

G12R AND G12RE SERIES UNITS

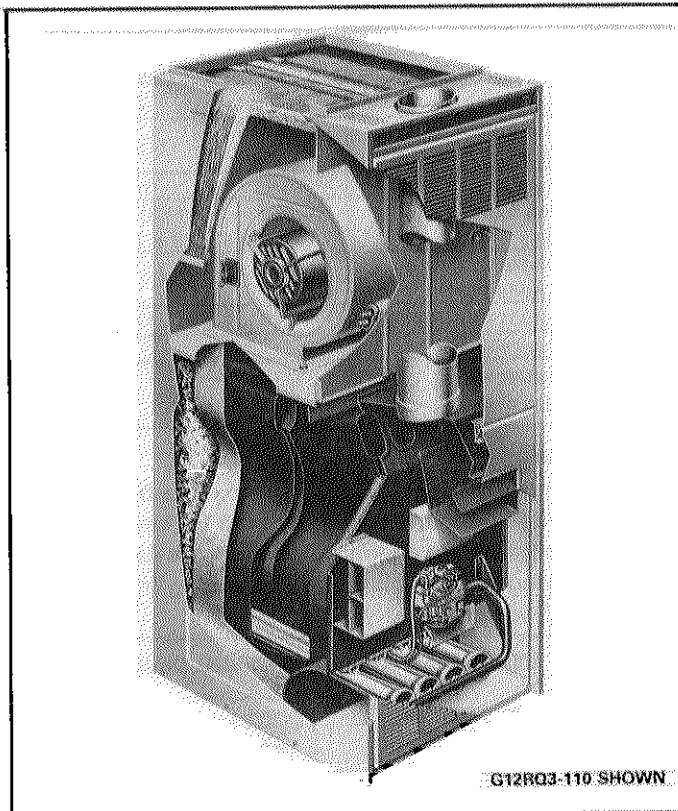
I - INTRODUCTION

Both G12R and G12RE units are built with Duracurve heat exchangers formed out of cold rolled steel. These furnaces are atmospheric type burners that use pilot burners for ignition. The "G12R" units use a standing pilot which burns continuously to ignite the main burners on each heating demand. This standing pilot uses a thermocouple for flame verification. In the event of pilot outage, the gas valve locks itself out in response to the thermocouple.

"G12RE" 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.

These units are down-flo furnaces designed for installations with the duct work installed under the floor or tunneled into a concrete slab floor. Only the G12RE 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 changeover kits are available.



G12RQ3-110 SHOWN

FIGURE 1

Figure 1 shows a cutaway of a G12RQ3E-110.

II - UNIT INFORMATION

A - Specifications

Model No.	G12RD2E-55	G12RQ3E-82	G12RQ3E-110	G12RQ3E-137	G12RQ5E-137	G12RQ5E-165
Btuh input	55,000	82,000	110,000	137,000	137,000	165,000
Btuh bonnet output	44,000	65,600	88,000	109,600	109,000	132,000
Vent size (in.)	4 round	4 round	5 oval	6 oval	6 oval	6 oval
High static certified by A.G.A. (in. wg.)	.50	.50	.65	.50	.75	.60
Gas piping size (I.P.S. in.)	Nat.	1/2	1/2	1/2	1/2	3/4
	Prop.	1/2	1/2	1/2	1/2	3/4
No. of burners	2	3	4	5	5	6
Blower wheel nominal diam. x width (in.)	9 x 7	10 x 7	10 x 8	10 x 8	12 x 12	12 x 12
Blower motor hp	1/5	1/3	1/3	1/3	3/4	3/4
Net filter area (sq. ft.) & cut size (in.)	(4.2) 2 — 20 x 24 x 1	(4.2) 2 — 20 x 24 x 1	(4.2) 2 — 20 x 24 x 1	(4.7) 2 — 24 x 22 x 1	(4.7) 2 — 24 x 22 x 1	(5.3) 2 — 24 x 24 x 1
Tons of cooling that can be added	1-1/2	2-1/2 or 3	2-1/2 or 3	2-1/2 or 3	3-1/2, 4 or 5	3-1/2, 4 or 5
Shipping wt. (lbs. -1 pkg.)	160	182	215	247	271	303
Electrical characteristics	120 volts/60 hertz/1 phase (All Units)					
Vent Damper Assembly — Optional	AFDR4	AFDR4	AFDR5	AFDR6	AFDR6	AFDR6
Air Shutter Kit (Nat. Gas Only)	LB-32077CA			LB-32077CB		

