

## SAWTOOTH PELLET GRILLS

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SPG-410/610



# OPERATING MANUAL

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### **NOTICE!**

PLEASE READ THIS ENTIRE MANUAL BEFORE ASSEMBLING OR USING YOUR SAWTOOTH GRILL TO MAINTAIN WARRANTY!

*Please go to our website at [www.sawtoothpelletgrills.com](http://www.sawtoothpelletgrills.com) for the latest updated Operating Manual information*

Serial Number: \_\_\_\_\_

Purchase Date: \_\_\_\_\_

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# CAUTION

- ENSURE GRILL IS LEVEL BEFORE OPERATING.
- KEEP GRILL AT LEAST 5 FEET FROM WOOD STRUCTURES

Sawtooth Pellet Grills. and all of our employees would like to thank you for purchasing your new grill. Sawtooth Pellet Grills are proudly manufactured in the State of Idaho. As you learn the secrets of your new Sawtooth Pellet Grill you will quickly realize that you didn't simply buy a new barbeque—you purchased an entirely new way to cook! You can prepare everything from Smoked Turkeys to pizzas on your new Sawtooth Pellet Grill. Indeed, the cooking possibilities are endless! When you discover a new recipe, or want to divulge an old family favorite, send it to us so that we may share it with others. With your help, we can change the way the world prepares its food and, once again thank you!

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Helpful web sites for smoking, grilling, cooking recipes, tips and FAQ's

- [www.sawtoothpelletgrills.com](http://www.sawtoothpelletgrills.com)
  - [www.smoker-cooking.com](http://www.smoker-cooking.com)
  - [www.the-greatest-barbecue-recipes.com](http://www.the-greatest-barbecue-recipes.com)
  - [www.cooks.com](http://www.cooks.com)
  - [www.thesmoking.com](http://www.thesmoking.com)
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# Safety

***FAILURE TO FOLLOW ALL SAFETY TIPS AND OPERATING INSTRUCTIONS MAY CAUSE SERIOUS INJURY, DEATH AND/OR PROPERTY DAMAGE!***

## SAFETY RULES FOR SAWTOOTH GRILLS

- This is an electric appliance to be used outdoors only. Use it with the same caution you use with other outdoor electric appliances. It is recommended that you disconnect from power source when not in use.
- This grill must only be used outside in a well-ventilated area. Do not use the grill indoors under any circumstances. Keep at least 5 feet from any structure!
- Whenever this grill is in use, it is hot and may cause injury if touched anywhere except the designated handles.
- Never use any fuel source other than food grade Barbeque Pellets. Use of any other fuel source voids the Warranty and may cause serious injury, death and or property damage.
- Never store combustible fuels within 20 feet of this grill.
- Do not modify any part of the grill for any reason. Any modifications void all warranties and may cause serious injury, death and or property damage.
- Should a grease fire occur, turn off the grill if safe to do so, unplug it, and close the lid until the fire is out and the unit is cool.
- If the grill fails to Ignite, empty the fire box and begin the firing sequence again.
- Never leave the grill unattended.
- Never operate the grill on an uneven or unstable surface(s).
- Store all barbeque pellets in a dry, cool area.
- When storing your grill for long periods of time, remove all pellets from the hopper and the auger.
- Disconnect the grill from power source before removing the protective cover from the Hopper Assembly for maintenance or cleaning.
- **DANGER:** Never stick body part(s) or tools into the auger assembly for any reason.
- Always wear closed toe shoes while grilling.
- Never add pellets by hand to a hot fire pot. This is dangerous and may result in serious burns. If the hopper runs out of pellets and the fire is lost while cooking, open the lid, turn off all controls, and let the unit cool completely before restarting using the standard ignition sequence.
- Frequently inspect and remove any built up grease and drippings from the Grease Collection Pan before starting the grill. To make clean up easier, line the pan with heavy-duty aluminum foil. However, be sure the foil is tightly applied to the pan in a manner that allows the drippings to drain into the drip bucket.

# Sawtooth Pellet Grills

## Warranty

The LIMITED WARRANTY on Sawtooth Pellet grills covers defects in workmanship and structural parts and materials, excluding the powder coat finish, for a period of three (3) years from the date of original retail purchase, and covers defects in electrical parts for a period of one (1) year from the date of original retail purchase. The LIMITED WARRANTY is only valid for the original purchaser. During the warranty period, Sawtooth Pellet Grills, Inc., will replace or repair, at its sole option, any defective Sawtooth Pellet grill part returned to Sawtooth or one of its dealers. Sawtooth Pellet Grills, Inc. reserves the right to determine if the part is defective. All costs to return a defective grill or parts to Sawtooth or authorized dealers are the responsibility of the original purchaser.

This LIMITED Warranty does not cover and EXCLUDES grease bucket, hardware, grilling grates and/or accessories, powder coat fading, flaking or peeling, problems that arise from, relate to, or result from, abuse, misuse of the grill, problems with external electrical power sources, normal corrosion, normal metal warping due to heat, damage to personal property or personal injury through the use of this Sawtooth Pellet grill. This LIMITED WARRANTY does not cover and EXCLUDES uses not in accordance with the instruction manual. Commercial use of this product voids all warranties.

THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS WHICH MAY VARY FROM STATE TO STATE (PROVINCE TO PROVINCE IN CANADA). SAWTOOTH PELLET GRILLS, INC.'S RESPONSIBILITY FOR DEFECTS IN MATERIAL AND WORKMANSHIP SHALL BE LIMITED TO REPAIR AND/OR REPLACEMENT AS SET FORTH IN THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED

WARRANTIES AND WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

NEITHER SAWTOOTH PELLET GRILLS, INC., NOR ITS MANUFACTURERS OR SUPPLIERS ACCEPT RESPONSIBILITY, LEGAL OR OTHERWISE, FOR THE INCIDENTAL OR CONSEQUENTIAL DAMAGE TO PROPERTY OR PERSONS RESULTING FROM THE USE OF THIS PRODUCT. ANY WARRANTY IMPLIED BY LAW, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS, SHALL BE LIMITED TO ONE (1) YEAR FROM THE DATE OF ORIGINAL PURCHASE. WHETHER A CLAIM IS MADE AGAINST SAWTOOTH PELLET GRILLS, INC., ON THE BREACH OF THIS WARRANTY OR ANY OTHER TYPE OF WARRANTY EXPRESSED OR IMPLIED BY LAW, SAWTOOTH PELLET GRILLS, INC., SHALL IN NO EVENT BE LIABLE FOR ANY SPECIAL, INDIRECT, CONSEQUENTIAL OR OTHER DAMAGES OF ANY NATURE WHATSOEVER IN EXCESS OF THE ORIGINAL PURCHASE PRICE OF THIS PRODUCT. ALL WARRANTIES BY SAWTOOTH PELLET GRILLS, INC., ARE SET FORTH HEREIN AND NO CLAIM SHALL BE MADE AGAINST SAWTOOTH PELLET GRILLS, INC., ON ANY ORAL WARRANTY OR REPRESENTATION.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations of implied warranties, so the limitations or exclusions set forth in this limited warranty may not apply to you. This limited warranty gives you specific legal rights and you may have other rights, which vary from state to state.

