARTS

1. **Read General Safety** section prior to repairing equipment and installing replacement parts.
2. Only trained persons should be authorized to perform maintenance or repairs to equipment.
3. Read and follow all manufacturer's repair instructions. All tool, torque, clearance and lubrication recommendations should be followed.
4. During replacement of any part, inspect mating part for wear and replace if necessary.
5. Do not attempt to install or use a part whose dimensions, clearances, function or use are suspect.
6. Test repaired equipment carefully and thoroughly before putting it into service. Do not put any piece of repaired equipment into service if its performance is questionable. If repaired equipment performance is questionable, call manufacturer of repair parts for assistance.

This section concludes all the same information included in the yellow JETSTREAM SAFETY WARNING pamphlet (PI-082).

SECTION 2: PRODUCT DESCRIPTION

The Epps 420K BTU heater is a stand alone oil fired water heater. The heater is provided pressurized water from a Jetstream 2000 pump @ 5000 psi. The temperature is controlled by a thermostat on the heater's control panel. Heated water is provided through a QD on the outlet of the heater at the top of the unit.

FLOW SWITCH

The flow switch prevents the burner from being turned on if there is insufficient water. Proper water flow causes the magnetic core to be pushed up, closing the reed contact. This contact is interlocked with the fuel control.

SAFETY RELIEF VALVE

The relief valve prevents the machine from being subjected to abnormally high pressures. If this situation occurs, the valve will blow off relieving the pressure in the coil. This valve may also operate if the pump pressure is adjusted too high.

THERMOSTAT

The built-in thermostat stops the unit from overheating. The temperature is set by the adjustable dial. Above this temperature, the burner stops automatically.

HIGH LIMIT SWITCH

The high limit is a temperature control that stops the unit from overheating. If the water temperature goes above the set point, the burner stops automatically. The temperature set point is not adjustable. The standard setting is 230 °F (110 °C).

CIRCUIT BREAKER

25 amp circuit breaker protecting the main power supplied to the burner.

PRIMARY CONTROL

When attempting to start the burner, the fan and ignition transformer start. When the controls are satisfied, the fuel solenoid opens and lets fuel enter the combustion chamber. If the fuel does not ignite within 15 seconds, the primary control shuts down the burner.

Product Specifications

Model Name	Epps 420K Water Heater Package
Maximum Operating Pressure (psi)	5,000
Maximum Flow (gpm)	20
Maximum Operating Pressure (bar)	345
Maximum Flow (l/min)	75.7
Weight (lbs)	400
Weight (kg)	181
Heater Outlet Connection	3/8" Snap Coupling

SECTION 3: PREPARATION FOR USE

3.0 The heater is provided pre-installed on Jetstream's 75hp trailer with 2000 series pump. Refer to the Jetstream Pump Manual for operating instructions and rebuild procedures for the 2000 Series pump. In general:

- The supply water should be clean and cold. The maximum allowed inlet water temperature is 125°F. Reduced packing life may be encountered with warmer inlet water.
- Verify all power, fuel and HP water connections are properly connected.

3.1 Ensure there is adequate fuel supply for the burner.

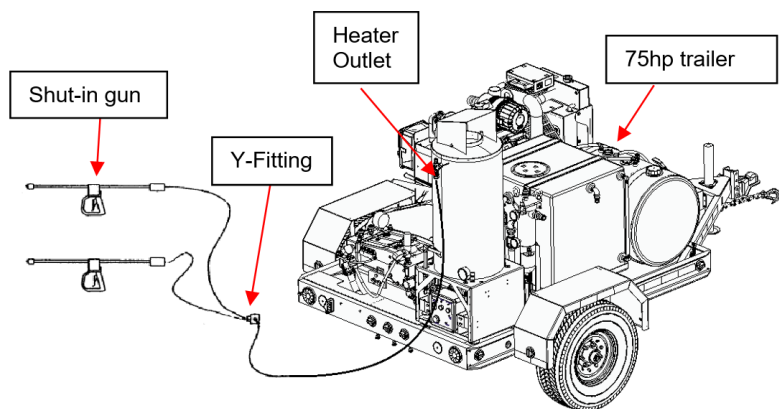
3.2 Ensure the exhaust stack is clear.

