



Owner's Manual and Instructions

Director™ Construction Heater



| MODELS | OUTPUT (Btuh) | FUEL |
|----------|---------------|--|
| CP300CKI | 258,700 | Kerosene #1, #2 Diesel/ Fuel Oil, JP-8 or Jet A |



Congratulations!

You have purchased the finest indirect fired construction heater available.

Your new L.B. White heater incorporates the benefits from the most experienced manufacturer of heating products using state-of-the-art technology.

We, at L.B. White, **thank you** for your confidence in our products and welcome any suggestions or comments you may have...call us, toll-free, at (800) 345-7200.

This heater has been tested and evaluated by C.S.A. International in accordance with the requirements of Standard UL 733 and ANSI A10.10-1990, CAN/CSA B140.0-03 and CSA B140.8-1967 and is listed and approved as a ductable, indirect fired Kerosene forced air construction heater with application for the temporary heating of buildings under construction, alteration, or repair.

If you are considering using this heater for any application other than its intended use, then please contact L.B. White Co.



Quality heaters you can count on.

W6636 L.B. White Rd., Onalaska, WI 54650 ■ (800) 345-7200 ■ (608) 783-5691 ■ (608) 783-6115, fax ■ info@lbwhite.com

150-28136



GENERAL HAZARD WARNING

- Failure to comply with the precautions and instructions provided with this heater, can result in:
 - Death
 - Serious bodily injury or burns
 - Property damage or loss from fire or explosion
 - Electrical shock
- Read this Owner's Manual before installing or using this product.
- Only properly-trained service people should repair or install this heater.
- Save this Owner's Manual for future use and reference.
- Owner's Manuals and replacement labels are available at no charge. For assistance, contact L.B. White at 800-345-7200.



WARNING

Fire and Explosion Hazard

- Not for home or recreational vehicle use.
- Installation of this heater in a home or recreational vehicle may result in a fire or explosion.
- Fire or explosions can cause property damage or loss of life.



WARNING

Fire and Explosion Hazard

- Keep solid combustibles a safe distance away from the heater.
- Solid combustibles include wood, paper, or plastic products, building materials and dust.
- Do not use the heater in spaces which contain or may contain volatile or airborne combustibles.
- Volatile or airborne combustibles include gasoline, solvents, paint thinner, dust particles or unknown chemicals.
- Failure to follow these instructions may result in a fire or explosion.
- Fire or explosions can lead to property damage, personal injury or loss of life.

FOR YOUR SAFETY

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.



Table of Contents

| <u>SECTION</u> | <u>PAGE</u> |
|---|--------------------|
| General Information | 3 |
| Heater Specifications | 4 |
| Safety Precautions | 5 |
| Installation Instructions | 6 |
| Operation Instructions | |
| Basics of Operation | 8 |
| Fuels | 8 |
| Connecting Thermostat | 9 |
| Start-Up Instructions | 10 |
| Shut-Down Instructions | 11 |
| Re-set Instructions | 11 |
| Maintenance Instructions | 11 |
| Cleaning and Storage Instructions | 12 |
| Service Instructions | |
| General | 13 |
| Burner Nozzle | 13 |
| Fuel Pump | 14 |
| High Limit Switch | 14 |
| Setting for High Altitude | 15 |
| Fan and Motor | 15 |
| Photocell | 16 |
| Igniters | 16 |
| Air Pressure Switch and Tubing | 17 |
| Fuel Filter and Heating Element | 17 |
| Troubleshooting | 18 |
| Electrical Connection Diagram | 21 |
| Heater Component Function | 22 |
| Parts Identification | |
| Parts Schematic | 23 |
| Parts List | 24 & 25 |
| Warranty Policy | 26 |
| Replacement Parts and Service | 26 |

General Information

This Owner's Manual includes all options and accessories commonly used on this heater.

When calling for technical service assistance, or for other specific information, always have model number, configuration number and serial number available. This information is contained on the dataplate.

This manual will instruct you in the operation and care of your unit. Have your qualified installer review this manual with you so that you fully understand the heater and how it functions.

The installation, repair and servicing of the heater requires continuing expert training and knowledge of gas heaters and should not be attempted by anyone who is not so qualified. See page 6 for definition of the necessary qualifications.

Contact your local L.B. White distributor or the L.B. White Co., Inc. for assistance, or if you have any questions about the use of the equipment or its application.

The L.B. White Co., Inc. has a policy of continuous product improvement. It reserves the right to change specifications and design without notice.

Heater Specifications

Model

SPECIFICATIONS

CP300CKI

| | | |
|---|--|--------------|
| Fuel Type | Kerosene, #1 #2 Diesel/Fuel Oil, JP-8, Jet A | |
| Max Input (BTUH) | 294,000 | |
| Net Output (BTUH) | 258,700 | |
| Air Flow (Hot) CFM | 2,500 | |
| Pump Pressure , (PSI) | 232 | |
| Fuel Tank Capacity (gal.) / Fuel Consumption per Hour (gal.) | 27.7/ 2.17 | |
| Motor Characteristics | Ball Bearing | |
| | 1 H.P. / 1,750 RPM | |
| Electrical Supply (Volts/Hz/Phase) | 115/60/1 | |
| Amp Draw | STARTING | 28.4 |
| | CONTINUOUS OPERATION | 6.5 |
| Dimensions (Inches) L x W x H (w/o wheels) | 65 x 22 1/4 x 34 1/2 | |
| Minimum Safe Distances From Nearest Combustible Materials | EXHAUST OUTLET TOP | 8 FT |
| | SIDES | 3 ft. 10 in. |
| | BACK | 3 ft. 10 in. |
| | BLOWER OUTLET | 10 ft. |
| | BULK FUEL STORAGE CONTAINER | 25 |
| Net Weight (lbs.) | 297 | |
| Shipping Weight (lbs.) | 352 | |
| Minimum Ambient Temperature in Which Heater May Be Used | - 20°F | |
| Duct Diameter and Maximum Length Using 1 way Adapter | 16 in. x 75 ft. | |
| Using 2 way Adapter | 2 - 12 in. x 35 ft | |
| Temperature Rise at 67F. | 126 F. | |

Safety Precautions

1. Do not attempt to install, repair, or service this heater unless you have continuing expert training and knowledge of liquid fuel heaters.

Qualifications for service and installation of this equipment are as follows:

To be a qualified liquid fuel heater service person, you must have sufficient training and experience to handle all aspects of indirect fired liquid fuel heater installation, service and repair. This includes the task of installation, troubleshooting, replacement of defective parts and testing of the heater. You must be able to place the heater into a continuing safe and normal operating condition. You must completely familiarize yourself with the heater by reading and complying with the safety instructions, labels, Owner's Manual, etc., that is provided with each heater.

2. All installations and applications of L.B. White heaters must meet all relevant local, state and national codes. Included are electrical and safety codes. Your local fuel supplier, a local licensed electrician, the local fire department or similar government agencies, or your insurance agent can help you determine code requirements.

Refer to the following:

- ANSI/NFPA 70, National Electrical Code.
- ANSI A10.0, 1990 Latest Edition Safety Requirements for Temporary and Portable Space Heating Devices and Equipment Used in Construction Industry.

3. The area surrounding the heater shall be kept clear and free from combustible materials, gasoline, and other flammable vapors and liquids.
4. We cannot anticipate every use which maybe made of our heaters. Check with the local fire safety authority if you have questions about applications.
5. For safety, this heater is equipped with fan and high limit switches. Never operate the heater with any safety device that has been bypassed. Do not operate this heater unless these features are fully functioning.
6. Do not locate fuel containers near the blower outlet of the heater.
7. Do not block air intakes or discharge outlets of the heater. Doing so may cause improper combustion or damage to heater components leading to property damage.
8. Check for fuel leaks and proper function upon heater installation, when relocating, and after servicing.
9. This heater should be inspected for proper operation by a qualified service person before each use, not less than once per shift, and at least annually.
10. This heater is equipped with a three-prong (grounding) plug for your protection against shock

hazard and must be plugged directly into a properly grounded three-prong receptacle. Failure to use a properly grounded receptacle can result in electrical shock, personal injury, or death.

11. Read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.
12. Use only the recommended fuels to avoid risk of fire or explosion. Never use gasoline, naphtha, paint thinners, alcohol, or other highly flammable fuels.
13. Fueling:
 - a) Personnel involved with fueling shall be qualified and thoroughly familiar with the manufacturer's instructions and applicable regulations regarding the safe fueling of heating units.
 - b) Use only the type of fuel specified within the manual.
 - c) All flame shall be extinguished and the heater allowed to cool prior to fueling.
 - d) During fueling, all fuel lines and fuel-line connections shall be inspected for leaks. Any leaks shall be repaired prior to returning the heater to service.
 - e) At no time shall more than one day's supply of heater fuel be stored inside a building in the vicinity of the heater. Bulk fuel storage shall be outside the structure.
 - f) All fuel storage shall be located a minimum of 25 feet from heaters, torches, welding equipment, and similar sources of ignition (exception: the fuel reservoir integral with the heater unit).
 - g) Whenever possible, fuel storage shall be confined to areas where floor penetrations do not permit fuel to drip onto or be ignited by a fire at lower elevation.
 - h) Fuel storage shall be in accordance with the authority having jurisdiction.
 - i) Fuel storage shall not be permitted within 10 ft. of floor penetrations used for vertical access unless separated from the penetration by full masonry height walls.
14. Use only in areas free of flammable vapors or high dust content.
15. Locate heater on a stable and level surface while hot or operating.
16. Never start heater if fuel has accumulated in combustion chamber.
17. Heater may start at any time when used with thermostat.

