

# HIGH ECONOMY GAS FURNACE USER'S INFORMATION MANUAL

**WARNING:** If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- 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.
  - 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.

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MANUAL 2100-204 REV.  
SUPERSEDES REV.

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## GENERAL

The warnings shown on the cover of this manual and the information on the following pages are very important and should be fully read and understood by the operator of this equipment. Please take the few minutes necessary to completely read this booklet, and if there are any questions when you are through, ask your installer to review them with you. Please retain this booklet for future reference.

## CLEARANCES

There are certain minimum installation clearances from the furnace cabinet and sheet metal plenum attached to the top of the furnace to any combustible materials. These clearances for each model of furnace are shown on the furnace rating plate (located in the burner compartment) and are the responsibility of the furnace installer during the installation of the appliance.

It is the user's responsibility to make sure these clearances are always maintained thereafter. Additionally, a minimum of 24 inches of serviceability of furnace is required from the front of all models.

A furnace installed in an attic or other insulated space must be kept free and clear of insulating material. The furnace area should be examined when the furnace is installed or when any additional insulation is added. Some insulating materials may be combustible.

<b>NOTICE -- BE SURE TO OBSERVE THE FOLLOWING RULES:</b>
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1. **DO NOT** allow any cardboard, newspapers, or any other combustible material (this includes wood, 2 x 4's, etc.) within the above specified minimum clearances. This includes placing any combustibles on or against the sheet metal plenum attached to the top of the furnace.
2. **DO NOT** use this furnace if any part has been under water. Immediately call a qualified service technician to inspect the furnace and to replace any part of the control system and any gas control which has been under water.
3. The equipment area is to be kept clear and free of combustible materials, solvents, painting supplies, and any other flammable vapors or liquids.

## COMBUSTION AND VENTILATING AIR

Whether your furnace is installed in a closet, basement, garage or other location as dictated by the particular application, an adequate source of fresh outside air has been provided by the installer to allow proper combustion and venting of the products of combustion to the outside of the building.

It is again the responsibility of the user to assure that this important flow of combustion and ventilating air is not obstructed from reaching the furnace.

Do not block or obstruct air openings on the furnace, air openings communicating with the area in which the furnace is installed, and the spacings around the furnace.

## LIGHTING AND SHUTDOWN INSTRUCTIONS

Reference should be made to Figures 1 and 2 for general location of components referenced in the following "Lighting Instructions".

<b>IMPORTANT</b>
Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the furnace before shutting off the electrical supply.

