G11E SERIES UNITS

I - INTRODUCTION

G11E units are built with Duracurve heat exchangers that have the Lennox Duraglass coating. These furnaces are atmospheric type burners that use pilot burners for ignition.

"G11E" units use electronic ignition systems to light the pilot on each operating cycle (intermittent pilot). A protection circuit verifies pilot flame to allow main burner ignition. Main burner and pilot are extinguished during the off cycle. If the pilot gas does not light, the main gas valve will not open.

Only the G11E unit is approved for usage with the optional Vent Damper Assembly. The damper actuator electrically interlocks with the ignition system. The vent damper must be fully open before pilot ignition can occur.

The units are manufactured for natural gas applications, but field propane field changeover kits are available.

Figure 1 shows a cutaway of a G11E-110.

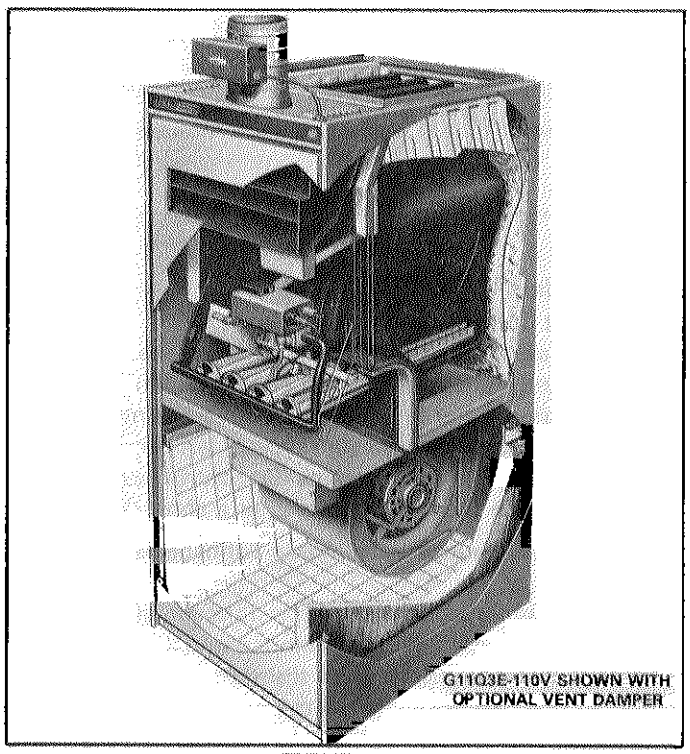


FIGURE 1

Model Number		G11E-200V
Btuh input		200,000
Btuh bonnet output		155,000
Cfm for 100 F temperature rise		1480
Vent size (in.)		7 oval
High static approved by A.G.A. (in. wg.)		50
Gas piping size (I.P.S. in.)	Natural	3/4
	†Propane	3/4
No. of burners		7
Blower wheel nominal diam. x width (in.)		12 x 12
Blower pulley bore x diam. (in.)		1 x 7 — A
Blower motor & drives (shipped separately)		see drive kit selection table
Net filter area (sq. ft.) & cut size (in.)		9.7 52 x 28 x 1
Tons of cooling that can be added		3 1/2, 4 or 5
Shipping weight (lbs.)		330
Number of packages in shipment		2
Electrical characteristics		120 volts -- 60 hertz 1 phase
(Optional) Return Air Cabinet	Model No.	RA10-16-53
	Net weight (lbs.)	75
Vent Damper Assembly — Optional		AFD7
Air Shutter Kit (Nat. Gas Only)		LB-32077CC

