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User's, Maintenance and Service Information Manual

15 Thru 25 Ton Single Package Air Conditioner Gas/Electric & Electric/Electric

The manufacturer recommends that the "User" read all sections of this manual and keep the manual for future reference.

▲WARNING

Fire or explosion hazard

Failure to follow safety warnings exactly could result in serious injury, death, or property damage.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

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.
- Leave the building immediately.
- 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.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

Safety information

For your safety

- Make sure that the furnace area is clear and free of combustible materials, gasoline, and other flammable vapors and liquids.
- Make sure that the furnace is free and clear of insulating material. Examine the furnace area after installation of the furnace or the installation of additional insulation. Some types of insulation are combustible.
- For proper operation of this furnace, air for combustion and ventilation is required. Make sure that these openings are not obstructed.
- For lighting or shutting down this furnace, refer to the lighting instructions provided adjacent to the burners. See *Shutting down the furnace* and *Lighting the furnace* on page 3.
- A blocked vent roll-out switch is provided in the burner compartment. This switch is a manual reset. If the furnace fails to operate, contact a qualified service technician.
- If the gas supply fails to shut off or if the furnace overheats, shut off the gas valve to the furnace. Then shut off the electrical supply and contact a qualified service technician.
- Do not use this furnace if any part has been under water. A flood-damaged furnace is extremely dangerous. Attempts to use the furnace can result in fire or explosion. Contact a qualified service technician to inspect the furnace and to replace all gas controls, control system parts, and electrical parts that have been wet, or the furnace if deemed necessary.
- Determine the integrity of the installation regarding the flue gas vent, and the return and supply air duct. Confirm that the equipment is well supported and that there are no signs of deterioration. The manufacturer recommends that the main burner, ignition device, and controls are inspected by a qualified service technician before each heating season.

System operation

Thermostats

Set your thermostat for either heating or cooling then set it for the required temperature.

IMPORTANT: Do not move the thermostat rapidly on and off, or from heat to cool. This could damage your equipment.

Always allow at least 5 minutes between changes. Find the temperature that is most comfortable to you and then do not change the thermostat setting. An exception is for night or vacation set back to conserve energy.

Manually moving the thermostat up or down does not speed up temperature changes in your rooms. This only causes the thermostat switch to function at your command rather than responding to room temperature.

Heat generated by devices other than the furnace may interfere with thermostat performance. Therefore, do not place items such as lamps, radios, and television sets near the thermostat.

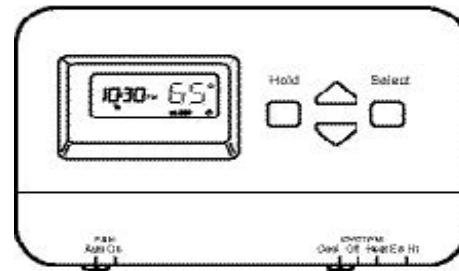


Figure 1 - Typical thermostat

Intermittent ignition device

Your unit is equipped with a cycling pilot burner. It has a pilot relight control designed to automatically light the pilot burner each time the thermostat calls for heat.

CAUTION

This furnace is equipped with an intermittent pilot and automatic re-ignition system. **Do not** attempt to manually relight the pilot. This could result in personal injury.

When the thermostat calls for heat, pilot gas is supplied and at the same time sparking occurs to light the pilot gas. With the pilot lit, the flame sensor rod closes a circuit to the igniter control. The igniter control then opens the gas valve to admit the main burner gas.

When the temperature reaches the required setting, the electrical circuit to the gas valve opens. This simultaneously closes off both the main burner and the pilot gas. If the pilot burner fails to light, contact your heating contractor or gas utility for service to insure that proper operating conditions are restored.

Input

The correct heat capacity of the furnace is regulated by the burner orifices and the gas pressure. The proper orifices are provided but the gas pressure regulator must be adjusted by the installer or gas utility service technician.

Operating instructions

Shutting down the furnace

1. Close the main gas shutoff valves.
2. Turn off the electric power supply.

Lighting the furnace

NOTE: Do not light the furnace manually.

1. Open the main gas shutoff valves.
2. Adjust the set point of the room thermostat above the temperature in the space.
3. Turn on the electric power supply.

The draft fan operates. After an adequate purge time, the electric spark igniter lights the burners.

The burners extinguish and relight automatically upon the demand of the room thermostat.

Vent safety system

This gas furnace is equipped with an automatic reset high temperature sensor or rollout switch. In the unlikely event of a sustained main burner flame rollout, the switch shuts off the flow of gas by closing the main gas valve. The ignition modules are also disabled to prevent the flow of gas to the valves. The switch is located inside the gas heat access panel above the burner inlet.

