

bryant

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# installation instructions

# 394G

## UPFLOW GAS-FIRED FORCED-AIR FURNACE

Series A, B, & C  
Sizes 050  
thru 150

CLICK ANYWHERE on THIS PAGE to RETURN TO CARRIER AIR  
CONDITIONERS BOILERS FURNACES AGE MANUALS at [InspectApeia.com](http://InspectApeia.com)

Cancels: 40394DP1-B, 40394DP21-A  
40394DP10-A, & 5/1/79  
40394DP16-A

### INTRODUCTION

Before installing the furnace, refer to "Procedure for Gas Furnace Installation" (packaged with the equipment) for information concerning combustion, venting, piping, and other standard installation practices. Further reference is made to the current edition of the American National Standard Z223.1 National Fuel Gas Code.

Each furnace is shipped from the factory completely assembled with multispeed direct-drive blower and wired ready for indoor heating installation. All sizes feature a printed-circuit board control center with easy-to-read, low-voltage terminal strip to ensure proper connections.

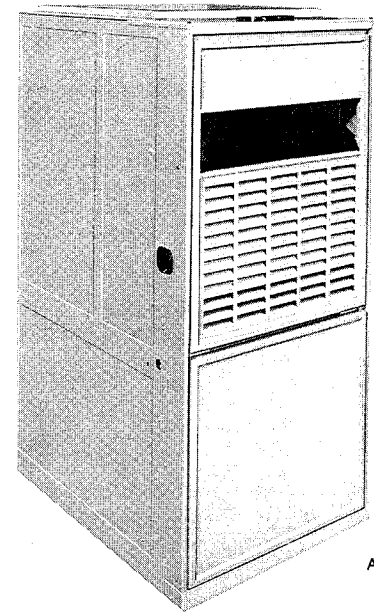
**NOTE:** The strain-relief bushing shipped in the literature packet is to be used when a Model 997A Vent Damper is installed with the furnace. See instructions packaged with the vent damper for usage.

**CAUTION:** Do not install furnace in a corrosive or contaminated atmosphere. Make sure all combustion and circulating air requirements listed in "Procedure for Gas Furnace Installation" are adhered to, in addition to all local codes and ordinances.

The design of the upflow gas-fired furnace is A.G.A. certified for installation on combustible flooring, in alcoves, basements, closets, or utility rooms. The design of this furnace line is *not* A.G.A. certified for installation in a mobile home, recreation vehicle, or outdoors.



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Figure 1—Model 394G048125

TABLE I—CLEARANCES (In Inches)

Sizes	050 & 075	100 thru 150
Sides—Single-Wall Vent	1	1
Type-B Double-Wall Vent	0	1
Back	0	0
Top of Plenum	1	1
Vent Connector—Single-Wall	6	6
Type-B Double-Wall	1	1
Front—Combustion Air	6	6
Service	30	30

Installation comprises the following:

- \*I. Inspection
- \*II. Location, Ventilation, and Air for Combustion
- \*III. Gas Piping
- \*IV. Venting
  - V. Electrical
- VI. Sequence of Operation
- VII. Filter
- VIII. Startup and Adjustment
- IX. Care and Maintenance

\*To perform these sections (or installation steps), refer to the appropriate sections of "Procedures for Gas-Fired Furnaces" booklet packaged with this unit.

For accessory installation details, refer to applicable installation literature.

### V. ELECTRICAL CONNECTIONS

#### A. Line-Voltage Wiring

**IMPORTANT:** Before proceeding with the electrical connections, make certain that voltage, frequency, and phase correspond to that specified on the unit rating plate. Also, check to be sure that the service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit rating plate for equipment electrical requirements.

**CAUTION:** Do not connect aluminum wire between disconnect switch and furnace.

See Figure 3 for wiring diagram showing the proper field high- and low-voltage wiring. Make all electrical connections in accordance with the National Electrical Code and any local codes or ordinances that might apply.

Use a separate branch electrical circuit for this furnace. A disconnecting means must be located within sight of, and readily accessible to, the furnace.

The auxiliary J-box can be moved to the right-hand side of furnace when a right-hand power supply is desired.

1. Remove two screws holding auxiliary J-box.
2. Drill two holes in same position on opposite side and mount auxiliary J-box.
3. Plug or cap unused electrical entry holes in left side of casing.

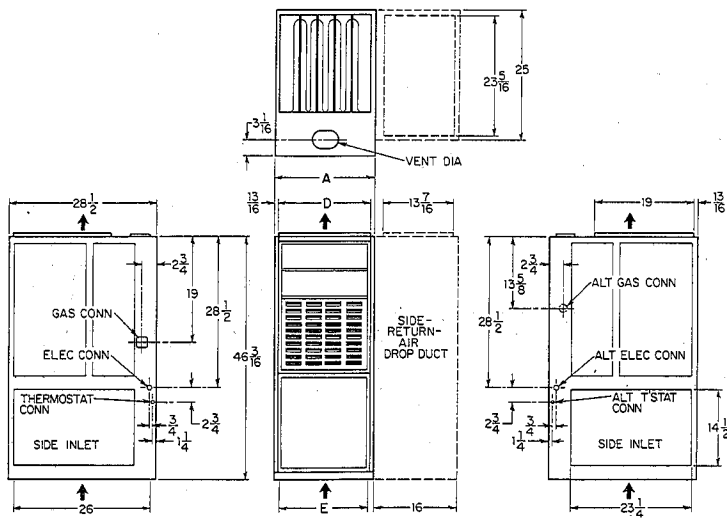


Figure 2—Dimensional Drawing

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TABLE II—DIMENSIONS (In Inches)

