EB200D Field Assist Troubleshooting Guide

Welcome to the Campo **"Field Assist Troubleshooting Guides".**
These guides were developed to assist the working technicians in the field. We've supplied issues and solutions to the most common problems encountered in the field. If you need assistance while troubleshooting on the job, they are easy to store in your smart phone, tablet or computer.

Getting Started is easy! Just click on 'Page #'
for the problem you are encountering

Burner control is locked-out on reset ⟷ Burner control is NOT locked-out on reset and won't start

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- To receive Field Assist Troubleshooting Guides, Tech Tips and more…Page 38
- Quick set-up and Installation Guides and technical information…Page 39
- Contact Us…Page 37

Burner is locked-out on reset

"Field Assist Troubleshooting Guide"

- A flashing reset button light indicates the burner control is locked-out on reset. Press and release the button to reset.

Flashing

- A solid red 'reset button light' indicates the burner control is in hard lock-out. Reset the control by pressing the button for 15 seconds or till the prime light comes on.

Solid red

- You Reset The Control, The Burner Starts , But Does Not Ignite… Page 3
- You Reset The Control. The Burner motor Did Not Start and Locks-out on Reset… Page 15
- If the green 'Flame Present' Light Is Illuminated Before The Call For Heat…Page 18
- If A Flame Is Present During The Pre-Purge…Page 20

➢ Warning! Continuous resetting of the burner control may cause an accumulation of fuel oil in the heatexchanger, and this could lead to an Implosion of the heatexchanger or personal harm.

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You Reset The Control, The Burner Starts , But Does Not Fire

Reset the control and check for pressure

- If the pressure gauge reads 50 psi and remains at 50 psi… Page 4
- If the pressure increases to 150 psi after the pre-purge… Page 7
- If the pressure gauge reads ZERO psi…Page 10

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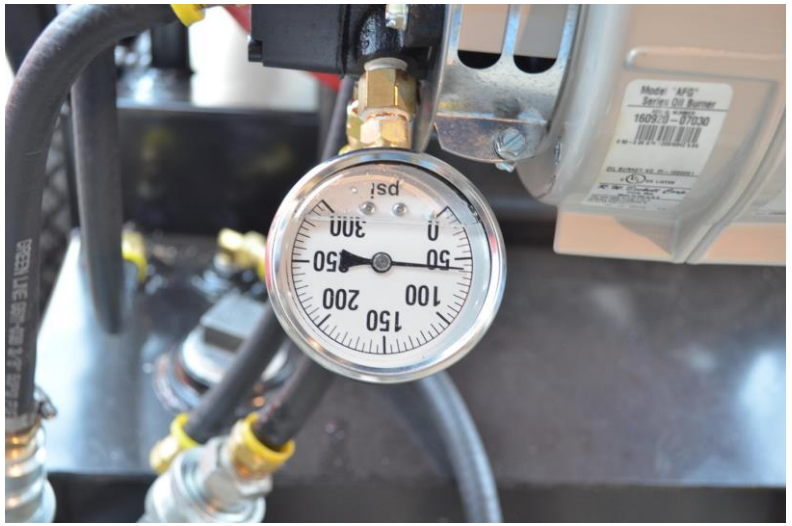
If there is only 50 PSI and the control locks out on reset.



- ✓ Defective solenoid valve coil.

- ✓ Defective burner control.

- ✓ Defective fuel pump.

➢ Test the components… Page 5

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Check the solenoid valve coil

- Set your meter to OHMs. Measure the resistance across the two terminals of the coil.

  ✓ If there is approximately .357ohms resistance, the coil is good.

  ✓ If NO resistance, the coil is defective.

➢ If the coil tests good… Page 6

HOME

Check the burner control and fuel pump

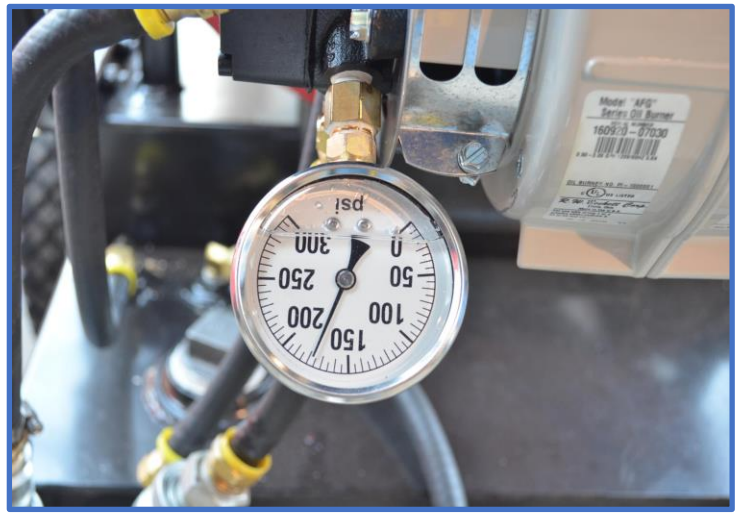
- Start the burner. After the purge check for 120 volts from burner control on the coil plug.

  - ✓ If 120 volts is not present, the control is defective.
  - ✓ If 120 volts is present, defective fuel pump.

Problem Solved

HOME

If the pressure increases to 150 psi after the pre-purge…



- ✓ Defective igniter.

- ✓ Defective electrodes.

- ✓ Water in fuel oil.

- ✓ Defective nozzle.

