

## G81 SERIES UNITS

### I - INTRODUCTION

The G81 is applicable to residential, small business or commercial installations. It is designed to handle large air volumes required for air conditioning and also supply adequate heating requirements.

The G81 is built with a Duracurve heat exchanger which has the Lennox Duraglass coating. The unit uses two standing pilots with separate thermocouples to verify flame. The left side pilot is controlled by gas valve and right side pilot by pilot safety switch. In the event of pilot outage in either side, the gas valve is locked out.

The G81 is manufactured for natural gas applications, but a field propane changeover kit is available.

Figure 1 shows an encased view of a G81-220.

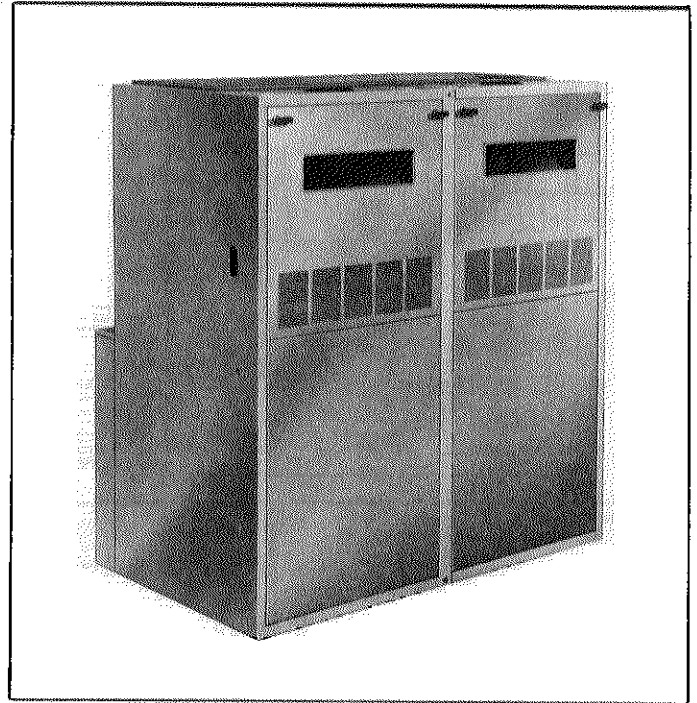


FIGURE 1

### II - UNIT INFORMATION

#### A - Specifications

Model Number		G81-220V
Btuh input		220,000
Btuh bonnet output		176,000
Vent size (in. round)		(2) 5 (oval)
No. of burners		7
High static certified by A.G.A. (in. wg.)		.85
Gas piping size (I.P.S. in.)	Natural	3/4
	Propane	1/2
Blower wheel nominal diam. x width (in.)		(2) 12 x 12
Blower pulley bore x diam. (in.)		1 x 9 - A
Blower motor horsepower		
Adj. motor pulley bore x diam. (in.)		Choice from drive kit
Rpm range with drives furnished		selection table
Belt length (in.)		(shipped separately)
Tons of cooling that can be added		7-1/2 or 11
Electrical characteristics (60 Hertz)		115/230v/1ph, 208 220v/3ph 230 460v/3ph, 440v/3ph
Shipping weight (lbs.)		535
Filter	Model No.	LB-19768C
Box	No. & size of filters (in.)	(4) 16 x 25 x 1
(Optional)	Shipping weight (lbs.)	49
Number of packages in shipment		3

