

# Installation Instructions & PARTS LIST

## LLO5/OLL LLO7/OLM (B) Series Oil Fired Basement Furnace

### SAFETY CONSIDERATIONS

Installation of fired heating units shall be in accordance with the regulation of authorities having jurisdiction and the CAN/CSA B139 or USA/NFPA No. 31-1983 installation code for oil burning equipment.

DO NOT operate furnace in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals.

DO NOT store or use gasoline, or other flammable vapors and liquids in the vicinity of this or any other appliance.

The chimney is a very important part of your heating system. It must be the right size, properly constructed and in good condition. Chimney should be sized in accordance with the regulations of authorities having jurisdiction and the latest CAN/CSA B139 or USA/NFPA No. 31-1983 installation code for oil burning equipment.

Oil fired appliances shall be connected to flues having sufficient draft at all times to ensure safe and proper operation of the appliance. Before connecting the vent connector to a chimney, examine all parts and the passageway for condition and to make sure it is clean and clear, free of obstructions, and no air leaks in flues or at the cleanouts access.

Maximum capacity of individual tank used shall be 250 gallons and must be located at least 5' from the appliance. Local codes will govern the size of vents and fillers as the type of caps used. 1<sup>1</sup>/<sub>4</sub>" IPS and 2" IPS are generally accepted as minimum sizes for vent and fill pipes respectively. The burner oil line shall not be less than 3<sup>3</sup>/<sub>8</sub>" O.D. copper tubing for runs 50' or less and 1<sup>1</sup>/<sub>2</sub>" O.D. copper tubing for longer runs. A manual shut-off valve and an oil filter shall follow in sequence from tank to burner. Be sure that the oil line is clean before connecting to the burner. The oil line should be protected to eliminate any possible damage. Installation having the fuel oil tank below the burner level must employ a two pipe fuel supply system with an appropriate fuel oil pump (more than 8' lift use 2 stage pump and more than 16' an auxiliary pump).

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### **⚠ WARNING**

This furnace is NOT designed for use in mobile homes, trailers, or recreational vehicles. Such use could result in property damage, bodily injury and/or death.

International Comfort Products Corporation (USA)  
Lewisburg, TN USA 37091

# 1. Safety Labeling and Signal Words

## Danger, Warning and Caution

The signal words **DANGER**, **WARNING** and **CAUTION** are used to identify levels of hazard seriousness. The signal word **DANGER** is only used on product labels to signify an immediate hazard. The signal words **WARNING** and **CAUTION** will be used on product labels and throughout this manual and other manuals that may apply to the product.

## Signal Words

**DANGER** - Immediate hazards which **WILL** result in death or serious injury.

**WARNING** - Hazards or unsafe practices which **COULD** result in death or injury.

**CAUTION** - Hazards or unsafe practices which **COULD** result in personal injury or product or property damage.

## Signal Words in Manuals

The signal word **WARNING** is used throughout this manual in the following manner:

**WARNING**

The signal word **CAUTION** is used throughout this manual in the following manner:

**CAUTION**

## Product Labeling

Signal words are used in combination with colors and/or pictures on product labels. Following are examples of product labels with explanations of the colors used.

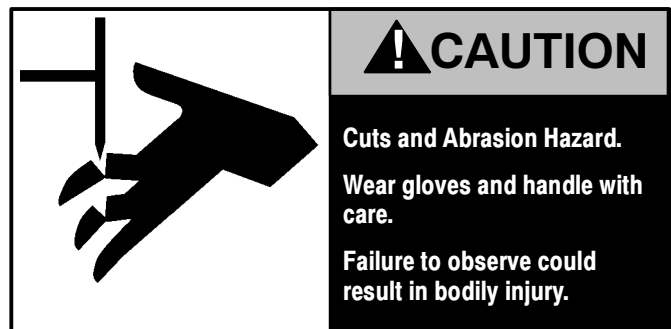
## Danger Label

White lettering on a black background except the word **DANGER** which is white with a red background.



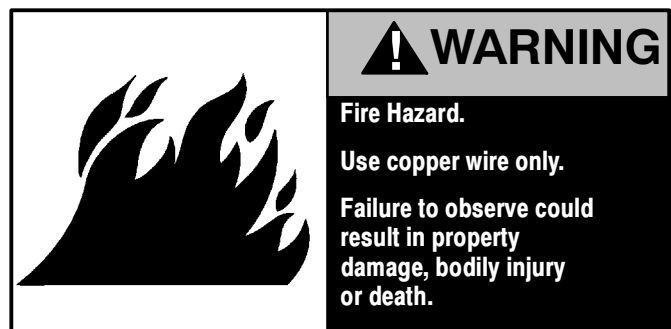
## Caution Label

White lettering on a black background except the word **CAUTION** which is black with a yellow background.



## Warning Label

White lettering on a black background except the word **WARNING** which is black with an orange background.



Burner No. _____	Model _____	Date of Installation _____
Service Telephone: Day _____		Night _____
Dealer's Name and Address _____		
<b>REPORT OF TEST</b>		Date of Test _____
CO <sup>2</sup> _____ %	Stack Net _____	Draft: at Stack _____ Over Fire
Firing Rate _____	GPH/US _____	Smoke No. _____
Note _____	Test Made By _____	

## 2. Safe Installation Requirements

**⚠ WARNING**

**Installation or repairs made by unqualified persons can result in hazards to you and others. Installation MUST conform with local codes or, in the absence of local codes, with codes of the country having jurisdiction.**

**The information contained in this manual is intended for use by a qualified service technician familiar with safety procedures and equipped with the proper tools and test instruments.**

**Failure to carefully read and follow all instructions in this manual can result in furnace malfunction, property damage, personal injury and/or death.**

**NOTE:** It is the personal responsibility and obligation of the customer to contact a qualified installer to ensure that the installation is adequate and conforms to governing codes and ordinances.