Flame rollout can be caused by blockage of the power vent system, and improper gas pressure or adjustment. If this event occurs, the furnace does not operate properly. Shut off the gas supply to the furnace and do not attempt to place the furnace in operation. Contact a qualified service technician to inspect the system. See Figure 2 for a typical installation.

100% shut off

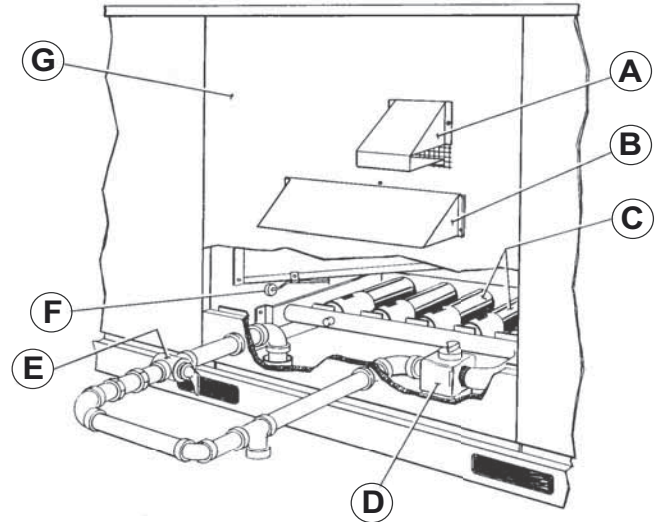
The ignition modules are designed for 100% shut-off. If the furnace fails to ignite within 85 seconds after a call for heat, the flow of gas including the pilot is shut off and the ignition module locks out.

To reset the module, complete one of the following actions.

- Turn the system switch on the room thermostat to the OFF position and back to the HEAT position.

- Decrease the set point of the room thermostat below the temperature in the conditioned space and return it to its original setting.
- Open and close the unit's main disconnect switch.

If the furnace continues to lock out, contact a qualified service technician to determine the cause of the problem.



A	Vent outlet	E	Field installed main gas shut-off valve (mounted externally)
B	Combustion air intake	F	Flame rollout switch
C	Burners	G	Gas heat access panel
D	Gas valve		

Figure 2 - Typical installation

WARNING

Electrical shock, fire, or explosion hazard

Failure to follow safety warnings exactly could result in dangerous operation, serious injury, death or property damage.

Improper servicing could result in dangerous operation, serious injury, death or property damage.

- Before servicing, disconnect all electrical power to furnace.
- When servicing controls, label all wires prior to disconnecting. Reconnect wires correctly.
- Verify proper operation after servicing.

WARNING

Prior to any of the following maintenance procedures, shut off all power to the unit to avoid personal injury.

Explain unit function

When the system is functioning properly, show the owner the location of all the disconnect switches and the thermostat. Explain how to start and stop the unit and how to adjust temperature settings within the limitations of the system. Advise that the flue exhaust hood surface and the immediate area experience high temperatures during the heating cycle, and that all unauthorized personnel and debris must be kept away from this area.

General maintenance

In order to insure long and trouble free service from your system, we recommend periodic inspection, cleaning, lubrication, and adjustment by your installing dealer or contractor. Be sure to ask about this service. For those who prefer to do-it-yourself, follow the instructions listed below to care for your system.

Make sure that snow or debris does not accumulate in or around the unit. Make sure that overhanging structures or shrubs do not obstruct the outdoor air discharge, combustion air inlets, or vent outlets on your unit. These provide air for combustion and ventilation. Adequate air is important to the safe and proper operation of the unit.

Heating system inspection

It is the owner's responsibility to insure that an annual inspection of the entire heating portion of the unit is made by a qualified service technician. This must include inspection of the burner, heating element, and flue for any corrosion or soot accumulation that may require cleaning. The burner and controls are also checked for proper operation.

In addition, at least once during the heating season, the owner must make a visual inspection of the flue outlet for evidence of black soot or blockage of flue outlet by leaves or other debris. If you find any soot, contact a qualified service technician immediately. If any blockage is found, it must be cleared immediately.

Inspecting the unit

To inspect the unit, complete the following actions.

- Check for obvious signs of deterioration of the unit.
- Check that the return and supply ducts attached to the unit are sound and air tight.
- Check that the unit's physical support, concrete slab, or roof curb is sound and not in need of repair.
- Make sure that there are no gaps between the roof curb and the unit where rain could leak into the building.
- Start the furnace. Check that the vent motor starts, the igniter starts to spark and ignites the pilot flame. After a short delay the main burner ignites.

If the main burner does not ignite, contact a qualified service technician for assistance.

- Check the appearance of the main burner flame. Adjust the burner shutters so that no yellow flame is observed in the heat exchanger tubes. See Figure 3.