#### C - Field Wiring

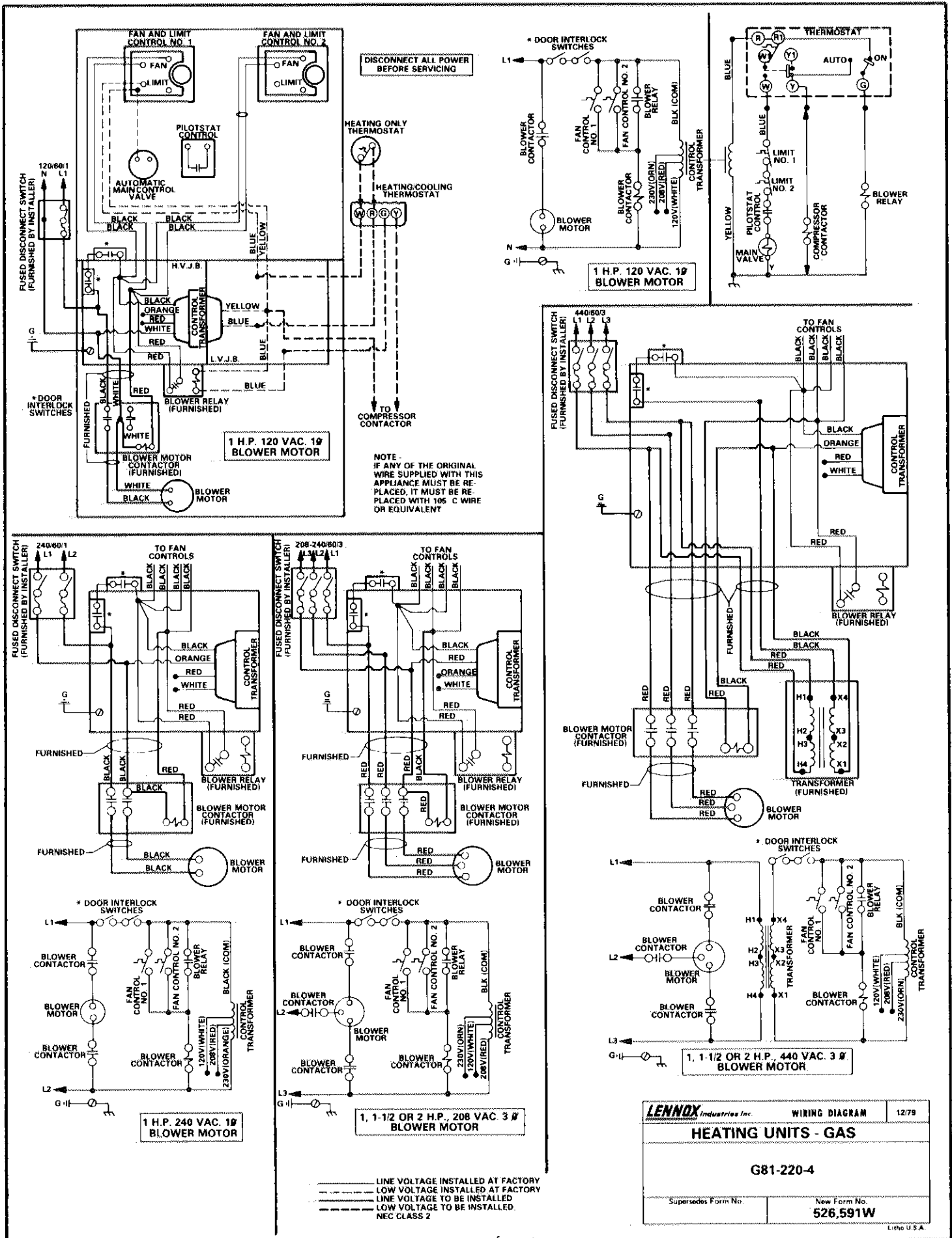
Thermostat wiring is made to the low voltage junction box.

Figure 2 shows the line voltage connections for the various voltages. The blower motor contactor is furnished with the drive kit. On 440 volt applications a power transformer is also included with drive kit.

#### B - Blower Data

Air Volume (cfm)	STATIC PRESSURE EXTERNAL TO UNIT (Inches Water Gauge)																					
	0		.10		.20		.30		.40		.50		.60		.70		.80		.90		1.00	
	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP	RPM	BHP
2400	370	.22	450	.30	520	.37	580	.45	645	.55	700	.62	750	.72	800	.82	840	.90	880	.96	925	1.05
2600	400	.27	470	.35	535	.42	600	.51	660	.60	710	.70	760	.80	810	.88	850	.96	895	1.05	935	1.12
2800	435	.35	500	.41	565	.50	625	.57	675	.67	725	.76	775	.86	825	.95	860	1.04	905	1.13	945	1.20
3000	470	.40	525	.48	585	.56	645	.65	700	.76	750	.86	790	.94	840	1.05	880	1.14	920	1.23	960	1.32
3200	495	.48	550	.56	610	.62	660	.75	715	.85	765	.95	805	1.05	850	1.13	895	1.24	930	1.33	970	1.42
3400	530	.55	585	.65	635	.75	685	.84	735	.95	780	1.07	825	1.15	870	1.27	910	1.35	945	1.43	985	1.57
3600	565	.67	605	.75	655	.85	705	.97	750	1.06	800	1.17	845	1.28	885	1.37	925	1.45	965	1.57	1000	1.66
3800	585	.73	640	.88	685	.97	730	1.07	775	1.18	820	1.30	865	1.40	900	1.50	940	1.60	980	1.70	1015	1.78
4000	615	.88	660	.98	710	1.10	755	1.20	800	1.32	840	1.40	880	1.52	920	1.64	955	1.72	995	1.83	1030	1.95
4200	645	1.00	695	1.12	735	1.22	780	1.35	820	1.44	860	1.57	900	1.67	940	1.77	975	1.88	1015	2.00	1045	2.10
4400	680	1.16	720	1.23	765	1.37	805	1.50	845	1.60	880	1.70	920	1.80	960	1.92	995	2.02	1030	2.17	1070	2.25
4600	710	1.30	745	1.38	795	1.52	830	1.65	870	1.76	905	1.83	945	2.00	980	2.12	1015	2.20	---	---	---	---
4800	750	1.50	770	1.57	820	1.70	850	1.80	895	1.93	930	2.05	970	2.15	1000	2.26	---	---	---	---	---	---
5000	785	1.65	805	1.77	845	1.85	880	2.00	920	2.12	955	2.22	---	---	---	---	---	---	---	---	---	---