**⚠ WARNING**

**The furnace must be installed in a level position, never where it will slope to the front.**

**If the furnace were installed in that position, oil would drain into the furnace vestibule and create a fire hazard, instead of draining properly into the combustion chamber.**

- **This furnace is NOT approved for installation in mobile homes, trailers or recreation vehicles.**
- You must have a sufficient supply of fresh air for combustion and ventilation to the area in which the furnace is located.
- Do **NOT** use this furnace as a construction heater or to heat a building that is under construction.
- Use only the Type of fuel oil approved for this furnace (see **Rating Plate** on unit). Overfiring will result in failure of heat exchanger and cause dangerous operation.
- Visually check all oil line joints for signs of wetness which would indicate a leak.

- Connect furnace to a masonry or Class A prefabricated chimney only.
- The “*Check and Adjustments*” starting on page 6 are vital to the proper and safe operation of the heating system. Take the time to be sure they are all done.
- Follow the rules of the NFPA Pamphlet No. 31 or local codes for locating and installing the oil storage tank.
- Follow a regular service and maintenance schedule to efficient and safe operation.
- Before servicing, allow furnace to cool. Always shut off electricity and fuel to furnace when working on it. This will prevent electrical shock or burns.
- Seal supply and return air ducts.
- The vent system **MUST** be checked to determine that it is the correct type and size.
- Install correct filter type and size.
- Unit **MUST** be installed so electrical components are protected from direct contact with water.

### Safety Rules

Your unit is built to provide many years of safe and dependable service providing it is properly installed and maintained. However, abuse and/or improper use can shorten the life of the unit and create hazards for you, the owner.

- A. The U.S. Consumer Product Safety Commission recommends that users of oil-burning appliances install carbon monoxide detectors. There can be various sources of carbon monoxide in a building or dwelling. The sources could be gas-fired clothes dryers, gas cooking stoves, water heaters, furnaces, gas-fired fireplaces, wood fireplaces, and several other items. Carbon monoxide can cause serious bodily injury and/or death. Therefore, to help alert people of potentially dangerous carbon monoxide levels, you should have carbon monoxide detectors listed by a nationally recognized agency (e.g. Underwriters Laboratories or International Approval Services) installed and maintained in the building or dwelling (see Note below).
- B. There can be numerous sources of fire or smoke in a building or dwelling. Fire or smoke can cause serious bodily injury, death, and/or property damage. Therefore, in order to

alert people of potentially dangerous fire or smoke, you should have fire and smoke detectors listed by Underwriters Laboratories installed and maintained in the building or dwelling (see Note below).

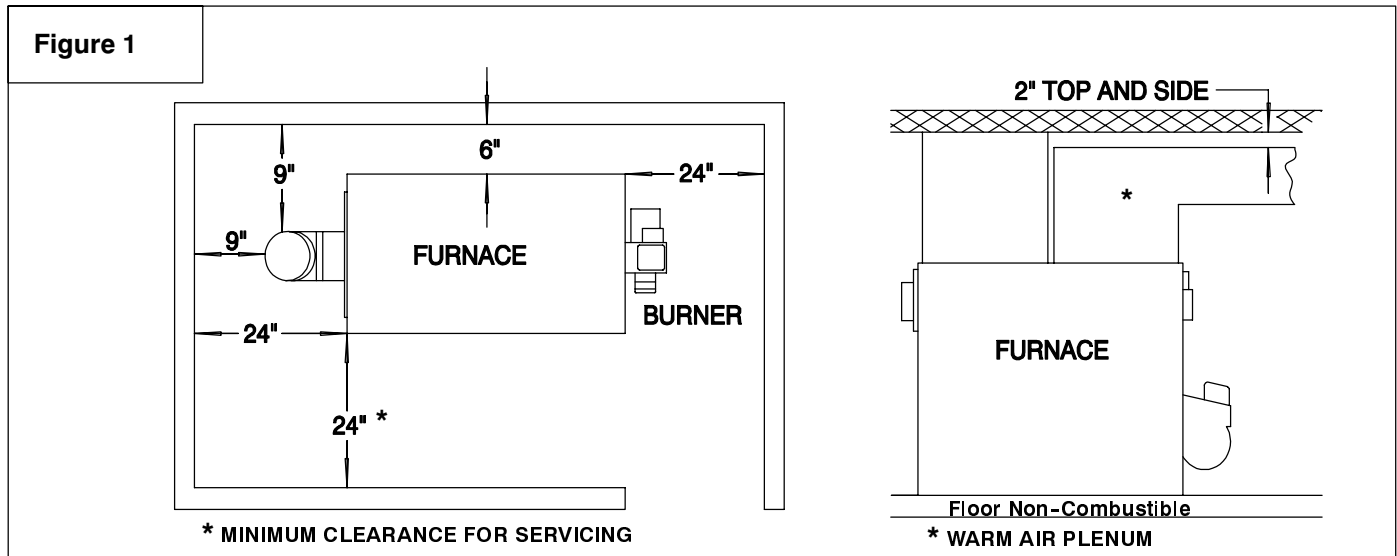
**Note:** The manufacturer of your furnace does not test any detectors and makes no representations regarding any brand or type of detector.

C. To ensure safe and efficient operation of your unit, you should do the the following:

1. **Thoroughly read this manual and labels on the unit.** This will help you understand how your unit operates and the hazards involved with gas and electricity.
2. **Do not use this unit if any part has been under water.** Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.
3. **Never obstruct the vent grilles, or any ducts that provide air to the unit.** Air must be provided for proper combustion and ventilation of flue gases. Carbon monoxide or "CO" is a colorless and odorless gas produced when fuel is not burned completely or when the flame does not receive sufficient oxygen.

### 3. Locating the Furnace

FURNACE INSTALLATION CLEARANCE FROM COMBUSTIBLE MATERIALS			
Plenum - Top & Sides	2"	Flue Pipe	9"
Front Panel	24"	Sides - One Side	6"
Rear	24"	- One Side	24"
NON COMBUSTIBLE FLOOR			



### 4. Installation

#### Combustion and Ventilation Air

Furnaces require ventilation openings to provide sufficient air for proper combustion and ventilation of flue gases. All ducts or openings for supplying combustion and ventilation air must comply with oil burning equipment NFPA No. 31 (or current edition) and applicable provisions of local building codes.