Size	A	D	E	Vent Dia
000050	14-3/16	12-9/16	11-11/16	4
024050	14-3/16	12-9/16	11-11/16	4
036050	14-3/16	12-9/16	11-11/16	4
048060	21	19-3/8	18-1/2	4
000075	14-3/16	12-9/16	11-11/16	4
024075	14-3/16	12-9/16	11-11/16	4
036075	14-3/16	12-9/16	11-11/16	4
048075	21	19-3/8	18-1/2	4
060080	21	19-3/8	18-1/2	5
000100	17-1/2	15-7/8	15	5
036100	17-1/2	15-7/8	15	5
048100	21	19-3/8	18-1/2	5
060100	21	19-3/8	18-1/2	5
000125	21	19-3/8	18-1/2	5
036125	21	19-3/8	18-1/2	5
048125	21	19-3/8	18-1/2	5
060125	24-1/2	22-7/8	22	5
000150	24-1/2	22-7/8	22	6
048150	24-1/2	22-7/8	22	6
060150	24-1/2	22-7/8	22	6

TABLE III—RATINGS AND PERFORMANCE\*

SIZE	Input Btuh	Bonnet Capacity Btuh	Temp Rise Range	Heating		Cooling		Motor HP & Type	Approx Ship. Wt		
				Ext Static Pressure	Ft <sup>3</sup> /Min	Ext Static Pressure	Ft <sup>3</sup> /Min				
000050	50,000	40,000	40-70	0.12	673	—	—	1/10 SP	119		
024050			40-70		673			0.5	815	1/6 SP	122
036050			35-65		740			1170	1/3 SP	127	
048060	60,000	48,000	30-60	0.12	985	—	—	1/2 PSC	134		
000075			55-85		793			1/10 SP	124		
024075	75,000	60,000	55-85	0.12	793	0.5	800	1/6 SP	125		
036075			45-75		925			1150	1/3 SP	132	
048075			30-60		1235			1600	1/2 PSC	134	
060080†			30-60		1315			1970	1/2 PSC	156	
000100	100,000	80,000	65-95	0.15	925	—	—	1/6 SP	145		
036100			60-90		987			0.5	1155	1/3 SP	154
048100			45-75		1234			1610	1/2 PSC	165	
060100†			40-70		1345			1970	1/2 PSC	156	
000125	125,000	100,000	70-100	0.2	1089	—	—	1/5 SP	169		
036125			65-95		1157			0.5	1230	1/3 SP	176
048125			60-90		1234			1550	1/2 PSC	182	
060125†			45-75		1543			2110	1/2 PSC	189	
000150	150,000	120,000	65-95	0.2	1388	—	—	1/3 SP	203		
048150			65-95		1388			0.5	1600	1/2 PSC	204
060150†			45-75		1851			2110	1/2 PSC	220	

\*The above ratings are certified for altitudes to 2000 ft. For elevations above 2000 ft, reduce ratings 4% for each 1000 ft above sea level.

† Air delivery above 1800 ft<sup>3</sup>/min, or systems with a total static pressure drop above 0.5 in. wc, require that both sides, or a combination of one side and bottom or bottom only, of the furnace be used for return air.

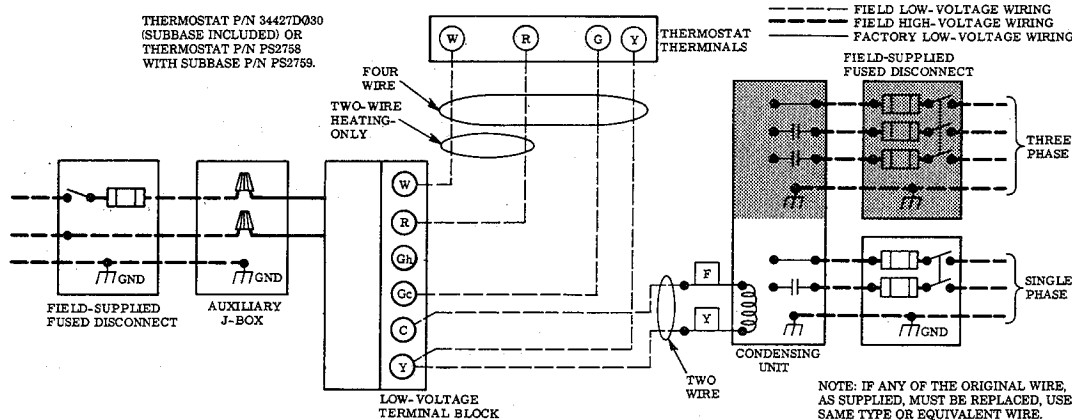


Figure 3—Heating and Cooling Application Wiring Diagram

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**WARNING:** The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. This may consist of electrical wire or approved conduit when installed in accordance with existing electrical codes.

If line voltage wiring to the unit is encased in a nonmetallic sheath, connect the incoming ground wire to the grounding wire inside the furnace J-box. If metallic conduit is used, it will serve as the ground.