18. When heater is moved or stored, it must be in a level position or fuel spillage may occur.
19. Never move, handle, refuel, or service a hot, operating, or plugged-in heater.
20. Never attach duct work to rear of heater.
21. Follow all local codes if connecting the heater to an external fuel source.
22. Heaters used in the vicinity of tarpaulins, canvas, or similar enclosure materials shall be located in safe distance from such materials. The recommended

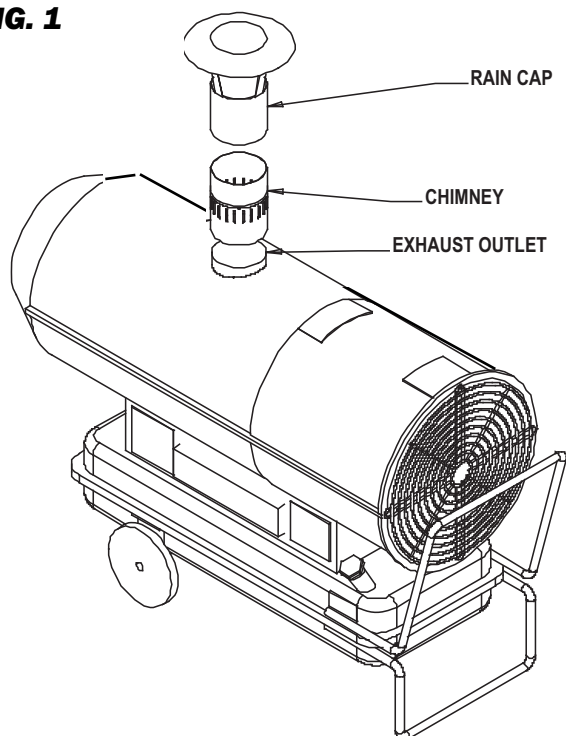
minimum safe distance is 10 ft. It is further recommended that these enclosure materials be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the heater due to wind action.

23. Unplug heater when not in use.
24. When the heater is used in an enclosed or partially enclosed permanent or temporary structure, tests for the presence of carbon monoxide shall be made within one hour after the start of each shift, and at least four hours thereafter. Immediate, more frequent testing may be dictated by job conditions.

Installation Instructions

1. Read all safety precautions and follow L. B. White recommendations when installing this heater. If during the installation or relocating of heater, you suspect that a part is damaged or defective, call a qualified service agency for repair or replacement.
2. Install chimney, Part #24311 onto exhaust outlet. Install raincap, Part #24223 (optional accessory) onto chimney to protect against water entry when heater is installed outside. See Fig. 1.

FIG. 1



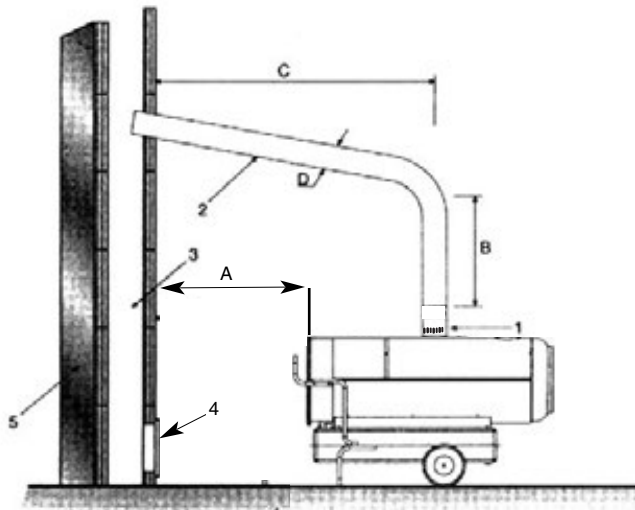
3. This heater may be installed either indoors or outdoors. For indoor installations, the heater must be vented to outside. See Figs. 2 & 3 on page 7 for chimney set-up and installation.
4. The heater may be ducted. Use only 20 ft. flexible duct, part #24220, and duct adapter, part #26986. Both parts are optional accessories. Do not use any other length of duct, field fabricated ducts, or adapters, stove pipes, etc. Locate the duct under suitable wind barrier materials for jobsite requirements.

5. When installed indoors, proper ventilation air must be supplied to support the combustion of the heater. Refer to Pg. 4 of this Owner's Manual, or heater's dataplate for ventilation air requirements.
6. Insure all heater accessories have been installed.
7. The heater must be installed so as not to interfere with or obstruct normal exits, emergency exits, doors and walkways.
8. Railing, fencing or suitable substitute materials must be used to keep the heating equipment from any people using and visiting the structure.
9. The unit shall be located so that rain, ice, or snow drainage from the structure does not affect equipment operation. The heater must be mounted above any pooled or standing water. A surrounding trench is recommended to drain any rain, ice or snow away from the unit.
10. The ground and surrounding terrain must be cleared of any combustible vegetation and other combustible materials when the heater is used.
11. Eventually, like all electrical/mechanical devices, the thermostat can fail. Thermostat failure may result in an underheating condition. The thermostat should be tested to make sure it turns the heater on and off within a temperature differential of $\pm 3^{\circ}\text{F}$.
12. Take time to understand how to operate and maintain the heater by using this Owner's Manual. Make sure you know how to shut off the power supply to the heater.
13. Any defects found in performing any of the service or maintenance procedures must be eliminated and defective parts replaced immediately. The heater must be retested by properly qualified service personnel before placing the heater back into use.

EXTENSION CORD WIRE SIZE REQUIREMENTS FOR DIRECTOR 300

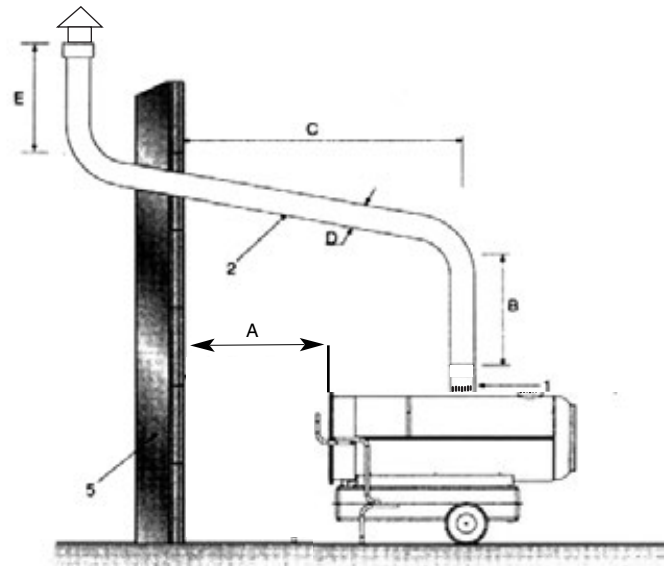
- 6 to 100 ft. long, use 14 AWG rated cord
- 101 to 200 ft. long, use 12 AWG rated cord
- 201 to 300 ft. long, use 10 AWG rated cord

FIG. 2 VENTING TO EXISTING CHIMNEY



- A) Minimal 3 ft.
- B) Minimal 3 ft.
- C) The shortest
- D) The same or bigger than the stacks outlet diameter
- E) Minimal 3 ft.

FIG. 3 VENTING TO OUTSIDE THROUGH WALL



- 1) Anti-wind device provided with the heater
- 2) Horizontal crossing with minimal upside angle pitch of 5°
- 3) Chimney 8 in. x 8 in. of minimal inside measure
- 4) Chimney anti-explosion flap door
- 5) External seating wall

Note: The above information is a recommendation only. Have your installation checked by local authority.

Operation Instructions

BASICS OF OPERATION

THE FUEL SYSTEM

The motor turns the fuel pump. The fuel pump pulls fuel from the fuel tank. The fuel pump pushes fuel through a filter and a solenoid valve and out the burner head nozzle. A fine mist of fuel is sprayed into the combustion chamber.

THE AIR SYSTEM

The motor turns the fan while at the same time operating the pump. The fan creates air pressure, closing the air pressure switch, which delivers power to the solenoid for supply of fuel to the burner nozzle.

Additionally, the fan is also responsible for pushing the air into and around the combustion chamber. This air is heated and provides a stream of clean, dry, hot air.

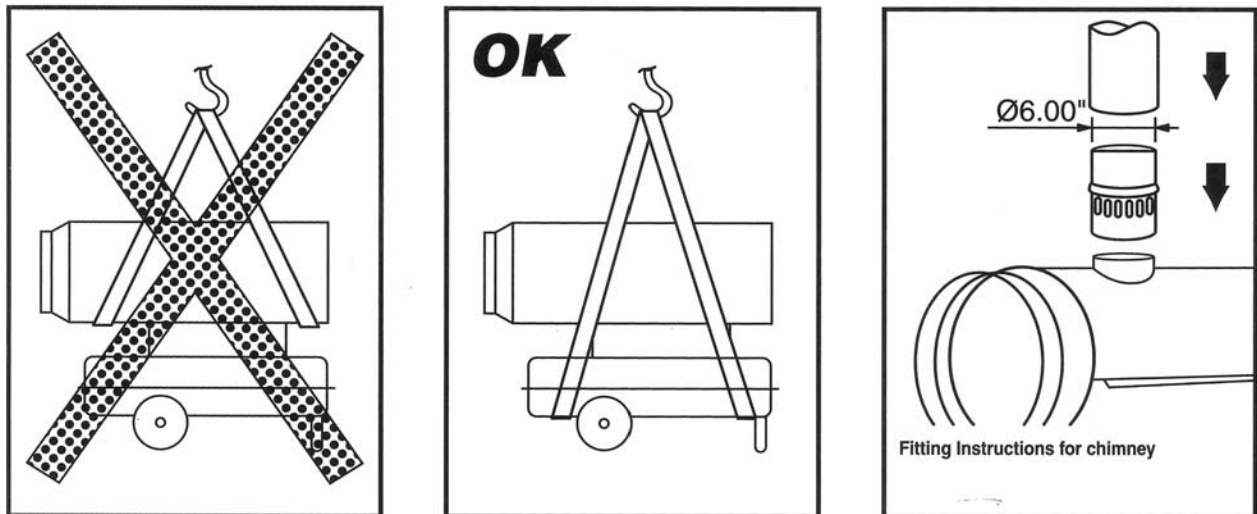
THE IGNITION SYSTEM

The electronic ignitor sends voltage to the spark plug. The spark plug ignites the fuel and air mixture.