FIGURE 1

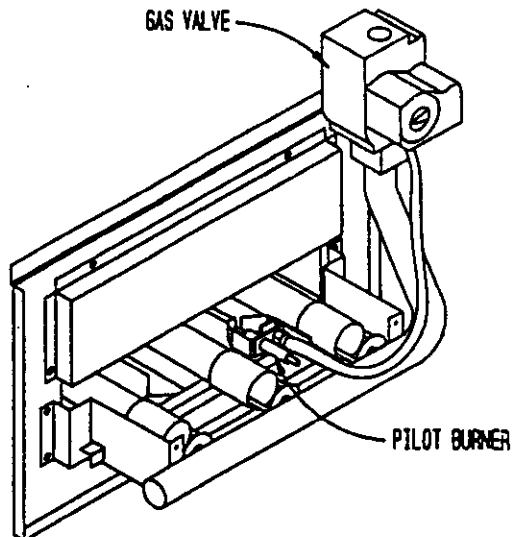


FIGURE 2

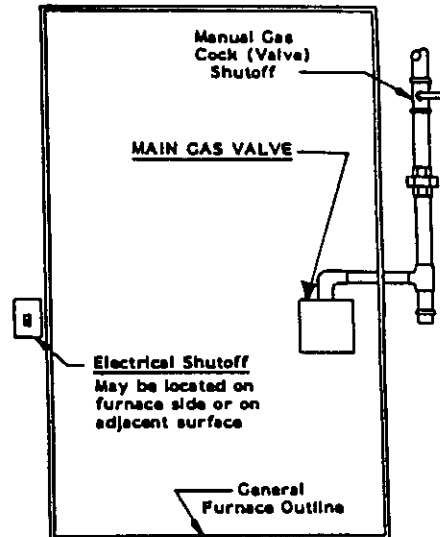




FIGURE 3  
ALL MODELS

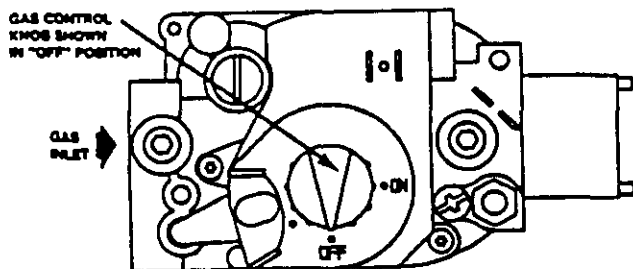
## FOR YOUR SAFETY READ BEFORE OPERATING

**WARNING:** If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.


- A. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
- B. BEFORE OPERATING smell all around the appliance area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.
- WHAT TO DO IF YOU SMELL GAS**
- Do not try to light any appliance.
  - Do not touch any electric switch; do not use any phone in your building.
  - Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.
- C. If you cannot reach your gas supplier, call the fire department.
- C. Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand, don't try to repair it, call a qualified service technician. Force or attempted repair may result in a fire or explosion.
- D. Do not use this appliance if any part has been under water. Immediately call a qualified service technician to inspect the appliance and to replace any part of the control system and any gas control which has been under water.

## OPERATING INSTRUCTIONS

1. STOP! Read the safety information above on this label.
2. Set the thermostat to lowest setting.
3. Turn off all electric power to the appliance.
4. This appliance is equipped with an ignition device which automatically lights the pilot. Do not try to light the pilot by hand.
5. Remove control access panel.
6. Push in gas control knob slightly and turn clockwise  to "OFF".  
**NOTE:** Knob cannot be turned to "OFF" unless knob is pushed in slightly. Do not force.
7. Wait five (5) minutes to clear out any gas. Then smell for gas, including near the floor. If you smell gas, STOP! Follow "B" in the safety information above on this label. If you don't smell gas, go to the next step.
8. Turn gas control knob counterclockwise  to "ON".
9. Replace control access panel.
10. Turn on all electric power to the appliance.
11. Set thermostat to desired setting.
12. If the appliance will not operate, follow the instructions "To Turn Off Gas To Appliance" and call your service technician or gas supplier.



## TO TURN OFF GAS TO APPLIANCE

1. Set the thermostat to lowest setting.
2. Turn off all electric power to the appliance if service is to be performed.
3. Remove control access panel.
4. Push in gas control knob slightly and turn clockwise  to "OFF". Do not force.
5. Replace control access panel.

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## AIR FILTERS

It is the user's responsibility to check the condition of the air filters on at least a monthly basis when the furnace is in use and to clean or replace whenever it is necessary.

PERMANENT TYPE FILTER (usually foam type) are washable. Use a solution of soapy water followed by a rinse in clear water and then dried by tapping the frame against a solid object.

**NEVER** operate a furnace without a filter.

**NEVER** substitute a throwaway (fiberglass) for a permanent (foam) type.

TABLE 1

FILTER SIZES FOR GAS FURNACES	
Model	Size
NIL85D42D Lo-Boy	(2) 9-1/2 x 20 P
NIL115D48A Lo-Boy	(1) 10 x 20 P (1) 13 x 20 P
NIL145D60A Lo-Boy	(2) 13 x 20 P
NIH60D36B Hi-Boy	(1) 16 x 25 P
NIH85D48D Hi-Boy	(1) 16 x 25 P
NIH115D48B Hi-Boy	(1) 16 x 25 P
NIH115D60A Hi-Boy	(1) 20 x 25 P
NIH145D60A Hi-Boy	(1) 20 x 25 P
NIC60D36A Counterflow	(1) 15 x 20 P
NIC85D42D Counterflow	(2) 10 x 20 P
NIC115D48A Counterflow	(1) 15 x 20 P (1) 10 x 20 P

