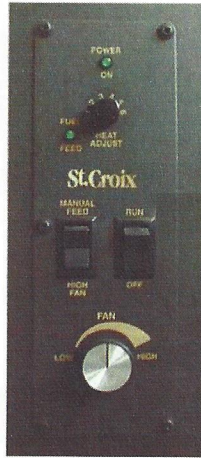


# St. Croix Analog Board to Digital Board Retrofit Kit

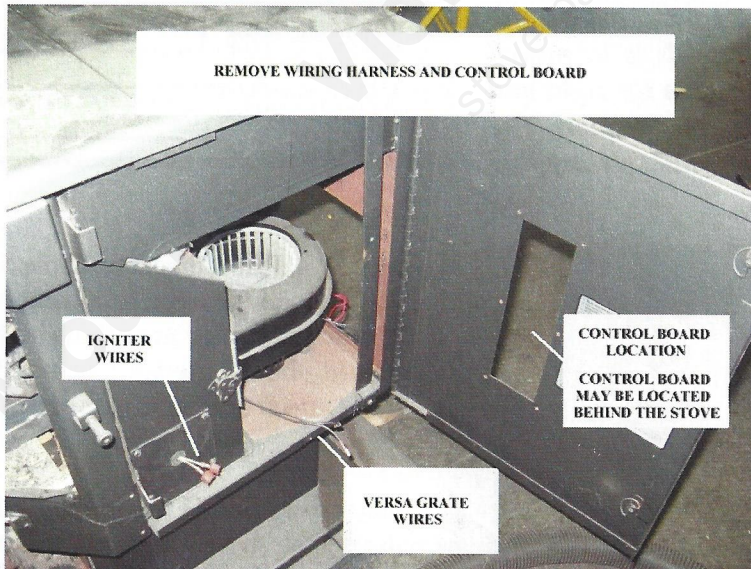


MOUNTED IN THE SIDE DOOR



MOUNTED ON THE BACK OF STOVE

These instructions cover freestanding stoves with the style of control boards shown above. These are Series II control boards only. Any Series I control board will not be supported with this kit. Series I boards will only have one Rocker Switch and have a Start Button in the center of the board to start the Auger.

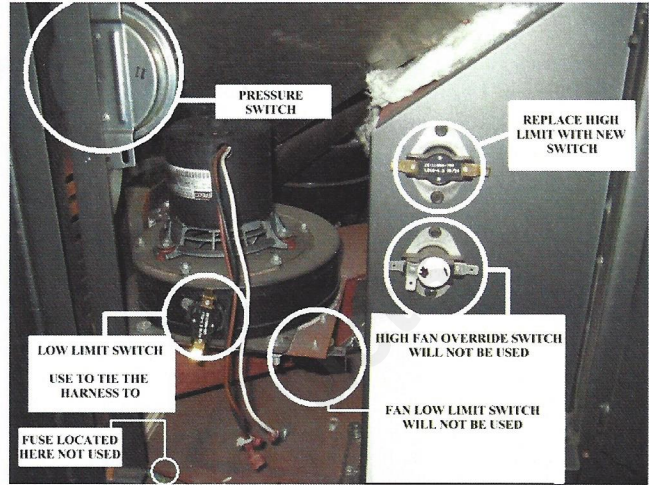
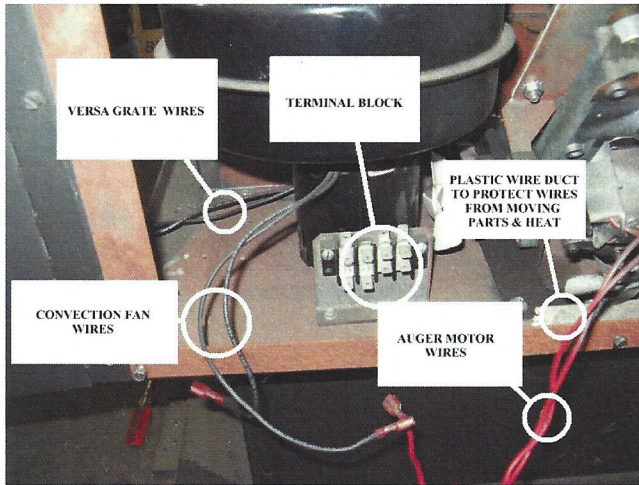


**Step 1** – First remove the Wiring Harness from the stove.

Please note location of the wires for the components on this side of the stove.

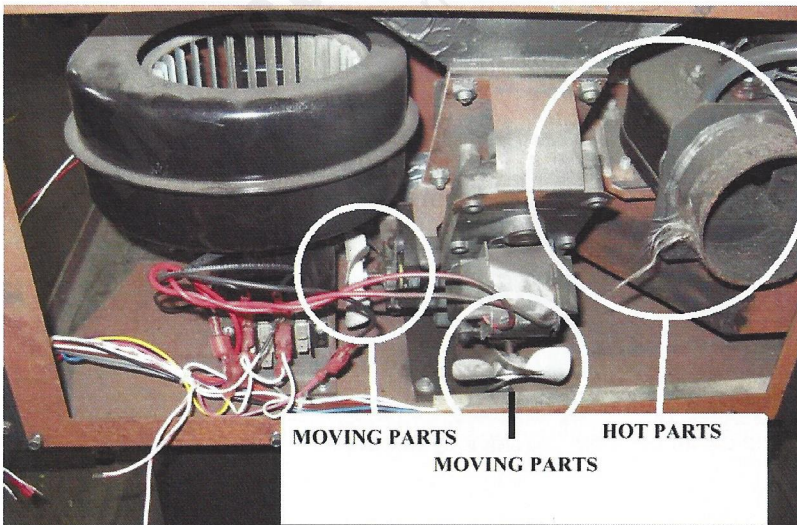
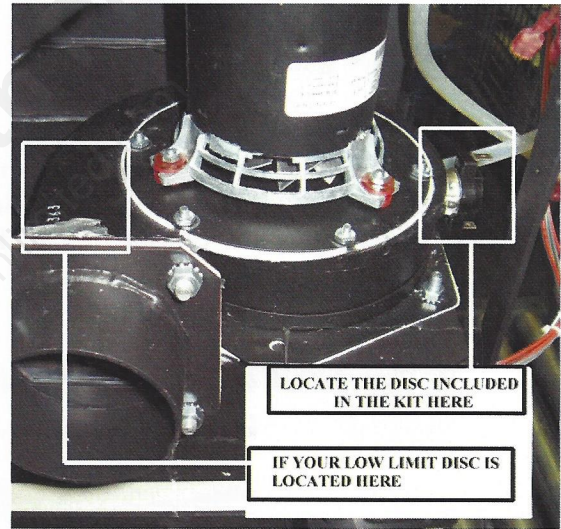
*This picture shows the Side Door mount.*

