

HEATWAVE

WARM IT UP WITH A FREE SOURCE OF HEAT!

MULTI-FUEL UNIT HEATERS



HW150 HW250 HW350

Siebring Manufacturing, Inc.

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HW150

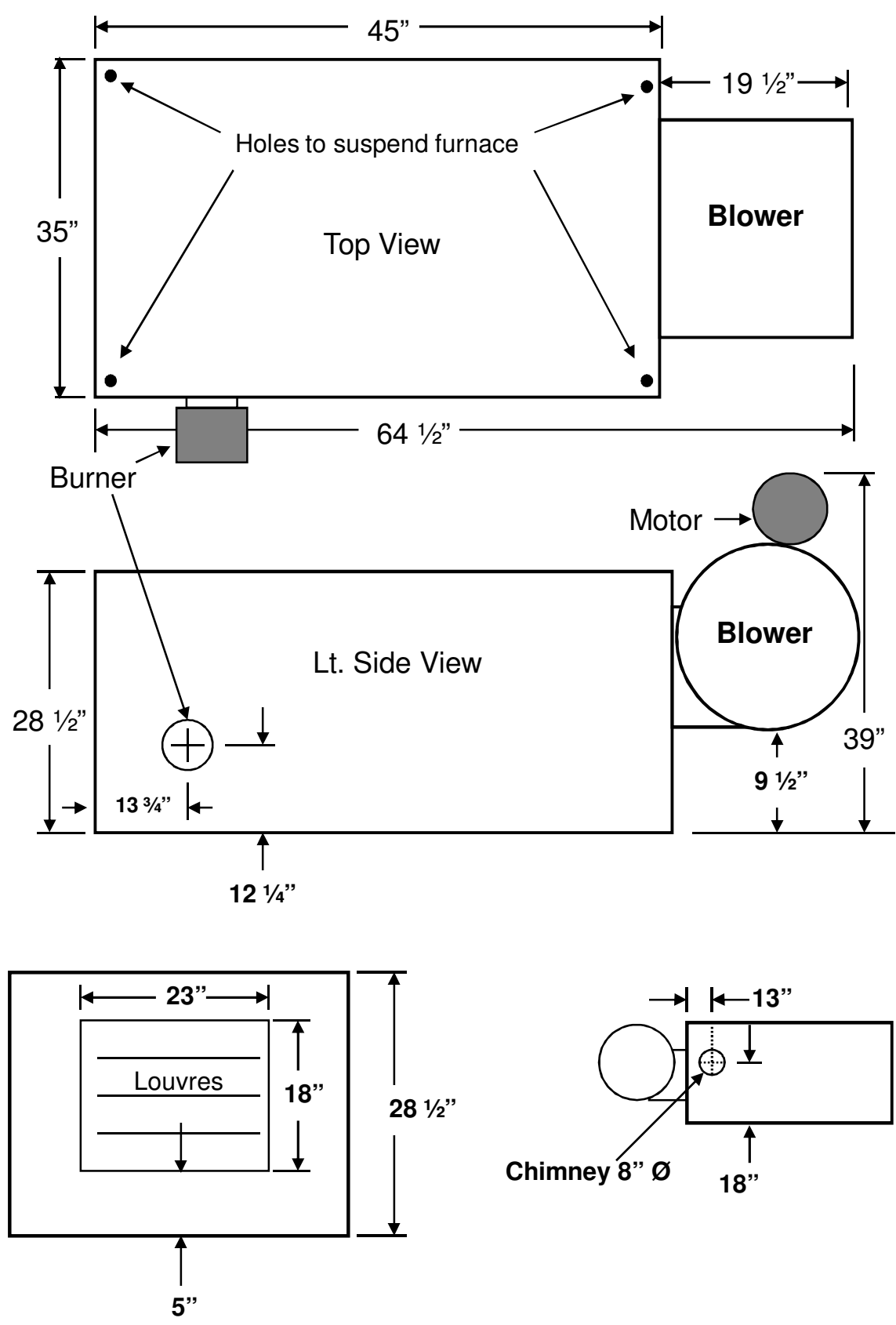


Figure 1

HW250

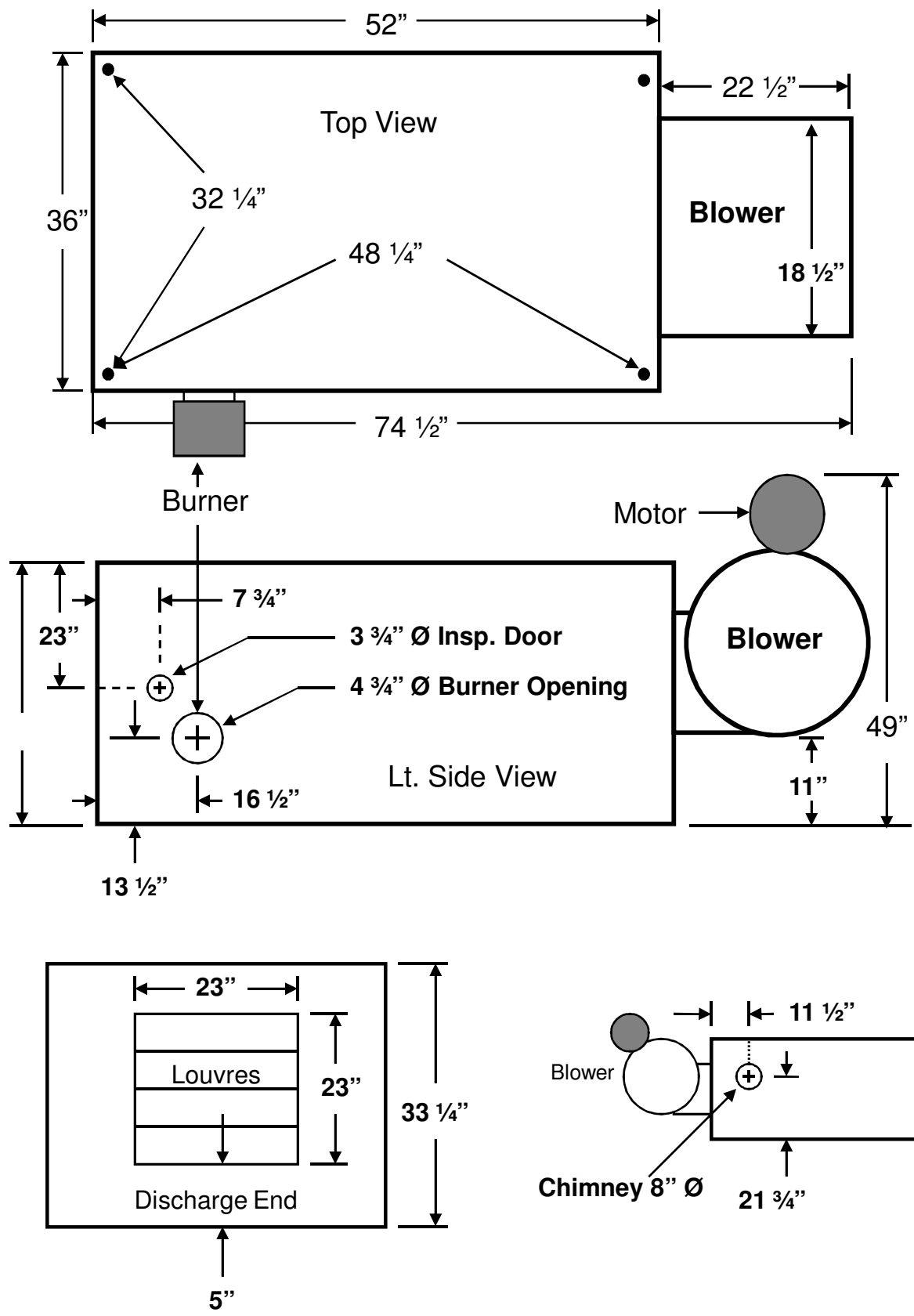


Figure 2

HW350

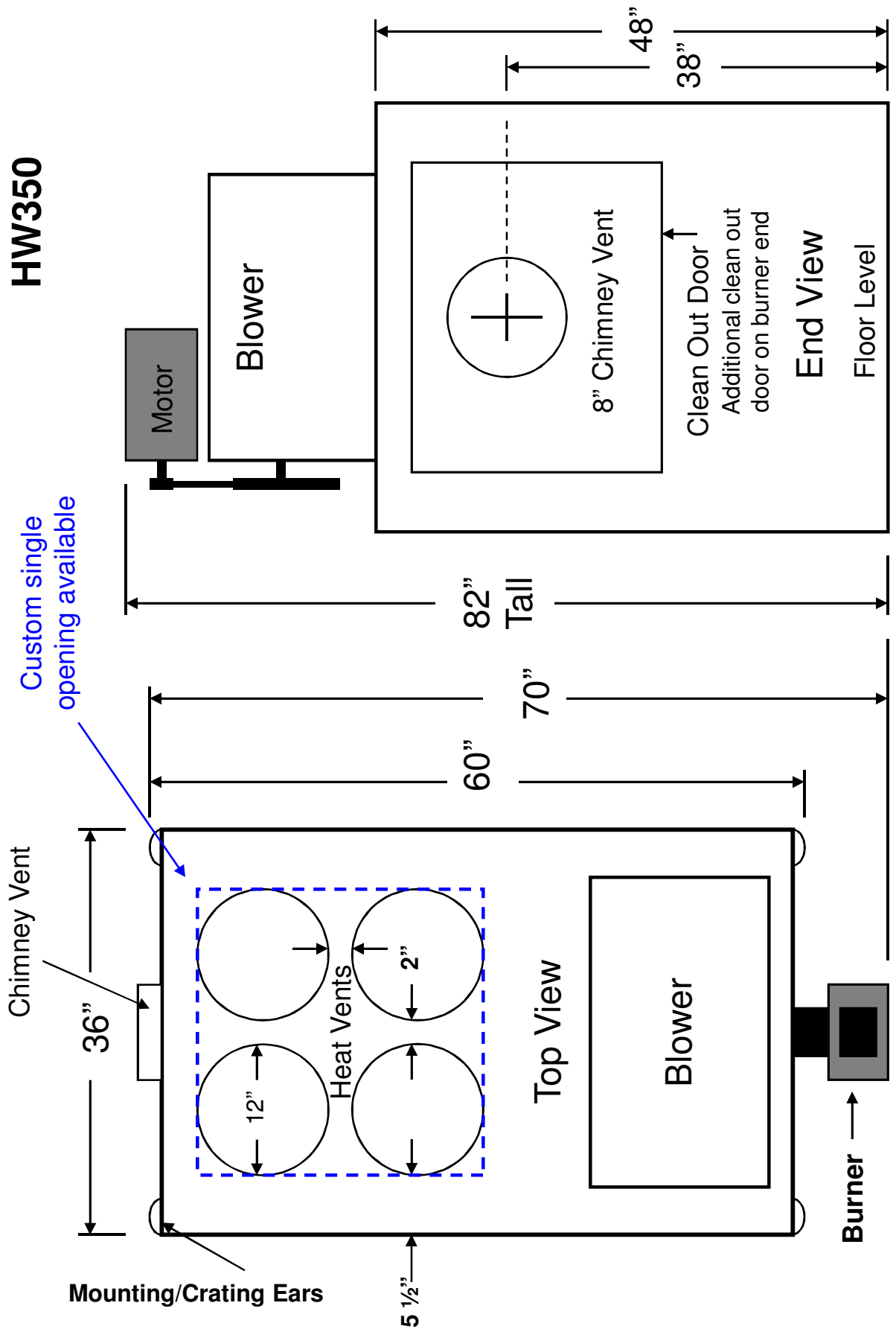


Figure 3

SIEBRING MANUFACTURING - HEATWAVE SPECIFICATIONS

28-Apr-09

D. Hollander

Model	HW150	HW250	HW350
BTU Input	150,000 BTU	250,000 BTU	350,000-380,00 BTU max
Square Foot Coverage	Up to 4,500 sq. ft.*	Up to 6,000 sq. ft.*	Up to 8,000 sq. ft.*
Hourly Fuel Usage	1.1 - 1.5 gallons	1.7 - 2.0 gallons	2.5 - 3.1 gallons
Compressed Air Requirements	2 CFM**	2.5 CFM**	3 CFM**
PSI Air	15	20	25
Flue Size	8 inches	8 inches	8 inches
Cabinet Size (w/o burner)	35" W x 45" L x 29" H	36" W x 52" L x 34" H	36" W x 60" L x 48" H
Width Overall (w/blower & burner)	48 inches	48 inches	36 inches
Length Overall (w/blower & burner)	65 inches	75 inches	70 inches
Height Overall (w/blower & burner)	40 inches	49 inches	82 inches
Crated Dimensions	42" W x 69" L x 45" H	44" W x 80" L x 50" H	45" W x 70" L x 84" H
Ductable Heat Discharge	Yes	Yes	4 12" Elbows
Air Movement Type	Belt Driven Blower	Belt Driven Blower	Belt Driven Blower
Blower CFM Free Air	3140	3950	4800
Blower Motor HP	3/4 HP	3/4 HP	2 HP
Plenum Dimensions	18 X 23	23 x 23	4 -12" or 22" X 22"+
Hanging Mount	5/8 " All Thread	5/8 " All Thread	Floor / Stand
Mounting Design (Floor or tank stand)	Floor, ceiling hung or tank stand	Floor, ceiling hung or tank stand	Floor / Stand
Stand Mount / Oil Tank	Yes	Yes	No
Electrical Voltage	115 Volt 60 Hz	115 Volt 60 Hz	115 Volt 60 Hz
Average Total Amperage Draw	12 - 13***	15 - 16***	19 - 20***
Weight (with blower & burner)	520 lbs.	700	900
Approximate Shipping Weight	700 lbs.	840	1,040
Warranty	1 yr burner, blower, controls. 10 yrs. Cabinet	1 yr burner, blower, controls. 10 yrs. Cabinet	1 yr burner, blower, controls. 10 yrs. Cabinet

* Depending on building insulation, ** Owner must supply compressed air, *** Total Amps = Burner, blower and oil pump

Construction (All Models):	10 GA - Combustion chamber barrel, swing-out bracket	11 GA - Exchanger tube bulkheads	
	12GA 309 SS - Target		
2 GA - Burner mount tube, cleanout doors	14 GA - Shell (case) bottom, pot tubes (case) sides	16 GA - Shell (case) top	18 GA - Shell