II - UNIT INFORMATION

A - Specifications

Model Number		G11Q3E-82V	G11Q3E-110V	G11Q3E-137V	G11Q4E-137V	G11Q5E-165V
Btuh		82,000	110,000	137,000	137,000	165,000
Btuh bonnet output		63,000	85,000	106,000	106,000	127,000
Vent size (in.)		4 round	5 oval	6 oval	6 oval	6 oval
High static certified by A.G.A. (in. wg.)		.50	.50	.50	.50	.50
Gas piping size (I.P.S. in.)	Natural	1/2	1/2	1/2	1/2	3/4
	†Propane	1/2	1/2	1/2	1/2	3/4
No. of burners		3	4	5	5	6
Blower wheel nominal diam. x width (in.)		10 x 7	10 x 8	10 x 8	12 x 9	12 x 12
Blower motor horsepower		1/3	1/3	1/3	1/3	3/4
Net filter area (sq. ft.) & cut size (in.)		(5.8) 36 x 28 x 1	(6.6) 40 x 28 x 1	(8.9) 52 x 28 x 1	(8.9) 52 x 28 x 1	(9.2) 54 x 28 x 1
Tons of cooling that can be added		2, 2-1/2 or 3	2-1/2 or 3	2-1/2 or 3	3-1/2 or 4	4 or 5
Shipping weight (lbs.)		175	204	256	264	314
Number of packages in shipment		1	1	1	1	1
Electrical characteristics		120 volt — 60 Hertz — 1 phase (All Units)				
Return Air Cabinet	**Model No.**	**RA10-16-49**	**RA10-16-49**	**RA10-16-53**	**RA10-16-53**	**RA10-16-53**
	Net Weight (lbs.)	65	65	75	75	75
Vent Damper Assembly — Optional		**AFD4**	**AFD5**	**AFD6**	**AFD6**	**AFD6**
Air Shutter Kit (Nat. Gas Only)		**LB-32077CA**		**LB-32077CB**		

B - Wiring

Field wiring is to terminal strips. Multi-speed blower motors are factory wired with low speed (red) tap for heating and high speed tap (black) for cooling. Optional vent damper is wired by removing jumper plug and connecting in vent damper harness. See Figure 2.

The units include an accessory terminal for wiring accessories such as humidifiers or electronic air cleaners. This terminal is energized only when the blower motor is operating (either through fan control circuit or when indoor blower relay is energized.

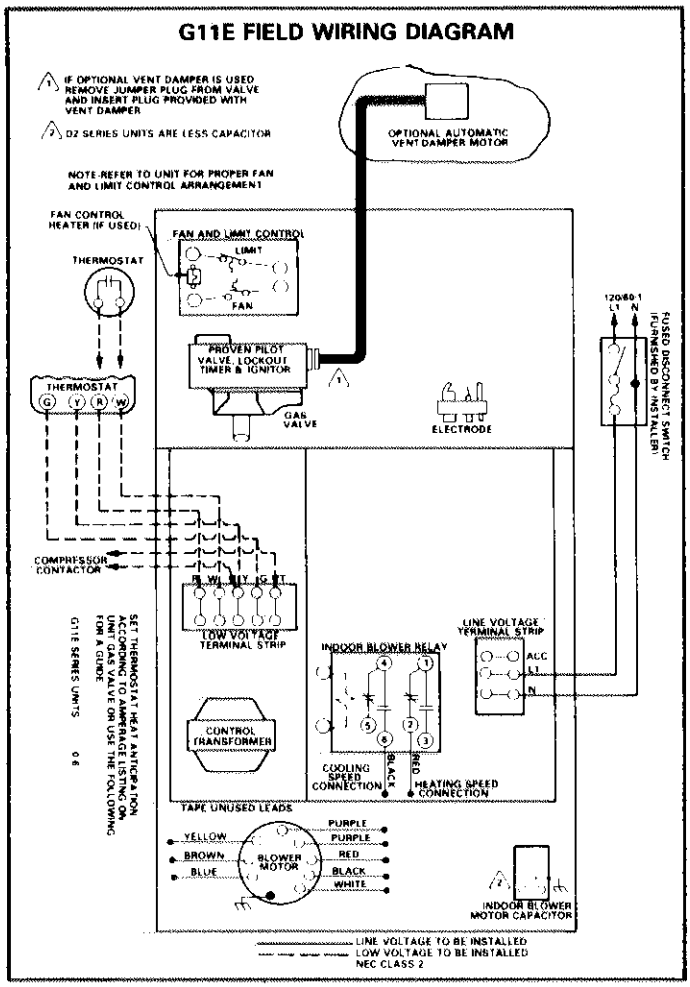


FIGURE 2

C - Installation Considerations

Installation of Lennox gas central furnaces must conform with local codes or in absence of local codes, with the National Fuel Gas Code (ANSI-Z223.1-1974). Air supply for combustion and ventilation must conform to the methods outlined in ANSI-Z223.1-1974.