### B. Low-Voltage Wiring

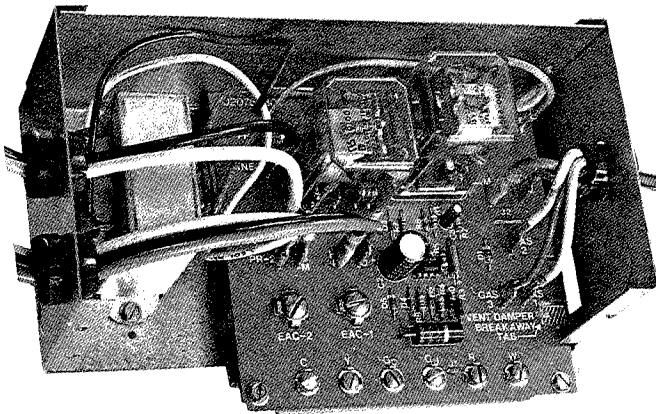
Make field low-voltage connections at the low-voltage terminal strip. See Figure 3.

Set the thermostat heat anticipator at 0.6 for a furnace with a BDP Model 646, BDP Model 647, Robertshaw Model 7000 BKER, or Essex Model 242 Gas Valve; 0.7 for a furnace with a Honeywell Model VR 800A; and 0.2 when a Model 997A Vent Damper is installed—no matter which of these gas valves is used. If additional controls are connected in the

thermostat circuit, their amp draw must be added to this setting. For accurate reading, check the amp draw at the thermostat with an ammeter. A failure to make this setting will result in improper operation of the system.

The room thermostat should be located where it will be in the natural circulation path of room air. Avoid locations where the thermostat would be exposed to cold-air infiltration, drafts from windows, doors, or other openings leading to the outside, or exposure to air currents from warm- or cold-air registers; or to exposure where the natural circulation of the air is cut off—such as behind doors, above or below mantels, shelves, etc.

The thermostat should not be exposed to heat from nearby



**Figure 4—Blower Control Center (Heat/Cool Model Shown)**

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**LEGEND**

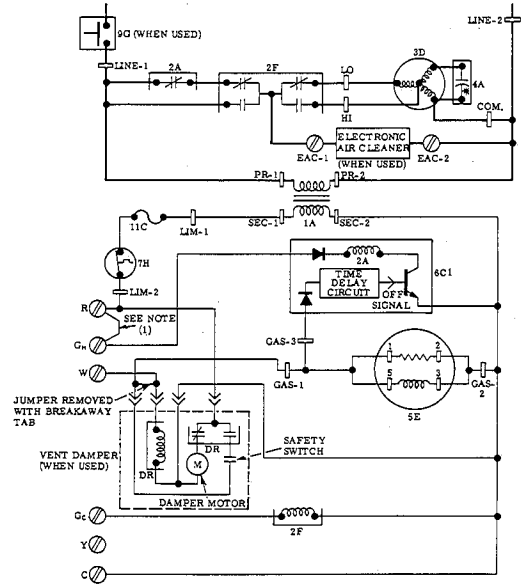
- 1A—Transformer 115/24
- 2A—Heat Relay (SPST-N.C.)
- 2F—Cool Relay (DPDT)
- 3D—Blower Motor
- 4A—Run Capacitor
- 5E—Gas Valve
- 5F—Gas Valve
- 6C1—Printed-Circuit Board
- 6F—Pilot Igniter
- 6H—Safety Pilot (Flame Sensing)
- 7H—Limit Switch (SPST-N.C.)
- 11C—Fusible Link

fireplaces, radios, televisions, lamps, or rays from the sun.

Nor should the thermostat be mounted on a wall containing pipes or warm-air ducts, or a flue or vent that could affect its operation and prevent it from properly controlling the room temperature. Any hole in the plaster or panel through which the wires pass from the thermostat should be adequately sealed with suitable material to prevent drafts from affecting the thermostat.

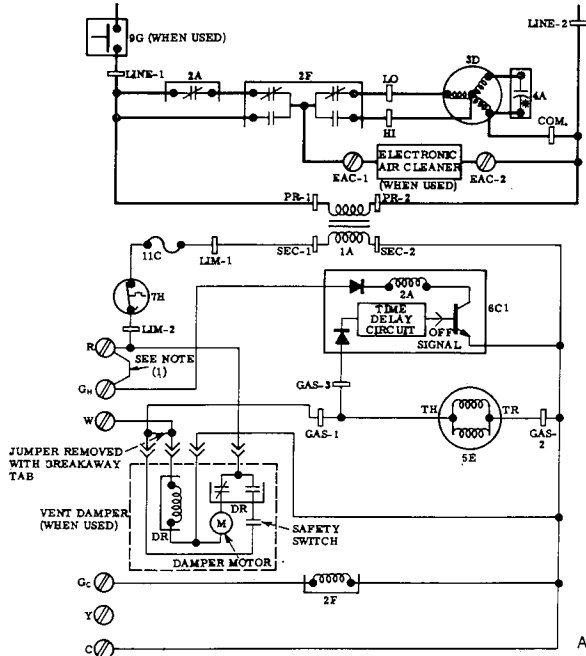
**C. Blower Control Center**

Each furnace features a blower control center. This will aid the installer and serviceman when installing and servicing the unit. A low-voltage terminal board is marked for easy connection of field wiring. See Figure 4.