*The controls could also be located on the back of the stove*



Please note several components that will no longer be used when switching to the Digital Control board. The **High Limit Switch** will be replaced with a new “**Manual Reset**” switch. The **Rheostat** that was mounted with the old Analog board will no longer be used. The “**High Fan Override switch** shown in the figure to the right will no longer be used (*Leave sensor in unit*). The **Fan Low Limit switch** will no longer be used. The existing **Fuse** located by the Power Cord will no longer be used.

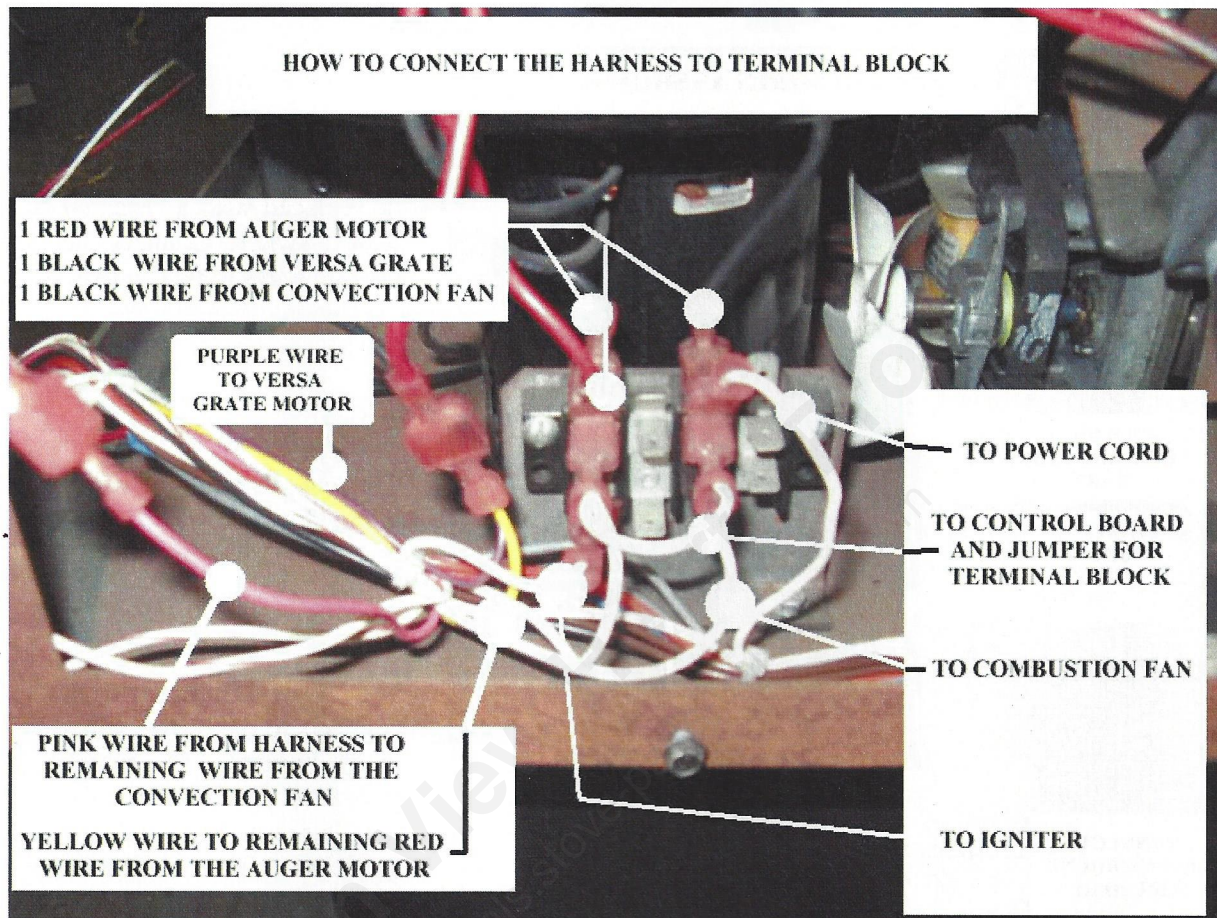
*Note: On units with the control board mounted on the back of the stove, the low limit switch needs to be moved to the position shown. Refer to the picture to the right and the picture directly above it to see the new location. The kit includes a new low limit switch and self tapping screws.*



**Step 2 - Place the new harness in the stove as shown in the following pictures. It is important to note that the harness should be protected from Moving Parts and from High Temperatures.**

There is a Plastic Duct in the back of the stove that should be used to route the harness through the back of the stove. The kit includes a plastic duct in case the existing one needs replacing. *Clean the surface of the stove before attaching the plastic wire duct, it will not stick to a dirty surface.*

The following pictures will show how to connect the wires to the components and tie wires back to protect them from heat.