## Procedures for Warranty Service

To register your grill go to:

<http://www.sawtoothpelletgrills.com/support/registration>

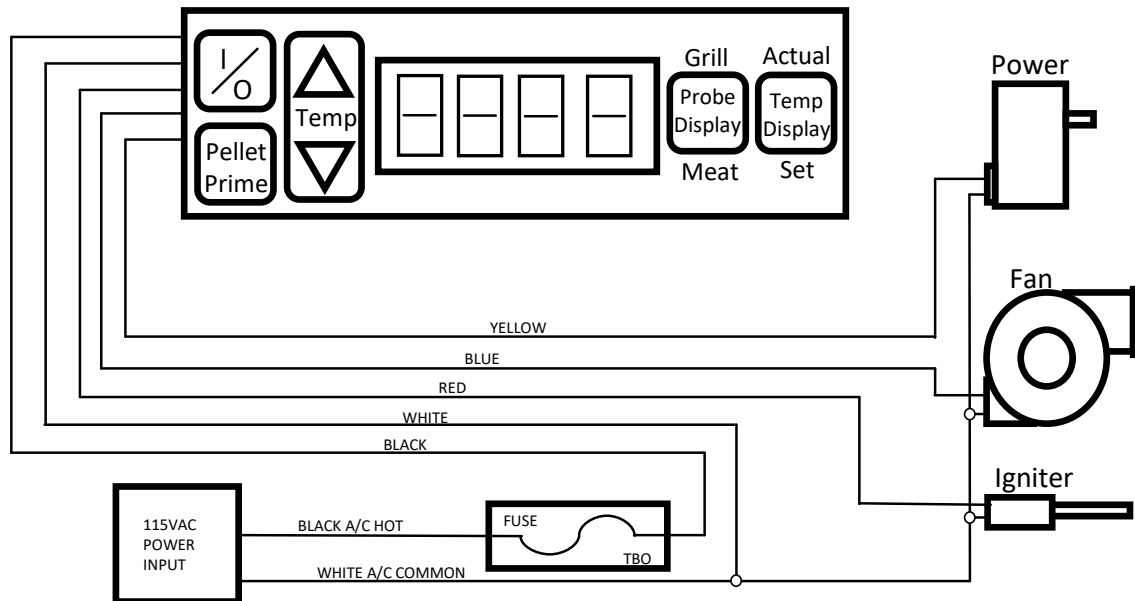
Contact your “Sawtooth Pellet Grill” dealer or Sawtooth directly for repair or replacement of your “in-warranty” grill or parts.

Be prepared to furnish the following information:

1. Purchaser’s name, model, serial number, and date of purchase.
2. An accurate description of the problem.
3. Your dealer will handle all trouble shooting questions.

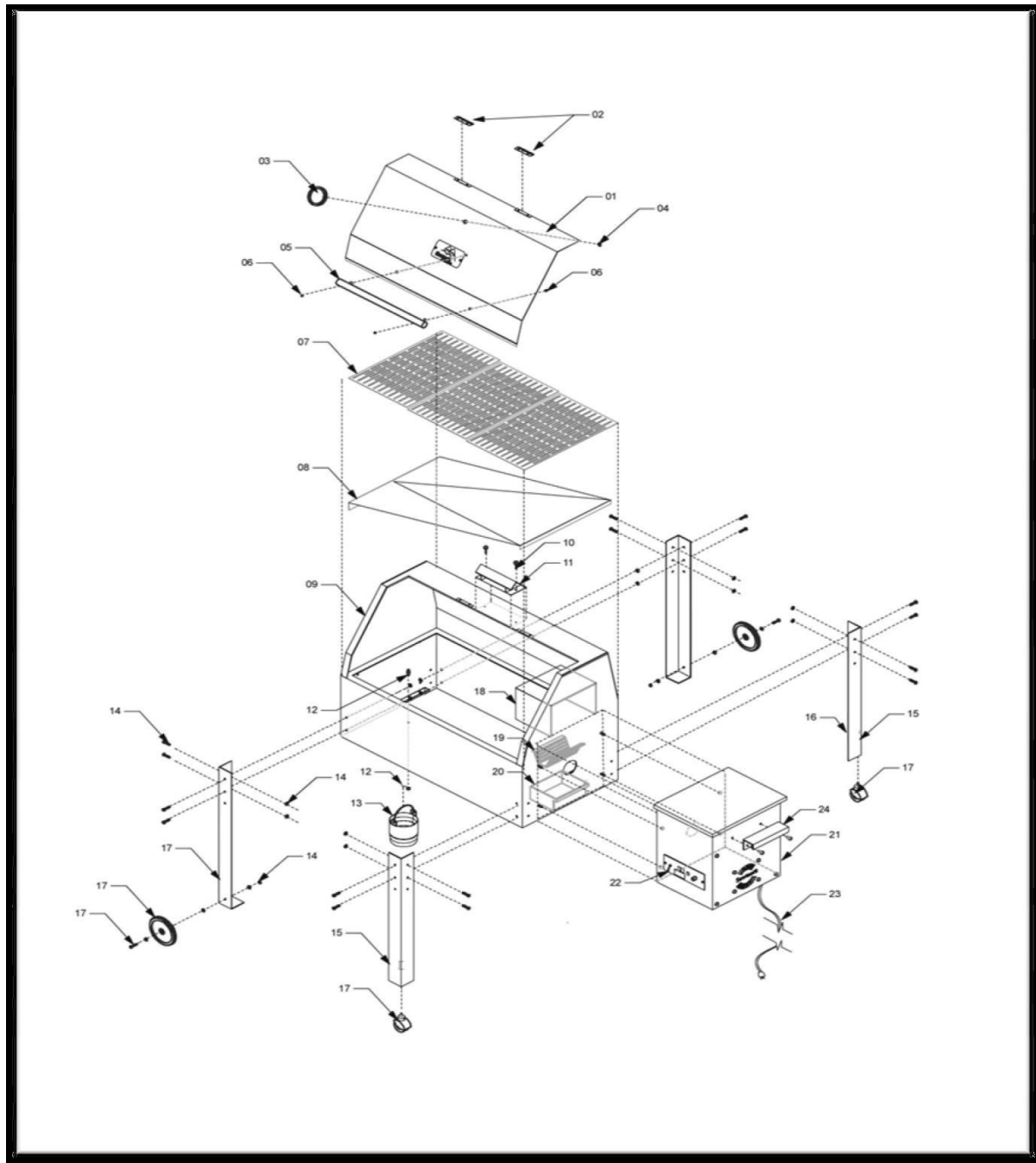
# Wiring Diagram

Digital Programmable Controller:

