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

C US

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

⚠ 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.

FOR YOUR SAFETY

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

⚠ 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.

Table of Contents

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		- 20ºF
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, naptha, 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.

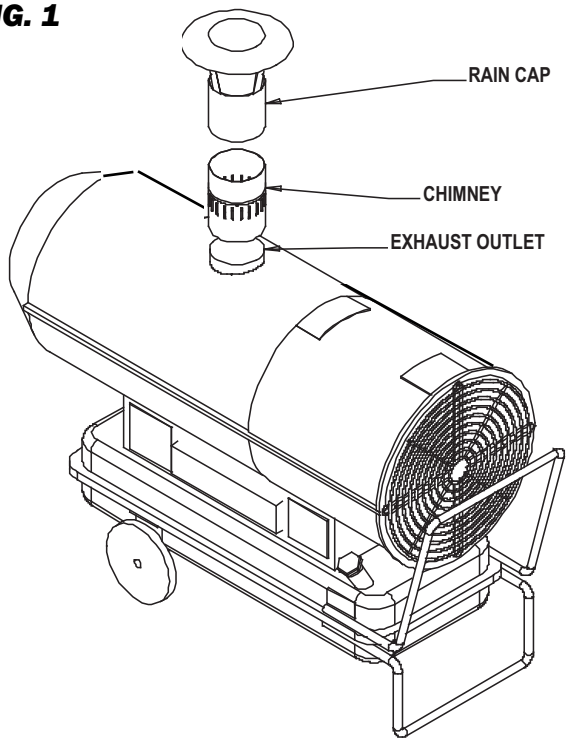
24. When the heater is used in an enclosed or partially enclosed permanent or temporary structure, tests for the presence of carbon monoxide shall be made within one hour after the start of each shift, and at least four hours thereafter. Immediate, more frequent testing may be dictated by job conditions.

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 ±3°F.

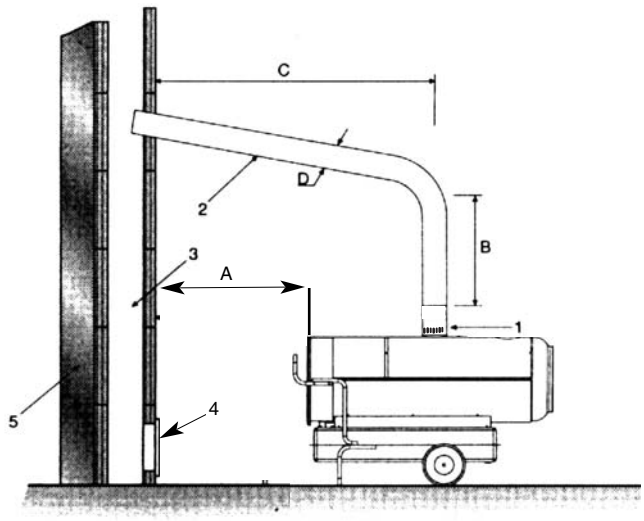
12. Take time to understand how to operate and maintain the heater by using this Owner's Manual. Make sure you know how to shut off the power supply to the heater.

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

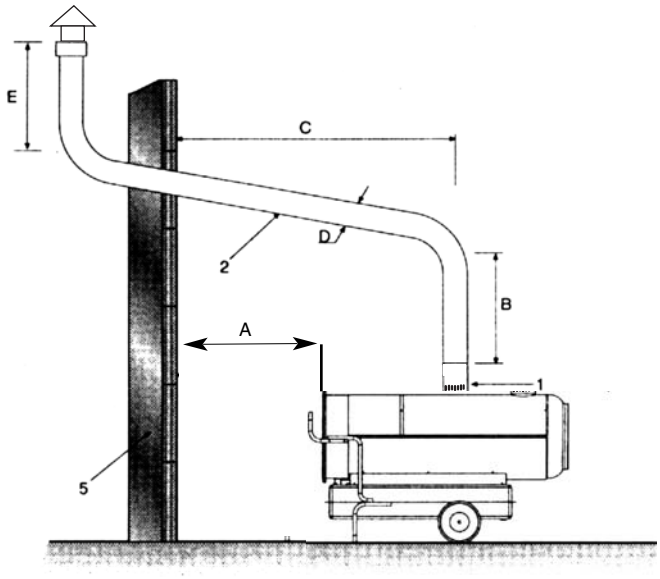
- 6 to 100 ft. long, use 14 AWG rated cord
- 101 to 200 ft. long, use 12 AWG rated cord
- 201 to 300 ft. long, use 10 AWG rated cord

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.

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.