When sizing grille or louver, use the free area of opening. If free area is not marked on grille or louver, assume 20% free area for wood and 60% for metal.

A confined space is defined as an area with less than 50 cubic feet per 1,000 BTU/H input rating for all fuel burning appliances installed in area.

For a confined space, one opening must be within 12" of the floor, and the second opening within 12" if the ceiling. Minimum free area required for each opening:

- Horizontal ducts require one square inch per 2000 BTU/H.
- Vertical ducts or opening to outside require one square inch per 4000 BTU/H.

Unconfined space is defined as an area having a minimum volume of 50 cubic feet per 1000 BTU/H total input rating for all fuel burning appliances in area.

1. Adjoining rooms can be considered part of an unconfined area if there are no doors between rooms, (homes with tight construction may not have adequate air infiltration for proper combustion and ventilation of flue gases. Most homes will usually require additional air).
2. Duct or ventilation opening in an unconfined space requires one square inch of free area per 4,000 BTU/H of total input rating for all appliances in area. (The interior end of the air intake must be at a maximum of one foot above ground level and clear of any obstruction and exterior end must be screened with screen with no less than 1/4" mesh).

## Chimney and Vent Pipe Connection

The chimney is a very important part of your heating system. It must be the rating size, properly constructed and in good condition. The chimney should supply a draft of at least 0.04" of water.

The chimney should have a minimum height of 15' and have nominal flue area dimensions of 8" x 8", or 6" round for an input of 0.60 GAL/H to 1.35 GAL/H. If you are more than 2,000 ft. above sea level, add 3' to chimney heights. Above 5,000', add 5'.

Before connecting the vent connector to a chimney, examine all parts and the passage way for condition and to make sure it is clear, free of obstructions and no air leaks through cracks in flues or at the cleanouts access.

Rebuild a faulty chimney: A new steel liner or a prefabricated chimney may be a solution.

## Vent Pipe and Draft Regulator

- ◆ Use vent pipe same size as the furnace vent outlet.
- ◆ Keep piping as short and direct as you can.
- ◆ Use L vent pipe with ventilated thimble if vent pipe passes through an interior wall.
- ◆ Slope horizontal run upward to chimney at least 1" for every 4' of pipe.
- ◆ Horizontal run should not be longer than  $1/2$ " of the chimney height NEVER over 10'.
- ◆ Install the draft regulator in a straight section as close to the furnace outlet as possible. Follow installation instructions from the draft regulator manufacturer (enclosed with the draft regulator).
- ◆ Adjust draft regulator to maintain -0.02" of water at the furnace vent outlet.

## Oil Tanks and Lines

For indoor storage, each tank shall be 275 gallons or less and the total indoor storage shall be 550 gallons or less.

Check your local codes for the installation of the tank and accessories.

The burner oil line shall not be less than  $3/8$ " O.D. copper tubing for 65' of runs or less, and  $1/2$ " O.D. copper tubing for 100' of runs or less.

If the tank bottom is no more than 10' below the burner oil pump, single stage pump with two lines can be used. (With two lines, the plug supplied with pump must be installed. Follow instructions supplied with the pump).

Follow the pump instructions to determine the size of tubing you need in relation of the lift, or the horizontal distance.

## Burner Installation

Install the burner on the burner plate using gasket provided. No adjustment must be made to the burner mounting position.

### **⚠ WARNING**

**Poison carbon monoxide gas hazard.**  
**Use only approved heating type oil in this furnace.**  
**DO NOT USE waste oil, used motor oil, gasoline or kerosene.**

## Electrical Wiring

Turn OFF electric power at fuse box or service panel before making any electrical connections and ensure a proper ground connection is made before connecting line voltage.

All electrical wiring must conform with local codes, ordinances and the National Electrical Code, NFPA No. 70-1990 or current edition.

Make all line voltage and ground connections with copper wires #14 AWG from a 15 AMP power supply circuit through the unit.

## Burner Safety Control

This control has an electronic circuit and cad cell. Both parts and factory wired in the oil burner.

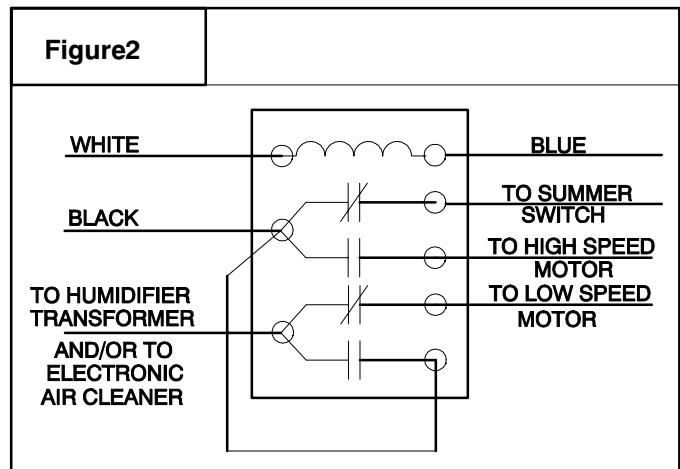
## Thermostat

Thermostat location and the heat anticipator setting have an important effect on the operation of the unit. Follow instructions included with thermostat for correct mounting and setting.

## Humidifier/Electronic Air Cleaner

Make connections for neutral and ground wires with connections to furnace at wiring shown in page 6 and connect the humidifier transformer or electronic air cleaner hot line at the fan relay.

The humidifier and/or the electronic air cleaner will be powered anytime the circulating air blower comes on.



## Adding Air Conditioning

Replace heating only thermostat and cables with heating/cooling thermostat and 5 wire thermostat cable if required.

Connect from G, Rc, and Y, on thermostat subbase to G, Rc, and Y, on furnace low voltage terminal board. Rh, and W, must be connected to T, T, of the burner safety control. Connect wires from contactor on compressor unit to Y and C on furnace low voltage terminal board. (Follow all instructions with condensing unit and evaporator coil).

## Summer Fan Operation

During the summer, continuous air circulation can be obtained by turning the manual fan switch from the "auto" position to the "on" position.