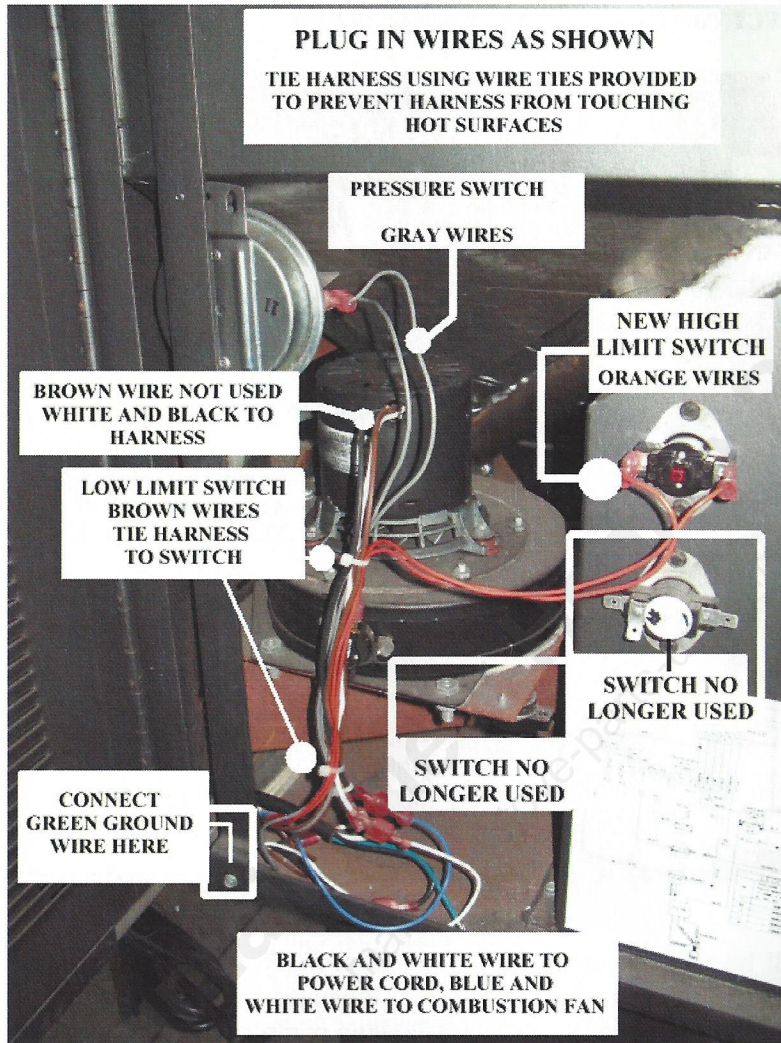
**Step 3** - The Terminal Block will be used to make all of the “**Common**” connections. In the Harness this includes only **White** wires that are “Clustered” together, one of which is a “**Jumper**” to connect the 2 strips of the Terminal Block. The following components will have one wire that needs to be connected to the Terminal Block. The Versa Grate motor (1 black wire), the Convection Fan (1 black wire) and the Auger Motor (1 red wire).

The Harness has the following colored wires to connect to the remaining “Hot” wires of the components.

Yellow wire connects to the remaining red wire to the Auger motor.  
Pink wire connects to the remaining black wire to the Convection fan.  
Purple wire connects to the remaining wire to the Versa Grate motor.

Be sure the 2 strips used for connecting the wires are **jumped** together with the **White Jumper Wire**

This side of the stove (*left side with door open*) has 3 sensors that will be used with the Digital Board.



The **High Limit switch** will be replaced with a “Manual Reset” switch. Connect the Orange wires to this switch.

Connect **Pressure Switch** to the Gray wires

The **Low Limit switch** connects to the brown wires in the harness. *The switch is behind the harness.* Tie the harness to the Low Limit switch as shown to prevent the harness from touching any hot surfaces of the Combustion Fan.

The following wires need to be connected on this side of the stove:

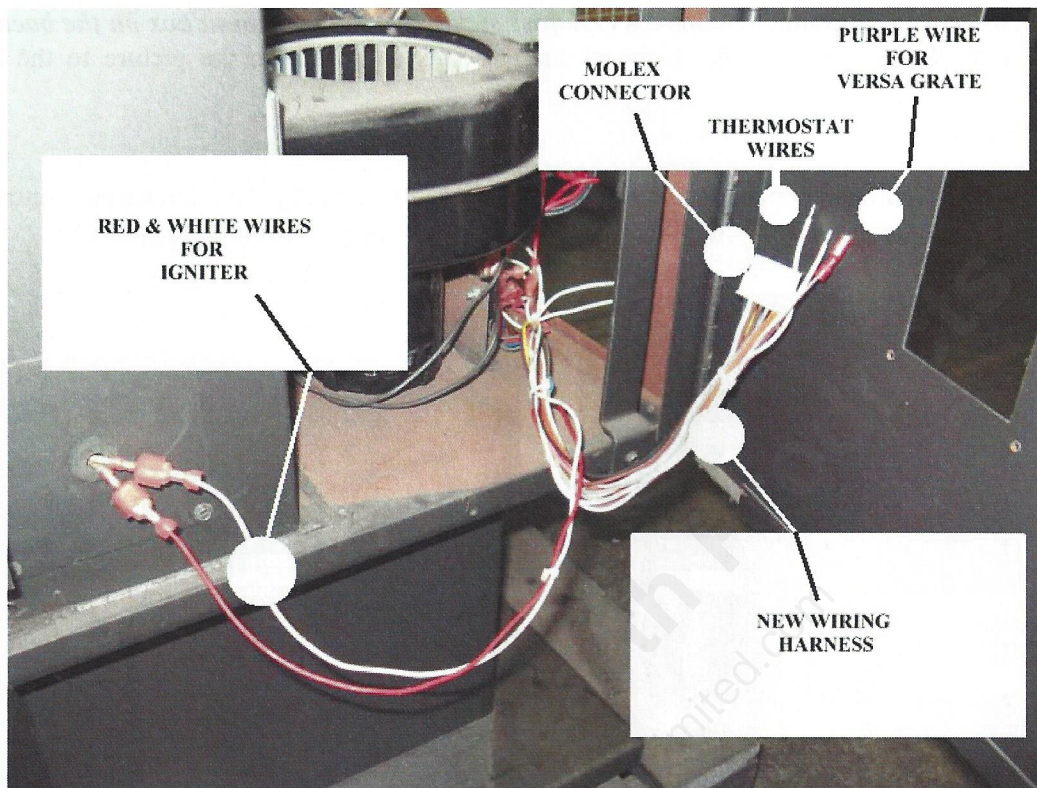
**White Wire** connects to the white wire from the Combustion fan