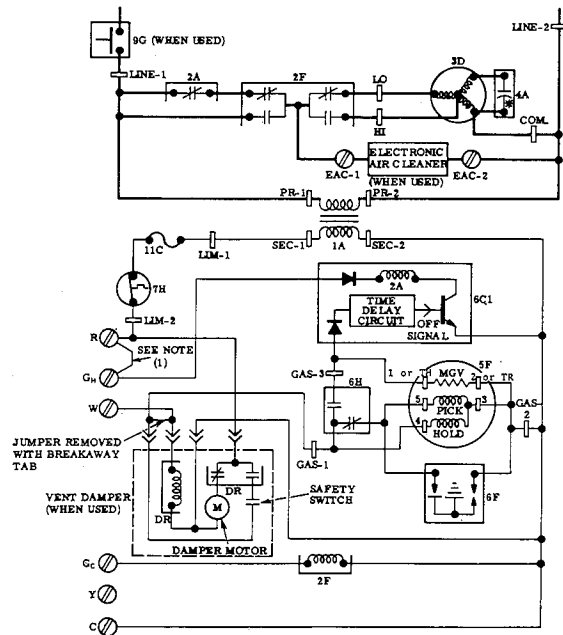
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**Figure 6—Line-to-Line Wiring Diagram for Sizes 050 thru 150 (match-lit pilot) Natural Gas & LPG With BDP 647 Gas Valve**



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**Figure 5—Line-to-Line Wiring Diagram for Sizes 050 thru 150 (match-lit pilot) Natural Gas & LPG With Essex 242 or Honeywell VR 800A Gas Valve**



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**Figure 7—Line-to-Line Wiring Diagram for Sizes 050 thru 150 (IID pilot) Natural Gas With BDP 646 or Robertshaw 7000 BKER Gas Valve**

## VI. SEQUENCE OF OPERATION

**NOTE:** The wiring diagrams shown in Figures 5, 6, and 7 are heating/cooling.

### A. Heating

Gas and electrical supplies must be turned on at the furnace.

**NOTE:** When power is applied to heat relay coil 2A in the control circuit, the normally closed contacts in the supply circuit will open.

#### 1. BDP 646 and Robertshaw 7000 BKER Gas Valves (IID Models)

When the thermostat "calls for heat," the control circuit is closed between terminals R and W. Power from transformer 1A through fusible link 11C and limit switch 7H energizes the pilot valve portion of automatic gas valve 5F and pilot igniter 6F. The pilot valve opens, permitting gas flow to the pilot burner where it is ignited.

The pilot valve portion of automatic gas valve 5F is a solenoid consisting of a "pick" and a "hold" coil. Both the "pick" and the "hold" coils must be energized to open the valve, but only the "hold" coil must be energized to **keep** it open.

When the pilot flame is established, pilot 6H switches its contacts in approximately 40 to 60 seconds, energizing the main valve portion of gas valve 5F and deenergizing pilot igniter 6F and the "pick" coil of the pilot solenoid portion in gas valve 5F.

The main valve portion of gas valve 5F is heat motor operated; therefore, after approximately 10 seconds, (Robertshaw Valve opens instantly), this portion of the valve opens, permitting gas flow to the main burners where the gas is ignited by pilot 6H.

#### 2. BDP 647, Essex 242, and Honeywell Gas Valves (Match-Lit Models)

The furnace pilot must be lit to energize the thermal magnet circuit of gas valve 5E, thus permitting gas flow to the remaining portion of the valve.

When the thermostat "calls for heat," the control circuit is closed between terminals R and W. Power from transformer 1A through fusible link 11C and limit switch 7H energizes gas valve 5E, causing the valve to open and permitting gas flow to the main burners, where it is ignited by the pilot.

### 3. Blower Circuit

With power through the solid-state time-delay circuit on printed-circuit board 6C1 and heat relay 2A, blower motor 3D is energized on heating speed approximately 75 seconds after gas valve 5E has been energized (or the pilot flame has been proven in the case of BDP 646 Gas Valve 5F.)

### 4. Limit Control

If the furnace overheats for any reason, limit control 7H switches, breaking the circuit to automatic gas valve 5E or 5F. The gas valve closes immediately, stopping gas flow to the main burners and the pilot. In addition, blower motor 3D continues to operate because heat relay 2A is deenergized to cool down the furnace.

Fusible link 11C is provided in the transformer 1A secondary circuit as protection from overheating conditions in the vestibule area of the furnace. Should this condition exist, the fuse opens and deenergizes gas valve 5E or 5F and heat relay 2A, stopping the gas flow to the burners and starting blower motor 3D.

When the thermostat is satisfied, the circuit between R and W is broken, deenergizing automatic gas valve 5E or 5F, pilot 6H (when used), and the solid-state time-delay circuit on printed-circuit board 6C1. The gas flow stops immediately to the pilot and main burners with the BDP 646 or Robertshaw 7000 BKER Gas Valves, and to the main burners only with the BDP 647, Essex 242, and Honeywell VR 800A Gas Valves. After approximately 75 seconds, heat relay 2A is energized and blower motor 3D stops.