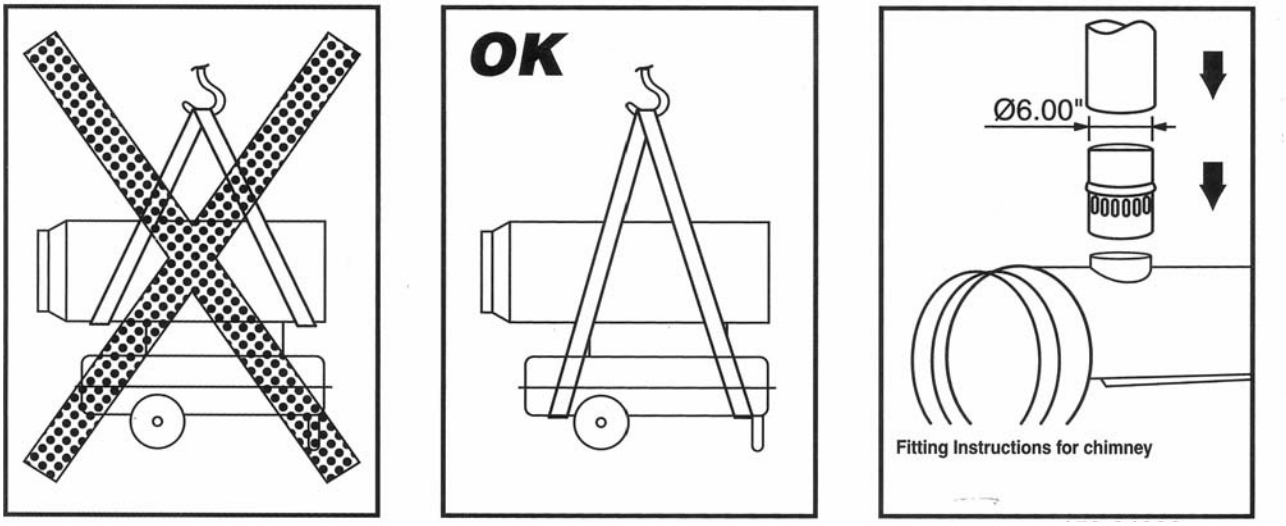
THE IGNITION SYSTEM

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, opr Jet A may be used. Using heavier fuels other than kersoene may result in 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.

1. Follow all ventilation and safety information.

2. Ensure electrical supply conforms to data plate requirments.

3. Fill tank with fuel.

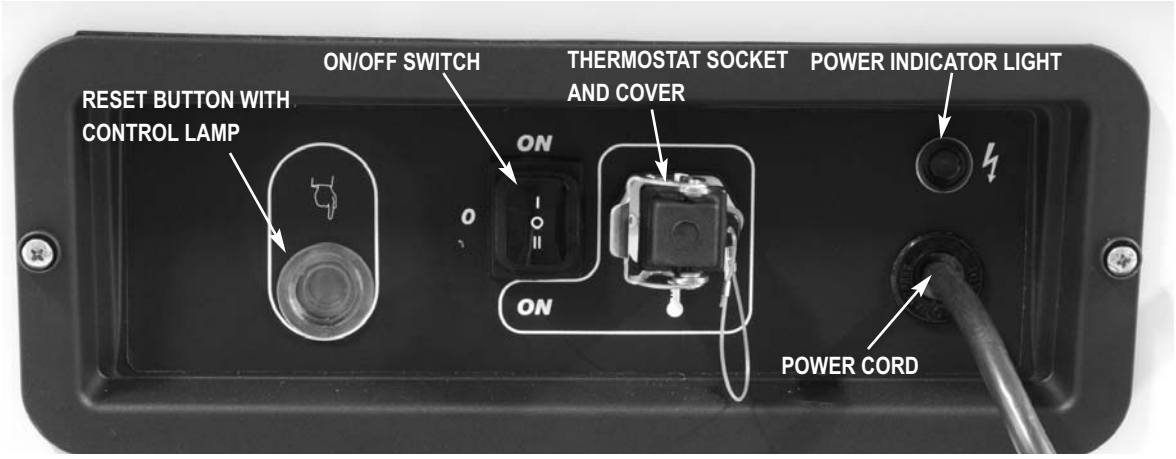
4. Connect heater to an approved electrical supply.

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.

⚠ 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.

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.
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.

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.

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.

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

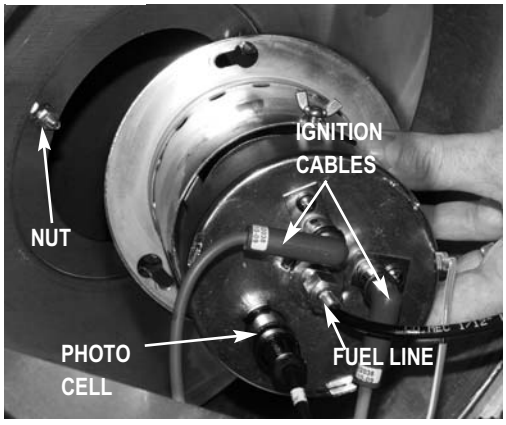


FIG. 8

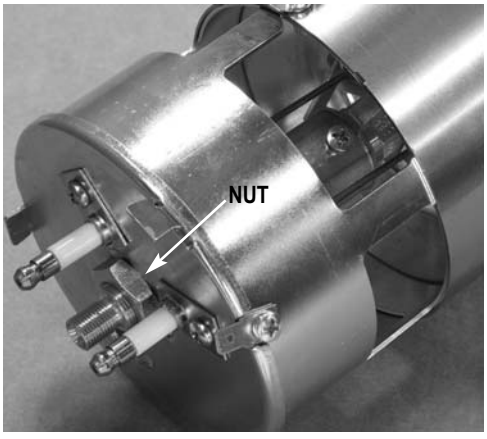
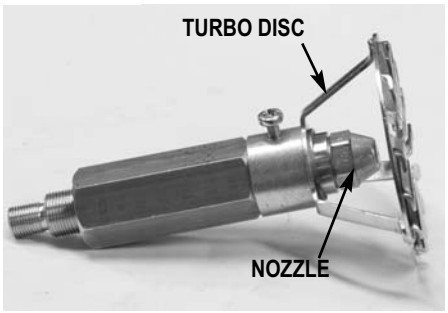


