

**BRECKWELL
DEALER SERVICE GUIDE**

issue date 4/96
supersedes previous issues

- 3.2 **BLOWER SERVICE:** Note: Be sure stove is unplugged before servicing. Each blower is tested for noise and operation prior to installation.

Prior to 1994 models, convection blower is Fasco model number U63B1. 1994 models use Fasco model number U21B.

Combustion blowers on all but P28 models are Durham model number C-E-020

Symptoms that may indicate blower problem

1. Clanging or pulsing convection blower.

2. Clanging or pulsing combustion blower.

3. Blower doesn't operate

4. Noisy blower

Possible cause and remedial action

1A. Impeller set screw may be loose. Impeller is bent and/or rubbing fan housing.

1B. Impeller dirty. Carefully brush and vacuum clean.

2A. Impeller set screw loose.

2B. Impeller blower full of creosote or ash. Access through firebox or remove blower. Brush and vacuum clean.

2C. Bent or broken impeller blade.

3A. Thermodisk (see section 3.1).

3B. Power supply problem.

3C. Loose or faulty connection.

3D. Blower's internal thermo protector has shut blower down. Check again after stove has cooled.

3E. Blower motor burned out (unlikely unless heavy creosote build-up).

4A. Mount screw tension causing vibration. Adjust tension and gasketing. **Do not over tighten.**

4B. Oil convection blower. Blower manufacturers suggest oiling annually. See owners manual for lubrication points. Use SAE 20W or turbine oil. Limit to one or two drops.

PROCEDURAL NOTES:

A. To service or replace convection blower, you'll need access to stove's left side.

B. Make certain gasketing is replaced and correctly positioned when blowers are removed and replaced. Note: Torque mounting screws to equal tightness. Do not over tighten.

C. Reconnect wiring according to the electrical diagram in owner's manual.

IMPORTANT: Factory will not accept a claim for blower replacement unless a manufacturing defect is found in returned blower. Blowers or impellers damaged due to creosote or ash accumulation will not be considered for warranty replacement.

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3.3 **AUGER SERVICE** Note: Be sure that stove is unplugged before servicing. See Figure 3.

The auger on every stove is filled with pellets and tested for operation.

Symptoms that may indicate an auger problem

1. Auger motor cycles, no pellets drop.

2. Noisy auger motor.

3. Erratic Pellet feed.

Possible causes and remedial action

- 1A. Coupling set screw loose on auger or auger motor shaft. Loosen set screws on coupling, ensure set screws line-up with shaft flat spots, re-tighten.
- 1B. Attempt to manually turn auger. (see below). If this does not clear auger, empty hopper, remove and inspect auger.
- 1C. Stripped gear on auger motor. Replace motor.
- 1D. Broken weld on auger flight. Replace auger.
- 2A. Stripped gear on auger motor. Replace.
- 2B. Auger motor may be vibrating on air inlet tube or steel post.
- 2C. Rubber cushion may have moved. Reposition and secure with RTV.
- 3A. Circuit Board Timing. See section 3.42pg 7.
- 3B. Spacing on top of auger flight not equal. Call customer service.
- 3C. Broken weld on auger flight. Replace auger.
- 3D. Erratic voltage from power outlet. Call power company.

TO REMOVE AUGER MOTOR:

Loosen lower set screw in auger motor coupling, or set screw in set collar on model P23. Disconnect wiring at spade connectors. Pull off motor.

TO MANUALLY TURN AUGER:

Remove auger motor (see above). Attach channel locks to shaft coupling, being careful to avoid damage to set screw, turn clockwise or counter clockwise until object is removed or jam is released. **Note: Do not turn clockwise more than 1/4 turn.** Turn counter clockwise several revolutions before remounting auger motor.

TO REMOVE AUGER:

Remove auger motor, (see above). Remove the two biscuit mounting screws and pull the auger, with biscuit and coupler attached, 1/2 out of the auger housing. Then loosen upper set and remove coupling and biscuit. Then pull auger out. On P23, remove two biscuit mounting screws, remove silicone, with screwdriver pry auger (with biscuit attached) from housing. When remounting auger, be sure it seals in upper bushing hole. Reverse procedure making sure flat spots on auger shaft and auger motor shaft line up with set screws. Reseal bottom biscuit to auger housing with silicone on model P23.

NOTE: Upper & Lower Bushings are left hand thread & must be secure to avoid vacuum leakage and subsequent creosote buildup.