NOTE - All cfm data is measured external to furnace using standard return air opening and with the air filter in place.



**FIGURE 2**

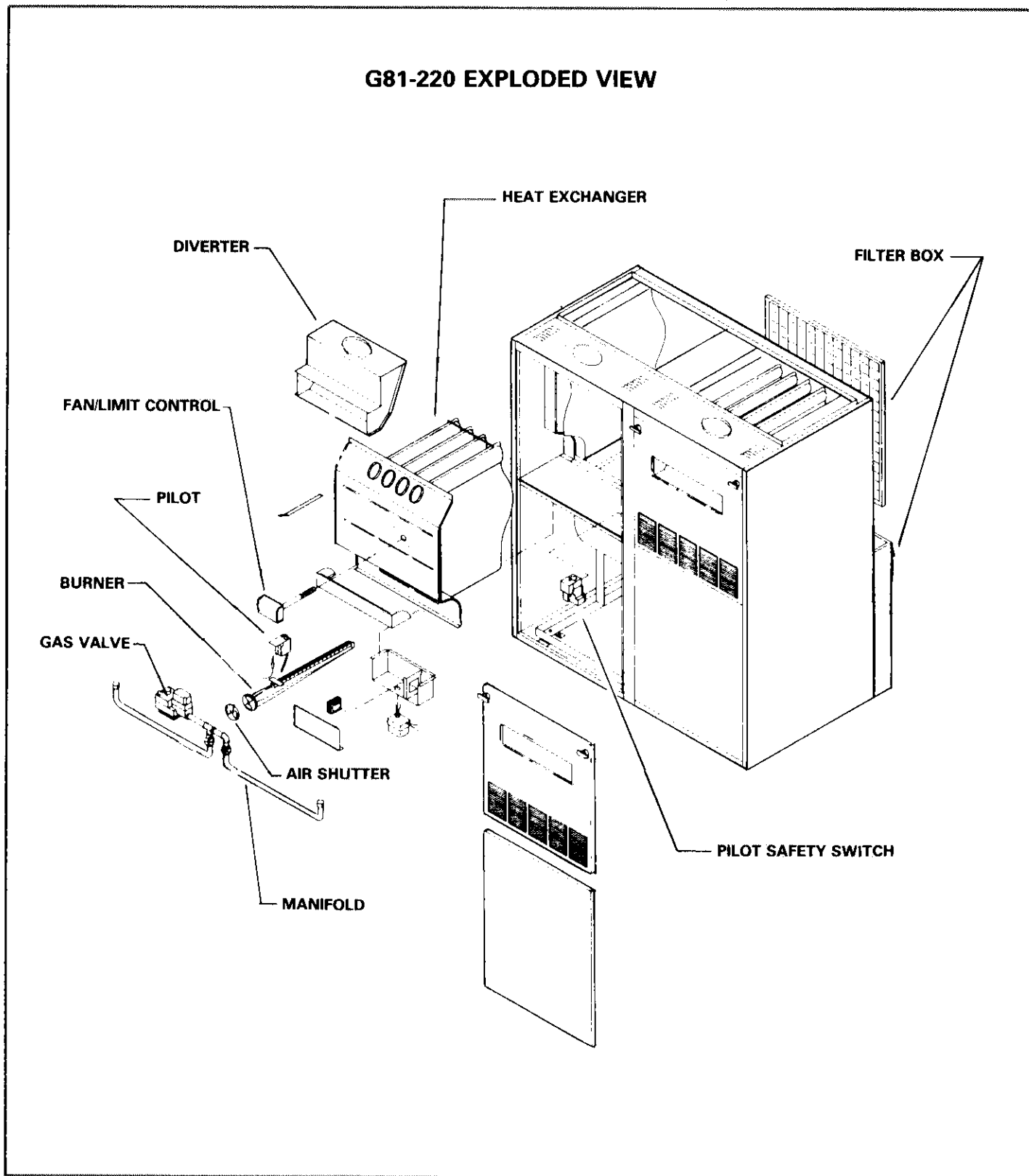
### D - Installation Considerations

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

Figure 3 shows an exploded view of unit.



**FIGURE 3**

### 1 - Transformer

This multitap transformer can be wired for 120V, 240V or 208V primary with 24V secondary and 45VA.

### 2 - Blower Relay

Single pole, single throw relay — 24 volt coil.

### 3 - Fan/Limit Controls

Each heating section has a separate control. The limits de-energize gas valve at excessive unit temperatures. Do not alter limit setting.

Refer to Figure 4 to determine type of fan control used and correct setting.