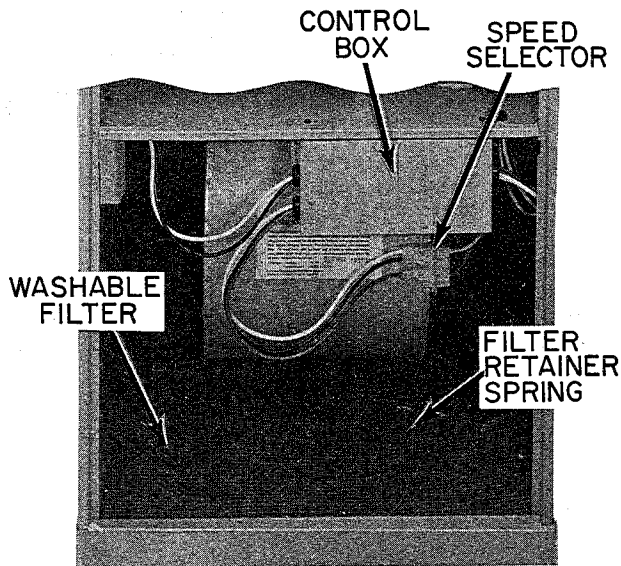
### B. Vent Damper (when used)

When the thermostat "calls for heat," the control circuit is closed between terminals R and W. Power from transformer 1A energizes the damper motor relay coil, causing the normally closed relay contacts to open, deenergizing the damper motor and causing the spring-loaded damper to open. When the automatic vent damper is open, the circuit is completed to automatic gas valve 5E or 5F. The sequence from this point on is the same as that for *heating*.

When the thermostat is satisfied, the circuit between R and W is broken, deenergizing the damper motor relay, and causing it to switch its contacts. The damper motor starts and closes the damper.

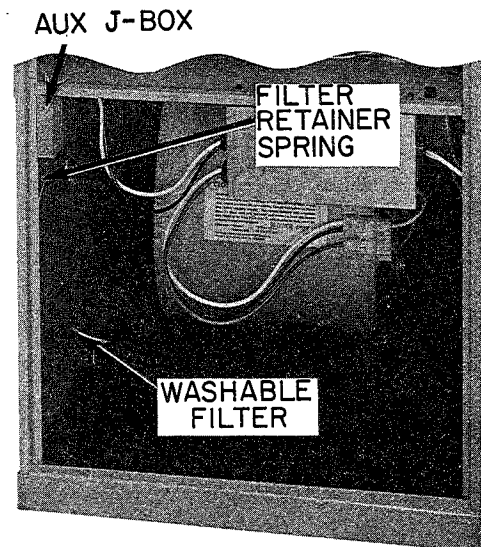
### C. Cooling (cooling models only)

When the thermostat "calls for cooling," power from transformer 1A energizes the condensing unit contactor, cooling



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Figure 8—Filter Installed For Bottom Inlet



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Figure 9—Filter Installed for Side Inlet

relay coil 2F, closing its contacts and energizing blower motor 3D on its cooling speed. It continues to operate until the thermostat is satisfied.

When the thermostat is satisfied, the circuit to terminal Gc is broken, deenergizing cooling relay coil 2F which, in turn, opens its contacts, stopping blower motor 3D.

## VII. FILTER

### A. Filter Arrangement

The filter is factory-installed in the bottom of the furnace. This is for bottom inlet application. See Figure 8.

**NOTE:** Remove and discard bottom closure panel when bottom inlet is used.

For side inlet application, see Figure 2 for the opening size. Remove the filter and retainer spring from the bottom opening. Install the retainer spring in the holes provided—one in the blower deck and the other in the retainer spring bracket. Install the filter (the filter must be trimmed to clear the J-box on some sizes) as shown in Figure 9.

**CAUTION:** Be sure the filter retainer spring is behind the flange of the casing side.

### B. Bottom Closure Panel

When the side inlet is used, the bottom opening must be properly sealed by installing a bottom closure panel shipped under the filter in each furnace. To install the bottom closure panel, perform the following steps:

1. After filter has been installed for side return, remove bottom closure panel from furnace.
2. Rotate panel 180° so that it is inverted. See Figure 10.
3. With furnace either tilted or raised, install panel in opening from bottom of furnace.
4. Apply appropriate material around bottom closure to obtain airtight seal.

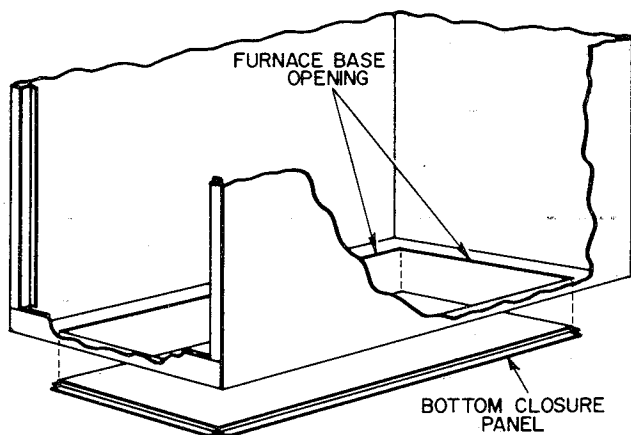
**WARNING:** Never operate unit without a filter or with filter access door removed.

## VIII. STARTUP AND ADJUSTMENT

In addition to the following information, refer to "Procedures for Gas Furnace Installation" packaged with the unit.

**CAUTION:** This furnace is equipped with a fusible link in the vestibule area that will melt if an overheating condition caused by an inadequate combustion air supply or improper venting practices develops. *Do not* jumper this fuse. Correct the condition and replace the fuse with an identical part.

The gas service pressure must not exceed 14 in. wc (8.1 ounces) for natural gas, or 11 in. wc (6.3 ounces) for LPG.



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Figure 10—Installing Bottom Closure Panel

**NOTE:** The gas valve regulator has been factory-set at 3.5 in. wc for natural gas and 10.5 in. wc for LPG. Refer to "Procedure for Gas Furnace Installation" for readjusting when checking input.