If you cannot adjust the flame, obtain the assistance of a qualified service technician and refer to the *Pilot Checkout* and *Burner Air Shutter Adjustment* sections in the Unit Installation Instruction.

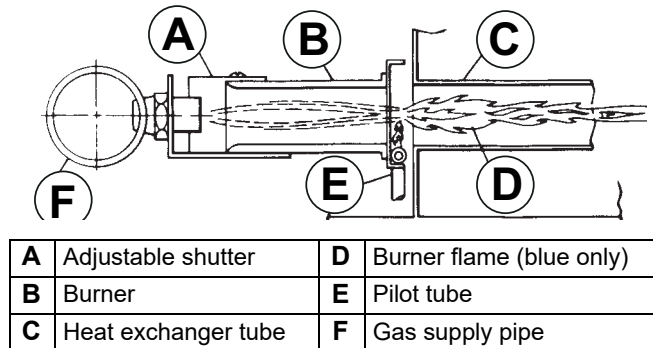


Figure 3 - Typical flame appearance

Burner and pilot check

Periodically, at least annually at the beginning of each heating season, make a visual check of the pilot and main burner flame. If necessary, adjust the main burner primary air shutters to give a distinct, sharp blue flame as explained in the *Burner Air Shutter Adjustment* section in the Unit Installation Instruction. If it is not possible to adjust for the proper flame, the burners may need cleaning.

Cleaning burners

Remove the burners from the furnace as explained in the *Burner Instructions* section in the Unit Installation Instructions. Clean the burners with a wire brush and vacuum as needed.

Cleaning flue passages and heating elements

With proper combustion adjustment, the heating element of a gas fired furnace seldom needs cleaning. If the element becomes sooted, complete the following steps to clean the element.

1. Remove the burner assembly as outlined in the *Burner Instructions* section of the unit installation instructions.
2. Remove the unit roof from over the gas heat section.
3. Remove the top plate and the top draft blower wheel from the upper draft blower housing.
4. Remove the screws holding the top of the flue collector box. Carefully remove the top of the flue collector box with-

out ripping the adjacent insulation. Then remove the center divider plate separating the upper and lower flue boxes.

5. On the inside of the flue collector box, remove the flue baffles from the tube interiors. Note the last bend of the baffle fits tightly against the tube forcing the end of the baffle to lock into the tube collar. This collar is formed when the tube is expanded into the end sheet. To remove, move the end of the baffle towards the center of the tube releasing the end of the baffle from the tube collar, then pull it out of the tube. See Figure 4.
6. Using a wire brush on a flexible wand, brush out the inside of each heat exchanger from the burner inlet and flue outlet ends.
7. Brush out the inside of the flue collector box and the flue baffles.
8. Run the wire brush down the vent hoods from the flue collector end.
9. If soot build-up is particularly bad, remove the vent motor and clean the wheel and housings. Run the wire brush down the flue extensions at the outlet of the vent housings.
10. After brushing is complete, blow all brushed areas with air or nitrogen and vacuum as needed.
11. Replace the parts in the order that they were removed in steps 1 thru 5.
12. When you replace the center and top of the flue collector box, be careful not to tear the adjoining insulation.
13. Ensure that all seams on the vent side of the combustion system are air tight. Apply a high temperature (+500°F) sealing compound where needed.

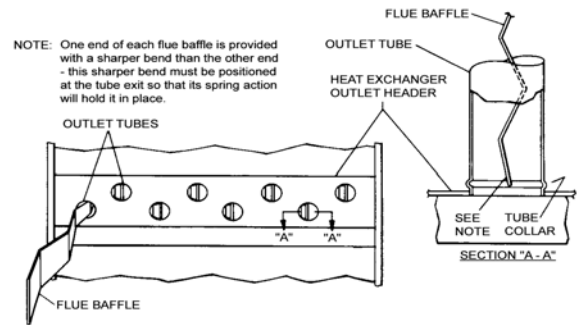


Figure 4 - Typical flue baffle installation

Air filters

All units contain 2-inch filters. Filters can be installed in the building at a suitable return air location if an economizer or outside air accessory is not used.

NOTE: Do not operate the unit without a filter.

Inspect filters once a month. Thoroughly clean the filters or replace them if it appears that they are beginning to accumulate excessive dirt. Table 1 shows filter sizes and quantities.

Table 1: Filter sizes

Throwaway filter sizes (Inches)	Quantity per unit (nom, tons)			
	15 ton Std & high eff.	15, 20, 25 ton reheat 20 ton std & high eff.	25 ton std eff.	15 - 25 ton ultra high eff.
12 x 24	-	-	12	12
16x 20	-	4	-	-
16 x 25	-	4	-	-
18 x 24	5	-	-	-

Installing air filters

1. Remove the filter access panel located to the left of the condensate drain connection. See Figure 5.

NOTE: Install the filters with the Air Flow arrows pointing inward towards the indoor coil. In the event the spacers in the filter section are removed, they must be reinstalled in their original position.