FIG. 9

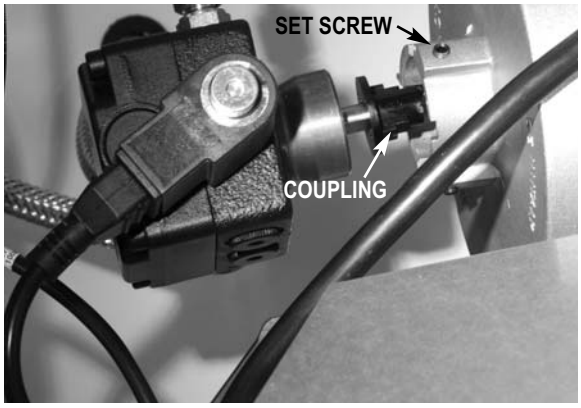


FUEL PUMP

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

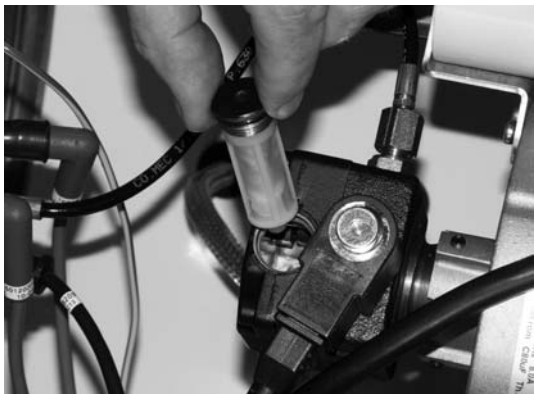
1. Remove pressure gauge plug from fuel pump port as shown in Fig.11, located in the upper right hand corner of the pump. Use a 4 mm allen wrench.
2. Install a pressure gauge that has 1/8-28 BSP (British Straight Pipe) threads to the fuel port marked “P”. See Fig. 12. (If 1/8 in. NPT is used, apply some pipe thread compund 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

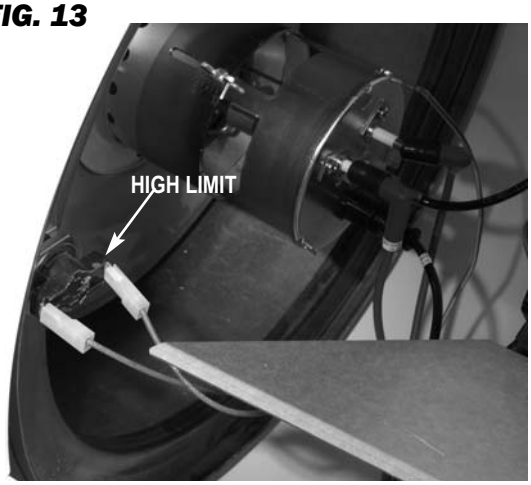


HIGH LIMIT SWITCH

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

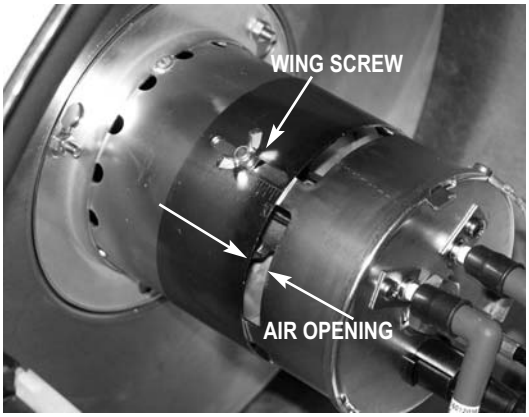


SETTING FOR HIGH ALTITUDE

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 adjustmewnt 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

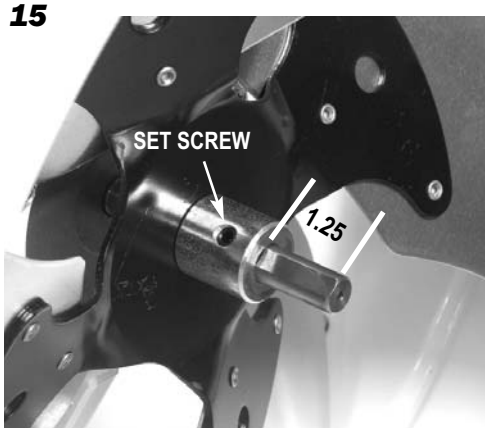
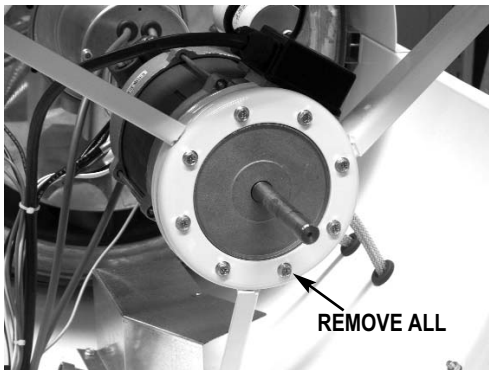