There are two basic furnaces that can be rerated: Models 394GAW048060 and 394GAW060080. Each of these furnaces has two A.G.A.-certified input ratings, and can be field-converted for the higher rated heating input if desired. An auxiliary rating plate is attached to each furnace showing the new ratings.

**NOTE:** To convert the furnace to the higher input ratings, the main burner orifices must be replaced with orifice P/N 55365-42. Order same quantity as in the furnace being converted.

To convert one of these furnaces proceed as follows:

1. Remove furnace control access door.
2. Remove secondary-air shield.
3. Remove main burners.
4. Remove and discard factory-installed orifices from manifold.
5. Install new orifices P/N 55365-42.
6. Reinstall main burners.
7. Reinstall secondary-air shield.
8. Using ballpoint pen, mark an "X" in appropriate box on auxiliary rating plate to indicate that unit has been rerated.

### A. Adjustment of Blower Speed

**WARNING:** Disconnect the electrical power before changing the speed tap.

To change motor speed taps, remove the motor tap lead (see Figure 8 and Table IV) and relocate it on the desired terminal on the plug-in terminal block/speed selector located on the blower.

**CAUTION:** When adjusting the blower speed, make certain that the temperature rise across the heat exchanger does not exceed that specified on the rating plate.

TABLE IV—  
SPEED SELECTOR

Speed	Tap No.
Common	C
Hi	1
Med-Hi	2
Med-Low	3
Low	4

### B. Automatic Gas Control Valve

These units are equipped with an automatic gas control valve. If not already checked when lighting the main burner, check the proper operation of this valve by moving the room thermostat pointer above and below room temperature and observing that the main burners light on "call for heat" and go off when the pointer is moved below room temperature setting.

**NOTE:** For ease of adjusting the pilot flame, disconnect one power lead at main gas valve. For Models 646 or 647 Gas Valve, disconnect terminal No. 1, and for Models 242, VR 800A or 7000 BKER Gas Valves, disconnect terminal TH. This will prevent main burner ignition and allow time to adjust the pilot. Reconnect the power lead after adjustment.

## IX. CARE AND MAINTENANCE

**CAUTION:** Because of possible damage to the equipment or personal injury, maintenance should be performed by qualified persons only.

**WARNING:** Never store anything on, or in contact with, the furnace, such as:

1. Spray or aerosol cans, rags, brooms, dust mops, vacuum cleaners, or other cleaning tools.
2. Soap powders, bleaches, waxes or other cleaning compounds, plastic or plastic containers, gasoline, kerosene, cigarette lighter fluid, dry cleaning fluids, or other volatile fluids.
3. Paint thinners and other painting compounds, paper bags or other paper products.

For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your local Dealer as to the proper frequency of maintenance and the availability of a maintenance contract.

The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these, contact your Dealer for maintenance.

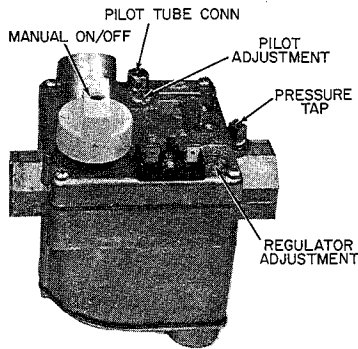
**WARNING:** Turn off gas and electrical supplies to unit before performing any maintenance or service on unit. Follow relighting instructions on plate attached to furnace.

The minimum maintenance that should be performed on this equipment is as follows:

1. Check and clean or replace air filter each month or as required.
2. Check blower motor and wheel for cleanliness and lubrication each heating and cooling season. Clean and lubricate as necessary.
3. Check electrical connections for tightness and controls for proper operation each heating season. Service as necessary.

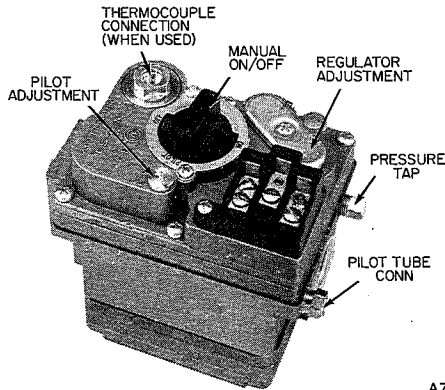
**WARNING:** As with any mechanical equipment, personal injury can result from sharp metal edges, etc.; therefore, be careful when removing parts.

## REDUNDANT AUTOMATIC GAS VALVES



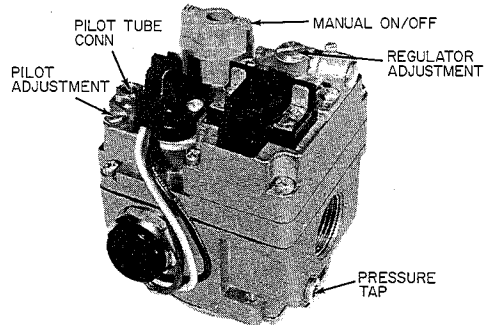
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Figure 11—BDP Model 646



