



FSI HEAT 200A
Heavy Duty Portable Water Heater
Operating Manual

Model No. FSIHEAT200A
Certified to the ETL listed standard and
certified to the CAN/CSA STD B140.11



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FSI Products

LIMITED 1 -YEAR WARRANTY

FSI North America®, a Division of Fire Safety International, Inc.®(FSI), (“Warrantor”) warrants to the original purchaser of all new FSI equipment supplied by Warrantor and to any person to whom such equipment is transferred, that such equipment shall be free from defects in materials and workmanship during the one (1) year period commencing upon the receipt of such equipment.

FSI will repair or replace product at FSI’s discretion, which fails to satisfy this warranty at no charge.

We will not be responsible for wear and tear; any improper installation; improper use or maintenance; negligence of the owner or user; damage; or anything else beyond our control. Further, we will not be responsible for any consequential, incidental or indirect damages including any damages and loss of profits from any cause whatsoever. No person has authority to change this warranty.

FSI North America® warrants all new FSI products for a period of one (1) year after the date of purchase against defects in materials or workmanship. We will repair or replace a product that fails to satisfy this warranty. Repair/replacement shall be at the discretion of FSI. Products must be returned promptly to FSI for warranty service AT CLIENT’S COST IN PACKAGING SUITABLE AND CORRECT TO PROPERLY PROTECT THE PRODUCTS DURING THE RETURN SHIPMENT. DAMAGE CAUSED DURING THE RETURN PROCESS, IF ANY, WILL BE AT CLIENT’S EXPENSE AND RESPONSIBILITY. IF THE CLAIM IS INDEED A VALID WARRANTY CLAIM AS DEFINED SOLELY BY FSI - ALL FREIGHT COSTS WILL BE CREDITED BACK TO CLIENT. We will not be responsible for: wear and tear, improper installation, use, maintenance or storage, negligence of the owner/user, repair or modifications after delivery, failure to follow instructions or recommendations, or other misuse or activity beyond our control. FSI reserves the right to change the design or parts of/in its’ products from time to time without notice and with no obligation to maintain a spare parts inventory or to make matching changes in products previously manufactured.

The following items are excluded from this warranty:

1. Stuck check valves
2. Pump packing, and/or seals
3. Hose
4. Fuel pump damage due to moisture
5. Clogged filters and screens
6. Nozzles and orifices
7. Paint
8. Gauges
9. Damage caused by improper use of chemicals.

Conditions resulting from misuse, negligence, alterations, accident, or improper repair are not covered under warranty.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OTHER THAN THOSE INCLUDED IN THE AFOREMENTIONED STATEMENT ARE OFFERED. FURTHER, WE DISCLAIM ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

IMPORTANT SAFETY INSTRUCTIONS! WARNING:

When using this product the basic precautions should always be followed:

1. Read all the instructions before using the product.
2. When operating, use basic protective clothing.
3. To reduce risk of injury, close supervision is necessary when the product is used near children.
4. Be thoroughly familiar with the controls and know how to stop the product.
5. Stay alert – and closely pay attention to the work at hand.
6. **Do Not** operate the product when fatigued or under the influence of alcohol or certain prescription drugs.
7. Keep the operating area clear of all persons not helping/using the product.
8. **Do Not** over reach or stand on unstable ground. Keep good footing and balance at all times.
9. Follow the maintenance instructions specified by the manual
10. Consult the factory before changing the basic design or operating procedure of this machine.
11. Have trained and qualified technicians connect your machine.
12. Use only recommended fuel in machine.
13. For a grounded or double insulated products rated 250volts or less: “This product is provided with a ground fault circuit interrupter built into the power cord plug. If replacement of the plug or cord is needed, use only identical replacement parts.
14. ”For grounded or double insulated products rated more than single phase, or over 250volts: “This product should only be connected to the power supply. Receptacle is protected by a ground fault circuit interrupter.”

Grounding Instructions

THIS PRODUCT MUST BE GROUNDED. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of serious shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER- Improper connection to 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 adaptor with this product.

Extension Cords

Use only 3-wire extension cords that have 3-prong grounding-type plugs and 3-pole cord connectors that accept the plug from the product. Use only extension cords that are intended for outdoor use. These extension cords are identified by a marking: "Acceptable for use with outdoor appliances; store indoors while not in use." Use only extension cords having an electrical rating not less than the rating of the product. Do not use damaged extension cords. Examine extension cord before using and replace if damaged. Do not abuse extension cord and do not yank on any cord to disconnect. Keep cord away from heat and sharp edges. Always disconnect the extension cord from the receptacle before disconnecting the product from the extension cord.