FIG.16



PHOTOCELL

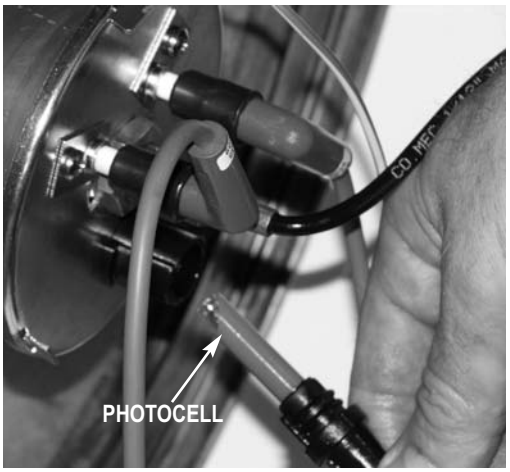
1. Remove the photocell by firmly grasping its body and pulling it from its holder. See Fig. 17.

2. Ensure tab on photocell body is firmly pushed within slot of holder at reassembly to lock photcell in place

Cleaning
-- Disconnect photcell 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

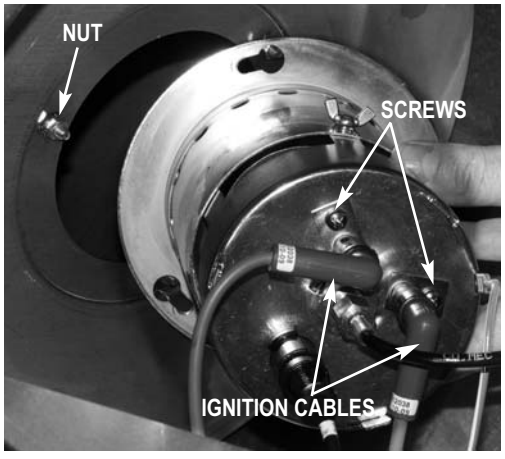
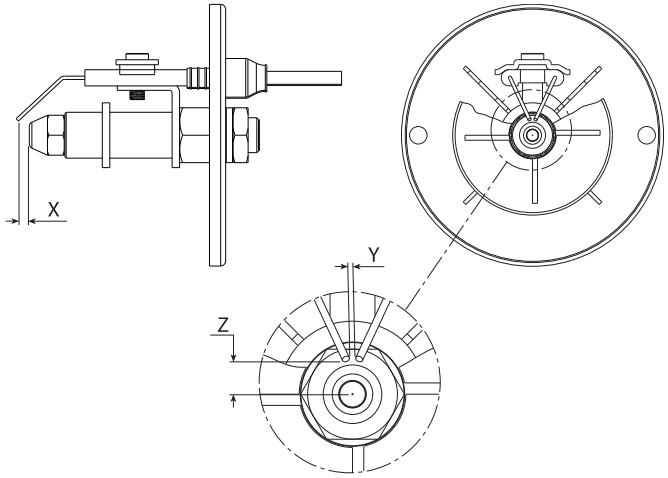


FIG. 19



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

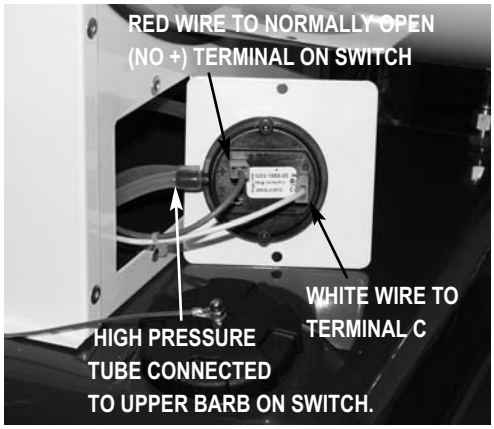


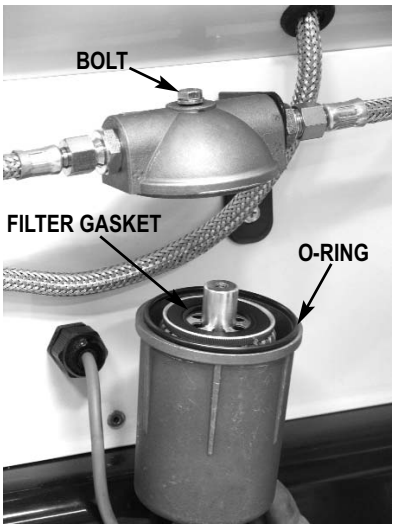
FIG. 21

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 retrial 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:

