

# INSTALLATION INSTRUCTIONS

## SEALED COMBUSTION DOWNFLOW GAS FURNACE

**MGD SERIES  
SIZES 60, 75, 90**



**FOR INSTALLATION IN: MANUFACTURED (MOBILE) HOMES, RECREATIONAL VEHICLES, PARK MODELS, MODULAR HOMES AND BUILDINGS**

**CAUTION: READ ALL SAFETY GUIDES BEFORE INSTALLING THIS FURNACE**

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## GENERAL INFORMATION

These down flow sealed combustion furnaces install in Manufactured Homes, Recreational Vehicles or Modular Construction. The furnaces conform to Part 3280 (a) (2) of HUD Manufactured Homes Construction and Safety Standards. They must be installed only with listed RJ-Roof Jack, Sealed Combustion venting system.

NOTE: These instructions are intended to assist qualified individuals experienced in the installation of heating equipment.

Some state and local codes require installation personnel to be licensed. Read all instructions before starting the installation.

## SAVE THIS MANUAL

### **WARNING-RISK OF FIRE OR ELECTRICAL SHOCK**

Only qualified service personnel shall be used to install and provide maintenance of this furnace.

**NOTICE** – Furnace set-up and any adjustment needed is responsibility of the installer/ retailer/ contractor and is not covered by the furnace manufacturers warranty.

### **CHECKLIST: FURNACE START-UP**

1. Has furnace roof jack crown been correctly installed?
2. Has the furnace gas valve and burner orifice been cleaned?
3. Is the gas line outlet pressure set for the fuel used?
4. If the home uses a crossover air connector duct, is it installed per homebuilders installation instructions?
5. Has furnace been operated through complete heating cycle?



**SAFETY CONSIDERATIONS**



- **ELECTRIC POWER** - turn off all electrical power to furnace before performing any maintenance or service on unit. Failure to take this precaution may result in personal injury due to electrical shock.
- **SERVICE** - a qualified service technician should service this unit. Fuel burning appliances can generate toxic flue products. Modification of the appliance can cause carbon monoxide in deadly amounts. To prevent a safety hazard, maintain this appliance in a safe operating manner and do not modify.
- **DO NOT** modify vent or operate the unit with a blocked vent or inlet air pipe.
- **DO NOT** re-drill a burner orifice. If the orifice size must be changed, use only a new orifice.
- **DO NOT** use matches, lighters, candles, or other sources of open flame to check for gas leaks.
- **PROPER** maintenance for this unit requires certain mechanical skills and tools. If you are at all uncertain, contact your Heating Service Co. for maintenance and service.
- **CONSULT** with a service technician for any problems or questions you may have pertaining to this appliance.
- **ALWAYS** inspect the appliance before starting a new heating season, paying special attention to vent pipes and fuel lines.

**NOTE:** The words “Shall” or “Must” indicate a requirement, which is essential to satisfactory and safe furnace performance.

The words “Should” or “May” indicate a recommendation which may be helpful or enhance performance.

**INSTALLATION STANDARDS**

**CODE COMPLIANCE**

The installer shall become familiar with and follow all local codes and regulations which govern the installation of this furnace. Where applicable, local codes may take precedence.

- Federal Manufactured Home Construction and Safety Standards – HUD Title 24, Part 3280.
- National Fuel Gas Code – ANSI-Z223.1/NFPA-54
- Unit electrical wiring and grounding shall comply with National Electrical Code – ANSI/NFPA-70
- “Manufactured Housing” – NFPA-501 and Fire Safety Criteria for Mobile Home Installations – NFPA 501A
- “Recreational Vehicles” – ANSI – 119/NFPA – 501C

**HIGH ALTITUDE INSTALLATION**

For elevations above 2,000 feet derate furnace input 4% for each 1,000 feet of elevation above sea level. Furnace deration is accomplished by reducing the burner orifice size. See DERATING CHART for orifice size and CONVERSION INSTRUCTIONS, Page 16.

**INSTALLATION CLEARANCES**

These furnaces are design certified for the following minimum clearances from combustible materials in alcove or close installations.

Top .....	6 in.
Sides .....	0 in.
Back .....	0 in.
Alcove-front of furnace .....	18 in.
Closet-front of furnace .....	6 in.
Duct .....	0 in.
Vent/Roof Jack .....	0 in.

\* If the return air opening is below the top of the furnace, clearance to the side or rear shall be 6”.

\*\* See Return Air for clearances less than 6”.

Locate furnace to ensure adequate room for service access to all vent connections, controls and the heat exchanger. A front clearance of 18” minimum (24” recommended) shall be provided by a closet door or spacing away from a facing wall or partition.

For installation on combustible flooring (except carpeting) using manufacturers supplied floor base P/N 87FB0005 and duct Connector Series P/N 86AA001, included in 90-DCU0-01/03 kits.

**RETURN AIR**

**ALCOVE INSTRUCTION**

The furnace may be installed free standing or in an alcove with a free flow of air back to the furnace. A minimum of 18” shall be provided at the front for return air and service access.

**CLOSET INSTALLATION – 6 in.**

Note: If return air is through a side wall, there must be a minimum of 6-in. clearance from side wall to furnace in addition to 6-in. minimum clearance from inside of closet door to front of furnace.

If a louvered door complying with the minimum air requirements is used, the front clearance may be reduced to 1”.

