

HYDRO FLAME
CORPORATION

FURNACE

MAINTENANCE SERVICE MANUAL

CAUTION: READ PAGE 1 PRIOR TO FIRING YOUR FURNACE!

HYORO FLAME CORPORATION
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RV-1-1-7

CAUTION - READ THIS PRIOR TO FIRING YOUR FURNACE!

Hydro Flame Furnaces are precision built. Please treat them accordingly. All air passages are fixed and cannot be adjusted. Do not make any physical change in the furnace construction.

Before furnace is put into operation, there are certain steps that must be followed to insure proper operation, efficiency, long life and safety.

CAUTION: AN OVERFILLED GAS BOTTLE CAN BE DANGEROUS

Liquid gas from an overfilled bottle can be forced through the gas bottle pressure regulator. Should this happen the liquid will immediately expand to a vapor creating a high pressure gas. This high pressure gas could destroy the gas seal in the gas control valve, causing a large amount of gas to escape into your living area. This could, of course, result in a fire or an explosion. To prevent this, please read and carefully adhere to the following.

All LP.G. gases are put in bottles or cylinders under high pressure as a liquid. The top 10% of the interior area of the cylinder must be reserved for a gas vapor area, Each cylinder has a small round valve located either beside the main valve or on the side of that valve. This is called a 10% valve.

When the cylinder is being filled, this valve should be open. It can be opened by hand, DO NOT use pliers or wrenches to open or close this valve. When the cylinder is being filled, with the 10% valve open, you will hear high velocity gas escaping, When you see a white, frosty vapor coming out, the cylinder is over filled. Shut main gas valve. Allow gas to discharge from 10% valve until it becomes invisible. Close the valve and the bottle is properly filled.

LACK OF ALCOHOL IN GAS BOTTLE

When a gas bottle is manufactured, the manufacturer is required by law to subject it to a Pressure Test. To do this, the bottle is usually filled with water and it is seldom that all of this water is removed. The following often happens when the furnace is in operation: The gas in a propane cylinder is liquid; as it is drawn off, it becomes a vapor as does a small amount of the water. Then the gas vapor and water vapor proceed to the small orifice in the pressure regulator at 100 lbs. PSI, pressure or more. Passing through this orifice, the gas pressure is dropped to approximately eleven inches of water column, or six ounces pressure.

This extreme expansion is the basic principle of refrigeration. Propane is an excellent refrigerant; therefore, the interior of the regulator will be cooled below freezing temperature and the water vapor will freeze and form tiny ice crystals around the outlet of the small gas orifice inside the gas pressure regulator. This will cut down on the amount of gas available to the main burner and rob the amount of gas available to the much smaller pilot orifice. The result is a pilot flame too small to properly heat the 100% safe thermocouple, which in turn will shut off all of the gas to the furnace, which is its' proper function. While this is not hazardous, still it can certainly become an exasperating nuisance.

To keep this from happening, simply add 1/2 cup or more of alcohol to each gas bottle. This is done when the bottle is empty by opening main gas valve on the bottle and pouring it in. This need be done only one time to each bottle.

FUEL LINE CHECKS

We recommend frequent checks on all lines, fittings and pressure regulators. Look for sharp bends or breaks in the tubing. Check for leaks (use a soap and water solution; do not use matches), have pressure checked at each appliance to make certain that each has 11" to 12" W.C. or 6 to 6 1/2 ounces of pressure for proper operation on L.P.G. gas.

CAUTION! Never subject the furnace to more than 8 ounces air or gas pressure when testing fuel lines. More than this can blow the seal in the gas valve and cause a gas leak.

FUEL LINE STOPPAGE

When a camper or trailer is not in use and fuel lines are disconnected, always plug or protect them from foreign material. Mud Daubers love to plug them. Many times the lines are partially plugged, but not completely blocked off, so appliances may run, but at a reduced rate.

SMALL TUBING

Use 3/8" or larger tubing when installing Hydro Flame Furnaces. Smaller tubing can drop gas pressure and heat output.