Model No.	G12RD2-55	G12RD2-82	G12RQ3-82	G12RD2-110	G12RQ3-110	G12RQ3-137	G12RQ5-137	G12RQ5-165
Btuh input	55,000	82,000	82,000	110,000	110,000	137,000	137,000	165,000
Btuh bonnet output	44,000	63,000	63,000	85,000	85,000	106,000	106,000	127,000
Flue size (in.)	4	4	4	5 oval	5 oval	6 oval	6 oval	6 oval
High static Certified by A.G.A. (in. wg.)	.50	.35	.50	.35	.65	.50	.75	.60
Gas piping size	Natural	1/2	1/2	1/2	1/2	1/2	1/2	3/4
	Propane	1/2	1/2	1/2	1/2	1/2	1/2	3/4
No. of burners	2	3	3	4	4	5	5	6
Blower wheel nom. diam. x width (in.)	9 x 7	9 x 7	10 x 7	9 x 9	10 x 8	10 x 8	12 x 12	12 x 12
Blower motor hp	1/5	1/5	1/3	1/5	1/3	1/3	3/4	3/4
Net filter area (sq. ft.) & cut size (in.)	(4.2) 2 —	(4.2) 2 —	(4.2) 2 —	(4.2) 2 —	(4.2) 2 —	(4.7) 2 —	(4.7) 2 —	(5.3) 2 —
	20 x 24 x 1	20 x 24 x 1	20 x 24 x 1	20 x 24 x 1	20 x 24 x 1	24 x 22 x 1	24 x 22 x 1	24 x 24 x 1
Tons of cooling that can be added	1-1/2	1-1/2 or 2	2-1/2 or 3	2	2-1/2 or 3	2-1/2 or 3	3-1/2, 4 or 5	3-1/2, 4 or 5
Shipping weight (lbs.-1 pkg.)	160	178	182	208	215	247	271	303
Electrical characteristics	120 volts/60 hertz/1phase (All Units)							
Air Shutter Kit (Nat. Gas Only)	LB-32077CA					LB-32077CB		

B - Wiring

Field wiring is made at unit junction box. The blower motor is 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.