**CLOSET INSTALLATIONS  
Additional Requirements**

Concerning under floor or ceiling return air systems, the following item (1 – 10) must be adhered to:

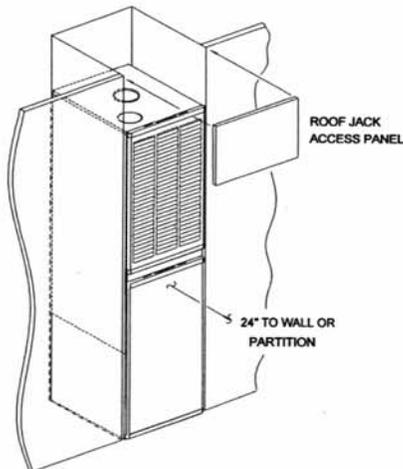
1. The return-air opening into the closet, regardless of location, is to be sized not less than specified on the appliance rating plate.
2. If the return-air opening is located in the floor of the closet (versus the vertical front or side wall), the opening is to be provided with means to prevent its inadvertent closure by a flat object placed over the opening.
3. The cross-sectional area of the return system (when located in the floor or ceiling of the manufactured home) leading into the closet is to be not less than that of the opening specified on the appliances rating plate.
4. The total free area of openings in the floor or ceiling registers serving the return-air duct system is to be not less than 150% of the size opening specified on the appliance rating plate. At least one such register is to be located where the likelihood of its being covered by carpeting, boxes, and other objects is minimized.
5. Materials located in the return duct system have a flame spread classification of 200 or less.
6. Non-combustible pans having one-inch upturned flanges are located beneath openings in the floor return duct system.

7. Wiring materials located in the return duct system conform to Article 300-22 (B&C) of the National Electric Code, ANSI / NFPA-70.
8. Gas piping is not run in or through the return duct system.
9. The negative pressure in the closet, as determined by test with the air-circulating fan operating at high heating speed and the closet door closed, is to be not more negative than minus 0.05-inch water column.
10. For floor return systems, the manufactured home manufacturer or installer shall affix a prominent warning where it is easily read when the closet door is open.

The marking shall read:



**RETURN AIR**

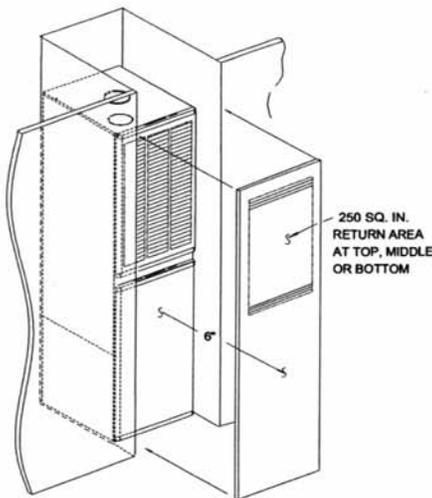


**ALCOVE INSTALLATION**

**ALCOVE**

A minimum of 18" front clearance to a facing wall or partition is needed for service access and return air.

Provide a removable panel above the furnace for access to roof jack and pipe connections on top of the furnace.

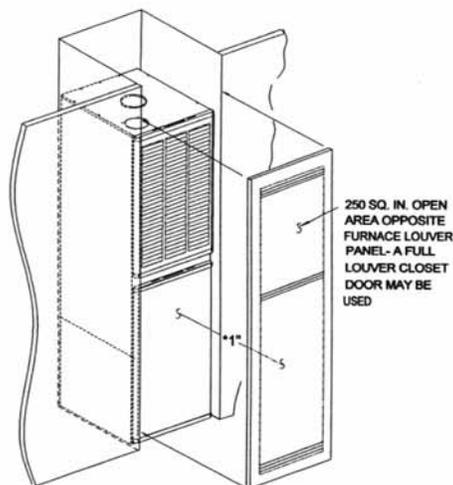


**CLOSET INSTALLATION**

**CLOSET - 6" CLEARANCE**

A minimum of 250 sq. in free open area return opening is required to the closet. The return opening may be anywhere on or above the closet door. If the return is through a side wall, and the opening is below the top of the furnace, a minimum of 6-in. clearance from side wall to furnace must be provided in addition to 6-in minimum clearance from inside of closet door to furnace.

If a 5T A/C will be installed, the return shall be increased to 390-sq. in. open area.



**\*SPECIAL - 1" - 6" CLOSET INSTALLATION**

**SPECIAL-CLOSET, 1" CLEARANCE**

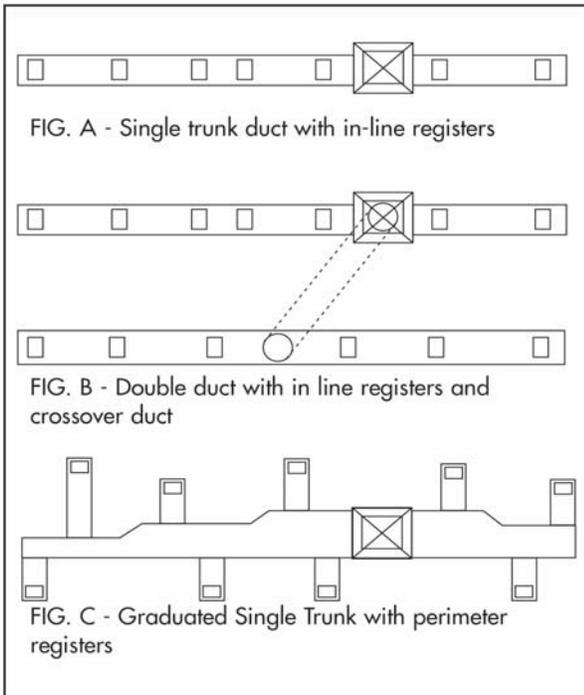
For closet installations with less than 6-in. clearance from inside of closet door to furnace, a louvered closet door must be used with a min. of 250 sq. in open area directly in line with the furnace top louver panel as shown. A fully louvered closet door may be used.