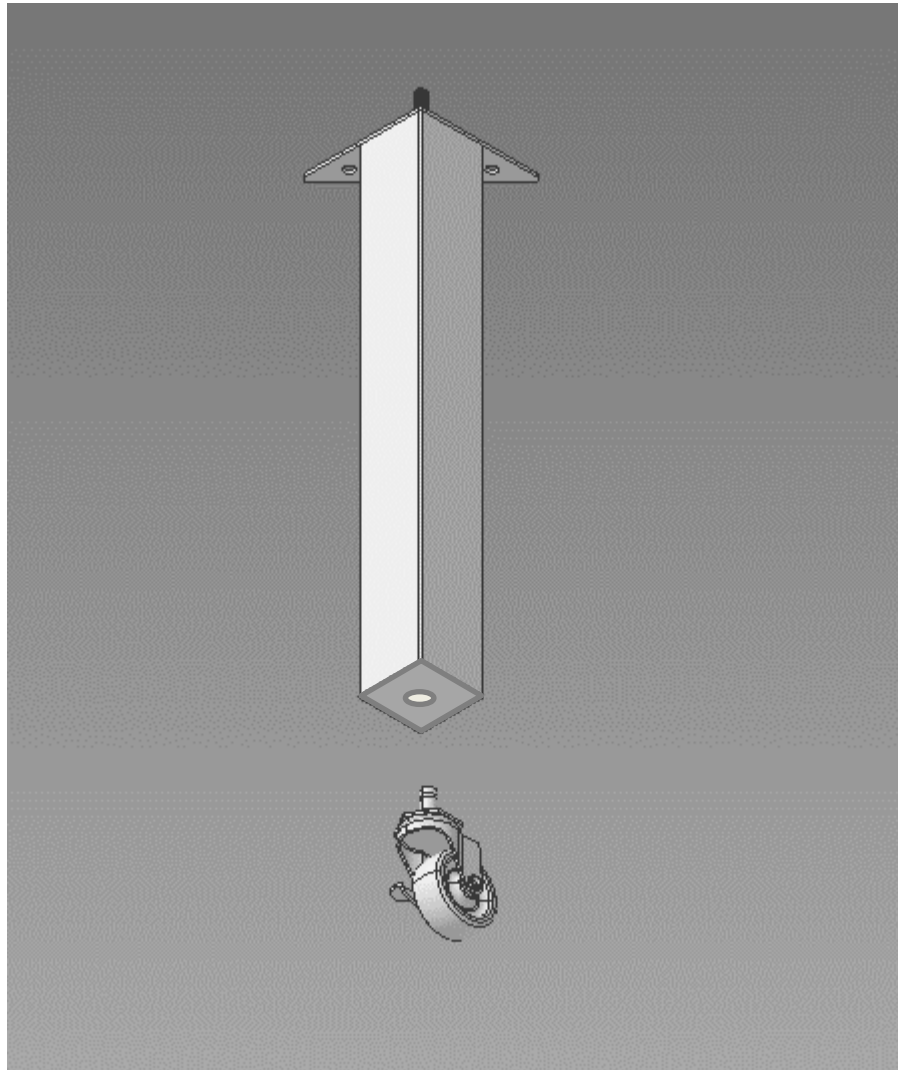




## Component Diagram

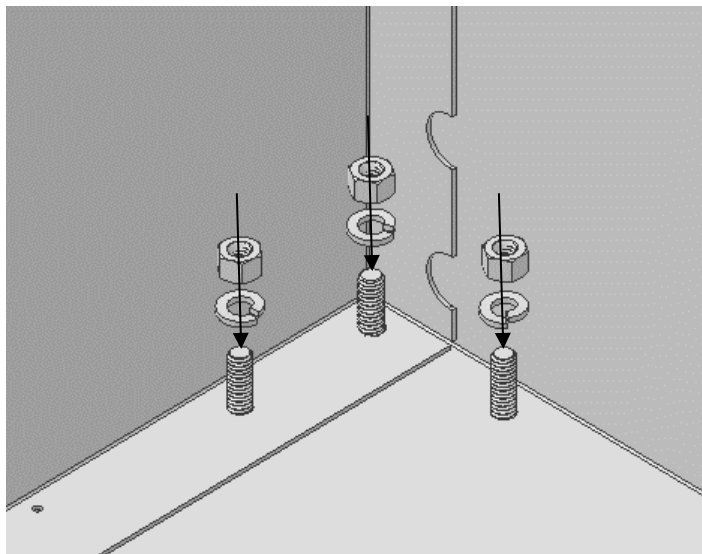
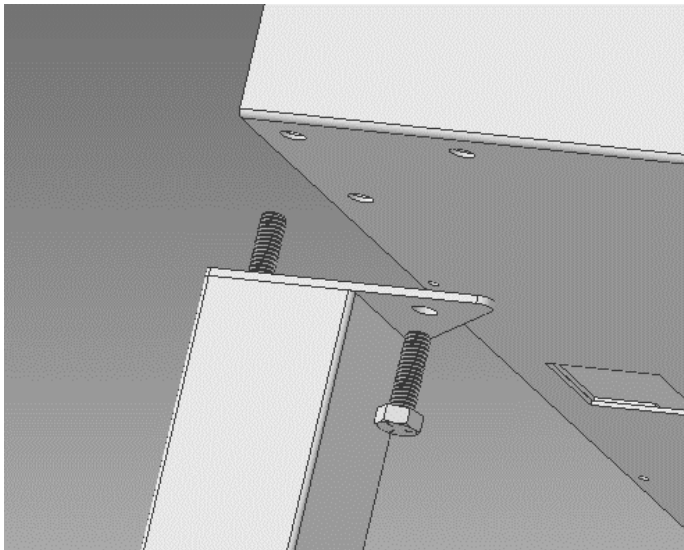


## Caster Attachment



Tools – none  
Push caster stem in to caster socket. Make sure it is firmly seated.  
Note: Some grills come with casters already in place.