The extended warranty on heat exchanger will not apply if furnace is operated in a contaminated atmosphere, when supplied with 100% outdoor air or when installed downstream from a cooling coil.

III - UNIT COMPONENTS

A - Control Box (Figure 3)

1 - Low voltage terminal strip with thermostat markings.

2 - 30VA transformer, 120 volt primary/24 volt secondary.

3 - Double-pole, double-throw indoor blower relay - 24 volt coil.

4 - Power supply and accessory terminal strip.

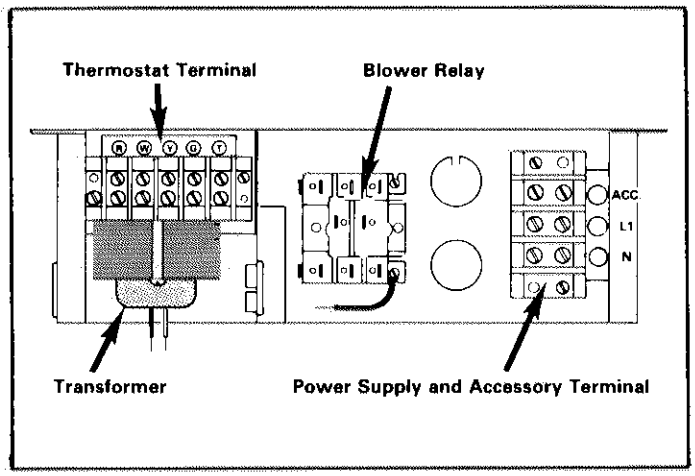


FIGURE 3

B - Exploded View (Figure 4)

1 - **Fan/Limit Control**

Three basic types of fan/limit controls are used: Camstat, Cemco and Honeywell. Do not adjust the limit from factory settings. Refer to Figure 5 for fan adjustment. Some units may employ a sure start type of fan control. As the main gas valve is energized the fan control heater is activated to close the fan contacts after a short delay.

2 - **Manual Gas Shutoff Valve (Penn-Johnson Ignition System Only)**

Furnaces equipped with the Penn-Johnson electronic ignition system are equipped with a manual shutoff valve factory installed adjacent to the gas valve. This is an A.G.A. requirement to permit manual shutoff of gas supply. This shutoff valve must not be moved to the gas line external to unit to satisfy local codes. If codes require an external gas valve, it must be in addition to this valve.

NOTE - Robertshaw and White-Rodgers systems have shutoff at gas valve.

3 - **Electronic Ignition Components (G11E)**

Lennox has used three basic electronic ignition systems in G11E production. The systems are identified by the unit dash number. See Table 1. Refer to sections within this manual for additional information. These sections also explain the vent damper interface when used.

TABLE 1

Dash Number	Ignition System
G11E-1 Series	Penn-Johnson (G60 - system 1)
G11E-2 Series	White Rodgers
G11E-3 Series	Robertshaw
G11E-4 Series	Penn-Johnson (G60 - system 2)
G11E-5 Series	Robertshaw
G11E-6 Series	Penn-Johnson (G60 - system 2)

Note - On Robertshaw systems the ingition control powers the "R" leg of thermostat. When troubleshooting the 24 volt control circuit, check the fuse internal to the ignition control.

G11E EXPLODED VIEW (PENN-JOHNSON SYSTEM SHOWN)