Figure 4

KAGI S250/500 WASTE OIL BURNER

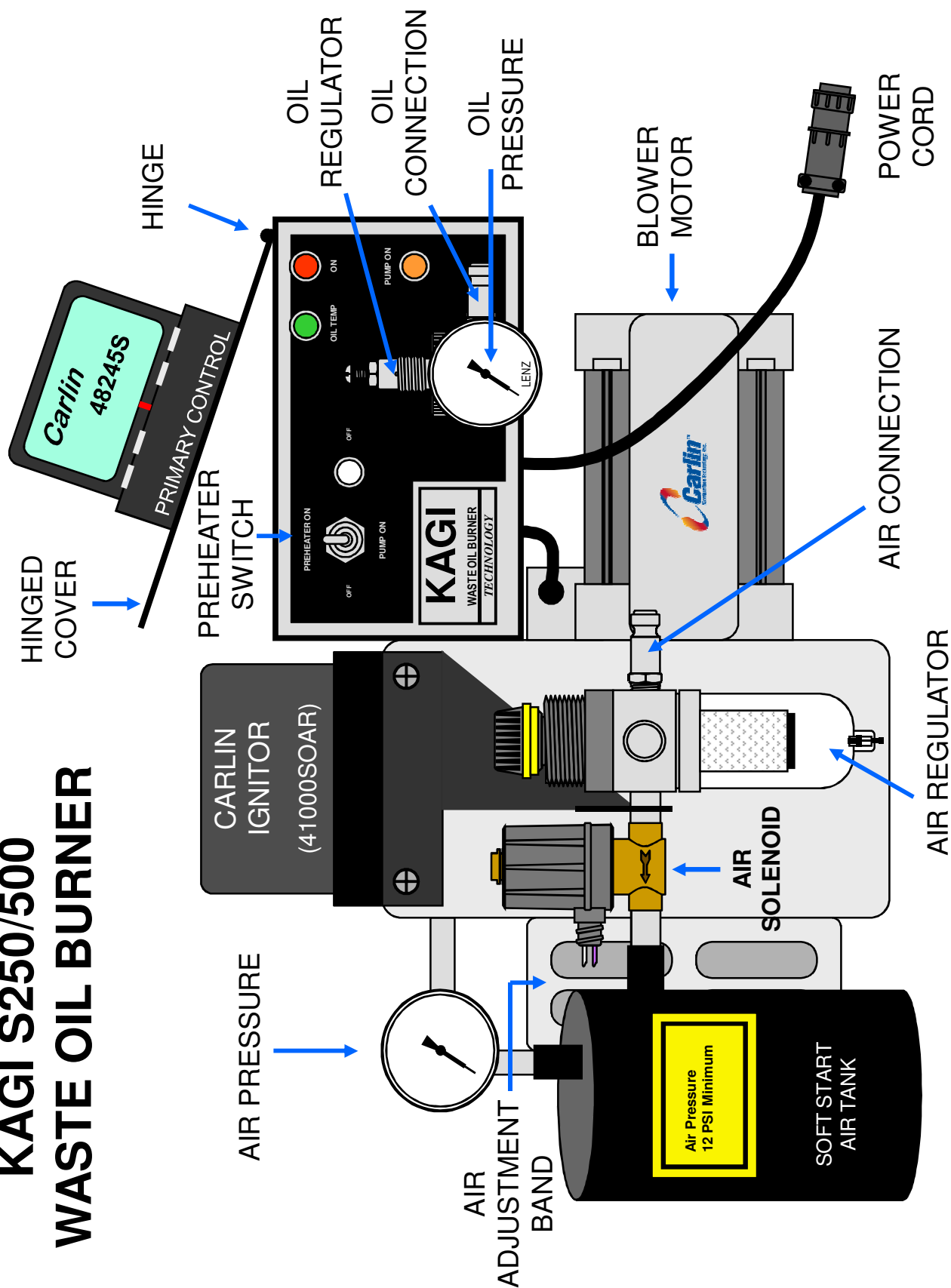


Figure 5

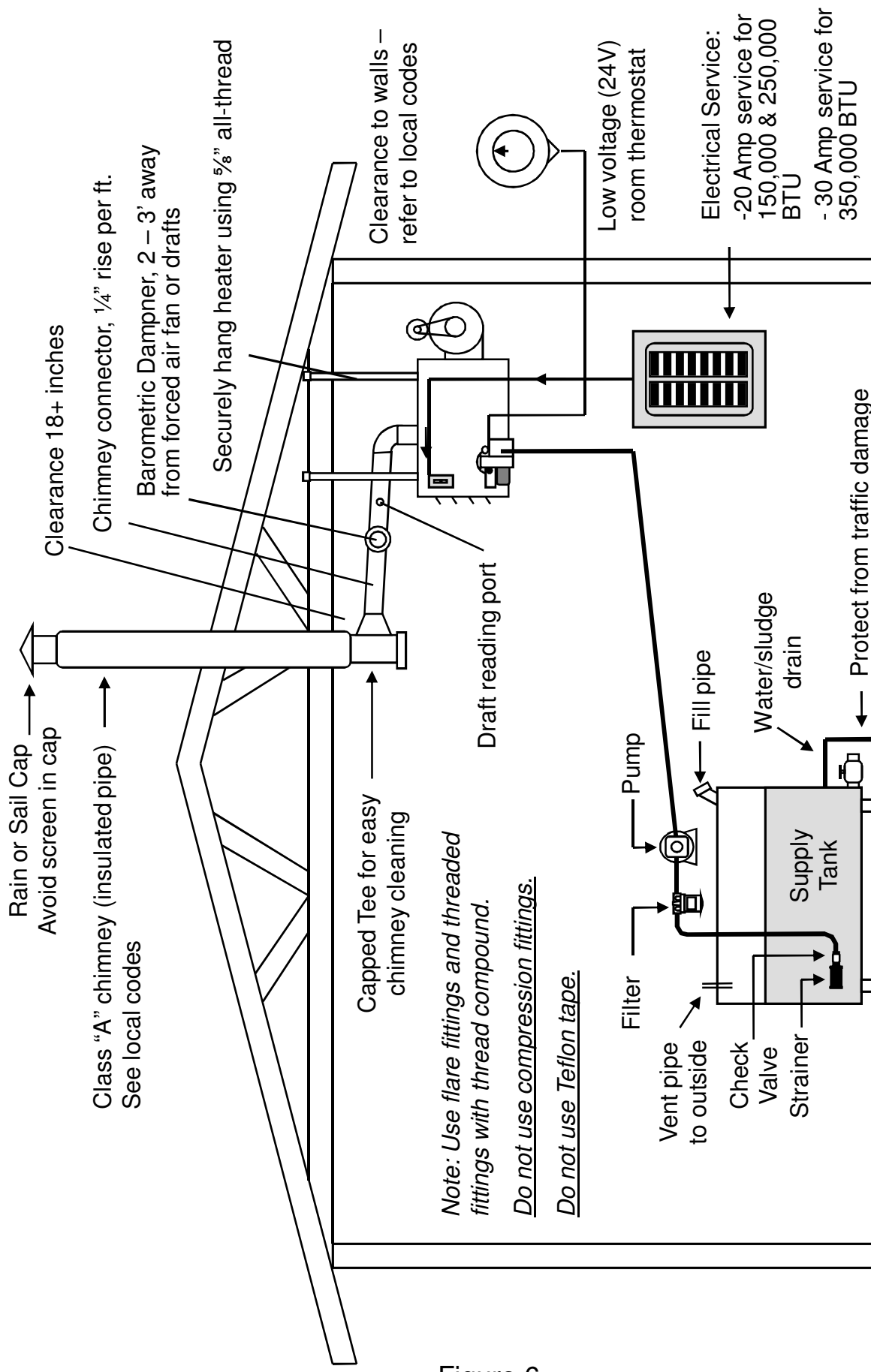
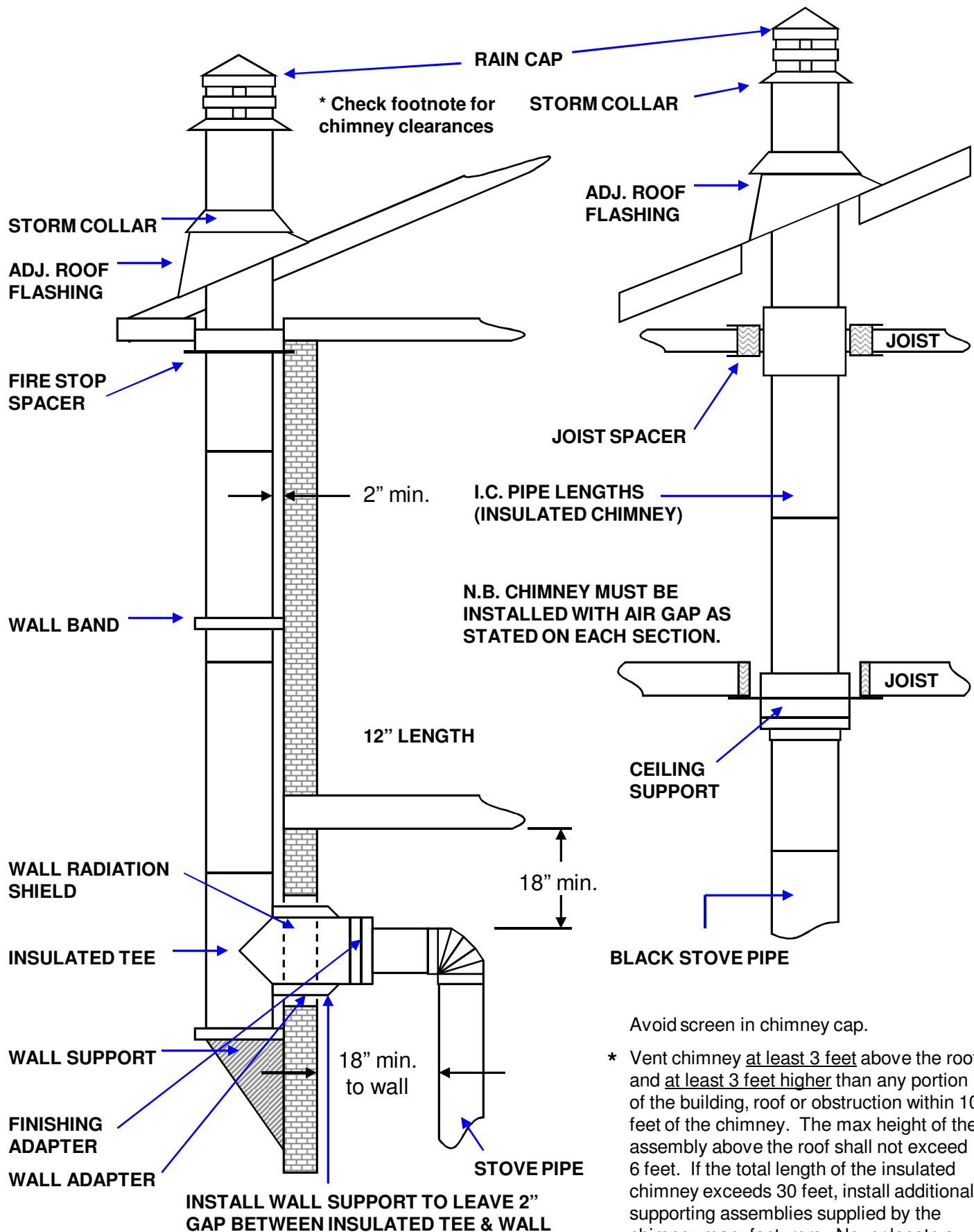


Figure 6

150,000/250,000 BTU Furnace Installation Example

MULTIPLE WALL INSULATED CHIMNEY INSTALLATION



Avoid screen in chimney cap.

- * Vent chimney at least 3 feet above the roof and at least 3 feet higher than any portion of the building, roof or obstruction within 10 feet of the chimney. The max height of the assembly above the roof shall not exceed 6 feet. If the total length of the insulated chimney exceeds 30 feet, install additional supporting assemblies supplied by the chimney manufacturers. Never locate a joint inside walls or in a joist spacer.