➢ Test the components… Page 8

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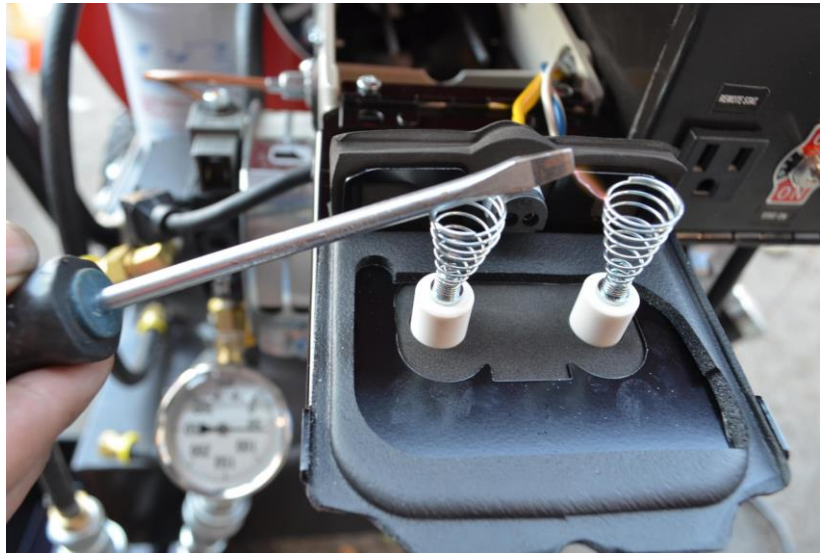
Check the igniter for spark



- Shut off the power supply to the heater.
- Open the igniter from the burner housing
- Remove the cad from the igniter base plate
- Restore power and start the burner.
- Check for spark across igniter terminals

➢ NOTE: ensure to use a well insulated screwdriver to test for spark.

✓ If there is no spark, defective igniter.

- If there is spark, continue…Page 9

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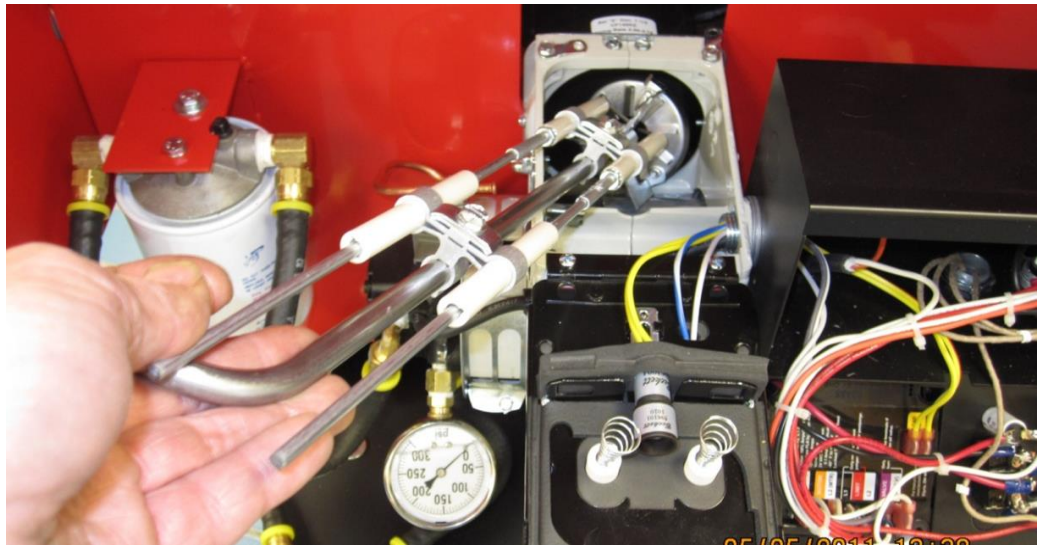
Check electrodes and nozzle



Remove the Nozzle Line Assembly from the burner housing…

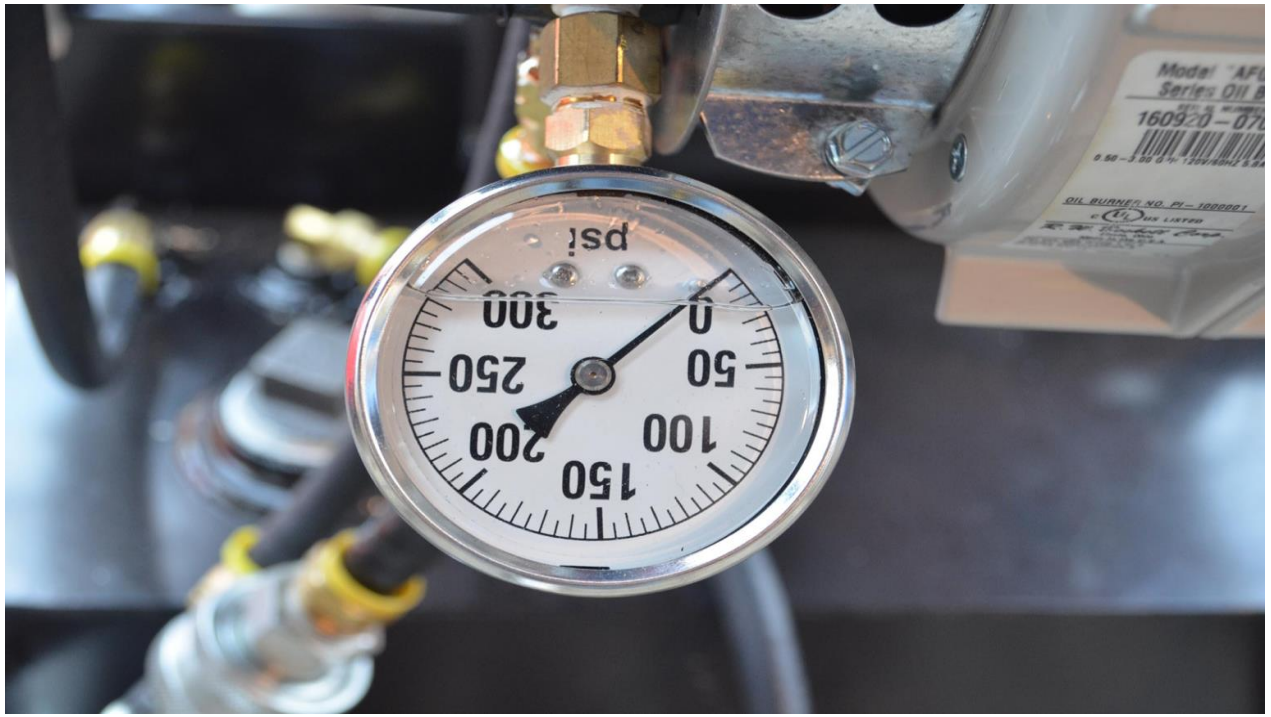
- Inspect electrode porcelains for cracks
- Check for water in nozzle assembly tube.
- Check electrode adjustments