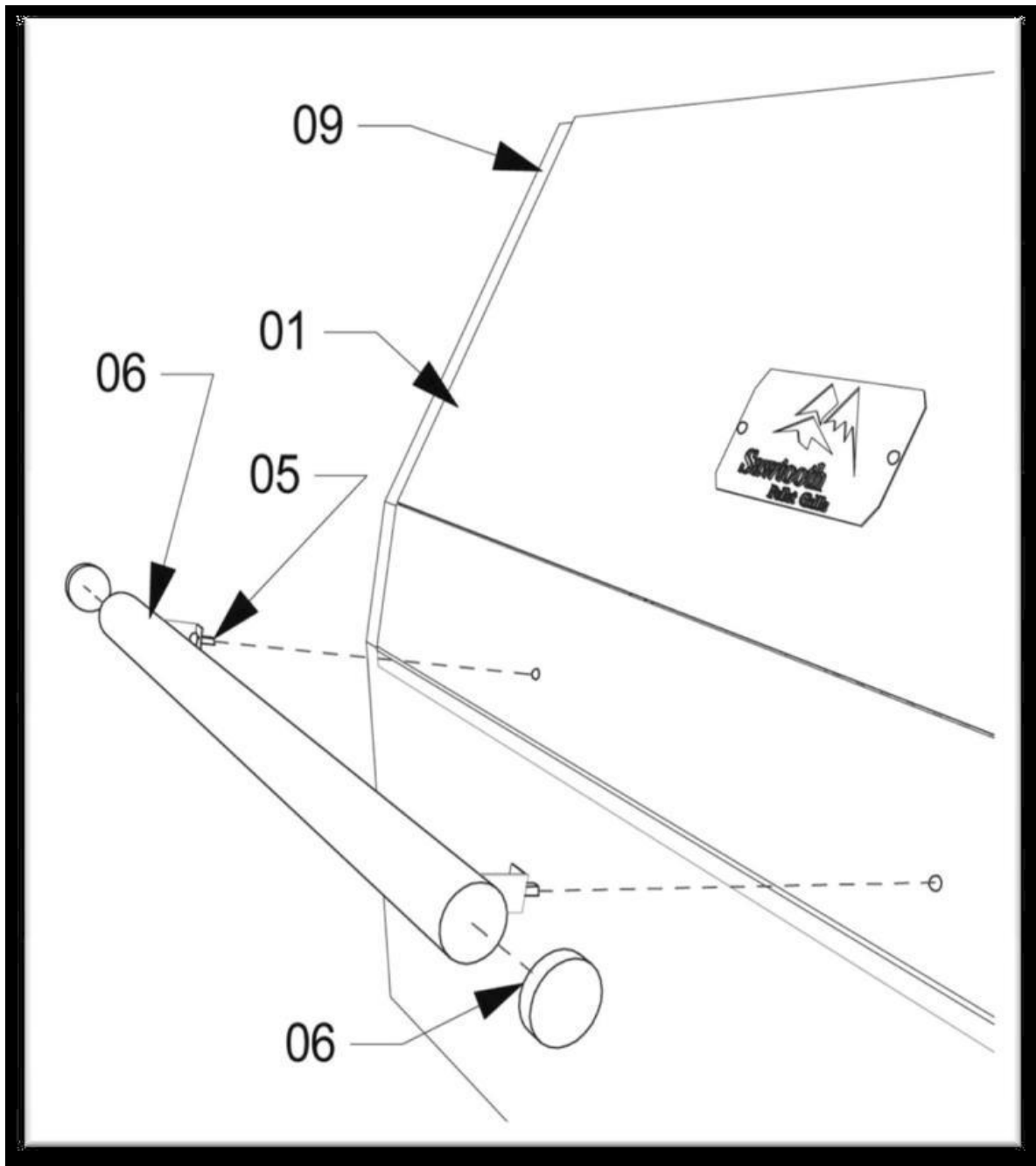
## Leg Attachment



Tools – ½" open Wrench or Socket

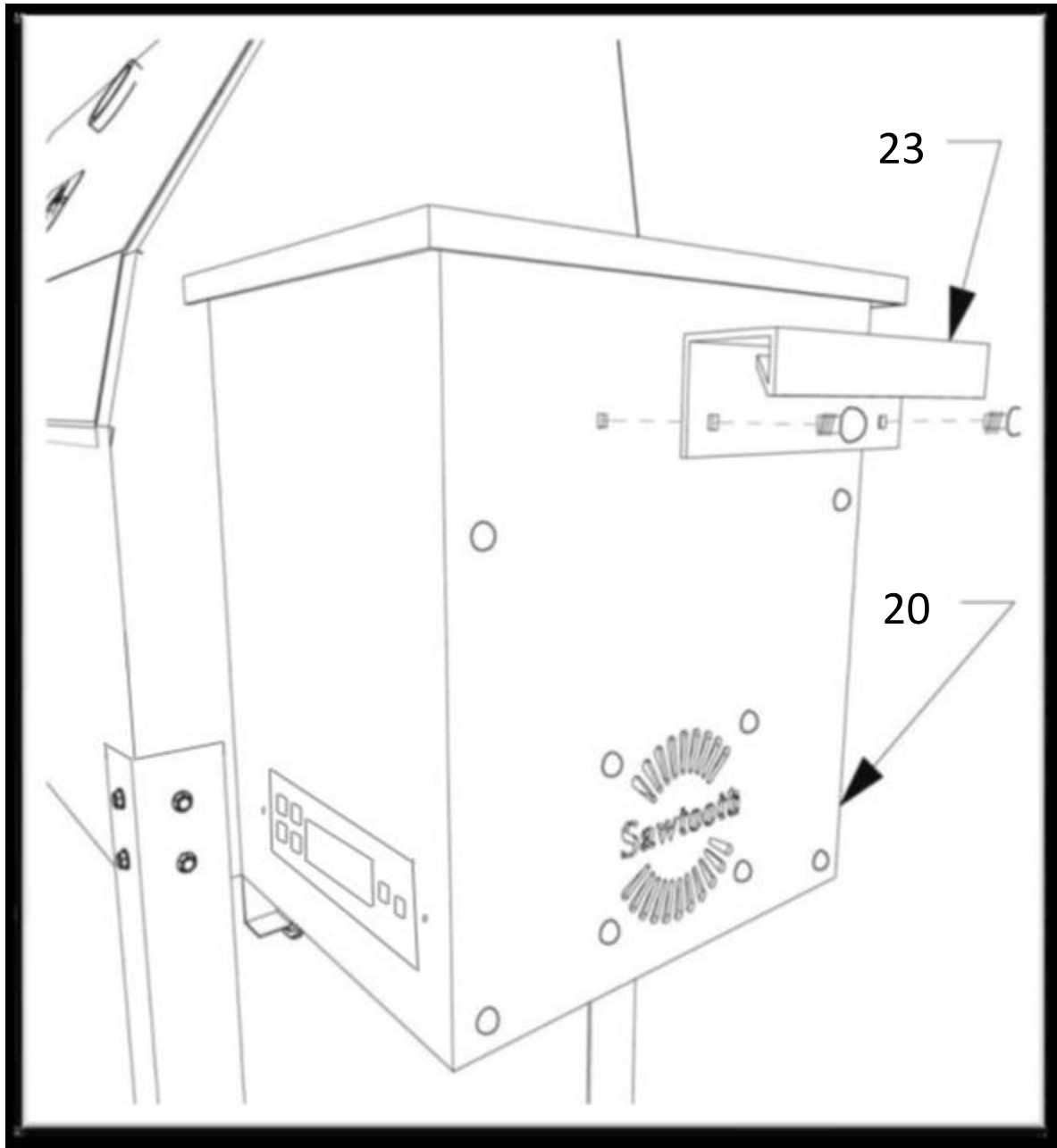
Slide the threaded post on leg in to corner hole at bottom of grill. Inside the grill put a lock washer and nut on the threaded post. Put bolts in to the other two holes and secure them from inside the grill with lock washer and nut. (Note: if adding optional bottom shelf it is easier to install by leaving nuts that secure the leg loose to allow play in the legs.)