If a 5T A/C will be installed, the return shall be increased to 390 sq. in open area directly in line with the furnace louver panel.

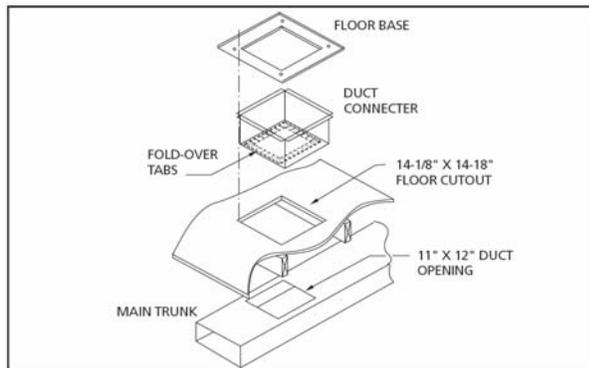
**AIR DISTRIBUTION SYSTEMS**

The supply duct system must be designed so that static pressure in the duct does not exceed the static pressure listed on the furnace rating plate. Location, size and number of registers should be selected on the basis of best air distribution and floor plan of the home. A manual to review before selecting a duct system is *Manufactured Housing Duct Systems: Guide to Best Practices* by Manufactured Housing Research Alliance (MHI-MHRA).

Typical duct systems are shown below: FIG. A, B, C



**DUCT CONNECTOR / BASE INSTALLATION**



The furnace may be on combustible flooring (except carpeting) when installed with 86AA001- Duct Connector and 87FB0005 Floor Base.

1. Cut a 14-1/8 x 14-1/8 opening in floor. Fig. D.

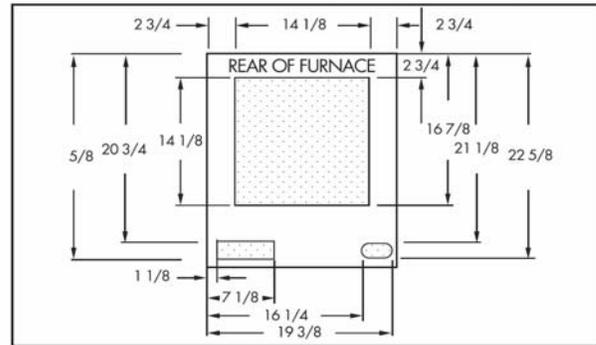


FIG.D Duct Connector Opening, Fuel & A/C Lines

2. Orient duct connector to align 11x13 tabbed opening with floor duct. See FIG. E

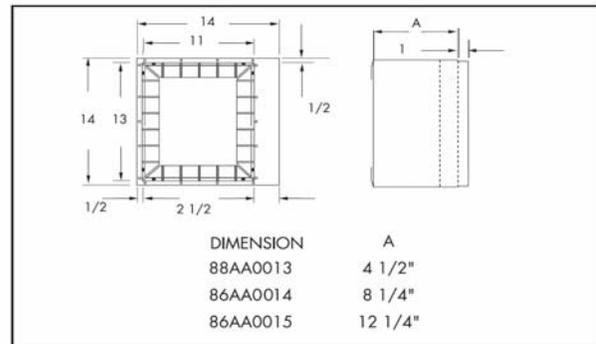


FIG. E- 86AA001- Duct Connector

1. Place duct connector tab end down, thru floor opening to rest on top duct surface.
2. Use eight (8) oval holes on tab surfaces as locators and mark for 11x13 duct opening; remove duct connector.
3. Connect marks with straight lines and cut out the duct opening slightly outside the lines.
4. Attach four (4) foam tape gaskets (provided) to duct connector alongside tabs for a 11x13 perimeter seal.
5. Replace duct connector/gaskets through floor opening.
6. Bend tabs down into the duct opening and fold back 180 degrees, securing duct connector. Add screws if needed.
7. Slit the 4 corners of the connector extending above the floor. Bend sides over onto the floor surface. Fig. F
8. Install floor base over floor opening with 13x13 flanges down. Nail to floor thru 4 holes. Fig. G

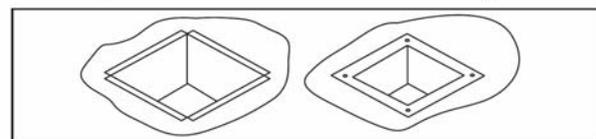


FIG. F

FIG. G

### INSTALL FURNACE

Prior to installing furnace, fuel and A/C line openings may be cut in. See FIG. D

