

TRAVIS INDUSTRIES TRAINING
YOUR SUCCESS IS OUR BUSINESS

Pellet Appliance Troubleshooting Guide

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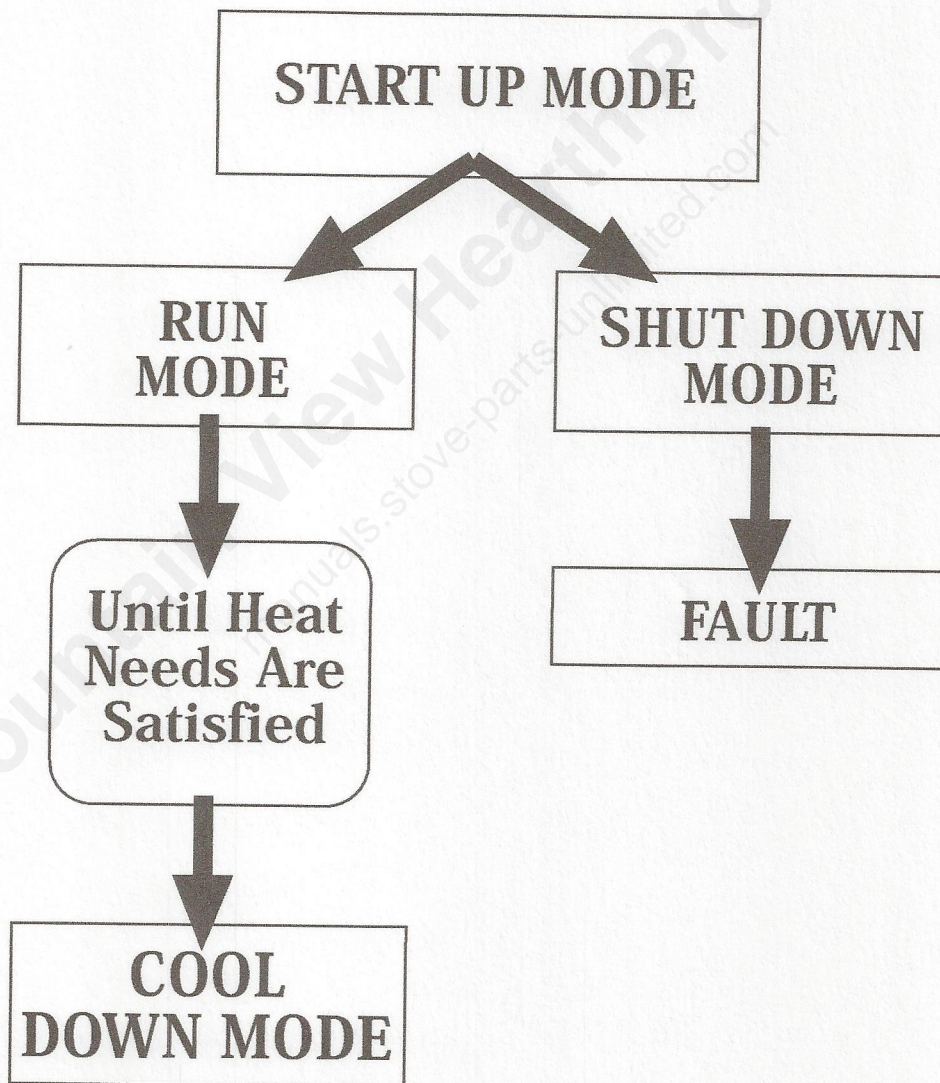
Appliance Operation Principles

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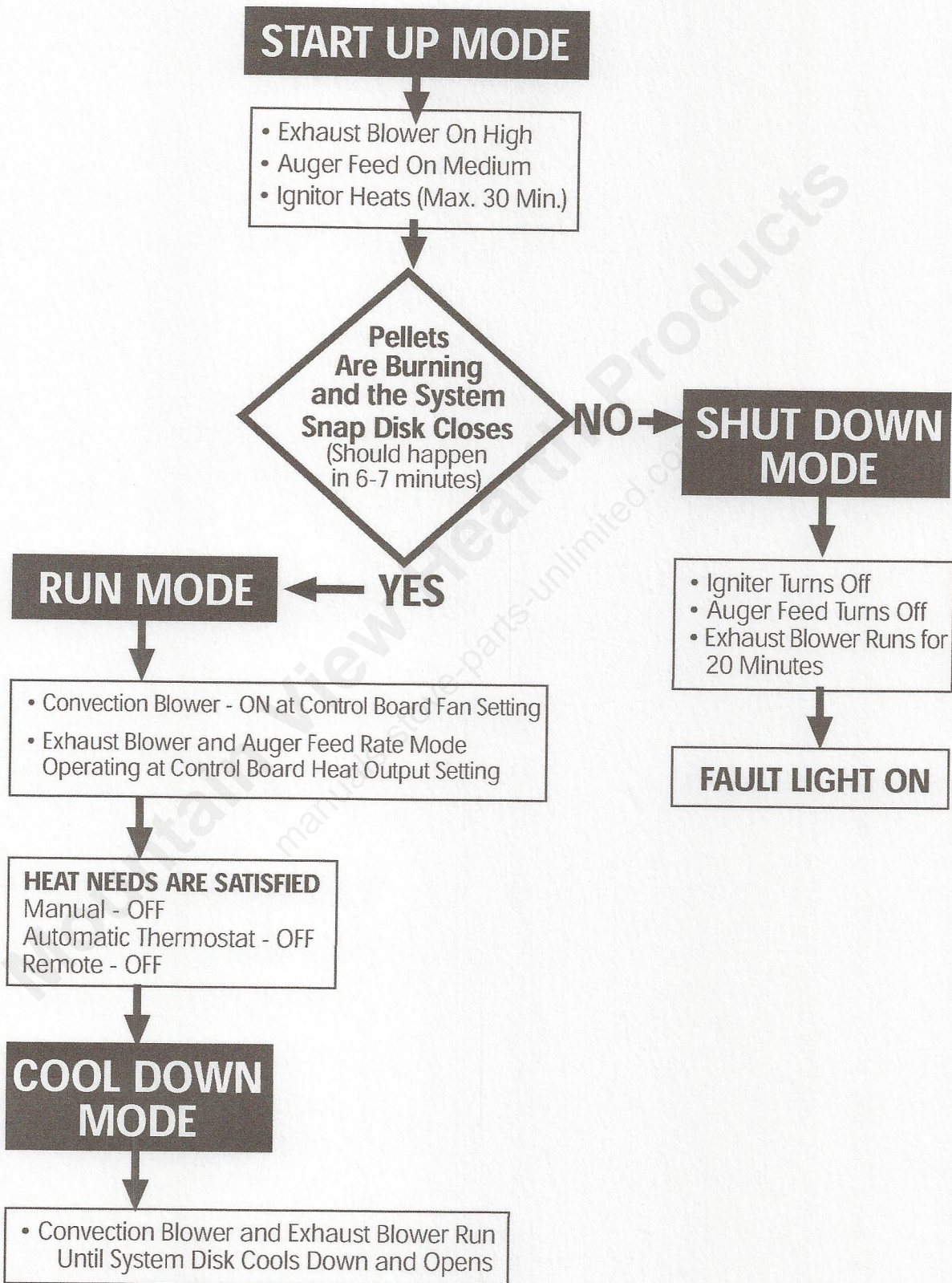
Mountain View Hearth Products
manuals.stove-parts-unlimited.com

Pellet Appliance Operation Sequence

- Pellet appliance operation sequence is important to understand when servicing pellet appliances.
- Below are the steps our pellet appliances go through. The following page provides a detailed flow chart of what happens in each step.



Operating Pellet Sequence



Auger Feed Rate Timing

- The feed rate of the pellets is determined by the ON/OFF cycling of auger motor. Remember the auger motor turns at a constant speed of 1 RPM. Therefore, to vary the pellet feed, we control the on and off time of the auger motor.
- In the box below you will see the ON/OFF rates:
- The auger feed light on the control board will be lit for the following times

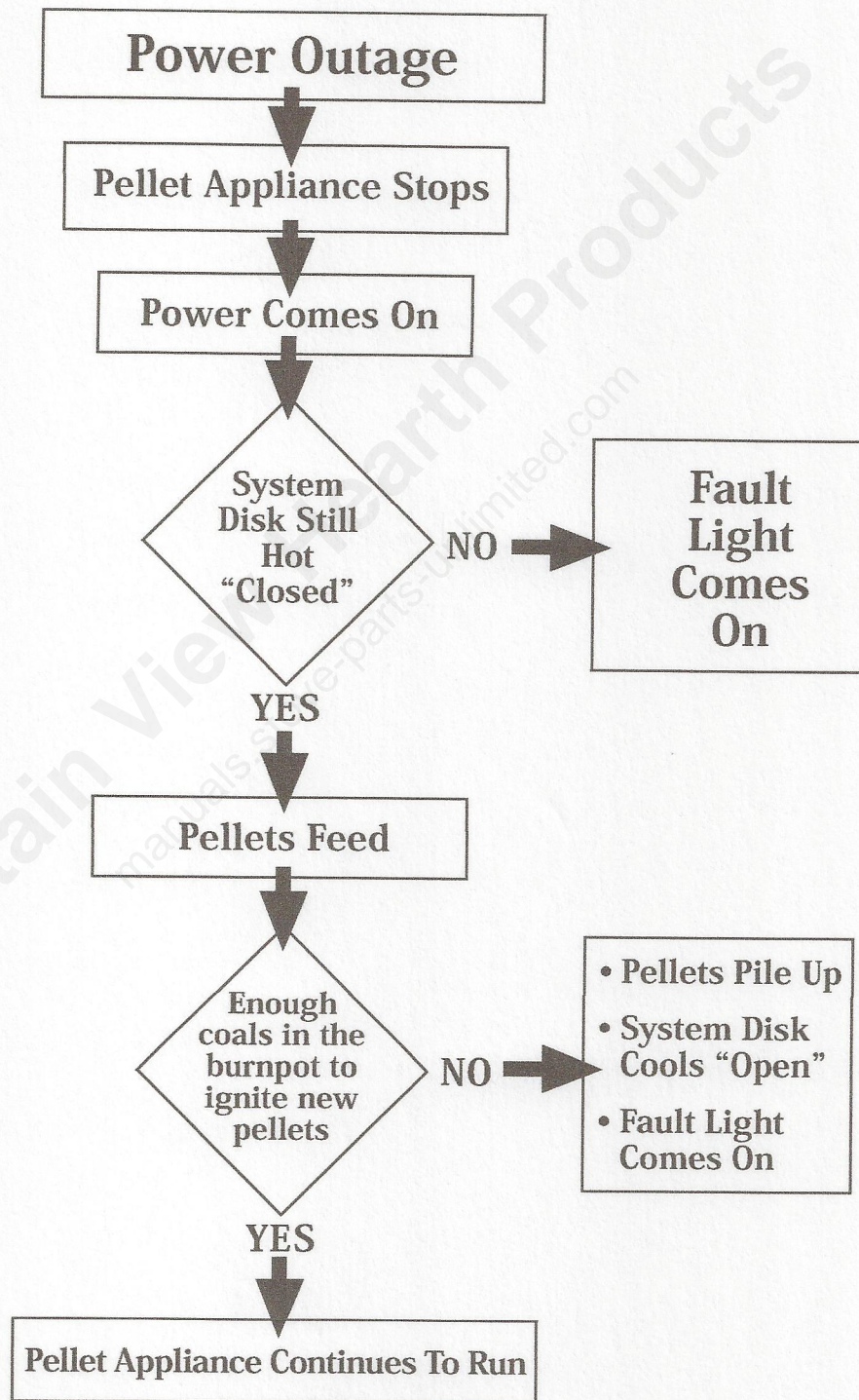
HIGH ON 3 Seconds
HEAT OUTPUT OFF 2 Seconds