## Fan and Limit Control

The setting of the fan control will depend upon the particular house and heating installation. The "fan off" setting is factory set at 100° F. This setting should provide satisfactory operation for most installations. The "fan on" temperature is determined by the built-in differential setting of the control.

It is desirable to have the "fan off" setting low enough for extended blower operation. However, a "fan off" setting too low will circulate cool air. To alter the "fan off" setting, rotate the indicator to the desired position on the temperature scale.

The limit control is factory preset at 180° F. and should not be adjusted. A replacement limit control must be identical to that supplied as original equipment (See Parts List).

## Ductwork and Filter

Design and install air distribution system to comply with Air Conditioning Contractors of America manuals or other approved methods that conform to local codes and good trade practices.

When furnace supply ducts carry air outside furnace area, seal return air duct to furnace casing and terminate duct outside furnace space.

The furnace is provided with one or two filters, either the disposable low velocity type or high velocity type. The size and type of filter supplied with the furnace will handle the airflow required. Filters can be replaced only with same type and size.

## Operating the Furnace

Before starting the burner, be sure the fuel tank is adequately filled with clean oil. Use No. 1 or No. 2 heating oil (ASTM D396).

Follow instructions included with the burner, for adjustment, service and spare parts.

You may notice a slight odor the first time your furnace is operated, this will soon disappear. It is only the oil used on the parts during manufacturing.

### CAUTION

**Do NOT attempt to start the burner when excess oil has accumulated, when the furnace is full of vapor, or when the combustion chamber is very hot.**

1. Set the thermostat to call for heat.
2. Open the shut-off valves in the oil supply line to the burner.
3. Close the line switch to start the burner. If the burner does not start immediately, reset the manual overload which is on the motor if so equipped, and the safety switch of the burner primary control.
4. Vent the fuel unit as soon as the burner motor starts rotating. to vent, attach a clear plastic hose over the vent plug.
5. Loosen the plug and catch the oil in an empty container.
6. Tighten the plug when all the air is purged.

## Burner Troubleshooting

Follow instructions included with the burner.

### Shutting Burner Off

1. Set the thermostat lower than room temperature or,
2. Turn off disconnect switch.

### Shutting Burner Off For Summer

1. Turn off disconnect switch.
2. Close the valves in the suction line.

## Checks and Adjustments

1. Operate the furnace long enough for flame to become steady (15 minutes or more).
2. Check the pump pressure. The pressure should be 100 pounds per square inch for Beckett burner and 145 pounds per inch for Riello burner.

3. Adjust stack draft between  $-0.02$  &  $-0.025$ " of water. (Follow instructions with the draft regulator).
4. Adjust the smoke at No. 1 spot on the smoke scale. (Maybe you will have to reduce or increase the air supply at the burner).
5. Insert the CO<sup>2</sup> Analyzer tube in vent pipe. The reading should be between 10<sup>1</sup>/<sub>2</sub>% - 14%.

## Adjust Air Flow

Fan speed must be selected to give an air temperature rise of between 70° F. and 85° F. through the furnace.

## Furnace Maintenance

the furnace and flue pipe should be cleaned once a year.

Select the speed of the motor to reach temperature rise shown.

Air temperature rise is the temperature difference between supply and return air.

### CAUTION

**This furnace has a high efficiency ceramic fiber refractory combustion chamber. Does not require cleaning. If for any reason it becomes necessary to work in the area of the combustion chamber, use extreme care.**

Remove cleanout panel and vent pipe from the back panel. Remove baffles of each pipe and vacuum these passages as far back as the cleaning tool reaches.

Replace the parts in reverse order after the passages are cleaned. Be careful not to damage the gasket.

Once a year, prior to the beginning of the heating season have your oil burner inspected by a Technician.

1. Check firing head, replace nozzle with same size, angle and spray, re-adjust electrode setting and clean burner fan wheel.
2. Adjust the combustion following instructions under "checks and adjustments" in this manual.
3. Oil burner motor and blower motor with SAE #10W30 motor oil if motor has oil cup at both end. Before accessing blower motor, shut off electric power at fuse box or service panel.
4. Check air filter twice during the heating season and replace if dirty.
5. The blade of the blower wheel should be cleaned periodically.
6. The line oil filter cartridge should be replaced every year to avoid contamination of the fuel unit.