Figure 7

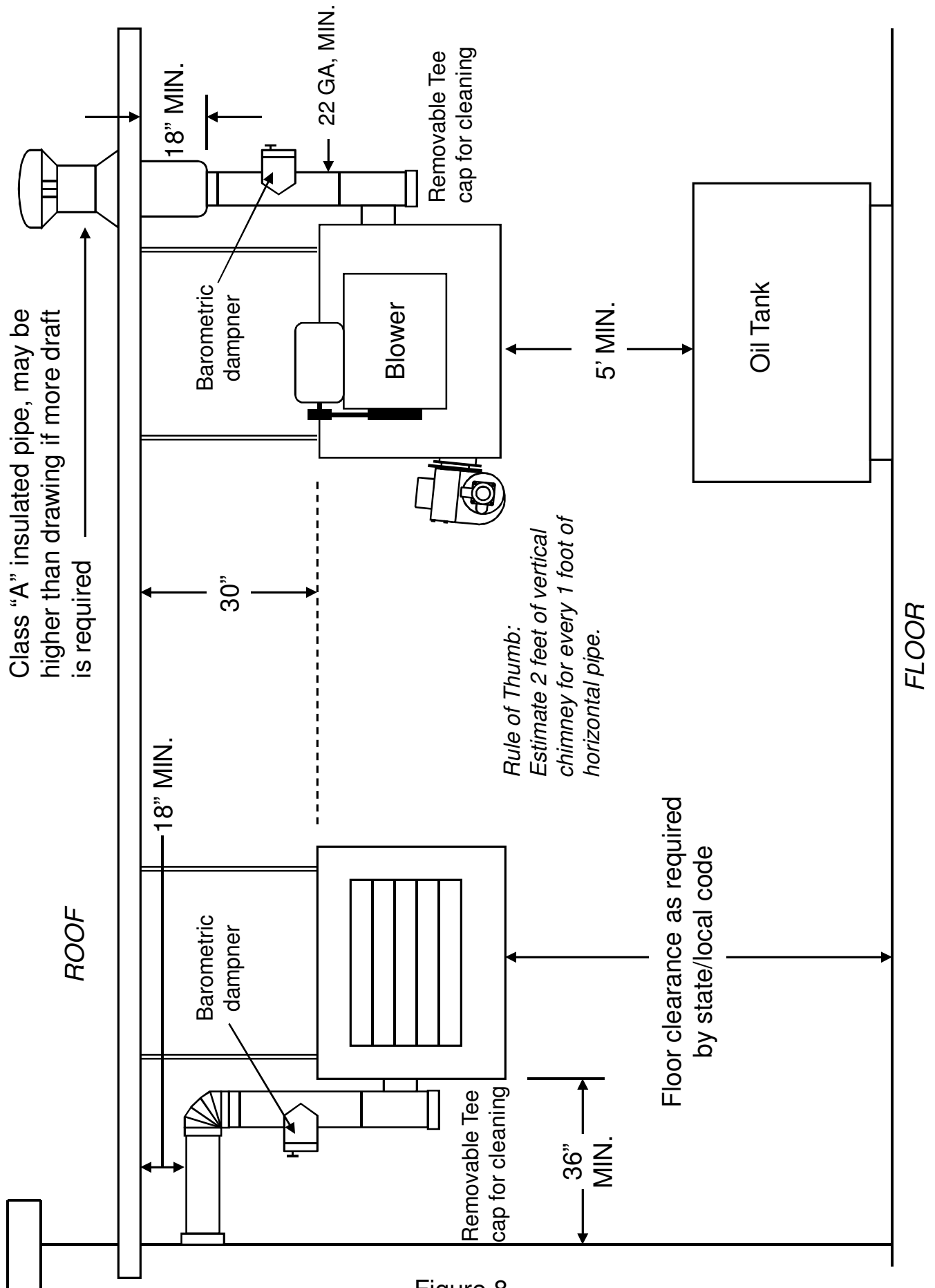


Figure 8

FLOATING PICKUP SUMP FOR DIRTY STORAGE TANKS

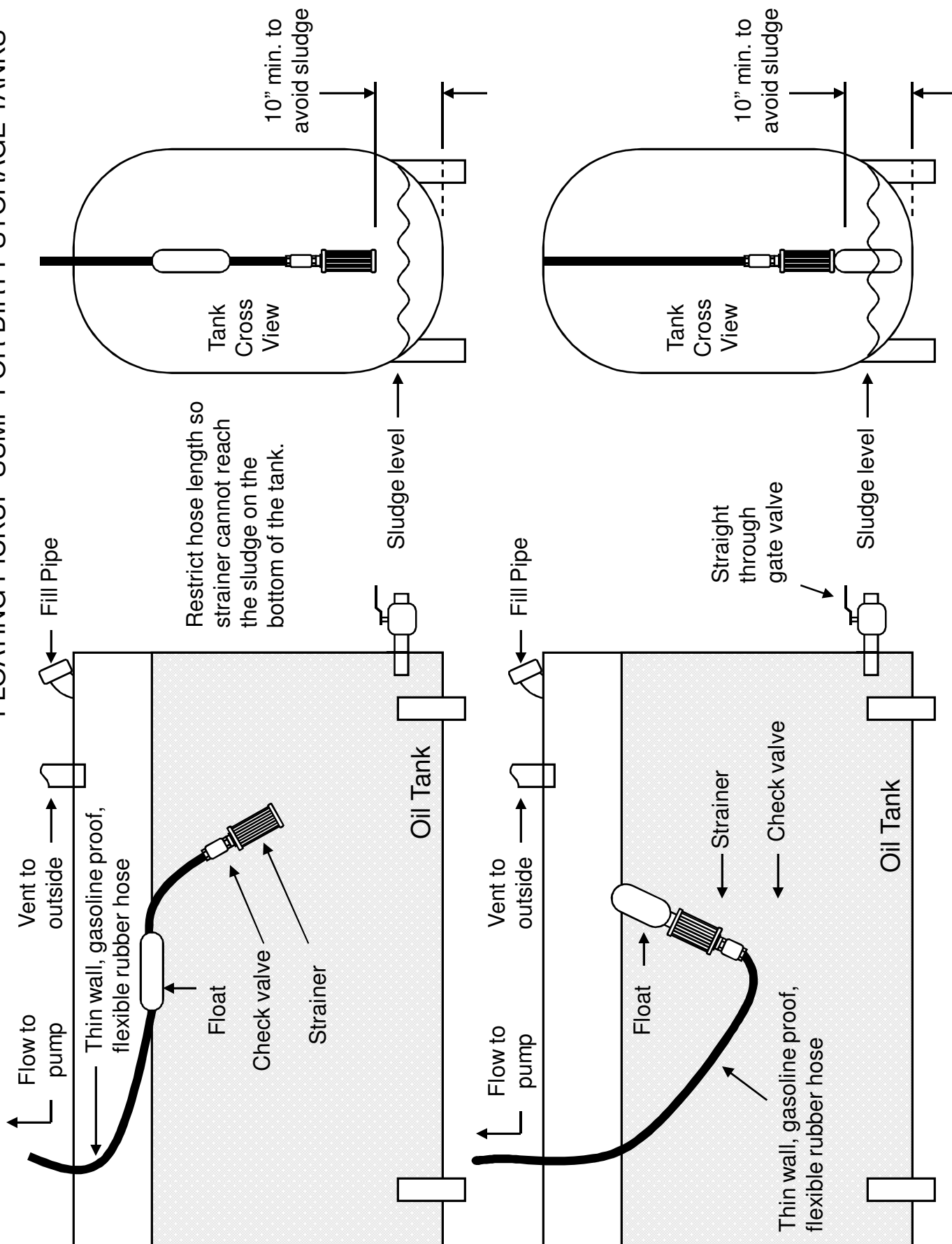


Figure 9

Oil Primary Control

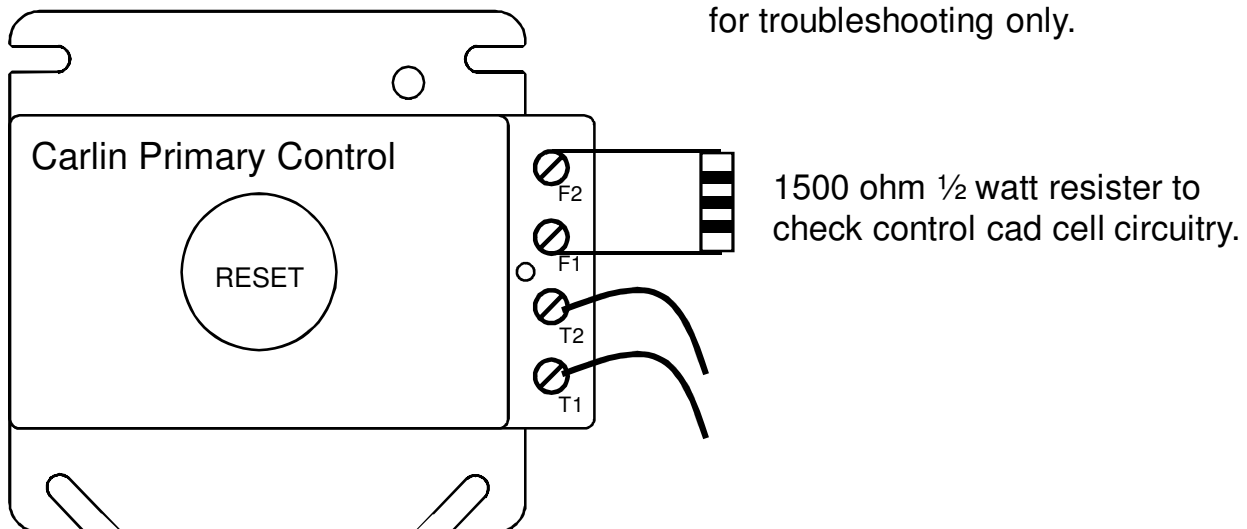
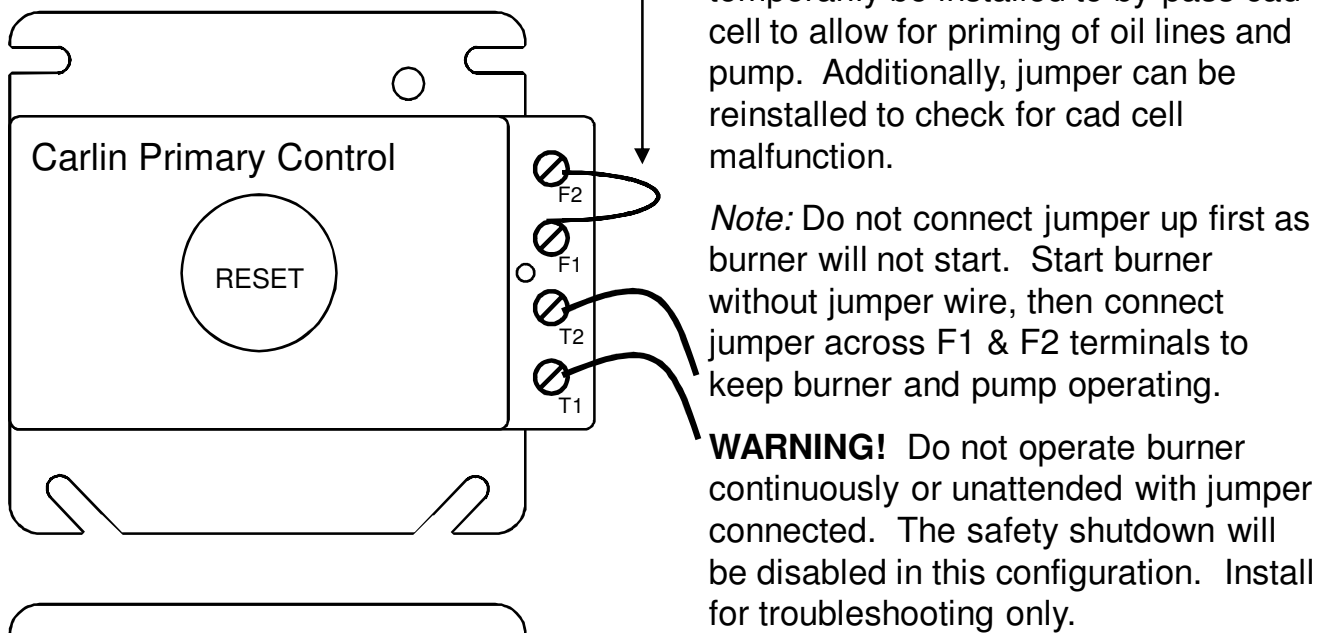
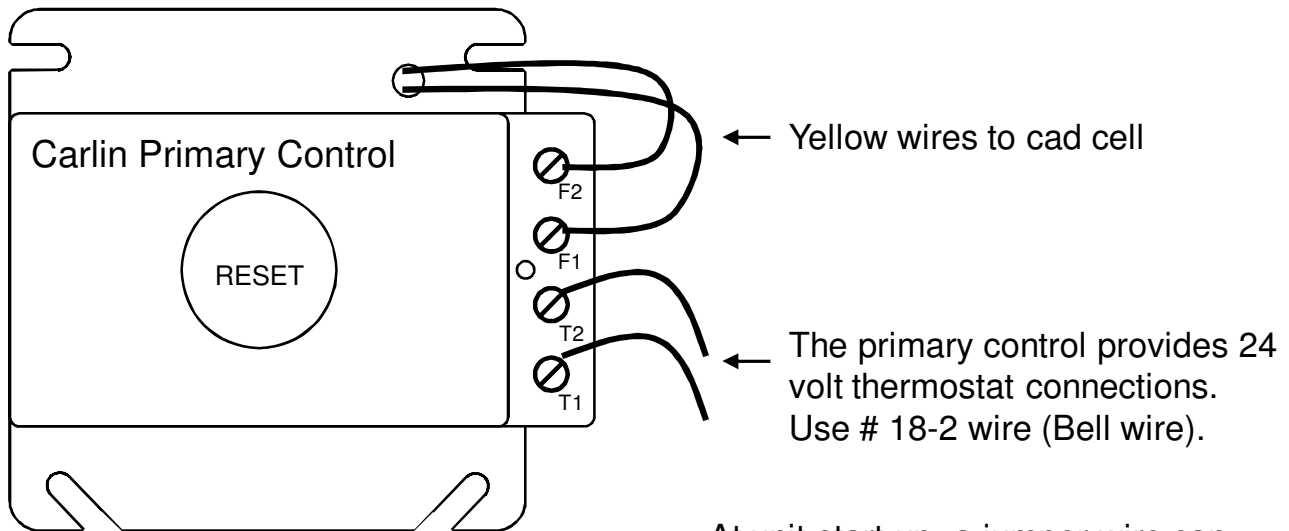
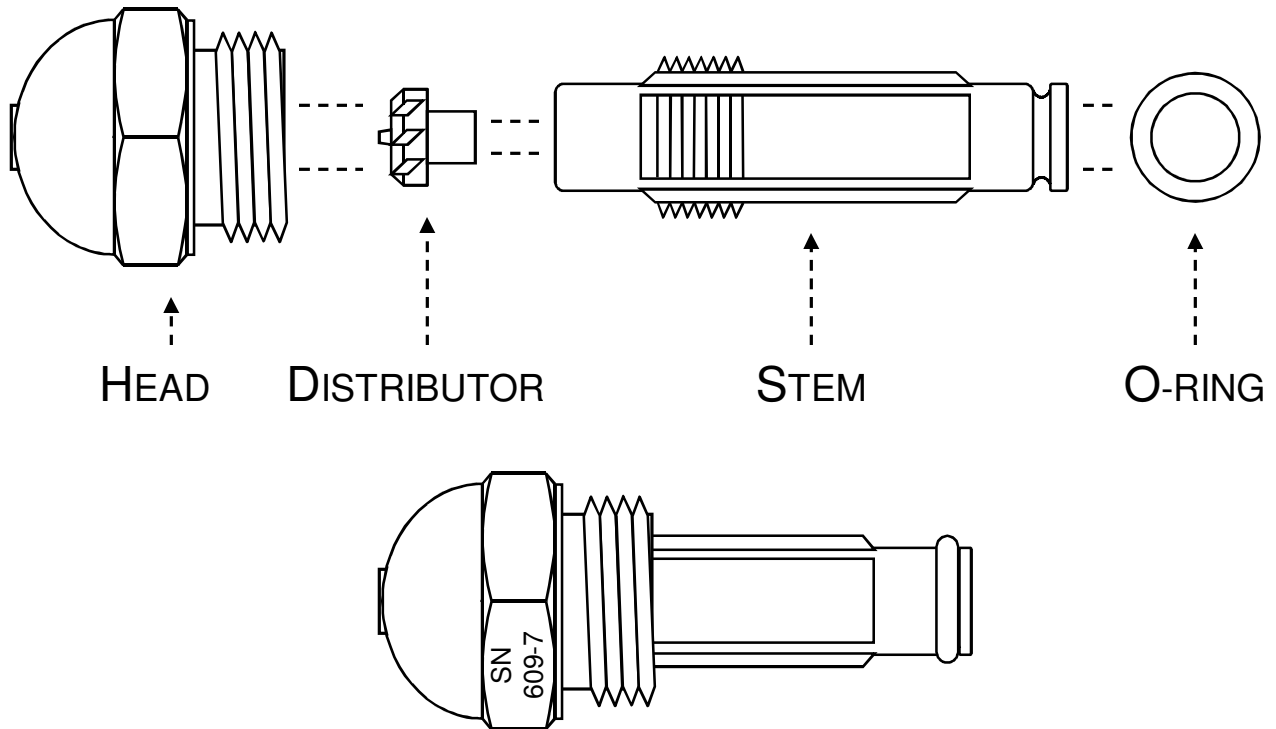
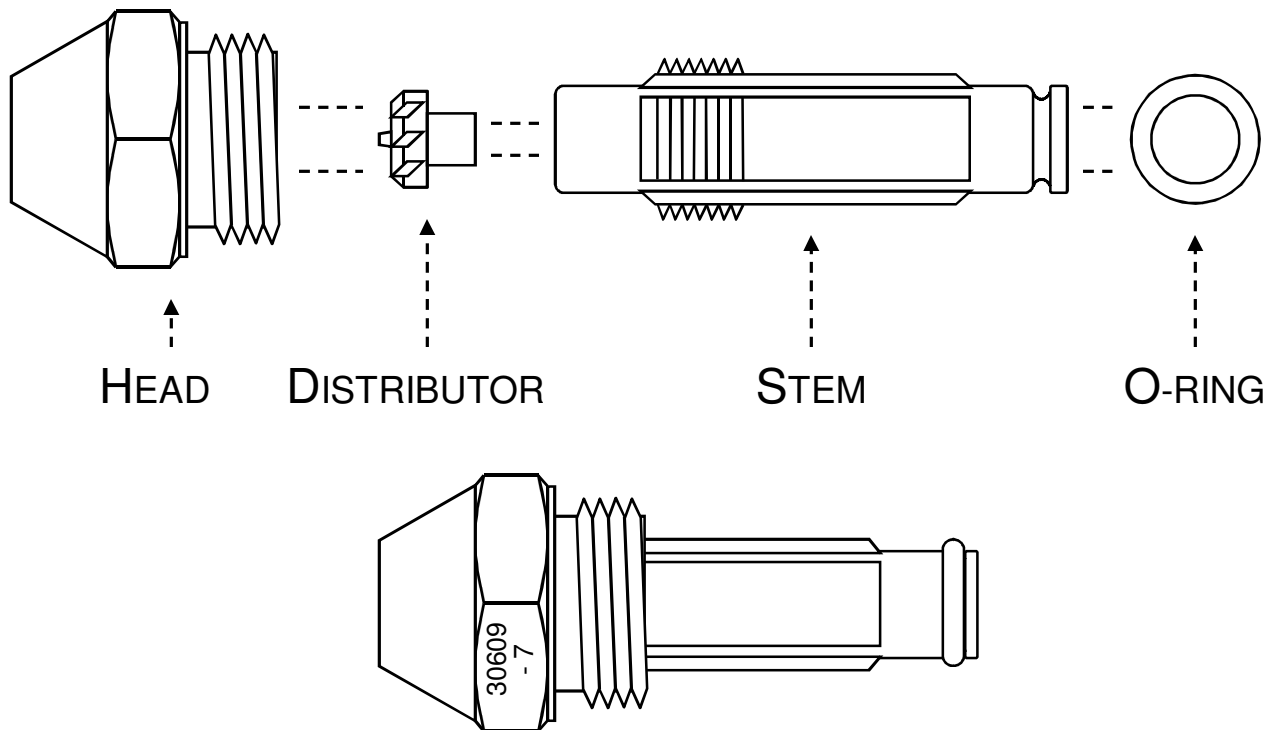


Figure 10

HEATWAVE NOZZLE – TYPICAL (HAGO)



HEATWAVE NOZZLE – TYPICAL (DELAVAN)



Normal application: HW150 = 609-5, HW250 = 609-7, HW350 = 609-9

Figure 11

Adjustment of the Electrodes

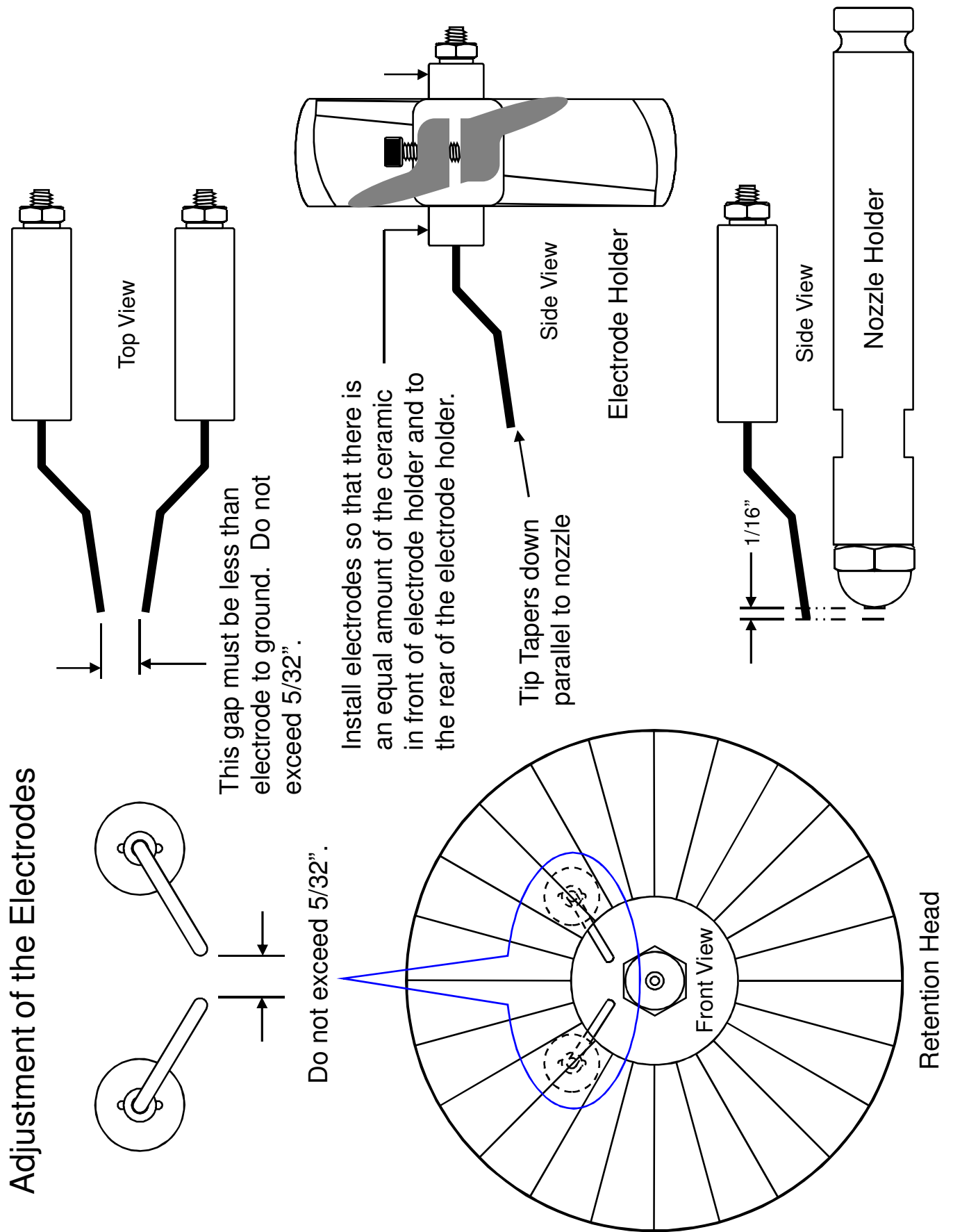
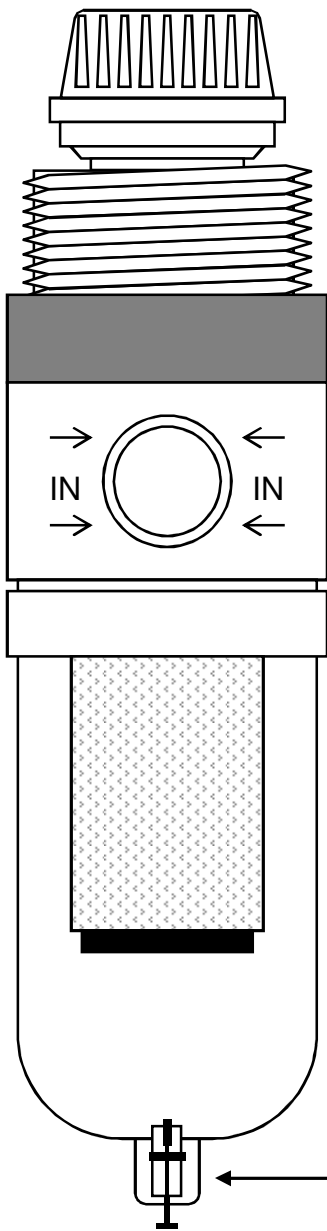


