



The Design, and Methods of Installation for the BT&C Planing Stop

(Draft-2)

Introduction

A planing stop is a great way to quickly immobilize your material so that you can easily plane it or perform other similar operations. We took all we knew about planing stops - centuries of information and material - and poured it into our design for the BT&C Planing Stop.

The BT&C Planing Stop has two versions: the unhardened Mild Steel version ([BT-PS.MS](#)) and a somewhat more expensive one in hardened steel ([BT-PS.HS](#)). The two versions have identical geometries and work equally well in grabbing the wood. The hardened version is designed for frequent use - it will stay sharper longer. For average use the unhardened Mild Steel version, which costs less, will work just as well.

Here is a roundup of the design considerations of the Planing Stop; our ideas for installation; a history of the planing stop; and some very basic instructions on usage.

Design Features

The major design criteria we considered in developing our stops:

- Needs to grab like the dickens
- Wouldn't require a big square hole chopped in your workbench
- Fairly small so that it would work well even on typical $\frac{3}{4}$ " material
- Fairly thin so when placed flush against the workbench it could safely grasp thin stock
- Mounting hardware would be readily available
- Comparatively inexpensive

In short, we wanted a tool that worked great but was easy enough to install and inexpensive enough so that someone who isn't a traditionalist wouldn't feel that the barrier to trying a planing stop out was too high.

The most important feature of a planing stop is that it grabs the wood and holds it down. The BT&C Stop features scalloped teeth with thin sharp points that can easily grab the wood, along with a strong base that ensures that the teeth do not bend. The teeth penetrate deeply into the wood with minimal markings. The scallops are also pretty shallow, giving a long wide edge for the wood to engage with past the points.

The spacing of the teeth are fairly fine. You'll get more tooth engagement on narrow boards being planed on edge and therefore stability than you'd get with a coarse tooth pattern.

The BT&C Stop has three countersunk holes for installation. Providing three holes is more work and more expensive than just drilling one hole and a detent to keep the stop from spinning, but we thought this approach was worth the effort. We realized we could include three #8 screws with the stop. The three point mounting gives a lot of stability in both directions of usage. Three 1" screws leave plenty of clearance under the stop for mounting hardware, and three 1/2" screws will work fine in thin materials for other mounting methods.

Larger, more traditional planing stops typically require chopping a big square hole in your workbench. We hate that. We understand that some people don't mind the work and modification, but we simply don't want to modify our workbench for specialized use. Also, if you have the ability to move the planing stop around for different setups it will be a lot more versatile.



Installing the BT&C Planing Stop

In general, mounting the Planing Stop flat on the workbench is fine. It turns out that as long as the Stop grabs the wood and forces it down (because of the scallops), the Stop works great. Some exceptions: when the end of your board is rounded or contains a slight warp so that the stop

ends up being too low to engage the board. Ideally you want 1/4" or so of travel - more than that seems to serve no purpose.



Joel's workbench is based on the Frank Klausz workbench in *The Workbench Book* by Scott Landis and has a traditional tail vise and square dog holes (in addition to round ones). The obvious method of setting up a planing stop on this type of bench is to just screw the stop onto a square block of wood and clamp it into the tail vise when needed. This took all of three minutes to do, and for that type of bench, it's a great solution.

But there are millions of workbench configurations and tail vises are not all that common.

Another option:

The hole pattern of the Stop is tight enough so that we were also able to mount a planing stop atop a $\frac{3}{4}$ " square bench stop that fits into the square dogs on the bench's hole. This works great, and allows you to put the stop nearly anywhere on the bench. The downside: it's not quite as solid as using the tail vise.

And of course not every workbench has square dog holes.

Two More Methods for Installation - Though Honestly Neither of Them is That Great:

Screw the stop directly into your bench. We would never do this ourselves, but it does make sense for a bench constantly used for planing.

Install threaded inserts into your bench top and screw the stop into the inserts. When you need to remove it, just unscrew it.

Neither of these methods allows for vertical adjustment.

A Promising Method That Fell Out of Favor:



With care you can mount the stop on the end of a $\frac{3}{4}$ " or 1" dowel. In the former case, use #5 screws and pre-drill carefully. Then cross-drill about $\frac{3}{8}$ " below the top of the dowel and screw in a fourth #5 screw so it sticks out about $\frac{1}{4}$ ". Then put the stop in a standard $\frac{3}{4}$ " holdfast hole in your bench (we had to sand the down the dowel a bit for a running fit). Push it down until that fourth screw marks the benchtop, and using that as a center point, drill down using a $\frac{7}{32}$ " drill bit about $\frac{1}{2}$ " deep. Then score and remove just

enough of the bit between holdfast hole and small hole so that the screw sinks down and the stop sits flush. You might have to adjust the screw for a snug fit.