MEDIUM ON 3 Seconds
HEAT OUTPUT OFF 6-9 Seconds

LOW ON 3 Seconds
HEAT OUTPUT OFF 12-15 Seconds

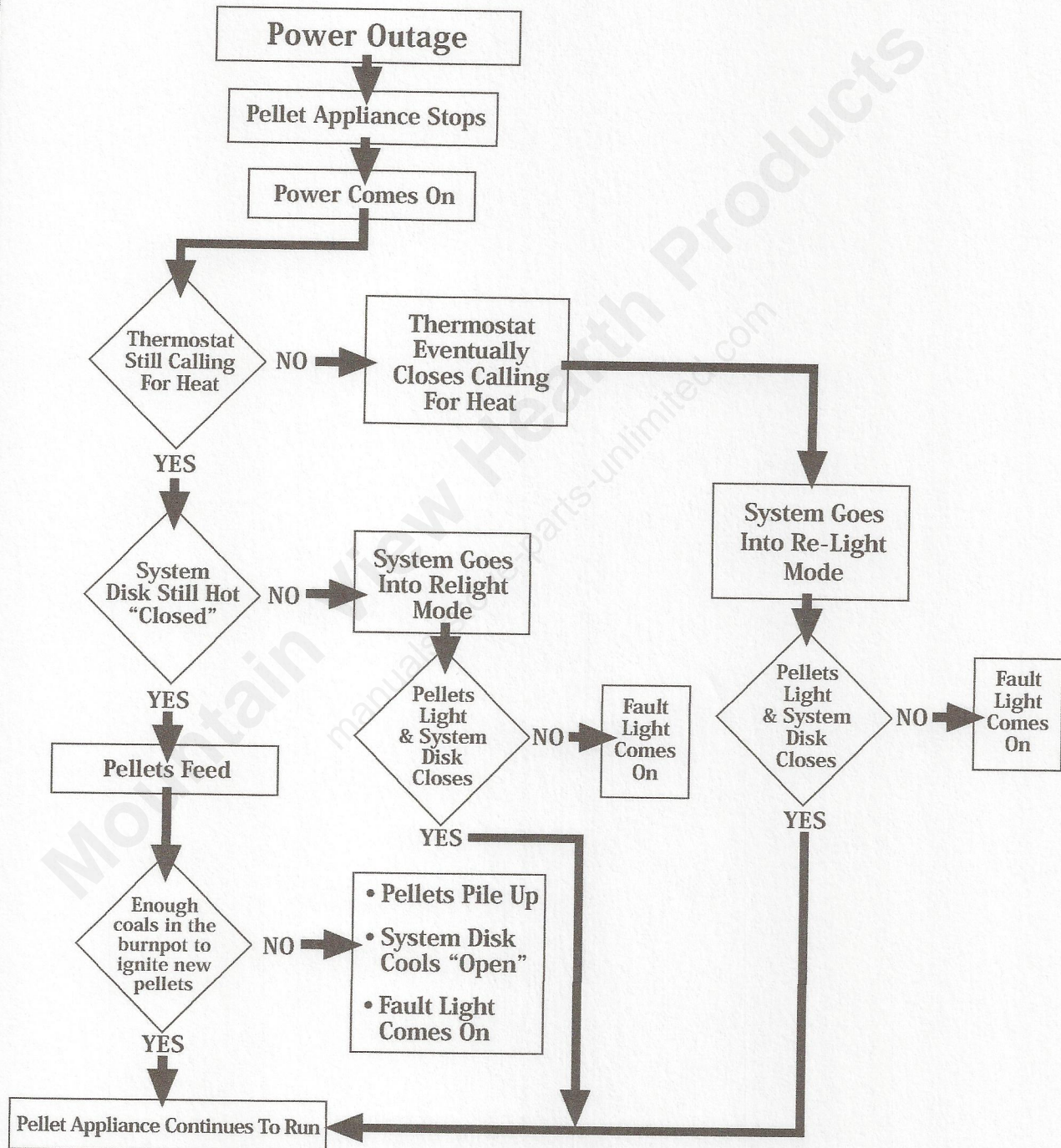
Power Outage

In manual or Remote Control (ON/OFF) operation



Power Outage

In automatic operation (Wall Thermostat or Remote Control)



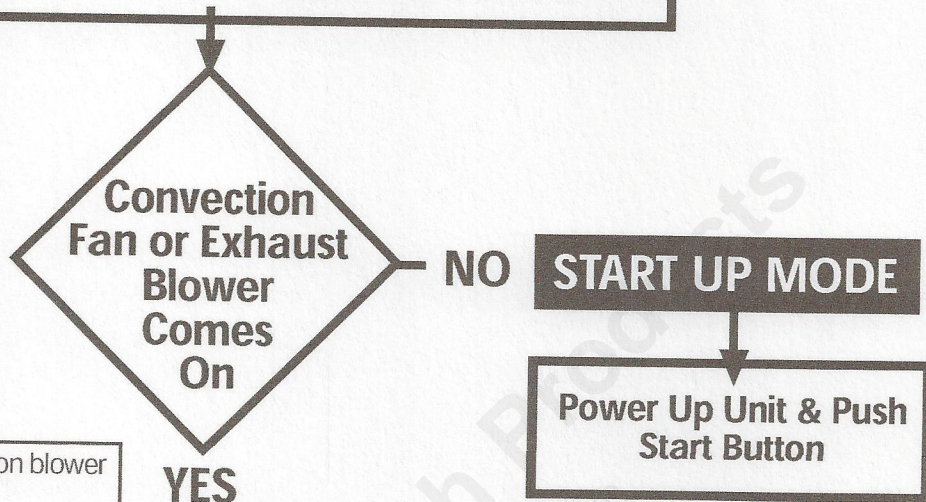
Pellet Troubleshooting Flow Chart

Pellet Troubleshooting Flow Chart

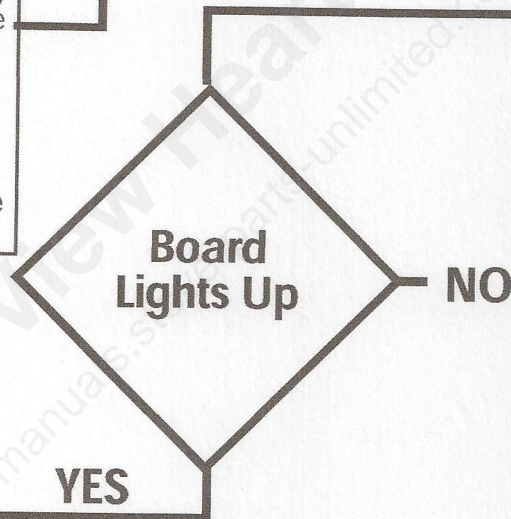
1-3

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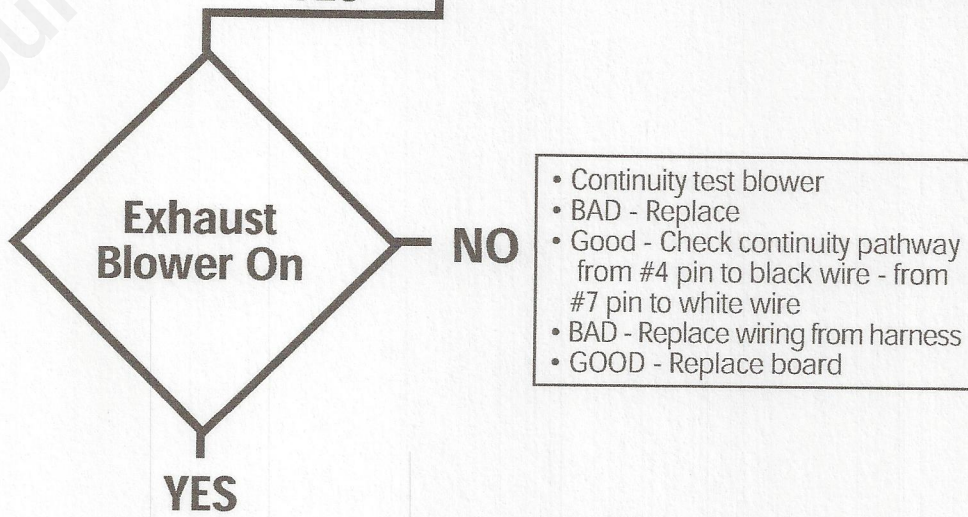
With the appliance ON/OFF switch off,
unplug and replug the power cord