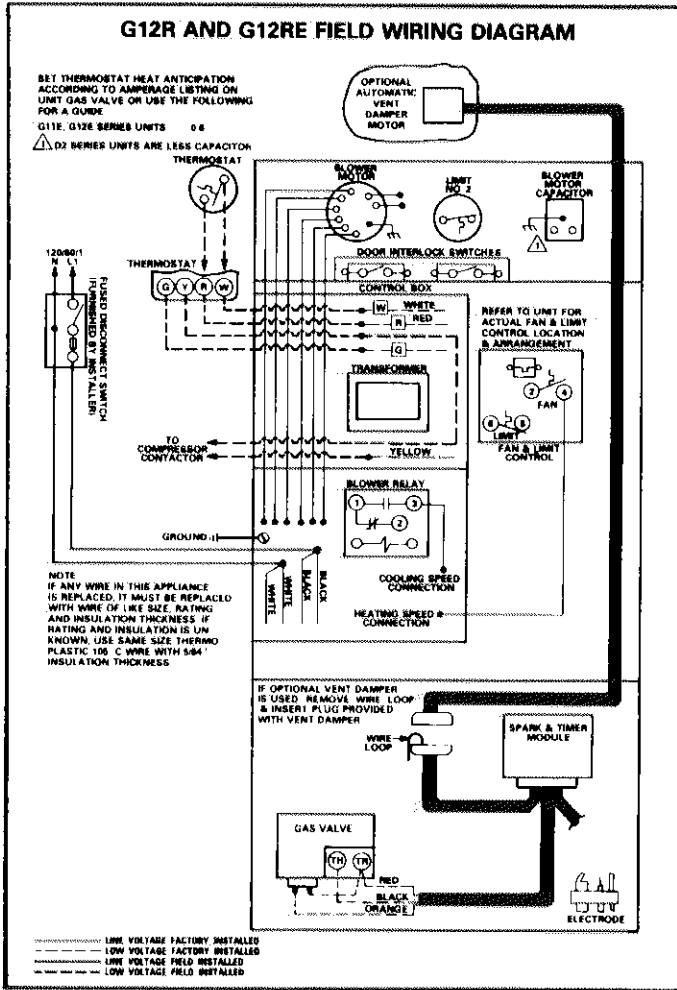


FIGURE 2

Accessories must never be wired through fan control since it is possible to generate approximately 180 volts. This happens when the indoor blower relay is energized and the circuit is fed through the black motor lead. The motor acts as an auto transformer and generates the higher voltage through red leg to fan control. See Figure 3. Accessories must be wired through an isolated circuit and may be interconnected to blower operation with the use of a current sensing relay or sail switch.

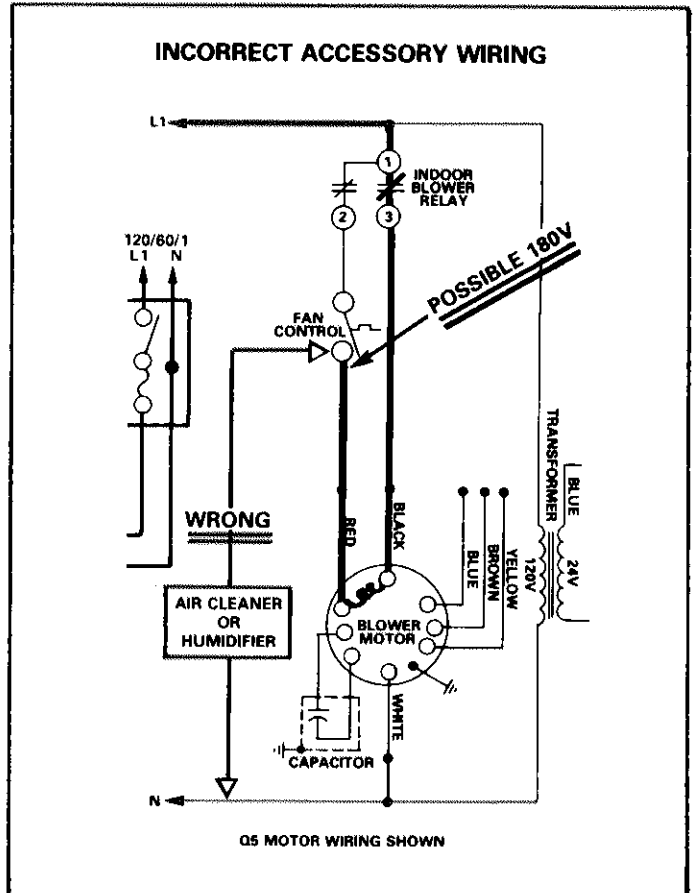


FIGURE 3

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 down-stream from the cooling coil.

III - UNIT COMPONENTS

A - Control Box

- 1 - 30VA transformer, 120 volt primary/24 volt secondary.
- 2 - Single-pole, double-throw indoor blower relay - 24 volt coil.

B - Exploded View (Figure 4)

- 1 - **Fan/Limit Control**
Reverse flow units use a sure start combination fan and limit control. As the main gas valve is energized, the fan control heater is activated to close fan contacts after a short delay. The fan control is adjustable. See Figure 5. Do not alter limit control setting.
- 2 - **Auxiliary Limit Control**
An additional limit is placed in the blower housing. It is wired in series with the other limit.
- 3 - **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 sup-