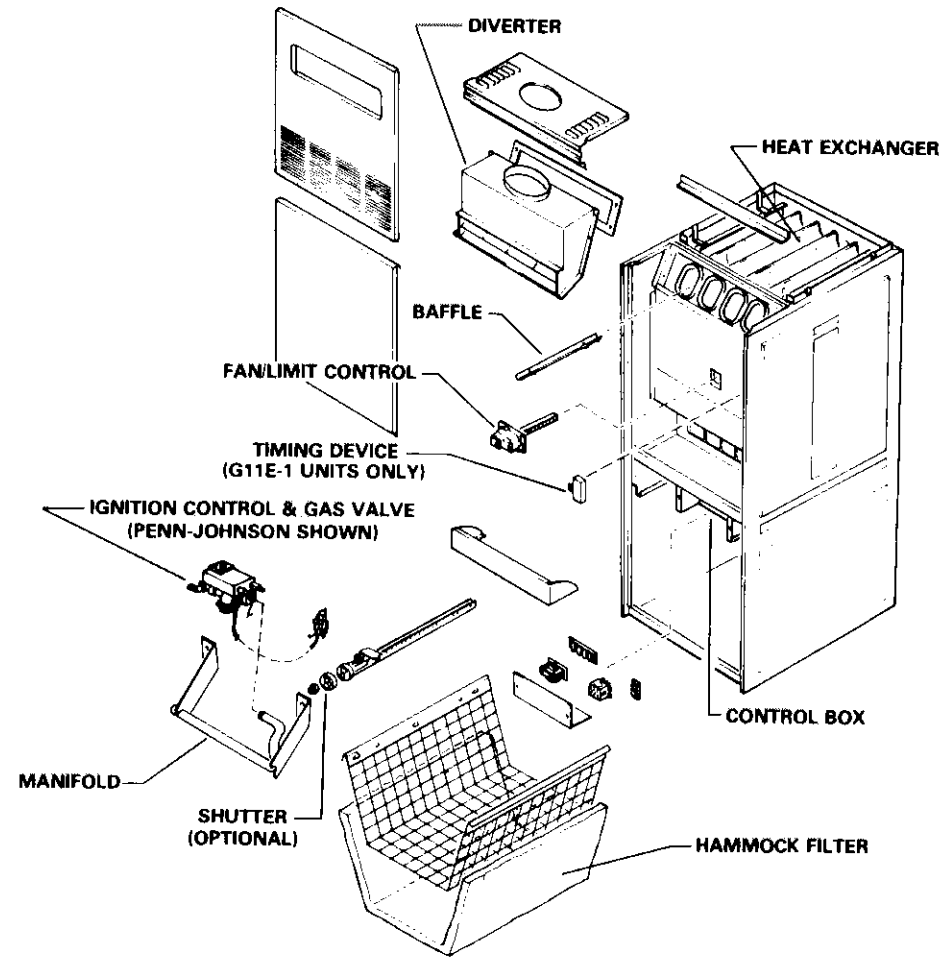


FIGURE 4

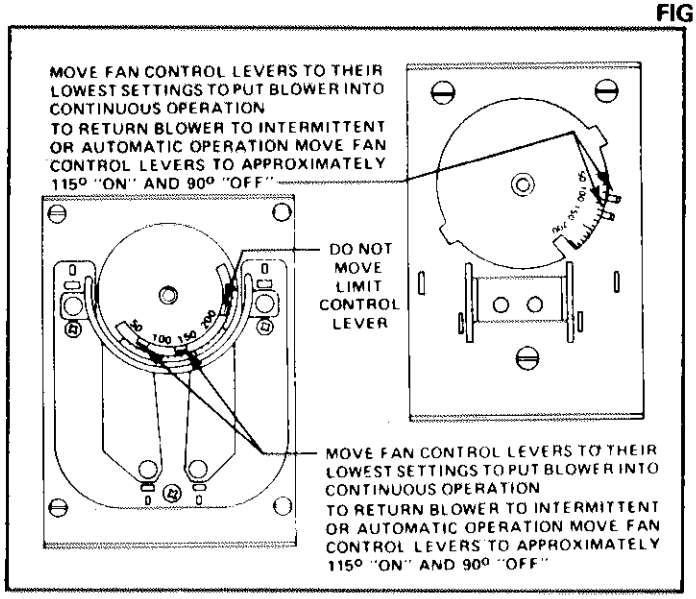


FIGURE 5

The individual mated components consist of the gas valve, pilot assembly and ignition control. Dash 5 and 6 units use a redundant main gas valve. This features two internal solenoids. Should one solenoid stick open, the other assures gas shutoff.

4 - **Door Interlock**
Later production units incorporate a door interlock to de-energize the control circuit whenever the blower access panel is removed.

5 - **Air Shutters (If Used)**
If desired an air shutter kit is available for natural gas installations. See unit specifications for kit numbers. The propane changeover kits include air shutters. Minor adjustments for flame lifting, burner noise, etc., may be necessary. Refer to Figure 6.