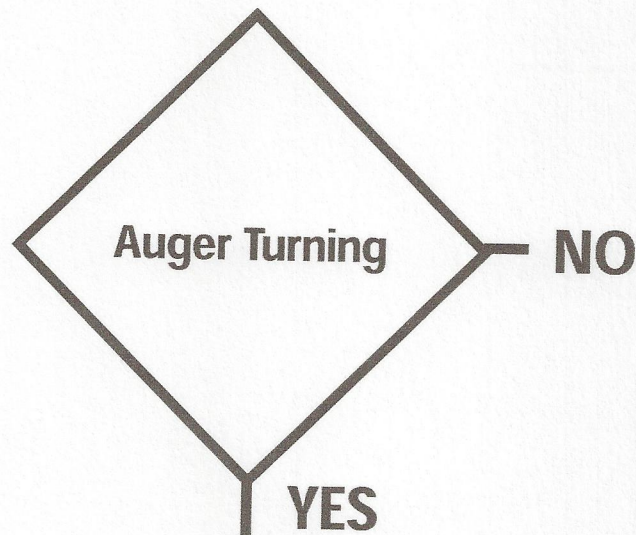
- Continuity test convection blower
- BAD - Replace
- GOOD - Continuity test pathway from - pin #5 - to the end of the brown wire
- From pin #7 to the end of the white wire
- Check system disk for closed when it should be open
- If everything is GOOD - Replace board



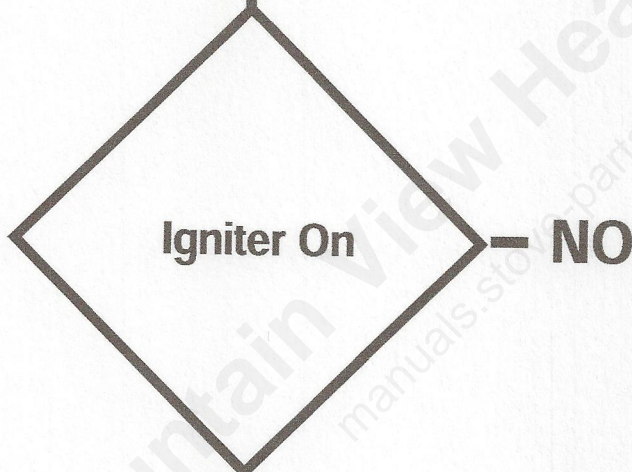
- Check 110V supply
- Check power cord
- Check for proper wiring configuration
- Check Main fuse
- Check board fuse
- Check continuity from #3 pin to the fuse lead
- Check continuity from pin #7 to white power wire
- Replace board



- Continuity test blower
- BAD - Replace
- Good - Check continuity pathway from #4 pin to black wire - from #7 pin to white wire
- BAD - Replace wiring from harness
- GOOD - Replace board



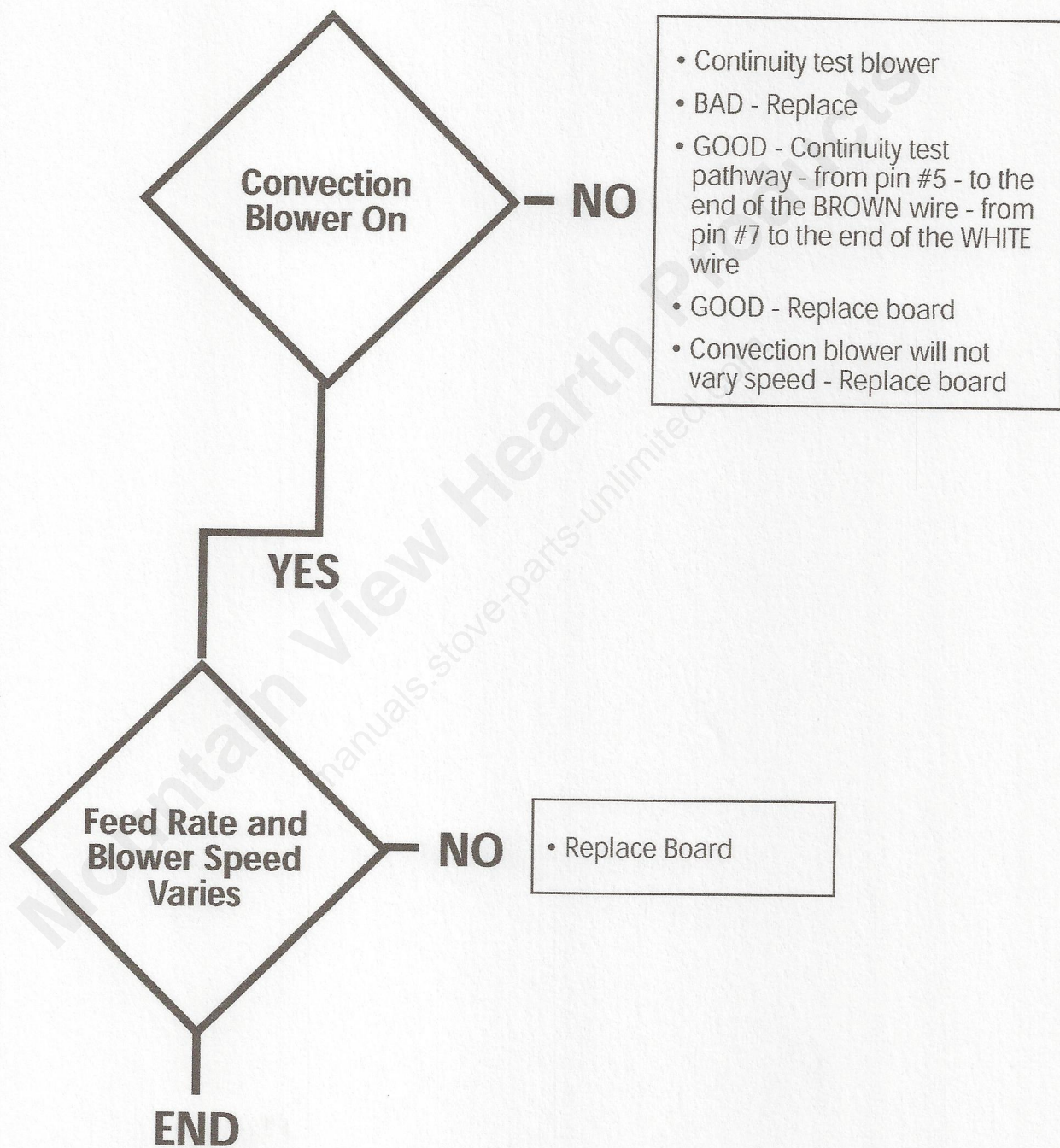
- Check for pinched vacuum hose or blocked hose on flow switch (Tube & barbed connector)
- Continuity test auger motor
- BAD - Replace
- GOOD - Check pathway (check continuity from pin #6 to end of RED power wire, check Snap Disk(s) continuity, check Flow Switch, check pin #7 to the end of WHITE wire)
- BAD - Replace defective item(s)
- GOOD - Replace bBoard



- Continuity test igniter
- BAD - Replace
- GOOD - Continuity test pathway - #1 Pin to BLACK Wire - #7 Pin to WHITE Wire
- BAD - Replace Wire Harness
- GOOD - Replace Board

Move to RUN Mode by Jumping the System Disk with a Jumper Wire

RUN MODE



Troubleshooting Testing

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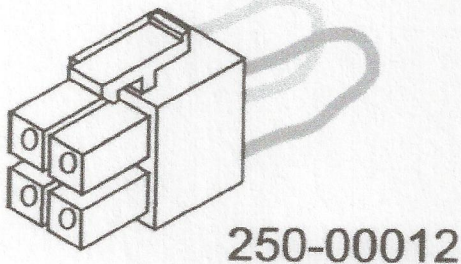
Configuring the Control Board

Overview

The new AVR control board is the next generation control board that is compatible with all pellet stoves and inserts, large and small manufactured from 1997 to today. Circuitry on the board allows it to be programmed for either the large or small pellet heaters (these heaters use different voltage settings). See “” for details. It also includes a diagnostic feature that allows a service person to diagnose a fault without having to inspect the wiring or components. The indicator lights on the control board will display a fault code after a fault has been detected. This allows the service person to determine which component caused the fault. See “Diagnostic Codes” for details. NOTE: the new wiring harness (250-00017) is required to utilize this feature.

Configuring for Large or Small Heaters

The control board is initially configured for the large heaters (Astoria and Yankee models). To change the configuration the control board must be in the off position plugged into a cold stove, (no lights or running components) with the jumper molex removed (see the illustration below). In this condition press and hold the manual auger button down and press both fan up and fan down arrow keys at the same time. All heat output lights will flash. One flash denotes the large pellet heater configuration. Two flashes denote the small pellet heater configuration (Newport and Pioneer models). Repeat pressing the keys until the correct configuration is obtained.



Configuring the Control Board

Using this Control Board with Older Wiring Harnesses

When the control board is installed on an older wire harness the 4 pin molex jumper plug on the back of the control board next to the stock wire harness must be installed. This jumper replaces the diagnostic wires (see “”) that are present on the new wiring harness. The control board will work normally, but the diagnostic capabilities will not function.

Technical Notes for Operation

The new pellet control board is essentially the same as our old board. The biggest difference between them is that buttons were used in place of knobs on the heat and fan controls.

Make sure to give the home owner the “Pellet Heater Operating Instructions” if you are replacing an older board (the final 4 pages of this instruction sheet). It contains the new operating instructions for this control board.

A few changes were made to accommodate the new control board. The start up cycle indicator on the old board illuminates all heat output indicator lights to show the unit is in a start-up cycle and adjusting the heat setting knob would not change them. On the new board to enable adjusting the run settings during start-up we made the start-up indicator the blinking #1 heat output light. If the #1 heat output light is blinking the board is in a start-up mode and the blower and auger outputs can not be adjusted. The run settings the unit will go to after start-up are displayed on the heat output indicator. These settings can be adjusted any time during start up by pushing the up or down heat buttons on the panel. When the fan setting is adjusted up or down the heat output indicators will turn off and the fan setting will display.