What is great about this method is that it is easy to do and requires minimal modification to your workbench. What we don't like about this method is that it might wear. More importantly, the next method is plainly better - easier to do and more reliable:

How to Mount the Planing Stop at the End of Your Workbench!

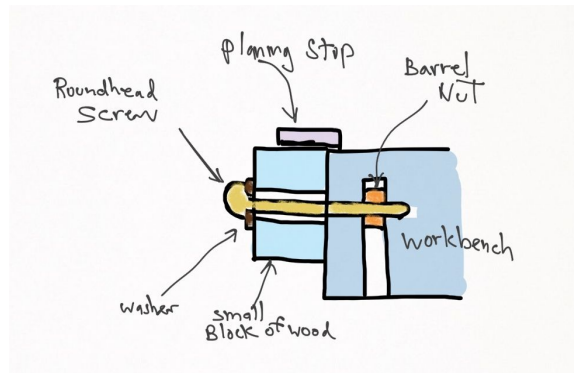
We mounted the Planing Stop on a block of wood, and drilled two holes in the benchtop. You will need to layout the holes and drill pretty square so that the two holes meet up inside your benchtop.

For this method, you'll need the following hardware:

1 x $\frac{1}{4}$ - 20 round head bolt about 4" long

1 x $\frac{1}{4}$ - 20 barrel nut $\frac{3}{8}$ " in diameter and whatever length the hardware store stocks.

1 washer for the bolt.



First we drilled a $\frac{1}{4}$ " hole about 3 - 4 inches deep in from the end of the workbench. The hole is just below the centerline of the benchtop. If your top is thin, you can just bolt a piece of wood under the bench and use that. (This way is easier to do and doesn't require a special barrel nut.)

The hole should be about 4 or 5 inches in from the front edge of the workbench. We ended up putting in line with the existing holdfast holes. The theory is you want to hold wood on edge a comfortable distance from the edge for planing,

but not so close to the edge that you are always unbalanced when planing edges of boards.

Then drill a $\frac{7}{16}$ " hole so that it intersects the bolt hole. The hole should intersect the $\frac{1}{4}$ " hole closely enough to the edge of the bench so that you can unscrew the $\frac{1}{4}$ " bolt about $\frac{1}{2}$ " or more without disengaging the barrel nut. We drilled a $\frac{7}{16}$ " hole rather than a $\frac{3}{8}$ " hole because the $\frac{3}{8}$ " barrel nut could get easily stuck in a $\frac{3}{8}$ " and be impossible to remove (which you might have to do if you drill a little deep). And the extra wiggle room made the fitting of bolt to nut much easier.

Make a thick wood block about $1\frac{1}{2}$ " - 2" thick and mount the Stop on it. Pick a pivot point so that when the Stop is up it just peeks over the workbench, and when you loosen and pivot the Stop down, it goes under the workbench. Trim the block as needed so the blank end does not stick out over the benchtop in the down position.

Drill a sloppy hole, at least 5/16" (but 3/8 or 1/2" is better). You could cut a slot, but the sloppy hole works fine. This give you a little play so you can raise the stop a little off the bench if you need to.

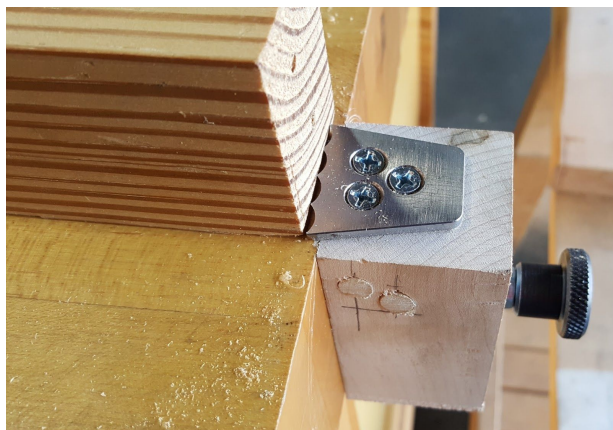
Once we figured this out and got the hardware it took about 30 minutes to install with brace and bit.