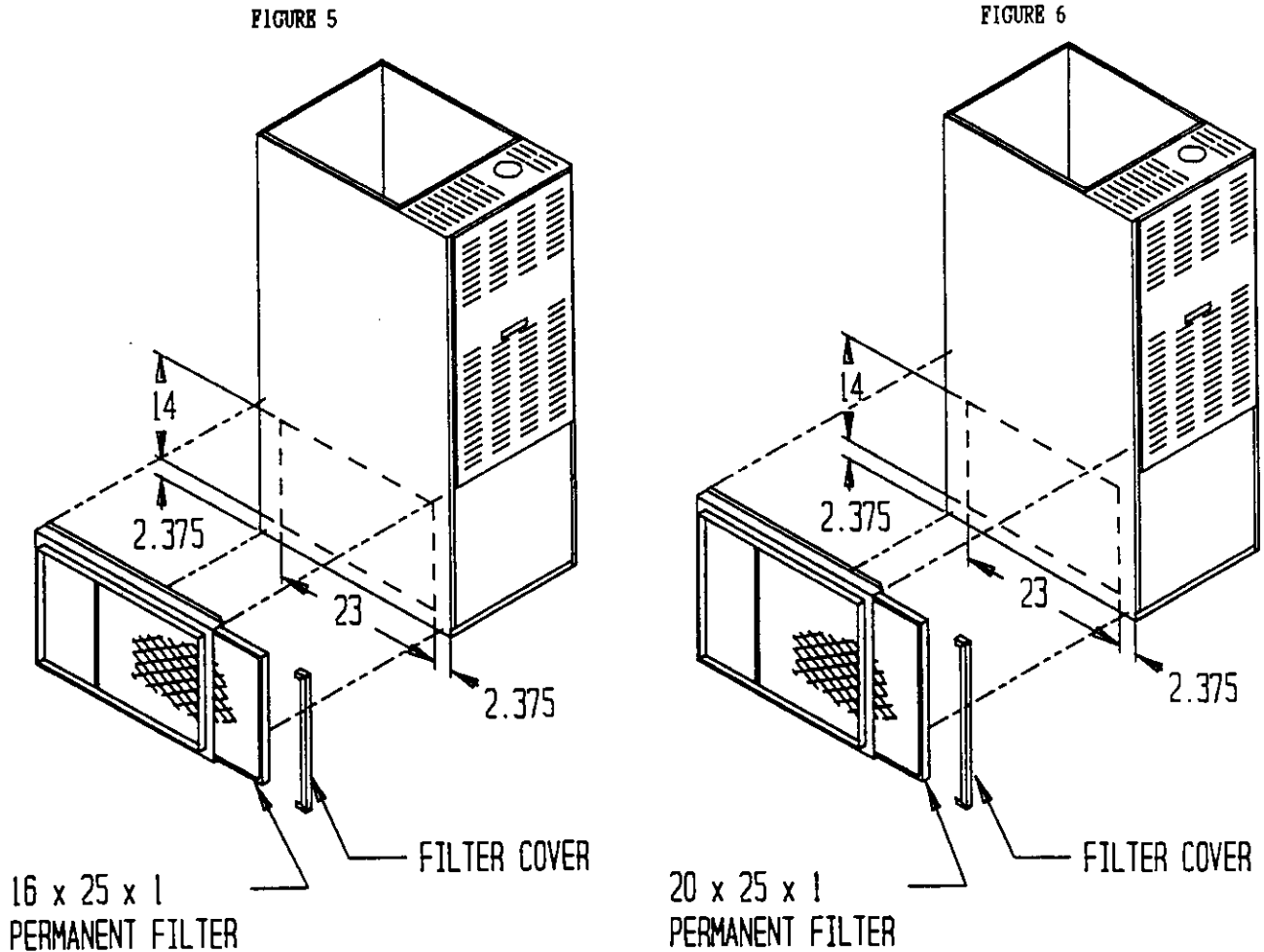
P - Permanent

## FILTER LOCATIONS--REMOVAL AND REPLACEMENT PROCEDURES--ALL HI-BOY MODELS

16 x 25 x 1 external filter racks are supplied as standard equipment for all NIB models (20 x 25 x 1 is standard for NIB115D60A and NIB145D60A models). A 14 x 23 opening is to be cut into either the left or right side of the furnace depending upon installation requirements.

See Figure 5 for typical installation of a 16 x 25 x 1 filter rack centered over the 14 x 23 cutout.

Figure 6 shows a typical installation of a 20 x 25 x 1 filter rack. The same 14 x 23 cutout is required in the furnace side, and the bottom of the filter rack is aligned over the bottom of the 14 x 23 cutout. The top of the filter rack rises approximately 6 