➢ If electrodes are good and there is no water in oil tube, the nozzle needs to be replaced.

Problem Solved

HOME

ZERO pressure on the gauge.



- ✓ Defective pump
- ✓ Broken pump coupling
- ✓ Clogged filters
- ✓ Clogged oil lines
- ✓ No fuel in tank

➢ Test the components…Page 11

HOME

Checking the pump coupling and fuel oil pump

- Remove the oil line fitting at the pump to see if there is fuel oil in the line.

  - If there is fuel in the pump and oil line…

    ✓ Defective pump coupling

    ✓ Defective fuel oil pump

➢ If there is fuel in the pump and oil lines…Page 12

➢ If there is NO fuel in the pump and oil lines…Page 14

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Checking the fuel pump and coupling

Fuel Pump

Pump coupling

Remove the pump and coupling. Inspect the coupling to ensure the coupling is fitted secure to both the motor shaft and the pump shaft.

- NOTE: If the coupling is good, then the pump is defective. Before replacing the fuel pump…Page 13

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When replacing the fuel oil pump…!!!!

Note: You MUST ensure there is a bypass plug Installed in the pump when replacing.

Bypass plug port indicated on pump label

When replacing the fuel pump, install the bypass plug into the new pump.

Problem Solved

HOME

Checking for fuel in the filter, fuel lines and fuel tank…

If there is no fuel oil in the pump and oil lines…

- Check for fuel oil in tank
- Check for blocked filter or lines
- Check pickup tube in tank

Problem Solved

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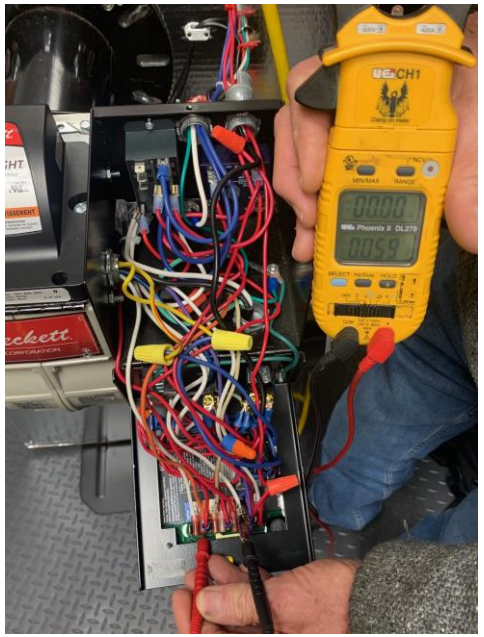
The burner motor did NOT start and the control locks-out on reset…



- ✓ Defective burner motor

- ✓ Defective Burner Control

- ➢ Test the components…Page 16

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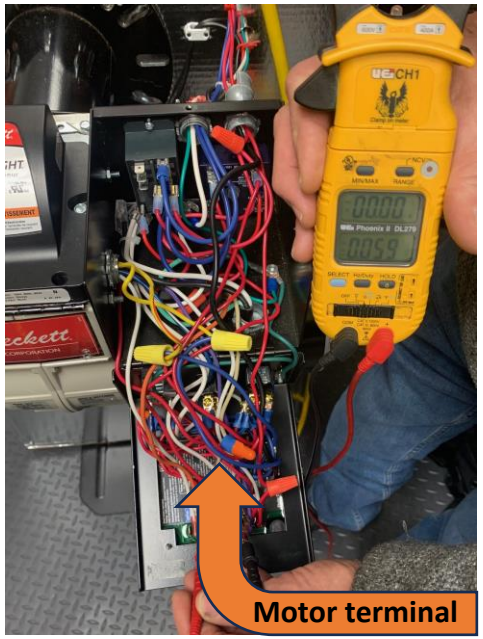
The burner motor did NOT start and the control locks-out on reset…



Reset the burner control and check for 120 volts on the orange terminal of the burner control, labeled "motor"

- ✓ If 120 volts is not present, defective control.
- ✓ If 120 volts is present, the burner motor is defective.