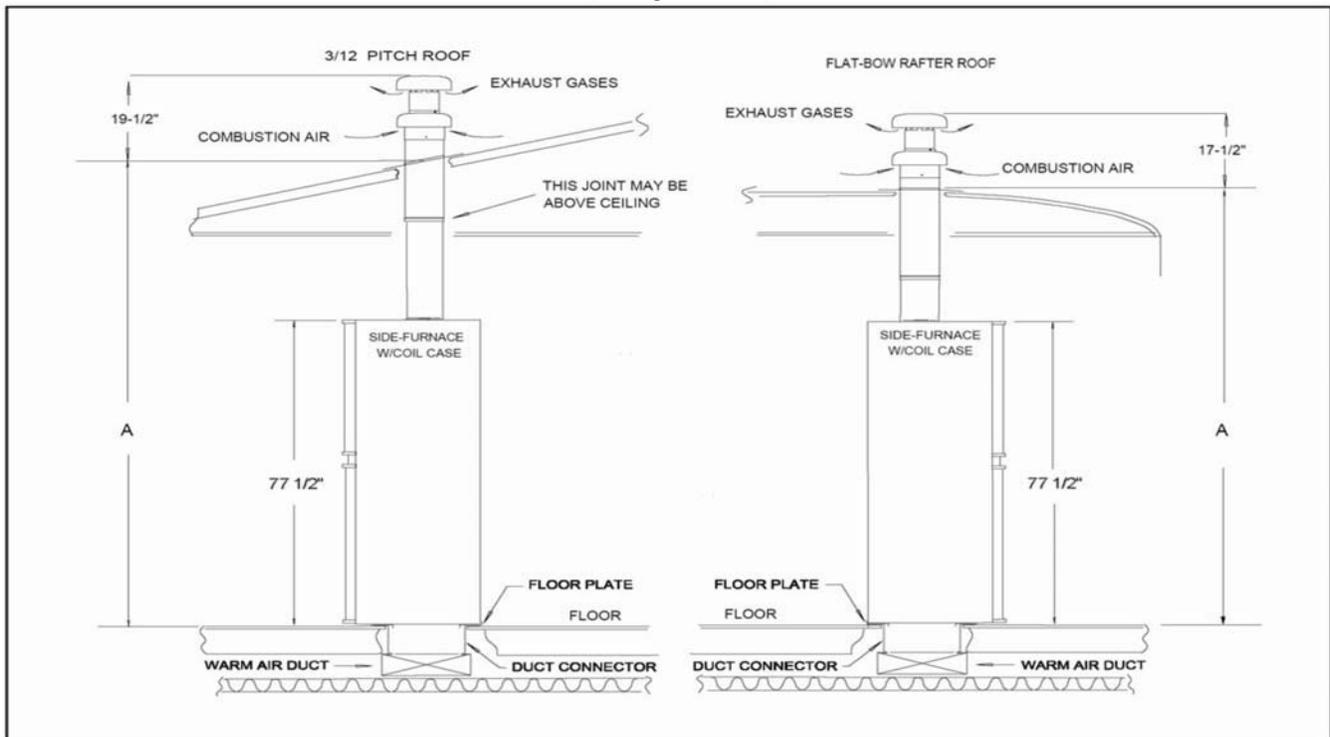
1. Remove upper and lower furnace doors.
2. Slide furnace onto floor base and push back until cabinet is against rear flange of floor base.
3. Secure furnace to floor with fasteners such as screws at right and left front inside corners of cabinet.
4. Attach pipe strap at top of furnace to alcove or closet framing, or fasten through furnace front edge cabinet sides to wood framing.

### RJ – SERIES ROOF JACK

MGD’s are sealed combustion furnaces tested and listed for use **ONLY** with **RJ – Series Roof Jack Venting System**. Furnace exhaust gases vent outdoors through the inner pipe of the RJ – Series “pipe-within-a-pipe” vent system. The space between the outer and inner pipes is used to bring in outside combustion air for the burner.

**WARNING:** Do not install furnace with any other type of venting system. **A HAZARDOUS CONDITION MAY RESULT.**

### SEALED COMBUSTION ROOF JACK – (REQUIRED)



THE SEALED COMBUSTION VENT SYSTEM CONSISTS OF: ROOF JACK BODY AND ROOF JACK CROWN		FURNACE SERIES All MGD
PART NO. ROOF JACK BODY	FOR: FLAT OR SLOPE ROOF	"A" ADJUSTABLE HEIGHT
90-RJF1729-AL	FLAT	94 1/2" - 106 1/2"
90-RJF2551-AL	FLAT	102 1/2" - 128 1/2"
90-RJS1729-AL	3 / 12	94 1/2" - 106 1/2"
90-RJS2551-AL	3 / 12	102 1/2" - 128 1/2"
90-RJS3868-AL	3 / 12	115 1/2" - 128 1/2"
90-RJS6399-AL	3 / 12	140 1/2" - 176 1/2"

PART NO. ROOF JACK CROWN	MUST USE WITH:	GAS CROWN ASSEMBLY REQUIRED W/RJ BODY
90 - RJCRWN - AL	ROOF JACK BODY	

### CUTTING ROOF JACK OPENING

A proper installation of the roof jack requires that openings in roof and ceiling be on the same vertical centerline as the furnace flue collar. See FIG. 1

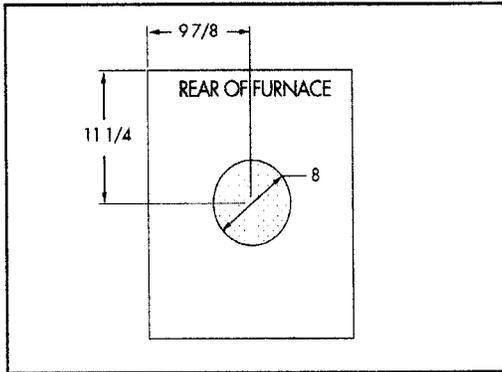


FIG. I - ROOF CUT-OUT

Mark the center point on the ceiling and scribe a 4" radius (8" diameter) around this mark. If furnace is in place during this step, cover the furnace and flue opening to prevent debris from entering flue.

### INSTALLING ROOF JACK

The roof jack body should be secured to the furnace before the roof flashing is secured to the roof.