3.3 Jetstream hot water units include an unloader valve for use with shut-in guns. A paddlewheel flow sight is included to allow the user to see how much water is being sent back to the tank through the unloader. Either 1, 2 or 4 guns can be used. Utilize the charts below to determine gun nozzle sizes.

*Thrust in excess of 1/3 of the operator's body weight is not recommended.

3.4 Setup the guns per step 3.3 and plumb to heater outlet (3/8" snap coupler) using +200F temperature rated hose. 2 gun example shown below.

Contact Jetstream representative for assistance.



5000 PSI, 420K BTU Heater, 1 Gun

Nozzle Part Number	Flow	Temp Rise	Gun Pressure	Thrust*
	GPM	F	PSI	lbs
HHTC-052	4.5	142	4810	17
HHTC-057	5.36	135	4720	20
HHTC-069	7.58	90	4400	28

5000 PSI, 420K BTU Heater, 2 Guns

Nozzle Part Number	Flow	Temp Rise	Gun Pressure	Thrust*
	GPM	F	PSI	lbs
HHTC-052	4.41	72	4610	16
HHTC-057	5.15	68	4370	19
HHTC-063	6.16	56	4180	23
HHTC-069	7.18	45	3950	27
HHTC-073	7.67	40	3600	29

5000 PSI, 420K BTU Heater, 4 Guns

Nozzle Part Number	Flow	Temp Rise	Gun Pressure	Thrust*
	GPM	F	PSI	lbs
HHTC-035	2.01	90	4675	7
HHTC-038	2.32	75	4470	9
HHTC-042	2.80	70	4370	10
HHTC-047	3.46	58	4250	13
HHTC-052	4.01	50	3810	15

SECTION 4: OPERATION

Starting The Machine

4.0 Verify the Unloader mounted on the rear of the 2000 Series UNx pump is open (counterclockwise) - pressure relieved to water tank

4.1 With the trailer engine running at idle, engage PTO. Do not engage the PTO at high engine RPMs - doing so will damage the PTO.

4.2 Slowly increase Engine speed to 1600 rpm.

4.3 Have only one operator pull the trigger on their shut-in gun. This will ensure adequate flow is available for the unloader to operate.

4.4 Slowly turn Unloader clockwise to increase system pressure to desired blasting pressure, but do not to exceed 5000 psi. If the pressure stops increasing during the adjustment, and the flow sight on the unit stops spinning, the pump is not producing enough flow for the current nozzles. Unscrew the unloader adjustment 1 turn, increase engine speed 100 rpm, and try again. If the engine speed reaches the governed maximum (2400rpm) before the desired pressure is reached, the nozzles need to be changed to a smaller orifice size. Release trigger on gun.

4.5 Turn on the Burner On/Off switch on the heater control panel.

4.6 Set the Thermostat on the heater control panel as desired.

4.7 The heater is now ready to use. Burner will ignite and remain in operation if there is sufficient water flow to keep the flow switch on and the water temperature does not exceed the thermostat set point or temperature limit controls. Verify fuel pressure is 140 psi.

Stopping the Machine

4.8 Turn the thermostat down to the lowest possible setting. Have at least 1 operator pull and hold the trigger on their gun to begin cooling down the heater coil. Shutting down the burner without a cool down procedure will damage the equipment.

4.9 After at least 1 minute, turn off the burner rocker switch.

4.10 Continue to have at least 1 operator hold the trigger on their gun until the water coming out of it about the same as the inlet temperature.

4.11 Unscrew unloader, reduce engine speed and disengage PTO.

4.12 Pull the trigger on 1 gun to relieve trapped system pressure.

SECTION 5: SERVICE

Regular Checks

1. Check for system leaks. Leaks downstream of the unloader can cause premature wear or failure of the unloader. The warning signal for this kind of leak is frequent cycling of the unloader on the pump, more than once every 2 minutes in the gun-off position. Check the gun and swivel joints for leaks.
2. After using chemical additives such as antifreeze, thoroughly flush the system with clean water.
3. Inspect the electrical supply connections and cables regularly. Replace worn or damaged parts immediately.
4. Never run the heater module without water. Always check water supply before starting the heater module.
5. Protect from freezing. When transporting or storing the heater module in temperatures below freezing, winterize the heater module, pump, hose, and gun.
6. Check and replace fuel filter when necessary.
7. Inspect all hoses for leaks and cracks and replace when damaged or worn.