THE FLAME-OUT CONTROL SYSTEM

This system causes the heater to shut down if the flame goes out. It also allows the fan to continue running after normal shutdown of heater. This cools the combustion chamber.

FIG. 4 Handling instructions



FUELS

Heavier fuels such as #1, #2 Diesel, JP-8, or Jet A may be used. Using heavier fuels other than kerosene may result in:

- Clogged fuel filter and nozzle
- Carbon build-up on spark plug
- Dark smoke from stack
- The need of non-toxic anti-icer in fuel during very cold weather.

Use a KEROSENE ONLY storage container. Be sure storage container is clean. Foreign matter such as rust, dirt, or water will cause flame-out control to shut down heater. Foreign matter may also require you to clean fuel system often.

CONNECTING THERMOSTAT

(Accessory - Part #27508)

- a) Push latch away from thermostat socket on control panel and remove cover from thermostat socket. See Fig. 5a
- b) Connect thermostat plug to socket. Lock plug to socket using latch. See Fig. 5b.

FIG. 5 a.

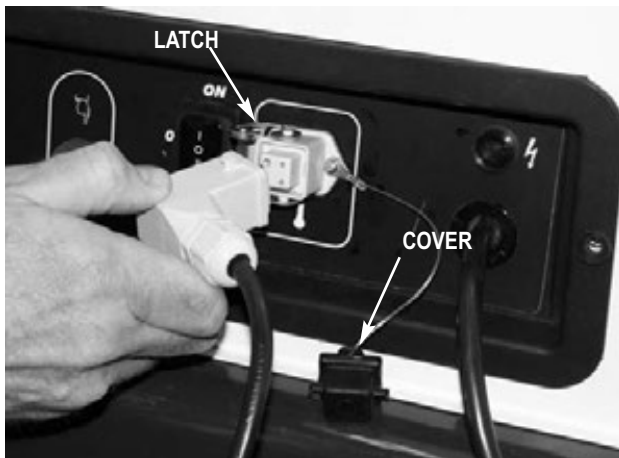


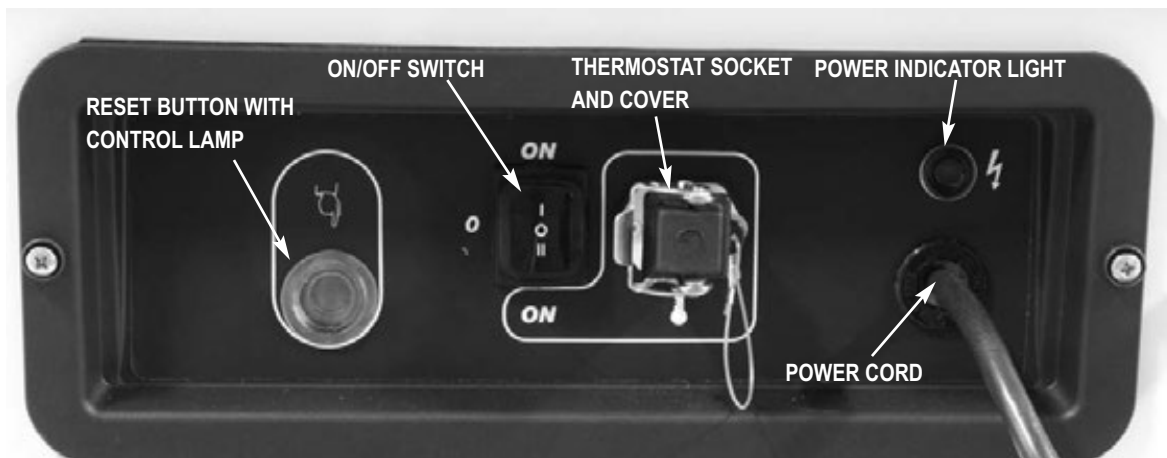
FIG. 5 b.



Start-Up Instructions

1. Follow all ventilation and safety information.
2. Ensure electrical supply conforms to data plate requirements.
3. Fill tank with fuel.
4. Connect heater to an approved electrical supply.
5. The heater may be operated with or without thermostat.
Without thermostat:
 - Push the top of the ON/OFF switch (I) to ON. The motor will start, followed by ignition.
 - The heater will operate until the switch is positioned to OFF.**With thermostat,**
 - Connect thermostat per instructions in this manual.
 - Push the bottom of the ON/OFF switch (II) to ON.
 - The heater will start when thermostat is set above surrounding air temperature.
6. When in normal operation, the Ignition control reset button with lamp emits a GREEN light.
7. When the unit is started for the first time or is started after the fuel tank has been totally emptied, the flow of fuel may be impaired by air in the circuit. The ignition control will shut the heater down. It may be necessary to restart the heater once or twice by depressing the "Reset" button. To ease starting, remove the canister bottom from the pump's fuel filter and fill with fuel. Reassemble the filter.

FIG. 6



Shut-Down Instructions



CAUTION

- Do not unplug the heater while heater is in operation.
- The heater must go through cooling cycle. The cooling cycle allows motor and fan operation after the burner has shut down. This cools the combustion chamber.
- Damage to heater can occur if combustion chamber is not cooled.
- Do not restart heater until cooling cycle is complete.

1. Turn thermostat dial to lowest temperature setting. This will shut the burner off. **The motor will continue to run for 90 seconds.** This allows the fan to cool the combustion chamber. When the cooling cycle is finished, the motor will stop.
2. Unplug extension cord from outlet.
3. To temporarily stop heater, set thermostat at a temperature lower than air around heater. Heater will cycle back on if air temperature around heater matches thermostat setting.

Re-set Instructions

Reset of the heater is required if the heater has failed in its ignition attempt.

RED light is observed at reset button:

- Position the ON/OFF switch to OFF.
- Push the reset button
 - Red light goes out.
- Push the ON/OFF switch to ON position (depending if thermostat is used)
- Heater begins ignition trial.
- Light will turn GREEN once ignition is achieved..

Maintenance Instructions

1. Check all wiring associated terminals and electrical components within the heater for corrosion, frayed or cut insulation, tight connections, etc. Repair or replace as necessary.
2. Review all heater markings (i.e. wiring diagram, warnings, start-up, shut-down, etc.) at the time of maintenance for legibility. Make sure none are cut, torn, or otherwise damaged. Any damaged markings must be replaced immediately by contacting the L.B. White Co., Inc. Dataplates, start-up and shut-down instructions and warnings are available at no cost. A nominal charge will be applied for wiring diagrams.
3. Inspect all fuel supply lines for cracks, abrasions, or ruptures. Replace if needed.
4. The heater should be tagged and removed from service if it shows evidence of damage that is a safety or health hazard.
5. Refer to the following preventative maintenance schedule:

| Item | Maintenance Schedule |
|---------------------------------|--|
| Fuel tank | Flush every 50 hours of operation or as needed |
| Fuel filter assembly | Clean twice a heating season or replace as needed |
| Fuel filter lines | Check and tighten loose connections before each use |
| Ignitors | Clean and regap every 300 hours of operation or replace if needed |
| Fan blades and air deflectors | Clean each season or as needed |
| Air passages around burner head | Check each season for dirt and debris. Remove debris with a clean, soft cloth. |

Cleaning and Storage Instructions



WARNING Fire, Burn, and Explosion Hazard

- This heater contains electrical and mechanical components in the fuel management, and safety systems.
- Such components may become inoperative or fail due to dust, dirt, wear and aging.
- Periodic cleaning and inspection as well as proper maintenance are essential to avoid serious injury or property damage.

CLEANING

The heater should have dirt or dust removed periodically:

- a. Before each use give the heater a general cleaning using compressed air or a soft brush or dry rag on its case and internal components. At this time, dust off the motor case to prevent the motor from over-heating.
- b. At least once a year, give the heater a thorough cleaning. At this time, remove the fan and motor assembly and brush or blow off the fan blade assembly. Additionally, make sure the burner air venturi port is free of dust accumulation.

STORAGE

1. Drain all fuel from fuel filters, fuel lines, and pump.
2. Clean and flush fuel filter and canister.
3. Remove drain plug and drain fuel tank. Replace drain plug.
4. If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir, and drain again. This will prevent debris from clogging filters during future use. Install fuel cap and drain plug.
5. Add 2 gallons of recommended fuel to fuel tank. Replace fuel cap.
6. Operate heater for 5 minutes (See Start Up Instructions). Shut heater down, let it cool completely.



WARNING

Do not use a pressure washer, water, or liquid cleaning solution on any heater controls. Use of a pressure washer, water, or liquid cleaning solution on the control components can cause severe personal injury or property damage due to water and/or liquids:

- In electrical components, and wires causing electrical shock or equipment failure.
- On fuel pump and hose connections causing corrosion which can result in fuel leaks and fire or explosion from the leak.

Clean all components of the heater with pressurized air, a dry brush, or a dry cloth.

7. Remove drain plug and drain fuel tank. Replace drain plug.
8. Properly dispose of old and dirty fuel.
9. Store heater in a dry location. Make sure storage place is free of dust and corrosive fumes.

Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

Service Instructions

GENERAL

WARNING Burn Hazard

- Heater surfaces are hot for a period of time after the heater has been shut down.
- Allow the heater to cool before performing service, maintenance, or cleaning.
- Failure to follow this warning will result in burns causing injury.

WARNING Fire and Explosion Hazard

- Do not disassemble or attempt to repair any heater components.
- All component parts must be replaced if defects are found.
- Failure to follow this warning will result in fire, causing property damage, injury, or death.

3. The high limit, thermostat, and air pressure switch can be tested by disconnecting the leads at the component, and jumpering the leads together:
 - Reconnect the electrical supply and open fuel supply valves.
 - If the heater lights, the component is defective and must be replaced.
 - Do not leave the jumper on or operate the heater if the part is defective. Replace the part immediately.
 - An alternate method for checking the components is to perform a continuity check.
5. All serviceable components such as the burner, high limit, switch, pump, motor, fan, and photocell are accessed by removing the upper shell at the fan end of the heater. Electrical components, such as ignition module, on/off switch, relay, and ignition transformer, are accessed by opening the control box on the heater.
6. Disconnect the electrical leads for the respective component.
7. For reassembly, reverse the respective service procedure. Ensure fuel connections are tightened securely.
8. After servicing, start the heater to ensure proper operation.