1. Insert roof jack body into opening in the roof.
2. From above, center the roof jack body aligning with the furnace collar.
3. From inside the home, pull down 4-3/16" D flue pipe seating the pipe fully and firmly over the furnace flue collar.
4. Next pull down the 7" D combustion air pipe seating it over the mating furnace collar. Rotate the combustion air pipe lining up to the screw hole on the 7" collar.
5. Check and make sure the combustion air pipe is fully seated. Then drive a # 10 sheet metal screw, attaching pipe firmly to furnace collar.
6. Install optional ceiling trim ring, 90-TRM-RNG.
7. On the roof, caulk liberally under the roof jack flashing.
8. Drive nails or screws through the flashing onto the roof surface about 1 – 1 1/2" apart. Caulk again to ensure a leak tight joint.
9. Install roof jack crown and fasten to roof jack body with three (3) screws (provided) using pre-punched holes.

### INSTALLATION IN SNOW REGIONS

When the combustion air inlet to the roof jack is blocked with snow, the furnace will not operate properly due to the depleted combustion air supply.

Therefore, if the furnace will be located in regions where snow accumulation on the roof exceeds 7" or in H.U.D. Snow Load Zones, a roof jack extension – Part5 No. 90-OUTXT16-AL is recommended.

### ROOF JACK ON HI-PITCH ROOF

To install the RJS (3/12) Series Roof Jack on roofs which have a slope between 4.5/12 – 6/12, install a Part No. 90-RJS56 Roof Saddle, FIG. J. The combined assembly of the RJS Roof Jack and Roof Saddle will conform to the higher roof pitch. If roof pitch is greater than 6/12, field fabricate a suitable adapter, or consult with factory.

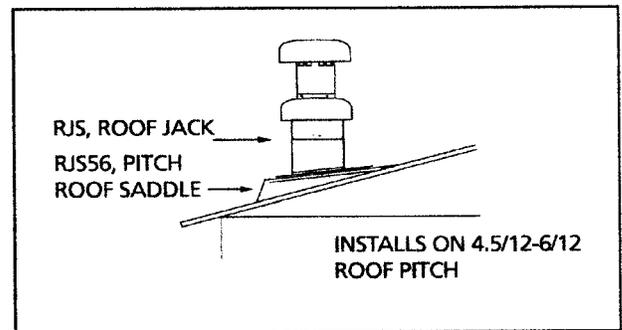


FIG. J - 90-RJS56 ROOF SADDLE, HI PITCH ROOF



To avoid electric shock, personal injury, or death, turn off the power at the disconnect or the main service panel before making any electrical connections.

**CONNECT POWER SUPPLY**

1. Remove the furnace control panel cover.
2. Insert 115 V wiring through a strain relief bushing on the left side of the furnace.
3. Connect the HOT wire to the black pigtail lead; connect the NEUTRAL wire to the WHITE pigtail lead. Secure the connections with suitable wire nuts and wrap with electrical tape. Refer to Wiring Diagram on Pg. 11 for connections.
4. Connect the GROUND wire to a grounding screw in the control panel.
5. Reinstall and secure the control panel cover with screws.

**WALL THERMOSTAT**

The location of the wall thermostat is important, as it must sense the desired temperature of the entire conditioned space. Choose a location 4-5 feet above the floor, preferably on an inside wall in an area with good air circulation. Stay away from lamps and air registers and do not install behind a door. Choose a location where the temperature will be reasonably representative of other living areas the thermostat is controlling.

**CONNECT THERMOSTAT WIRES**

When installing a furnace with a cooling coil compartment, use of a five-conductor thermostat cable is recommended. This will allow easy installation of an air conditioning system at a later date.

1. Insert 24V wires through the small plastic bushing on the left side of the furnace.
2. Connect low voltage wires to the color coded low voltage pigtails at top of the control panel.
3. Connect low voltage wires to the wall thermostat.

NOTE: The use of 18-gauge wire is highly recommended to carry the thermostat load. Use of smaller conductors risks operational problems caused by loose or broken conductors or wire that is too small to carry the load. Any such problems are the responsibility of the installer.

With conductors smaller than 18 gauge, observe the following guidelines.

Thermostat wire length -furnace to thermostat-	Thermostat wire gauge
0-45 feet	22
0-70 feet	20

**GAS PIPING**

Supply piping must be sized in accordance with recommendations found in National Fuel Gas Code ANSI Z223.1/NFPA-54. In addition materials used in manufactured homes must comply with requirements contained in HUD Title 24, Section 3280.705 as well as A119.1 and A119.2 for recreational vehicles.

See chart in this manual for minimum sizes for NAT and LP pipe and tubing serving the furnace only.

NOTE: The gas inlet on the gas control valve is 1/2-14NPT. The gas line may be installed through the bottom casing or on left or right side of furnace.

**⚠ WARNING**

Take care when connecting the gas line to the furnace gas valve. Use suitable wrenches to support the gas valve when tightening fittings to prevent mis-alignment of the attached burner orifice. Do not damage the gas valve as improper heating, explosion, fire or asphyxiation may result.

Do not use matches, lighters, candles or other open flame to check for leaks. Use a soap or water solution or a leak detector.

Do not pressure test the fuel system at more than 14" W.C. pressure once furnace has been connected to the gas line. Overpressure may void the warranty and damage the valve which could cause an explosion, fire or asphyxiation.

**GAS PRESSURE:**

TYPE GAS	INLET GAS PRESSURE	PRESSURE TO BURNER
NATURAL	7" W.C.	3-1/2" W.C.
PROPANE	11" W.C.	10" W.C.