**Blue Wire** connects to the Black wire from the Combustion fan (the Brown wire from the Combustion fan is not used with the Digital board).

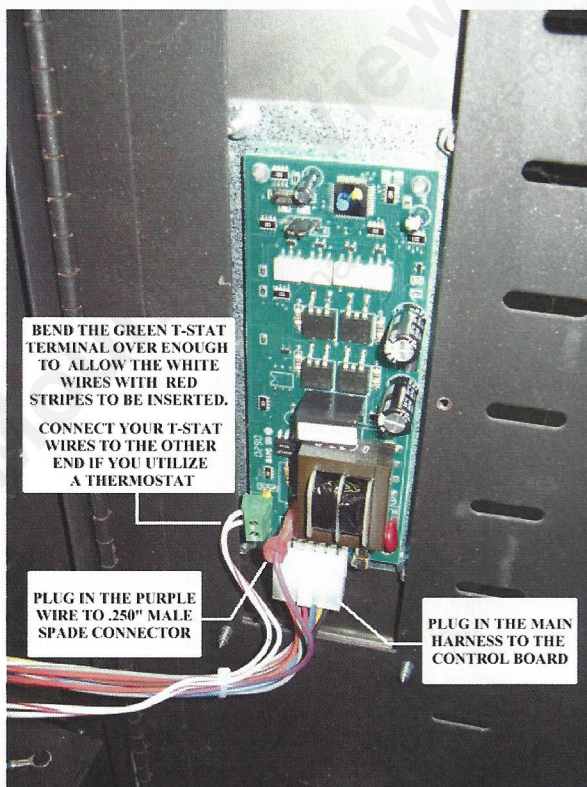
**Green Ground Wire** from the power cord to the screw shown in picture.

**White wire** connects to the White wire from the power cord

**Black wire** connects to the black wire from the power cord.



If your control board is mounted in the side door of your unit, your install will look like the picture to the left.



**Step 4** – Final harness connections to be made are as follows:

Red and White wires connect to the igniter. (See picture above)

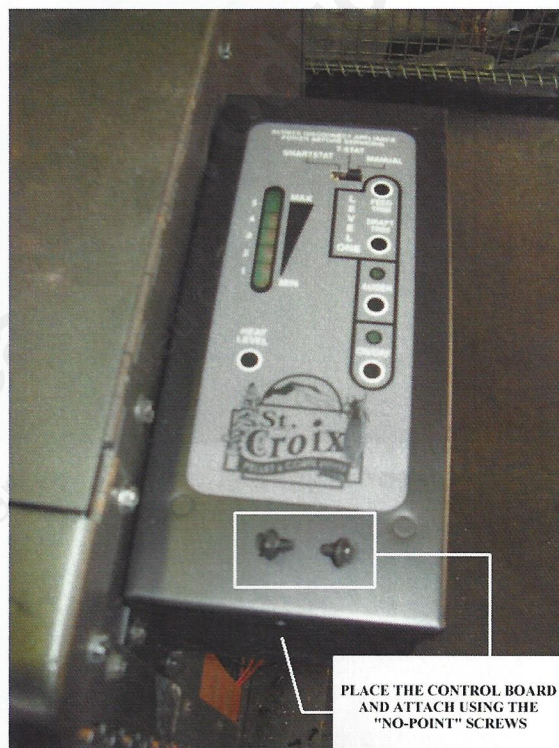
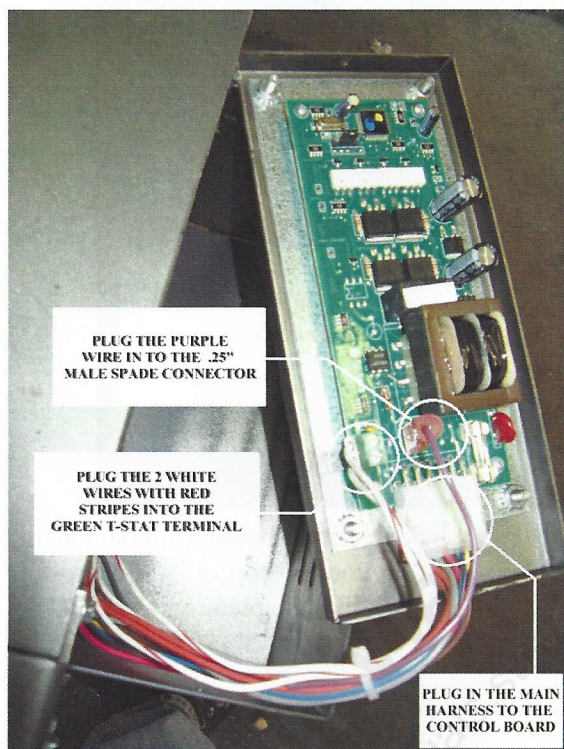
Main harness plugs into the Control Board. (See picture to the left)

The white Wires with Red stripes connect to the Control Board Thermostat Terminal. (See picture to the left)

The Purple Wire plugs into the ¼” Male Spade connector on the back of the Board. (See picture to the left)

If your control board is mounted on the back of your stove, *replace the mount box on the back of the stove with the one in the kit.* Connect the wires as shown in the picture to the left below.