## Lid Handle



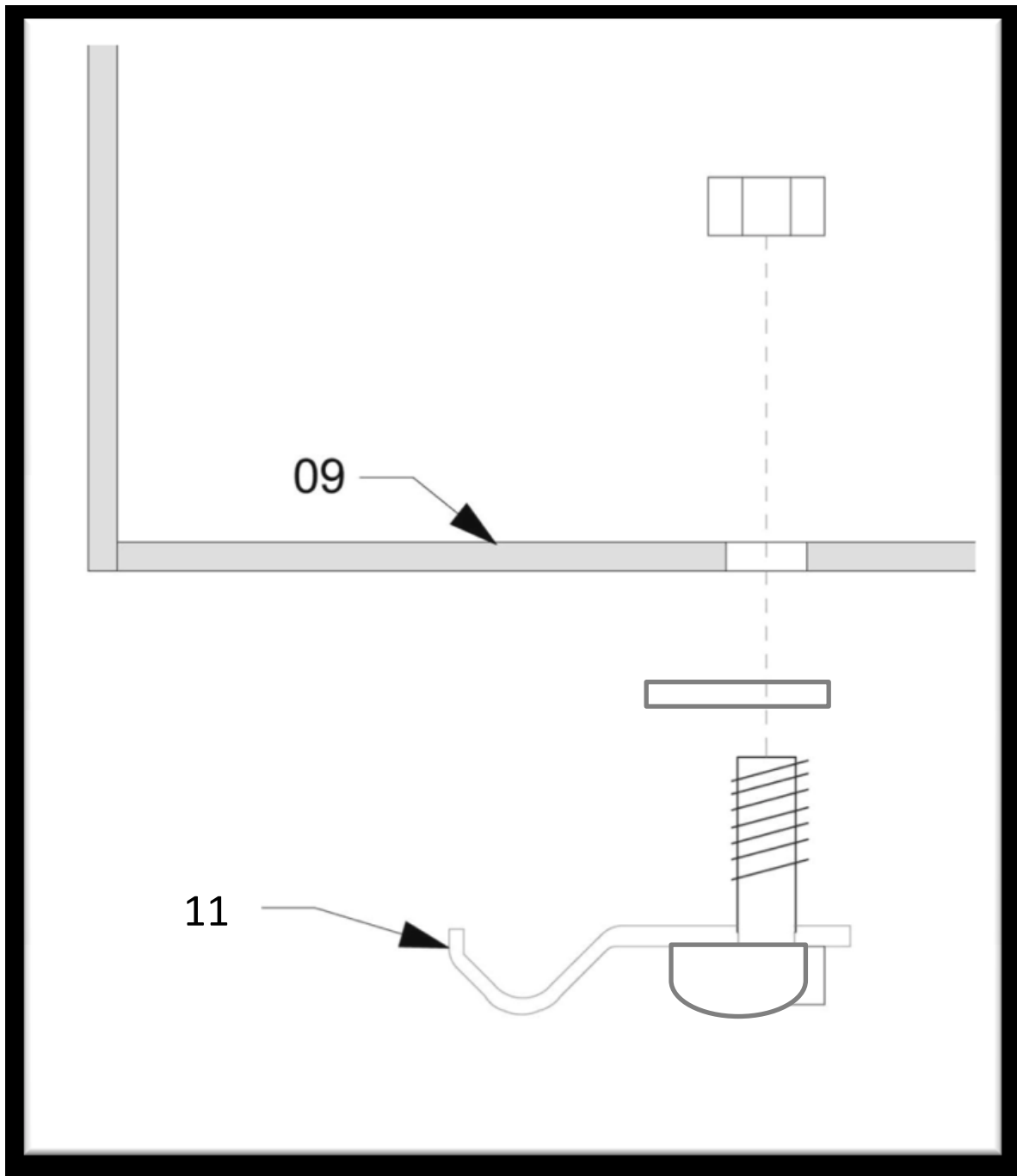
Tools – 7/16 Open end Wrench & Phillips screw driver  
Place a plastic grommet in the end of each side of the handle and press them in. Place the Phillips head bolts through the pre drilled holes in the handle and the lid. Place a nut on the back of each bolt and tighten until snug.

## Hopper Handle Attachment



Tools – Phillips screwdriver  
Place a Phillips headed bolt through the handle into the holes in the face of the hopper and tighten. <The nuts for these bolts are already attached to the hopper from the inside>