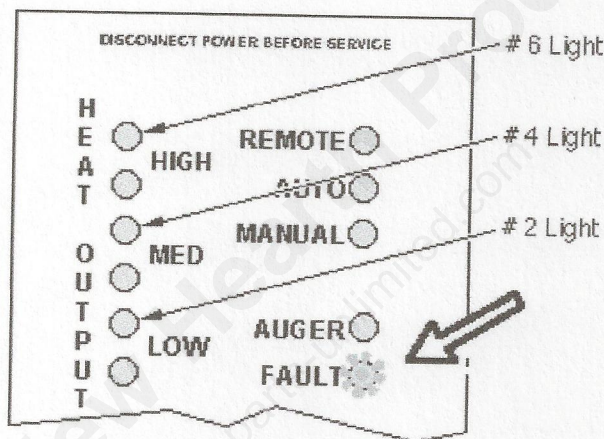
Another feature we added to the control board is a manual auger feed. This button can be used to prime and empty the auger or speed the initial delivery of pellets to the burn pot. All start-up timing remains the same and the stove will still self prime the auger tube – this option allows the operator an additional option. It is not needed for normal operation.

All voltage outputs and feed rates remain the same as the old board. There is a difference in respect to the auger on/off times. The auger timing was changed to shorten the interval between pellet drops to the burn pot. For example, on low the auger used to turn for 3 seconds and remain off for 13 seconds, for this same condition this control board turns the auger for 2.5 seconds and remains off for 10.7 seconds. This produces the same amount of time the auger is turning and not turning but gives a steadier flame height and less incidental outages on low.

Configuring the Control Board

Diagnostic Codes (Qualified Service Personnel Only)

- Fault and #2 (LOW) Light Flash = Flow Switch Fault
- Fault and # 4 (MED) Light Flash = System Snap Disk Fault (pellets run out & stove goes cold)
- Fault and # 6 (HIGH) Light Flash = Safety or Hopper Snap Disk Fault



Flow Switch Fault

Fault light and #2 heat indicator blinking.

This fault code indicates pressure/flow switch opened or broke its electrical connection during operation.

Likely causes:

- Pinched, cracked or broken pressure tubing.
- Plugged tubing nipple on blower housing.
- Heavy ash build up in the exhaust fan housing.
- Faulty wiring, bad or broken connection of flow switch gray wires.
- Weak or bad combustion blower
- Faulty pressure switch.

Configuring the Control Board

Diagnostic Codes (Qualified Service Personnel Only) - Continued

System Snap Disk Fault

Fault light and #4 heat indicator blinking.

This fault code is caused by a heat sensitive switch that tells the control board if the appliance is hot or cold. During operation if the unit runs out of pellets or loses its fire this switch will communicate to the control board that the stove is getting cold. The control board will shut off the auger functions and initiate a twenty minute combustion fan safety cool down. Another condition that will trigger this fault code is a failed start. When the appliance is started the control board initiates a 30 minute timer, if the appliance is cold at the end of this 30 minute start up timer the control board will indicate a #4 fault and initiate a 20 minute combustion fan cool down.

Likely causes:

- Unit ran out of pellets.
- Fire went out during operation.
- Unit was cold at the end of a start cycle (fire did not light).
- Faulty snap disk.

Configuring the Control Board

Diagnostic Codes (Qualified Service Personnel Only) - Continued

Safety or Hopper Snap Disk Fault

Fault light and #6 heat indicator blinking.

This fault code is caused by the safety or hopper snap disk registering an over-heated appliance during operation. The control board then shuts down the auger and the convection and combustion blower will run at maximum output for a 40 minute safety cool down cycle. The only way to stop this cool down is to unplug the appliance to reset the control board.

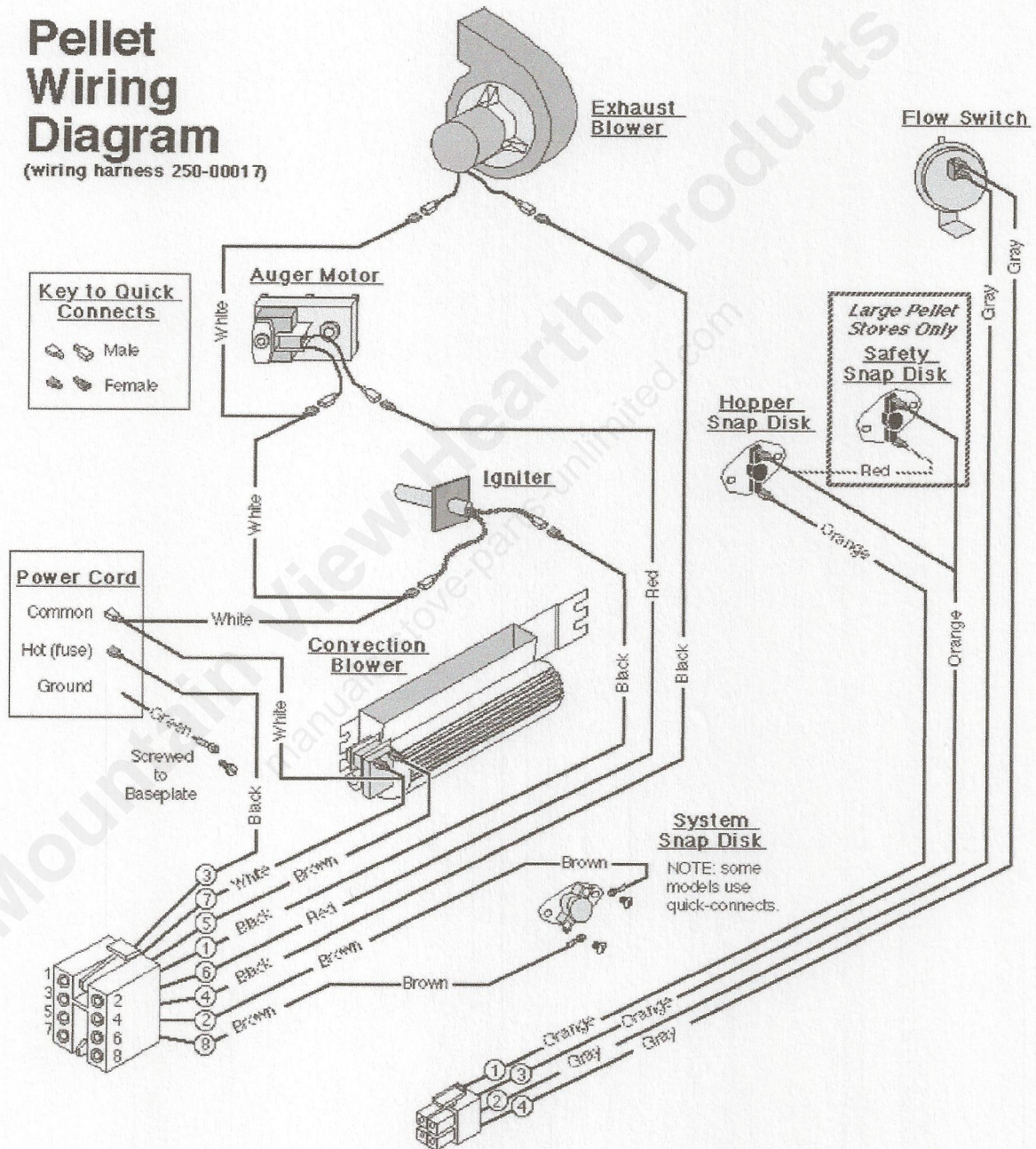
Likely causes:

- Faulty snap disk
- Corroded, loose or broken Snap Disk wiring.
- Failed, plugged or blocked convection blower.
- Reduced air flow into the motor compartment such as blocked air vents on panels or doors.
- Missing refractory.
- Improper fuel type.
- Unauthorized parts used in the pellet feed system.

Wiring Diagram (New, 2005 Version - 250-00017)

Pellet Wiring Diagram

(wiring harness 250-00017)

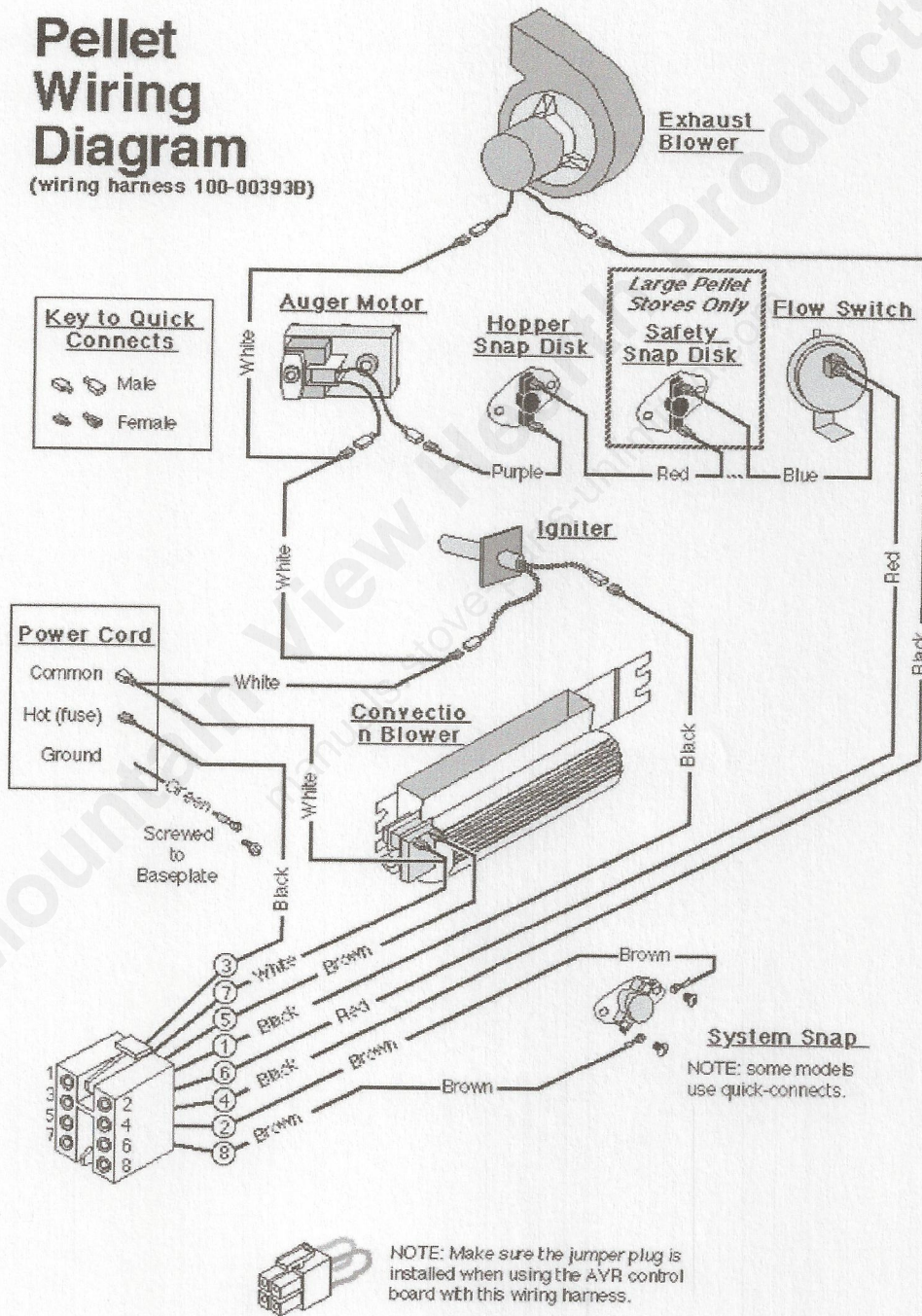


Wiring Diagram (Old Version - 100-00393B)