⚠ WARNING

Winterizing

⚠ WARNING It is good practice to winterize your hot water unit if it is to remain unused for more than 3-4 weeks or is transported or stored in freezing conditions. Winterizing prevents damage to the pump, connections, and heater in cold weather. Additionally, winterizing helps prevent corrosion in the internal heater coil. We recommend this procedure.

⚠ CAUTION

1) Shut off the water supply and disconnect the hose from the filter.

⚠ CAUTION 2) Drain the filter housing using the valve on the bottom of the housing.

⚠ CAUTION 3) Disconnect the hose running from the filter to the water tank. This drains the float valve.

4) Drain the water tank using the valve under the tank.

5) Close the water tank drain valve. (continued on following page)

⚠ WARNING 6) Disconnect the hose running from the unloader valve to the water tank and allow it to drain.

7) Remove the water tank lid.

8) Add 2 gallons of automotive antifreeze and 4 gallons of water to the tank. A higher concentration can be used for extremely cold weather.

9) Install the water tank lid. A little silicone grease on the tank threads can make removal easier in the future.

10) Attach a hose to the discharge fitting on the heater. Leave the end of the hose open. A shorter hose will speed up the process.

11) Set the unloader valve 2 turns clockwise from the point where resistance from the internal spring can first be felt.

12) On the control panel, Set the “OVERRIDE” switch to “ON”.

13) Start the engine.

14) Engage the PTO until the antifreeze mixture can be seen coming from the hose.

15) Disengage PTO

16) Turn off the engine.

17) Set the “OVERRIDE” switch to “OFF”

When replacing the outlet hose on the machine, always use a factory supplied replacement hose or an acceptable alternative. Failure to use the correct hose could result in hose failure and severe burn injuries or injection.

Any metal parts that are exposed to the flow of the hot water, such as the wand and hose couplings, become very hot during operation. Exercise extreme caution around these parts and wear protective clothing.

DO NOT attempt to start the burner when excess fuel has accumulated in the combustion chamber, or when the heat exchanger coil is full of vapors.

Vapor-filled combustion chamber. Allow the unit to cool off and all vapors to dissipate before attempting to restart.

Fuel flooded combustion chamber. Shut off the electrical power and the fuel supply to the burner, and then clear all accumulated fuel before continuing.

When changing high-pressure nozzles, always turn off the machine, release trapped pressure, and latch the trigger lock on the gun.

- Always point the nozzle away from you during this process.
- Never point the nozzle towards any other person or animal.
- Ensure the replacement nozzle is the correct size and is firmly secured in its position before restarting washing.

SECTION 6: TROUBLESHOOTING

WARNING: POTENTIAL FOR FIRE, SMOKE AND ASPHYXIATION HAZARDS.

Repairs or adjustments to the burner must **ONLY** be carried out by a professional, qualified oil-fired burner Technician. Incorrect installation, adjustment or misuse of this burner could result in death, severe personal injury, or substantial property damage.

Problem	Possible Cause	Remedy
Burner will ignite and run but flame is lost shortly thereafter	Air trapped in fuel system	Bleed fuel system
	Burner head covered in soot	Remove and clean burner head
	Thermostat set too low	Adjust thermostat
	Faulty thermostat	Replace
	Faulty flow switch/flow switch probe	Replace
	Faulty Primary control	Replace
Surface of coil skin getting hot	Tear in insulation around coil	Repair or replace
	Gap between coil insulation and top cap	Remove cap and add or adjust insulation to remove gap
	Coil bottom insulation disturbed	Remove coil repair or replace bottom insulation
	Misaligned burner flame tube	Inspect for visual damage to flame tube flange assembly. Adjust, repair, or replace flame tube assemblies.
Water leak	Loose fitting(s)	Tighten fitting(s)
	Frozen coil	Repair or Replace.
	Broken fitting(s)	Replace
	Severe condensation	Check insulation on bottom and around coil. Repair any tears or gaps in insulation