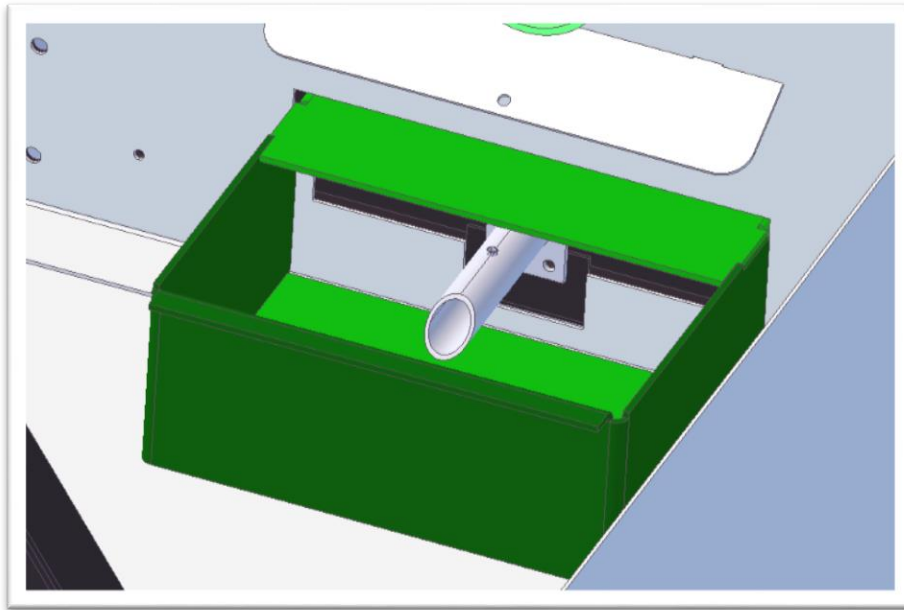
## Grease Bucket Holder



Tools – 7/16 Open end wrench & Phillips screw driver

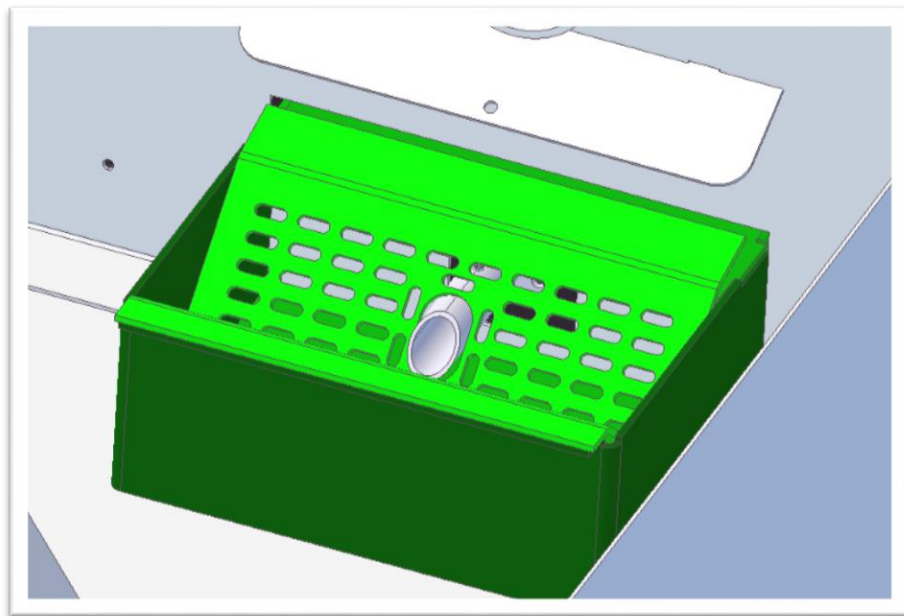
Place the Phillips headed bolt with washer through the bracket and the grill. Then apply the nut to the top and tighten.

## Fire Box Installation



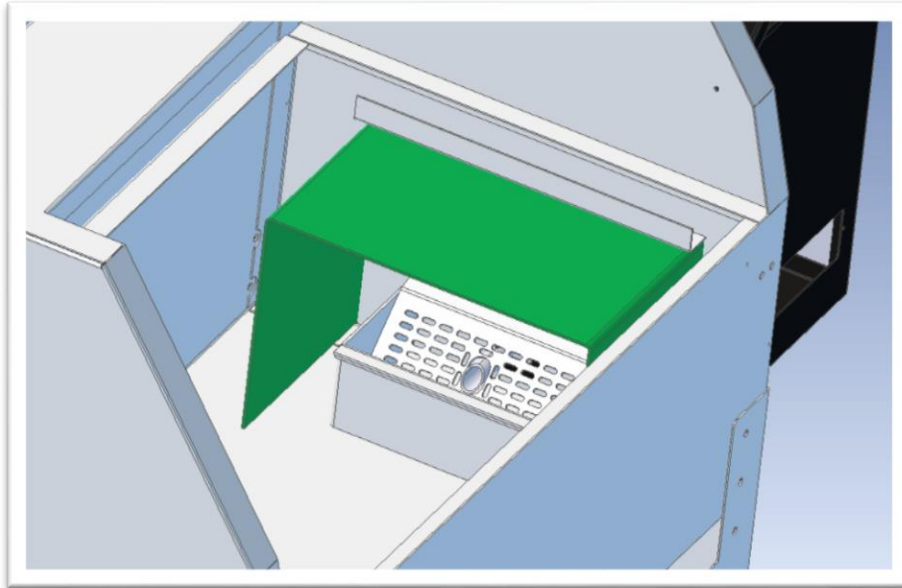
Insert Fire Box into slot in the right side of grill. Fire box should be flush with right side of grill.

## Fire Tray Installation



Insert fire tray in to Fire box with “V” down and hole over igniter tube as shown.

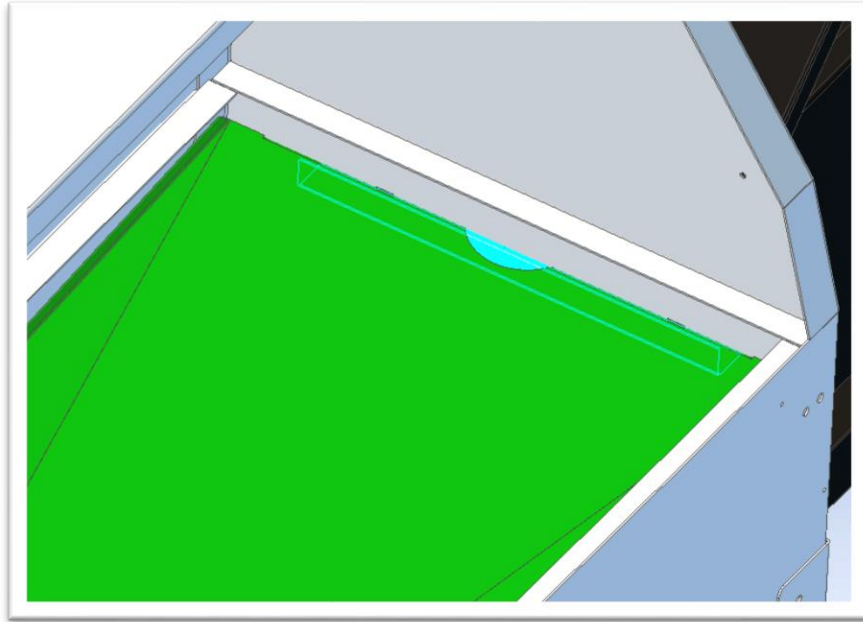
## Fire Shield Installation



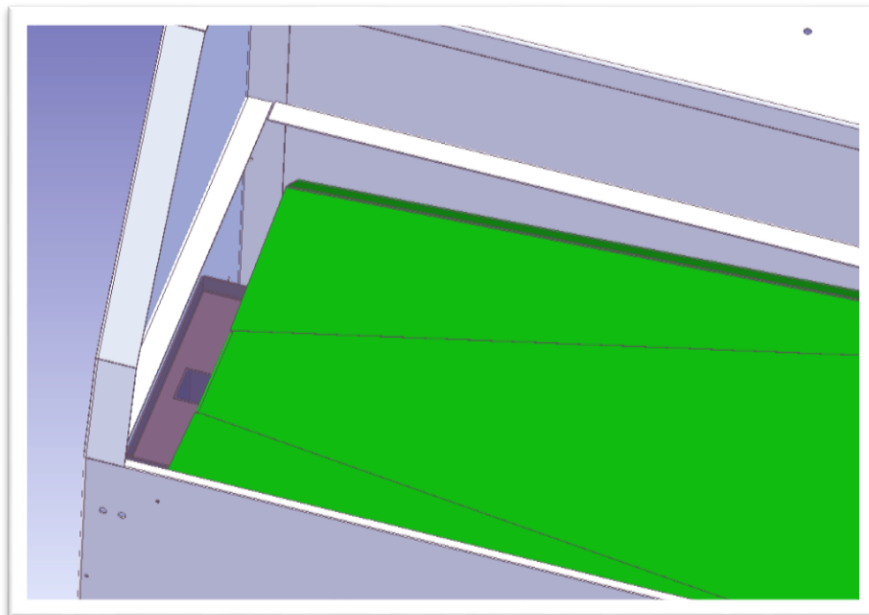
Install the fire shield by placing over the fire box with even spacing on each side. Fire shield should be placed against right wall of grill.