Figure 12

AIR REGULATOR



Pressure Adjustment Knob

Cap

Flat Washer

Main Spring

Diaphragm & Stem

Stem Guide

O-ring

Seat & Seat Spring

Regulator Body

Air Spinner

Filter Element

Filter Element
Retainer

Bowl O-ring

Filter Bowl

Water Drain

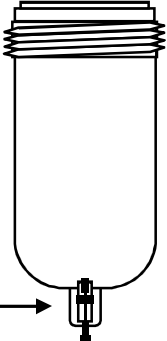
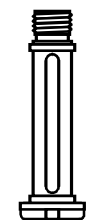
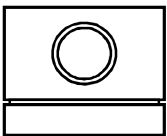
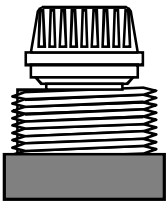


Figure 13

OIL REGULATOR

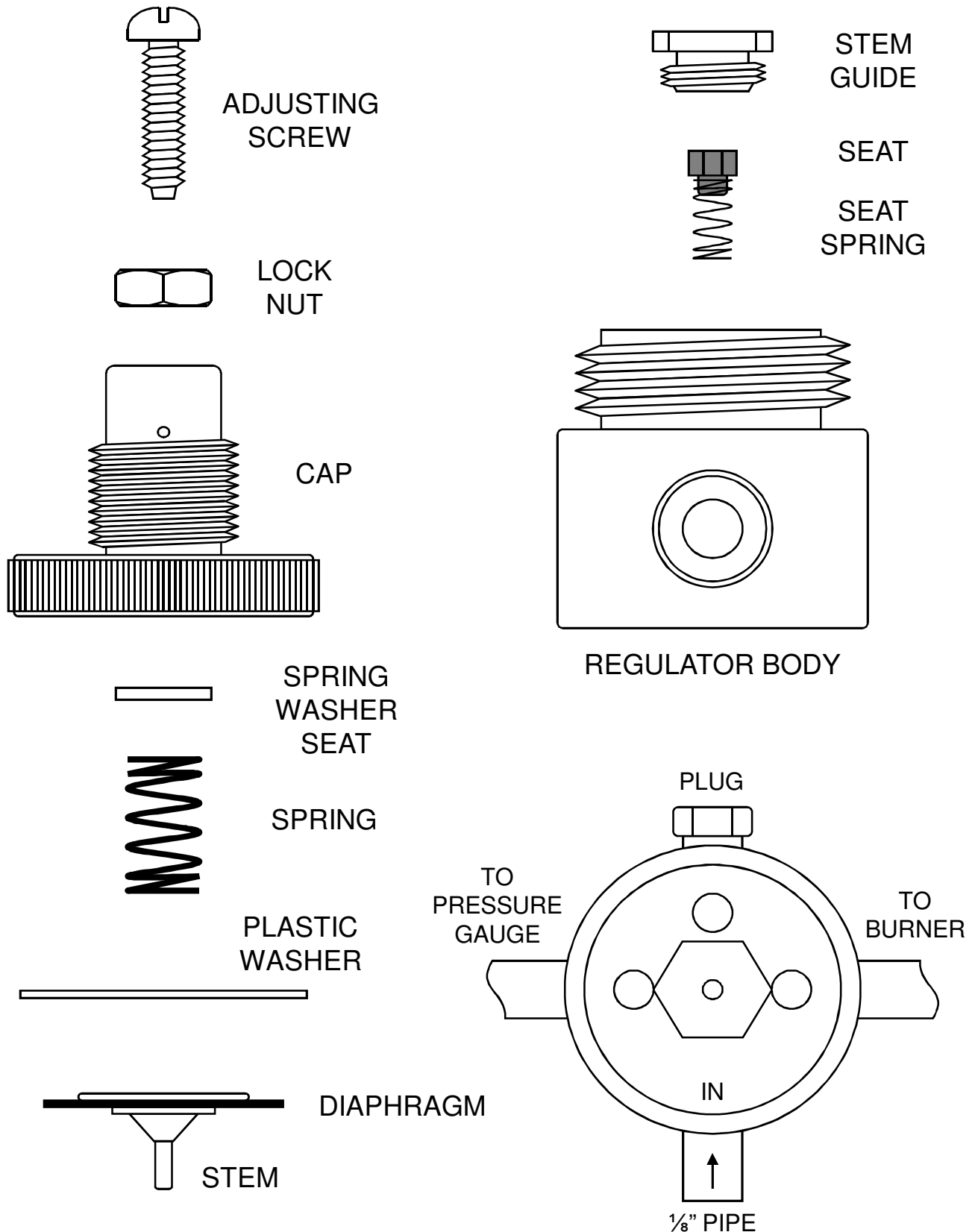
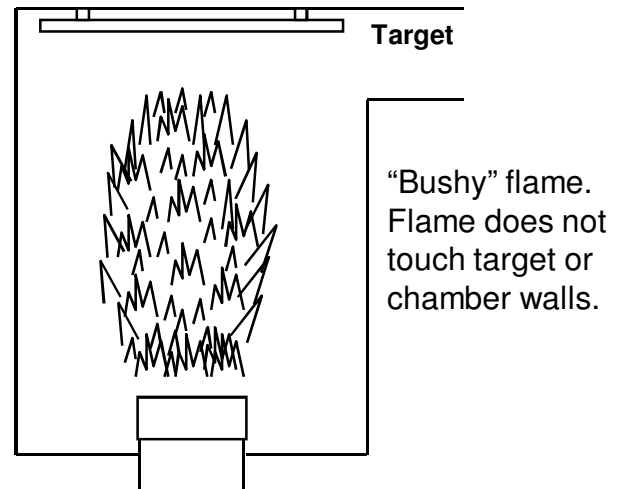


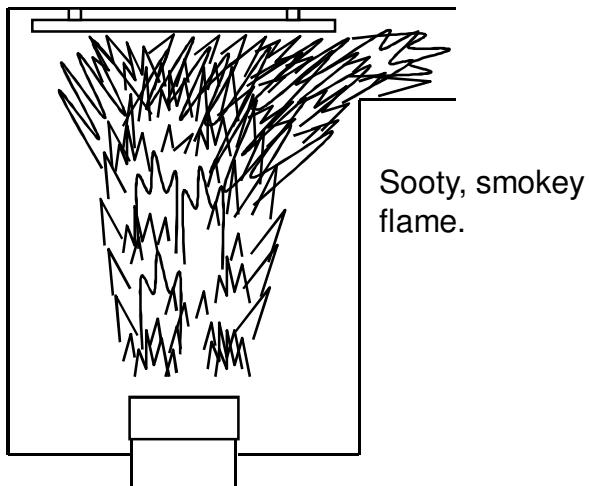
Figure 14

Flame Characteristics for adjusting oil pressure and troubleshooting

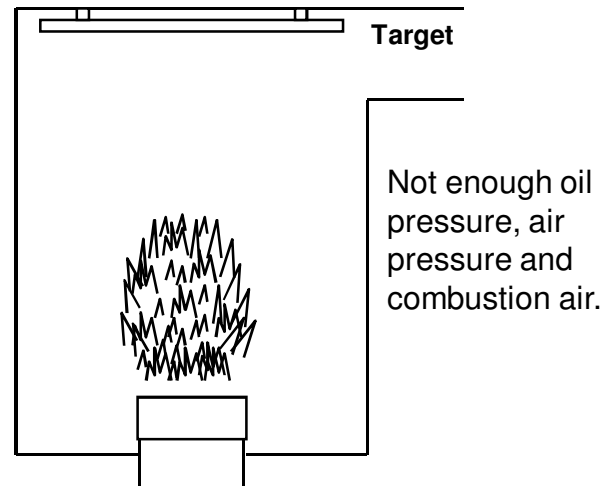
Warning: Over-firing the Heatwave
will void the warranty and create a
fire hazard.



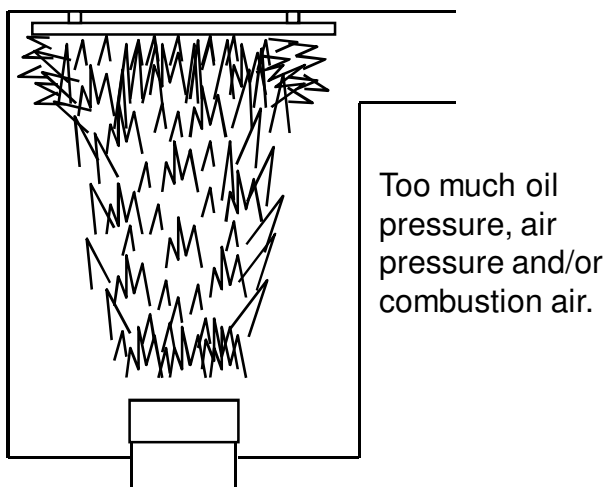
Correct maximum flame



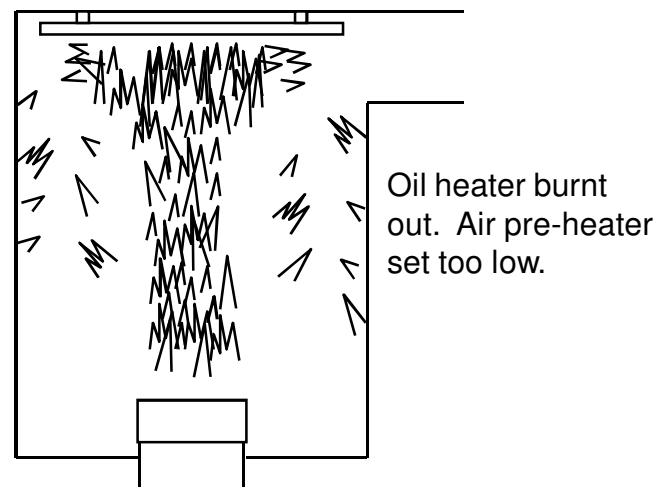
Excessive oil pressure.
Insufficient combustion air.



Under fired



Over fired.
Target area red hot.



Oil too cold

Figure 15

EXPLODED VIEW OF AIR / OIL SOLENOID

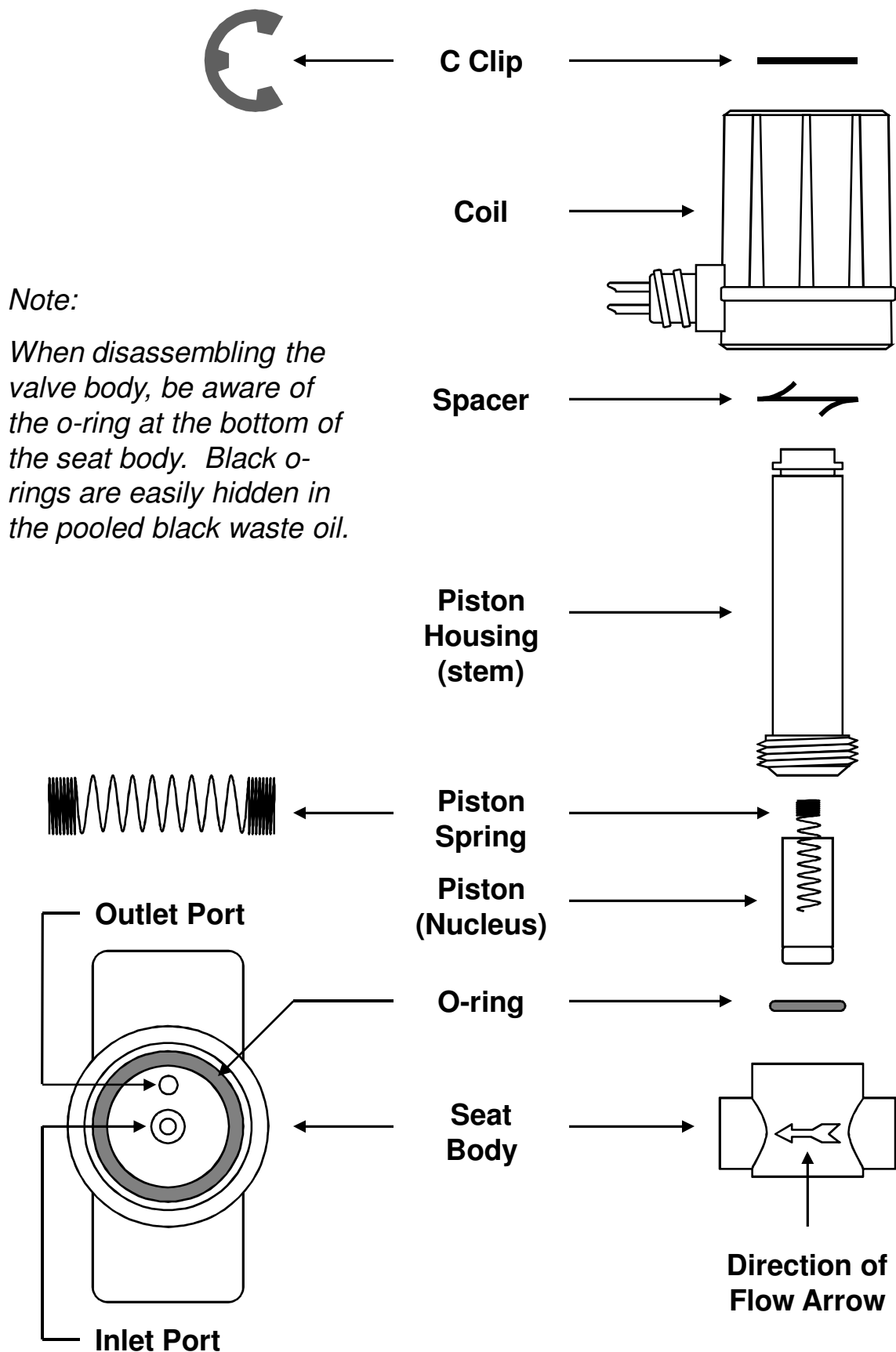
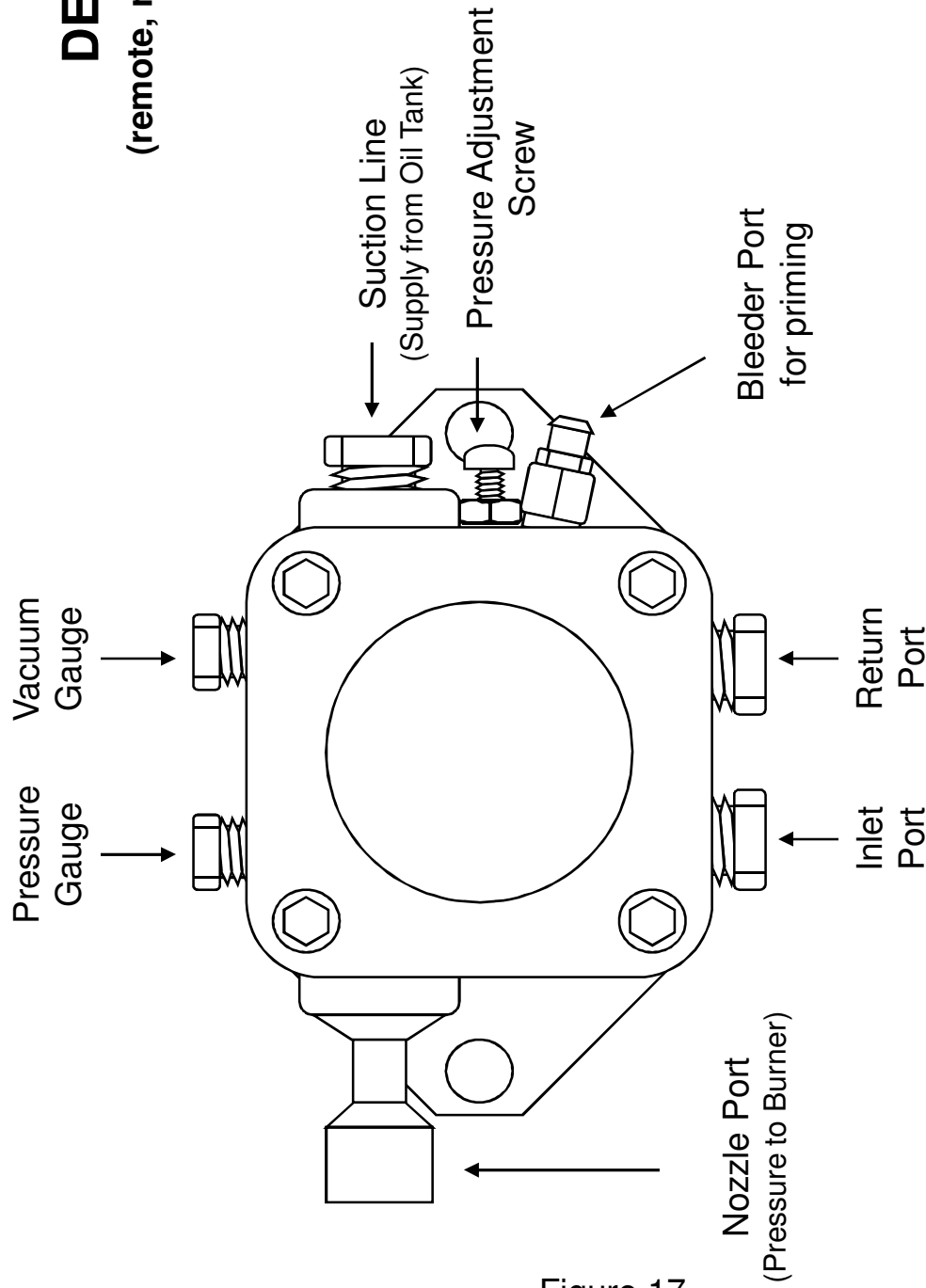