Problem	Possible Cause	Remedy
Burner runs but does not run smooth	Air band open too much or too little	Adjust air band
	Fuel filter/fuel connections loose	Tighten or repair
	Fuel nozzle clogged	Replace fuel nozzle
	Air in fuel system	Bleed Fuel system
Unit Smokes	Improper fuel	Use diesel fuel only
	Combustion air insufficient	Adjust air band
	Fuel nozzle interior loose	Replace nozzle
	Electrodes misaligned	Adjust electrodes
	Excessive soot build-up on coil	Clean coil
	Fuel filter clogged	Clean fuel filter/replace
	Improper fuel pressure	Fix visible leaks. Check for clogged fuel lines. Service or replace fuel filter and/or fuel pump.
Water temperature lower than normal	Thermostat set too low	Adjust thermostat
	Water inlet temperature lower than normal (50°F)	Not applicable
	Water flow rate higher than normal	Adjust flow rate to machine specifications
	Coil limed up	Descale coil
	Improper combustion	Readjust burner
	Thermostat malfunction	Replace

Problem	Possible Cause	Remedy
Blowing Fuses	Dead short	Check all wires and connections
	Wrong fuse	Replace with proper rated fuse
	Clogged or seized fuel pump	Repair or Replace
	Burner drawing too much current	Replace burner or repair burner components
	Motor seized	Replace burner motor
	Broken blower wheel	Replace blower wheel
Burner continues to run after water flow is stopped	Faulty flow switch/flow switch probe	Replace flow switch/flow switch probe

APPENDIX A

Replacement Parts

Part Number	Description 1	Description 2
72320	FLOW SWITCH,5K	SST,3/8" BSP FEM
72321	RELIEF VALVE	W/HOSE BARB
72323	THERMOSTAT	240F
72324	ROCKER SWITCH	12V
72285	FILTER,DIESEL	PARKER RACOR
72249	TEMP SWITCH	200F,2 WIRE,POTTED

WARRANTY

Limited Warranty - Jetstream of Houston LLC warrants that each new Jetstream pump or fluid end (the “Product” or “Products”) is free from defects in material and workmanship for a period of five (5) years or four thousand (4,000) operating hours, whichever occurs first, provided it is used in a normal and reasonable manner and in accordance with all operating and safety instructions.

Products must be registered within 60 days of delivery for warranty to be considered valid. Register your pump or fluid end by filling out the warranty registration form, available at waterblast.com/warrantyform or by contacting Jetstream via phone at 832-590-1300 or email to customerservice@waterblast.com. The warranty period begins on the date of delivery of the Product to the first end-user customer (or, if the Product is initially placed into rental service, on the date of delivery to the rental company or leasing entity), provided warranty registration has been submitted appropriately. This limited warranty may be enforced by any subsequent transferee during the warranty period. This limited warranty is the sole and exclusive warranty given by Jetstream. This limited warranty applies only to pump and fluid end Products manufactured and delivered after January 1st, 2025.

Exclusive Remedy - Should any warranted product fail during the warranty period, Jetstream will cause to be repaired or replaced, as Jetstream may elect, any part or parts of such Bareshaft Pump or Fluid End that the examination discloses in Jetstream’s sole judgment to be defective in material or factory workmanship. Repairs or replacements are to be made at Jetstream in Houston, Jetstream FS Solutions Rental Center, the customer’s location, or at other locations approved by Jetstream. Labor is furnished only when the unit or part is returned to the factory or when travel and expenses are paid by the purchaser. Freight, travel and expenses incurred in connection with repair or warranty are excluded from this warranty and shall be paid by the purchaser. The foregoing remedies shall be the sole and exclusive remedies of any party making a valid warranty claim.

The Jetstream Limited Warranty shall NOT apply to (and Jetstream shall NOT be responsible for):

Major components or trade accessories that have a separate warranty from their original manufacturer, such as, but not limited to: diesel engines, electric motors, electronic soft starter and/or across the line starter panels, axles, PTO's, clutch packs, high pressure gauges, high pressure hoses, flex lances, or other components carrying a warranty from their original manufacturer.

Normal adjustments and maintenance services.

Normal wear parts such as, but not limited to: oil, clutches, belts, filters, packing, cartridges, univalves, face seals, diffusers, gland nut bushings, plungers, nozzles, rupture disks, etc.