➢ Before replacing burner motor ensure the fuel oil pump is not just seized… Page 17

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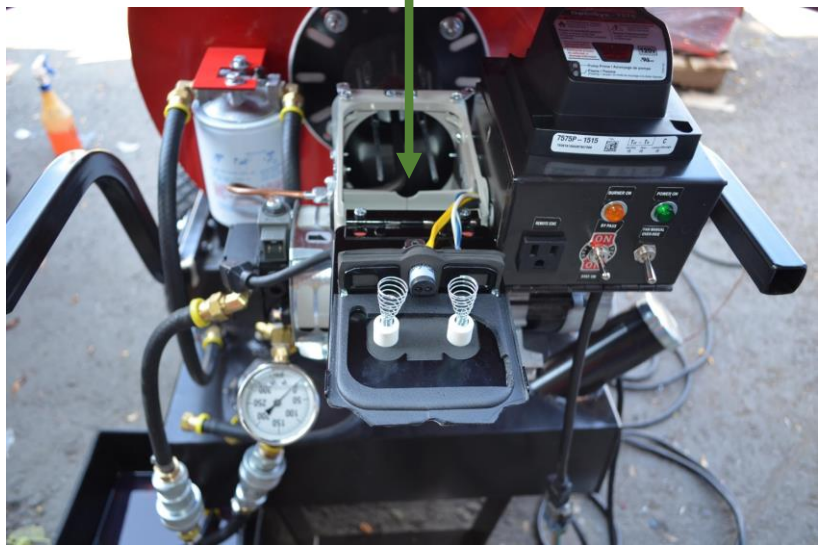
Checking The Fuel Oil Pump

blower wheel

blower wheel Location



- Unplug the heater and open the igniter to access the blower wheel. Rotate the blower wheel by hand. If the blower wheel does not turn freely, it is likely the pump is seized

  - ✓ Try freeing the pump by moving the blower wheel back and forth. "Caution should be taken" not to damage the blower wheel with excessive force.

  - ✓ If the pump does not turn by moving it back and forth. You can use a adjustable wrench, placed on the pump shaft to unseize.

Problem Solved

HOME

Flame Present' light on the control is illuminated *BEFORE* the call for heat..

Flame Present Light

- ✓ Defective cad cell

- ✓ Defective cad cell harness

- ➢ Testing the cad cell or harness… Page 19

HOME

Testing the cad cell and harness.

Remove the cad cell from the harness.

- ✓ If the green light remains ON, the harness is defective.
- ✓ IF the light goes out, the cad cell is defective.

Problem Solved

HOME

If there is a flame present during the pre-purge…

- If there is a flame during the pre-purge…

✓ Defective fuel oil pump.

Problem Solved

HOME

The burner is NOT locked out on reset.

Before Proceeding!

1. …ensure there is 120 volts power supplied to the heater.
2. …ensure the 'bypass switch' is in the ON position.
    - If the Burner Control is NOT locked out on Reset and will not start… Page 22
    - If the fan doesn't start automatically…Page 32
    - If the Circulating Fan Fails To start… Page 28
    - Circulating Fan Does Not Shut Off… Page 34

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If the Burner Control is NOT locked out on Reset and will not start…

Check for 120 volts between Limit Terminal and Common (L2) on the burner control.

✓ If 120 volts is NOT present, Page 23

✓ If 120 volts is present, Page 25

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If the Burner Control is NOT locked out on Reset and will not start…

- ✓ Defective 150°F high limit disc (#1)
- ✓ Defective 150°F high limit disc (#2)

➢ Testing the 150°F high limit discs…Page 24

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Testing the 150°F high limit discs…

- Check for 120 volts on each terminal of the disc to ground, starting on disc #1.

✓ If there is 0 volts on one terminal of disc #1, then disc #1 is defective.

✓ If there is 120 Volts present on each terminal of disc #1, disc #2 is defective.

Problem Solved

If the Burner Control is NOT locked out on Reset and will not start…

- ✓ Defective Bypass Switch

- ✓ Defective Circulating fan motor thermostat

- ✓ Defective Burner Control

➢ Test the components. Page 26

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If the Burner Control is NOT locked out on Reset and will not start…

Place a jumper wire on terminals T-T

- If the burner doesn't start, the burner control is defective

✓ If the burner starts, the bypass toggle switch or the circulating fan motor thermostat is defective.

➢ Testing the circulating fan motor thermostat and bypass switch… Page 27

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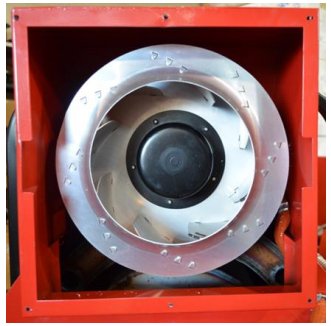
If the Burner Control is NOT locked out on Reset and will not start…

- NOTE: On late model, Blaze construction heaters, the circulating fan motors are equipped with a thermal heat thermostat in the blower motor and is not field serviceable.



- The motor thermostat is wired in series with the 24 - volt thermostat and bypass switch circuit.

Check to ensure the thermal heat thermostat contact is closed by testing for continuity, using the 2 white or 2 grey wires leading to the circulating fan motor.

- ✓ If the contact is closed, the thermal heat switch is good and the by-pass switch is defective

Problem Solved

- ✓ If the contact is open, the 'Circulating Fan Motor' thermostat is defective and needs to be replaced.

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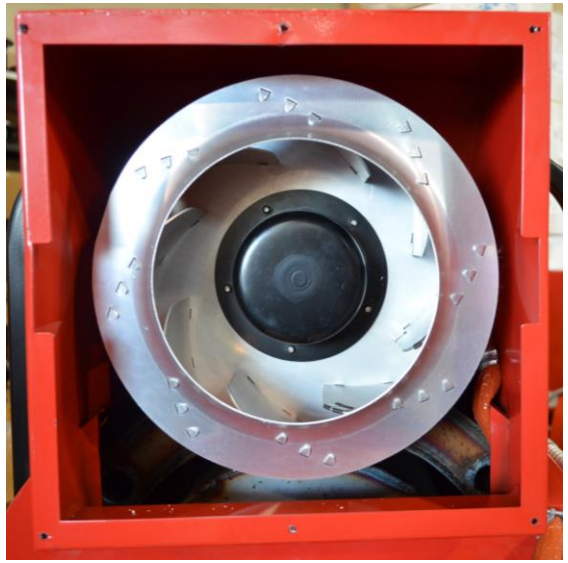
The Circulating Fan Fails To Start…



- ✓ Defective Fan Motor 
- ✓ Defective Fan Relay 
- ✓ Defective Fan 110F disc 
- ✓ Defective Fan Timer 

➢ Test the components… Page 29

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Testing the fan relay, fan motor, fan 110°F disc and fan timer

Toggle the FAN OVERIDE switch to ON.