NOTE: Wire coloring may not be identical to this diagram

Pellet Wiring Diagram

(wiring harness 100-00393B)



Control Board Operation

The Two Modes of Operation:

Manual

Manual mode requires the user to turn the heater on and off manually.

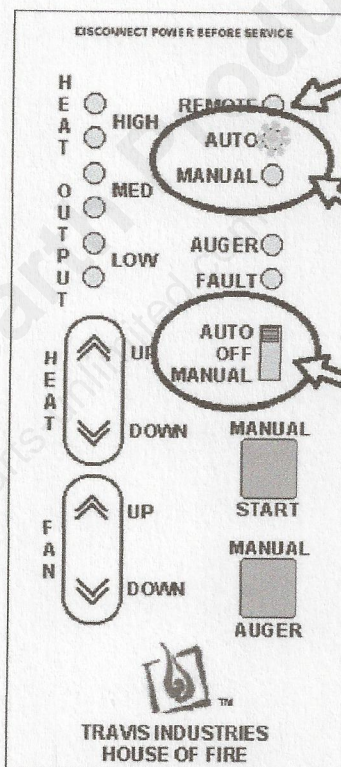
Auto (requires a thermostat)

Auto mode allows you to use a thermostat to control room temperature. The stove automatically turns on when the temperature drops below the thermostat setting. Once the stove reaches operating temperature, the stove then runs at the heat output setting selected.

Switching

Modes While in Operation

Whenever the stove is switched from one mode to another while in operation, the stove will enter the "start-up" sequence for a minimum of 20 minutes.



NOTE: If using a modulating remote, this light will come on to indicate the remote is controlling the heater.

These indicator lights are used to determine which mode you are in.

Use the mode switch to determine the mode.

Control Board Operation

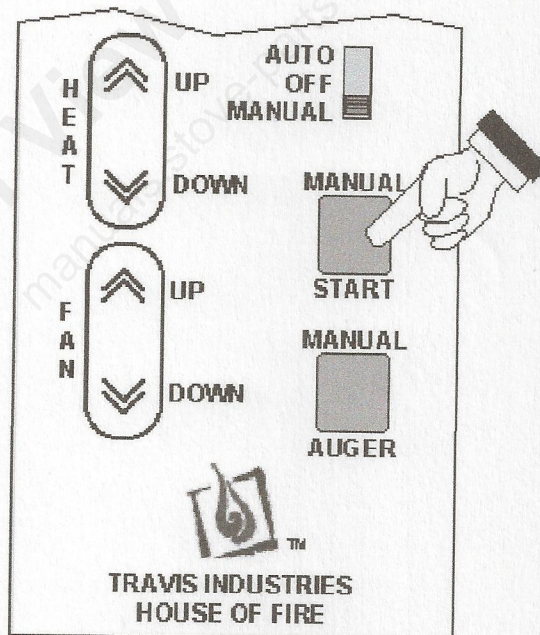
Manual Mode

Manual mode requires the user to turn the heater on and off manually.

To Start

Press the "Manual Start" button. That's it. The stove automatically goes to a medium burn rate and high fan while the igniter starts the fire burning within 10 minutes. During this period the lowest "HEAT OUTPUT" light will flash. If the stove does not start in 30 minutes, the stove turns off.

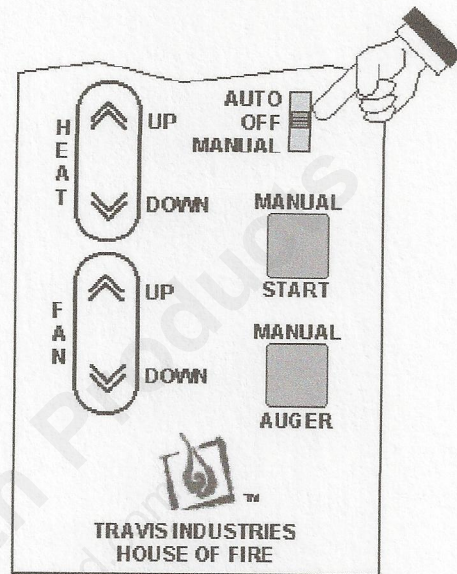
Once up to temperature, the stove will then run at the heat output setting selected on the control panel (see "To Adjust the Heat" below).



Control Board Operation

To Shut Down

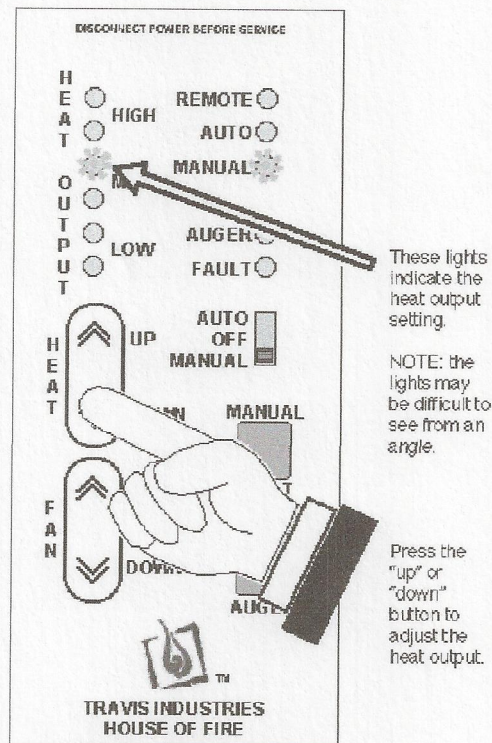
Move the mode switch to "OFF". The exhaust blower will still run until the heater cools down.



To Adjust the Heat

Press the "Heat" buttons to adjust the heat output.

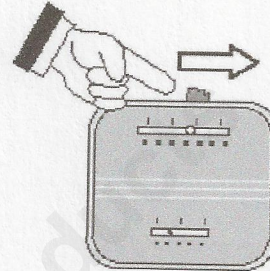
NOTE: During start-up you may adjust the heat setting. This heat setting will take affect once the start-up sequence is complete.



Control Board Operation

Auto Mode

Auto mode allows you to use a thermostat to control room temperature. The stove automatically turns on when the temperature drops below the thermostat setting. Once the stove reaches operating temperature, the stove then runs at the heat output setting selected.



To Adjust Room Temperature (or Start the Stove)

Move the thermostat to the heat setting desired. If the room is cooler than the setting, the stove will go through the start-up sequence for approximately 10 minutes. During this period the lowest "HEAT OUTPUT" light will flash. Once up to temperature, the stove will then run at the heat output setting selected on the control panel. If the room is too hot, move the thermostat to a lesser setting.

To Adjust the Heat

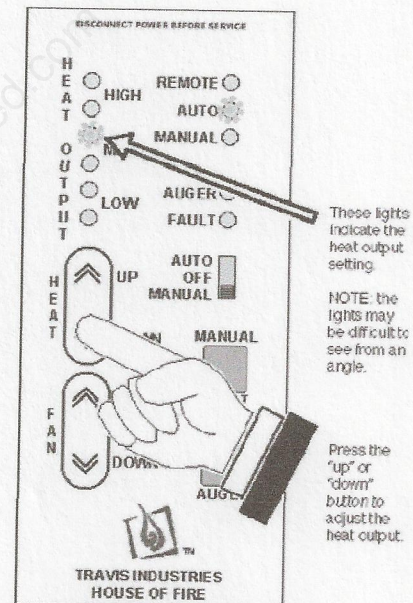
Press the "Heat" buttons to adjust the heat output.

HINT:

If you find that the stove turns on and off repeatedly, you may wish to turn the heat output to a lesser setting. The lower setting will provide a more consistent heat output over time, eliminating the need for the thermostat to repeatedly turn the stove off.

NOTE:

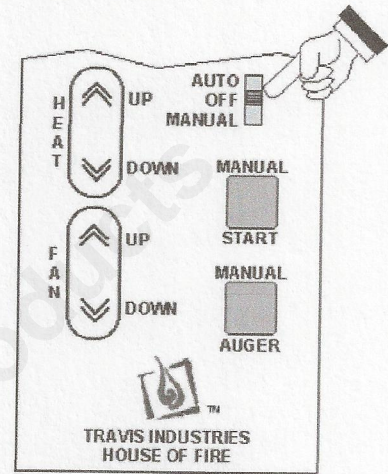
If the thermostat calls for heat while the stove is still cooling down, the stove will go through the start-up sequence (for a minimum of 20 minutes).



Control Board Operation

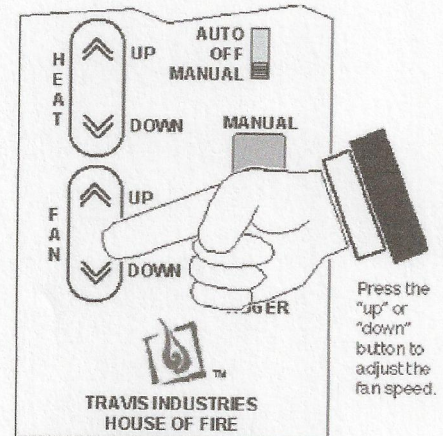
To Shut Down

Move the mode switch to "OFF". The exhaust blower will still run until the heater cools down.