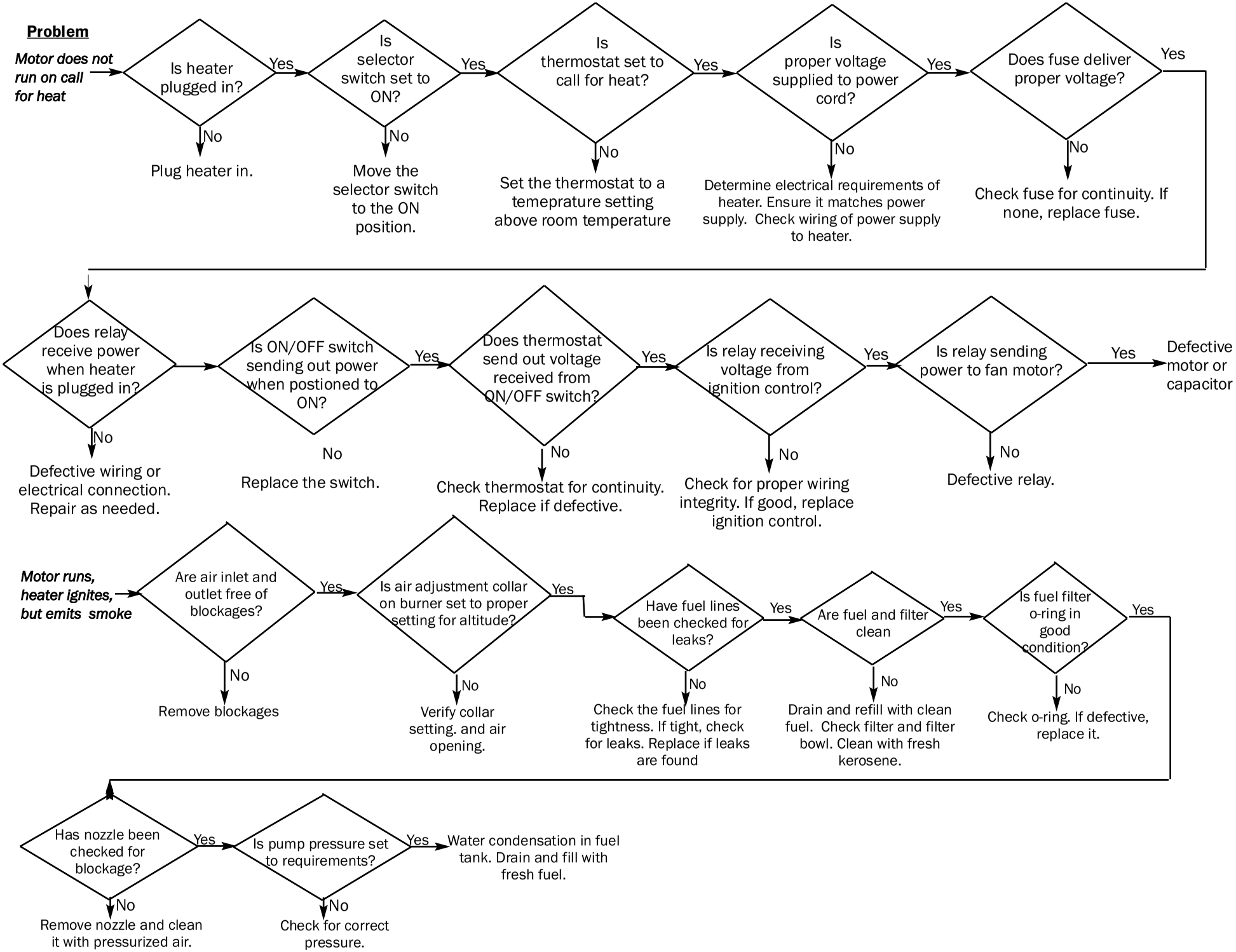
-- Heater has failed ignition attempt
TO RESET
-- Position the ON/OFF switch to OFF.
-- Push and release the reset button.
-- Red light goes out.
-- Push the ON/OFF switch to ON position (depending if thermostat is used)
-- Heater begins ignition cycle
-- Light will turn GREEN.
-- If ignition failure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