- If the fan does NOT start… Page 30

✓ Defective Fan Relay
✓ Defective Fan Motor

- If the fan starts… Page 31

✓ Defective Fan 110°F Disc
✓ Defective Fan Timer

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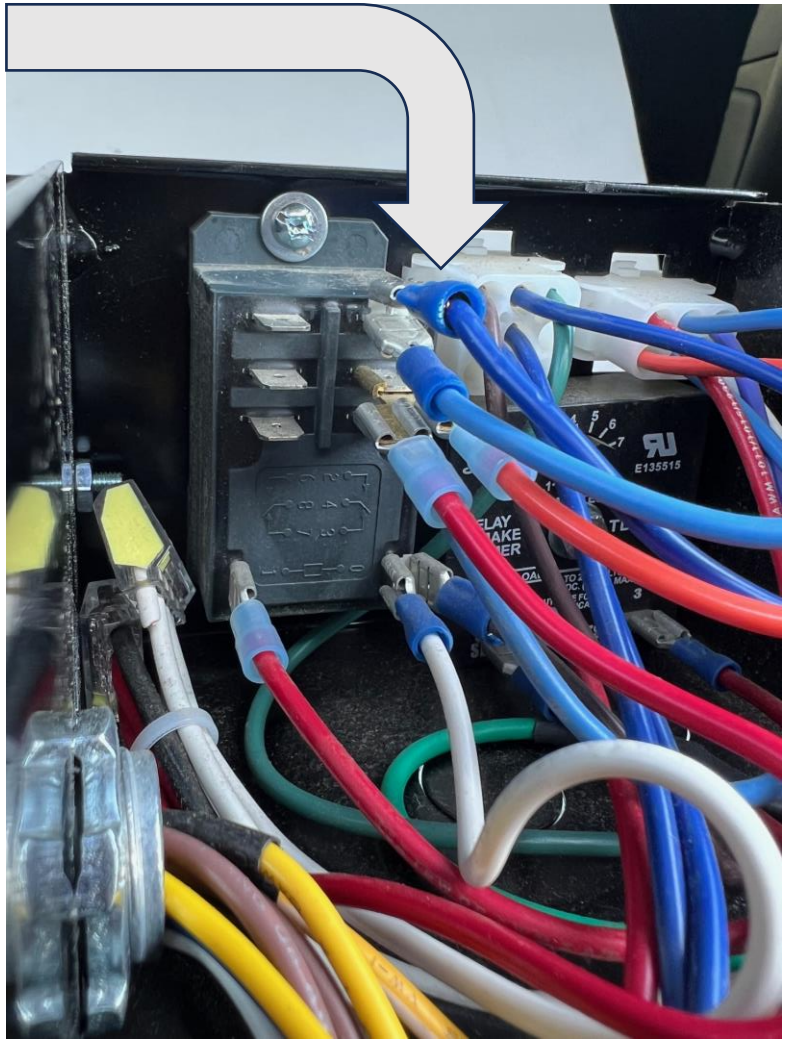
Checking fan relay and fan motor



With the Fan Override switch in the ON position, check for 120 volts at the motor terminal of the fan relay.

- ✓ If there is 120 volts, the fan motor is defective.

- ✓ If 120 volts is not present, defective relay

Problem Solved

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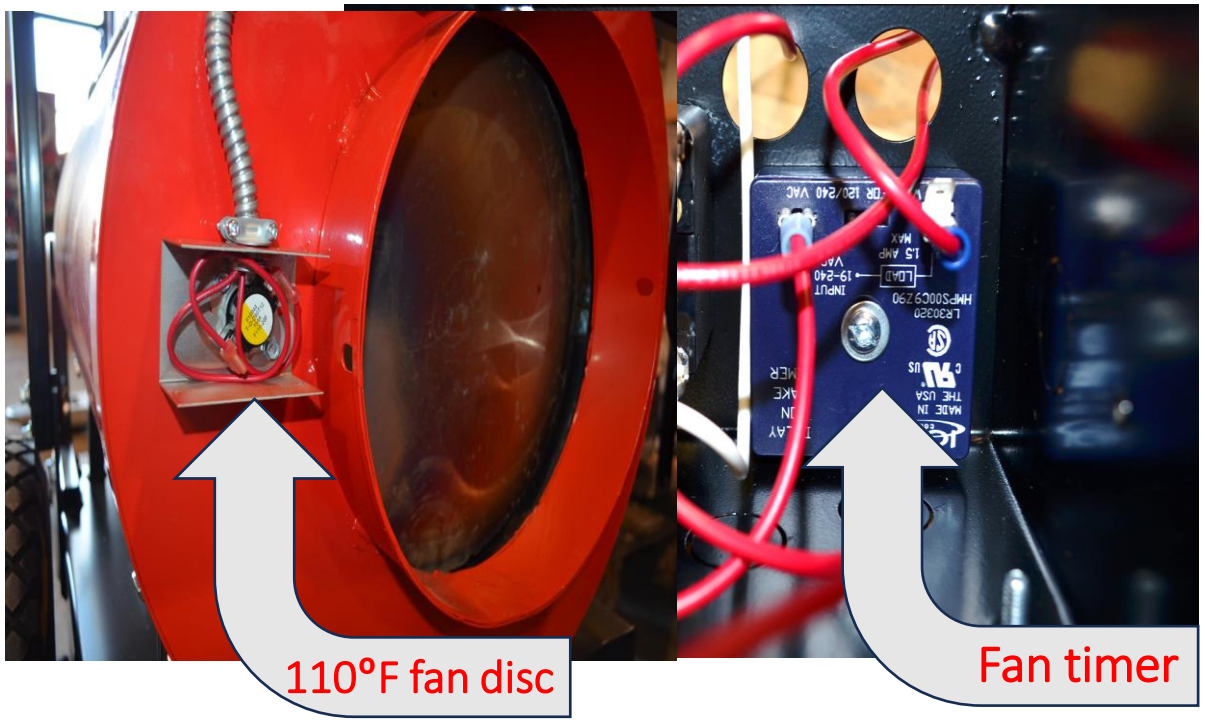
Checking the fan timer and 110º F fan disc