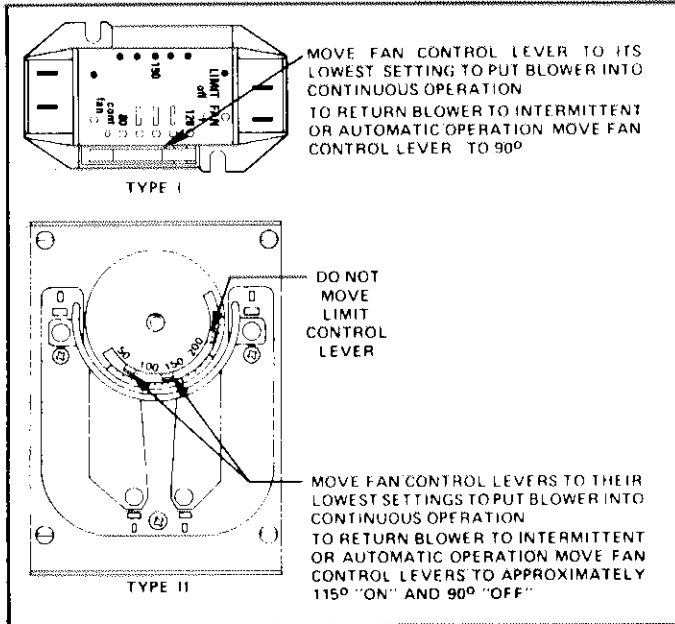


FIGURE 4

### 4 - Door Interlocks

Each heating section has its own interlock. When the access panel is removed, the interlock de-energizes the machine.

### 5 - Gas Valve

Provides gas flow to unit. The thermocouple verifies left side pilot.

### 6 - Pilot Safety

Verifies right side pilot. It de-energizes gas valve circuit in case of pilot outage. The control has its own pilot adjustment.

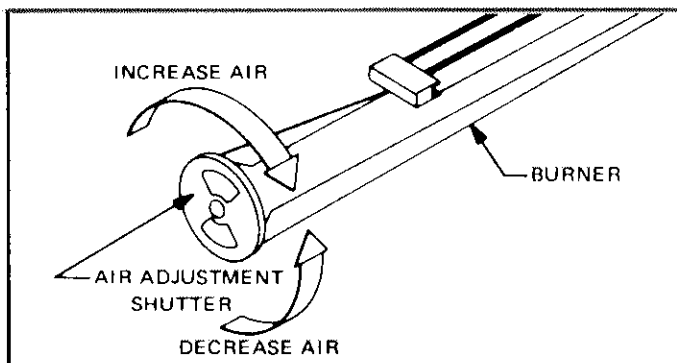


FIGURE 5

### 7 - Filters

Filter box is optional (LB-19768C). Filter access is at the top and sides of box.

### 8 - Air Shutters

Air shutters are factory set at 50% open. Minor adjustments for flame lifting, burner noise, etc., may be necessary. Refer to Figure 5.