Adjusting the Fan Speed

NOTE: When you press the Fan speed buttons the "Heat Output" lights will indicate fan speed (not "Heat Output"). After a few seconds the "Heat Output" lights will go back to displaying the heat output setting.

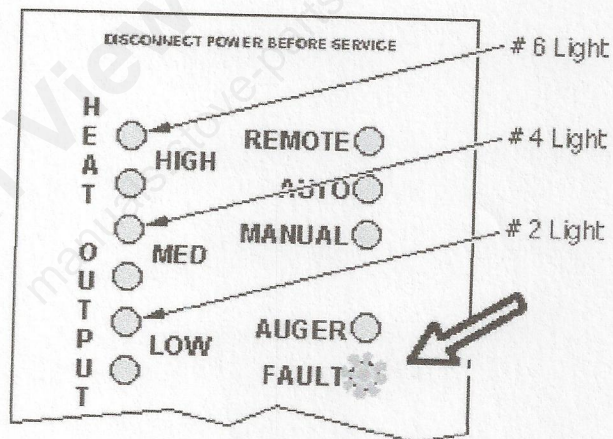


Control Board Operation

"FAULT" Light

This light comes on when an error occurs:

- The stove runs out of pellets
- During initial start-up (for a split second) or for improper electrical frequency
- A start-up sequence that does not result in the heater coming up to temperature
- To reset the fault light, turn the mode switch to off and re-start the stove.



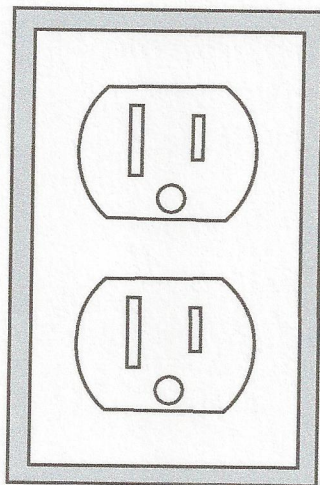
Troubleshooting Pellet Appliances

Troubleshooting Pellet Appliances

- **Mode Sequence Ask What?**
 - **Unplug To Reset Board**
 - **Move Through Modes of Operation**
 - **Self Diagnosis**
- Keep the operation sequence in mind. Ask what should be working in each mode and what should not.
 - Before troubleshooting any pellet appliance always **UNPLUG** and re-plug **THE APPLIANCE** to reset the control board, (If the appliance was turned off before it finished the cool down mode it will start there instead of the start-up mode).
 - Run through the modes and observe what is working or not working.
- Begin with what is not working before you move to the next mode.
 - Each time the pellet system is turned on it runs a quick self-diagnosis, (you will see the fault light come on and then go off).
 - If, during this diagnosis, it senses any problem with the convection blower or circuit, the exhaust blower will immediately come on, even through the ON/OFF switch is off.
 - This automatically tells you there is a convection circuit problem that must be corrected.

Pellet Stove Component Testing

Outlet Analyzer

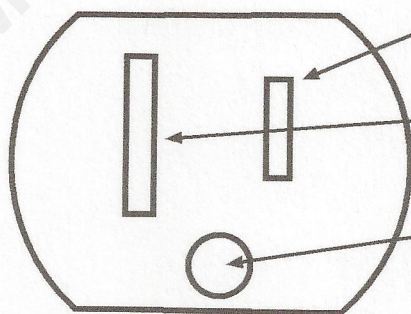


**110 Volt
Outlet**



OPEN GROUND	000
OPEN NEUTRAL	000
OPEN HOT	000
HOT GROUND HOT-NEUTRAL	000
HOT-NEUTRAL HOT-GROUND	000
CORRECT	000

- Test the power outlet to verify proper polarity and proper grounding.



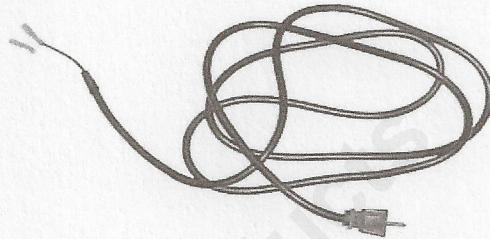
Short Side (Hot Side)

Long Side (Neutral Side)

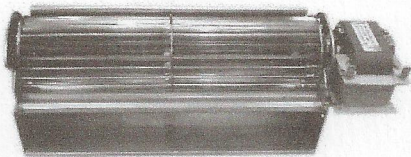
Ground

Power Cord Testing Pellet Components

- Connect power cord to component, then plug the power cord into a known, working power outlet.



- **Convection Blower**



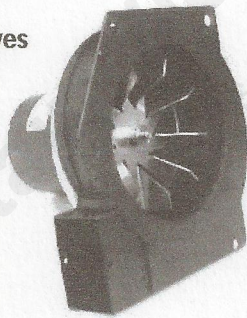
Small Pellet Stoves



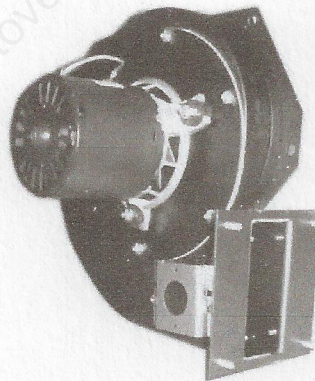
Large Pellet Stoves

- **Exhaust Blower**

Small Pellet Stoves



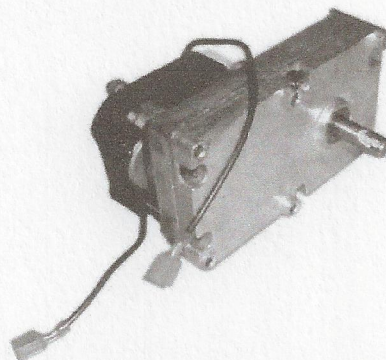
Large Pellet Stoves



- **Igniter**

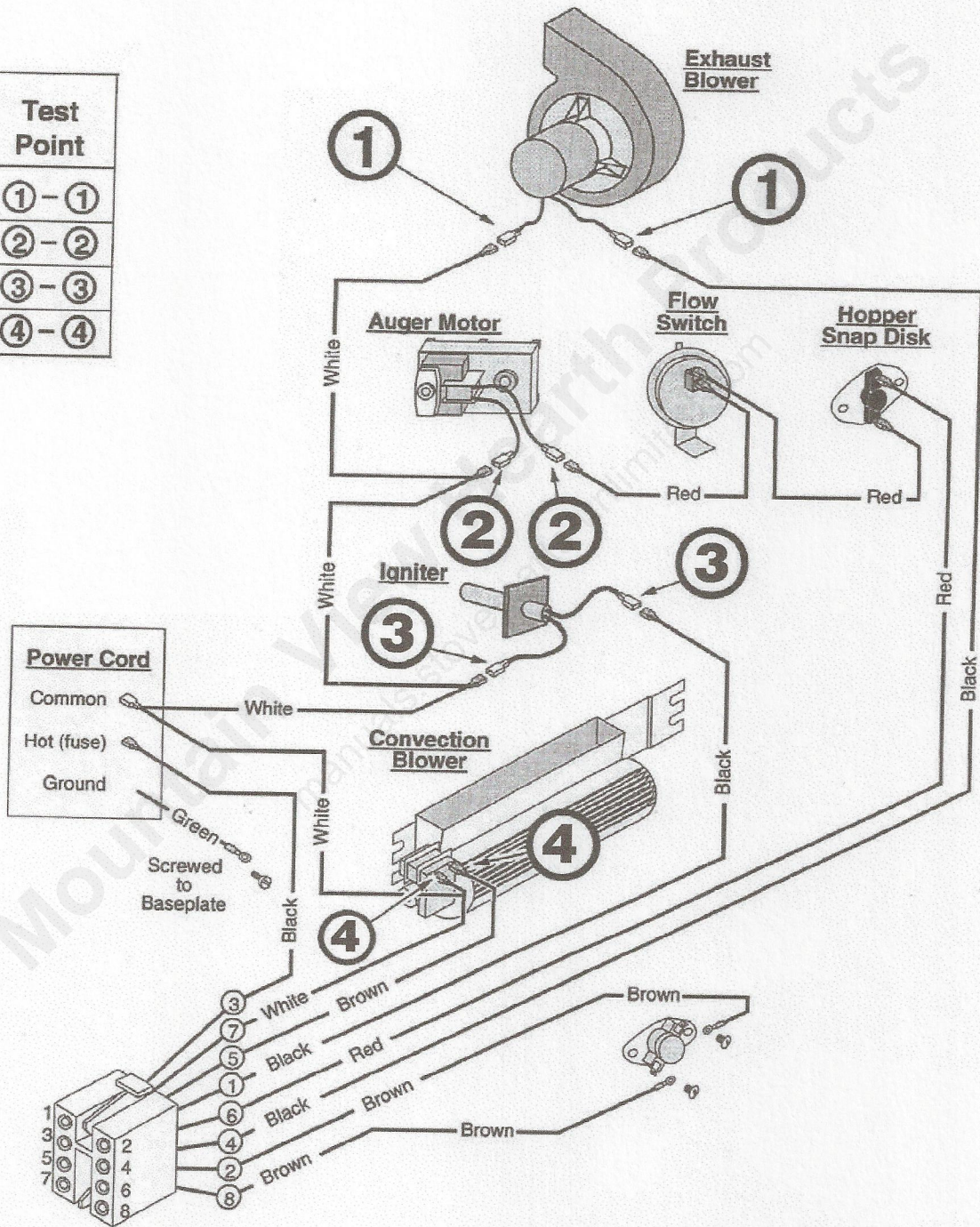


- **Auger Motor**



Power Cord Testing

Test Point
① - ①
② - ②
③ - ③
④ - ④



Continuity Testing Pellet Components

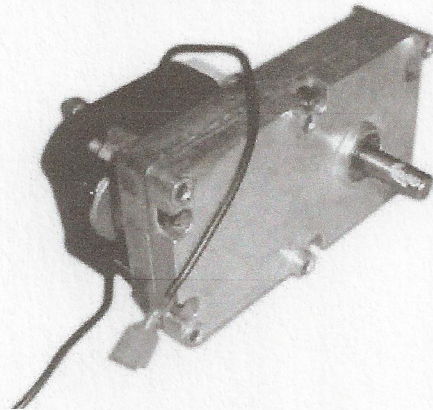
- **TURN OFF ALL POWER**
- Disconnect at least on side of the device being tested to avoid the "Back Door Sneak!"