inches above the top of the cutout. The 3 inch depth of the filter rack provides ample spacing between furnace side and leaving edge of filter for the entire filter surface to be effective.



To remove filter from the filter rack (see Figures 5 and 6), remove the filter access cover and grasp the end of the filter.

This filter is the permanent high velocity type foam filter which may be washed and used over and over. DO NOT replace it with a fiberglass disposable filter of the same size.

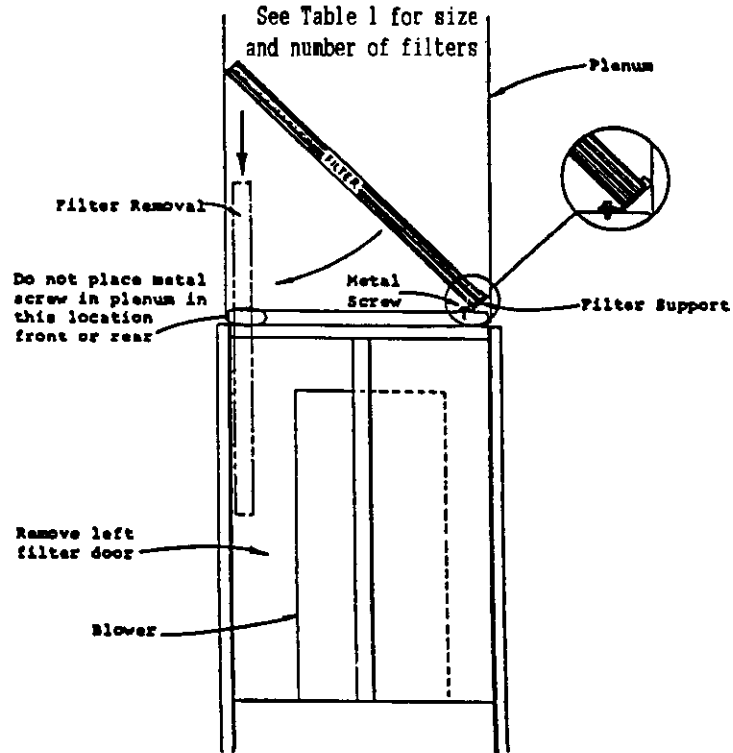
To replace filter, reverse the above procedure.

## FILTER LOCATIONS--COUNTERFLOW MODELS

Counterflow models normally have filters installed in the return air plenum above the furnace unless a common return air/filter grille is used.