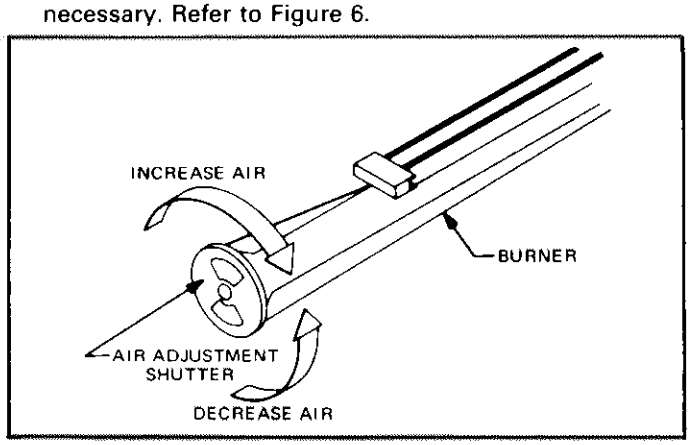


FIGURE 6

IV - TEMPERATURE RISE (FIGURE 7)

The blower speed must be set to meet the proper air temperature rise listed on the unit rating plate. To measure this temperature rise, place plenum thermometers in warm air and return air plenums. Locate thermometer in warm air plenum where thermometer will not "see" heat exchanger, thus picking up radiant heat. Set thermostat to highest setting. After plenum thermometers have reached their highest and steadiest readings, subtract the two. The difference should be in the range listed on unit rating plate. If this temperature is low, decrease blower speed; if temperature is high, increase blower speed.

Table 2 shows the speed selection charts for the various units. The 200V model furnace is equipped with a belt drive sulky blower. See Table 3 for the available drive kits. Blower speed is regulated by means of an adjustable motor pulley. Open pulley to decrease speed and close pulley to increase speed. Adjust belt tension as loose as possible without allowing slippage.

TABLE 2

BLOWER SPEED SELECTION

IMPORTANT - TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION. TAPE UNUSED MOTOR LEADS SEPARATELY.

SPEED	BLOWER MOTOR LEAD		
	D2 OR Q4	Q3	Q5
LOW	RED	RED	RED
MEDIUM LOW	----	YELLOW	YELLOW
MEDIUM	YELLOW	----	BLUE
MEDIUM HI	----	BROWN	BROWN
HIGH	BLACK	BLACK	BLACK