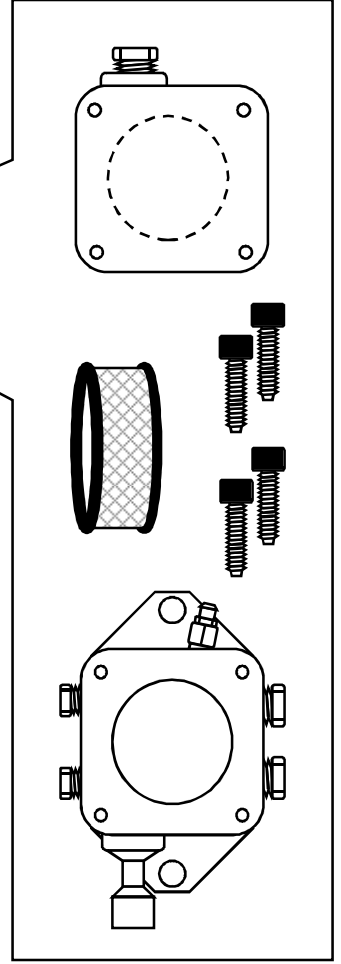
Figure 16

DELTA PUMP

(remote, non burner mounted)



Delta pump shown with screws, cover and screen removed for cleaning.



Note:
Pump will not prime if mounted upside down

Figure 17

SUNTEC “J” PUMP

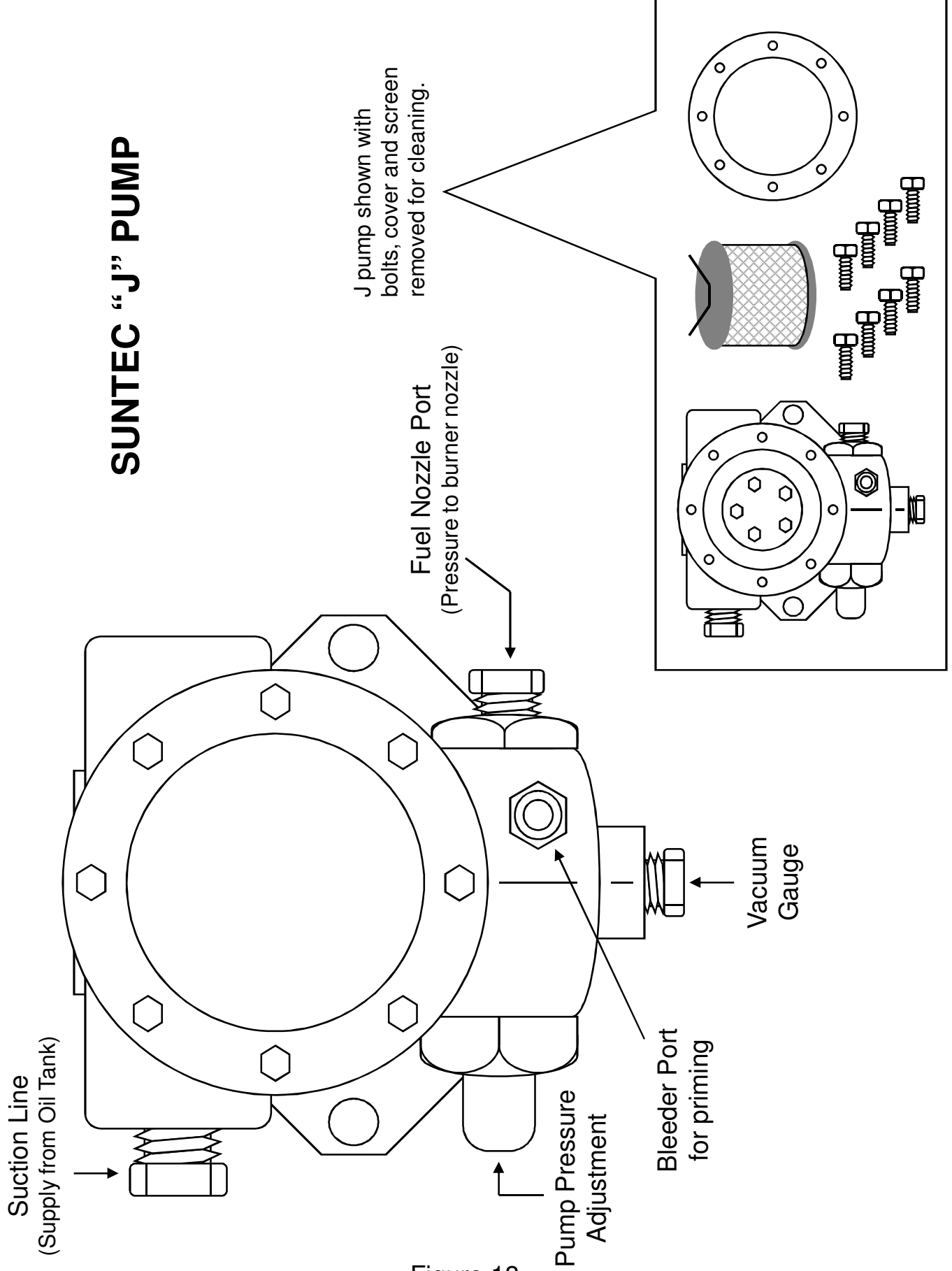
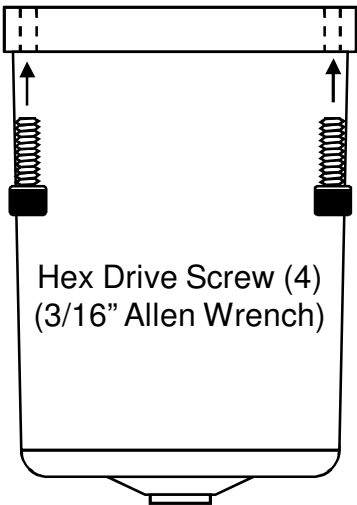
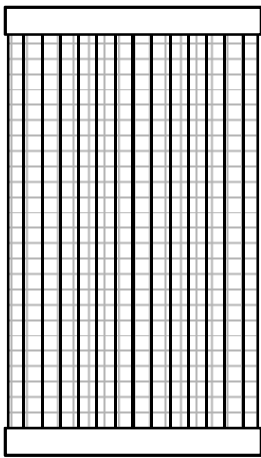
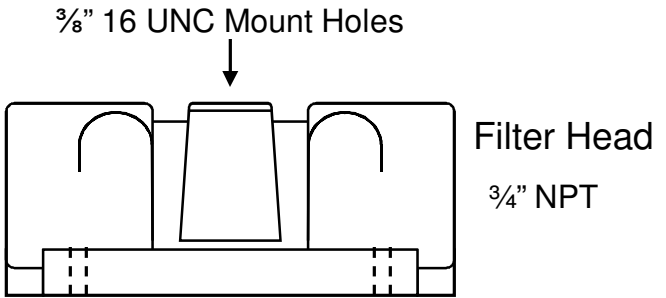


Figure 18

LENZ FILTER SYSTEM



Internal Wrenching Plug
(1/4" Allen Wrench)

Drain Plug O-ring

Drain Plug

To Clean:

Remove 4 hex head screws and lower filter bowl. Filter element can be removed by pulling downward with a slight twisting motion. Clean element and bowl with solvent.

Be careful not loose, cut or twist bowl o-ring upon reinstallation.

Fill bowl approximately 2/3 full with clean oil prior to installing to aid in pump priming.

Install bowl (with o-ring in place) and tighten screws evenly to reduce the possibility of suction leaks.

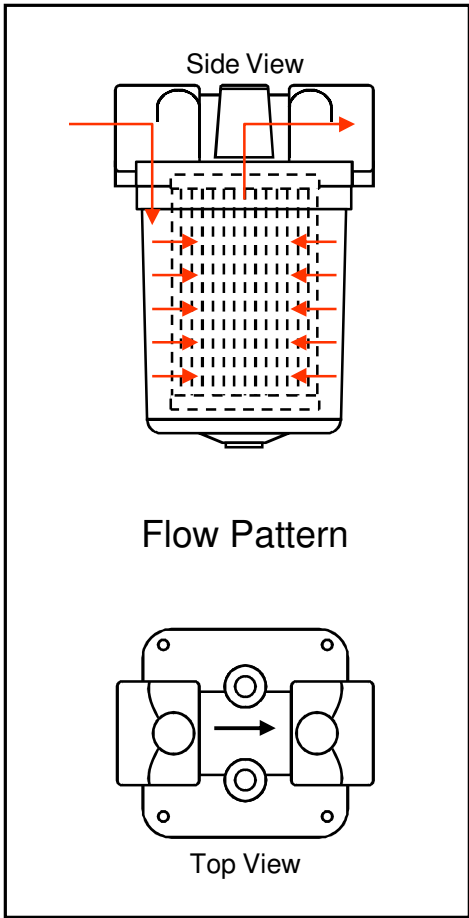
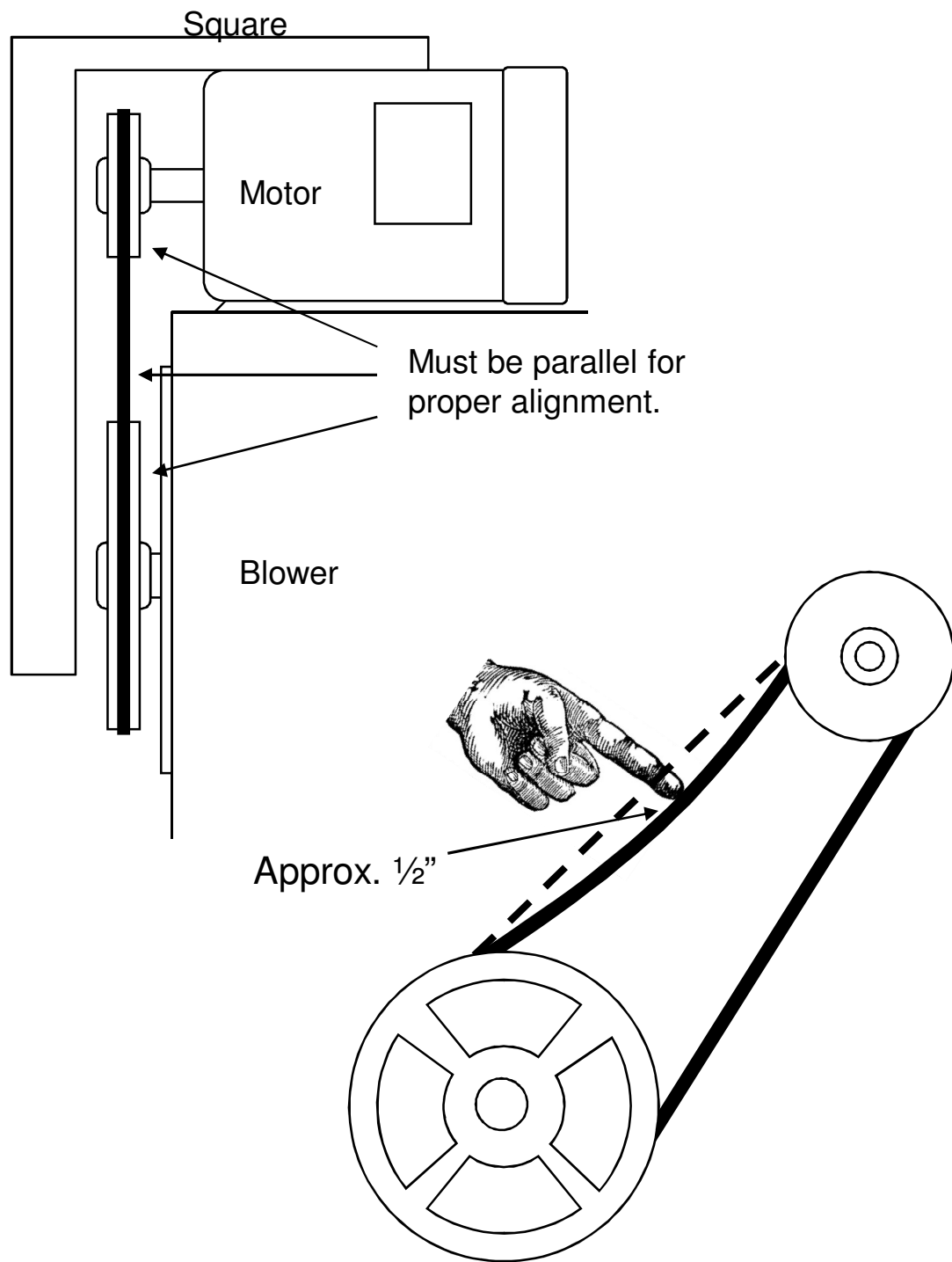