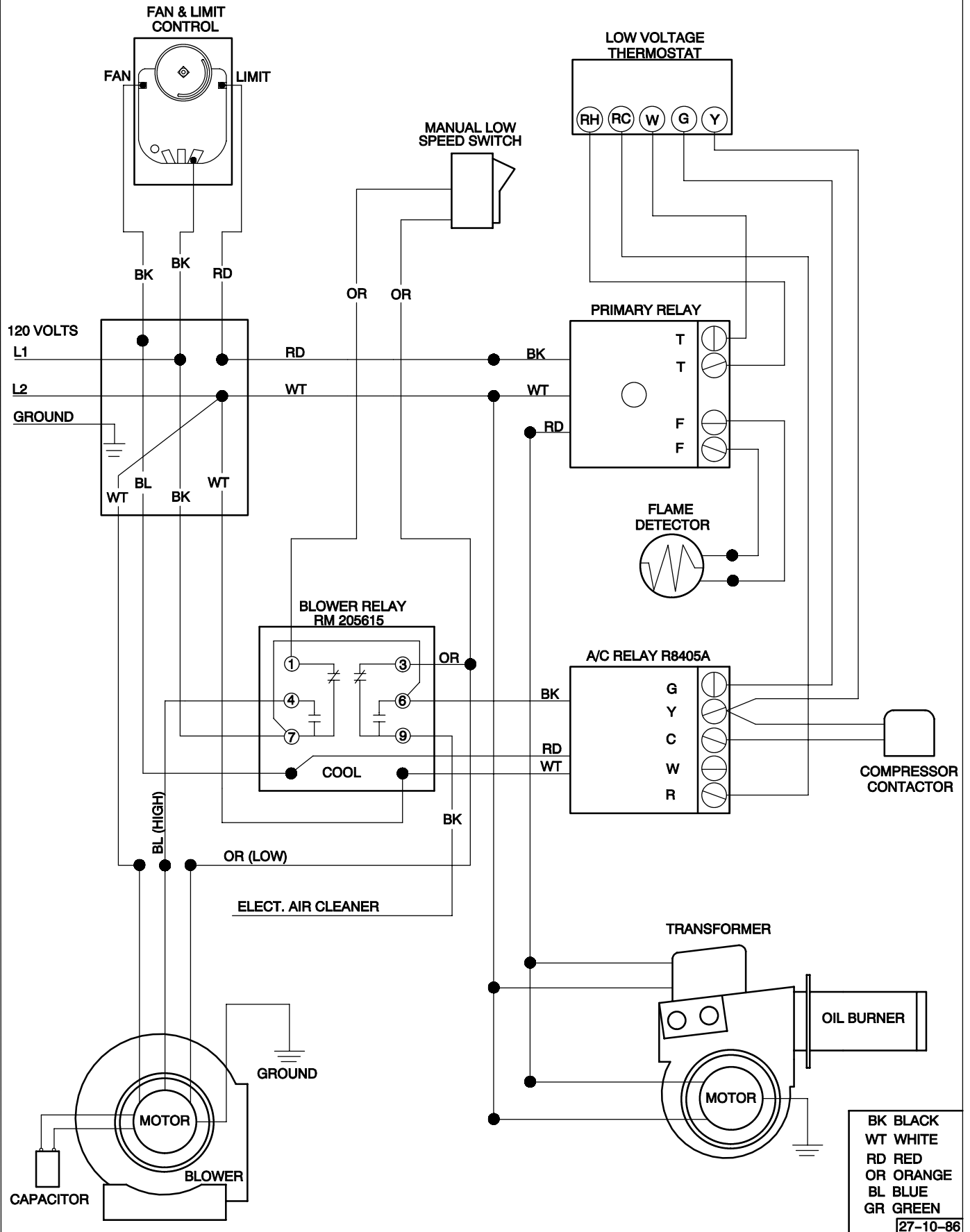
## **WARNING**

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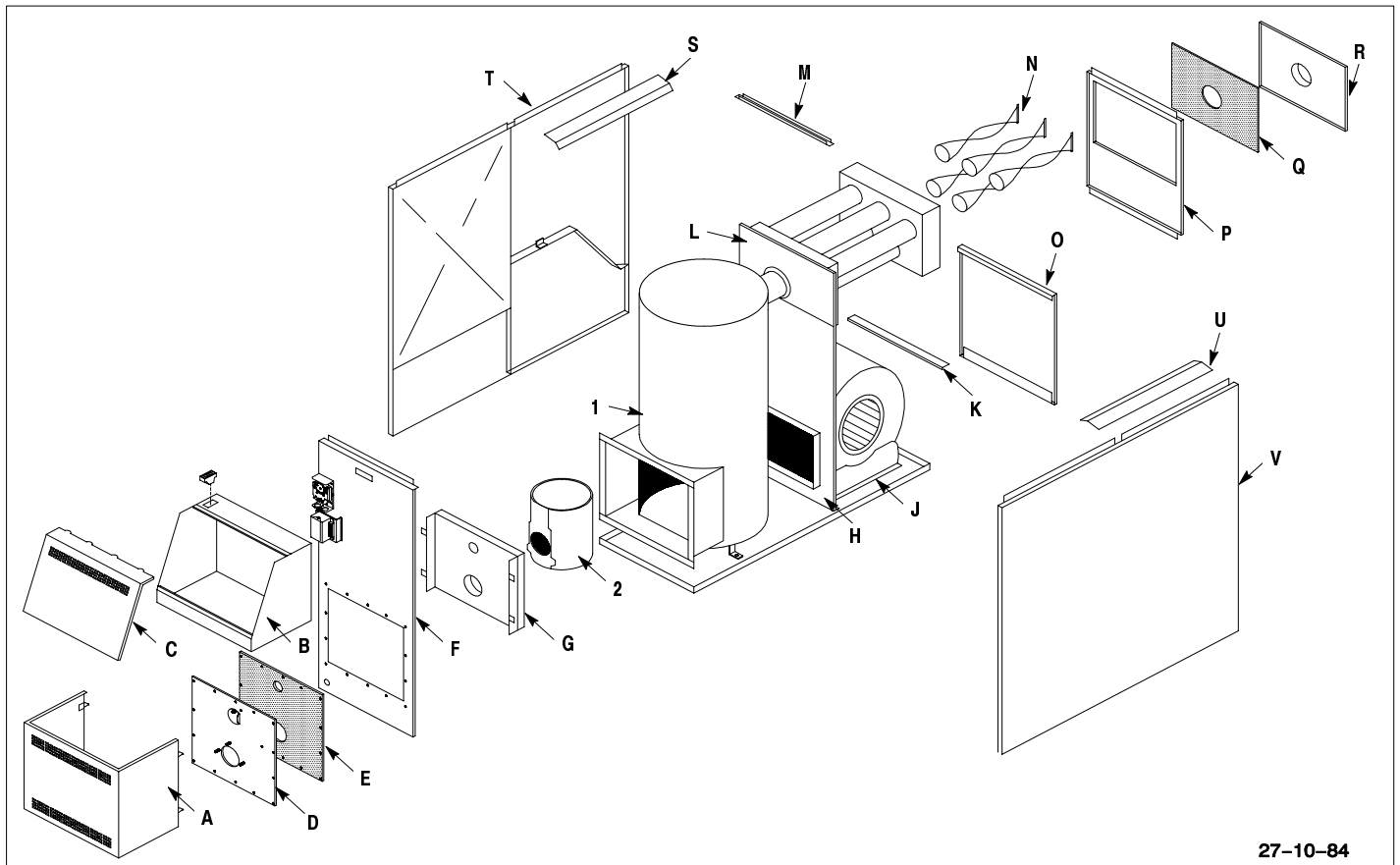
# WIRING DIAGRAM - LLO5/OLL/LL07/OLM