V - SCHEMATIC WIRING DIAGRAM OPERATING SEQUENCE

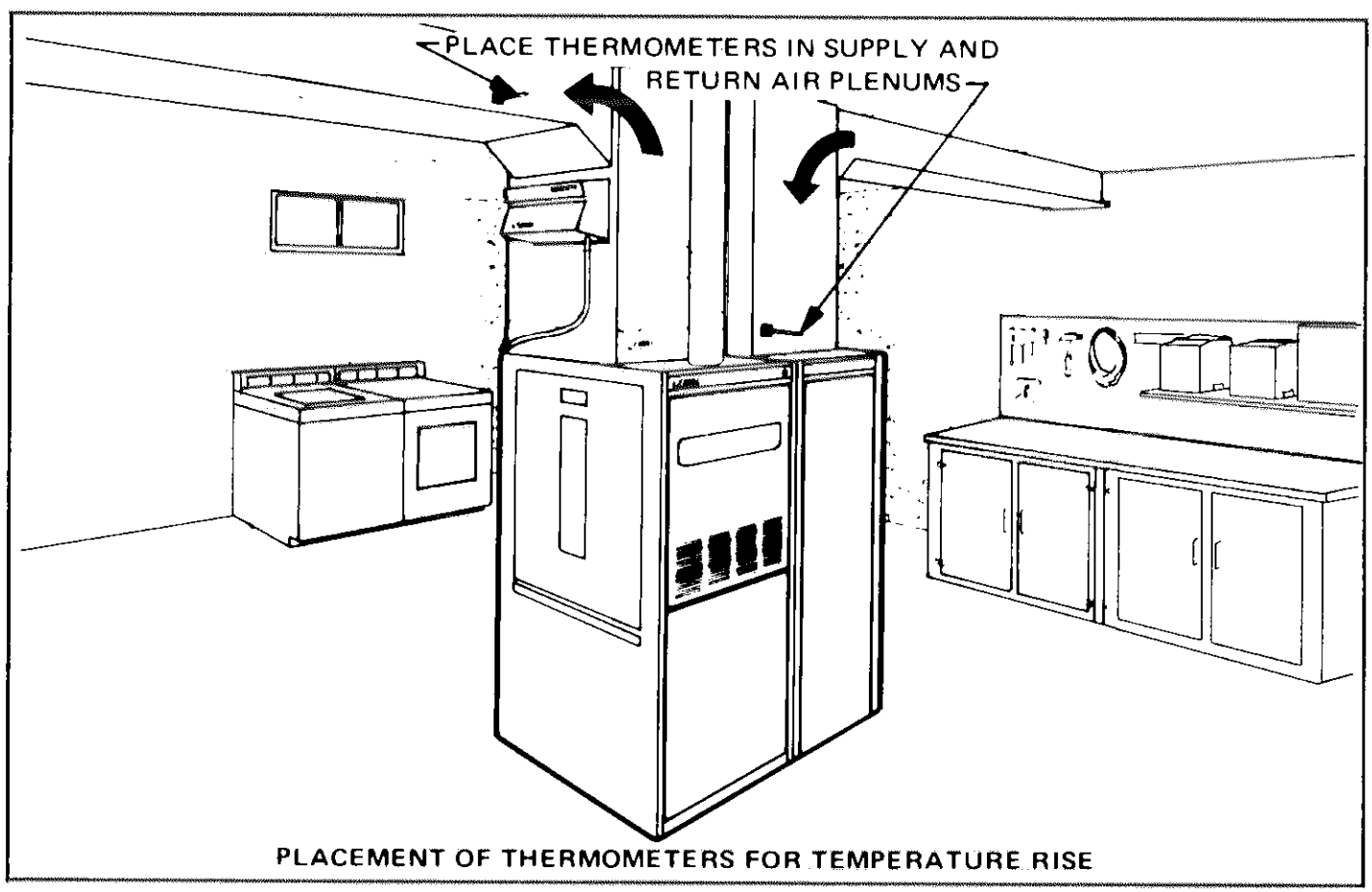
Figure 8 illustrates a typical G11E unit with Penn-Johnson pilot ignitor.

TABLE 3

Usage	Drive Kit Model No.	Motor hp	Motor Pulley (in.) & Groove	**Blower Pulley (in.) & Groove	*Rpm Range	Belt	Net Weight (lbs.) 1 Package
Heating	DK 1/3-5 (BM-5790)	1/3	1/2 x 3-3/4 — OA	1 x 7 — A	590 — 835	4L410	11
3-1/2 & 4 tons	DK 1/2-6 (BM-5791)	1/2	5/8 x 4-1/8 — OA	1 x 7 — A	690 — 935	4L420	26
5 tons	DK 3/4-7 (BM-5792)	3/4	5/8 x 4-1/8 — OA	1 x 7 — A	690 — 935	4L420	30
	DK-2007 (BM-7523)	1	5/8 x 4-3/4 — OA	1 x 7 — A	840 — 1085	4L430	36

*At 1725 rpm motor speed.