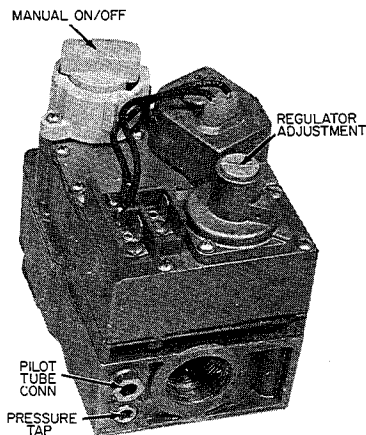
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Figure 12—Essex Model 242



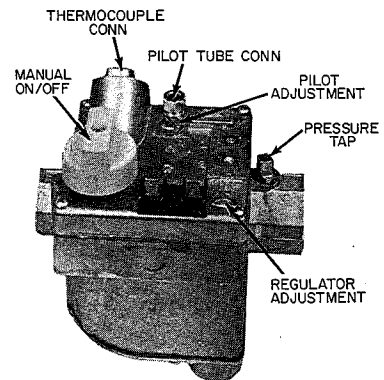
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Figure 14—Robertshaw Model 7000 BKER



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Figure 13—Honeywell Model VR 800A



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Figure 15—BDP Model 647

4. Clean filter with tap water.
5. Rinse and let dry. Oiling or coating of filter is not required.
6. Place filter in furnace with cross-sectional binding up or facing blower.

### B. Blower Motor and Wheel

For long life, economy, and high efficiency; clean accumulated dirt and grease from blower wheel and motor annually.

Lubricate motor every 5 years if motor is used on intermittent operation (thermostat FAN switch in AUTO position), or every 2 years if motor is in continuous operation (thermostat FAN switch in ON position).

Remember to disconnect electrical supply before removing access panels.

Clean and lubricate as follows:

1. Remove access panels.
2. Remove control box from bottom side of blower deck and lay it on top side. (Two clips are provided on back side of control box for hanging box on blower deck flange when desired.)
3. Remove electrical leads from numbered side of Molex speed selector. See Figure 9 and Table IV. Note location of wires for reassembly.
4. Remove screws holding blower assembly against blower deck and slide blower assembly out of furnace.
5. Squeeze side tabs of Molex speed selector and pull it from blower housing.
6. Loosen a screw in strap holding motor capacitor to blower housing and slide capacitor from under strap.
7. Mark blower wheel(s), motor, and motor support in relation to blower housing(s) before disassembly, to insure proper reassembly.
8. Loosen setscrew holding blower wheel(s) onto motor shaft.
9. Remove bolts holding motor mount to blower housing and slide motor and mount out of housing. Some motors have a ground wire attached to blower housing; disconnect it also.
10. Lubricate motor.
  - a. Remove dust caps or plugs from oil ports located at each end of motor.
  - b. Use a good grade of SAE 20 nondetergent motor oil and put one teaspoon, 5 cc, 3/16 oz., or 16 to 25 drops in each oil port.
  - c. Allow time for total quantity of oil to be absorbed by each bearing.
  - d. After oiling motor, be sure to wipe excess oil from motor housing.
  - e. Replace dust cap or plugs on oil ports.
11. Remove blower wheel(s) from housing.
  - a. Mark blower wheel(s) orientation and cutoff location to insure proper reassembly.
  - b. Remove screws holding cutoff plate and remove cutoff plate from housing.
  - c. Lift blower wheel(s) from housing through opening.
12. Clean blower wheel(s) and motor by using vacuum with soft brush attachment. Care must be exercised not to disturb balance weights (clips) on blower wheel vanes. Also do not drop or bend wheel, as balance will be affected.
13. Reassemble blower by reversing procedures 11a thru c. Be sure wheel is positioned for proper rotation.
14. Reassemble motor and blower by reversing procedures 5 thru 9. If motor has ground wire, be sure it is connected as before.
15. Reinstall blower assembly in furnace.

16. Connect electrical leads to Molex speed selector. Please note that connections are polarized for assembly—**do not force**.
17. Reinstall control box on bottom side of blower deck.
18. Turn on electrical power and check for proper rotation and speed changes between heating and cooling.

### C. Cleaning Heat Exchanger

If it becomes necessary to clean the heat exchanger because of carbon deposits, soot, etc., proceed as follows:

1. Turn off gas and electrical supply.
2. Remove access panels.
3. Remove vent connector and draft diverter. Screws are located inside draft diverter opening.
4. Remove flue chokes (two across flue outlets) and baffles from flue outlets of heat exchanger. See Figure 16.
5. Remove secondary air baffle and burners. To remove pilot burner, disconnect pilot supply tube at gas valve.
6. Clean flue ways with brush and or vacuum. Check heat exchanger for leaks and cracks. Replace if necessary.
7. Replace flue baffles. Be sure all screws are in place and tight.
8. Replace draft diverter and vent connector. Be sure screws are replaced and tight.
9. Replace secondary air baffle and burners.
10. Turn on gas and electricity. Check for gas leaks.

**WARNING:** Never use a match or other open flame to check for gas leaks. Use a soap-and-water solution.

### D. Pilot

Check the pilot and clean if necessary at the beginning of each heating season. The pilot flame should be high enough for proper impingement of the safety element and to light the burners. Remove the accumulation of soot and carbon from the thermocouple safety element or sensing probe.

### E. Electrical Controls and Wiring

**NOTE:** There may be more than one electrical supply to unit.

With power disconnected to unit, check all electrical connections for tightness. Tighten all screws on electrical connections. If any smoky or burned connections are noticed, disassemble the connection, clean all parts and stripped wire, and reassemble properly and securely. Electrical controls are difficult to check without proper instrumentation; therefore, reconnect electrical power to unit and observe unit through one complete operating cycle. If there are any discrepancies in the operating cycle, contact your Dealer and request service.