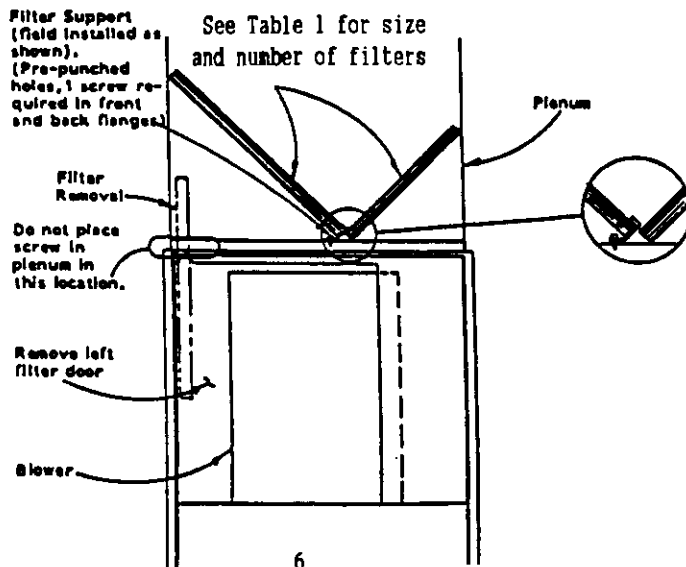
The electrical switch should be turned "off" before the front door to furnace is removed. After removing the front door, remove the left side filter door in the upper section of the furnace. Refer to Figures 7 and 8 below for proper filter locations.

FIGURE 7  
NIC60D36A



Attach filter support to furnace as shown with two sheet metal screws. The filter can be installed and removed through the left filter door.

FIGURE 8  
NIC85D42D, NIC115D48A

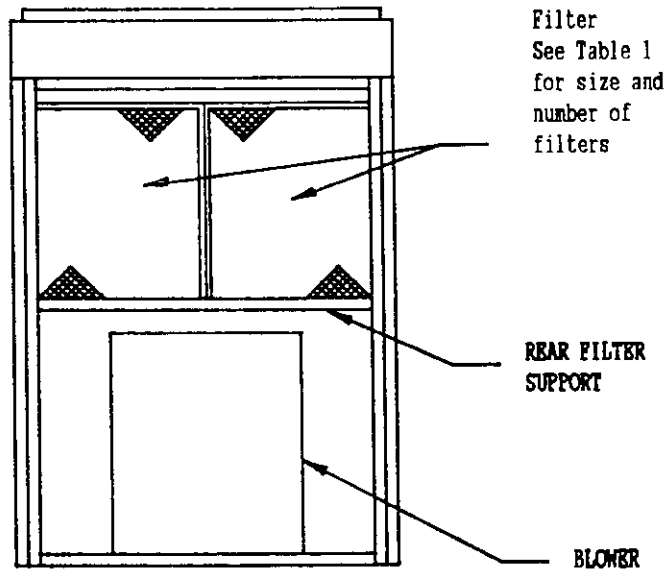




## FILTER LOCATIONS--LO-BOY MODELS

Lo-Boy models have the filters installed in the return air cabinet section of the furnace. They are accessible from the rear of the furnace by removing the blower/filter access door. The electrical switch should be turned "off" prior to removing the access door. Refer to Figures 9 and 10 below.

FIGURE 9  
NIL Series  
REAR VIEW WITH BLOWER/  
FILTER ACCESS DOOR REMOVED



## LUBRICATION REQUIREMENTS

All models have permanently lubricated blower motors. The induced draft blower motor must be lubricated every six months with three to four drops of SAE20.

## FURNACE EXAMINATION

The furnace and the vent system (commonly called the flue pipe, smoke pipe, chimney, etc.) should be inspected yearly by a qualified service agency, generally prior to the heating season. Detailed procedures for this inspection are contained in the instructions booklet and should be handled by the qualified service agency only.