1. Disconnect the electrical supply before servicing unless necessary for your service procedure.
2. Clean the heater's nozzle with compressed air or a soft, dry rag. Do not use files, drills, broaches, etc. to clean the nozzle hole. Doing so will enlarge the hole, causing combustion or ignition problems. Replace the nozzle if it cannot be cleaned properly.

BURNER NOZZLE

- If cleaning out nozzle, remove the fuel line from the nozzle inlet as shown in Fig. 7. Blow out with air.
 - If removing nozzle from burner, proceed as follows.
1. Disconnect the fuel line, ignition cables, and photo cell from burner head. Loosen the three nuts at burner head. and remove head from heat chamber. See Fig. 7.
 2. Remove the nut as shown in Fig. 8.
 3. Remove nozzle with manifold and turbo disc from head. See Fig. 9.
 4. Loosen screw securing turbo disc to manifold. See Fig. 9.
 5. Remove the nozzle from the manifold.

FIG. 7

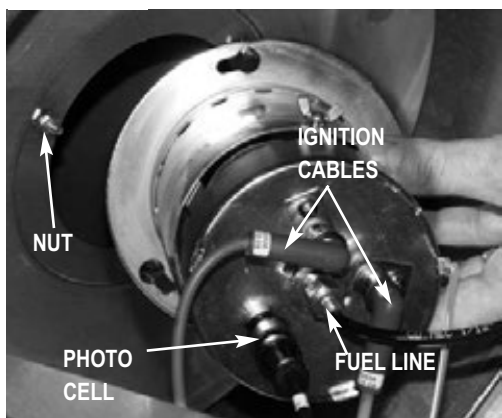


FIG. 8

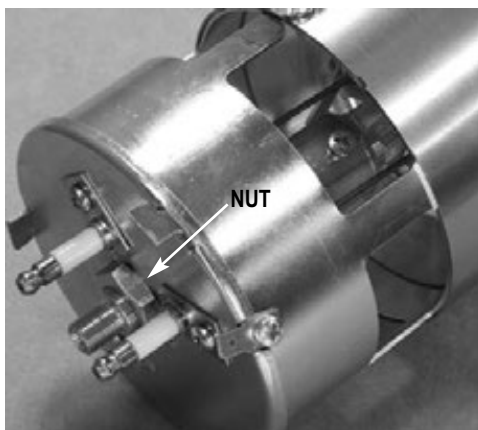
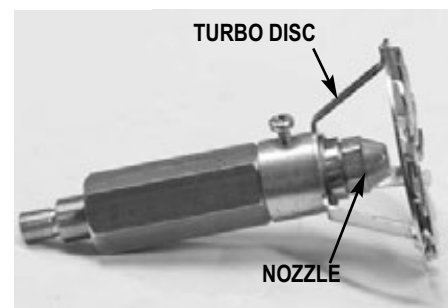
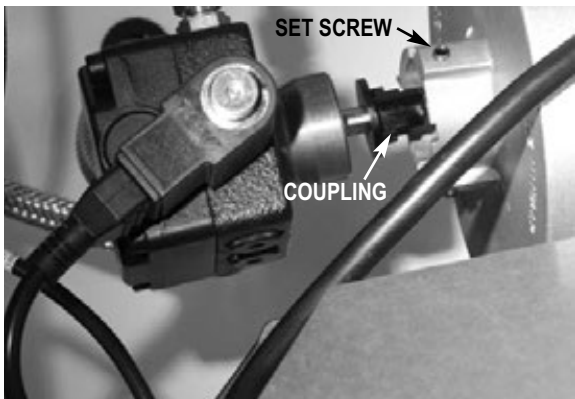


FIG. 9



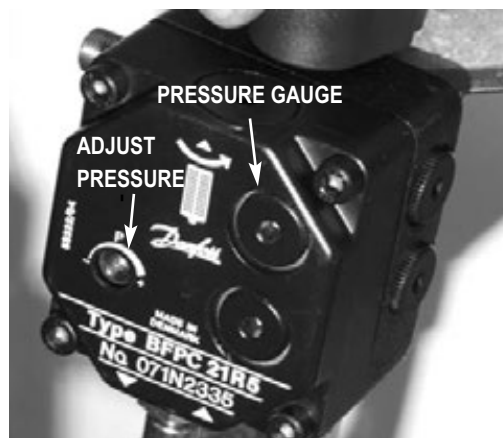
Removal

1. Disconnect fuel supply line from pump.
2. Using a 2.5 mm. allen key, loosen the three set screws where pump slides to motor shell. See Fig. 10.
3. Pull pump assembly from motor. Ensure pump coupling is in good condition.
4. Disconnect solenoid valve lead from pump.

FIG. 10**Checking Pressure**

1. Remove pressure gauge plug from fuel pump port as shown in Fig.11, located in the upper right hand corner of the pump. Use a 4 mm allen wrench.
2. Install a pressure gauge that has 1/8-28 BSP (British Straight Pipe) threads to the fuel port marked "P". See Fig. 12. (If 1/8 in. NPT is used, apply some pipe thread compound to the threads)
3. Start heater (See Start-Up). Allow motor to reach full speed. Pump pressure must be that given on dataplate or Pg. 4 of Owner's Manual.

4. To adjust pressure use 4mm allen wrench at adjustment screw, lower left of the pump, marked "-" and the "+". Turn the allen head clockwise towards the "+" to increase the pressure. Turn counter clockwise towards the "-" to decrease pressure. See Fig.11.

FIG. 11**Maintenance**

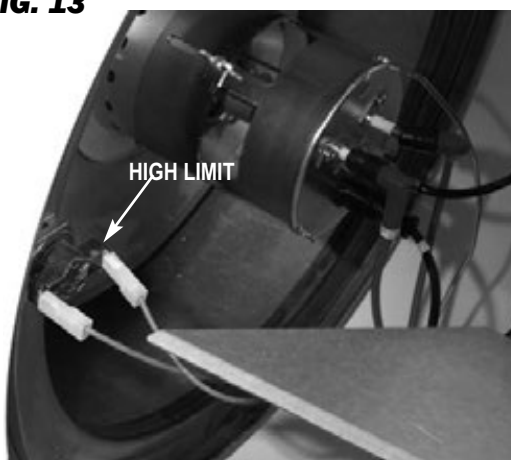
- Before use, remove the filter using a 4 mm. allen key and check for debris. See Fig.12.
- Rinse the filter with clean kerosene.

FIG. 12

HIGH LIMIT SWITCH

Mounted on the heat chamber near the burner head, the high limit is a normally closed switch that opens if the burn chamber reaches abnormally high temperatures, cutting power to the gas solenoid valve.

The switch may be tested by applying a soft flame for about 20 seconds to the sensing side of the switch. Check for continuity before and after flame application to determine if the switch has opened. Allow the switch to cool. Recheck continuity to ensure the switch has closed.

FIG. 13

SETTING FOR HIGH ALTITUDE

Set the air adjustment collar at the burner to compensate for change in altitude. The heater is set from the factory to operate at 1,000 ft. above sea level. **Failure to set the burner's air opening will result in smoke being emitted from the vent stack during operation.**

Loosen the wing screw at the burner head and slide the adjustment collar accordingly to these opening sizes in the table below. Note that these are approximate. **The opening should be increased or decreased as necessary to prevent the heater from emitting smoke.**

FIG. 14



| Air Opening Setting | Altitude |
|---------------------|-----------------|
| 6 mm. | 2,000' - 3,000' |
| 7 mm. | 4,000' - 5,000' |
| 9 mm. | 6,000' - 7,000' |

FAN AND MOTOR

1. Remove the fan guard from the heater.
2. Using a 4 mm. allen key, loosen the set screw at the fan hub. See Fig. 15.
3. Slide the fan from the motor shaft.
- 4.. Disconnect the wiring for the motor and the capacitor from the junction box at the motor.
5. Remove the pump from the end of the motor opposite the fan. (see Pump Service Instructions)
6. Remove all screws securing the motor to its support. See Fig.16.

NOTES: a. Ensure fan hub is spaced 1.25 inches from shaft end. See Fig.15.

- b. Fan set screw must be located directly over the shaft flat before tightening.

FIG. 15

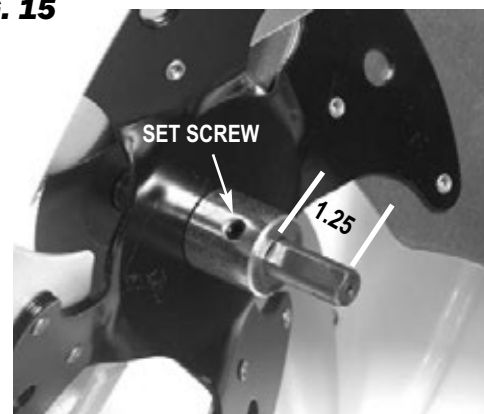
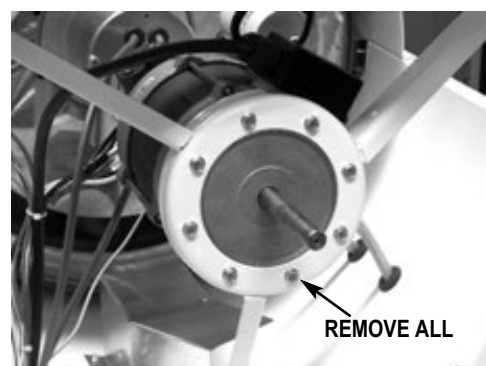


FIG.16



1. Remove the photocell by firmly grasping its body and pulling it from its holder. See Fig. 17.
2. Ensure tab on photocell body is firmly pushed within slot of holder at reassembly to lock photocell in place

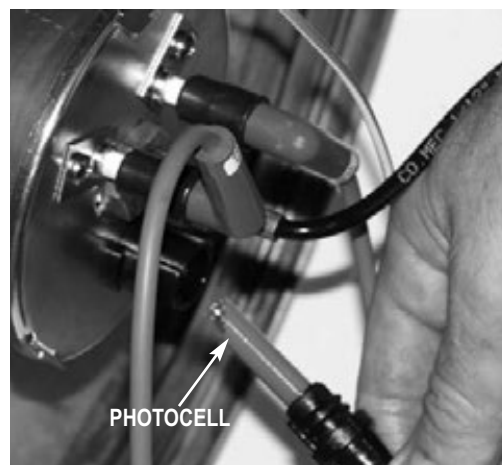
Cleaning

- Disconnect photocell from holder.
- Using a clean dry cloth, wipe lens of photocell.