FURNACE GOING OUT?

Pilot door must be closed tightly during operation.

When a Hydro Flame Furnace is in operation, the firebox is usually under a low pressure condition; therefore, if the pilot door is even slightly opened or cracked, air will be pulled into the firebox. This stream of air will force the pilot flame away from the thermocouple in toward center, which will cool the thermocouple and drop the furnace controls out on safety, shutting off all of the gas supply. Pilot door should be closed tightly after pilot is lit and before main burner is turned on,

PILOT OUTAGE

If the pilot flame will not stay lit when you release pilot knob, check ignition flame size. The flame should envelop the top 3/8" to 1/2" of thermocouple and should be approximately 1 1/2" long. If pilot flame does not envelop the top 3/8" to 1/2" of the thermocouple with 1 1/2" total length, turn pilot gas adjustment screw located on gas valve out, or counter clockwise, until a normal size flame is obtained, (See illustration)



CAUTION. Never bend or try to force thermocouple into pilot flame.

If you have proper gas pressure and pilot flame is still not at normal size, remove orifice from pilot, clean by blowing out frontwards and backwards with high pressure air and replace

HEAT OUTPUT UNSATISFACTORY

First, be sure the gas bottle is not overfilled and that you have alcohol in gas bottle and full gas pressure (12") to furnace. Locate sensing bulb further from heat.

If problem still persists, direct your correspondence to:

HYDRO FLAME CORPORATION
1874 South Pioneer Road
SALT LAKE CITY, UTAH 84104

HYDRO FLAME FA-79 AND HF-80 SERIES

INSTALLATION AND OPERATING INSTRUCTIONS

Sealed combustion system (Direct vent) Appliances for installation in Recreational Vehicles (Not tested for use with air filters or air conditioning)

Model No.	input BTU/hr.	Bonnet Capacity	Type Gas	Electrical Rating
FA-7920S (D or P)	19,500	15,600	Propane	12V.D.C. 29 AMP
FA-7920F (D or P)	19,500	13,650	Propane	12V.D.C. 2.9 AMP
FA-7916S (D or P)	16,000	12,800	Propane	12V.D.C. 2.7 AMP
FA-7916F (D or P)	16,000	11,200	Propane	12V.D.C. 2.7 AMP
FA-7912S (D or P)	12,000	9,600	Propane	12V.D.C. 2.7 AMP
FA-7912F (D or F)	12,000	8,400	Propane	12V.D.C. 2.7 AMP
HF.8012 (D or F)	12,000	8,400	Propane	12V.D.C. 1.6 AMP

Letters after the Model Number stand for:

S = Side Ducted F = Front Discharge D = Direct Spark Ignition P = Piezo Ignition

Overall Dimensions	Minimum Clearances to Combustibles	
Length: 20 5/8"	Top & Sides	1/4"
Height: 11 1/2"	Air tube	0"
Width: 9 5/8"	Rear	0"
Shipping wt.: 18 lbs.	Front	As required for servicing

INSTALLATION

This Furnace must be installed in accordance with these instructions and all National or Local Codes and CSA standards Z240.4 and Z240.6.1 or Z240,6.2

The Furnace must be installed with the combustion air box (B) and exhaust tube (C) through an outside wall.

The Furnace should be as near to the center of the vehicle as possible.

1. Provide a 11 1/4" High x 8 3/8" Wide Cabinet opening and 2 7/16" High x 4 15/16" Wide outside wall opening as shown in Fig. 3.
2. On side discharge (ducted models), remove left side knock-out plate and install two duct adapters.
3. Slide Furnace into cabinet opening. On side ducted Models Slide 4" D1A. Ducts over the adapters and seal with duct tape.
4. Gas Piping: Connect Gas supply line with a capacity to provide 11" W.C. Pressure to the gas control inlet fitting (3/4" minimum 0.0. tubing must be used) do not twist gas valve during piping.
5. Be sure that the Entire gas system is tight, properly supported and free of leaks. Do not fire any appliance until the entire system is fully checked out. Use a soap and water solution to detect gas leaks, never a lighted match or flame.