## Drip Tray Installation



Install drip tray with notch at right side of grill. Bottom flange on drip tray will rest on drip tray rest at right (above). The left side of drip tray will rest in the grease catch tray at the left of the grill (below). Drip tray should be evenly spaced from front to back. Take care not to block air flow around sides of drip tray.



## Initial Setup Instructions

This process ensures that all equipment is operating properly and your grill has been seasoned for future use! Please run this initial set up procedure every 12 uses to ensure proper and optimal operation!

1. After proper assembly, wash all non-cooking surfaces inside of the grill with a mix of mild dish soap and powdered laundry detergent. (Not where you intend to cook)
2. Completely rinse the inside of the unit with wet rag to remove any soap residue.
3. Apply a light coat of Vegetable oil to all areas of the grates, using a paper towel. This will help prime the grates and prevent rust from developing during prolonged storage or damp weather.
4. Insure grill is on level ground to avoid hopper fires.
5. Follow the Ignition Sequence and allow the grill to run on high for manual or 450deg for digital for 30 minutes to cure the finish before you cook for the first time.

## Ignition Sequence

NOTE: For grills equipped with Digital Programmable Controllers – Read Digital

1. Clean the fire pot by removing built up ash and any unburned pellets prior to each use to ensure optimal performance. Note: Be very carefully that ash & pellets are cold before removing.
2. Locate the grill in an area in accordance with safety guidelines in this manual.
3. Load the hopper with Barbeque Grade Pellets then close the hopper lid. (Make sure the lid of the hopper is always kept closed to protect your pellets.)
4. Plug the unit in to a 110 power outlet and unplug when finished cooking and Shut Down (see below) procedures have been completed.
5. Press the I/O button on the digital controller. (Initial startup you need to hold the Prime button down until you hear pellets drop into fire box)

## Digital Controller Operation

1. Press the power button to start grill
2. Using the Temp Up/Dn buttons set the grill to the desired temp.
3. The grill will begin to produce smoke during startup. This is normal. Keep the lid closed.
4. The igniter will turn off automatically when the grill has cycled through the initial ignition procedure.

**NOTE:** as a safety feature the grill will shut down if the temp does not reach 150F in the first 30min

5. Run the grill for at least 15 minutes before adjusting the temperature control, to avoid buildup of unburned pellets in the fire pot.

**NOTE:** At lower temperatures the fan will cycle on and off. This is normal operation to achieve the lower temperatures with minimal variation.

**CAUTION:** If excessive flame is visible i.e. the grease pan is glowing bright red; turn the grill off. And check for proper assembly once the grill has cooled.



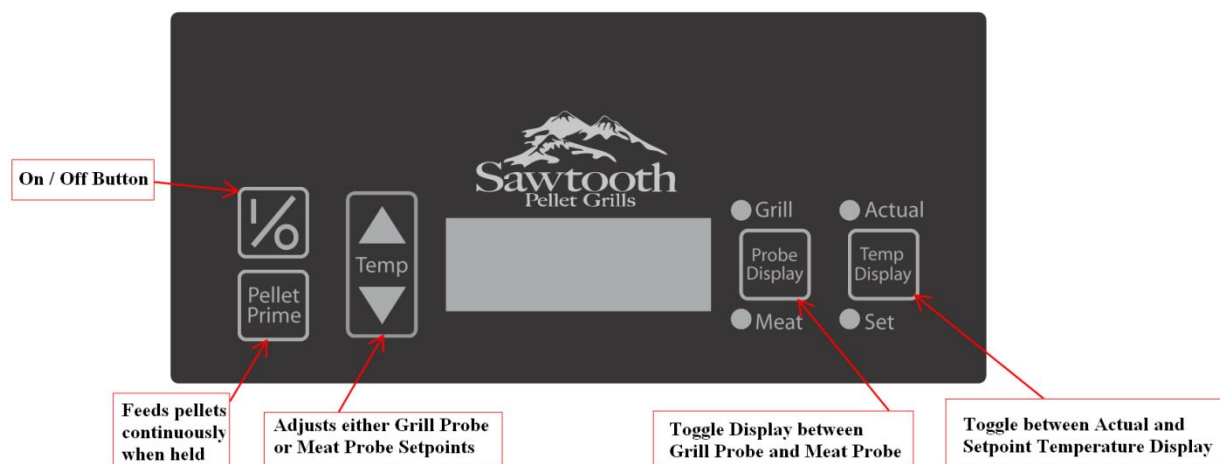
# Operation Manual

(Models 410 and 610)

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## BUTTONS



Probe Display – Toggle Display between Grill Probe and Meat Probe

Temp Display – Toggle Display between Actual and Set point

## MODES OF OPERATION

### POWER UP MODE

When power is applied to the system after plugging into an AC outlet, the grill control will display the following:

**SP6** identifies this as a Sawtooth Pellet Grill for 3 seconds

**610** or **410** showing the current model number for 3 seconds

**U116** identifies the software version running in this control as Version 1.16

Once the display identification is complete, the system will recall and reenter the last known mode prior to power down.

### OFF AND COOL MODE

The Off and Cool mode is the normal off state of the control when it has cooled below a safe temperature. Following shutdown the display will be dark and one LED light will be blinking. Once a cool state is achieved all LED indicators will be dark. Pressing the On/Off button in this mode will cause the system to enter the Run Mode.

### MANUAL MODE

The Sawtooth controller comes with two manual setpoints. These two settings are **S-I** and **GRLL**. These will manually control the grill with a set auger speed without influence from ambient temperatures.

**S-I** – Manual smoke mode.

The **S-I** setting is a manual setpoint. To use the **S-I** manual mode setting turn the grill on and set temp to 175F. Wait for the grill to stabilize at 175F. Once grill has stabilized use the temp down arrow button to set the grill to the **S-I** setting. Failure to take the grill to 175F before moving to the **S-I** setting will cause the grill to error. This setting is a fixed auger speed that will have a consistent pellet feed speed regardless of the ambient temperature. In hotter weather it will be around the 150F temperature or higher. In colder weather it will allow the user to smoke at much temperatures below 150F depending on the ambient temperature.

**GRLL** – Manual Grill Mode. This setting will be one step above your highest grill setting of 550deg. Its purpose is for grilling steaks or chicken at higher temperatures. This setting is more effective with the drip tray removed and the heat shield in place.

## RUN MODE

Upon first entering the Run Mode, the system will attempt to light the grill for a maximum of 30 minutes. During this 30 minutes, the auger is run at a 15% duty cycle (on for 1 second, off for 6.7 seconds), the igniter is turned on full, and the fan is turned on full. If after 30 minutes of this operation the measured Grill Probe temperature has not exceeded 150°F, the system will enter the Error mode and display the error code for failure to start (**EP-2**). If the Grill Probe temperature exceeds 150°F, the system will turn off the igniter and begin to control the Grill Probe temperature to the setpoint target.

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### GRILL PROBE SETPOINT DISPLAY STATE

The seven segment display will show the Grill Probe Setpoint temperature by default:



Note that if the Ignitor is on, the LED lit in this column will blink.