Failures resulting from the Product or Products being operated in a manner or for a purpose not recommended by Jetstream including failures or malfunctions resulting from corrosion, misapplication, over-pressurization, inadequate pump suction conditions, improper water quality, improper maintenance, misuse or use not in accordance with Jetstream's operating and safety instructions. A finding of such shall be in the sole discretion of Jetstream.

Repairs, modifications or alterations which in Jetstream's sole judgment, have adversely affected the machine's stability, operation or reliability as originally designed and manufactured.

Items subject to misuse, negligence, accident or improper maintenance.

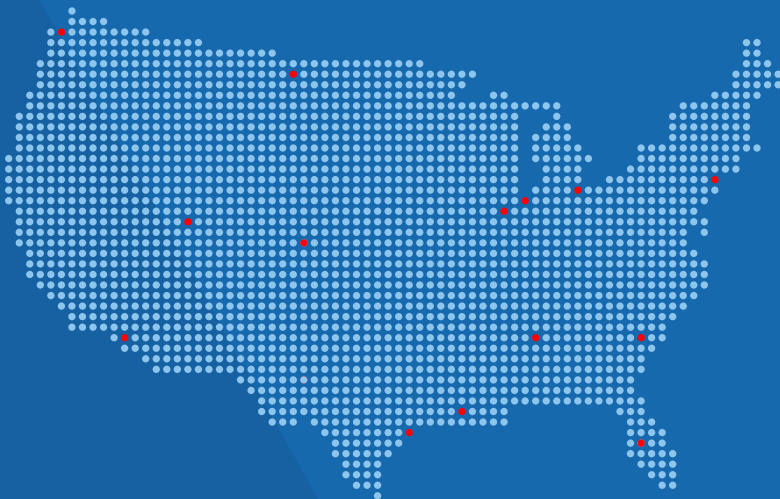
NOTE - The use of any part other than those approved by Jetstream may invalidate this warranty. Jetstream reserves the right to determine, at its sole discretion, if the use of non- approved parts invalidates the warranty. Nothing contained in this warranty shall make Jetstream liable for loss, injury, or damage of any kind to any person or entity resulting from any defect or failure in the machine or part.

THIS WARRANTY IS, AND SHALL BE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ALL OF WHICH ARE DISCLAIMED. THIS DISCLAIMER AND EXCLUSION SHALL APPLY EVEN IF ANY WARRANTY POSSIBLY ASSERTED FAILS OF ITS ESSENTIAL PURPOSE.

This warranty is in lieu of all other obligations or liabilities, contractual and otherwise, on the part of Jetstream. For the avoidance of doubt, Jetstream shall not be liable for any indirect, special, incidental or consequential damages, including, but not limited to, loss of use or lost profits. Jetstream makes no representation that the unit has the capacity to perform any functions other than as contained in Jetstream's written literature, catalogs or specifications accompanying delivery of the machine. No person or affiliated company representative is authorized to alter the terms of this warranty, to give any other warranties or to assume any other liability on behalf of Jetstream in connection with the sale, servicing or repair of any machine manufactured by Jetstream. Any legal action based hereon must be commenced within twelve (12) months of the event or facts giving rise to such action.

Jetstream reserves the right to make design changes or improvements to its products without imposing any obligation upon itself to change or improve previously manufactured products.

Contact Jetstream Customer Service by calling 832-590-1300 or by visiting waterblast.com



Jetstream products are also serviced by FS Solutions. With 13 convenient locations across the United States, FS Solutions provides high-performance parts, accessories, Jetstream rentals, repair, rebuild and safety training.

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(888) 415-7368

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(281) 674-8668

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(815) 672-6028

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(813) 477-8691

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(803) 996-0741

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New Brunswick, NJ
(732) 448-7830

Midland, TX
(432) 563-4450

Salt Lake City, UT
(801) 808-4590

Aurora, CO
(720) 896-0165



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HOUSTON, TEXAS 77092
(832) 590-1300 or (800) 231-8192

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Application Policy

Capacity ratings, features, and specifications vary depending upon the model and type of service. Application approvals must be obtained from Jetstream; contact your representative for application approval. We reserve the right to change or modify our product specifications, configurations, or dimensions at any time without notice.