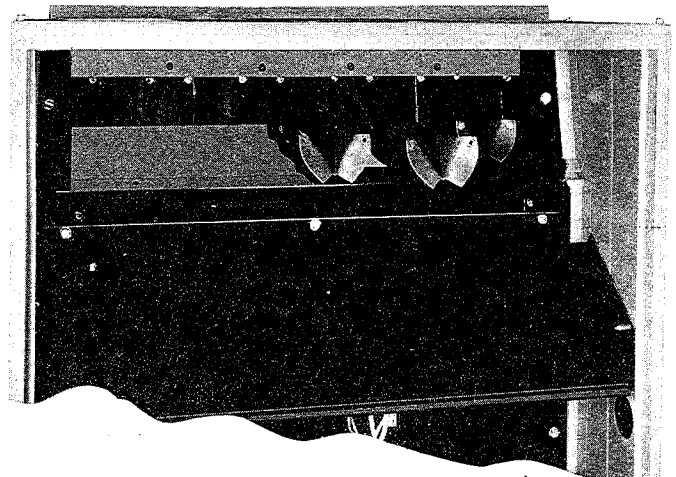
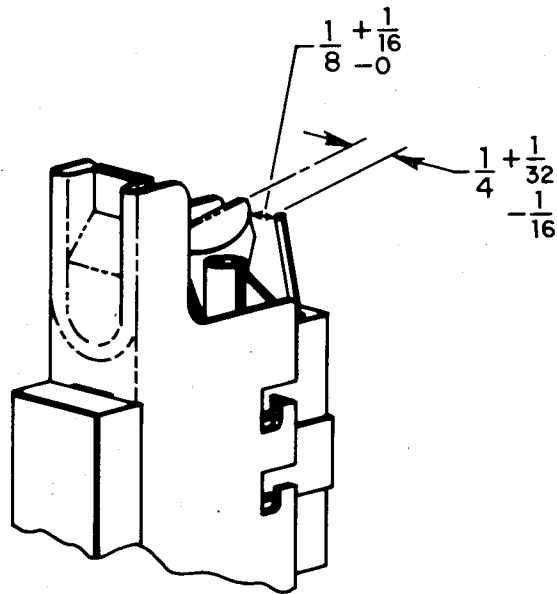


Figure 16—Removing Baffles

A73119



BDP Model 733B

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Figure 17—Position of Electrode to Pilot

TABLE V—TROUBLE ANALYSIS CHART

**WARNING: Turn off gas and power supply to unit before servicing (unless specific test requires gas and electric supplies).**

SYMPTOM	CAUSE	REMEDY
Pilot will not light	No spark at electrode	Readjust, if necessary, so that gap between electrode tip and pilot burner is as shown in Figure 17.
		Clean dirt or moisture accumulation from electrode ceramic with cloth.
		Cracked ceramic—replace pilot electrode assy.
		Check for loose or broken wiring at and between spark generator and electrode. Replace wire or tighten connection as necessary.
		Check fuse or circuit breaker for 115-volt supply to furnace.
Pilot will not light	Spark shorting out to main burner	Check 24-volt input to spark generator. If you read 24 volts and above steps have been completed, replace spark generator assy.
		Readjust electrode as specified.
		Clean pilot orifice.
		Check voltage to terminals 3 and 5 or TR and TH of gas valve.
		Check for proper opening of pilot valve, broken wires, or loose connections. If no deficiency is found, replace valve assy.
Burners will not ignite	No gas at pilot burner	Connect to power supply. Check fuse, wiring, or circuit breaker.
		Replace transformer.
		Check all wiring and all wirenut connections.
		Check voltage to terminals 1 and 2 or TR and TH of gas valve.
		Check for proper opening of main gas valve, broken wires, or loose connections. If no deficiency is found, replace gas valve assy.
Burners will not ignite	No 115-volt power to furnace	Clean pilot orifice.
		Move thermostat fan switch to AUTO position.
		Correct combustion air and venting practice—replace fuse link with identical part.
		Clean dirty air filter—reinstall.
		Replace printed-circuit board.
Blower operates continuously	Thermostat fan switch in ON position	Replace with proper size furnace.
		Check gas pressure at manifold. Clock gas meter for input. If too low, increase manifold pressure or install correct orifices.
		Clean dirty air filter—reinstall.
		Increase blower speed.
		Open registers—ductwork restricted.
Blower operates continuously	Fusible link blown	Check thermostat circuit amps and set anticipator accordingly.
		Adjust air shutter on burners to provide soft, blue flame. Check all screws around flue outlets and burner compartment. Tighten.
		See "Section II, Location & Air for Combustion & Ventilation" (Std Procedures for Gas-Fired Furnaces).
		Replace cracked heat exchanger.
		Reduce input and check orifices—furnace overfired.
Blower operates continuously	Dirty filter causing limit operation	Check vent for restriction.
Blower operates continuously	Defective heat relay	
Inadequate heating	Furnace undersized for application	
Inadequate heating	Gas input to furnace too low	
Inadequate heating	Limit switch cycles main burners	
Aldehyde odors, (CO), sooting flame—floating flame	Thermostat anticipator set too low	
Aldehyde odors, (CO), sooting flame—floating flame	Incomplete combustion—poor flame characteristics	