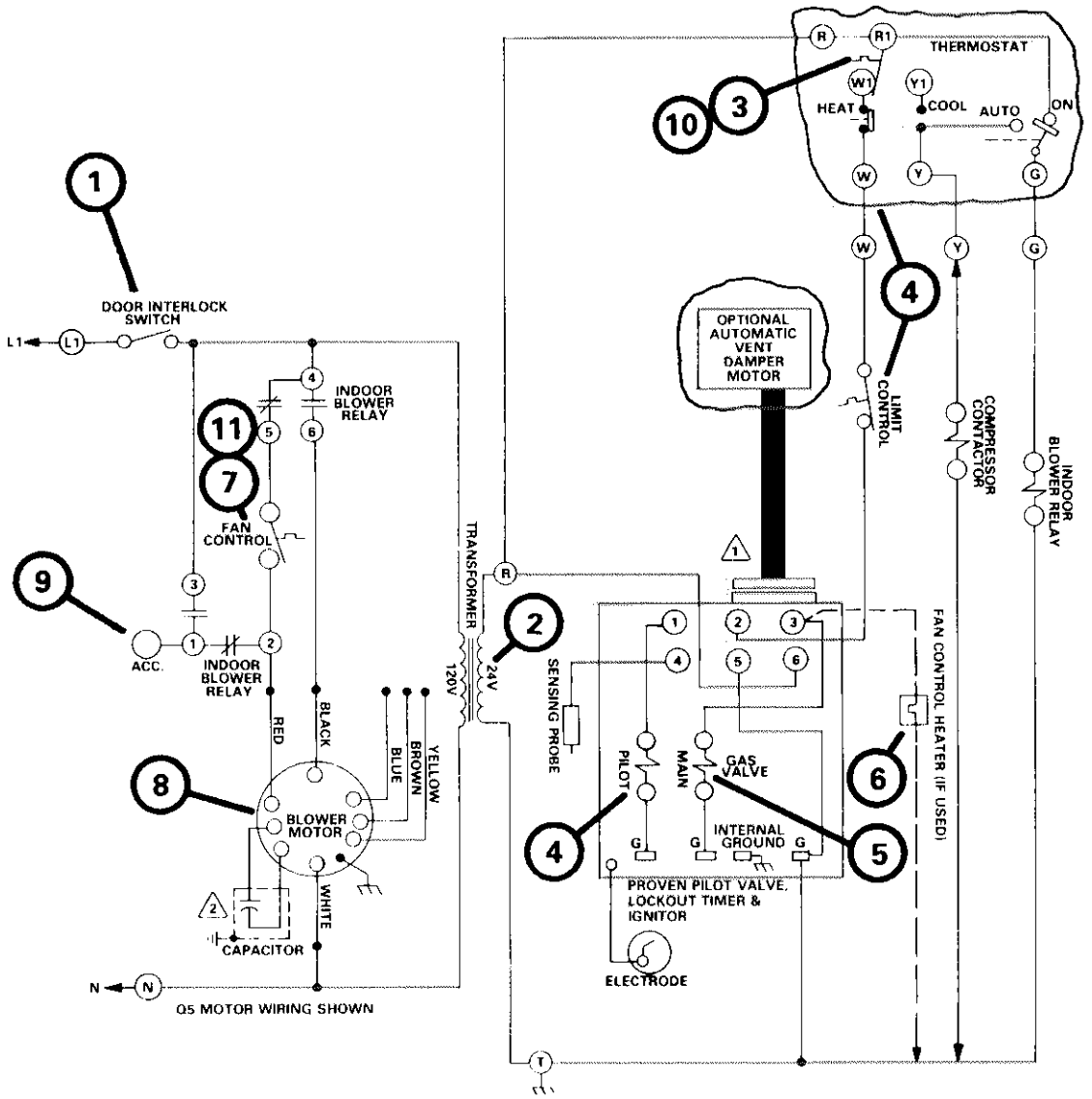
**Factory installed in furnace package and not included in drive kit.



PLACEMENT OF THERMOMETERS FOR TEMPERATURE RISE

FIGURE 7

TYPICAL G11E SEQUENCE OF OPERATION



1 - Line potential feeds through the door interlock (if used). The blower access panel must be in place to energize machine.

2 - Transformer provides 24 volt control circuit.

3 - On a heating demand, the thermostat heating bulb makes.

4 - The control circuit feeds from "W" leg through limit control to initiate pilot operation.

5 - After the pilot flame has proven, the main valve is energized. Main burners are ignited.

6 - As the main valve is energized, the fan control heater (if used) is also activated.

7 - After a short period, the heater provides sufficient heat to close the fan control contacts.

8 - This then energizes the blower motor on low speed.

9 - The accessory terminal is also energized through the N.C. indoor blower relay contacts.

10 - As the heating demand is satisfied, the thermostat heating bulb breaks. This de-energizes the ignition control, gas valve and fan control heater.

11 - The blower motor continues running until the furnace temperature drops below fan control setpoint.

FIGURE 8