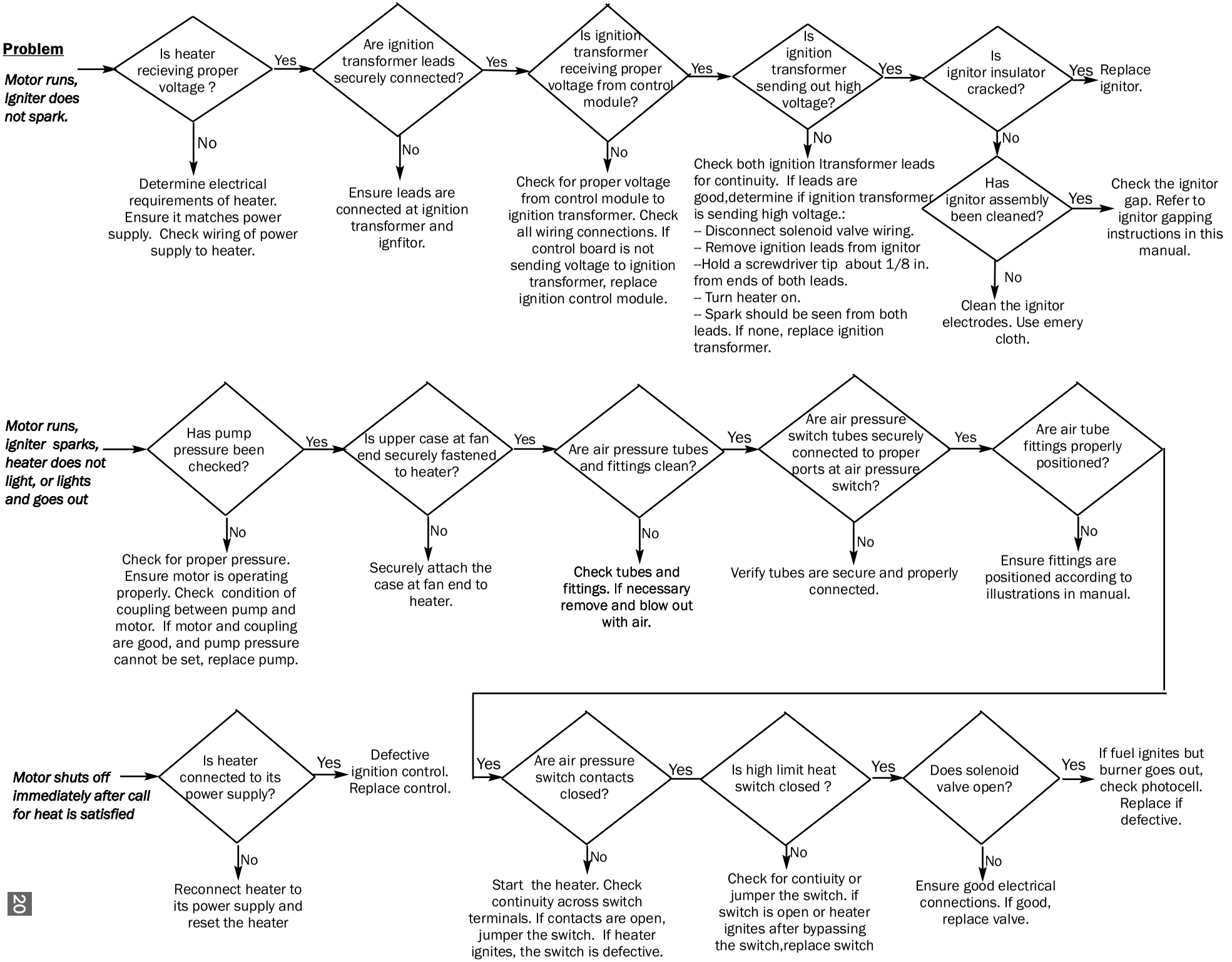
OPERATION SEQUENCE:

-- 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
- Ignitors 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

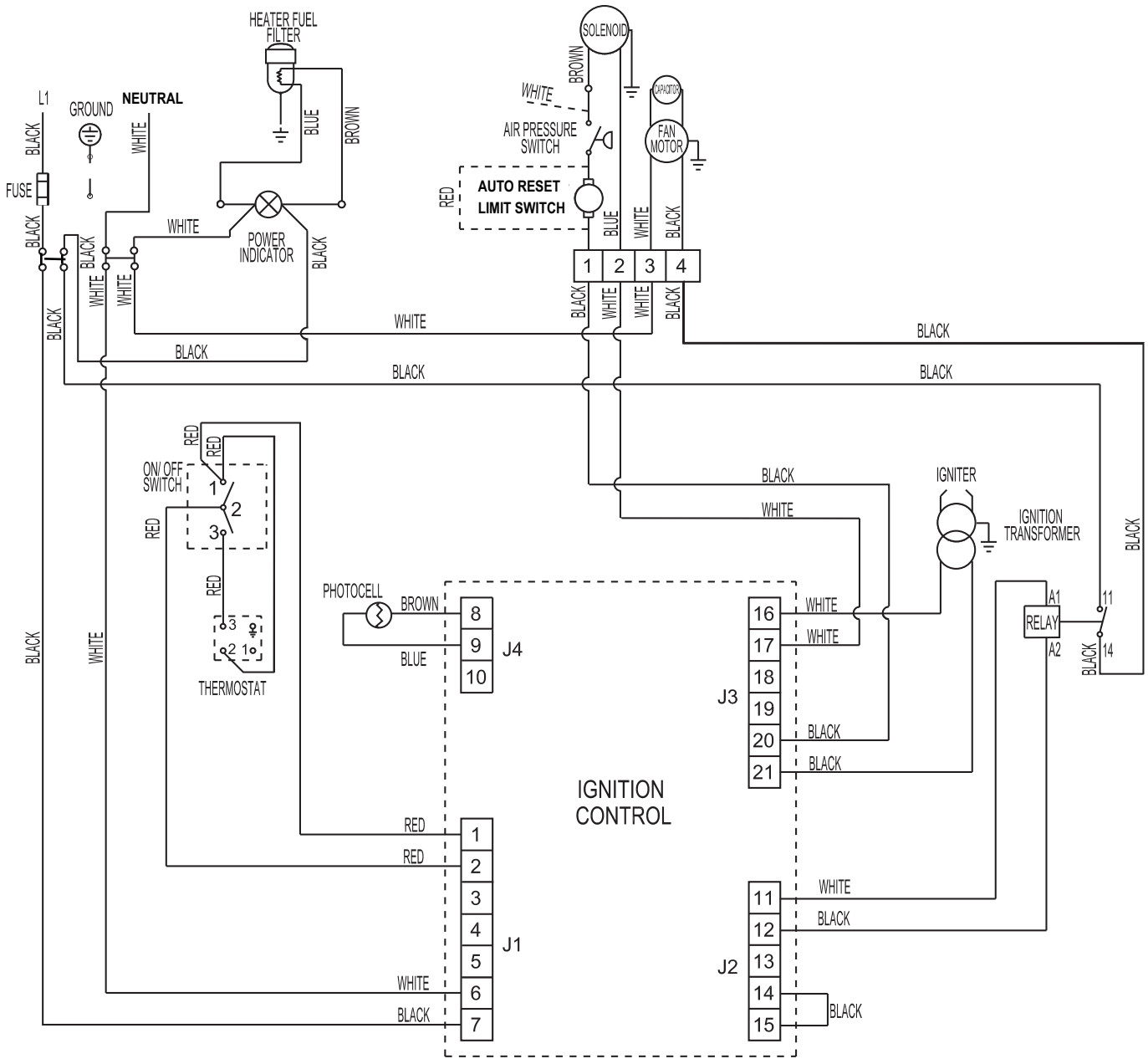
IGNITION FAILURE SEQUENCE:

-- 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
Is heater plugged in?
Yes
No
Plug heater in.
Is selector switch set to ON?
Yes
No
Move the selector switch to the ON position.
Is thermostat set to call for heat?
Yes
No
Set the thermostat to a temeprature setting above room temperature
Is proper voltage supplied to power cord?
Yes
No
Determine electrical requirements of heater. Ensure it matches power supply. Check wiring of power supply to heater.
Does fuse deliver proper voltage?
Yes
No
Check fuse for continuity. If none, replace fuse.
Does relay receive power when heater is plugged in?
No
Defective wiring or electrical connection. Repair as needed.
Is ON/OFF switch sending out power when postioned to ON?
Yes
No
Replace the switch.
Does thermostat send out voltage received from ON/OFF switch?
Yes
No
Check thermostat for continuity. Replace if defective.
Is relay receiving voltage from ignition control?
Yes
No
Check for proper wiring integrity. If good, replace ignition control.
Is relay sending power to fan motor?
Yes
No
Defective relay.
Defective motor or capacitor
Motor runs, heater ignites, but emits smoke
Are air inlet and outlet free of blockages?
Yes
No
Remove blockages
Is air adjustment collar on burner set to proper setting for altitude?
Yes
No
Verify collar setting. and air opening.
Have fuel lines been checked for leaks?
Yes
No
Check the fuel lines for tightness. If tight, check for leaks. Replace if leaks are found
Are fuel and filter clean
Yes
No
Drain and refill with clean fuel. Check filter and filter bowl. Clean with fresh kerosene.
Is fuel filter o-ring in good condition?
Yes
No
Check o-ring. If defective, replace it.
Has nozzle been checked for blockage?
Yes
No
Remove nozzle and clean it with pressurized air.
Is pump pressure set to requirements?
Yes
No
Check for correct pressure.
Water condensation in fuel tank. Drain and fill with fresh fuel.


Problem
Motor runs, Igniter does not spark.
Is heater recieving proper voltage ?
Yes
No
Determine electrical requirements of heater. Ensure it matches power supply. Check wiring of power supply to heater.
Are ignition transformer leads securely connected?
Yes
No
Ensure leads are connected at ignition transformer and ignfitor.
Is ignition transformer receiving proper voltage from control module?
Yes
No
Check for proper voltage from control module to ignition transformer. Check all wiring connections. If control board is not sending voltage to ignition transformer, replace ignition control module.
Is ignition transformer sending out high voltage?
Yes
No
Check both ignition ltransformer leads for continuity. If leads are good,determine if ignition transformer is sending high voltage.:
– Disconnect solenoid valve wiring.
– Remove ignition leads from ignitor
–Hold a screwdriver tip about 1/8 in. from ends of both leads.
– Turn heater on.
– Spark should be seen from both leads. If none, replace ignition transformer.
Is ignitor insulator cracked?
Yes
Replace ignitor.
No
Has ignitor assembly been cleaned?
Yes
Check the ignitor gap. Refer to ignitor gapping instructions in this manual.
No
Clean the ignitor electrodes. Use emery cloth.
Motor runs, igniter sparks, heater does not light, or lights and goes out
Has pump pressure been checked?
Yes
No
Check for proper pressure. Ensure motor is operating properly. Check condition of coupling between pump and motor. If motor and coupling are good, and pump pressure cannot be set, replace pump.
Is upper case at fan end securely fastened to heater?
Yes
No
Securely attach the case at fan end to heater.
Are air pressure tubes and fittings clean?
Yes
No
Check tubes and fittings. If necessary remove and blow out with air.
Are air pressure switch tubes securely connected to proper ports at air pressure switch?
Yes
No
Verify tubes are secure and properly connected.
Are air tube fittings properly positioned?
Yes
No
Ensure fittings are positioned according to illustrations in manual.
Motor shuts off immediately after call for heat is satisfied
Is heater connected to its power supply?
Yes
Defective ignition control. Replace control.
No
Reconnect heater to its power supply and reset the heater
Are air pressure switch contacts closed?
Yes
No
Start the heater. Check continuity across switch terminals. If contacts are open, jumper the switch. If heater ignites, the switch is defective.
Is high limit heat switch closed ?
Yes
No
Check for contiuity or jumper the switch. if switch is open or heater ignites after bypassing the switch,replace switch
Does solenoid valve open?
Yes
No
Ensure good electrical connections. If good, replace valve.
If fuel ignites but burner goes out, check photocell. Replace if defective.