A general inspection of the furnace, the furnace area, and the venting system should be conducted on a regular basis by the user/occupant. This review should include:

1. Assure that all flue product carrying areas external to the furnace (chimney, metal vent pipe, etc.) are clear and free of obstructions.
2. Make sure the furnace always has the minimum clearances as detailed on serial plate. Special attention must be given to these items if any remodeling is done.
3. Make sure the vent connector (system) is in place, slopes upward and is physically sound without holes or excessive corrosion.
4. Reviewing that the return air duct connection(s) is physically sound, is sealed to the furnace casing, and terminates outside the space containing the furnace.
5. The physical support of the furnace is sound without sagging, cracks, gaps, etc. around the base.
6. Inspect for any obvious signs of deterioration of the furnace.
7. If the vent system incorporates a condensate drain, the drain must be inspected monthly for any blockage. If drain appears dirty or clogged, it must be removed and thoroughly washed out with warm water. Blockage of the drain can result in premature component failure.

Periodic examinations of the combustion area and vent system should also be conducted by the user on a regular basis, preferably every month but at least every two months, during the heating season.

The following procedure should be followed for the periodic inspection as conducted by the user.

1. Set the wall thermostat to the "off" position or lower the set point lever to a temperature well below the existing room temperature. Shut off electric power to the furnace. A switch should be mounted either on the outside of the furnace or adjacent to the furnace for this purpose.
2. Remove the furnace door exposing the burner compartment.
3. Using a flashlight or trouble light, observe the burner compartment and where the burner(s) extend into the heat exchanger. There should be very minimal scaling or sooting in this area. Some loose debris may have fallen down on to the floor of the heat exchanger from the upper flue passageways, and this may be vacuumed out. Also observe the sides of the heat exchanger for "hot spots" due to improper burner alignment or overfiring and give particular attention to any area where it looks like there may be any deterioration from corrosion or rusting. Observe for any corrosion on the burners themselves. Should anything appear questionable, contact your service agency.

4. The pilot lights only when the thermostat calls for heat and the main burner lights within a few seconds thereafter. It is recommended that any observation of the pilot or main burner operation be done only with the burner compartment door in place and viewing through the combustion air slots. Any adjustments to the pilot flame should be done by a competent service agency. A properly adjusted main burner flame and pilot flame are shown in Figures 10 and 11 respectively.
5. Inspect the flue pipe the full distance from the furnace to chimney or to exit point from the building, observing for corrosion and possible leakage that might result in products of combustion entering the living area.

<b>WARNING</b>
Leakage of products of combustion into the living area may result in asphyxiation.

Any questionable flue pipe should be replaced. Considering its importance, it is relatively cheap insurance to protect your family. Consult your service agency.

6. Replace the burner compartment access doors by reversing the procedure as outlined under Step 2.
7. Restore the electrical power to the furnace by turning the switch back on. Adjust the thermostat to call for heating operation.
8. Observe the main burners in operation viewing through combustion air slots. The flame should be mostly "blue" with possibly a little orange at the tips of the flame. The flames should be in the center of the heat exchanger compartments and not impinging on the heat exchanger surfaces themselves.

The inner cone of the flame as shown below in Figure 11 should be approximately 1 inch to 1-1/4 inches tall from the burner ports when natural gas is used. When LP gas is used, the inner cones should be approximately 1/2 inch tall from the burner ports. If no primary air adjustment has been made after the furnace has been converted for use with LP gas, the inner cones may be lying flat on the burner ports. This condition can be corrected by decreasing the amount of primary air in the burners. Slowly, close down the primary air shutters at the end of each burner until the desired inner cone height is obtained. Be sure to tighten all the air shutter set screws once the adjustment has been made.

9. Observe the fire until the blower starts (there is a normal delay period until the heat exchanger warms up). There should be no change in the size or shape of the flame. If there is a wavering or blowing of the flame on the blower start-up, it is an indication of a possible leak in the heat exchanger. Turn off the main electrical switch to the furnace and the gas valve in the gas line leading in the furnace, and call your service agency.