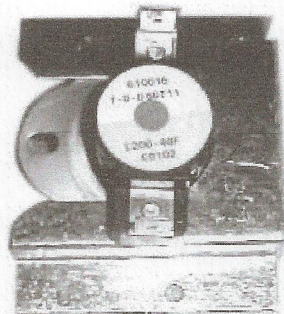
- **FLOW SWITCH (N. O.)**
Normally Open



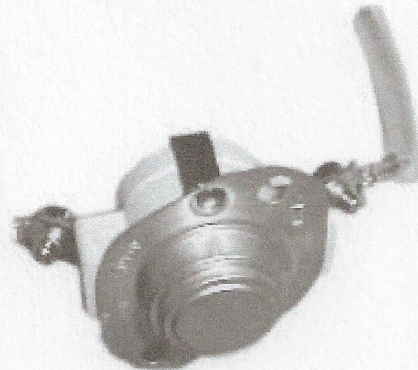
- **AUGER MOTOR**



- **200° SNAP DISKS**

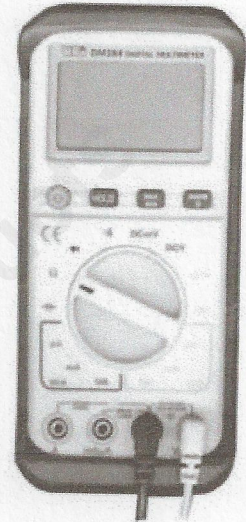


Convection & Hopper Snap Disk (N. C.)
Normally Closed

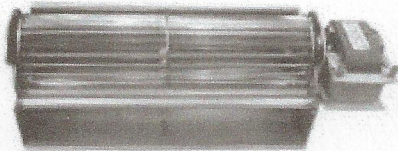


120° System Snap Disk (N. O.)
Normally Open

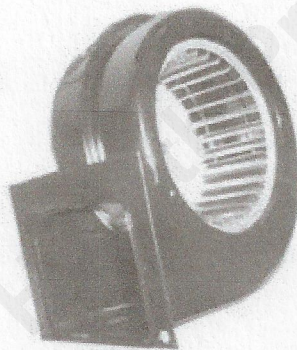
Continuity Testing Pellet Components



• CONVECTION BLOWER



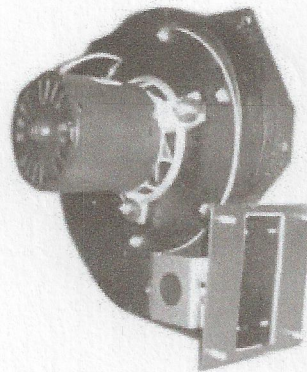
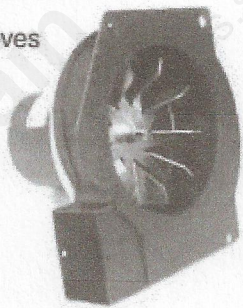
Small Pellet Stoves



Large Pellet Stoves

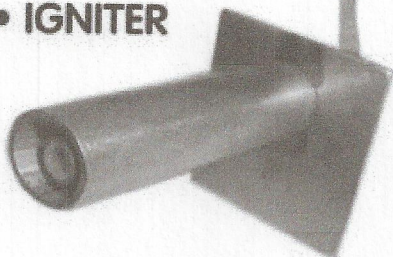
• EXHAUST BLOWER

Small Pellet Stoves



Large Pellet Stoves

• IGNITER



NOTE: Do not continuity test igniter in the audible "BEEP" meter mode, use the (ohms) mode.

The range for our two igniters is as follows:

200 watt element (plain white wires) $72\Omega +10/-5$

250 watt element (red striped white wires) $57\Omega +10/-5$

Pellet Stove Continuity Component Testing

Component	Condition	
	Good	Bad - Replace
Auger Motor	Continuity Across Wires	No Continuity Across Wires
Flow Switch	(With Vacuum) Continuity Across Switch Contacts	No Continuity Across Switch Contacts
Igniter	Continuity Across Wires	No Continuity Across Wires
System Disk: Porcelain Snap Disk F- 120° F (N. O.)	<u>Ambient Temperature</u> No Continuity <u>Temperature Rise</u> Continuity	No Continuity With Temperature Rise
Safety Hopper Disk: Snap Disk L-200° F (N. C.)	<u>Ambient Temperature</u> Continuity <u>Temperature Rise</u> No Continuity	Continuity With Temperature Rise. No Continuity When Cold or When Hot.
Convection Chamber Disk (Large Appliances) L-200° F (N. C.)	<u>Ambient Temperature</u> Continuity <u>Temperature Rise</u> No Continuity	Continuity With Temperature Rise. No Continuity When Cold or When Hot.
Convection Blower	Continuity Across Wires	No Continuity
Exhaust Blower	Continuity Across Wires	No Continuity

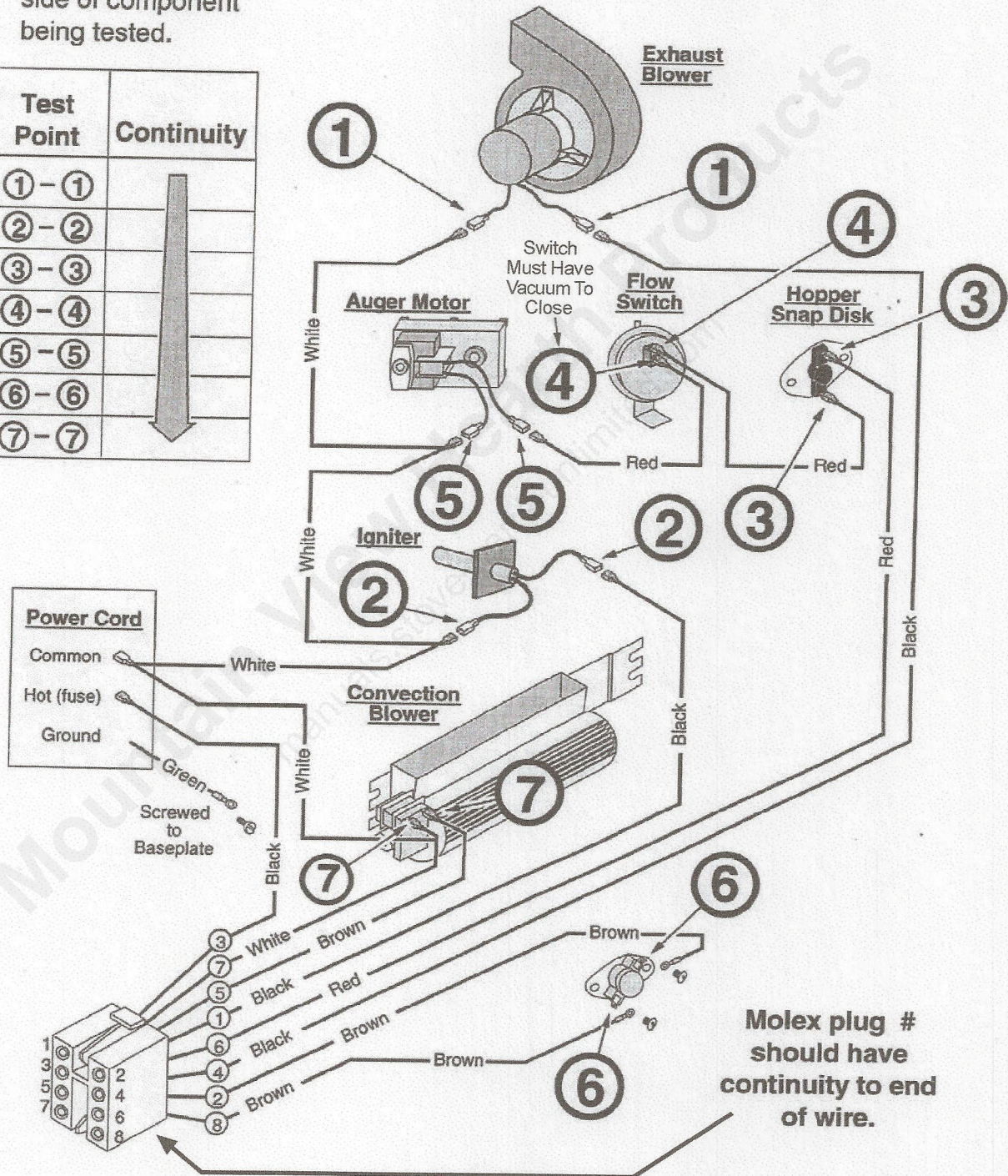
- Always Have “POWER OFF” When Conducting a Continuity Test
- Always Isolate the Component By Disconnecting at Least One Side of the Circuit

Pellet Appliance Continuity Testing

110 VAC
POWER OFF!

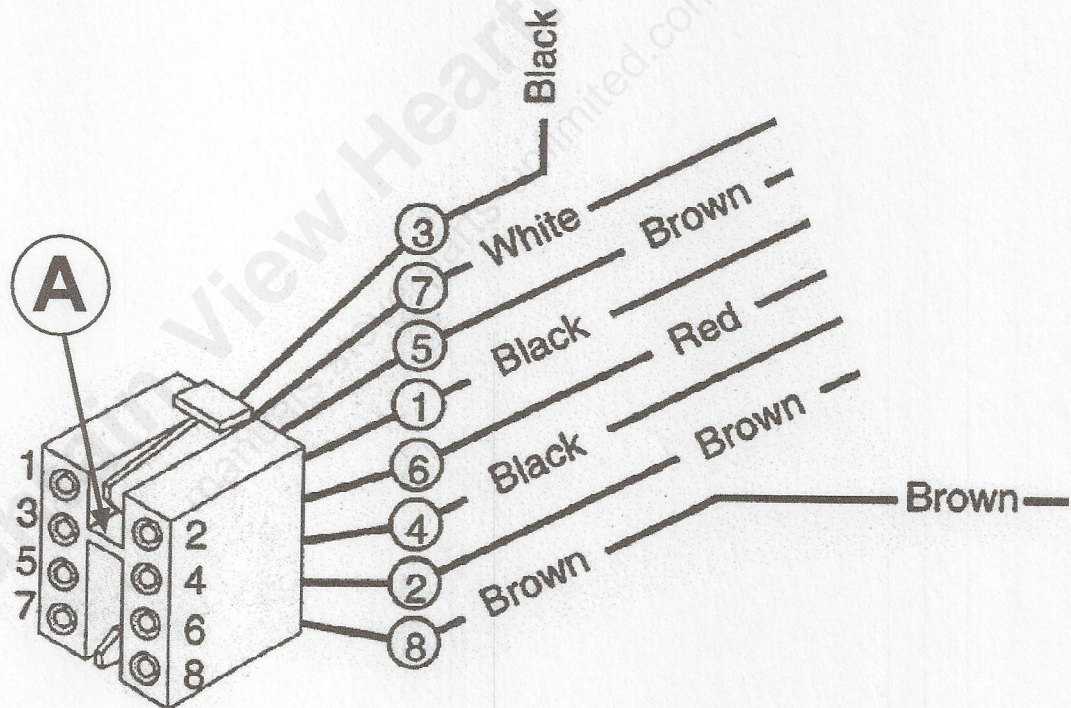
- Disconnect one side of component being tested.

