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# **SECTION ONE**

## **Site Preparation and Installation**

### **SITE PREPARATION**

#### **PLACEMENT**

The Glenwood should be installed pursuant to all applicable federal, state, and local codes. The boiler should be placed on a level, non-combustible surface. Clearances should comply with all applicable mechanical codes. At the very least, there should be enough room around the Glenwood to allow easy access for service and maintenance. Side and rear clearances to combustibles shall be no less than twelve inches. Front clearances should be no less than 48" to allow for easy loading of the firebox. Overhead clearances should be no less than eighteen inches. These are minimum clearances and may be superseded by codes and ordinances. When using as an outdoor boiler, install on a level, concrete pad. Protect boiler from exposure to the elements.

#### **CHIMNEY AND STOVE PIPE CONNECTIONS**

The Glenwood should be connected to a correctly sized chimney to maintain proper draft. Models 7020, 7030, and 7040 require an 8" or larger chimney. Models 7050, 7060, 7070, and 7080 require a 10" or larger chimney. Stove pipe clearances should conform to chimney manufacturer's recommendations and applicable codes and ordinances. Minimum clearance requirements to combustibles are as follows: Single wall pipe = 16"USA/18" CAN; Double wall pipe = 6"USA/8"CAN. Be sure the chimney is clean and in good repair. Install a stainless steel chimney flue liner. Keep the boiler as near to the chimney as possible. Outdoor applications require a stainless steel, double wall, insulated chimney pipe at least ten feet high. Guy wires will be needed for chimney support. The Glenwood will perform equally well with masonry or stainless steel chimneys providing they are insulated.

A barometric damper may need to be installed between the boiler and the chimney if the draft is too strong.

### **INSTALLATION**

#### **WATER SUPPLY AND RETURN**

There are two larger fittings on the top of the boiler. The front one is the recommended supply. The center one can be used for a second supply but must have an automatic air bleeder installed. The returns are located at back and near the bottom of the boiler. One of those fittings should have a boiler drain installed. Supply and return size piping should be no less than 1". An appropriate size expansion tank should be used. Calculate the amount of water capacity the heating system holds and size accordingly.

#### PRESSURE/RELIEF VALVE

The pressure/relief valve (supplied) should be installed on the port nearest the back and on the right side of the top of the boiler. A down-pipe must be installed on the relief valve to safely discharge the hot water. Do not use other types of relief valves.

#### TEMPERATURE/PRESSURE GAUGE

Install the temperature/pressure gauge in the top rear of the boiler using a  $\frac{3}{4}$ "x $\frac{1}{2}$ " steel bushing. Do not use a nipple to increase the height of the gauge. This will cause the gauge to read inaccurately.

#### SAFETY AQUASTAT

A safety aquastat is provided to prevent the water from boiling in case of the boiler over-firing. Install in the top rear of the boiler and connect it to the largest heat zone. Set control to 200°. See control wiring diagrams. This will dump any excess heat into the heat zone thereby protecting the boiler.

#### OPERATING TEMPERATURE

The operating temperature should be adjusted to approximately 180°F. (Read the instructions for the Honeywell 4081B or 6081A aquastat for adjustment procedures.) If the Glenwood is being used as an "add-on", adjust the aquastat on the existing boiler to 140°F.

#### AQUASTAT SETTINGS (wood only or wood/coal)

The draft blower shuts down when the water temperature reaches the “HI” setting on the aquastat, bringing the fire down to idle stage. Set to 180°F. Never set below 160°F. If the Glenwood is your only boiler, the “LO” setting is used to provide power to the zone control. When the Glenwood is an “add on” to your existing boiler, this side of the aquastat is used to provide power to the circulator between the two boilers. This should be set at 140°F.

#### AQUASTAT SETTINGS (multi-fuel)

The draft blower shuts off when the water temperature reaches the “HI” setting on the triple aquastat (Honeywell 6081A) bringing the fire down to an idle. This “HI” setting should be set to 180°F. When the water temperature falls to ten degrees below that setting, the draft blower will restart. If there is enough wood or coal in the firebox, the fire will automatically flare up and heat the water until the “HI” setting is once again reached. If there is no wood or coal to burn, the draft blower will run until the water temperature falls to the “LO” setting. It then shuts off, and the actuator opens the oil burner isolator inside the combustion chamber behind the firebox. Once that isolator is open, the oil burner will fire and maintain the water temperature at the “LO” setting until the wood or coal fire is re-established. The “LO” setting should be set to 140°F.

