YODER SMOKERS
COMPETITION GRADE BBQ PRODUCTS

YS640 Variable Damper Best Practice

The original design of the YS640, included only one fan in the combustion section of the cooker. With this design the YS640 variable damper affected large changes inside the cooking chamber. This allowed 2 distinctive heat zones in the cooker, and allowed for adjustment, by the cook moving the variable damper, to react to how the cooker was performing, based on environmental conditions and the size/shape/quantity of food cooking.

Early in 2012, the combustion system design was changed to incorporate 2 fans. The original fan was changed to a different performance level, and a second fan was incorporated to allow for a more positive air charge inside the hopper and to affect cooling of the hopper area and components. With this change, the YS640 variable damper's effect on the heat distribution in the cooking chamber was affected. While the YS640 variable damper still functions, the actual affect was much more subtle than in the original design.

In June of 2013, a fan diffuser was added to the secondary fan in the combustion system. This was incorporated in the design of the combustion system to effect changes to the airflow into the cooker to address temperature stability, which in turn allowed for lower pellet fuel consumption. The addition of this fan diffuser effectively changed the operation functionality of the YS640 variable damper to almost having a fine tuning effect on the heat distribution in the cooking chamber rather than the large changes the variable damper was able to make to the temperature inside the cooking chamber in the earlier designs. Other than causing intense heat for direct grilling when pushed all the way in toward the firebox (in this configuration the heat diffuser should be removed, and the optional grill grates used, to prevent potential damage to the cooker), the YS640 variable damper is now capable of effecting the temperature distribution only slightly when compared to the original design.

When a cooker is purchased, an owner may decide to do temperature testing, to "see" how the cooker performs. If the Yoder Smokers temperature test criteria are followed, the test results will be accurate, and give the owner a "snapshot" of how the cooker performs, **when it is empty**. The normal expectation is to use the YS640 variable damper to even the temperature out from end to end (side to side). Again, if the Yoder Smokers temperature test criteria are followed, this is potentially achievable. There are many more factors that affect temperature(s) in the cooker, i.e., ambient temperature, humidity, wind, grill setup (foil), pellet fuel (brand/flavor/storage), etc., which cumulatively may affect the cooker in a manner that will not allow a "perfectly" even temperature from end to end (side to side).

Further testing may be done by an owner, to "see" the top to bottom temperature performance of the cooker, in addition to the end to end (side to side). During testing, the YS640 variable damper may be utilized to effect changes in the top to bottom, and side to side, temperatures in an attempt to find the magical location for the variable damper, where all temperatures in the cooker are even. The top to bottom temperatures will always be different, as the YS640 cooks from the bottom up, i.e., the heat source comes from the bottom of the cooker, so the further away from the lower grate (in inches), the lower the temperature may be. This phenomenon is not specific to the YS640, as every cooker made has these temperature variances, whether side to side, top to bottom, or bottom to top. Even kitchen ovens exhibit these differences, but very few test their ovens like they test a BBQ cooker.

After all this testing, a "perfect" location for the YS640 variable damper may be settled on by an owner. This "perfect" location is associated with an empty cooker, on a specific day, with specific environmental conditions, cooker setup and brand/flavor/condition of pellet fuel. If the testing is done on another day, considering all the potential variables that affect the cooker, a different position for the variable damper may be settled on, but again, this location is most importantly associated with testing an empty cooker.

So now that an owner has the "perfect" location for the YS640 variable damper, the cooker is started, the damper set to the "perfect" location, the meat is prepped, and put on the cooker. Now the temperatures are all wrong, not only side to side, but top to bottom. Why? The size, shape, quantity and placement of the food in the cooker alter the heat, smoke and airflow inside the cooker. Remember the testing was done on an **empty** cooker, and placing anything in the cooking chamber has the potential to change everything in the cooking environment. Now the frustration sets in, as all the testing seems to have been a waste of time. Because of this frustration owners will ask other owners where they locate the YS640 variable damper.

Here is a fact for consideration: All testing and programming at the Yoder Smokers factory is done with the YS640 variable damper fully pulled to the chimney end of the cooker, i.e., the handle pulled completely out to the right of the cooker.

So, what is the "perfect" location of the YS640 variable damper to get side to side and top to bottom temperatures? This is a great question, and there really isn't a "perfect" answer, but let's consider what we have learned so far:

- The design of the combustion system in the cooker has changed over time which largely negates the effect of the variable damper.
- The variable damper still functions but to a much lesser, and more subtle degree.
- The factory does testing and programming with the variable damper pulled fully open.
- Putting anything in the cooker changes the cooking environment, including temperature.
- The environment will change how the cooker performs.
- Pellet fuel brand/flavor/condition will drastically affect cooker performance.

So knowing these facts, how should the YS640 variable damper be located to properly utilize the cooker? Again, a great question to which there isn't a "perfect" answer. The better question to ask is what are you comfortable with in attempting to achieve this temperature nirvana? There are as many answers to this question as there are owners of YS640s.

If you are a "participating" cook, then the answer may be to locate the variable damper as the factory does during testing and manage the food accordingly, or periodically take internal temperatures of the food and make adjustments to the variable damper to potentially compensate for temperature differences in the food (this can take hours, as each variable damper movement should be given time to effect change), or take internal temperatures of the food and rotate as necessary to meet your expectations, or set the damper at the location specified in the manual and follow the procedures already outlined above.

If you are a "non-participating" cook, then the answer is to pick a location for the YS640 variable damper and cook the food, removing the food as required when either internal temperature or desired tenderness is achieved.