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The board now in use is found on all Breckwell models with serial numbers larger than the following:
P24FS - 80000 or OP600000; P24I - 40000 or OP200000; P32 - 50000; P26 - 90000

3.4 **CIRCUIT BOARD SERVICE** (Note: Be sure to unplug stove before servicing. If board contacts any metal surface while plugged in, an electrical shock could occur and the board could blow out.)

Each circuit board is tested by its maker, Applied Control Electronics (A.C.E.), prior to shipment and by us prior to installation.

If you and your customer have examined for, and ruled out other potential causes of the symptom, the circuit board can and should be tested on site.

3.41 **POWER**

You will need an AC Volt Meter or a 110V tester lamp, also two 6" insulated jumper wires. One with clips or male spade connectors and one with bare wire ends. The tests you will perform will sense power to the board. Do these tests in order. **CAUTION: Never jumper #1 to any other terminal.**

- A. Unplug power cord. Remove control panel plate by removing the four brass mounting screws. **Carefully** pull out panel plate and attached circuit board. Detach at Molex connector. Set board aside.
- B. Plug power cord in. Though power cord must be plugged in for these tests, it is safer to make the test connections specified when unplugged. Make connections then plug in.
- C. Test blower circuitry. Using jumper wire with bare wire ends, connect 2 and 4. Convection blower should operate. With 2 and 4 connected use jumper wire that has male spade connectors to jump blower thermodisk wires. Combustion blower should operate.
- D. Test Manual Feed auger circuit. Jump blower thermodisk wires. Move Molex jumper to connect 2 and 5. Auger should run.
- E. Test power to the circuit board. Using A/C volt meter, connect 2 to positive and 1 to negative. Should show 120 volts AC.
- F. Test auger thermodisk circuit. Move molex jumper to connect 2 and 6 and jumper wire with spade connectors to auger thermodisk wires. Auger should run.

After going through this sequence of tests and you have determined that the electrical components and wiring are functioning properly, plug in the circuit board and control panel to the Molex connector and leave loose outside stove panel. (Be sure back of circuit board is not touching stove.) Continue on to feed rate test.

Note: Never jump #1 (white) to any other terminal.

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CIRCUIT BOARD SERVICE - CONTINUED.

3.42 FEED RATE

The tests above will not identify problems in circuit board switches or the feed control circuit.

To test the feed control circuit, you'll need a stop watch. Make sure the stove is in normal operating mode; plugged in, switched on, and green light is on. You'll need visual access to the auger L.E.D. timing light behind the control panel. Later models have a hole in the control panel through which you can see the L.E.D. timing light without removing control panel from stove.

1. Measure duty cycle. At any control knob setting, there should be approximately 14.0 seconds between the start of one auger rotation and the start of the next. (auger L.E.D. light on to on.) 20.2 seconds on model P23.
2. Set Feed Control Knob to "Low". Use stopwatch to measure how long green timing light stays on during each duty cycle. It should stay on approximately .75 - 1.25 seconds, 3.75 - 4.25 seconds on model P23.
3. Set feed control knob to "Max". Light should stay on approximately 4.25 to 4.75 seconds (P24's) or 3.5 to 3.8 seconds (P32 & P26-Prior to "94" models.) or continuous for model P23.

SEE ATTACHED TIMING CYCLE SHEETS.

3.43 SWITCHES

Finally, if you've completed all the other diagnostic tests and not found the cause, defective switches in the circuit board could be responsible. The following tests should be conducted and if the specified performance is not observed, the board probably should be replaced. Call Breckwell Technical Service if unsure.

1. Push on/off switch to on position. Both blowers should come on.
2. Push and hold the Manual feed/High fan switch to Manual feed. The auger should rotate continuously.
3. Set feed control knob to low. Push the Manual feed/High fan switch to high fan. The convection blower should increase to highest speed.
4. Push the auger button. The green light should come on.

In rare cases, (i.e. if there is a short circuit,) a circuit board will be "blown." Symptoms of this might be an auger that runs continuously or other unlikely behavior. A blown board will usually show outward signs, like darkened components. In rare cases, a power surge can blow fuse. Call Technical Service if you suspect this.

3.44 FUSE P24's, 32's and P26 Series Only)

If the stove malfunctions and causes a constant auger feed, a fuse attached to the circuit board will blow. If this occurs, the stove wiring harness or the circuit board may have shorted out. An external electrical problem (i.e. power surge or electrical storm) could also have blown the fuse. Replace with Bussman .75 or 1 AMP, slow blow, 250V, MDL 3/4 fuse. If the fuse blows out again quickly, it is likely a blown board.