Figure 19



Blower Belt – Alignment and Tension

SQUARE D BREAKER BOX – Waste Oil

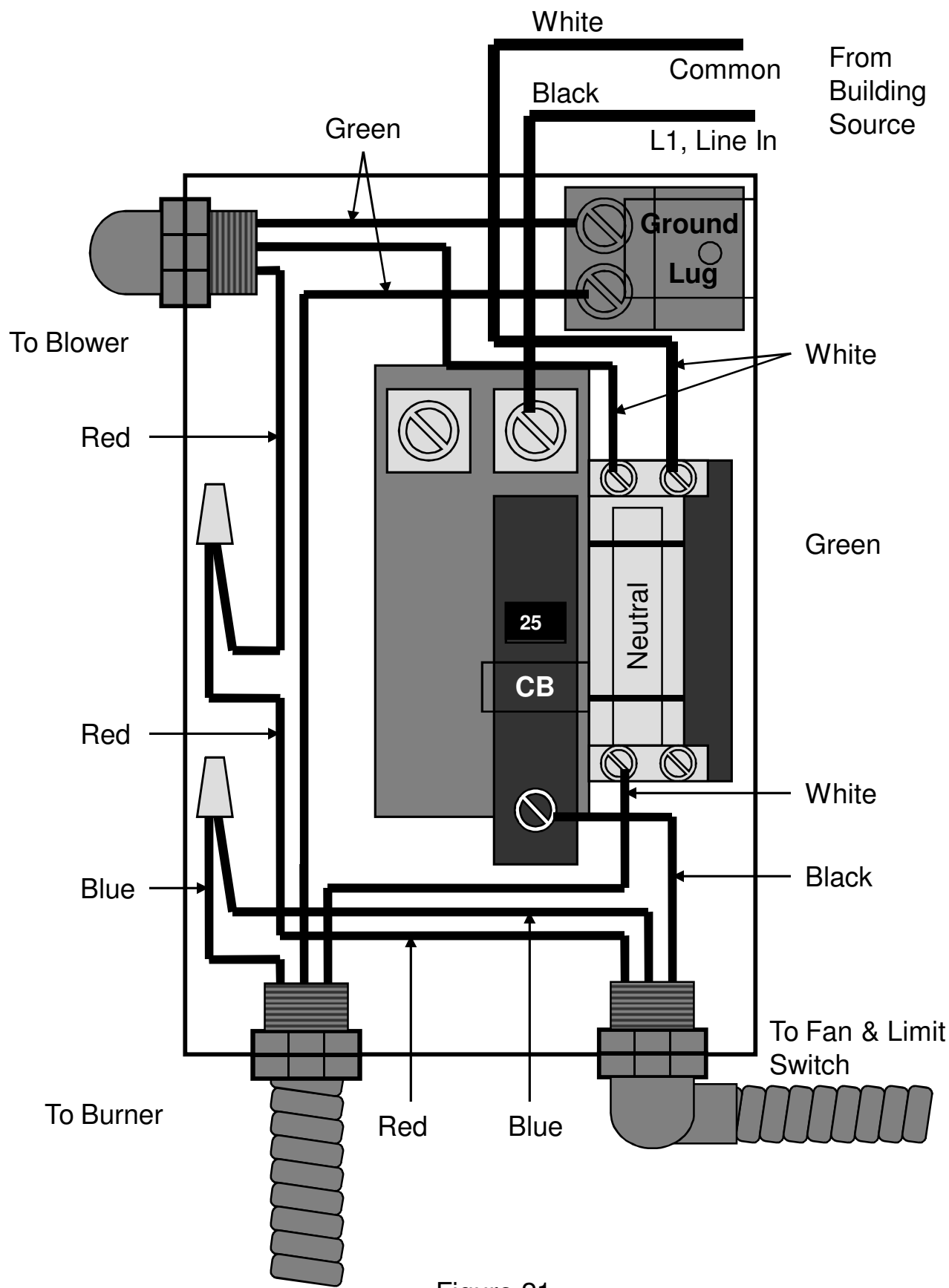
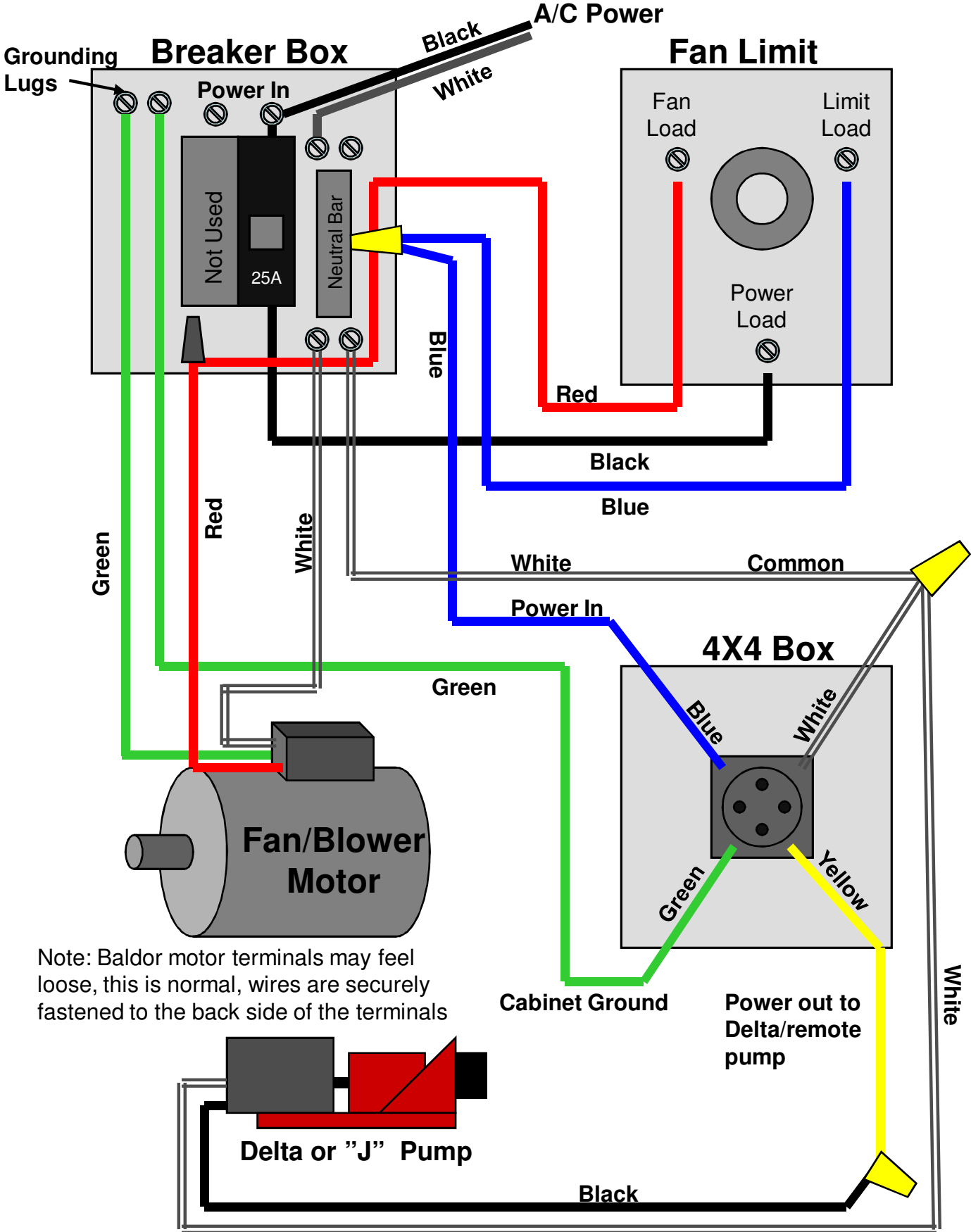


Figure 21

Wiring Schematic



Note: Baldor motor terminals may feel loose, this is normal, wires are securely fastened to the back side of the terminals

Figure 22 White

1

4 X 4 Junction Box (Burner Power Disconnect)

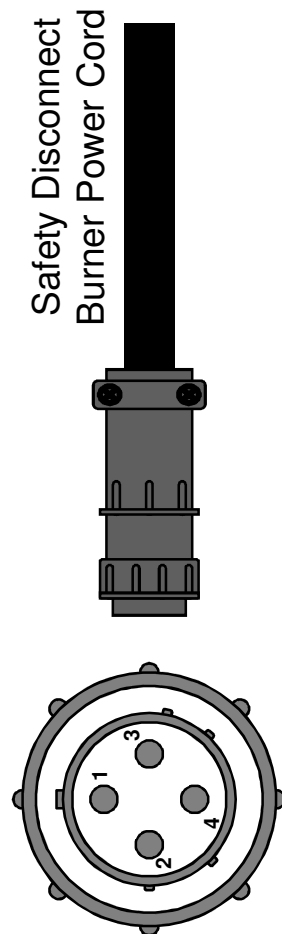
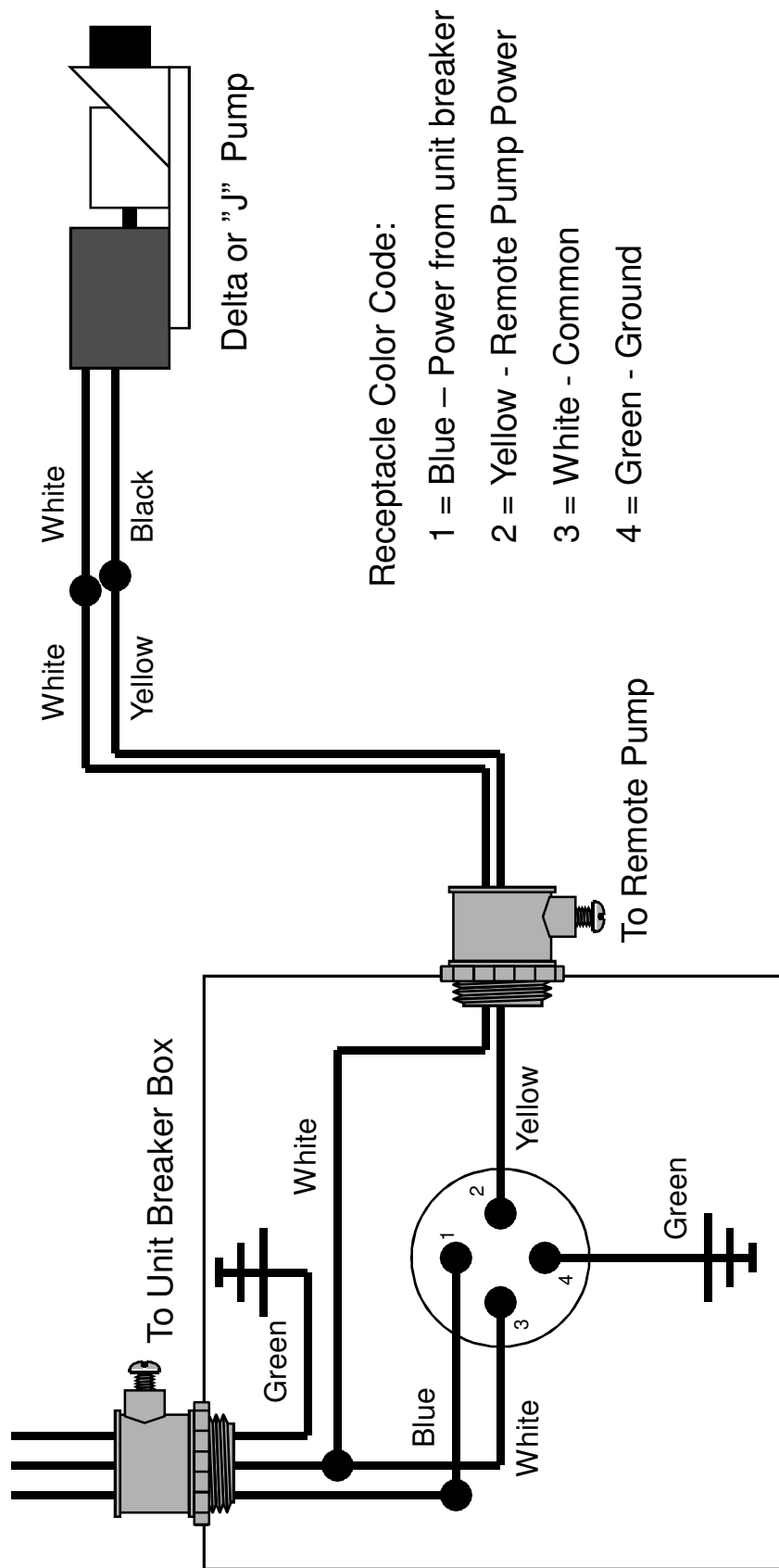


FIGURE 24

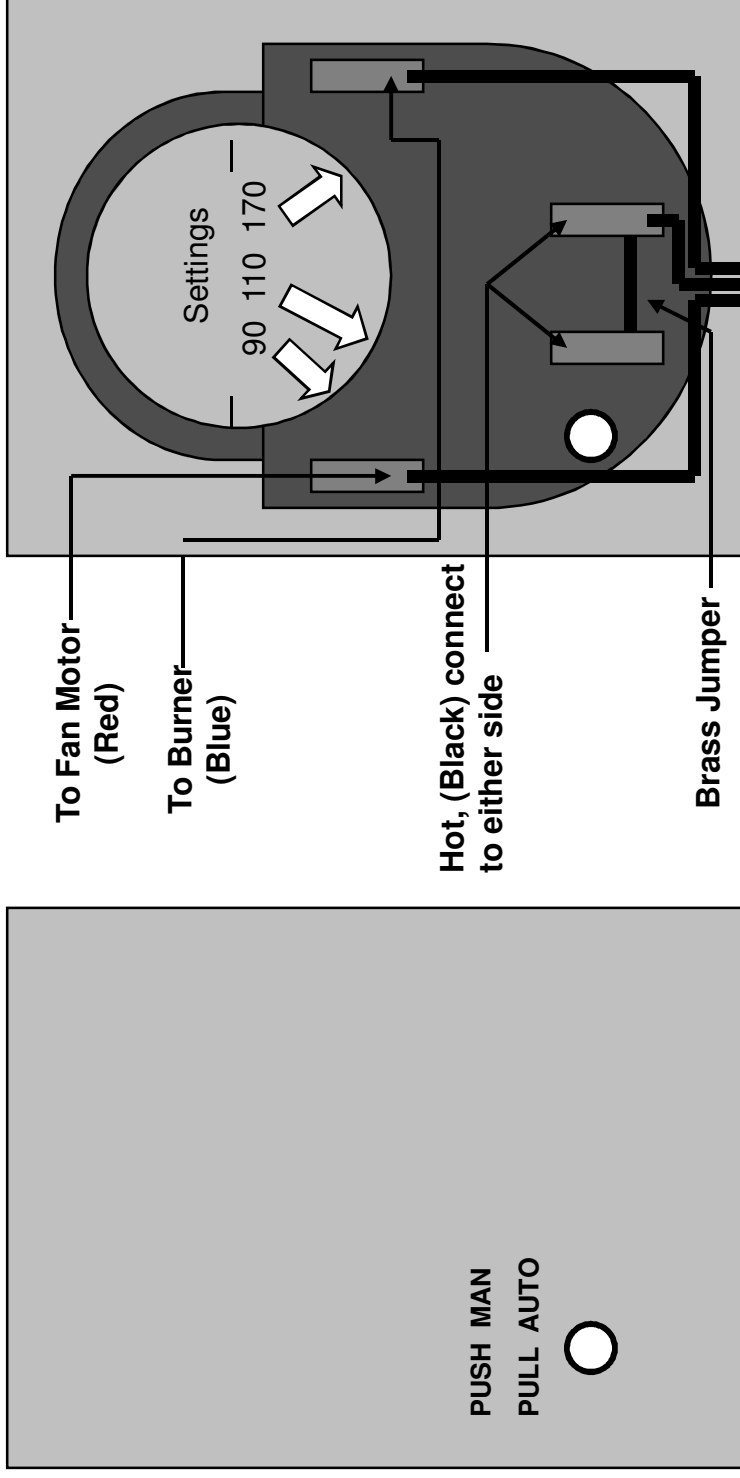
Fan & Limit Control

Fan Off: 90 Fan On: 110 High limit: 170

CAUTION:

Do NOT block the flow of heated air from the heater.

When adjusting set point levers, hold the scaleplate dial to keep it from turning and straining the sensing equipment.



Note: Pushing the white "MAN/AUTO" button to "MAN" will allow the fan to run continuously

Figure 25

TERMINAL STRIP

Note: Wire colors and wire locations do not have to match exactly so long as wires are installed in the proper section.