Test Point	Continuity
① - ①	↓
② - ②	
③ - ③	
④ - ④	
⑤ - ⑤	
⑥ - ⑥	
⑦ - ⑦	



Molex Connector # System

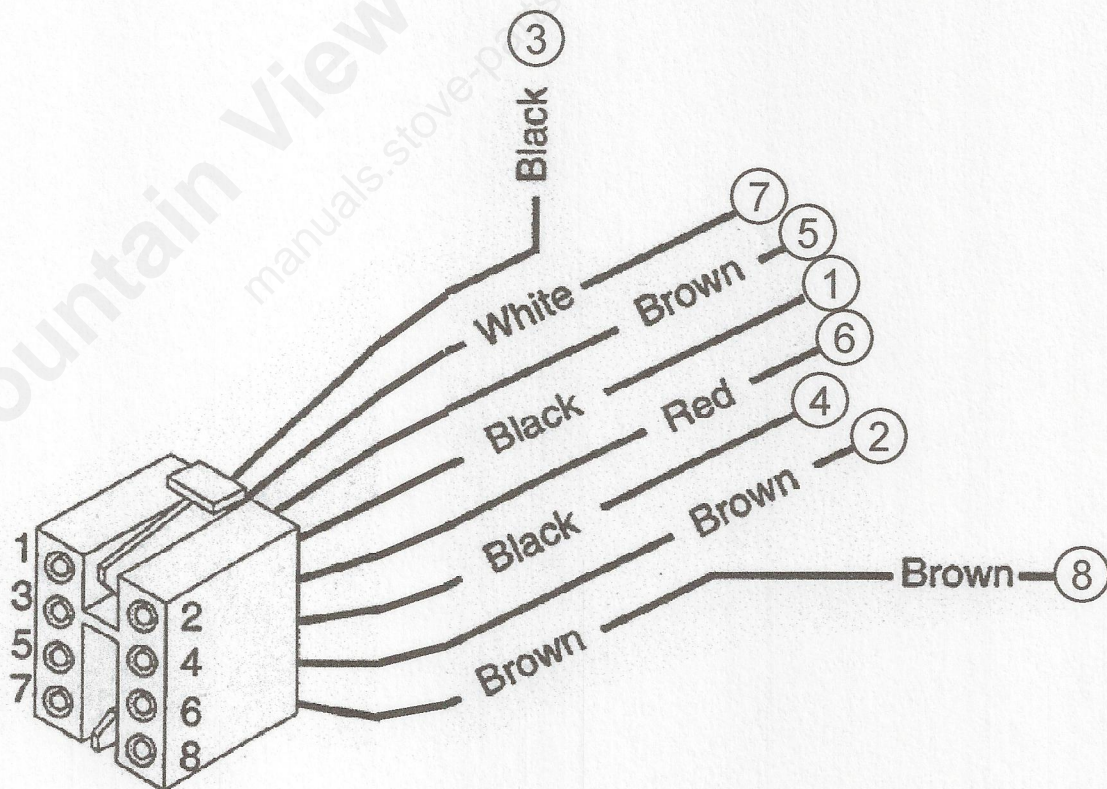
- The Molex connector is numbered, but hard to read so...
- With Molex connector turned so the cross member (A) is at the top-
 - The left side is odd #
 - The right side is even #



- The left side is odd #
- The right side is even #

Continuity Testing Molex Connector & Wires

MOLEX END	TEST TO	WIRE END	CONTINUITY	NO CONTINUITY
1	↔	1	GOOD	DEFECTIVE
2	↔	2	GOOD	DEFECTIVE
3	↔	3	GOOD	DEFECTIVE
4	↔	4	GOOD	DEFECTIVE
5	↔	5	GOOD	DEFECTIVE
6	↔	6	GOOD	DEFECTIVE
7	↔	7	GOOD	DEFECTIVE
8	↔	8	GOOD	DEFECTIVE



New Pellet Board Auger Timing

Auger ON Time 2.5 Sec.

LOW	First Light	OFF Time	10.7 Sec.
	Second Light	OFF Time	7.5 Sec.
	Third Light	OFF Time	4.6 Sec.
	Fourth Light	OFF Time	3.8 Sec.
	Fifth Light	OFF Time	2.9 Sec.
	Sixth Light	OFF Time	2.2 Sec.

Combustion Fan Volts Per Setting - Small Stoves

LIGHT	1	LOW	68 AVC.
	2		75 AVC..
	3		85 AVC.
	4		95 AVC.
	5		105 AVC..
	6	HIGH	115 AVC.

Combustion Fan Volts Per Setting - Large Stoves

LIGHT	1	LOW	85 AVC.
	2		95 AVC..
	3		105 AVC.
	4		115 AVC.
	5		115 AVC..
	6	HIGH	115 AVC.

New Board Convection Fan Levels

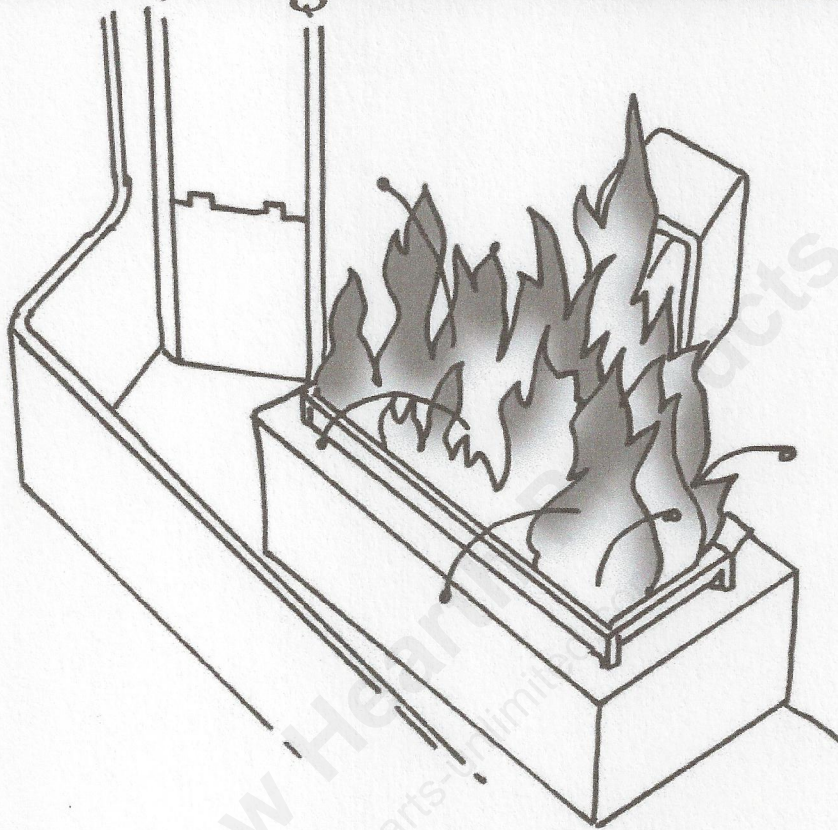
LIGHT	1	LOW	70 AVC.
	2		85 AVC..
	3		90 AVC.
	4		100 AVC.
	5		105 AVC..
	6	HIGH	115 AVC.

Troubleshooting Burn Problems

Burn Characteristics	1
Burn Related Problem Matrix	2
Pellet Fuel	3

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Troubleshooting Burn Characteristics



Burn Characteristics

NORMAL

- Bright orange flame
- Slight "Popcorning" effect of pellets
- Ash blowing out of burnpot
- Occasional ember blowing out of burn pot

ABNORMAL

- Pellet piling up
- Excessive "Popcorning" effect of pellets
- Unburnt or partially burnt pellets blowing out of burnpot
- Excessive clinker buildup in burnpot
- Soot deposits

Pellet Appliance Operation Problem Check List

Burn Related Problems	CHECK							
	Door Gasketing Air Leak	Glass Gasketing Air Leak	Poor Pellets	Dirty Burnpot	Dirty Exhaust System	Restrictor Needs More Restriction	Restrictor Needs Less Restriction	Air Wash Slots Blocked
Excessive Clinker Buildup	X	X	X		X		X	
Excessive Ash Buildup	X	X	X	X	X		X	
Pellets Buildup	X	X		X	X	X		
Dirty Glass	X	X		X	X		X	X

No Heat	CHECK							
	Operator Error	Client Expectations	Door Gasketing Air Leak	Glass Gasketing Air Leak	Poor Pellets	Dirty Burnpot	Dirty Exhaust System	Dirty Heat Exchanger Tubes
	X	X	X	X	X	X	X	X

Auger Jam	CHECK					
	Lack of Proper Maintenance (Fine Buildup)	Foreign Objects	Poor Quality Pellets (Fine Buildup)	Defective Bearing	Defective Auger Motor	