**GAS PIPE AND TUBING-MIN SIZES**

MODEL MGD	TYPE OF GAS	LENGTH (FT.)	PIPE SIZE (IN.)	TUBING SIZE (IN. OD)
60	Natural	to 20	3/8	5/8
		to 60	1/2	-
		to 70	-	3/4
	Propane	to 40	3/8	-
		to 70	-	5/8
		to 80	1/2	-
75	Natural	to 20	-	5/8
		to 50	1/2	-
		to 60	-	3/4
		to 80	3/4	-
	Propane	to 30	3/8	-
		to 60	-	5/8
90	Natural	to 40	1/2	3/4
		to 50	-	3/4
	Propane	to 30	3/8	-
		to 40	-	5/8
		to 60	1/2	3/4

**⚠ WARNING**

When converting gas control valve from or to Propane gas, it will be necessary to change the main burner orifice to prevent an underfired or overfired condition. The pressure regulator on the gas control valve must also be converted. See label on lower furnace compartment for full instructions.

If the gas input to the furnace is too high due to excessive gas pressure, wrong size burner orifice, no orifice, high altitude, etc., the burner flame will be sooty especially with Propane gas. This type of furnace operation can produce carbon monoxide, which could result in unsafe operation, explosion, and/or fire and asphyxiation.

**OPERATION** - Once system gas piping has been checked for leaks, operate the furnace using the lighting instructions on the front furnace panel, and:

1. Observe burner through viewport and make sure it ignites. The color of the flame when operating on natural gas will turn blue with yellow tips. On Propane, a significantly yellow flame can be expected. If flame is not the proper color call a qualified service technician for service.
2. Let furnace operate until blower cycles on. This takes about 2 to 2 1/2 minutes.
3. Turn thermostat down.
4. Observe burner to make sure it has shut off.
5. Let furnace cool and blower cycle off.

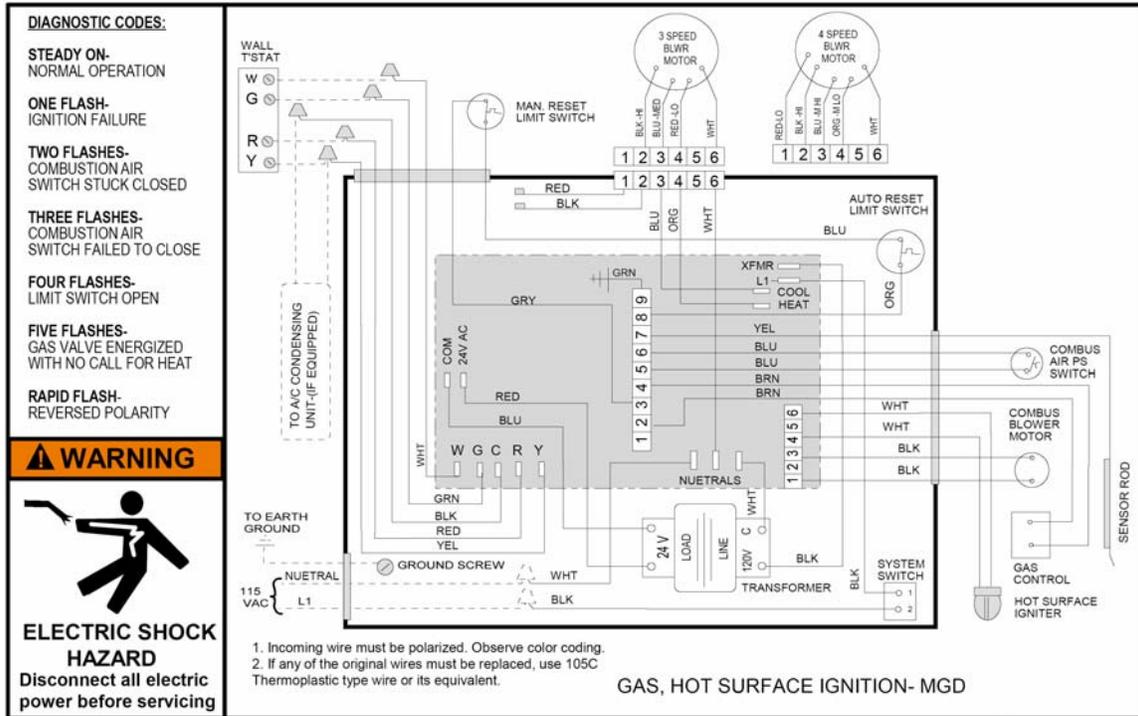
**⚠ WARNING**

*Should overheating occur, or the gas supply fail to shut off, shut off the manual gas valve to the furnace and allow burner to run until furnace cools down and blower shuts off before shutting off electrical supply.*