A dual aquastat (Honeywell 4081B) powers the triple aquastat (Honeywell 6081A). The “HI” setting should be set to 200°F. This provides a safety shut down if the boiler over-fires. The “LO” setting provides power to the zone control. This should be set to 120°F.

#### PLUMBING

Approved pipe must be used in the installation process. This includes copper, steel and certain kinds of plastic. Do not use rubber hose. If using plastic, make sure it has a vapor barrier and sufficient temperature rating to handle 240° water. Failure to follow this spec will void the warranty. Supply and return piping should be no less than one inch in diameter. In radiant floor heat applications, install a mixing valve(s) between the supply and return lines to modulate floor water temperature. Air bleeders should be installed at the highest points in the system. You can never use too many air bleeders. It’s better to put in extra than not enough. Follow the plumbing diagrams on page five.

In radiant floor heat applications, mixing valves must be installed to keep the boiler temperature at 180°F and the floor temperature at 120°F. Do not attempt to run the boiler temperature below 120°F. This will void the warranty.

## **ILLUSTRATIONS**

## ELECTRICAL

The Glenwood is shipped prewired and only needs 120V, 60HZ current from a 20 amp breaker dedicated to the boiler. Multi-fuel boilers come with a toggle switch that line voltage is connected to. For wood only or wood/coal models, line voltage is wired into the Honeywell dual aquastat (4081B). See control wiring diagrams. Be sure to follow all federal, state, and local codes and ordinances that pertain to electrical.

## OIL BURNER (if equipped)

Install oil burner in accordance with the oil burner owner's manual provided. Be sure to read the primary control manual also to familiarize yourself with its operation.

## DOMESTIC COIL HOOK-UP (if equipped)

The cold water from the pressure tank should be diverted into the Glenwood's domestic coil before entering the water heater. From the coil, the heated water should enter the existing water heater where the cold water normally enters. The thermostat on the existing water heater should be adjusted to a lower setting so the water heater serves as a back-up. A tempering valve must be installed to control tap water temperature. Coil flow capacity is 5 GPM.

## **FORCED DRAFT SYSTEM**

The forced draft system consists of a draft blower mounted on the firebox door with a draft box mounted to the side. The draft blower is controlled by the aquastat and automatically shuts down when the water temperature setting is reached. A switch on the fan allows the operator to shut the fan off if he so desires. Multi-fuel models have a double throw switch with three positions marked as follows: "A" for automatic oil backup, "O" for OFF, and "W" for operating the boiler without oil burner back-up. If the switch is set to "W", the blower will continue to run even if the boiler temperature is below 140°F. See description under "AQUASTAT SETTINGS". Because of this, the switch on the oil burner must be turned off whenever the blower switch is set to "W".

The draft box serves as a control for the air going into the blower. A flapper in the box opens when the fan runs and shuts when the fan quits. An adjustable draft control plate on the underside of this box meters the amount of air allowed into the fan when it is running. Normally, this plate should be open about ½" when burning wood and may need to be open almost the whole way for burning coal, depending on the size of the coal. If not enough heat is being generated by the fire to meet the demand, this plate can be opened

further. Keep in mind that the further open it is the faster the wood or coal will be consumed.

When adjusting the draft control plate, make sure a positive draft is still maintained inside the firebox. A simple way to check this is to hold a lighted match to the inspection hole located in the firebox door just above the draft blower. If the draft control is set correctly, the flame will always pull into the firebox. Check the draft intensity when the fire is at a relatively low stage.

## **INSPECTION OPENING**

Just above the draft blower on the firebox door, there is a hole with a plug in it. This inspection opening serves a dual purpose. It allows the operator to safely monitor the fire without opening the door. Also, it allows a small amount of air to flow into the combustion chamber and out the chimney thereby keeping dangerously explosive sulfur gases from building up in the combustion chamber when burning coal. For this reason, the plug must be removed when burning coal and reinstalled when burning wood.

## **COAL PLATES (with optional grate)**

Upon opening the firebox door, you will notice one horizontal plate near the bottom of the door frame and one vertical plate behind it. These are air diverter plates to divert air from the draft blower down under the grates for burning coal. When burning wood these plates should be removed. With the boiler cold and the firebox empty of fuel and ashes, remove the horizontal plate first. Afterwards, slide the vertical plate slightly to the left, push left side in and remove plate. When reinstalling, repeat the steps backward. Make sure the vertical plate rests on the grate frame and leans against the inside of the door frame.