2. Slide the filters all the way into the filter racks provided. When more than one filter in a filter rack is required, they must butt each other when you slide them into position.
3. Replace the filter access panel.

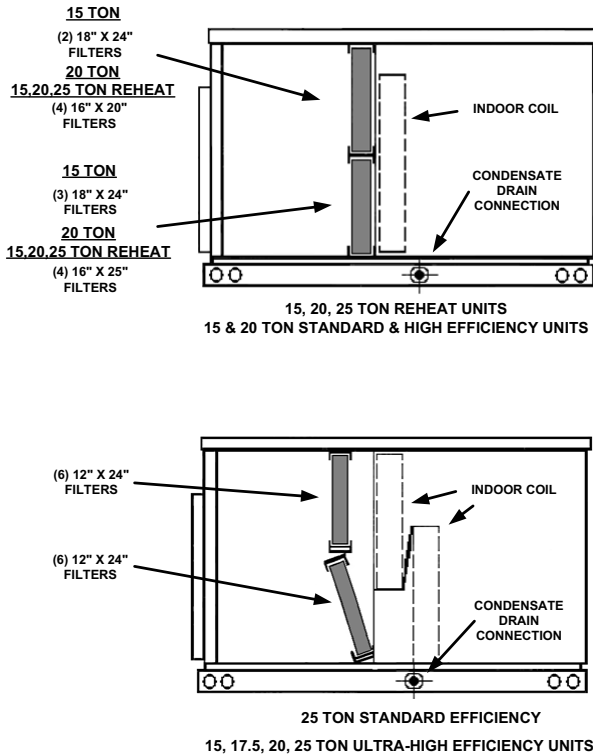


Figure 5 - End view less filter access panel

Economizer

Even with good filters properly in place, the economizer assembly can become dust laden after many months of use. Inspect the entire assembly annually. If the assembly is heavily coated with dust, you can brush and clean it with a vacuum cleaner. A common aerosol contact cleaner can help remove excess accumulation.

After the dust and debris is removed, apply a silicon based spray lubricant to each of the gears used to connect and ensure proper alignment of the damper blades.

WARNING

Perform all maintenance operations on the damper assembly with power disconnected. Do not clean or lubricate with the unit in operation.

CAUTION

Excessive lubrication may accelerate the accumulation of dust.

Blower assembly

Even with good filters properly in place, blower wheels and motors can become dust laden after many months of operation. Inspect the entire blower assembly annually. If the motor and wheel are heavily coated with dust, you can brush and clean them with a vacuum cleaner.

Blower shaft bearing

Inspect blower shaft bearings on a monthly basis. At a minimum, re-lubricate the bearings every 6 months using a lithium-based grease (NLGI grade 2) recommended for ball bearing service.

WARNING

Perform all maintenance operations on the blower motor with electric power disconnected from the unit. Do not attempt to lubricate bearings with the unit in operation.

CAUTION

Damage can occur if the bearings are overlubricated. Use grease sparingly.

Motors

Outdoor fan motors are permanently lubricated and require no maintenance.

Ventor motor is factory lubricated for an estimated 10-year life.

Indoor blower motor and drive

The indoor blower motor features ball bearings that do not require periodic lubrication. Periodic lubrication of the motor and bearings can extend the life of components but is optional.

Every three years, use a low pressure grease gun to pump grease into the bearing grease fitting until grease just begins to show at the seals. Do not over lubricate. Use any lithium base grease recommended for ball bearing service.

Condenser coil

Check the outdoor coil annually. Clean the coil as often as necessary to keep the coil clean. Clean any debris and dirt from the outside coil face with a brush being careful not to damage the fins. If the coil is extremely dirty, you can use a hose to wash the coil from the inside out. You can brush a soapy solution on the outside.

Registers

Supply and return air registers must be open when the unit is in operation. Make sure that obstructions do not block the air-flow in or out of the registers.

Installation information

OWNER please have your installer fill in the following information immediately after unit has been installed and is properly operating.

Installed by _____

Installer's Address _____

Installation Date _____

Owner's Name _____

Owner's Address _____

Equipment installed at (address) _____

Model Number _____ Serial Number _____

Distributor from whom the equipment was purchased _____

The owner should keep this information in a place where it can be found if needed for warranty purposes.

Troubleshooting

Before you call a service person, complete the following checks.

- Check the thermostat settings and insure that the thermostat is calling for heat or cooling.
- Check the thermostat for lint.
- Check the fuses or circuit breakers.
- Check the filters for excessive dust accumulation.