Testing the photocell:

- Disconnect electrical leads of photocell.
- Connect ohm meter between leads.
- Note resistance of photocell. Ohm meter should read anywhere from 50 to 60 k ohm.
- Shine a bright light (flash light) at the photocell lens.
- Resistance should drop to anywhere from 2 - 4 k ohm. If no change in resistance, the photo cell is defective and should be replaced.

FIG. 17



IGNITERS

Cleaning and Checking Gap

- a. Loosen nuts at burner head. See Fig. 18.
- b. Remove head from heat chamber.
- c. Clean the igniter tips using emery cloth.
- d. Ensure proper gap. See Fig. 19

Replacement.

- Follow steps a and b above.
- Remove the ignition cables and igniter mounting screws.
- Ensure proper igniter gap after servicing.

FIG. 18

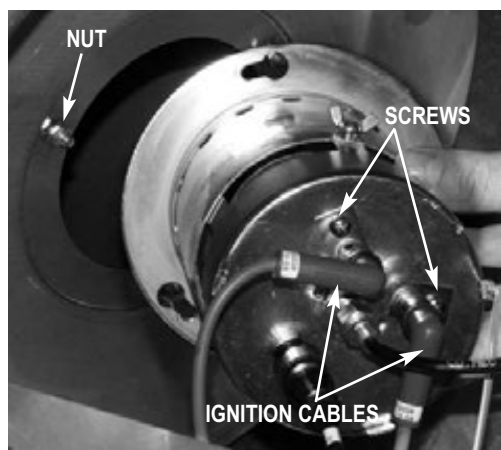
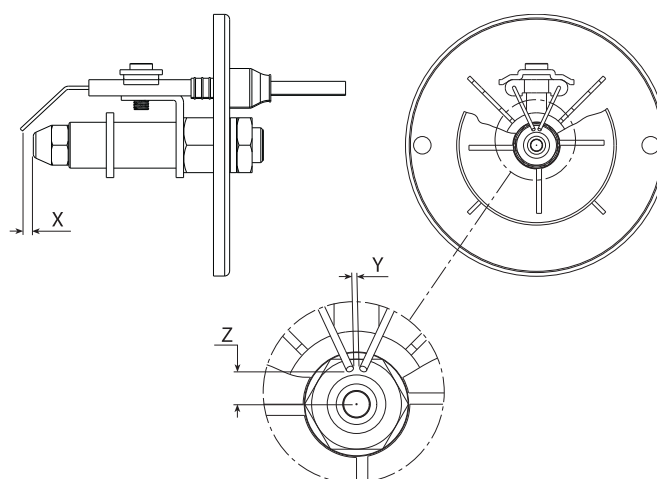


FIG. 19



| X | Y | Z |
|--------------------|-------------------|-----------------|
| 5/32 in (.157 in.) | 3/32 in. (.0938) | 5/32 in. (.157) |

AIR PRESSURE SWITCH AND TUBING

- The air pressure switch is mounted to the inside of a small access panel at the fan end of the heater. See Fig. 20.
- Ensure the switches flexible tubes and fittings are not blocked with dust/dirt or pinched. Tubes must be securely connected to the pressure switch and fittings.
- The tube fittings are located at the exterior below the fan (See Fig. 21) and in the lower barrel of the heater near a wiring exit hole, see Fig. 22. Ensure this fitting is positioned as shown.
- The tube connected to the fitting below the fan guard is connected to the barbed connection on lower section of the switch. The tube connected to the fitting at the lower barrel is connected to the barb on the upper section.

FIG. 20

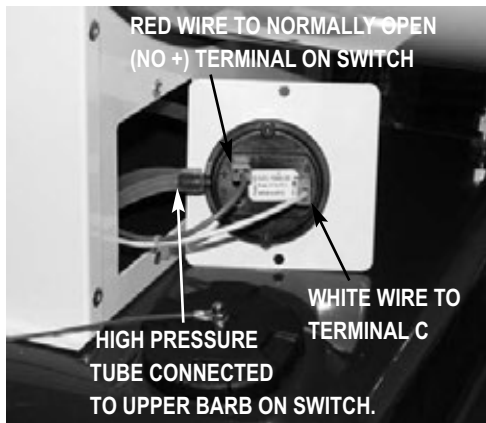


FIG. 21



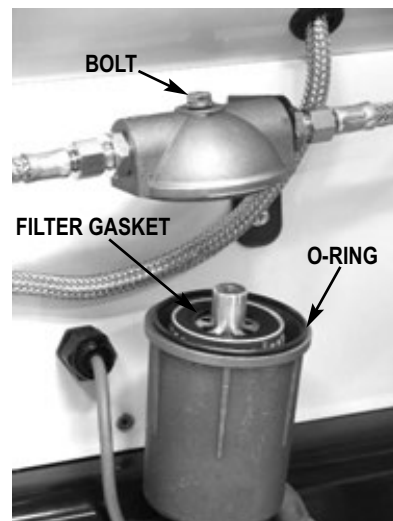
FIG. 22



FUEL FILTER WITH HEATING ELEMENT

1. Loosen the bolt at the top of the fuel filter housing.
 2. Remove filter from housing bowl and clean as necessary with fresh fuel. Replace filter if necessary.
 3. Ensure filter gasket and bowl o-ring are in good condition and properly located prior to reassembly. Tighten the bowl to the housing securely. A defective o-ring will prevent proper suction of fuel from the bowl.
- The fuel bowl should start feeling warm to touch within the first few minutes of connecting the heater to the power supply.
 - If the element does not warm up by this time, check element continuity. If defective, replace complete bowl and filter assembly.
 - Heating element is not available as a separate part.

FIG. 23



Troubleshooting Information

READ THIS ENTIRE SECTION BEFORE BEGINNING TO TROUBLESHOOT PROBLEMS.



WARNING

- This heater can start at any time.
- Troubleshooting this system may require operating the heater with line voltage present. Use caution when working on the heater.
- Failure to follow this warning may result in property damage, personal injury or death.

This guide is intended for use by a QUALIFIED HEATER SERVICE PERSON. **DO NOT ATTEMPT TO SERVICE THESE HEATERS UNLESS YOU HAVE BEEN PROPERLY TRAINED.**

TEST EQUIPMENT REQUIRED

The following pieces of test equipment will be required to troubleshoot this system with minimal time and effort.

- **Digital Multimeter** - for measuring AC voltage and resistance.
- **High Pressure Gauge** - for checking pressures at the fuel pump against dataplate rating.
- Visually inspect equipment for apparent damage.
- Check all wiring for loose connections and worn insulation.

Components should be replaced only after each step has been completed and replacement is suggested in the flow chart. Refer to the Servicing sections as necessary to obtain information on disassembly and replacement procedures of the component once the problem is identified by the flow chart.

Refer to the system operation sequence in this section to gain an understanding as to how the heater operates during a call for heat. Understanding the sequence of operation is important as it relates to problem solving.

If the heater is operating and ignition failure occurs, the heater will attempt one retrieval for ignition. If the retry fails, the heater locksout, with the reset button emitting a red light

If RED light is observed at reset button:

- Heater has failed ignition attempt
TO RESET
- Position the ON/OFF switch to OFF.
- Push and release the reset button.
 - Red light goes out.
- Push the ON/OFF switch to ON position (depending if thermostat is used)
- Heater begins ignition cycle
- Light will turn GREEN.
- If ignition failure occurs and light turns RED, observe ignition sequence to determine cause of failure.

Problems

Page

| | |
|--|----|
| Motor does not run, heater does not light. | 19 |
| Motor runs, heater ignites, emits smoke. | 19 |
| Motor runs, igniter does not spark | 20 |
| Motor runs, ignitor sparks, heater does not light. or lights but goes out | 20 |
| Motor shuts off immediately after burner shuts down .. | 20 |

OPERATION SEQUENCE:

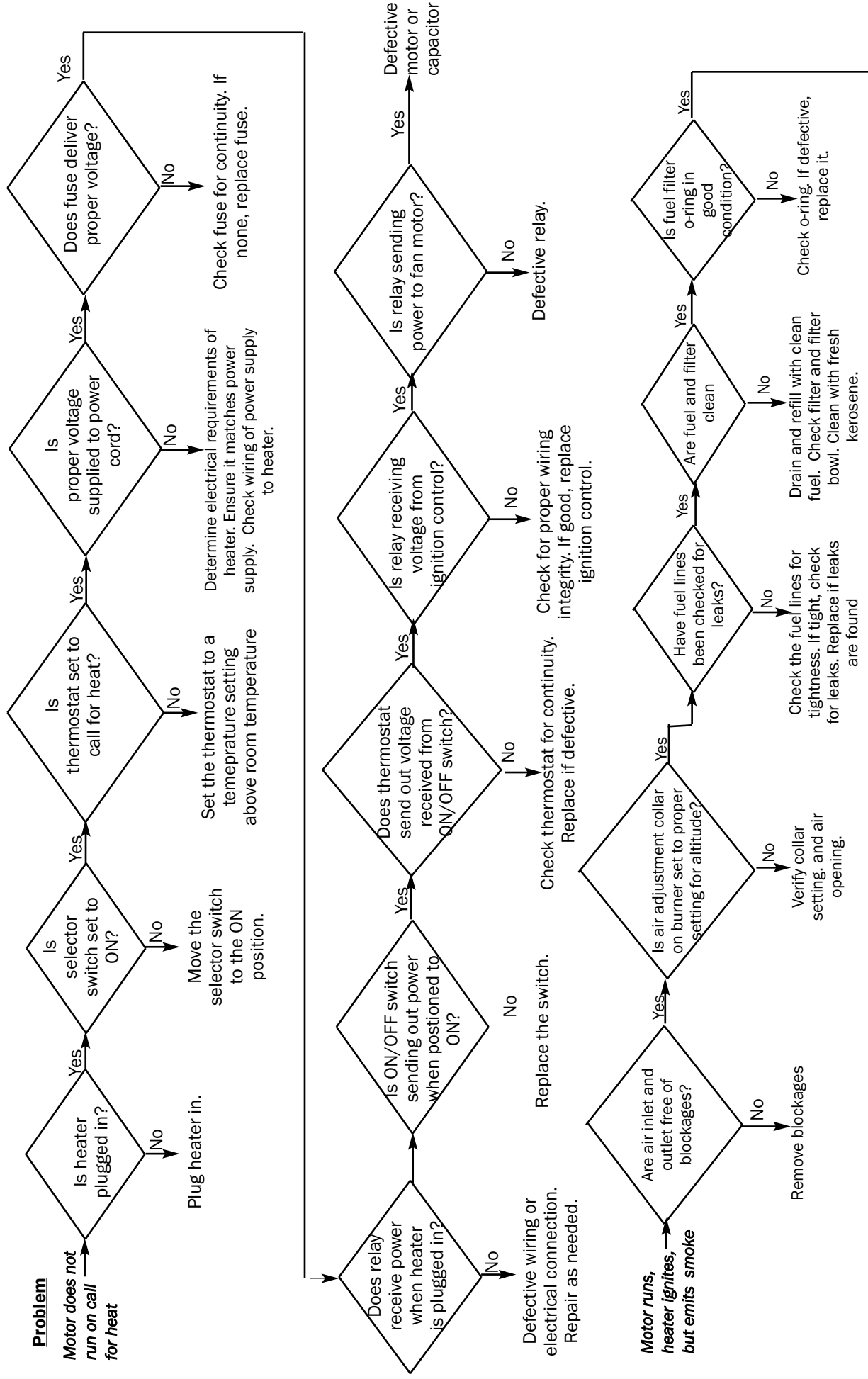
- Power cord is connected to line voltage.
- Line voltage is sent to fuse.
- Fuse sends voltage to:
 - Indicator lamp
 - Heated fuel filter
 - Relay
 - ON/OFF switch
- ON/OFF switch set to on.
- Power sent to thermostat (if used)
- Thermostat closes and voltage is returned from thermostat to ignition control. (GREEN light comes on from reset)
- Ignition control sends voltage to motor relay.
 - Relay closes
 - Sends power to fan motor.
 - Fan motor starts
 - Fan motor turns pump, creating fuel pressure
- Ignition control module sends voltage to ignition transformer and to solenoid valve
 - Ignition transformer sends high voltage to igniters
 - Igniters spark
 - Solenoid valve opens
 - Ignition occurs
 - Ignitor continues to spark until photocell proves flame.
 - Ignitor stops sparking.
- Thermostat opens once heat demand is satisfied
- **Ignition control keeps the fan motor running for 90 seconds to allow a cool down cycle for the heat chamber.**
 - Ignition control shuts off fan motor
- Proces begins again on a call for heat

IGNITION FAILURE SEQUENCE:

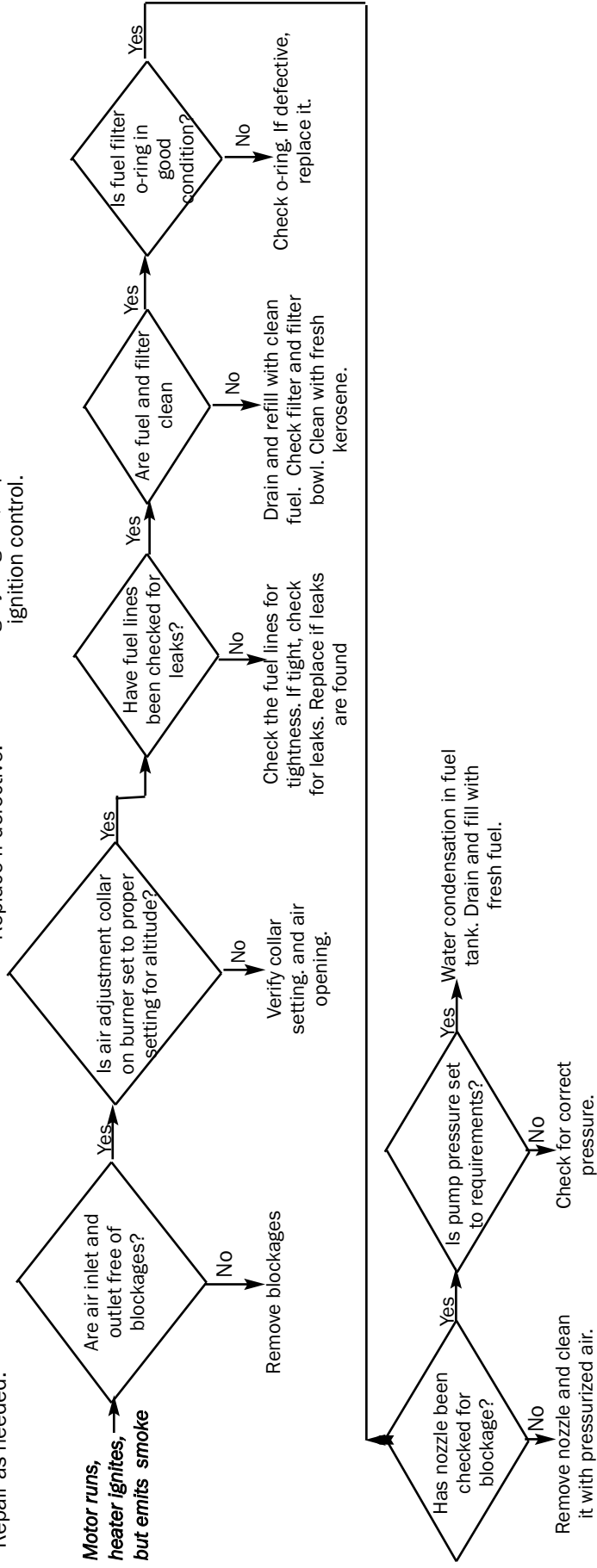
- Trial for ignition takes approximately 20 seconds.
- If photocell does not prove burner flame exists:
 - Fuel solenoid valves close.
 - Ignition spark shuts off.
 - Fan motor stops.
 - RED light comes on from reset.
- To retry for ignition, the system must be reset:
 - Refer to Reset Instructions

Problem

Motor does not run on call for heat



Motor runs, heater ignites, but emits smoke



Water condensation in fuel tank. Drain and fill with fresh fuel.

Is pump pressure set to requirements?

Yes

No

Check for correct pressure.

Remove nozzle and clean it with pressurized air.

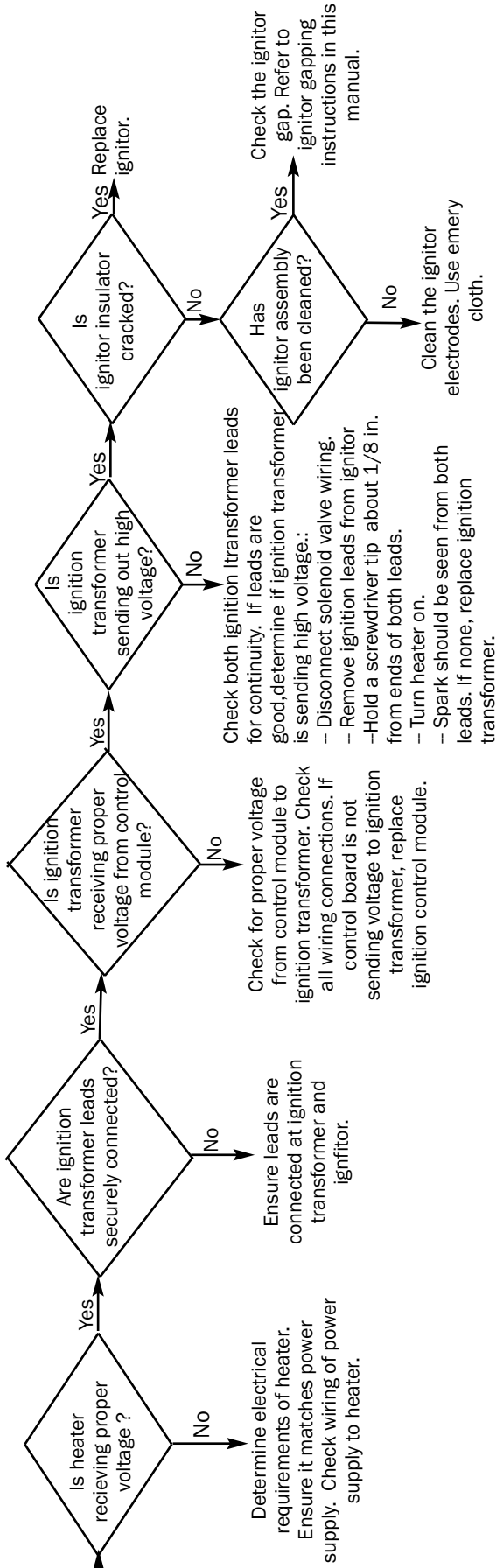
Has nozzle been checked for blockage?