Power Cord (Black)	Jumper	7	HOT	7	Primary Control (Black)
Air Pres. Switch (Top)					
Thermostat					Red Lamp
Toggle Switch (Hot)					Green Lamp
Ignitor Hot (Blue)	Jumper	5	LOAD	5	Primary Control (Orange)
Blower Motor (Hot)					Oil Heater
Air Solenoid (Purple)					Oil Solenoid (Purple)
		4		4	
Ignitor (White)	Jumper	3	COMMON	3	Primary Control (White)
Air Solenoid (White)					
Snap Disc					Oil Solenoid (White)
Toggle Switch					
Blower Motor (Common)					Red Lamp
Power Cord (White)		1		1	Amber Lamp

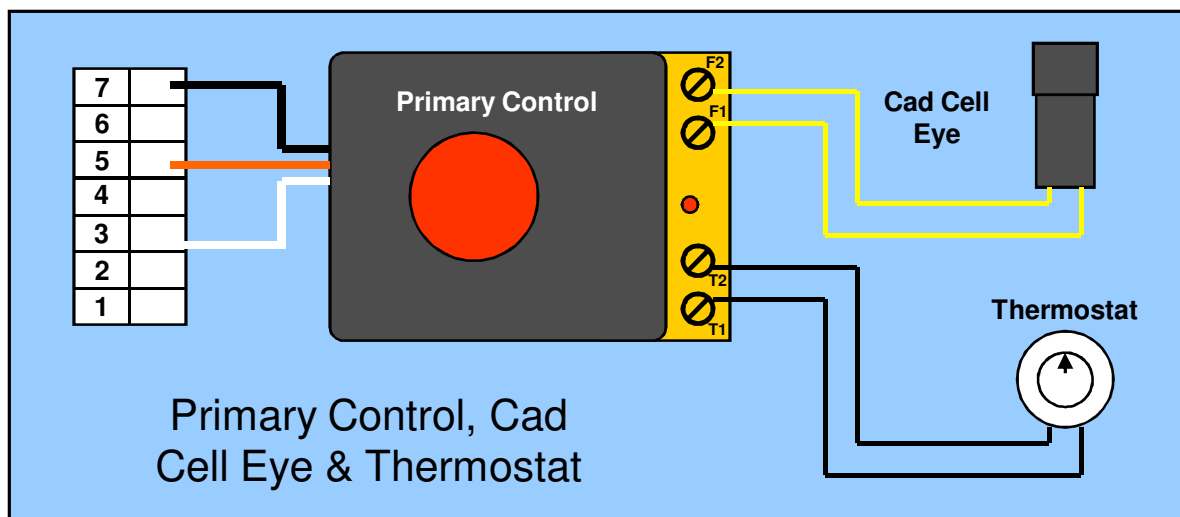
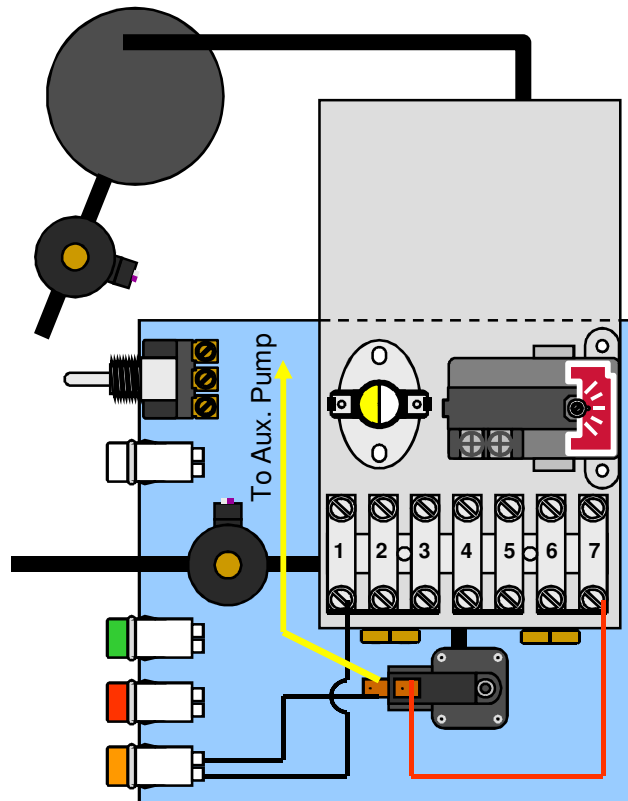
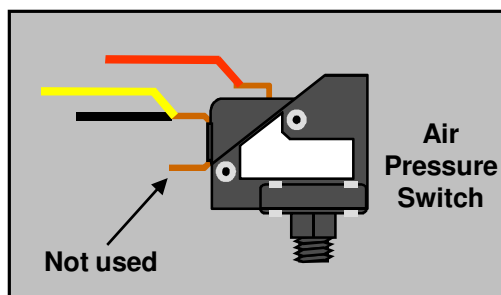


Figure 26

Drawing A

To connect amber lamp, auxiliary pump & air pressure switch.

Note: use only the top two tabs on the air pressure switch. Lower tab is not used.



Drawing B

To connect ignitor transformer, air & oil solenoid.

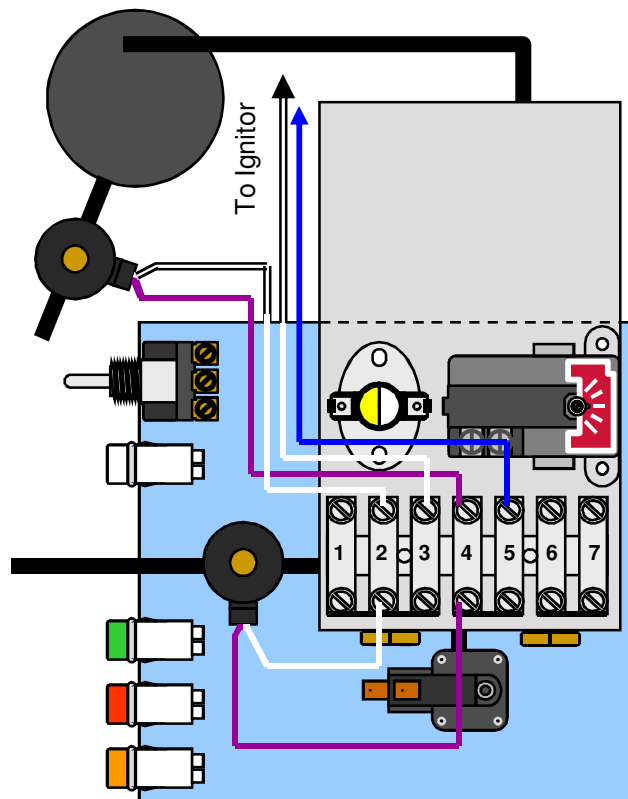
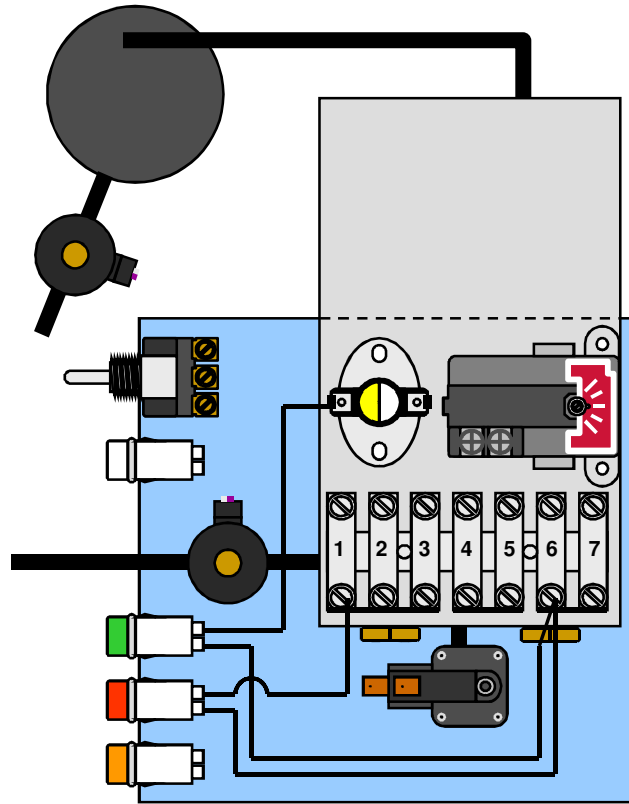


Figure 27

Drawing C

To connect red
and green lamp.



Drawing D

Top

White Lamp

Oil Heater

Air Heater

To connect white lamp, air & oil cartridge heaters and thermostat.

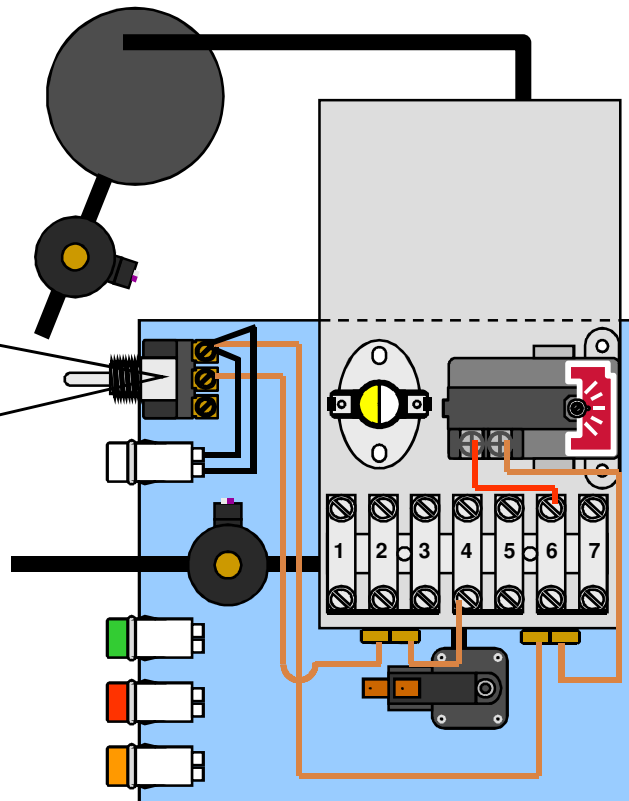
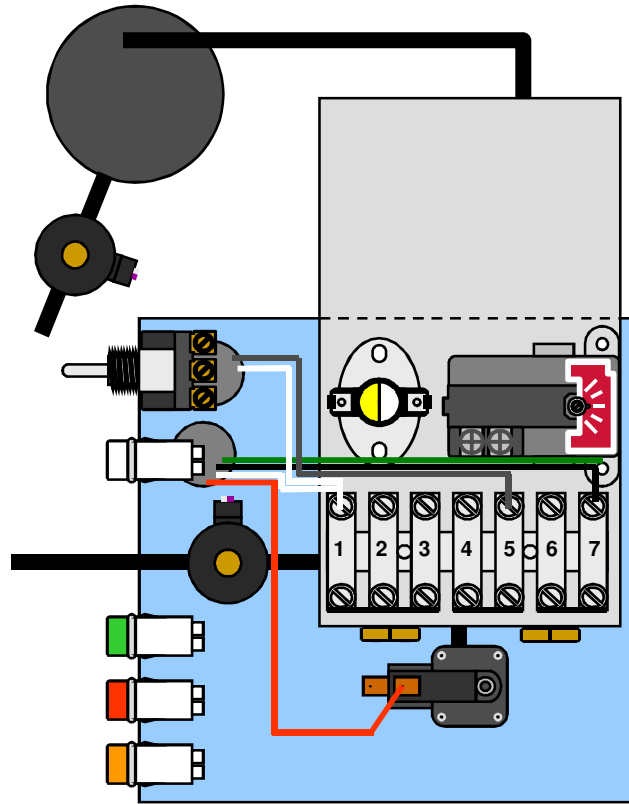


Figure 28

Drawing E

To connect burner
power cord and
blower motor.



Drawing F

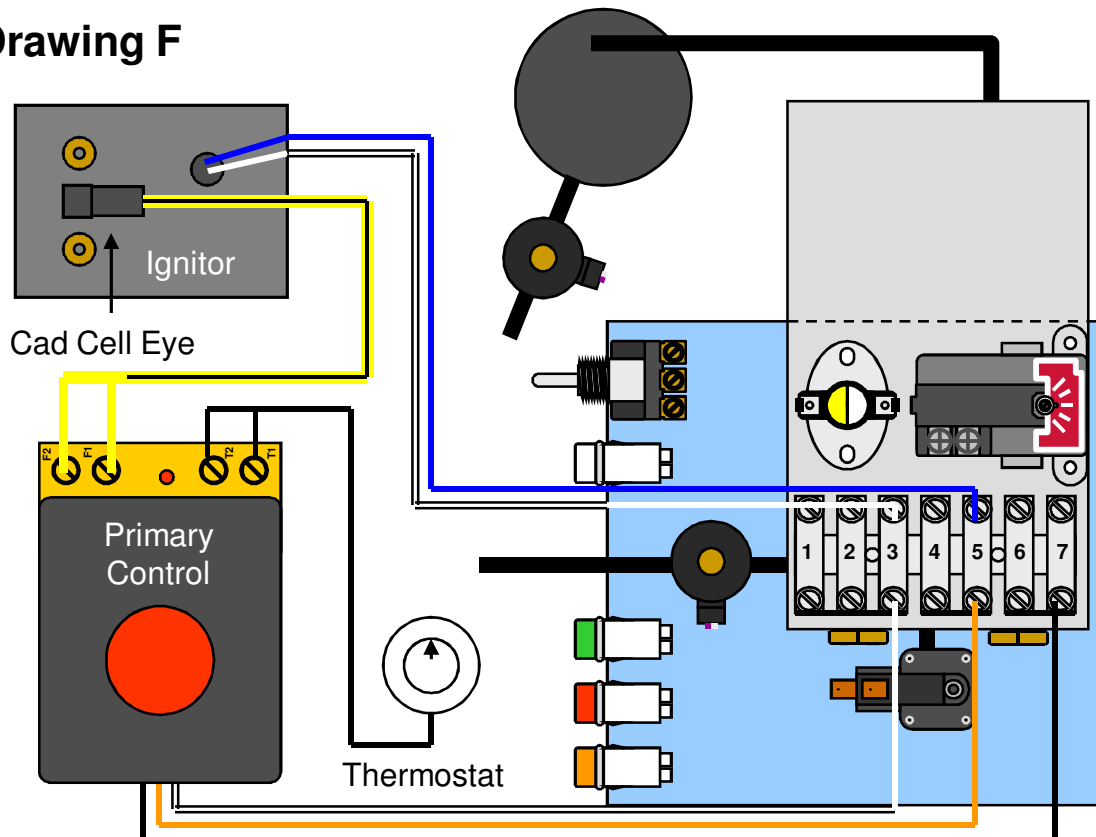
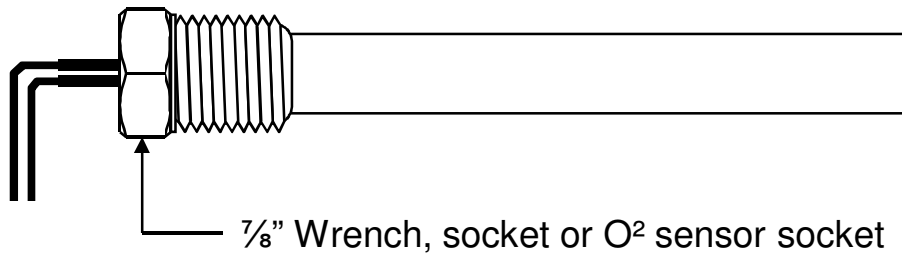


Figure 29

Air / Oil Pre-Heater Cartridges

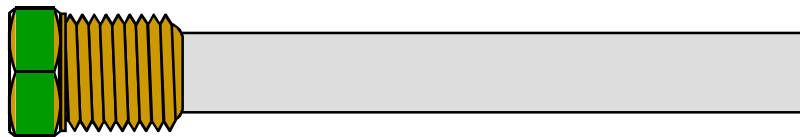


To test with ohm meter:

Heater lead to heater lead should read within 10% of values listed below = good cartridge

Under value or an "open" reading = bad cartridge – replace

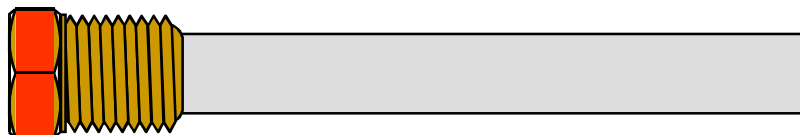
High reading = may be failing - replace



50 watt Oil Pre-heater 287-294 ohms
Kagi Model S250 Burners (HW150/250)



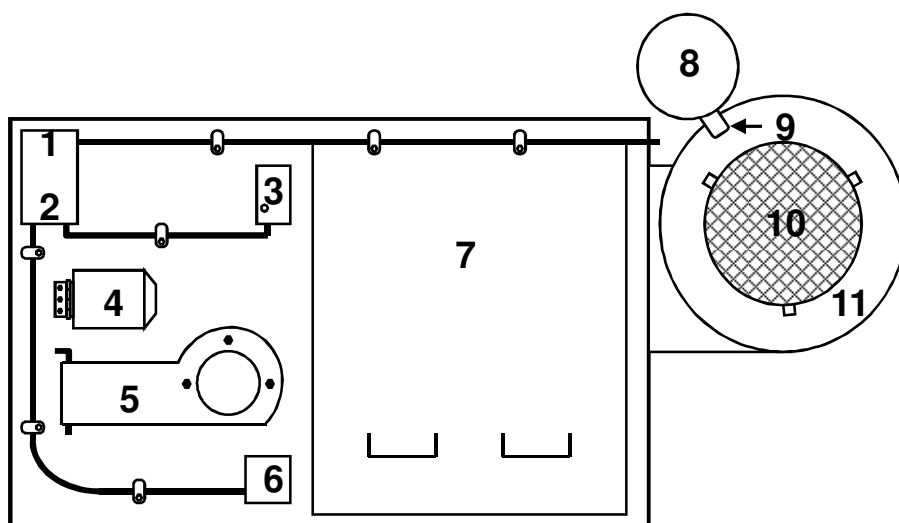
100 watt Oil Pre-heater 136-144 ohms
Kagi Model S500 Burners (HW350)



250 watt Air Pre-heater 56-59 ohms
Kagi Model S250 & S500 Burners

Figure 30

HEATWAVE 150 / 250 PARTS



- | | |
|------------------------|---------------------------------------|
| 1. Breaker Box | 10. Blower screen |
| 2. 25A Breaker | 11. Blower |
| 3. Fan & Limit Switch | 12. Drive Pulley |
| 4. Inspection Door | 13. Driven Pulley |
| 5. Swing-out Bracket | 14. Blower Guard |
| 6. 4 X 4 Junction Box | 15. Belt |
| 7. Shell Cleanout Door | 16. Louvres |
| 8. Blower Motor * | 17. Lt. Pot Cleanout Door (not shown) |
| 9. Motor Mount Bracket | 18. Rt. Pot Cleanout Door (not shown) |