## IV - LIGHTING INSTRUCTIONS

Light left pilot first and right pilot second.

- 1 - Move thermostat switch to "OFF" and adjust thermostat to lowest setting.
- 2 - Remove burner access panel. Turn gas valve knob to "OFF". Wait 5 minutes.
- 3 - Turn gas valve knob to "PILOT". Depress knob and light left side pilot. Depress knob for 60 seconds while flame is burning, then release knob. Leave gas valve in pilot position.
- 4 - Depress manual button on pilot safety switch and light right side pilot. Keep button depressed for 60 seconds while flame is burning, then release.
- 5 - Turn the knob on gas valve to "ON" position and replace burner access panels. Set room thermostat for "HEAT" and adjust to desired temperature.

## V - TEMPERATURE RISE

Adjust blower speed for proper air temperature rise listed on appliance 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 it will not "see" heat exchanger, thus picking up radiant heat. Turn up thermostat to its highest setting to start appliance. After

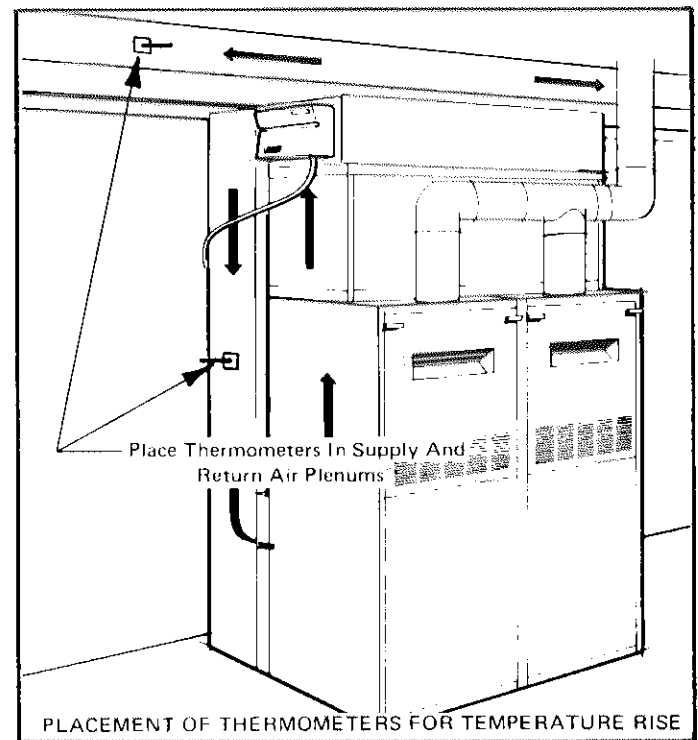


FIGURE 6

TABLE 1

Additive Cooling	Drive Kit Model No.	Voltage & Phase	Motor hp	Motor Pulley (in.) & Groove	**Blower Pulley (in.) & Groove	*Rpm Range	Belt	Net Weight (lbs.) 1 package
7-1/2 Tons	DKG81-220-1-9	115-230v/1ph	1	5/8 x 4-3/4 — A	1 x 9 — A	660 — 858	A — 49	36
	DKG81-220-1-10	208-220v/3ph						34
	DKG81-220-1-11	440v/3ph						42
7-1/2 & 11 Tons	DKG81-220-1.5-12	208v/3ph	1-1/2	7/8 x 5-3/8 — A	1 x 9 — A	765 — 960	A — 48	39
	DKG81-220-1.5-13	230-460v/3ph						45
11 Tons	DKG81-220-2-14	208v/3ph	2	7/8 x 6 — A	1 x 9 — A	892 — 1086	A — 49	43
	DKG81-220-2-15	230-460v/3ph						54

\*At 1725 rpm motor speed.