BLOWN BOARDS MUST BE REPLACED, OR A DANGEROUS CONDITION COULD DEVELOP.

SEE FOLLOWING PAGE FOR CIRCUIT BOARD DIAGRAMS

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2.2 "HOT ROD" AUTOMATIC FIRE STARTER INSTALLATION INSTRUCTIONS TRADITION SERIES:

NOTE: INSTALLATION MUST BE DONE BY AN AUTHORIZED BRECKWELL DEALER.

1. Unplug Stove.
2. On P24FS remove rear sheet.
3. On the P24I remove the convection blower.
4. Remove the 3/8" hinge pin from the rear of the firestarter housing (1/8" single allen wrench) tube by loosening the set screw on top of the housing tube.
5. Insert **HOT ROD** into rear of firestarter housing tube making sure that back of rod (with wires) is flush with housing back. Secure by tightening set screw. **CAUTION!** do not over tighten set screw as this may collapse HOT ROD!
6. Making sure that the Molex Connector on the firestarter control board is in the "up" position, very carefully connect the board to the pipe guide bracket by inserting the four (4) standoffs into the holes provided.
7. Connect the wire harness to the control board by plugging the male end of the molex (on harness) into the female end attached to the board.
8. Connect the two red wires to the two HOT ROD wires (either way) with spade connectors.

YOU HAVE NOW COMPLETED THE INSTALLATION OF THE BRECKWELL **"HOT ROD"** FIRESTARTER SYSTEM!

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2.3 VERTICAL INSTALLATION KIT INSTRUCTIONS - (# A-VIK):

For use with 1990 - 1996 models Breckwell P24FS.

NOTE: REAR SHEET MUST BE REMOVED FROM STOVE BEFORE INSTALLATION.

- A. Remove cover plate (1990-1993) or "knockout" (1996) on stove top. Remove rear sheet from back of stove.
- B. Remove 3" Dura Vent pipe adaptor from blower transition if installed. Note: The adaptor may have been shipped loose inside stove.
- C. Attach stainless steel flex pipe to blower transition. For best seal use high temperature RTV silicone sealant around the end of the flex pipe after it is installed. Using metallic tape, wrap the end of the flex pipe and RTV. Be sure to seal down tightly. Install hose clamp over metallic tape and flex pipe.
- D. Using the self threading screw provided with the kit, install the 3" OD pipe to the A-VIK bracket. Note: Top of pipe should not extend beyond top of stove.
- E. To prevent smoke leakage between walls of adaptor apply a large bead of RTV between inner and outer wall of 3" Dura Vent pipe adaptor. Slide 3" adaptor inner pipe over the 3" OD pipe. Be sure that adaptor outer wall goes as far through stove top as possible. Note: Do not seal adaptor to 3" OD pipe until chimney system is complete. Then use only metallic tape, no RTV.
- F. Bend flex pipe and install over bottom of 3" OD pipe. Secure and seal as in C. above.
- G. You can now complete your vertical chimney extension with Dura Vent L-Vent chimney. Seal 3" adaptor to 3" OD pipe with metallic tape and reinstall rear sheet to back of stove. Install Exhaust Cover Plate to rear sheet with screws provided.
- H. When cleaning chimney, follow procedure on blower transition removal in Owners Manual. (Section 4.4)

Fig. 2

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3.0 FIELD SERVICE:

Asking the right questions is crucial to reducing costs of field service. The trouble shooting guide in each Owners Manual is designed to help customers solve their own simple problems. You should avoid making a service call or you should charge for one unless the problem is a factory defect or an installation problem.

3.1 THERMODISK SERVICE: (Note: Be sure stove is unplugged before servicing)

Every thermodisk is tested for electrical continuity before it is installed. It is also tested on a hot plate for its ability to switch positions.

Symptoms that may indicate a faulty thermodisk (and which thermodisk may be faulty).

- A. Auger does not feed pellets after firebox is warm (within 15 minutes check that auger flight is full of pellets) and green light is on (auger thermodisk T-22 or hi temp thermodisk T-21).
- B. Auger feeds at start-up to a cold firebox (auger thermodisk T-22).
- C. Blowers won't shut off after stove has cooled; wait 1 hour (blower thermodisk T-22).
- D. Blowers shut off immediately when "off" switch pushed on hot stove (blower thermodisk T-22).
- E. Stove auger does not shut down when temperatures are excessive (hi-temp thermodisk T-21).