- ✓ Defective timer
- ✓ Defective 110°F fan disc

- ➢ If the 110°F fan disc is defective…Page 32
- ➢ If the fan timer is defective… Page 33

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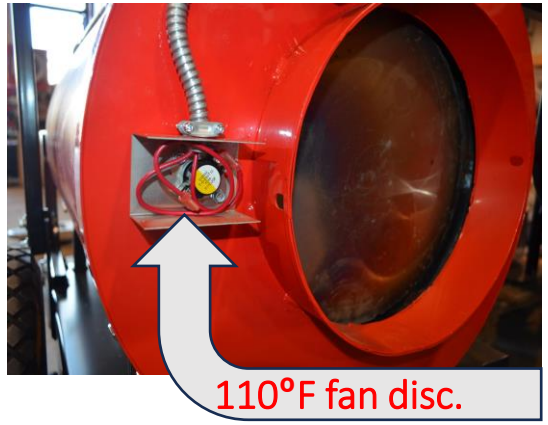
Defective 110F fan disc



If the 110°F disc is defective, the fan will shut down at the same time as the burner shuts off.
Or the fan will not shut off when the burner is off.

- **Caution :** Allowing the heater to continue to operate with a defective fan disc will shorten the life expectancy of the heat exchanger and burner components.

Testing the timer…Page 33

If the fan timer is defective, the burner will produce heat and then shut off on high temp limit, *before the circulating fan starts*. The heater will continue to operate this way until the defective fan timer is replaced.

- Caution : Allowing the heater to continue to operate with a defective fan timer will shorten the life expectancy of the heat exchanger and burner components.

Problem Solved

Circulating Fan Does Not Shut Off

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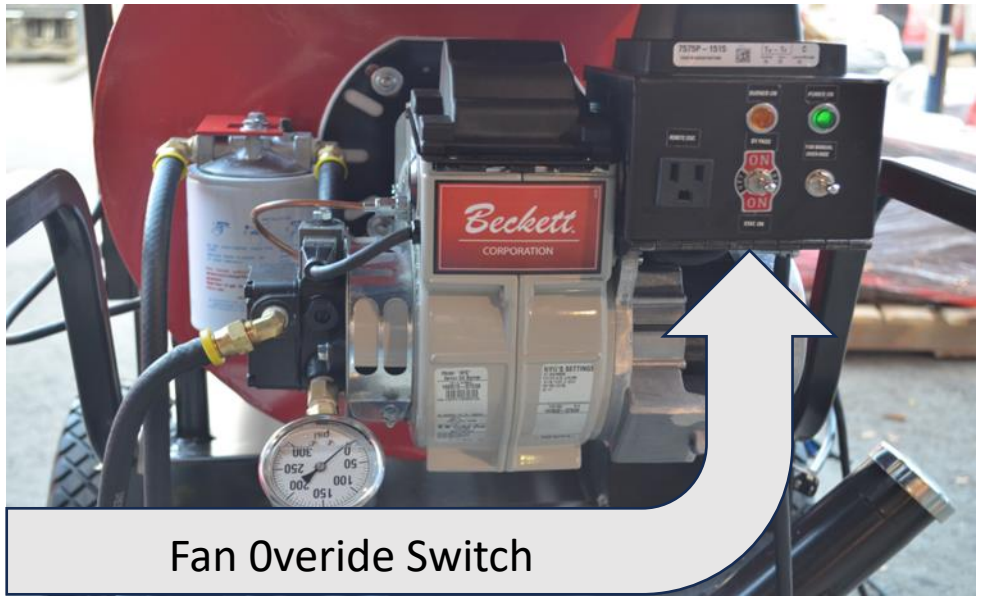

Fan Overide Switch

First! Ensure that the ambient temperature at the 110°F fan disc is less than 80°F.

- ✓ The Fan Override switch is not in the ON position. (Turn it to the OFF position)
- ✓ Defective 110°F fan disc 
- ✓ Defective fan relay 

- ➢ Checking the defective 110°F fan disc… Page 35
- ➢ Checking the defective fan relay… Page 36

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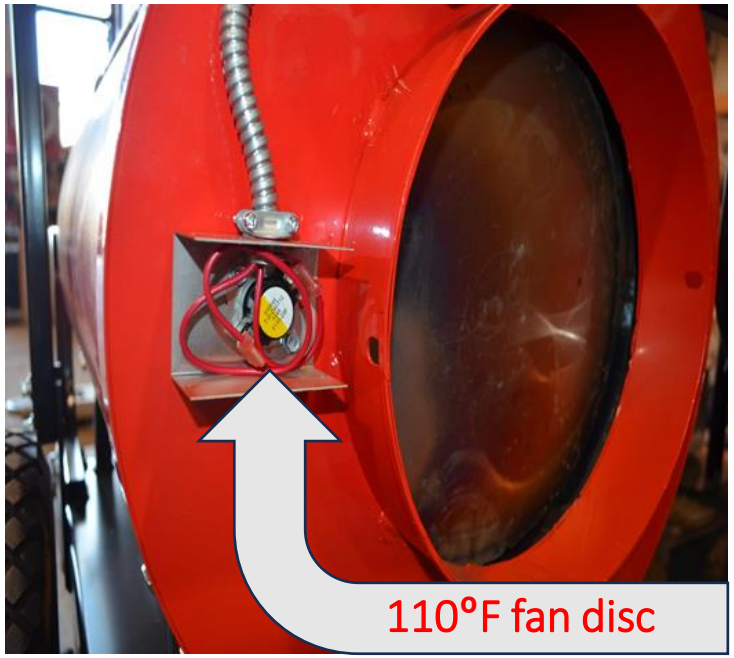
Circulating Fan Does Not Shut Off
Checking – Circulating Fan Disc



- Check for 120 volts on each terminal of the fan disc.