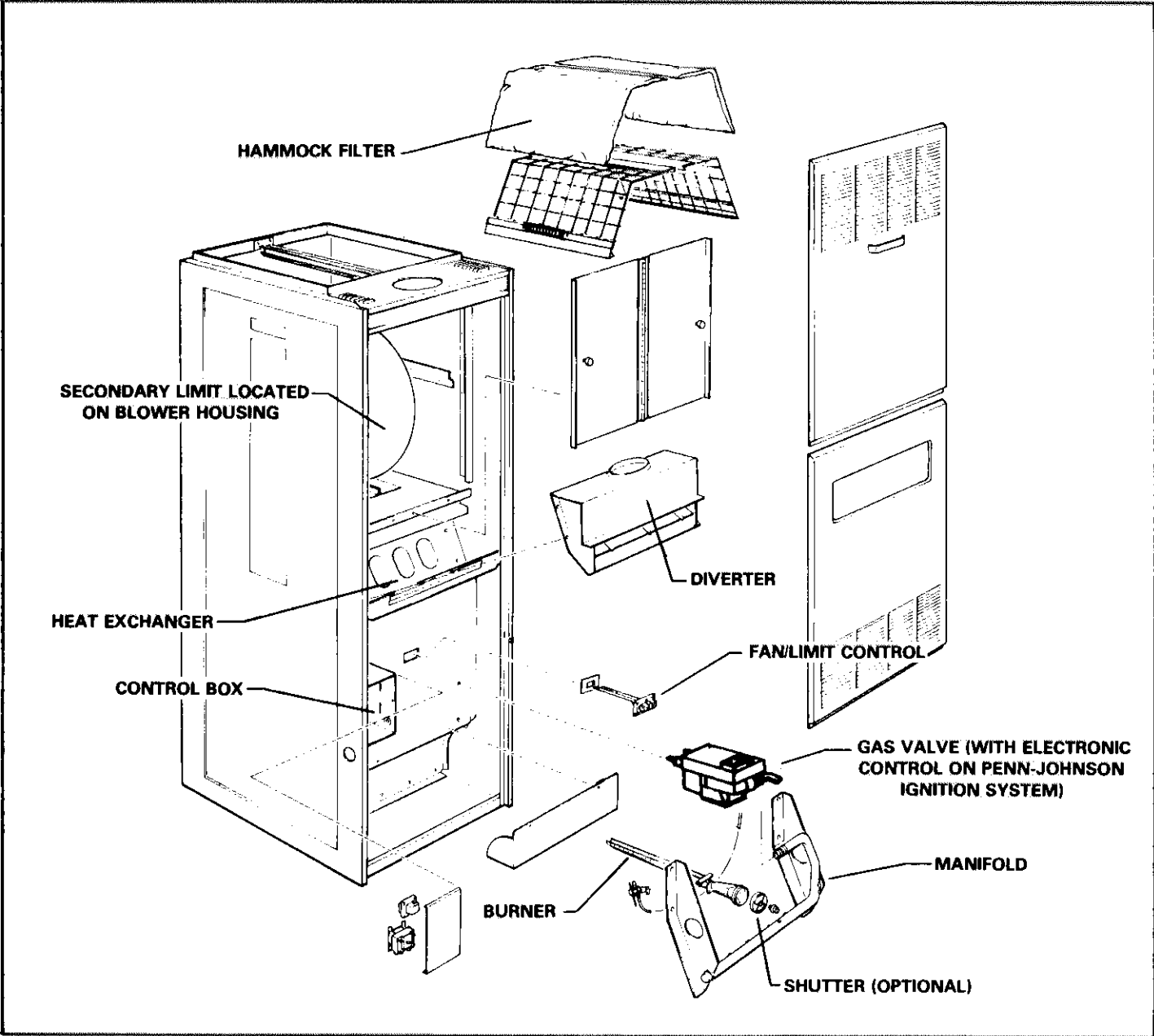


FIGURE 4

ply. 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.