PROCEDURE - Thermodisks need to be tested for continuity. T21 is normally "closed" and T22 is normally "open." They do not need to be removed from stove. First, disconnect wires from thermodisk terminals. Use ohm meter portion of multi-meter. Even if there is electrical continuity, a thermodisk can become stuck in either open or closed position. Use a hot plate to test thermodisk on site before replacing.

REMEMBER: Factory will not accept a claim for thermodisk replacement unless a defect is found in returned thermodisk.

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CIRCUIT BOARD
(OLD STYLE)

- WHITE
- BLACK
- BLUE
- PINK
- ORANGE
- YELLOW

CIRCUIT BOARD

MOLEX CONNECTOR
(MALE END)

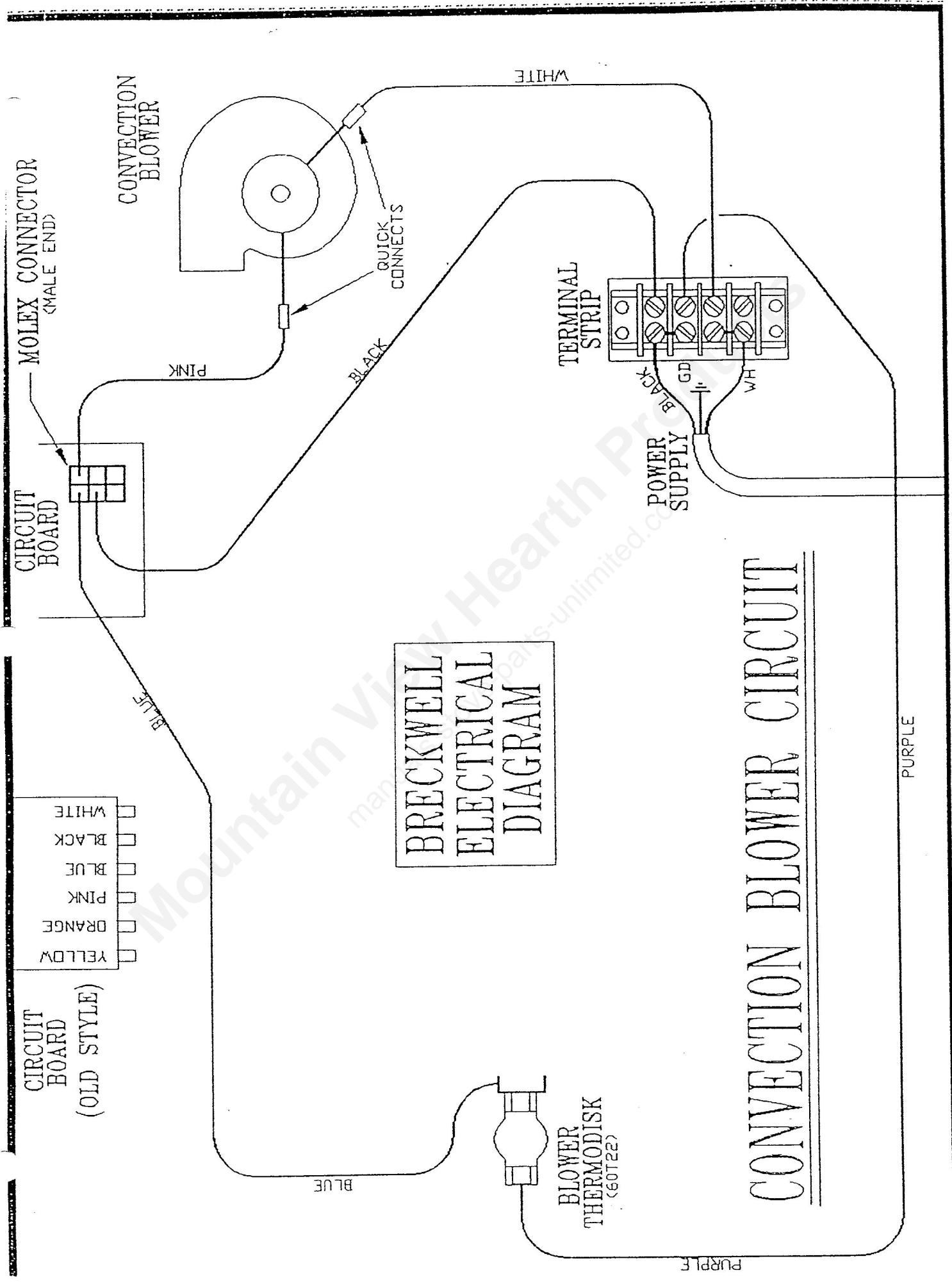
CONVECTION BLOWER

BRECKWELL ELECTRICAL DIAGRAM

BLOWER
THERMODISK
(60T22)