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

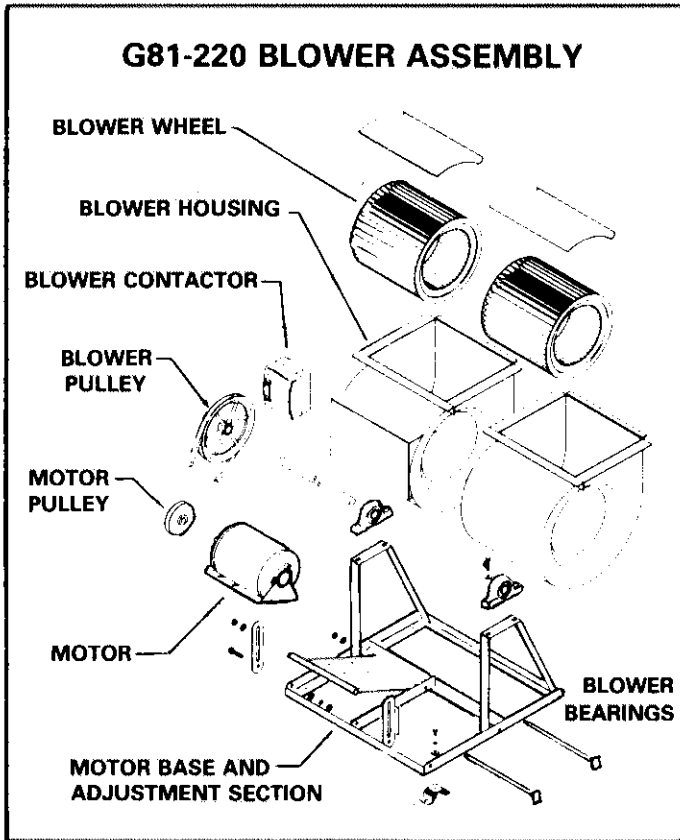


FIGURE 7

plenum thermometers have reached their highest and steadiest readings, subtract the readings.

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 1 lists the available drive kits. Figure 7 shows exploded view of blower.

**VI - BELT ADJUSTMENT**

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Initially, tension new belt at the maximum deflection force recommended, and then re-tension belt after a run in period