WARNING- To reduce the risk of electrocution, keep all connections dry and off the ground. Do not touch plug with wet hands.

Caution

1. Protect machine from freezing.
2. Hot discharge fluid – **Do not** touch or direct discharge stream at persons.
3. Risk of asphyxiation. Use this product only in a well ventilated area.
4. If connected to a circuit protected by fuses, use time-delay fuses with this product.
5. When servicing or cleaning needs to be done, disconnect machine from supply circuit.
6. Risk of fire. **Do not** add fuel when the product is operating or still hot.
7. Use on a noncombustible surface, 18 inches (457 MM) or more above the floor.

Manufacturer's Note

The following parts **must** be resealed with **silicone sealant** if they are in any way dismantled for repairs, service, etc. In the process of resealing make sure that all electrical terminals and wires are coated. If silicone is used for gasket purposes be sure and replace with an adequate amount to provide proper seal.

1. Motor Capacity Cover (gasket)
2. Motor Shroud (gasket inside circle on end of motor)
3. Switch Mounting Plate
4. High Limit Switch

Pre Set Up

1. Please examine machine and crate carefully for shipping damage.
2. Assemble the pressure gun and hose.
3. Position the machine for easy access from all sides for servicing.
4. Always protect the machine from freezing.
5. Place the machine on a solid level surface.

6. Protect the machine from external damage.

Set Up

1. Have only a trained and qualified person service your machine.
2. Connect the machine to the proper electrical supply. Comply with all national, state, and local codes. **MAKE SURE THAT IT IS PROPERLY GROUNDED.**

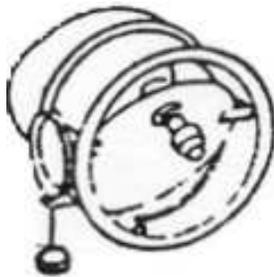
Start Up

Note: The first time the machine is operated after set up or any repairs have been made, always run the machine for a few minutes to flush out the system.

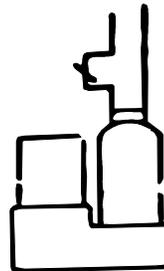
Connect the machine to the proper electrical supply. Comply with all national, state and local codes; make sure it is properly grounded. The machine must be supplied from an adequate sized fused disconnect. If an extension cord is used, keep it as short as possible. (It is better to use a longer hose than to use a long extension cord.) Keep cords off the floor and out of the water.

Follow your detergent manufacturer's recommended mix instructions when using detergents. Fuel pressure adjustment: Burner air adjustment is factory set for approximately 1100 feet elevation. Adjustment may be required for different altitudes. If unit is smoking, open the air bend. Make slight adjustments and allow a little time for burner to react to adjustments. Supply the machine with proper stacking.

Note: STACKING.



**Single Acting
Draft Control
for Oil**



**Location
for Oil**

The stacking and draft control are not furnished. Contact your local heating sales and service person or your dealer for proper hardware and installation instructions. The following statements are suggestions for stack installation:

- a. Never reduce the diameter of the stack
- b. Prevent cold down drafts from freezing the coil when the machine is not in use.
- c. Oil fired machines must have a single acting draft control installed.
- d. Install a U.L. listed weather cap.
- e. Comply with all national, state, and local codes.

Start Up Instructions:

1. Turn on water.
2. Turn on electricity.

3. Start the pump
4. Set temperature control to desired temperature by adjusting the temperature mix valve.
5. When a steady stream of water flows out of the valve, start the burner.
6. Adjust the soap metering valve as required(if equipped with detergent injector).

Shut Down

1. Turn off the soap valve.
2. Stop the burner.
3. When the water flowing from the gun has cooled and is free of soap, stop the pump.