✓ If 120 volts is present on BOTH terminals, the disc is defective.

- If 120 volts is present on ONE terminal only, the disc is GOOD.

➢ Testing fan relay…Page 36

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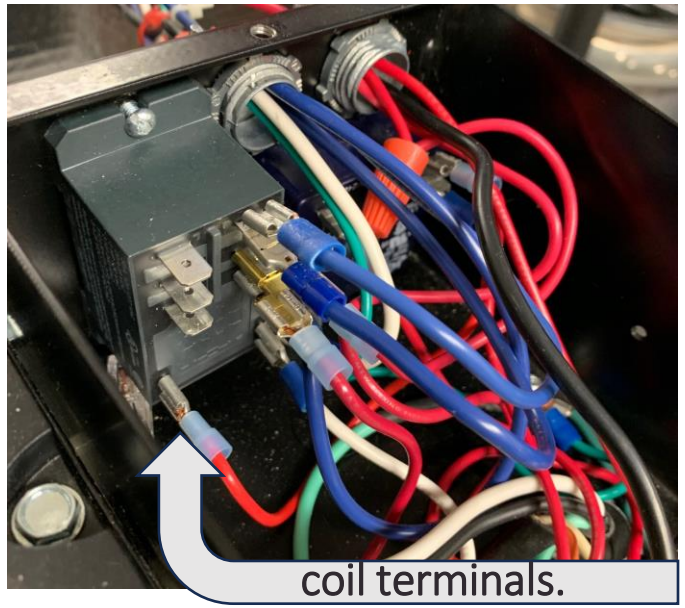
Circulating Fan Does Not Shut Off
Check circulating fan relay



- Check for 120 volts on the relay coil terminals.

✓ 0 volts indicates a defective fan relay

Problem Solved

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Choose the information you require and click on the Page

Instruments needed for Fuel Oil heater set-up and diagnostics.

What you need to commission the heater!

Combustion Analyzer

Voltmeter

Smoke Tester

➢ Start-up continued…Page 41

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Start-up procedure Fuel Oil fired units. "Field Assist Troubleshooting Guide"

- Make sure the venting is properly installed…Page 45
- Make sure the proper size wiring and proper voltage is supplied to heater…Page 48
- Make sure all piping and fittings are tight and free from oil leaks.

➢ Start-up continued…Page 42

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Start-up procedure Fuel Oil continued.

- With the switch for the burner in the off position, plug in the heater, turn the fan manual override switch to ON position and ensure voltage remains steady. Return fan manual override switch to OFF position.

- Place the toggle switch in bypass position to start the burner. Once the burner is running make sure that the oil pressure is adjusted to the manufacture's recommendations 175 PSI.

➢ Start-up continued…Page 43

Clean & Reliable Combustion

Getting the most reliable performance out of an oil burner comes down to ensuring that it is properly set up. This can require some fine tuning, but the following steps should help you achieve the reliable combustion you are looking for…

- **No installation** is complete until the combustion of the heater has been performed.

Using a combustion analyzer… Page 44

Clean & Reliable Combustion

"Field Assist Troubleshooting Guide"

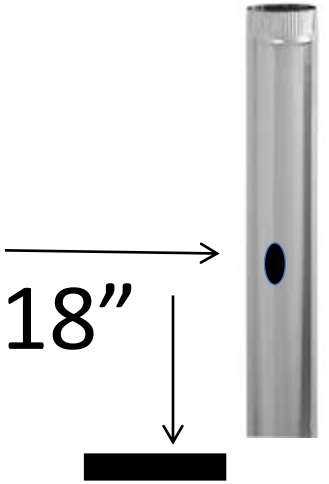
- **While the flue-stack is still cold pre-drill ¼" hole in the flue-stack 18" above the flue collar.**

Set the air settings to manufacture's recommendations. Once you've done that, start the burner and let it operate for 10 minutes. Draw a smoke sample from the flue pipe. Adjust the air settings to achieve between trace and number 1 smoke.. Next, draw a carbon dioxide (CO2) sample from the flue pipe. Adjust the air settings to achieve between 11.5% & 12%. CO2
Check the CO (Carbon Monoxide) level, it should not be higher than 50 PPM.

Air setting 4/2

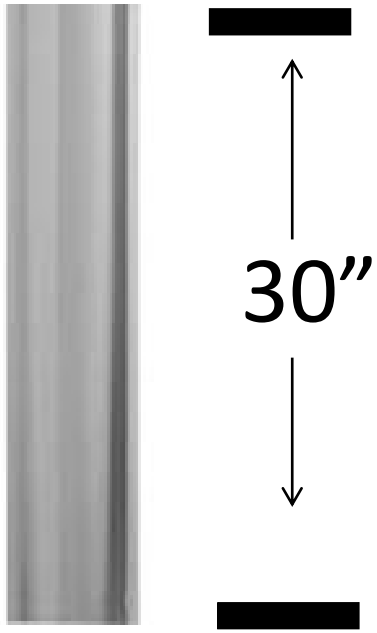
Smoke Tester

Combustion Analyzer



Test Hole

Venting outside a building.