Yes

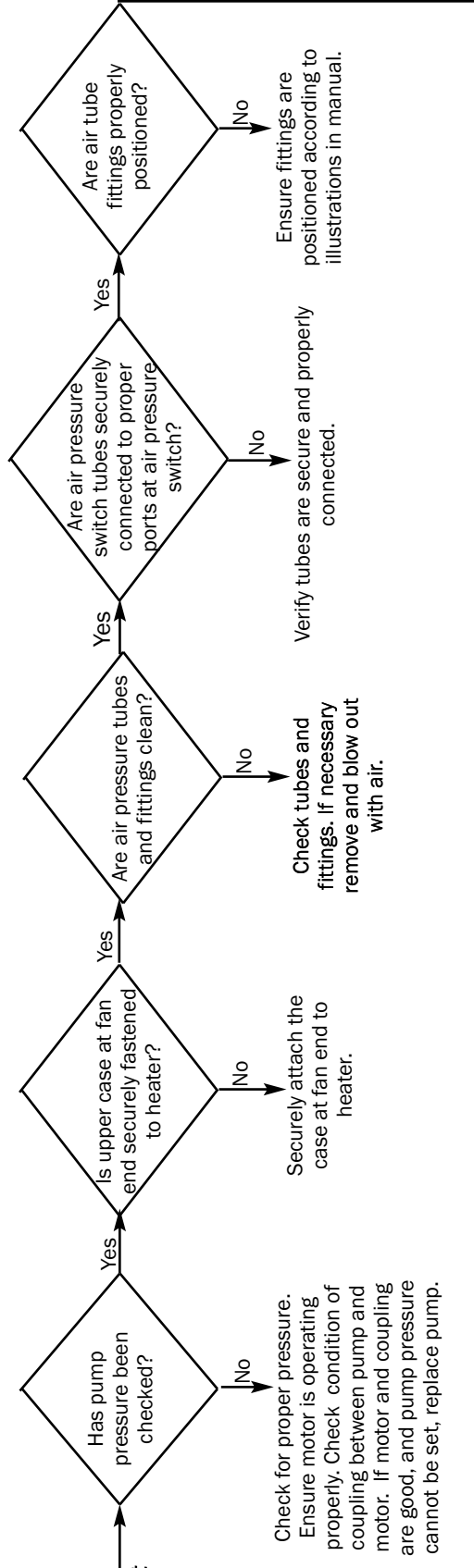
No

Problem

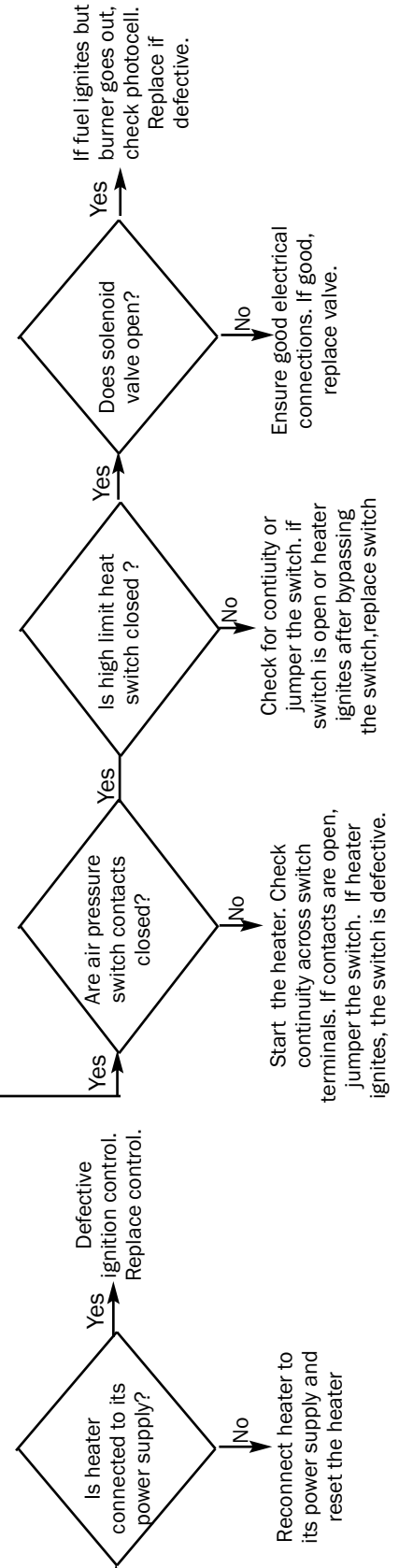
Motor runs, Igniter does not spark.



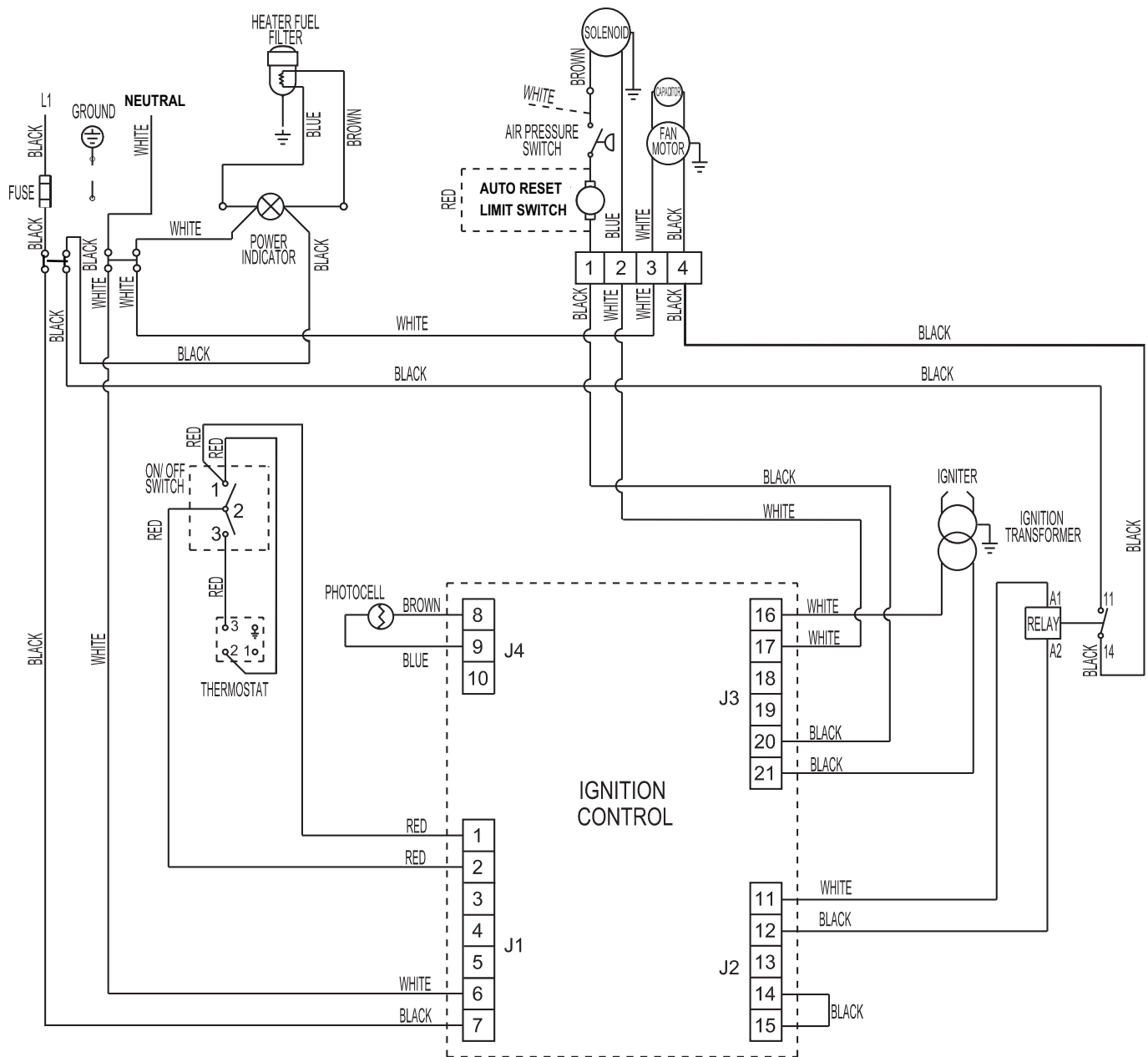
Motor runs, Igniter sparks, heater does not light, or lights and goes out



Motor shuts off immediately after call for heat is satisfied



Electrical Connection



Heater Component Function

Air Pressure Switch

Safety device used to insure that the proper air flow is being achieved as the gas solenoid is opened.

Burner

Mounted to the rear of the combustion chamber. The burner meters and mixes the amount of air entering the chamber to obtain proper combustion characteristics.

Fan Blade Assembly

Component used in conjunction with the motor to push the cool air over the heat exchanger for transfer of heat before blowing it into the occupied area.

Filter

The purpose of the filter is to trap very small particles which may be present in the fuel system. The high degree of filtering is necessary to prevent foreign materials from entering the burner nozzle.

Fuel Heating Element

Ensures the fuel being supplied to the pump remains in liquid form even when the heater is used on cold days.

Heat Exchanger

Sealed combustion chamber over which cool air passes for heat transfer. Also provides an area where burner flame mixes with combustion air, thereby providing heat.

High Limit Switch

Safety device wired into the control system, used to break the electrical circuit to the solenoid valve in the event of an overheat situation.

Igniter

Ignition device used on automatic direct spark ignition control systems. Ignites fuel by spark.

Ignition Control

Circuit board which sends voltages to various controls in an automatic ignition system, and monitors safe operation of the heater. The device also incorporates a reset which must be pushed to restart the heater if ignition fails.

Ignition Transformer

Receives 120 volts from the ignition module and then boosts it to a very high voltage at the ignitor causing the fuel sprayed from the nozzle to ignite.

Motor

Electric device used to force preheated air through the heater and to circulate heat within a certain area. Converts electrical energy into mechanical energy. Drives the pump and rotates the fan.

Nozzle

Sprays the fuel under pressure from the pump.

On/Off Switch

Simple electrical device used to supply power to the ignition control for heater operation.

Photocell

A light sensitive resistor. Used to sense the presence of light in the combustion chamber, allowing the heater to continue its operation.

Pump

Connected to the motor shaft by a coupling, the pump pulls fuel from the tank and forces it to the nozzle under pressure for ignition when the fan motor is in operation.

Relay

Electrical component wired between ignition control and motor. Used to feed voltage to motor upon receipt of voltage from ignition control.