Trouble Shooting

<u>Trouble</u>	<u>Possible Cause</u>	<u>Remedy</u>
Low pressure	Leak in water system	Tighten all fittings
	Insufficient water supply	Increase water supply or line size to the machine.
Pump motor heating	Electrical service insufficient and/or undersize extension cord.	Loose connection-insufficient voltage under 1 load. Check machine specs. Use heavier extension cord.
	Chemical injector plugged	Remove and clean.
	Faulty motor	Replace or repair.
Burner won't ignite	No fuel	Fill fuel tank and check filter for water and other contaminates.
	Electrodes out of alignment	Adjust per diagram.
	Electrode insulator failure.	Check for breaks, cracks, or spark trails-replace
	Water flow switch not closing	Adjust, repair, or replace. (Adjust by moving probe up or down.)
	Temperature control switch not closing	Adjust or replace
	Fuel solenoid valve not opening	Clean, repair or replace.
	Weak transformer	Clean and check terminals. Replace if necessary. Check for spark.

	Faulty primary control	Replace
	Plugged oil nozzle	Replace. (<i>Do not clean</i>)
	Faulty burner oil pump	Adjust or replace.
Unit Smokes	Improper fuel	Use home heating oil, diesel, or kerosene.
	Air to burner insufficient	Air adjustment on burner -remove soot from coils.
	Fuel nozzle interior loose	Replace nozzle. (leaky or loose fitting will cause improper combustion and smoke, especially after shut down.)
	Gun out of alignment	Bend oil pipe to center burner nozzle.
	Too high fuel pressure	Adjust fuel pressure (100 to 125 psi)
Water Temperature to temperature	Thermostat adjustment	Adjust the thermostat desired
	Coils liming up	Descale
	Improper combustion	Readjust burner and clean combustion chamber.

Periodic Maintenance

Fuel

1. Fill with clean diesel, #1 home heating oil or kerosene.

Screens

2. Clean strainer screens in water inlet fitting and float tank periodically (if equipped)

Hoses and Periodic Leaks

3. Inspect the machine for possible leaks before each operation. If a leak is found, **DO NOT OPERATE**. Disconnect power and repair. Check hoses for fatigue and for wear where they might be rubbing on other objects. Tighten hose connections and seal pipe connections with Teflon tape when finished. **DO NOT RUN OVER HOSE OR KINK IT.**

Coil Maintenance

Before



Build-up begins Combined build-up Chemical build-ups Hard water build-up Lime & calcium build-ups Plugged by ALL build-ups

After



In alkaline water areas, lime deposits can accumulate rapidly in the coil pipes. This deposit is increased by the extreme heat build up in the coil. Periodic cleaning of the coil will remove lime and rust deposits before they become a serious problem. Coils should be cleaned three or four times per year depending on frequency of use. In extreme alkaline water areas cleaning may be required more often, sometimes daily. Clean with coil cleaning fluid (available through FSI) when needed.

Checking for Scale or Liming in Coil

Note: Change combination machines to the pressure cleaning mode before checking for scale or liming in coils.

1. Remove outlet orifice and check for liming. Clean orifice if needed. Install a pressure gauge between the water pump and coil inlet.
2. If your machine is satisfactory, reassemble. Coil should be de-scaled on a periodic schedule.

Oil Burner Maintenance

Adjusting Electrode Assembly

1. Disconnect the fuel line from the gun assembly oil line. Loosen the other end of the line(fuel pump end) and swing line out of the way. Remove retaining nut.
2. Loosen the bolt and open the transformer cover.
3. Carefully remove the gun assembly.
4.
 - a. Check and replace electrode insulators if cracked.
 - b. Clean burnt electrode strips.
 - c. Clean carbon off electrodes.
 - d. Clean carbon off oil nozzle. (Use caution not to scratch face of nozzle.)
 - e. Check for loose oil nozzle. Replace nozzle if loose.
Note: Check with dealer and/or replace nozzle with proper nozzle.
5. Loosen screws holding electrodes.
6. Raise electrode tips 5/32 inches above surface plane or end of foil nozzle.
7. Place each electrode tip 5/16 inches from center of spray nozzle hole, maintaining previous measurement.
8. Spread electrode tips to 3/16 inches gap maintaining previous measurements.
9. When the proper measurements are reached, gently tighten screws that hold electrodes in place. **Caution:** Do not over tighten as this will cause electrode failure.
10. Gently replace burner electrode assembly in drawer. **Caution:** Do not force. Forcing will cause electrode misalignment.
11. Partially close the transformer cover. Check if the electrode strips align and contact the transformer buttons. If electrode strips do not contact, gently bend them into place.
12. Close the transformer cover and tighten the bolts.