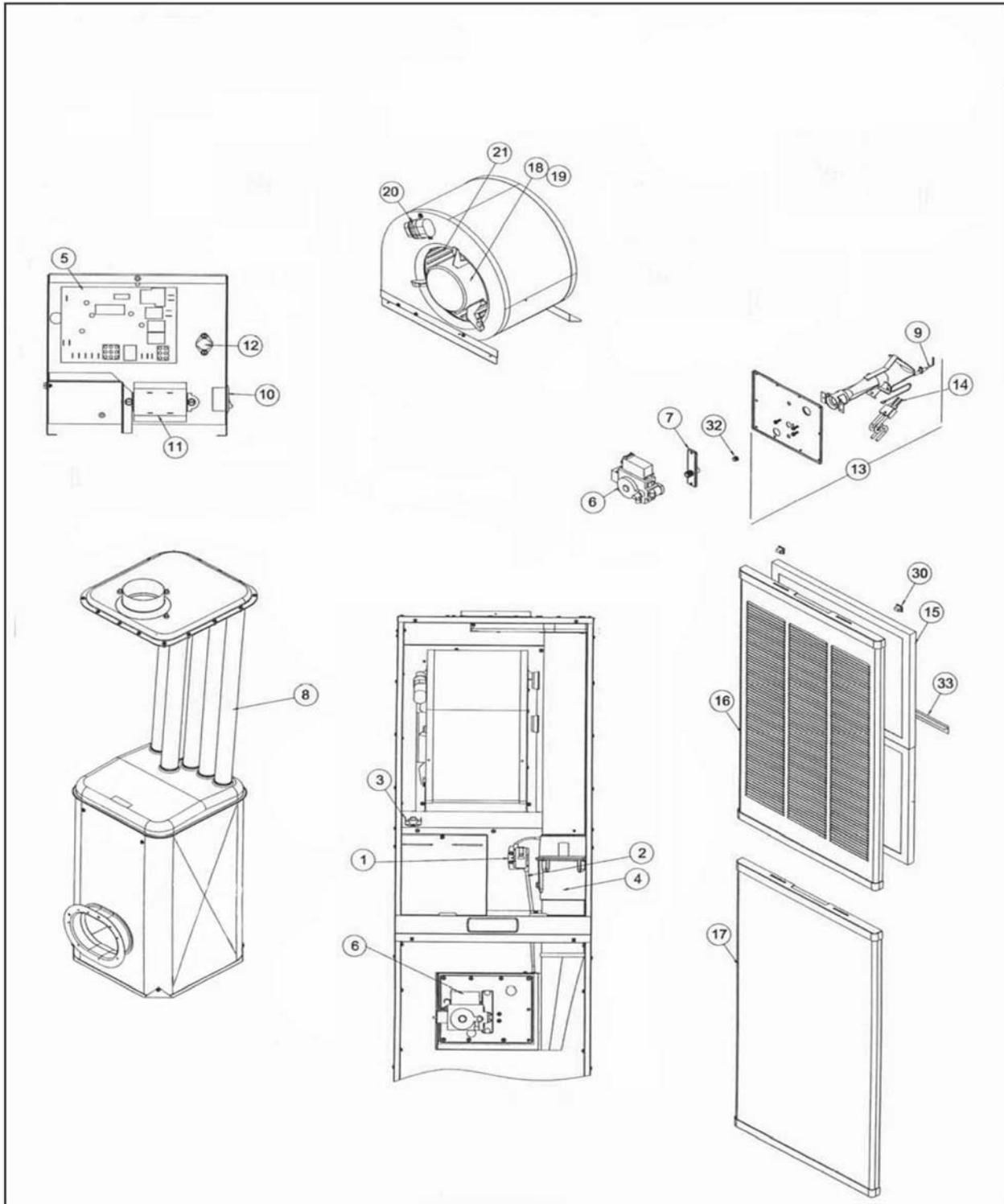
**IF FURNACE FAILS TO OPERATE PROPERLY:**

1. Check setting on wall thermostat and the position of the HEAT-COOL switch if air conditioning is installed.
2. Check to make sure that electrical power is ON at the furnace and the furnace circuit breaker has not tripped.
3. Make sure that filters are clean and return grills are not obstructed. The supply registers should be open.
4. Be sure that the furnace flue and inlet piping has not been obstructed and is open. If the cause for failure is not obvious, do not attempt to service the furnace yourself. Call a qualified service agency or the gas supplier.

**WIRING DIAGRAM, MGD**



**REPLACEMENT PARTS**



### MGD Gas Furnace Parts List

ITEM NO.	USED ON FURNACE MODEL	PART NO.	QTY	DESCRIPTION
1	All	R68DD0010	1	Pressure Switch, -0.20 N.O.
2	All	R71CA0006	2 ft.	Silicon Tubing
3	All	R68CA0005	1	Limit Switch, Manual, Upper-180F
4	All	R86GF0050	1	Boost Blower Assembly, w/ Air Orifices
5	All	R68GF0001	1	Integrated Control Board, HSI
6	All	R68GF0006	1	Gas Valve for HSI Electric Ignition
7	All	R68BKN007	1	Valve Bracket & Orifice Holder
8	MGD60	R86GF0051	1	Heat Exchanger & Gaskets
	MGD75, 90	R86GF0052	1	Heat Exchanger & Gaskets
9	All	R68GF0004	1	Flame Sensor
10	All	R68DD0009	1	System Switch - SPST
11	All	R68GF0002	1	Transformer (115V-24V, 40VA)
12	All	R68CA0004	1	Limit Switch - Open 140 F - Close 110 F
13	All	R86GF0054	1	Burner Assembly
14	All	R68GF0005	1	Hot Surface Igniter
15	All	R76AA0002	2	Filter (16" X 20" X 1")
16	All	R86GF0055	1	Door Panel - Upper
17	All	R86GF0143	1	Door Panel - Lower
18	MGD60/90-E3A	R65GF0002	1	Motor - 1/3 HP
	MGD60/90-E5A	R65GF0003	1	Motor - 3/4 HP
19	MGD60/90-E5A	R86GF0056	1	Motor Mount Assembly
20	MGD60/90-E3A	R68DE0002	1	Capacitor - 15/370M
	MGD60/90-E5A	R68DE0003	1	Capacitor - 25/370V
21	All	R69AB0001	1	Blower Wheel - 10 x 8
30	All	R86GF0058	4	Door Latch, Set
32	MGD60 (Natural Gas)	72AG-144	1	Main Burner Orifice - #27
	MGD75 (Natural Gas)	72AG-166	1	Main Burner Orifice - #20
	MGD90 (Natural Gas)	72AG-177	1	Main Burner Orifice - #16
	MGD60 (Propane)	72AG-089	1	Main Burner Orifice - #43
	MGD75 (Propane)	72AG-101	1	Main Burner Orifice - #38
	MGD90 (Propane)	72AG-110	1	Main Burner Orifice - #35
33	All	R87NNE001	1	Filter Retainer Bracket

**FINAL PROCEDURE**

**INSTALL FURNACE DOOR PANELS**

A. Install the lower door panel by engaging 2 tabs on bottom cabinet pan into slots on plastic end cap. Then, push in top of door panel until clips on the center divider panel are engaged with latches on door.