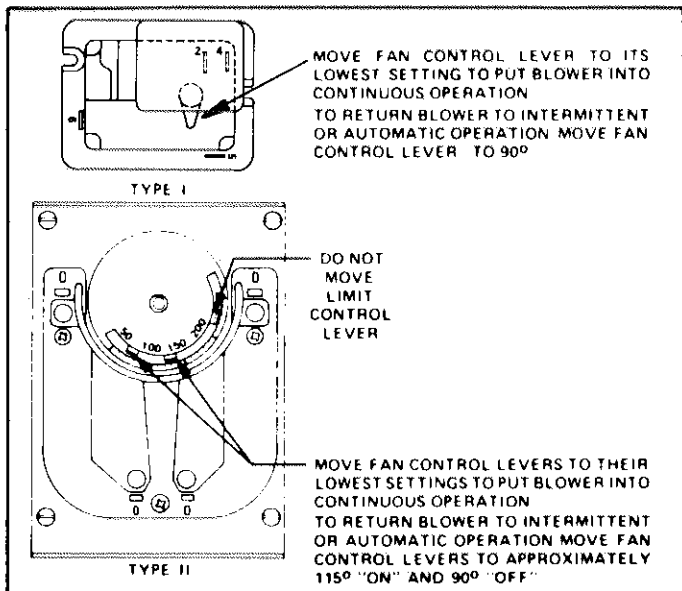


FIGURE 5

4 - Electronic Ignition Components (G12RE)

Lennox has used three basic electronic ignition systems in G12RE production. The systems are identified by the dash number. See Table 1. Refer to sections within this manual for additional information. These sections also explain the vent damper interface when used.

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

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.

TABLE 1

Dash Number	Ignition System
G12RE-1 Series	Penn-Johnson (G60 system 1)
G12RE-2 Series	White Rodgers
G12RE-3 Series	Robertshaw
G12RE-4 Series	Penn-Johnson (G60 system 2)
G12RE-5 Series	Robertshaw
G12RE-6 Series	Penn-Johnson (G60 system 2)

5 - Door Interlocks

Later production units incorporate two door interlocks to de-energize control circuit whenever the blower access panel is removed.

6 - 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.

IV - TEMPERATURE RISE

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. See Figure 6. 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.