Once the harness has been connected, turn the board over and carefully push the harness into the mount box and attach the board to the box with the “No-Point” screws provided in the kit.



**Final step:** Use the wire ties included in the kit and go back through the stove and tie the harness back in areas that are hot and around any moving parts that could cause damage to any wires.

*Once installed be sure to read the manual explaining the new control board*

**Please note your Replacement Board must say “NON-REVOLUTION STOVES” at the bottom.**

This control board has 4 programs; Programs 1 and 2 are for the Ashby-MF models, the Auburn, the Lancaster and the Greenfield. Programs 3 and 4 are for the Ashby-P, Afton Bay, the Prescott EXL, the Prescott EXP, the Hastings, and the York

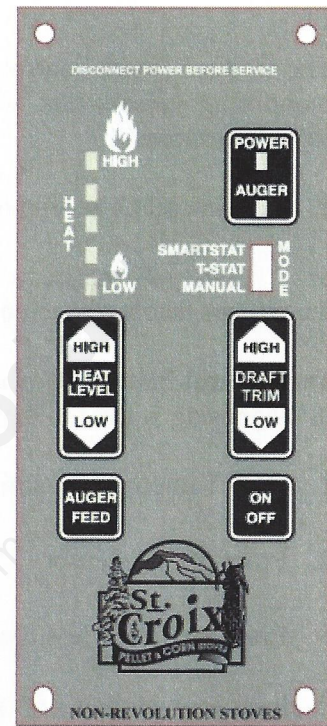
**THE BOARD SHIPS SET TO PROGRAM 1**

Programs 1 and 2 are not compatible with pellets. When upgrading your Freestanding stove, only use Program 3.

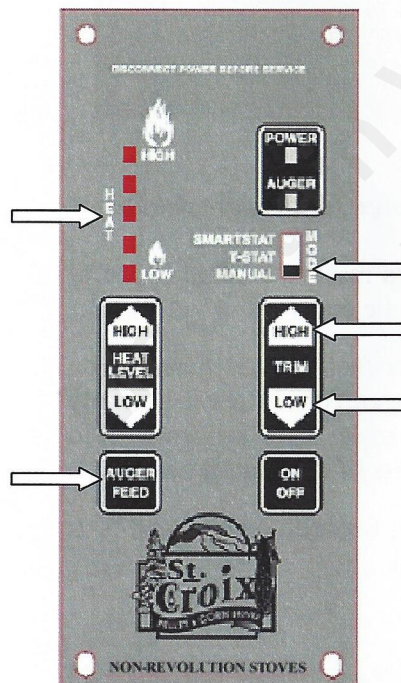
**Program 3 is a similar program as used with obsolete Pellet Boards. If you are upgrading a Freestanding stove with an Analog board use program 3**

Program 4 is not compatible with upgraded pellets stoves.

- The DHC4000 Series control board offers more Feedrate adjustments and Draft Fan voltage adjustments. This allows for more user friendly control over how the stove burns based on the quality of fuel.



80P30523-R



**How to set your new Board to Program 3**

After installing your new board, your stove must be in the OFF position and the unit must be completely cooled down so the Proof of Fire Switch is Open.

**The Thermostat slide switch must be in the Manual mode.**

**Press & Hold** the Auger Feed Button, then **Press & Release** the Trim **High & Low** Buttons at the same time.

Watch the LED lights flash. The number of times the lights Flash will indicate which program is running.

**Program 1 – LED lights flash once**

**Program 2 – LED lights flash twice**

**Program 3 –LED lights flash three times**

**Program 4 – LED lights flash four times**

## Control Board Features

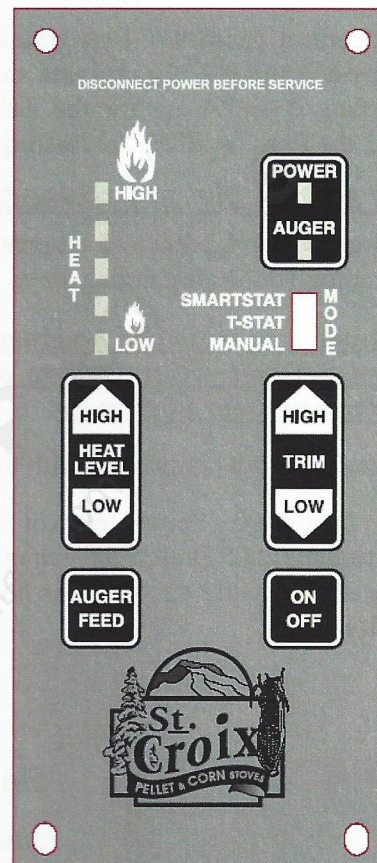
The Control Board controls all functions of your stove by monitoring sensors that are in the system. These sensors serve 2 purposes.

- a. General Operation of the Insert.
- b. Safety Features, to shut the unit down in the event the sensors detect a problem in the unit.