NOTE: If local codes require an external gas "Shut off Valve", it must be located outside the furnace casing.

6. Electrical Wiring: With the Junction box cover removed route battery or 12V.D.C. and thermostat leads through opening on the right side of furnace casing and connect to furnace wiring.

CONNECTIONS

Supply Leads		Furnace Wiring
12V.D.C. (+ & One Thermostat	TO	Thermo & 12V.D.C. +
12V.D.C. (-)	TO	12V. D.C. -
One Thermostat	TO	Thermostat

Observe polarity of leads when connecting.

NOTE: Supply leads other than thermostat should be 14 GA. Mm.

7. Thermostat: Locate the Thermostat about four feet above the floor, at least a foot from windows, four feet from doors and preferably on an inside wall. Run two conductor wire from furnace to thermostat use a thermostat suitable for 12V.D.C.
8. Replace the Junction box cover and secure with screw, **CAUTION: Do not short any leads to ground. Any shorting or arcing may damage furnace components and thermostat.**
9. Vent Installation: Select the vent kit required for your overall installed cabinet and wall depth. (A minimum of 1 1/4" overlap is required on all telescoping exhaust tubes.)

Cabinet Depth	Vent Kit
20 5/8 to 23 3/4.	D-24
23 3/4 to 28 5/8	D-28
28 5/8 to 32	D-32

 - A. Apply mastic or sealant to back of air tube flange (B) slide through outside wall cut out and into furnace air channel.
 - B. Apply mastic or Sealant to back outer edge of vent grill (**Do not plug holes**). Slide assembly in over furnace exhaust tube, push into wall and secure with two screws.
10. Mounting: A. Secure furnace to compartment floor with two screws through holes in control box flange. **IMPORTANT:** To assure sufficient return air to the circulating blower, maintain specified clearances.
 - B. Install self trim door by sliding door flange over casing top flange and pushing in on bottom of door.

OPERATING INSTRUCTIONS

FA-79 "D" Models have direct spark ignition systems conforming to A.N.S. Z2120 standards, There is no pilot light. To place furnace in operation:

1. Turn gas valve to 'on' position (NOTE: Some models may be equipped with a gas valve that does not have a gas control knob).
2. Set thermostat to Lowest temperature setting, then to desired temperature (if thermostat has an "off" switch turn to "on").

NOTE: On initial lighting, the burner may not ignite due to air in the gas lines. Repeat step two as necessary until burner ignites.

FA-79 "P" Models have piezo ignition systems with pilot burners.

To place furnace in operation:

1. Turn gas valve to "off" position and thermostat to highest setting. Wait five minutes.
2. Turn gas valve knob to 'pilot' position.
3. Depress gas valve knob and light pilot by depressing igniter. Several strokes may be required if there is air in the gas lines.
4. Hold the knob in for about 30 seconds or until pilot remains burning when the knob is released.
5. Turn the gas valve knob to "ON" position and set thermostat to desired temperature.

NOTE: FAN SHOULD BE IN OPERATION WHEN TURNING GAS VALVE TO "ON" POSITION.