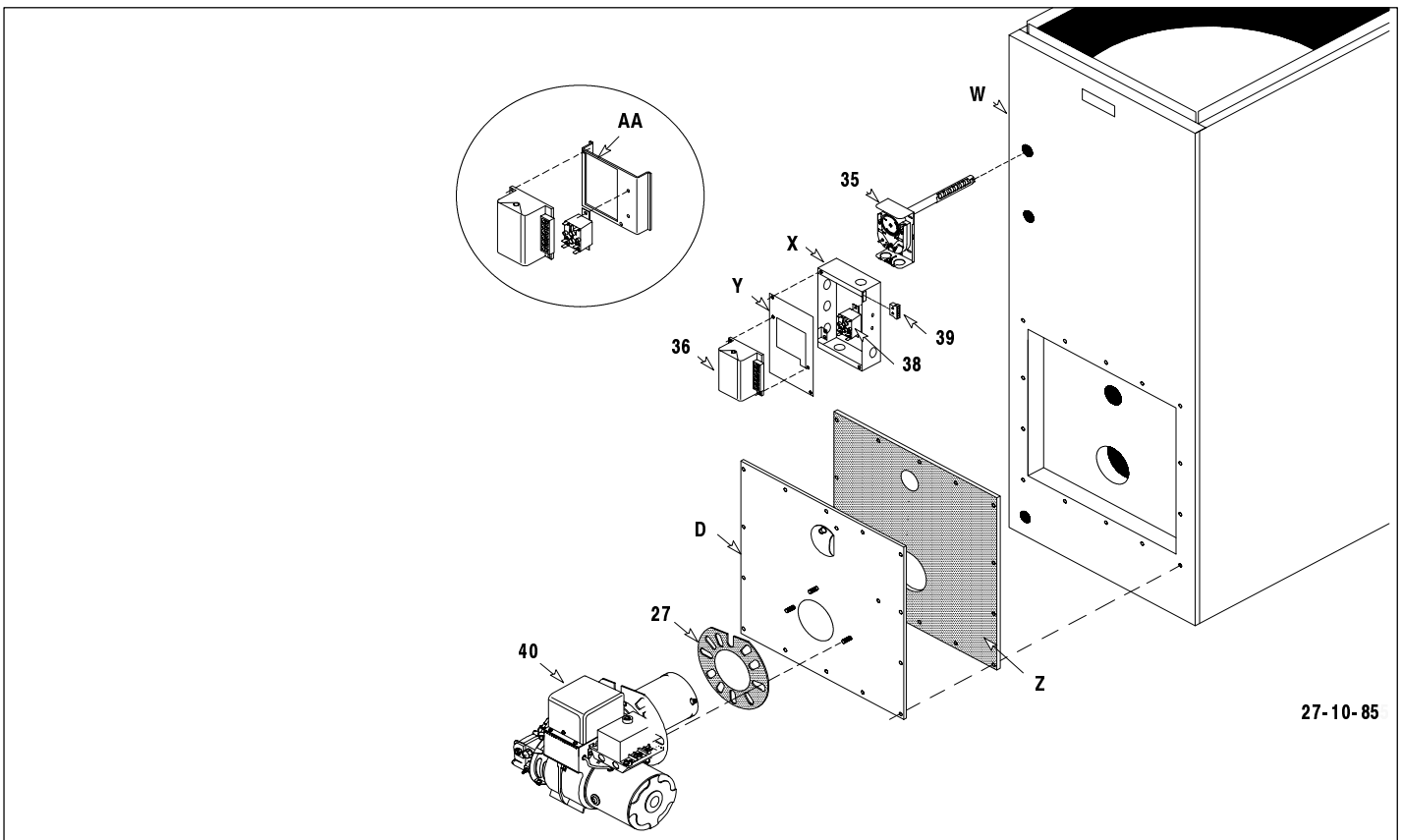
# Replacement Parts - LLO5/OLL/LL07/OLM

Models - LLO5125BKB1, LLO5145BKA1, LLO7115BGB1; OLL125B20B1, OLL145B20A1, OLM115B17B1

Replacement part supplied will be current active part. For parts not listed, consult place of purchase.