CONVECTION BLOWER CIRCUIT

PURPLE



MOLEX CONNECTOR
(MALE END)

CIRCUIT BOARD

CIRCUIT BOARD
(OLD STYLE)

- WHITE
- BLACK
- BLUE
- PINK
- ORANGE
- YELLOW

BRECKWELL ELECTRICAL DIAGRAM

COMBUSTION BLOWER CIRCUIT

TERMINAL STRIP

POWER SUPPLY

BLOWER THERMODISK (60T22)

COMBUSTION BLOWER

BLUE

BLACK

BLUE

BLACK

QUICK CONNECTS

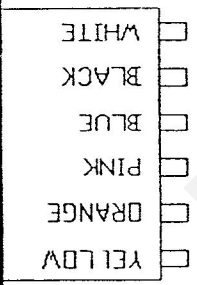
WHITE

PURPLE

PURPLE

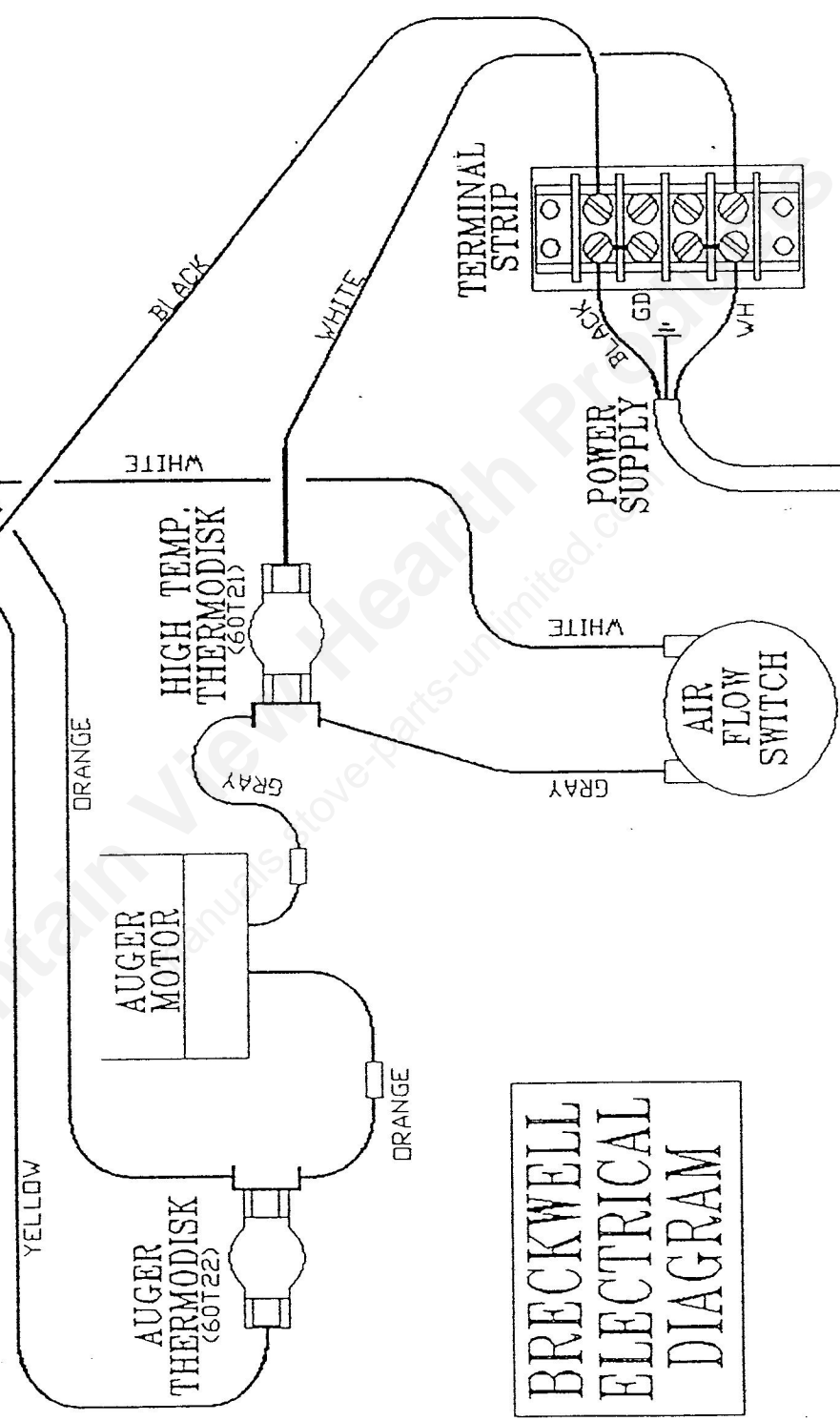
CIRCUIT BOARD
(OLD STYLE)