For Complete Shut Down - All Models

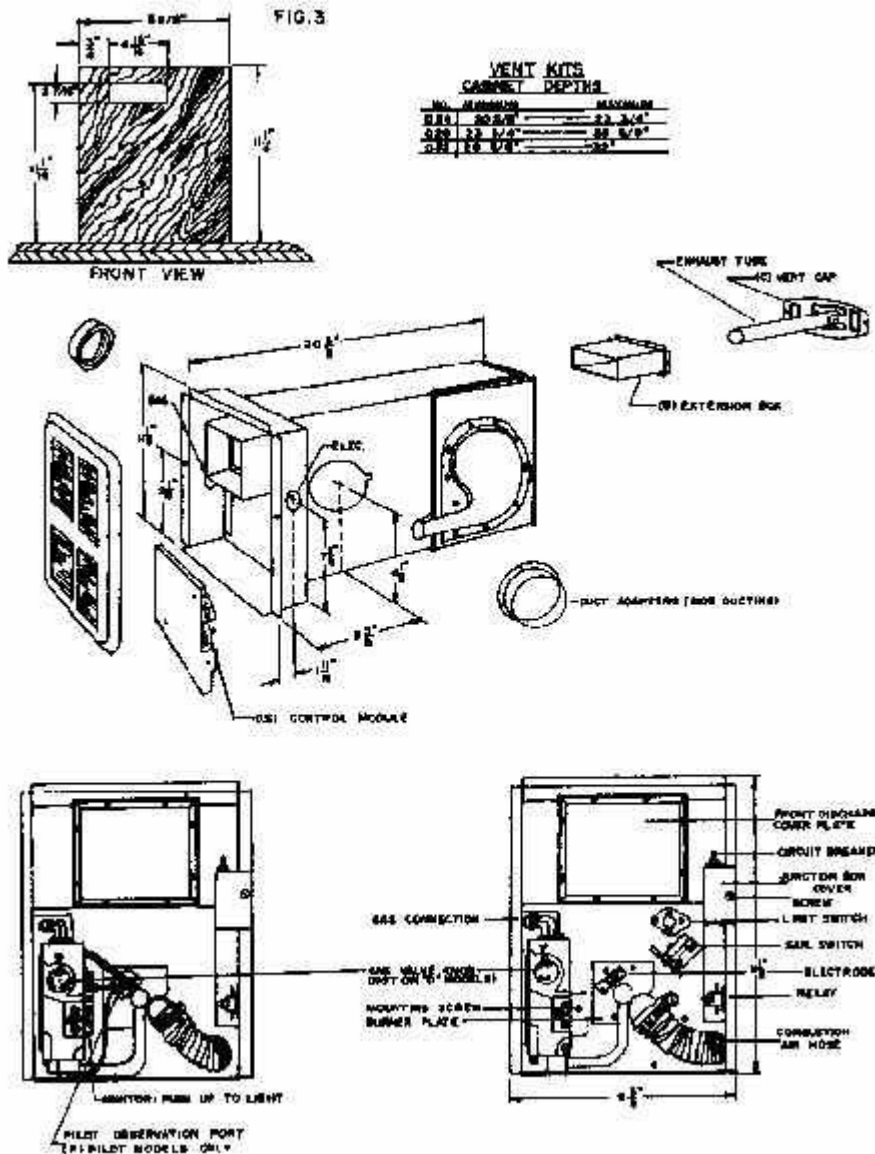
1. Turn gas valve knob to "off" position (on units with knob)
2. Set thermostat to lowest setting and/or 'off'

PREVENTIVE MAINTENANCE

1. Glean complete furnace and air box passageways periodically to remove dust, lint, etc.
2. Check gas system for leaks at least once a year.
3. Check and clean blower wheel annually,

IMPORTANT INSTALLATION & SERVICE INFORMATION

1. If coach is equipped with a dual AC/DC electrical system or a generator, make sure thermostat is turned to "OFF" before switching from one power source to another.
2. Do not attempt to alter the furnace for a positive ground system.
3. Do not replace any original wire with anything less than type rated at 105 deg. C or its equivalent.
4. Do not attempt to connect the furnace to 115 volt AC. power supply.
5. Do not operate the furnace with the electrode wire or the electrode assembly disconnected.
6. Do not operate the furnace through a battery charger.
7. Do not attempt field repairs on the electrical module on "D" models.
8. Do not install the furnace on top of carpeting or store flammable liquids or vapors in the vicinity.
9. Do not install furnace where clearances from combustible materials can not be maintained.
10. Do not attempt to ignite a direct ignition furnace with a match, torch, or flint type ignitors.
11. Do not make design changes or modify the furnace in anyway.
12. Do not attempt to convert the furnace to natural gas.
13. Do not install the furnace where it can not be easily removed for service.



14. If located in a range or storage compartment, provide an enclosure to isolate the furnace return airways.