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27-10-85



# Replacement Parts - LLO5/OLL/LL07/OLM

**Models** - LLO5125BKB1, LLO5145BKA1, LLO7115BGB1; OLL125B20B1, OLL145B20A1, OLM115B17B1

**Replacement part supplied will be current active part. For parts not listed, consult place of purchase.**

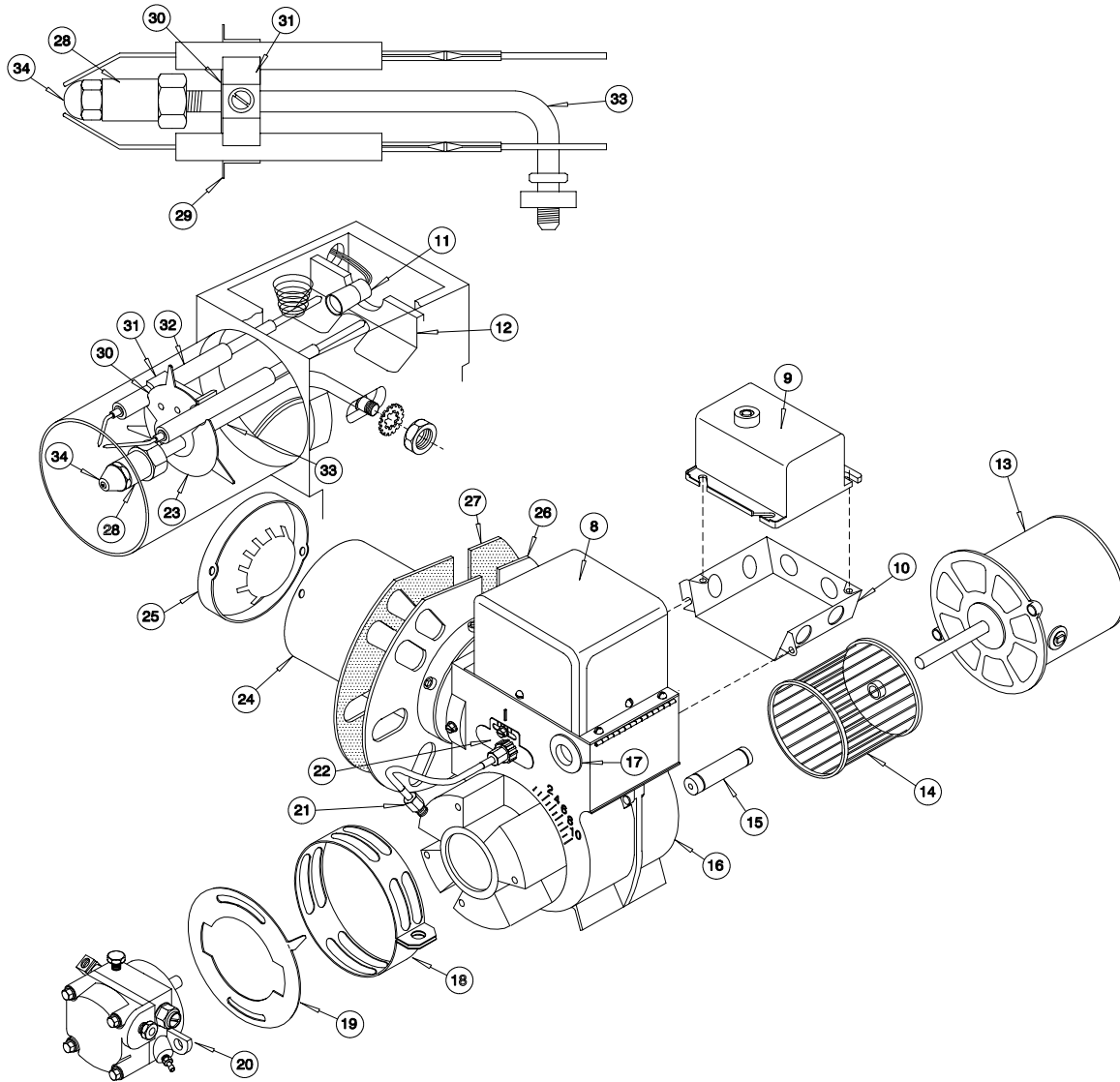
Key No.	Description Functional	Part Number	LLO5125BKB	LLO5145BKA	LLO7115BJB
			OLL125B20B	OLL145B20A	OLM115B17B
1	Heat Exchanger Assembly	35091030	1	-	-
		35091060	-	1	-
		18091020	-	-	1
2	Combustion Chamber	35090040	1	-	1
		35090030	-	1	-
27	Burner Gasket	1650244	1	1	1
35	Fan & Limit Control	1149503	1	1	1
36	A/C Relay	050120	1	1	1
38	Blower Relay	050125	1	1	1
39	Low Speed Switch	050115	1	1	1
40	Beckett Burner Ass'y W/O Nozzle	1010050	1	1	1

Key No.	Description Non-Functional	Part Number	LLO5125BKB	LLO5145BKA	LLO7115BJB
			OLL125B20B	OLL145B20A	OLM115B17B
A	Vestibule Assembly	35096011	-	-	-
B	Cabinet Assembly	18096011	-	-	1
C	Cabinet Cover Plate	39095031	-	-	1
D	Front Plate Assembly	35093050	1	1	1
E	Frt Plate Ceramic Fiber Gasket	35090085	1	1	1
F	Frt Plate Assembly	35092070	1	1	-
		18092050	-	-	1
G	Insulation Pad with Support	35093080	1	1	1
H	Partition Assembly	35090035	1	1	-
		18093015	-	-	-
		18093025	-	-	1
J	Blower Assembly	35096040	-	-	1
		35096030	-	-	-
		35096050	1	1	-
K	Filter Rack	35090090	1	1	-
		18092020	-	-	1
L	Top Partition	35090081	1	1	1
M	Plenum Separator	35090070	1	1	1
N	Twist Baffles Assembly	35092035	1	1	1
O	Fan Door	35091021	1	1	-
		18091021	-	-	1
P	Top Door Assembly	35092010	1	-	-
		35092020	-	1	-
		18092010	-	-	1
Q	Ceramic Fiber Cover Gasket	35090365	1	-	1
		15390225	-	1	-
R	Rear Rad Box Cover Assem	35092041	1	-	1
		35092071	-	1	-
S	Air Deflector	35090100	1	-	1
T	Left Side Panel Assembly	35091012	1	1	-
		18091012	-	-	1
U	Air Deflector	35090100	1	-	1
V	Right Side Panel Assembly	35091011	1	1	-
		18091011	-	-	1
X	Junction Box	35092016	1	1	1
Y	Junction Box Cover	35092040	1	1	-
Z	Front Plate Ceramic Fiber Assembly	35090085	1	1	1
AA	Holding Bracket	18092080	-	-	1
)	<b>Not Shown</b>				
)	Controls Vestibule Cover	1411	1	1	-
)	Cover Only	35065051	1	1	-
)	Burner Cover	35016021	1	1	-
W	Front Panel Assembly	35092030	1	1	-
		18092060	-	-	1