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 charactersitcs.

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 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
Cicuit 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 senstive resistor. Used to sense the presence of light in the combsution 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.

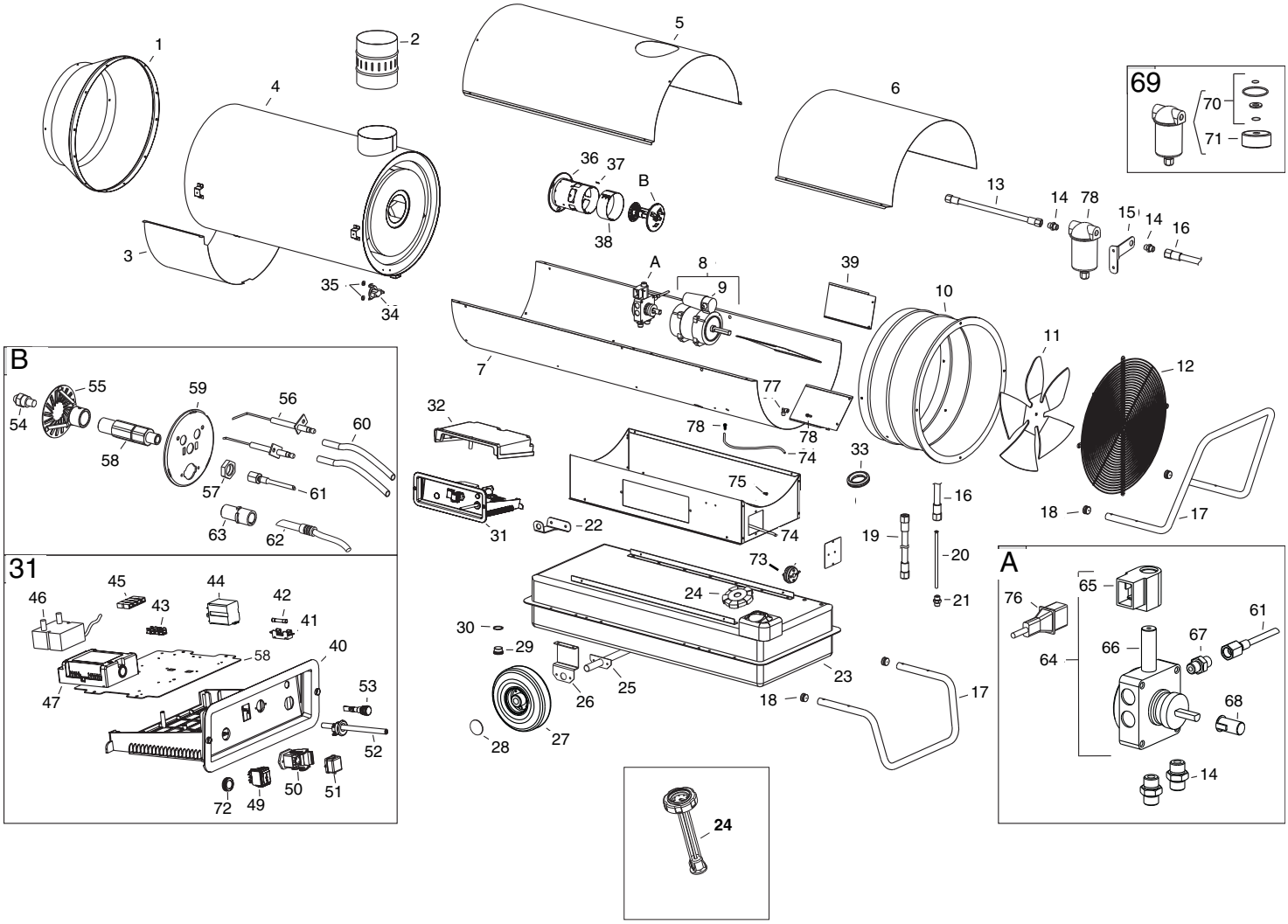
Relay
Electrical component wired between ignition control and motor. Used to feed voltage to motor upon receipt of voltage from ignition control.

Solenoid Valve
Electro-megnetic 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/capicitor	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 wtih 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.