Solenoid Valve

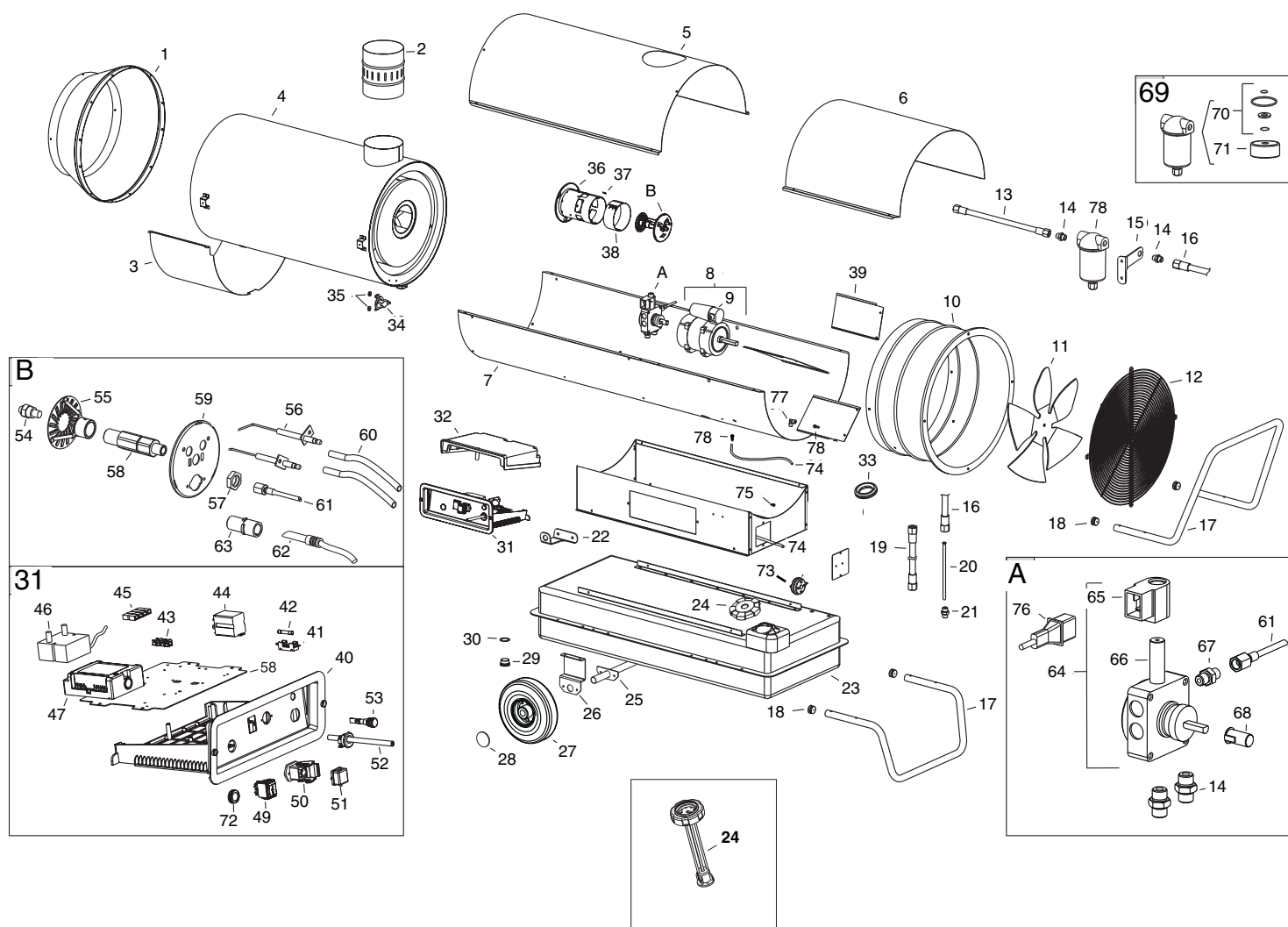
Electro-magnetic device mounted on the pump body. The solenoid acts as an on/off valve for fuel flow to the burner nozzle. On this heater, there are two solenoid valves, creating two stages of heat.

Thermostat

Electrical device used as an automatic "on/off" switch which will respond to changes in temperature in a certain area. Can be wired so contacts in the thermostat open or close on temperature increase or decrease.

Parts Identification

PARTS SCHEMATIC



* Bold Item Numbers Indicate Immediate Parts Availability.

| Item | Description |
|-------------|--|
| 1 | Outlet cone 572392 |
| 2 | Chimney 150mm 572393 |
| 3 | Combustion chamber support 572600 |
| 4 | Combustion chamber 572599 |
| 5 | Exhaust end upper case 572396 |
| 6 | Fan end upper case 572397 |
| 7 | Lower case 572598 |
| 8 | Motor w/capacitor 572399 |
| 9 | Capacitor 80 uF 572601 |
| 10 | Motor flange 572401 |
| 11 | Axial fan 572402 |
| 12 | Fan guard 570449 |
| 13 | Fuel line with fittings 572602 |
| 14 | Hose fitting 572403 |
| 15 | Filter support 572645 |
| 16 | Fuel line 572597 |
| 17 | Handle and leg 572391 |
| 18 | Plug 572728 |
| 19 | Fuel line 1/4 x 24 in. 572388 |
| 20 | Siphon tube and fitting 572387 |
| 21 | Fitting,siphon tube 572644 |
| 22 | Cord bracket 572404 |
| 23 | Fuel tank with cap 572384 |
| 24 | Fuel cap (standard) 572386 |
| | (with fuel gauge) 572647 |
| 25 | Axle with supports 572385 |
| 26 | Support, axle 572642 |
| 27 | Wheel with spring washer 572383 |
| 28 | Spring washer 572643 |
| 29 | Drain plug with o ring 572382 |
| 30 | O ring for drain plug 572646 |
| 31 | Electrical componets compartment assembly 572606 |
| 32 | Control box cover 572381 |
| 33 | Bushing 572638 |
| 34 | High limit switch 570887 |
| 35 | Washers for limit switch 572639 |
| 36 | Burner head 572604 |
| 37 | Terminal,burner ground 572611 |
| 38 | Altitude adjustment collar 572608 |
| 39 | Air diverter 572607 |
| 40 | Electrical drawer 572605 |
| 41 | Fuse holder 572372 |
| 42 | Fuse 570086 |
| 43 | Terminal block 572610 |
| 44 | Relay 570132 |
| 45 | Terminal strip 572609 |
| 46 | Ignition transformer 572612 |
| 47 | Ignition control 572613 |
| 48 | Electrical components plate 572614 |
| 49 | Switch ON/OFF 572366 |
| 50 | Thermostat plug 572615 |

PARTS LIST (cont.)

* **Bold Item Numbers Indicate Immediate Parts Availability.**

| | | |
|-----------|-------------------------------------|--------|
| 51 | Thermostat cap | 572365 |
| 52 | Power cord | 572364 |
| 53 | Indicator lamp | 572363 |
| 54 | Nozzle | 572616 |
| 55 | Burner disc | 572617 |
| 56 | Ignitor | 572618 |
| 57 | Nut, | 572619 |
| 58 | Nozzle manifold | 572620 |
| 59 | Burner flange | 572621 |
| 60 | Ignition cables,high voltage | 572622 |
| 61 | Fuel line | 572355 |
| 62 | Photocell | 572623 |
| 63 | Holder, photocell | 572624 |
| 64 | Pump | 572625 |
| 65 | Solenoid spool | 572626 |
| 66 | Solenoid valve | 572627 |
| 67 | Hose Fitting | 572355 |
| 68 | Coupling | 572356 |
| 69 | Heated fuel filter assembly | 572389 |
| 70 | O ring / gasket kit for fuel filter | 572640 |
| 71 | Fuel Filter with o ring and gasket | 572354 |
| 72 | Reset switch cover | 572628 |
| 73 | Air pressure swich | 572630 |
| 74 | Tubing air pressure switch | 572631 |
| 75 | Straight connection | 572632 |
| 76 | Solenoid valve cable | 572633 |
| 77 | Connection, 1/8 in. | 572634 |
| 78 | Connection | 572635 |

Warranty Policy

EQUIPMENT

L.B. White Co., Inc. warrants that the component parts of its heater are free from defects in material and workmanship, when properly installed, operated, and maintained in accordance with the Owner's Manual safety guides and labels contained with each unit. If, **within 12 months from the date of purchase by the end user**, any component is found to be defective, L.B. White Co., Inc. will at its option, repair or replace the defective part or heater, with a new part or heater, F.O.B., Onalaska, Wisconsin.

A warranty card on file at L.B. White will automatically qualify the heater and its component parts for warranty consideration. If a warranty card is not on file, a copy of the bill of sale will be required to establish warranty qualification. If neither is available, the warranty period will be 12 months from date of shipment from L.B. White.

PARTS

L.B. White Co., Inc. warrants that replacement parts purchased from the company and used on the appropriate L.B. White heater are free from defects both in material and workmanship for **12 months from the date of purchase by the end user**. Warranty is automatic if a component is found defective within 12 months of the date code marked on the part. If the defect occurs more than 12 months later than the date code but within 12 months from the date of purchase by the end user, a copy of a bill of sale will be required to establish warranty qualification.

The warranty set forth above is the exclusive warranty provided by L.B. White, and all other warranties, including any implied warranties or merchantability or fitness for a particular purpose, are expressly disclaimed. In the event any implied warranty is not hereby effectively disclaimed due to operation of law, such implied warranty is limited in

duration to the duration of the applicable warranty stated above. The remedies set forth above are the sole and exclusive remedies available hereunder. L.B. White will not be liable for any incidental or consequential damages directly or indirectly related to the sale, handling or use of the heater, and in any event L.B. White's liability in connection with the heater, including for claims based on negligence or strict liability, is limited to the purchase price.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Replacement Parts and Service

Contact your local L.B. White dealer for replacement parts and service or call the L.B. White Co., Inc. at (800) 345-7200 for assistance. Be sure that you have your heater model number and configuration number when calling.