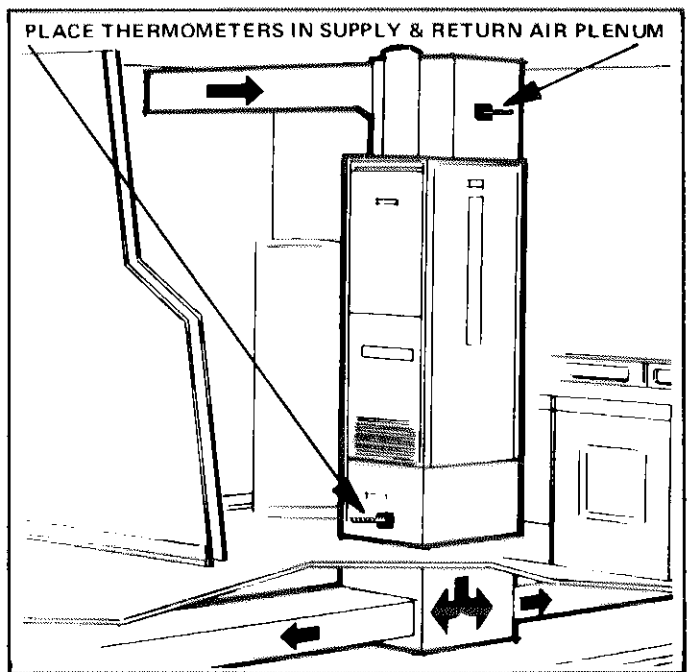


FIGURE 6

TABLE 2

BLOWER SPEED SELECTION

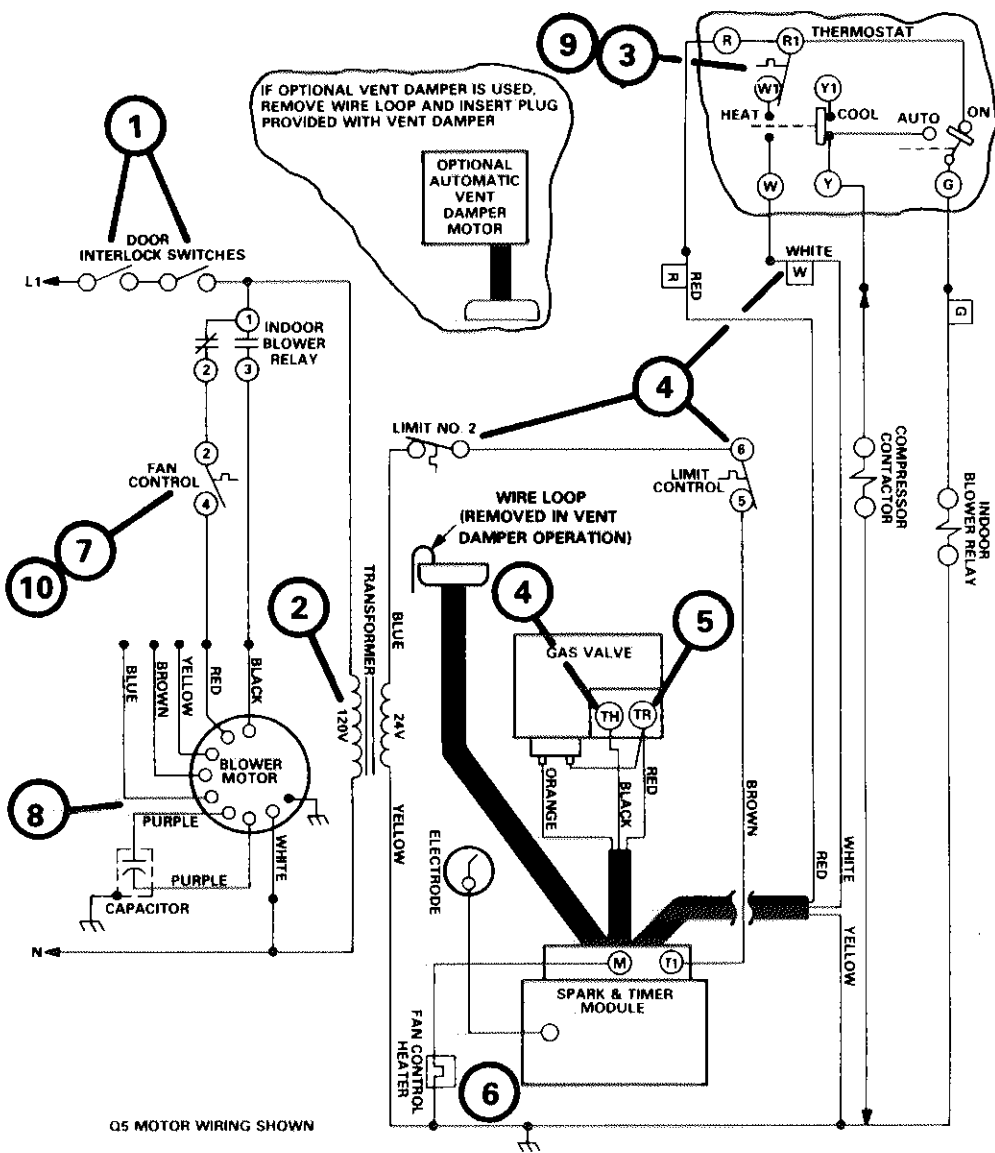
IMPORTANT TO PREVENT MOTOR BURNOUT, NEVER CONNECT MORE THAN ONE MOTOR LEAD TO ANY ONE CONNECTION. TAPE UNUSED MOTOR LEADS SEPARATELY.

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

V - SCHEMATIC WIRING DIAGRAM OPERATING SEQUENCE

Figure 7 illustrates a typical G12RE with Robertshaw pilot ignitor.

TYPICAL G12RE SEQUENCE OF OPERATION



Q5 MOTOR WIRING SHOWN

- 1 - Line potential feeds through the door interlocks (if used). Access panels 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 24V control circuit is complete to the pilot valve through limit controls, "W" leg of thermostat and internal ignitor circuits.
- 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 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 - As heating demand is satisfied, the thermostat heating bulb breaks. This de-energizes the ignition control, gas valve and fan control heater.
- 10 - The blower motor continues running until the furnace temperature drops below fan control set point.

FIGURE 7