The Control Board also has Diagnostic Capabilities to help in diagnosing 3 areas in the Insert. These areas are:

1. High Temperature Limit.
2. Proof of Fire Sensor
3. Pressure in the Vent System.

A closer look at the Control Board to the right will explain how the board works. There are essentially 4 buttons on the control board. Two of these buttons, the **Heat Level** and **Trim** Buttons, have a High/Low side to advance these settings up or down. There is a **Slide Switch** that controls the Thermostat Mode and an **LED Light** bar that indicates which of the 5 Heat Settings the Stove is running on.



*The LED Light bar is also used during the Diagnostic process, see page 11 for more details*

1. The On/Off button not only turns the Stove On and Off, it also resets the board if one of the sensors has detected a problem and the board is flashing a Diagnostic code.
2. The Auger Feed button will allow the user to manually auger fuel into the burn pot on start up when needed. This is particularly helpful in priming the Auger Tube when it is empty (After the hopper has run out of pellets). This button is also used to make small adjustments to the combustion air and the feed rates as part of the **Fine Tuning** process of the control board.
3. The Heat Level button will advance the setting up and down between level 1 and 5. It will also be used in the Fine Tuning process of the feed rates if needed.

### To adjust the Feed-rates:

Hold the Auger Feed Button down and press the Heat Level High/Low button and this will change the ON Time up or down .25 seconds from the factory setting. Watch the LED lights to see the setting is on (it will flash the new setting). This new setting will stay in memory from this

point on. The LED lights indicate the level of adjustment and the factory setting is the center LED light. This gives two .25 second adjustments up and two .25 second adjustments down.

4. The Trim button is used to adjust the Exhaust (Combustion) fan voltages up or down to provide for **fine-tuning** of the combustion air. The LED lights indicate the level of adjustment and the factory setting is the center LED light. This gives 2 adjustments up and 2 adjustments down.

#### **To adjust the Combustion Fan voltages:**

Hold the Auger Feed button down and press the Trim High/Low button and this will change the fan voltage approximately 2.5 volts up or down from the factory setting. Watch the LED lights to see the setting is on (it will flash the new setting). This new setting will stay in memory from this point on. **Use these adjustments in conjunction with the damper.**

5. The Thermostat Slide switch allows the Insert to be run in 3 different Modes:
  - a. **Manual Mode.** The Control Board controls all functions of the Ashby.
  - b. **T-Stat Mode.** The Stove is hooked to a Thermostat and when calling for heat the unit will advance to the Heat level set at the Control board. Once the Heat demand has been met the Insert will drop to the #1 Heat Level setting and pilot. The Insert never shuts off and provides constant heat.
  - c. **SmartStat Mode.** *(Can only be used with Pellets & Cherry Pits in the Ashby-P model. Not recommended for use with a mixture of Pellets and Corn.* The unit is hooked to a Thermostat and when calling for heat the Insert will advance to the Heat level set at the Control board. Once the Heat demand has been met the Insert will drop to the #1 Heat Level setting **and pilot for one hour**. If the Thermostat does not call for heat during that hour the unit shuts off and **re-lights itself the next time the Thermostat calls for heat**. This setting is best used during early Fall or late Spring, when constant heat is not needed.
6. **Cleaning Cycle.** Your Stove only uses Programs 3. This allows the Stove to operate in an Automatic mode using the Igniter. These 2 programs have a Cleaning Cycle built into them that allows the unit to drop to the #1 level for 5 minutes on timed intervals. During the cleaning cycle the Combustion Fan will run at line voltage to blow excess ash from the burn pot. This feature only functions if the unit is operating on levels 3 through 5. **The ON/OFF light blinks during this cycle.**

The Control Board has 4 separate programs. Each program is specific to a certain fuel. Before lighting the Insert for the first time, be sure the correct program is chosen.

To change the program on the board, the Insert must be off and the unit must be cold. The programs are identical in operation, except for the Cycle Time. The Cycle time is the total of the ON Time & OFF Time added together. The ON Times are constant, so this means that the OFF Time is increased or decreased, depending on the program chosen.

**Program 1 - This program is not for use with the Pellet stove that you are upgrading.**

**Program 2 - This program is not for use with the Pellet stove that you are upgrading.**

**Program 3** - The Cycle Time is 11.5 seconds and the ON/OFF times are similar to the old Analog board you are replacing. Only use this program with the replacement kit

**Program 4** - This program is not for use with the Pellet stove that you are upgrading.

*Choosing the incorrect program will cause the stove to burn incorrectly. Programs 1 and 2 will not burn hot enough and Program 4 will cause the pot to overload.*

**Lighting Your Stove for the first time.** (Read the Frequently Asked Questions, the Board must be in Program 3)

1. Make sure there are pellets in the hopper and the viewing door and ash pan door are closed.
2. Push the On/Off button on the control board.

At this point all that needs to be done is to monitor the burn pot to make sure the stove starts up properly. Once the On/Off button has been pushed the Start Up program takes over.

The Start up Program works as follows:

- a. The Combustion fan and Room fan come on at high speed and the control board checks to make sure the Vacuum switch locks in. (See Diagnostic features on page 34 and 35)
- b. When the board senses the Vacuum switch the Combustion fan drops to the #1 setting and the Room fan shuts off.
- c. The Igniter and the Auger come on (the Auger runs for 2 minutes). The stove will typically light in the first 3 - 4 minutes. After 5 minutes the board checks for "Proof of Fire" and starts feeding pellets on the #1 setting. Once the board senses P.O.F. the Igniter shuts off and the stove has started successfully.
- d. If the board fails to sense P.O.F. it will repeat the previous step and continue feeding pellets on the #1 setting for 5 more minutes.
- e. The board will check for P.O.F. one more time. If the board still fails to sense the Proof of Fire switch, the stove will go into "Safety shutdown" (See Diagnostic Features on page 35)

If the stove fails to start, repeat steps listed above.