# Replacement Parts - LLO5/OLL/LL07/OLM

**Models** - LLO5125BKB1, LLO5145BKA1, LLO7115BGB1; OLL125B20B1, OLL145B20A1, OLM115B17B1

**Replacement part supplied will be current active part. For parts not listed, consult place of purchase.**



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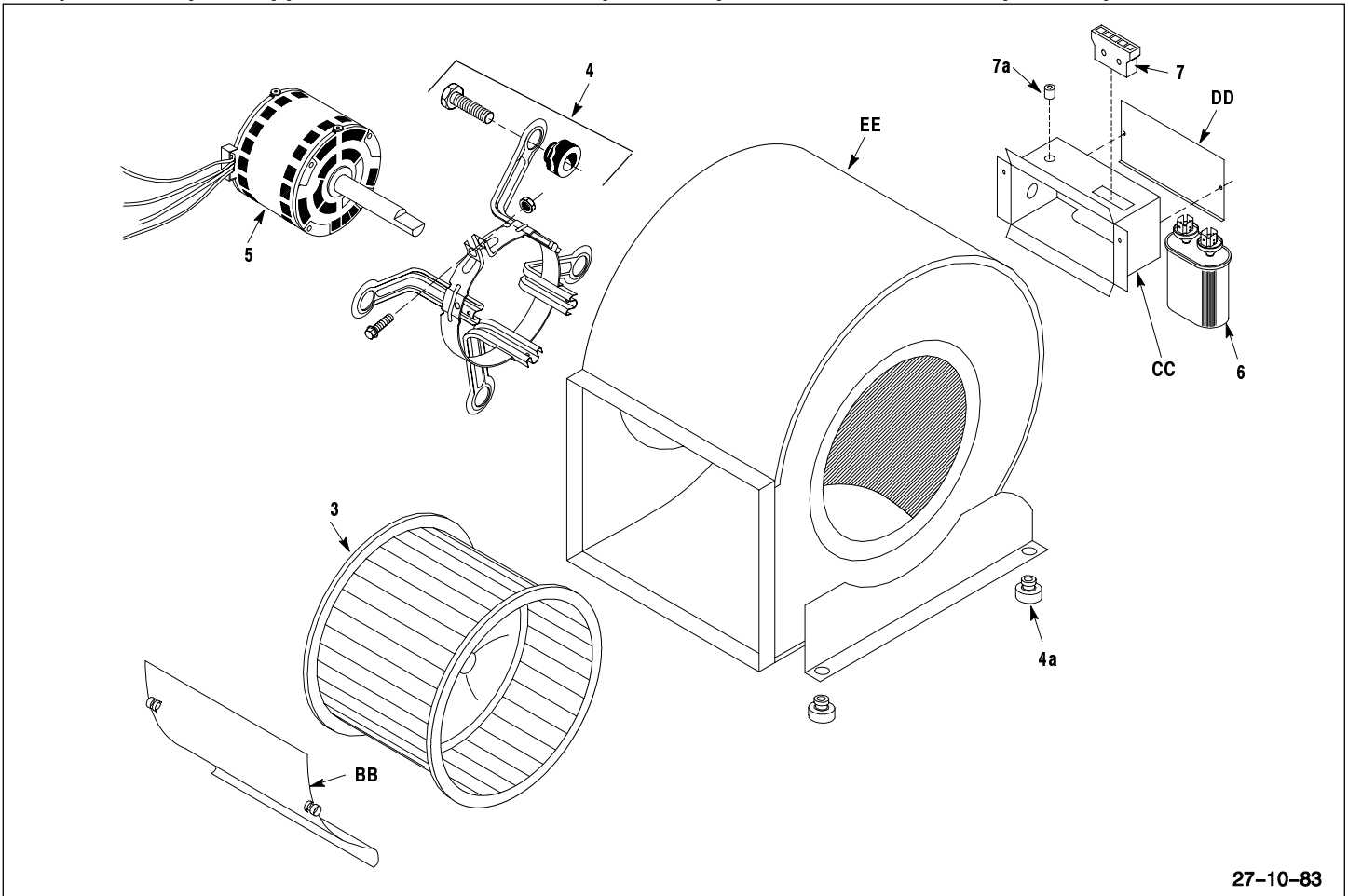
Key No.	Description of Beckett Burner	Part Number 1010050
8	Transformer, 115., 60Hz	1150466
9	Primary Control	612454
10	Junction Box Kit	1650257
11	Cad Cell	636063
12	Lo Firing Rate Baffle	1650256
13	Motor 1/7 H.P., 115V., 60Hz.	610424
14	Burner Wheel	1150448
15	Coupling	1150450
16	Burner Housing	1650233
17	Plug Hole	1150459
18	Air Band	1150446
19	Air Shutter	1650234
20	Fuel Pump Single Stage (Two Stage (Optional Accessory))	610467 1650250
21	Connector Tube Assembly	11150449
22	Escutcheon Place	1150453

Key No.	Description of Beckett Burner	Part Number 1010050
23	Nozzle, Line, Electrode Assembly	1162592
24	Air Tube	1162591
25	Burner Head	1650262
26	Burner Flange	1650242
27	Ceramic Fiber Burner Gasket	1650244
28	Nozzle Adapter	1150462
29	Spider Spacer	1650273
30	Static Plate	1650272
31	Electrode Clamp	1650269
32	Electrode and Insulator (2)	1150452
33	Oil Line	1162593
34	Nozzle:	
	GPH, 0.65 70° W Delavan	505633
	GPH, 0.75 70° W Delavan	1665504
	GPH, 0.85 70° W Delavan	0500190
	GPH, 1.00 70° W Delavan	1150472
	GPH, 1.10 70° W Delavan	1665506
	GPH, 1.25 70° W Delavan	0500230

# Replacement Parts - LLO5/OLL/LL07/OLM

**Models** - LLO5125BKB1, LLO5145BKA1, LLO7115BGB1; OLL125B20B1, OLL145B20A1, OLM115B17B1

**Replacement part supplied will be current active part. For parts not listed, consult place of purchase.**



27-10-83

Key No.	Description Functional	Part Number	LLO5125BKB	LLO5145BKA	LLO7115BJB
			OLL125B20B	OLL145B20A	OLM115B17B
3	Blower Wheel	601212	-	-	1
		601211	1	1	-
		601210	-	-	-
4	Motor Mount Grommet	609194	1	1	1
		64475	1	1	1
5	Blower Motor $\frac{1}{2}$ HP $\frac{3}{4}$ HP	500060	1	-	1
		1001480	-	1	-
6	Capacitor 10 MFD 370V 15 MFD	100192	1	-	1
		100193	-	1	-
7	Terminal Block	96471	1	1	1
7a	Terminal Bushing	96473	1	1	1

Key No.	Description Non-Functional	Part Number	LLO5125BKB	LLO5145BKA	LLO7115BJB
			OLL125B20B	OLL145B20A	OLM115B17B
BB	Cut-Off Panel	67584	1	1	1
CC	Junction Box	95076	1	-	1
		95078	-	1	-
DD	Junction Box Cover	1001203	1	1	1
EE	Blower Housing	9015510	1	1	1