In the Grill Probe Setpoint display state, the Grill Probe setpoint can be adjusted with the Temp Up and Down buttons. The Grill Probe setpoint defaults to 350°F, but can be adjusted between 150°F and 550°F in 5°F increments.

Note – Grill will default to last known set point after first start up. Set Point will reset every time the grill is unplugged to the default value.

### GRILL PROBE ACTUAL DISPLAY STATE

Press the Temp Display button to toggle to the Actual measured temperature of the Grill on the display:



In this state, if the Temp Up or Down buttons are pressed, the display will revert to the Grill Probe Setpoint Display state.

If a Meat Probe is detected, pressing the Probe Display button will change the display state to the Meat Probe.



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## MEAT PROBE SETPOINT DISPLAY STATE

In the Meat Probe Setpoint Display State, the target temperature for the Meat Probe is displayed. The Temp Up and Down buttons can be used to adjust the Meat Probe setpoint between 80°F and 180°F in single degree increments.



Press the Temp Display button to change to the Meat Probe Actual Display State.

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## MEAT PROBE ACTUAL DISPLAY STATE



In this state, if the Temp Up or Down buttons are pressed, the display will revert to the Meat Probe Setpoint Display state.

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## RUN MODE CONTROL PROCEDURE

### Deciding whether to control to the Meat Probe Setpoint or the Grill Probe Setpoint

Any time the system is in the run mode, it is attempting to control the Meat Probe to the Meat Probe setpoint first and the Grill Probe to the Grill Probe setpoint second. If a Meat Probe isn't detected, the system does not attempt to control to it. While a Meat Probe is present and the Meat Probe temperature is below the Meat Probe setpoint, the system will control the Grill Probe to the Grill Probe setpoint. When the Meat Probe is within 5 degrees of the Meat Probe setpoint or higher, the system will no longer control the grill temperature to the Grill Probe setpoint, but will instead use the minimum Grill Probe setpoint of 150°F and the display will change to **DONE**.

Taking this action can prevent exceeding the Meat Probe setpoint for some time, but in the case where the Meat Probe setpoint is significantly below the minimum Grill Probe Setpoint (for example if the Meat Probe setpoint is 80°F), the temperature of the item being monitored will likely continue to rise depending on the mass and the amount of time it is allowed to stay in this state. For the best results, either use a Meat Probe setpoint above 150°F or monitor the meat probe closely.

Note – if you are planning on doing multiple stage temperature cooking, you may consider NOT setting the Meat Probe set point. For example, if your recipe calls for cooking at 225° for 1.5 hours, then 250° for another 1.5 hours, the grill will automatically reduce to 150° as described in section above.

### Controlling the Grill Probe temperature to the Grill Probe Setpoint

Regardless of whether the system has a meat probe connected, the primary function of the controller is to increase the output of fuel to the combustion chamber when the Grill Probe actual temperature is measured to be below the Grill Probe setpoint, and decrease the fuel when the measured temperature exceeds the setpoint. Additionally, the fan output can be reduced in some cases where the call for heat is very low. This is an attempt to maintain a minimum air to fuel ratio for the best combustion at low temperatures. Because the system is attempting to monitor and control to a setpoint, operation with the lid open can dramatically affect the ability to control the system to a setpoint. It is recommended that the grill be operated with the lid closed to the extent this is possible.

### Reactions to falling temperatures

The system will react to a falling temperature in several ways. First, it will increase the amount of fuel and possibly the amount of air being supplied to the combustion area. If the temperature continues to fall more than 25°F below the setpoint, the igniter will turn on. If the system continues to fall below a minimum operating temperature of 115°F, it will reenter the ignition mode, and if after 30 minutes, the system has failed to reach at least 150°F, it will shut down and display the error code for failure to start (**EP-2**).

### Reaction to Over-Temperature

If the system detects a temperature on the Grill Probe exceeding 700°F, it will shut down and display the Over Temperature error code (**EP-1**).

## SHUTDOWN MODE

Shutdown Mode is possibly the most important mode for the system. It uses a procedure to gradually reduce the amount of fuel in the combustion area to reduce the possibility of the flames entering the auger tube and starting a fire in the hopper. It is strongly suggested that the shutdown procedure be used instead of simply unplugging the system from the outlet to turn it off. To initiate shutdown from the Run Mode, press the On / Off button. Over a 30 minute period, the amount of fuel being provided will be gradually reduced to none. The fan will run continuously to reduce the temperature. If the temperature is found to be less than 130°F at the end of the 30 minute shutdown procedure, the fan will turn off, but if it is not, the fan will continue to run until the 130°F temperature is reached. The shutdown procedure will not be attempted if the system has not reached the initial 150°F Run Mode setpoint from startup.

## ERROR MODE

If an error is detected, the system will perform the normal shutdown procedure regardless of the error value. The system cannot run while an error is present. If an error has been detected, it can be cleared by pressing the On / Off button to enter the Run Mode. However, if the cause of the error is still present it will enter the Error Mode again.

ER-1 – Over Temperature Error – This error can be detected at any time, and simply means the Grill Probe temperature exceeded 700°F. This can also be a sign of an open connection between the grill control and the Grill Probe.

ER-2 – Failure to Start Error – Occurs when the ignition procedure fails to increase the temperature above 150°F within a 30 minute window.

ER-3 – Power Failure Error – Occurs when the system is in the Run Mode and power is lost. When power is re-applied if the system detects a temperature of less than 150°F, the assumption is that power was lost and the fire went out while power was removed. It does not attempt to re-light the grill in this case. If power is re-applied before the temperature falls, the system will return to the last setpoint and continue the Run Mode normally.

ER-4 – Grill Probe Short Circuit – Occurs when the system detects a shorted Grill Probe that cannot be used to reliably measure temperature.

## COLD WEATHER STARTING INSTRUCTIONS

Many users cook year round with their smoker. In warmer weather your grill is designed to easily reach 150+degrees in minimum of 30 minutes. As a safety feature your grill is designed to shut down and give an ER-2 error on the display if it is not able to accomplish this. In colder climates this can be a challenge as temperatures start dropping below 40F. By following these simple instructions you will be able to enjoy the use of your grill year round regardless of the weather.

### **From a cold start:**

#### **Method 1:**

- Open lid and remove grates and drip tray.
- Slide heat shield to the left to gain access to the firebox.
- Remove any ash left in firebox from previous use.
- Replace heat shield over fire box.
- Replace drip tray and cooking grates.
- Close lid
- Press the start button.
- Press and hold the prime button for 60 seconds.

#### **Method 2:**

- Open lid and remove grates and drip tray.
- Slide heat shield to the left to gain access to the firebox.
- Remove any ash left in firebox from previous use.
- Add ½ cup of pellets (about a hand full) to the firebox around the igniter.
- Replace heat shield over fire box.
- Replace drip tray and cooking grates.
- Close lid
- Press the start button.

From this point the grill will be able to reach the desired cooking temperature regardless of the weather. It should be noted that it will take more time.