**CAUTION: NEVER ADD FIRE STARTER TO A HOT STOVE.**

## Shutting the Unit Off

1. Press the On/Off switch once; the lights will go off and the fire will go out in a few minutes. The board essentially goes into "Safety shutdown".
2. As long as the temperature within the Stove remains above 110°F the Fans will continue to run. When the P.O.F. switch drops out, the room fan shuts off and the Combustion fan will run for another 10 minutes and finally shut down completely.
1. NEVER unplug the Insert to shut it off. Doing so may cause a significant amount of smoke to enter the room.

## Diagnostic Features of the Control Board

The #2 LED, #3 LED and #4 LED lights on the LED Light bar) will flash to give a diagnostic code to help in diagnosing problems that may occur. *(Read Frequently Asked Questions for more information)*

These conditions fall into 2 categories:

- a. Heat related issues.
- b. Vacuum related issues.

The Diagnostic Lights flash as follows:

1. The **Proof of Fire** switch. This switch will sense the temperature of the Exhaust rising during start up. If the Exhaust temperature does not reach 110 degrees F, or if, during use, the temperature drops below 110 degrees F, the Insert will go into "**Internal Alarm**" and the Auger will quit feeding fuel. Once the Insert completes the safety shutdown, the #3 LED will start blinking. *(Read Frequently Asked Questions for more information)*
2. The **High Limit** switch. This sensor will sense if the unit reaches temperatures that are too high for normal operation. If this happens the Auger will quit feeding and the #4 LED light will start blinking. *(Read Frequently Asked Questions for more information)*
3. The **Vacuum** switch. For the Insert to operate correctly the firebox needs to be sealed. During the first 30 seconds after the unit has been turned on, the control board will check to see if the switch senses negative pressure (Vacuum) in the firebox of the Insert. If there is no negative pressure, the Insert will go into "Safety shutdown" and the #2 LED will start blinking. *(Read Frequently Asked Questions for more information)*

*During "Normal Operation" a 60 second delay has been incorporated before the unit shuts down when the board senses loss of vacuum. This is to accommodate opening the doors during maintenance. Once the board senses loss of vacuum the ON/OFF light will start blinking. While the light is blinking the control board will not feed any fuel nor respond to any of the buttons. Once Vacuum has been restored the unit will revert to normal operation.*

## TROUBLESHOOTING & FREQUENTLY ASKED QUESTIONS

The Insert is very trouble free in operation when properly maintained and quality fuel is used. When the Insert fails to operate properly, troubleshooting by the operator of the Insert is limited. Please read the following guide for answers to frequently asked questions

1. When first starting your Stove the auger tube is empty, which will delay feeding fuel to the burn pot. This will in some cases prevent the Insert from starting.

**Solution:** Prime the burn pot using the Auger Feed button if the auger tube is empty.

2. **My Insert keeps overloading the burnpot.** First check the Quality of your Fuel to make sure you are using clean fuel. Otherwise this is mainly caused by improper combustion settings. (See **Damper** Adjustment section of the Operations Manual) Besides the damper adjustment there are several areas that can have an effect on the combustion process.

**Solution:** Check all Gaskets, Doors and Door Latching Systems for air leaks. Any leaks in these areas will negatively affect the burn process and cause the pot to overload.

3. **My Insert isn't burning and the number 2 LED light is blinking.** This diagnostic light indicates the vacuum switch no longer senses negative pressure in the firebox area of the Insert. What caused the Insert to go out?

- a. The door of the unit was left open longer than 60 seconds. (**See solution**)
- b. The ash pan door was left open for longer than 60 seconds. (**See solution**)
- c. The combustion fan is not running. (Defective fan or control board)
- d. The vacuum switch is defective.
- e. The vacuum hose is disconnected
- f. The vent system is plugged with fly-ash.

**Solution:** *If the fire is out*, re-light the Insert. *If the fire is still burning* make sure all doors are securely latched and hold down the On/Off button (approximately 5 seconds) until Insert starts up again. This will re-start the Insert in the start-up program.

4. **My Insert isn't burning and the number 3 LED light is blinking.** This diagnostic light indicates that the Proof of Fire Switch no longer senses a fire in the Insert. First check to see if there is Fuel in the hopper. If there is fuel in the hopper check the following items to see why the Insert went out.

- a. Unburned fuel in the burnpot means the fire went out before the auger quit feeding.

Too much Combustion Air while burning on the Lowest Heat Level could cause the fuel to burn up too quickly and cause the fire to go out.

**Solution: Too much Combustion Air on the pilot setting.** Adjust the air damper or the combustion fan voltage. Fuel would still feed until the P.O.F. switch eventually shuts the Insert down. (See section covering *Damper Adjustment*)

- b. If all the fuel is burned up means the auger quit feeding fuel while there was still a fire in the burnpot. Check to see if there is fuel in the hopper. If the hopper is empty, fill the hopper and re-light the Insert.

If there is fuel in the hopper check to see if there is an obstruction in the auger system or if the auger set screw is loose.

**Solution:** Remove obstruction and re-light the Insert or tighten the setscrew on the auger shaft.

**5. My Insert isn't burning and the #4 LED light is blinking.** This means the high Limit has shut the Insert down. The Convection Blower could be defective or may need cleaning. The high limit switch may be also defective. It is best to call your dealer for support when trying to troubleshoot the High Limit Switch. Do not use your Insert if the High Limit switch frequently trips.

**8. I turned the Insert on with the On/Off switch and nothing happens.** First check to see if the Insert is plugged in and the receptacle has power to it.