- Make sure to install a stack minimum 30" on the flue.
  Make sure to install a rain cap on the flue pipe.
  Make sure that flue gases are not being circulated into by the cooling fan and pushed into the space you are heating.

WARNING: The appropriate measures must be taken to ensure there will be no positive pressures on the exhaust flue of the heater.

➢ Venting from inside a building…Page 47

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Best practices for venting when heater is located inside a building

- Avoid using as many 90-degree elbows as possible
- Venting runs should be as short as possible
- Vertical rise minimum 3 feet, 5 feet is better outside the building.
- Always install a rain cap.

- Never decrease diameter of flue piping.
- Horizontal runs ¼” per foot rise.
- Make sure all piping is properly secured.
- Make sure there is no negative pressure inside the building where the heater is placed.

➢ Note: where the vent pipe passes through a combustible wall a fireproof thimble must be used.

Back to startup procedure…Page 39

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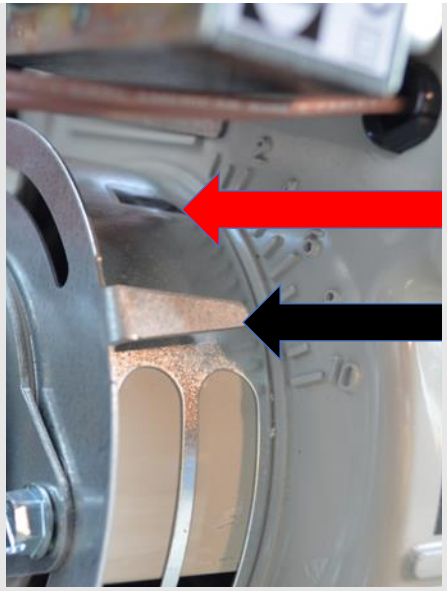
Combustion and adjusting the air settings.

Proper air adjustments must be preformed for reliable combustion



Air - settings EB200D 4/2

- Recommended air settings are indicated in manufactures instructions as:
  Example: 4/2 the first number being the shutter and the second number being the air band.

➢ Note: recommend air settings are approximate and will change with altitude and fuel oil temperature.

➢ Using a combustion analyzer will ensure clean burning and maximum efficiency.

➢ EB200D Air setting 4/2, Oil pressure is 175 PSI.

Back to technical information…Page 39

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Electrical hook-up…

- Only extension cords that are CSA / UL approved should be used.

Extension cords should be no less than # 12 gauge up to 50 feet
Over and up to 100 feet, no less than #10 gauge should be used.
Do not plug multiple extensions together.
Make sure extension cords are placed so as not to obstruct walkways and protected against traffic.

- WARNING: If the heater is going to be fed with power from a generator, always have the heater unplugged until the generator is running stable. Ensure the generator is sized to accommodate the heater voltage demand.

back to other technical information…Page 39

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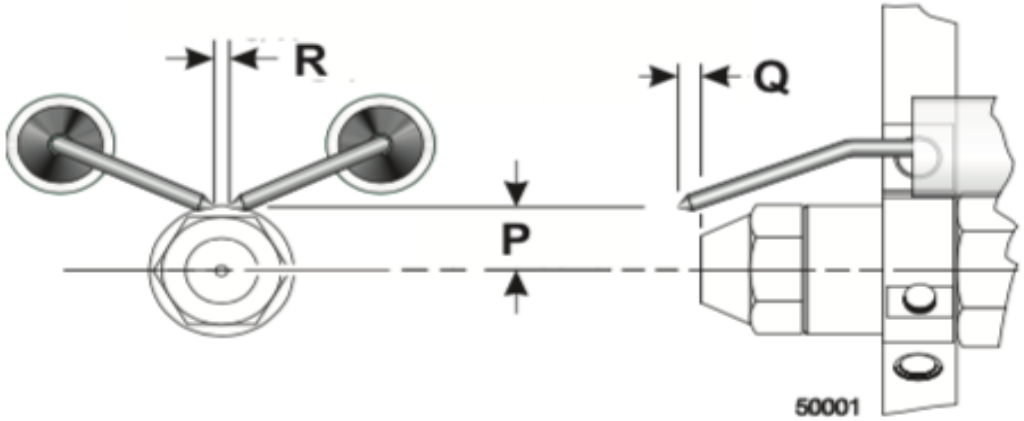
Electrode Adjustments

- EB 200D...(P = 5/16") (Q = 1/16") (R = 5/32" gap)



Legend (Figure 5)

P	Nozzle centerline to electrode tip = 3/16"
Q	Nozzle face to electrode tip = 1/4"
R	Electrode spacing = 3/16" gap

- EB200D Air setting 4/2, Oil pressure is 175 PSI.

back to technical information...Page 39

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Pre-season checklist oil fired Heaters:

SERIAL NUMBER:	Test DATE:
Model	/ /
Tested By:	
Oil Burner	
Preform and Record combustion results:	
CO2 PERCENTAGE (carbon dioxide)	
CO parts per million (ppm carbon monoxide)	
Remove nozzle line assembly adjust electrodes and clean	
Replace nozzle (if necessary)	
Remove cad cell and clean glass eye	
Test igniter	
Start burner and check control lock-out	
Check and adjust oil pressure	
Clean blower wheel (remove dust)	
Continue page 51	

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Pre-season checklist oil fired Heaters:

Heater controls	
Test temperature controller Fan on at 90F / Fan off at 80F Burner off 10F above set high limit / Burner back on at high set temp	
Check circulating fan,(Fan timer, Fan 110F disk)	
Check wiring terminals inside control panel	
Check for water in fuel oil tank and remove water, if need be, (important)	
Return to information menu…Page 39	

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