B. Install the upper louver door panel in a similar manner, by first engaging tabs on the center divider and then pushing the panel in to engage the clips at top of the cabinet.

**FINISH AND TRIM**

The alcove or closet installation may be finished and trimmed out as needed.

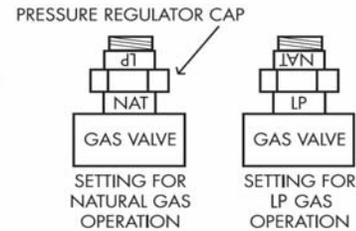
**AIR CONDITIONING SYSTEMS**

If an air conditioning system is installed which does not use the blower for air distribution and operates completely independent of the furnace, the thermostat system shall include interlock, which prevents simultaneous operation of the furnace and air conditioner. An interlock system typically contains a switch, which must be turned to either HEAT or COOL to activate either heating or cooling operation. A cooling thermostat may include a positive OFF switch for this purpose.

When used in connection with a cooling unit the furnace shall be installed parallel with or on the upstream side of the cooling unit to avoid condensation in the heat exchanger. For installations with a parallel flow arrangement, the furnace must be equipped with a damper or other means to prevent cold air from being discharged up around the heat exchanger.

**GAS VALVE CONVERSION INSTRUCTIONS**

1. Follow instructions "TO TURN OFF GAS TO APPLIANCE"
2. Remove two bolts securing the gas valve bracket. Pull gas valve bracket and burner orifice holder exposing the main burner orifice.
3. Install burner orifice specified on the rating plate for the desired gas. Conversion parts are in a bag attached to the gas valve.
4. Replace valve, bracket/orifice holder, and bolts. Attach ID tag for the desired gas adjacent to the gas valve. Ensure that all connections are tight.
5. Unscrew and reverse the pressure regulating cap so the name of the desired gas is closest to the valve. See illustration.



**HIGH ALTITUDE DERATE CHART - MAIN BURNER ORFICE SIZE**

NATURAL GAS									
ELEVATION	60,000 BTUH FURNACE			75,000 BTUH FURNACE			90,000 BTUH FURNACE		
	PART NO.	ORIF. DIA.	DRILL SIZE	PART NO.	ORIF. DIA.	DRILL SIZE	PART NO.	ORIF. DIA.	DRILL SIZE
SEALEVEL	72AG-147	0.147	26	72AG-161	0.161	20	72AG-180	0.18	15
2000	72AG-144	0.144	27	72AG-161	0.161	20	72AG-177	0.177	16
3000	72AG-140	0.1405	28	72AG-159	0.159	21	72AG-173	0.173	17
4000	72AG-140	0.1405	28	72AG-157	0.157	22	72AG-173	0.173	17
5000	72AG-140	0.1405	28	72AG-154	0.154	23	72AG-169	0.169	18
6000	72AG-136	0.136	29	72AG-152	0.152	24	72AG-166	0.166	19
7000	72AG-136	0.136	29	72AG-149	0.149	25	72AG-161	0.161	20
8000	72AG-128	0.1285	30	72AG-147	0.147	26	72AG-161	0.161	20
9000	72AG-128	0.1285	30	72AG-144	1.44	27	72AG-157	0.157	22
10000	72AG-128	0.1285	30	72AG-140	0.1405	28	72AG-152	0.152	24

LP - PROPANE GAS									
ELEVATION	60,000 BTUH FURNACE			75,000 BTUH FURNACE			90,000 BTUH FURNACE		
	PART NO.	ORIF. DIA.	DRILL SIZE	PART NO.	ORIF. DIA.	DRILL SIZE	PART NO.	ORIF. DIA.	DRILL SIZE
SEA LEVEL	72AG-089	0.089	43	72AG-101	0.1025	38	72AG-113	0.113	33
2000	72AG-086	0.086	44	72AG-099	0.0995	39	72AG-110	0.11	35
3000	72AG-086	0.086	44	72AG-098	0.098	40	72AG-110	0.11	35
4000	72AG-086	0.086	44	72AG-096	0.096	41	72AG-106	0.1065	36
5000	72AG-082	0.082	45	72AG-096	0.096	41	72AG-106	0.1065	36
6000	72AG-082	0.082	45	72AG-093	0.093	42	72AG-104	0.104	37
7000	72AG-081	0.081	46	72AG-093	0.093	42	72AG-101	0.1015	38
8000	72AG-078	0.078	47	72AG-089	0.089	43	72AG-101	0.1015	38
9000	72AG-078	0.078	47	72AG-089	0.089	43	72AG-098	0.098	40
10000	72AG-076	0.076	48	72AG-086	0.086	44	72AG-096	0.096	41

Reference: NFPA No. 54, ANSI Z 223.1 National Fuel Gas Code

Table shows 4% Input Reduction per 1,000 feet elevation

For Canadian High Altitude (2,000-4,500 feet), reduce gas pressure to burner manifold (manifold Ps.) to 3.0" W.C. and 9.0" W.C. for LP (Propane) Gas