## **SECTION TWO**

## **OPERATION OF STOVE**

### STARTING A WOOD FIRE

Open the door and pull the bypass damper forward. This will increase the draft and keep smoke out of the building. Place several pieces of crumpled newspaper on the floor of the stove (on the grates if equipped) right inside the door. On top of this place several pieces of dry kindling. Light the newspaper and close the door. Make sure the draft blower is running. **DANGER!! DO NOT use lighter fluid, gasoline or any other flammable liquid in starting the fire! Serious injury or death could result.**

After the kindling has caught fire, add a few larger pieces of wood. When the fire is burning nicely, fill the firebox and close the door. Remember to close the bypass damper.

### STARTING A COAL FIRE

Before starting the coal fire, the grate must be covered with a two inch layer of ashes. Failure to do this can result in warped grates. Make sure the coal plates are properly installed. The inspection opening and the secondary air holes must be open. (Remove the two knockout plugs located under the smoke box.) Follow the same procedures as starting a wood fire. Use newspaper and kindling followed by medium sized chunks of wood. Allow them to burn for approximately one hour or until the wood has changed to red hot charcoal. Apply a thin layer of coal over the entire firebox. After the flames have been coming through the coal bed nicely, apply another layer. Repeat this process until there is about a six inch deep coal bed. After the fire is well established, more coal can be thrown in. Coal can be hard or soft and should be pea size for the smaller boilers and nut or a mixture of pea and nut for the bigger boilers.

### RELOADING AND MAINTAINING THE COAL FIRE

Before reloading, shake the grates until you see hot coals falling into the ash pan. At this point, **stop shaking**. Griddling the coal bed too hard can destroy the grates. Even out the coal bed with the coal rake. Push the dead spots toward the bottom of the bed and chop up the crust. Do not just sprinkle more coal on top but put in a thick layer. Be careful not to smother the fire by covering all the red coals. A good practice is bank the new coal up against one side of the firebox leaving a place along the other edge for the flames to come through. If the coal fire is smothered, dangerous amounts of sulfur gas and carbon dioxide can build in the firebox. Then when the flame does burst through, there can be an explosion.

## ASH REMOVAL

Allow the fire to burn fairly low before removing the ashes. Shovel out the fine ash in the front of the firebox taking care not to remove the hot coals situated nearer the back. Once this is accomplished, rake the hot coals front and resupply with wood.

On models with shaking grates, do not shake the grates too frequently. When burning wood, once every other week is probably sufficient. Once hot coals start falling into the ash pan, stop shaking. When the ash pan gets full, open the ash pit door and slide the ash pan out. It can then be easily carried to the ash disposal site. After the ash pan is back in, make sure the door is shut and latched securely.

## **MAINTENANCE**



### SUMMER SHUTDOWN

1. Clean the fin type secondary heat exchanger using the fin scraper provided with the boiler.
2. Using a wire brush, clean the creosote deposits from the sides of the firebox. Make sure secondary air holes are open.
3. Remove the cleanout cover on the back of the smoke box and scrape out all ash and dirt.
4. Brush your chimney with a proper chimney brush.
5. Be sure to remove all the ashes. Damp ashes are corrosive.

### ANNUAL MAINTENANCE (prior to heating season)

1. Clean your chimney.
2. Have the boiler and all controls checked by your service man.

## **TROUBLE SHOOTING**

PROBLEM

POSSIBLE SOLUTION

1. Stove smokes when door opens
  - a. Open smoke bypass before opening door
  - b. Check for clogged chimney or stove pipe
  - c. Install a draft inducer
  
2. Can't hold fire overnight
  - a. Reduce draft intake
  - b. Load stove harder
  - c. Reduce heat demand
  
3. Very poor combustion
  - a. Burn dryer wood
  - b. Add less wood and allow more draft
  - c. Pull hot coals forward before loading
  
4. Stove puffs smoke through normal use
  - a. Check for down draft
  - b. Check for clogged pipe or chimney
  - c. Be sure chimney is high enough
  - d. Check draft with meter
  - e. Install draft inducer
  
5. Over-firing
  - a. Make sure all doors get shut properly
  - b. Check door gaskets
  - c. Make sure chimney draft is not too strong. See DIRECTIVES ON WOOD BURNING EFFICIENCY Draft Objectives.

Consult your Glenwood dealer