**Solution:** Check the fuse on the back of the control board. Replace with a 125 Volt, 5 Amp fuse.

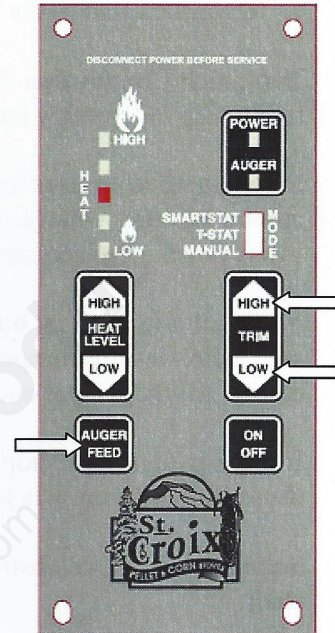
**9. Why is my glass dirty?** Normal operation of your St. Croix Insert will produce a light build-up on the glass that wipes off with a dry paper towel. However extended burning on the low setting only will produce a tan color. These types of build-up on the glass are normal. A heavy black build-up on the glass could indicate a problem.

**Solution:** Adjust the combustion air damper or combustion fan voltage. If this doesn't seem to help, make sure the clean out cover plates are installed in the Insert. It also could be an indication that the Insert is getting plugged and needs a good cleaning. Refer to the section in the manual that covers the Daily, Periodic and Yearly Maintenance of the Insert.

8. Are there any adjustments that can be made, through the control board, to the amount of fuel that is fed into the burnpot?

Answer: There are several ways to adjust the amount of fuel that is fed into the burnpot. The feedrates can be fine-tuned while the Insert is in operation by *pressing and holding* the “Auger Feed” button down and then *either* pressing the “Heat Level High” button to advance the feedrate higher, *or* pressing the “Heat Level Low” button to decrease the feedrate.

There are 5 levels on the control board and they are indicated by a single flash of the LED’s. The default setting is the center LED. This gives 2 adjustments increasing the feedrate (LED’s 4 & 5) and 2 adjustments decreasing the feed rates. (LED’s 1 & 2) The ON time is *increased or decreased* .25 seconds with each adjustment.

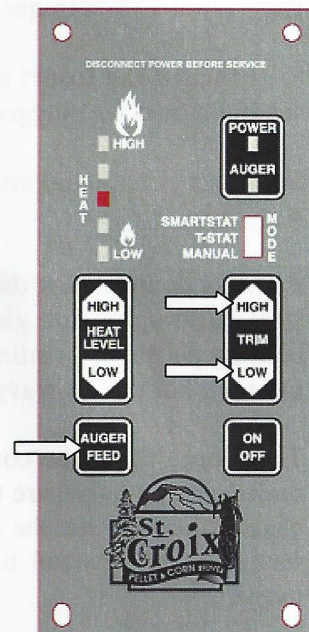


9. Are there any adjustments that can be made, through the control board, to the Combustion Fan voltages to help adjust the draft?

Answer: The Draft can be adjusted in a similar fashion as mentioned in the previous example.

The Fan voltages can be fine-tuned while the Insert is in operation by *pressing and holding* the “Auger Feed” button down and then *either* pressing the “Trim High” button to advance the voltages higher, *or* pressing the “Trim Low” button to decrease the fan voltages.

There are 5 levels on the control board and they are indicated by single flash of the LED’s. The default setting is the center LED. This gives 2 adjustments increasing the voltage (LED’s 4 & 5) and 2 adjustments decreasing the voltage. (LED’s 1 & 2) The voltage is *increased or decreased* 2.5 volts with each adjustment.



10. Are there Cycle Time adjustments on the Control Board for different types of fuel?

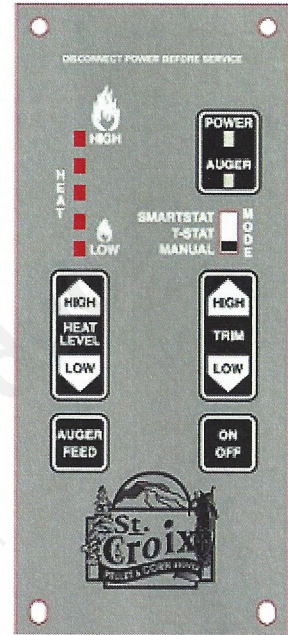
Answer: There are 4 individual programs on the control board, each with a different Cycle time for different fuels. Your stove was only designed to burn Pellets and must use Program 3.

**Program 1.** The Cycle Time is 11.5 seconds. THIS PROGRAM IS ONLY TO BE USED WHEN BURNING GRAIN. (DO NOT USE THIS PROGRAM WHEN UPGRADING A PELLET STOVE).

**Program 2.** The Cycle Time is 13 seconds. THIS PROGRAM IS ONLY TO BE USED WHEN BURNING GRAIN. (DO NOT USE THIS PROGRAM WHEN UPGRADING A PELLET STOVE).

**Program 3.** The Cycle Time is 11.5 seconds. **THIS IS THE PROGRAM TO USE WHEN UPGRADING A PELLET STOVE**  
This program is for use with **PELLETS ONLY**.

**Program 4.** The Cycle Time is 10 seconds. THIS PROGRAM IS ONLY TO BE USED WHEN CHERRY PITS. (DO NOT USE THIS PROGRAM WHEN UPGRADING A PELLET STOVE).



11. How do I make sure my Board is set to Program 3?

First the stove must be turned off and cooled down.

Step 1 - The Thermostat switch must be in the **Manual** position.

Step 2 - Press and hold the **Auger Feed** Button.

Step 3 - Press the **Trim High and Low** Buttons. Release all 3 buttons at the same time.

Step 4 - Observe the LED light flashing according to the Program chosen. Program 1 flashes once, Program 2 flashes twice, Program 3 flashes three times and Program 4 flashes 4 times.

Once the new Control Board has been installed, simply follow the instructions above until you see the LED light flash 3 times and your board is set to the correct program.