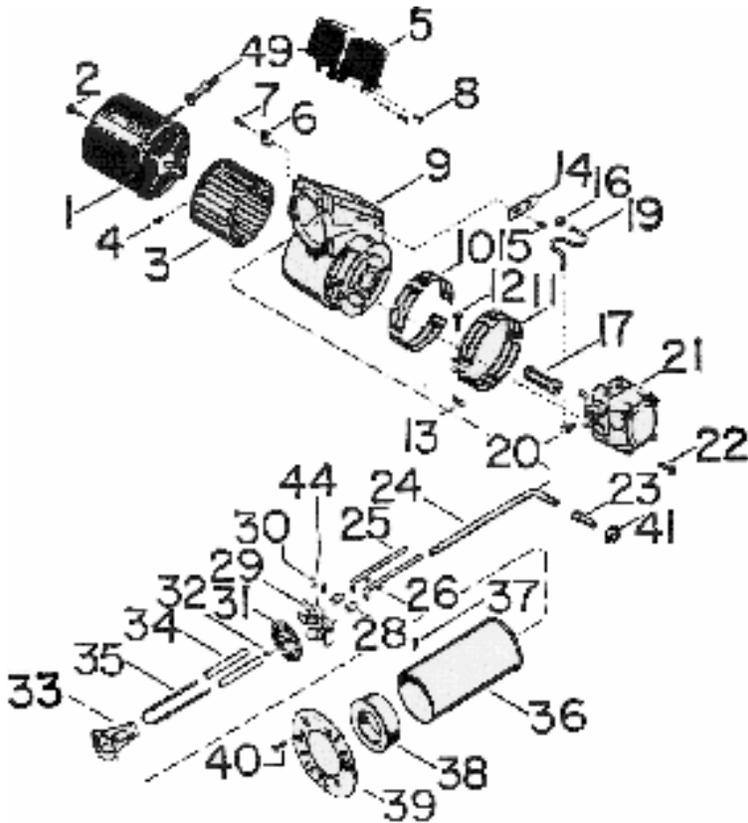
Pre-Winter Maintenance to Prevent Freezing

1. Turn off and disconnect water supply.
2. Attach the Air Chuck cap into the system's water inlet.
3. Open all water output valves.
4. Use compressed air (about 100PSI) with a standard air chuck valve to blow pressurized air into the system.
5. When dry air is released from the water output valves, release the air chuck valve. Leave all output valves in the open position.

(The following pages consist of diagrams and parts lists necessary for operation or repairing of the machine)

Wayne Oil Burner Parts List

Ref	Part#	Description	Ref	Part#	Description
1	11-10105	Motor 110 volt	21	10-20330	Fuel Unit
	11-10110	Motor 230 volt	22	10-20249	Fuel Unit Mount Screw
2	10-20249	Motor Mounting Screw	23	20-20172	Oil Line Fitting
3	10-20220	Fan	24	10-20175	Oil Pipe
4	****	Fan Set Screw(In Fan)	25	10-20061	Buss Bar
5	04-80144	Transformer 240V	26	****	Palnut
	04-80164	Transformer 120V	28	10-20044	Insulator Bushing
6	10-20245	Trans, Hold Down Clip	29	10-20238	Electrode Holder
7	10-20248	Trans, Hold Down Screw	31	10-14055	Baffle Plate
8	10-20246	Trans, Hinge Screw	33	10-10330	Flaming Assy
9	10-10210	Fan Housing Assy.	34	****	Insulator
10	10-20250	Air Adj. Band-inner	35	****	Electrode Stem & Washer
11	10-20260	Air Adj. Band-outer	36	10-20235	Air Tube
12	10-20249	Air Band Screw	38	10-14055	Baffle Plate
14	10-20171	Oil Line Adj. Slot Cover	39	10-20270	Flange
15	02-21355	Oil Line Slot Cover Screw	44	10-20045	Electrode Clip
16	10-10173	Oil Line Locknut	49	10-20287	Motor Cord Cover
17	10-10205	Pump Coupling		10-20050	Electrode Set Complete(ref 25,26,34,35)
19	10-20170	Oil Line Assembly		10-10200	Gun Assembly
20	10-20280	Oil Line Elbow		10-20360	Fuel Solenoid
				10-20370	Fuel Solenoid



Filters the oil before it enters the fuel unit(#21)