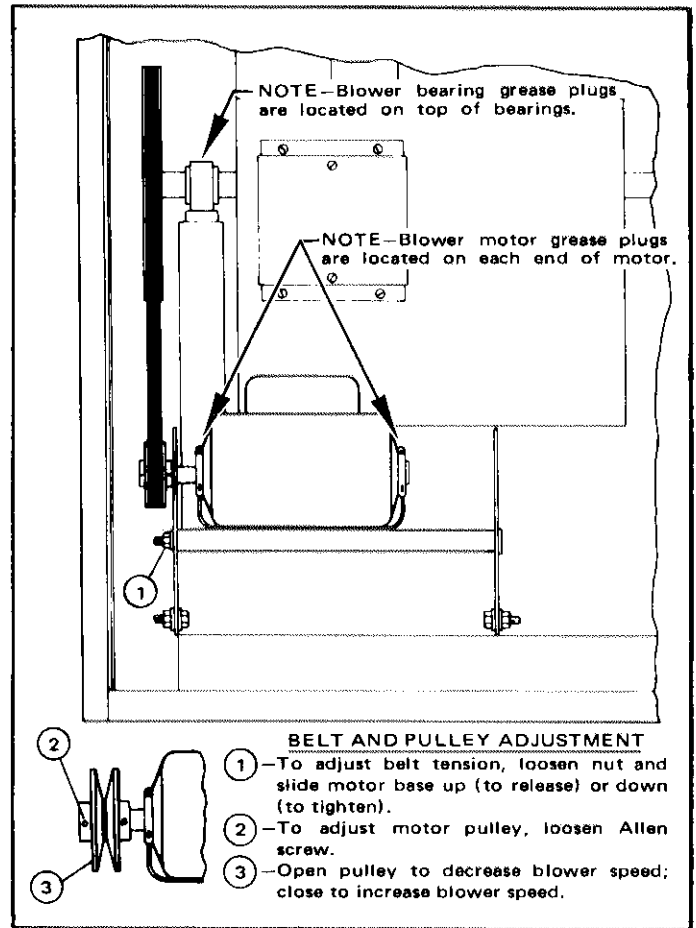


FIGURE 8

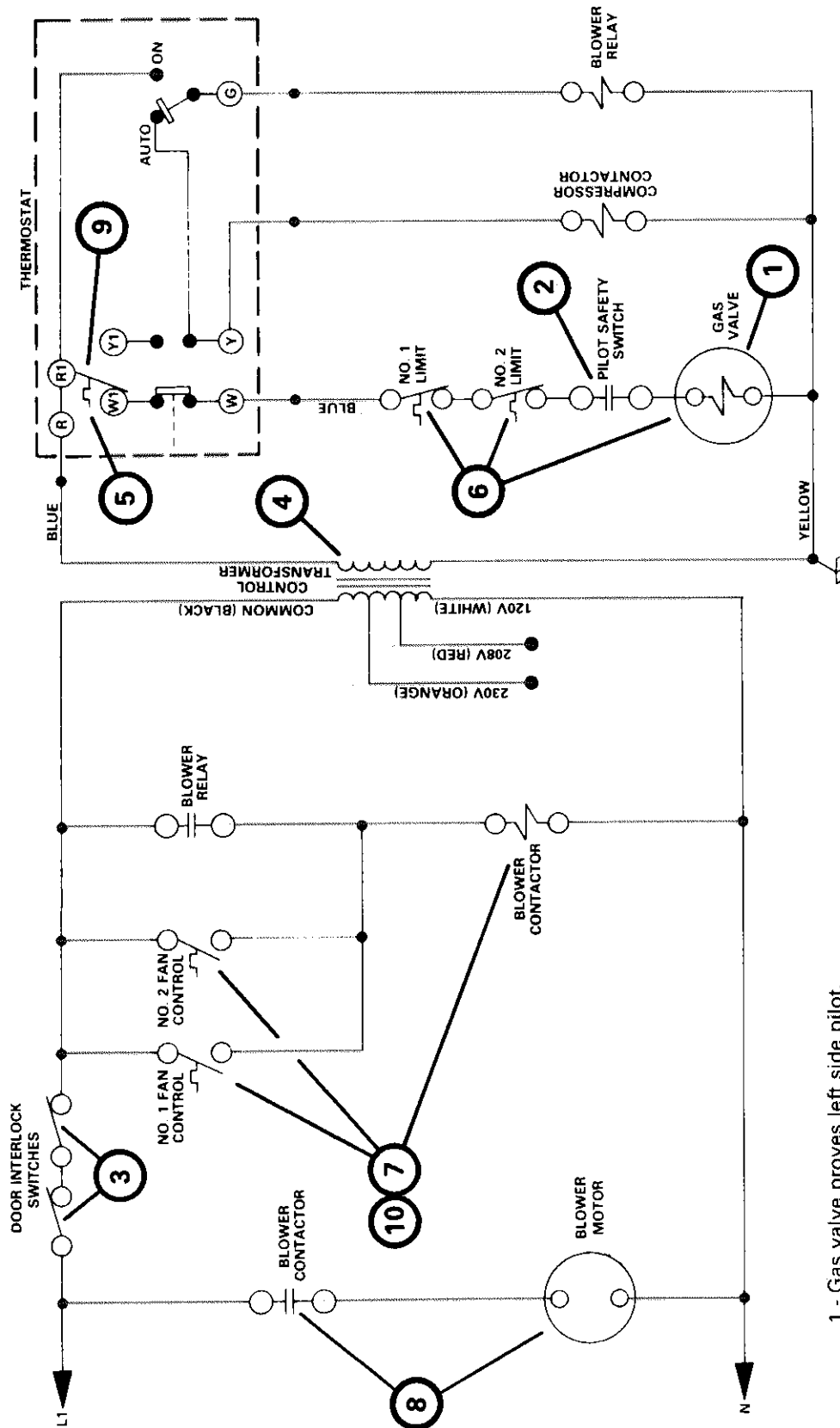
of 24-48 hours. This allows belt to stretch and seat in the grooves.

NOTE - Refer to Figure 8 for procedure for releasing or tightening belt tension. Be sure that Allen screw is lined up with flat side of sheave before retightening.

**VII - SCHEMATIC WIRING DIAGRAM OPERATING SEQUENCE**

Figure 9 shows a typical G81-220 sequence of operation for a 120 volt application.

# TYPICAL G81 SEQUENCE OF OPERATION



- 1 - Gas valve proves left side pilot.
- 2 - Pilot safety switch proves right switch to close contacts.
- 3 - Line potential feeds through the door interlocks. Access panels must be in place to energize machine.
- 4 - Transformer provides 24 volt control circuit.
- 5 - On a heating demand, the thermostat heating bulb makes.
- 6 - The gas valve is then energized providing the limit controls remain made. The pilot ignites main burners.

- 7 - The fan controls make after temperature rises above cut-in setpoint. This energizes the blower contactor (provided with drive kit).
- 8 - The blower contactor in turn powers the blower motor.
- 9 - As the heating demand is satisfied, the thermostat heating bulb breaks. This de-energizes gas valve.
- 10 - The blower motor continues running until furnace temperature drops below both fan control setpoints.

FIGURE 9