Note: For burner parts see Kagi manual

* **DO NOT** replace blower motor with farm duty or manual reset model

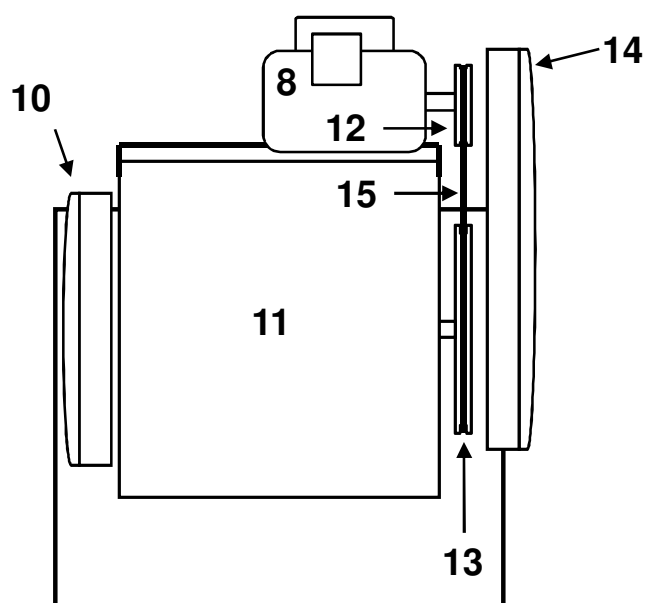
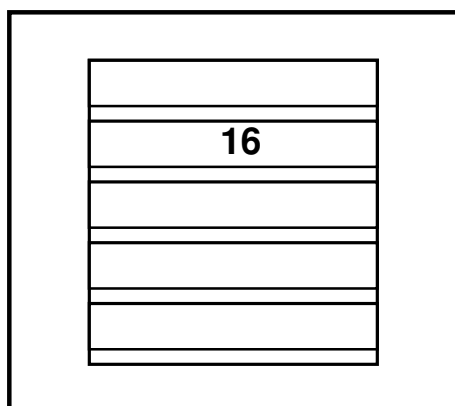
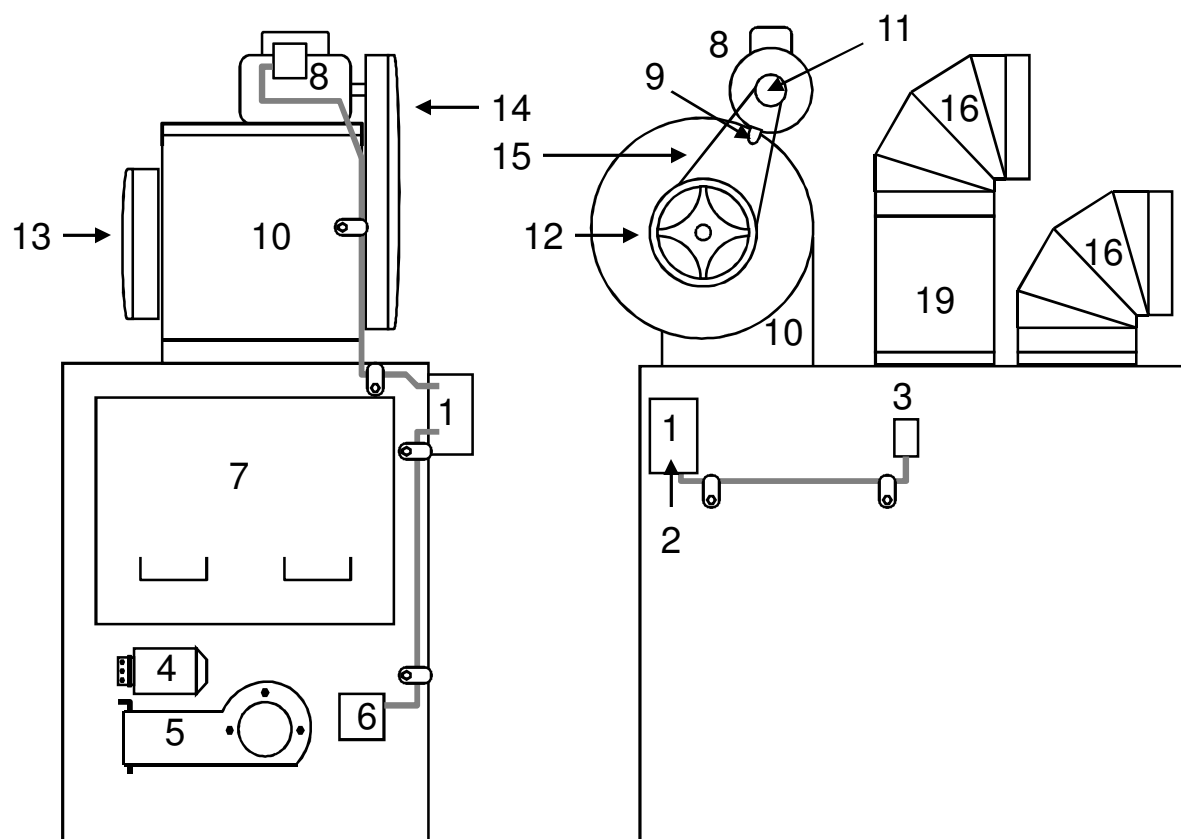


Figure 31

HEATWAVE 350 PARTS



Note: For burner parts see Kagi manual

- | | |
|--|---|
| 1. Breaker Box | 10. Blower |
| 2. 25A Breaker | 11. Drive Pulley |
| 3. Fan & Limit Switch | 12. Driven Pulley |
| 4. Inspection Door | 13. Blower Guard |
| 5. Swing-out Bracket | 14. Belt Guard |
| 6. 4 X 4 Junction Box
(burner cord safety disconnect) | 15. Belt |
| 7. Shell Cleanout Door | 16. 12" Elbow |
| 8. Blower Motor | 17. Front Pot Cleanout Door (not shown) |
| 9. Motor Mount Bracket | 18. Rear Pot Cleanout Door (not shown) |
| | 19. 12" X 12" Elbow Extension |

Figure 32

HEATWAVE CLEANING

Caution: Wear industrial dust mask and protective clothing.

Refer to section 7.06 "Seasonal Cleaning" for more information.

1. Turn thermostat to off or set below room temperature and allow furnace to cool completely.
2. Disconnect power from furnace, turn unit breaker to off.
3. Disconnect burner power cord, thermostat wires, air and oil lines and remove burner.

Note: Remove sheet metal screws from access panels prior to panel removal.

4. Remove chimney flue, clean and inspect.
5. Remove left and right shell access panel by lift upward and pulling out.

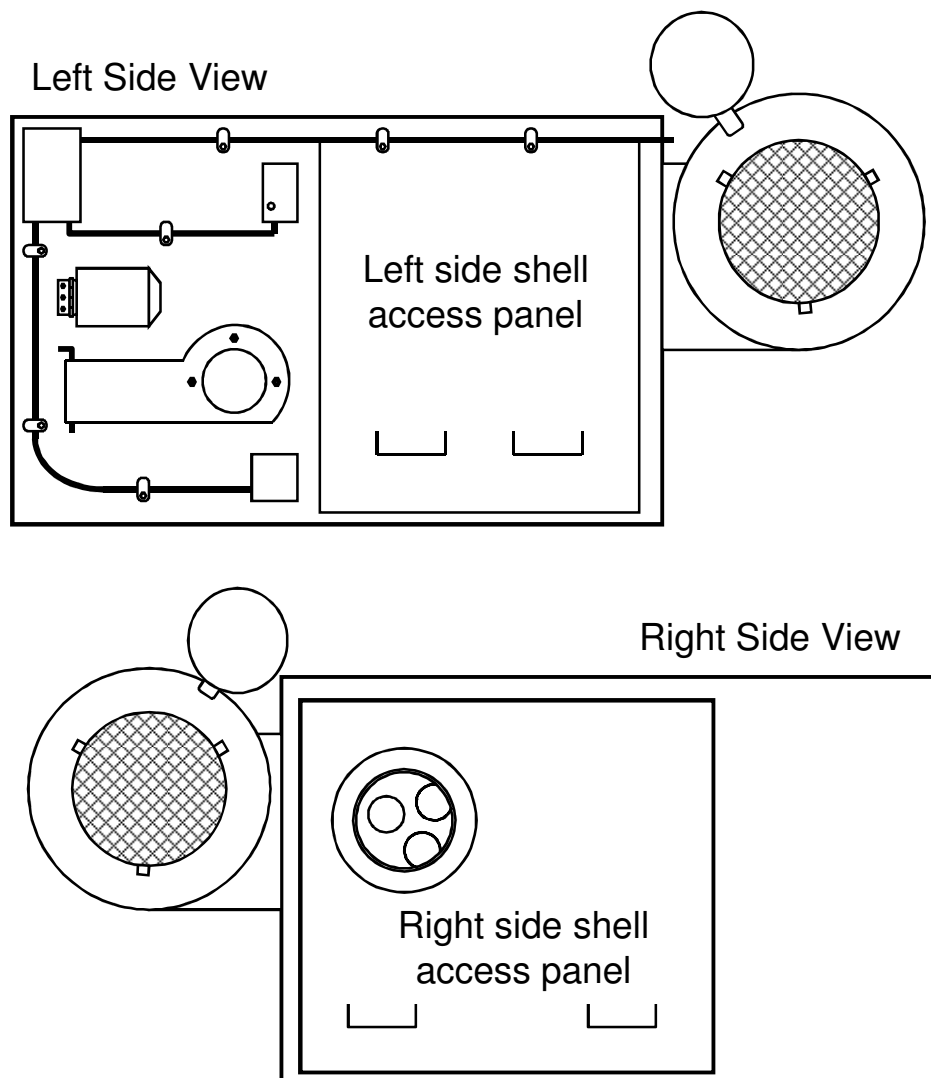


Figure 33

6. Loosen the brass nuts and clamps around left and right clean-out doors.
7. Remove center nut from right side (chimney) door.
8. Remove left and right clean-out doors to expose exchanger tubes and combustion chamber.
9. Clean all dust and residue with a shop vac. Gentle brushing may be required to remove dust and build up.
10. Check for “clinkers” and other build-up by the burner tube.
11. Inspect fiber gasket material on the clean-out doors and the left side tube area, replace as required.
12. Assembly is the reverse of the disassembly.

Note: Replace the doors carefully, making sure of a good seal. Light tapping around the perimeter of the doors with a mallet or dead blow hammer will help to ensure a good seal. There should be NO combustion chamber air leaks.

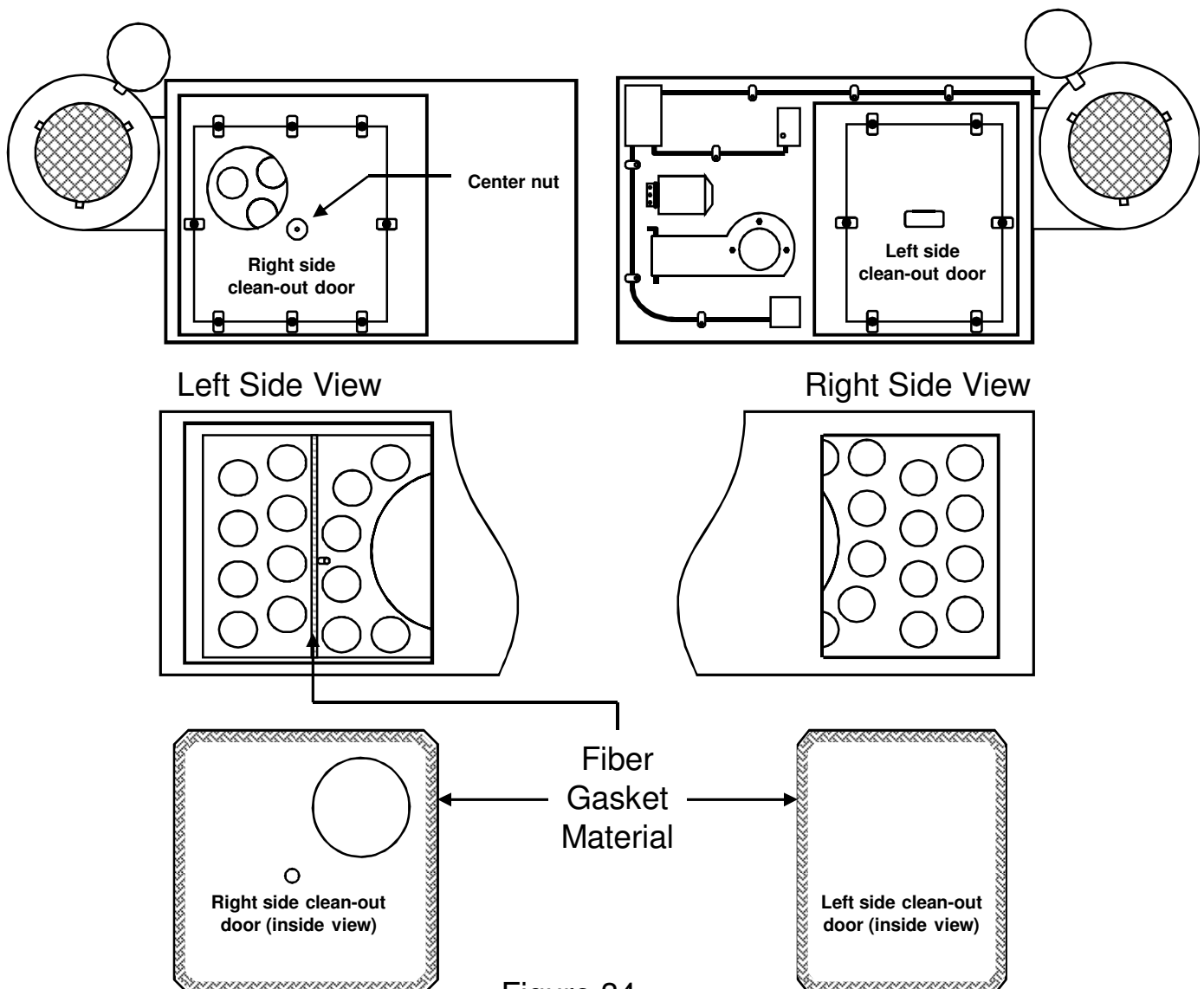


Figure 34

**DO NOT OPERATE WITH
BELTGUARD REMOVED**

**CAUTION
HOT**



WASTE OIL SPECIFICATIONS



CAUTION: Never burn Gasoline, Cleaning Solvents, printing fluid, brake fluid or any flammable hydrocarbons in the burner. Do not attempt to burn crude oil or garbage.

FUEL USE: # 1 & # 2 Fuel Oil, used (ATF) transmission oil and used motor oils up to 50 S.A.E.

FIRING RATE: Never exceed 1.3 GPH on the model HW150, 2.0 GPH on the model 250 and 3.25 GPH on the model HW350

ELECTRICAL: Furnace is wired for 115 Volt, 60 Hz, with a 24 Volt thermostat. Use copper wire. Provide a separate 25 Amp service to the furnace. Meet National Electrical Code NFPA # 70 and all state and local codes.

Figure 35



CAUTION

Minimum clearance to combustible material is 12" from the side walls, 18" from the top. If floor mounted, set on a non-combustible flooring material. Do not block or have anything obstructing the incoming air at the blower.

The minimum circuit amperage is 10 amp.

The maximum rating of circuit protective device is 25 amps.

Rev. 1

Use copper conductors only.

Do not obstruct the outlets on the heaters. These are designed for maximum output. For duct connection maintain a lower static pressure in duct than in heater.

START UP PROCEDURE

1. Turn off electrical supply.
2. Fill the fuel supply tank above the fuel supply check valve.
3. Check for proper chimney draft. (.02)
4. Check the combustion air setting on the burner.
5. Turn main electrical service on.
6. Push reset button on the primary for three seconds.
7. Prime fuel supply.
8. Adjust air pressure regulator to 12 PSI or above.
9. Set toggle switch to "Pre-heater On" if you are burning waste oil, leave off if you are burning regular fuel oil.
10. Wait for "Green Light" plus 10 minutes to preheat the oil to operating temperature.
11. Turn up thermostat, burner should fire. (Failure - see troubleshooting)
12. Check air pressure.
13. Adjust flame length by adjusting oil pressure and air band. Flame should reach $\frac{2}{3}$ - $\frac{3}{4}$ of the way across heat exchanger.

Figure 36

SHUTDOWN:

Turn wall thermostat below room temperature.

Allow furnace cool down, wait for burner to cycle off, then wait for blower to cycle off.

Prior to servicing, disconnect power by switching furnace breaker to OFF.

For long periods of shut-down, follow instructions in manual.



CAUTION

WHEN OPENING INSPECTION DOOR

PORT MAY BE HOT

OPEN DOOR SLOWLY

WEAR SAFETY GLASSES

KEEP FACE AWAY

PROTECT HANDS

Figure 37