CIRCUIT BOARD
(MALE END)



CIRCUIT BOARD
(OLD STYLE)

CIRCUIT BOARD
(MALE END)



BRECKWELL
ELECTRICAL
DIAGRAM

AUGER CIRCUIT

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Send defective control panel plates/circuit board to:

National Steelcrafters of Oregon, Inc.
1875 West 6th Ave
Eugene, OR 97402

Be sure to enclose **Breckwell Warranty Claim Form**. It will be repaired or replaced and sent back to you very quickly. If you have any questions, call 1-541-683-3210.

NOTE: Please do not return boards with blown fuses unless authorized in advance. Warranty claims will not be honored for blown fuses, unless the cause is traceable to a stove or circuit board malfunction.

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Mountain View Hearth Products
manuals.stove-parts-unlimited.com

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3.5 AIR SWITCH

The air switch (on all models) is required by the safety standard to which Breckwell is tested and listed. It is designed to shut down the auger if the flue becomes blocked or the combustion blower fails. It senses vacuum within the combustion system.

The only symptom of an air switch problem is that the auger turns off and the green L.E.D. light goes out during operation. If you press the black auger button, and the green L.E.D. auger light does not come on, there is no power to the auger thermodisk.

This symptom could also indicate:

1. An overheated stove, shut down by the high-temp thermodisk. You can verify this situation easily by noting whether or not the stove is set at a high pellet feed rate and has excessive surface temperatures, or by using the jumper wire to bypass the high temperature thermodisk. If stove now operates properly, allow stove to cool and test high temperature thermodisk. (Section 3.1)
2. An L.E.D. auger light malfunction. If the L.E.D. timing light blinks within 15 seconds, and the auger light is unlit, this situation may be likely.

Once these causes have been eliminated and thus an air switch problem is suspected, check the following, in order:

1. Measure vacuum in firebox. We suggest you use a negative pressure gauge. (For example - Dwyer Instruments Magnehelic or other suitable gauge that will measure from 0.0 to 1.0 inches of water column.) Refer to attached Magnahelics chart. Insert metal probe between hinges on door. With the damper in the open position the negative pressure reading should be at least .50. If negative pressure is below .50 check the following:
 - A. Disconnect chimney at blower transition. Check negative pressure again. If reading is now above .50 clean flue and all air passages. If reading is below .50, check for leaks in system. (See section 3.6)
 - B. If negative is still above .50 and green light does not activate when reset button is depressed (1) Check air switch hose for leaks, cracks, or blockage. (Two holes in air hose is normal). Check to make sure tube is not plugged where it enters combustion chamber . (2) By-pass air switch with jumper wire. Push reset button. If green light comes on, replace air switch.

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3.6 LEAKS IN THE SYSTEM

You should think of Breckwell performance in terms of a sealed, pressurized air circulating system, extending from the air intake to the end of the chimney. If there is a leak anywhere, the system will not function properly. Each unit is tested for pressure before it leaves the plant.

Symptoms that may indicate a poor seal and loss of pressure:

1. Lower than normal flame in burnpot.
2. Heavy creosote buildup within system.
3. Smoke smell in house.
4. Glass gets dirty faster than normal.

Where to look for a leak:

1. Joints in L-Vent or flex pipe sections.
2. Door seal (all four sides).
3. Glass mount seal.
4. Air switch hose connections or cracks in the hose. (2 holes in air switch hose are normal.)
5. Combustion blower gasket seal.
6. Round gasket seal on quick connect vent (off combustion blower, see owners manual).
7. Silicone seal on connection between combustion blower and transition. (see owners manual).

To check the vacuum in the system, we suggest you use a negative pressure gauge (for example - Dwyer Instruments Magnehelic or other suitable gauge that will measure from 0.0 to 1.0 inches of water column). Open door. Insert metal vacuum tube (on Magnehelic) in between hinges and into firebox area. Close door.

SEE FOLLOWING PAGE FOR MAGNAHELICS READING CHART

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