Put it all together and you have a rock-solid Planing Stop at the end of your bench, with more space than you would have with installing it in the middle of your bench. It won't interfere with anything under your bench, installs and stows away in seconds, and works like a charm. You don't even need to crouch down under your bench to adjust it.



Most of the tests and setups we made were in fairly soft wood, and of course we are drilling into endgrain. If you put too much torque on a screw going into endgrain it can easily strip out. In our particular case this isn't a big deal because in use all the force is in shear, or ninety degrees to the screws. But it's annoying. If you are annoyed we have three solutions: use hardwood for the mounting material, and don't over-torque the screws when you install them. Install dowels in the mount and screw into the dowels. Use a stout bit of wood with the grain vertical not horizontal and thick enough so that the wood won't split in use. All of these approaches will work fine.

The only flaw in the end mount design is that you need a screwdriver to swing it in place or stow it away. This flaw nags at us, but with just a little more effort a solution is pretty simple..



The tool-less solution:

Materials:

1 x 1/4 - Threaded 1/4-20 rod about 4" long (you can also take a long bolt and lop off the head).

1 x 1/4 - 20 barrel nut 3/8" in diameter and whatever length the hardware store stocks.

1 washer for the bolt.

1 threaded 1/4 - 20 knob. Anything you like

works.

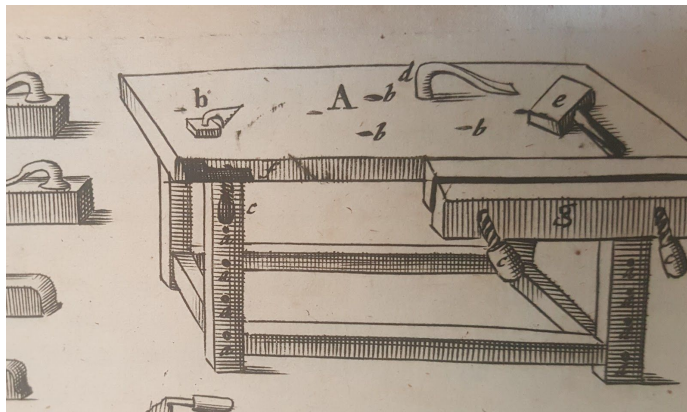
1 ¼ - 20 nut (for a locknut). You can also use lock-tite instead of the locknut if you have it handy)

The installation is pretty much the same as before only screw the knob onto one end of the rod, immobilize it by tightening on the (lock)nut (or use lock-tite), put on the wash and assemble. This method, which is what we are now using on our showroom bench is tool free.

Of course we have just touched the tip of the iceberg on installation options. The reason we are including both ½” and 1” screws with the stop is to give you the option of the method of installation will work best for you.

The History of Planing Stops

Planing stops have a long and venerable history. In *Ingenious Mechanics*, Chris Schwarz details planing stops going back to Roman times. While his book is filled with the earliest known images of planing stops in several interesting designs, the image we are most familiar with comes from Joseph Moxon's 1678 classic, *Mechanick Exercises* (see image at left). The stop at the left of the bench is a bent bit of metal, with spikes going at a right angle to catch the wood,



and the entire stop is stuck into a block of wood. At the time they would not have had wood screws to screw the stop to the bench, and the stop was probably made of wrought iron.

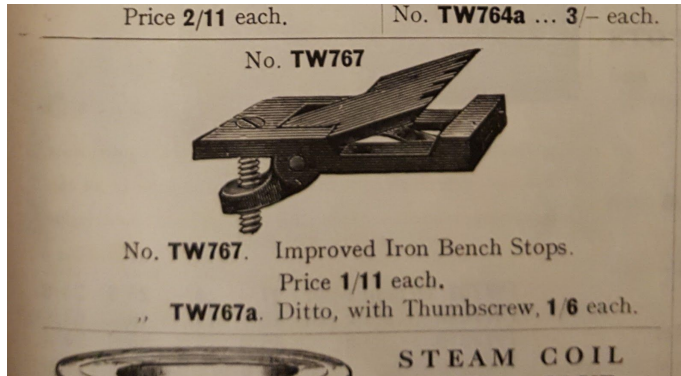
As we see it, the main reason for sticking the stop on a square shaft is so that you could remove it from the bench if it got in the way. At the time, a large square shaft was easier to chop than it was to drill a big hole, and a round shaft would twist with force. Over the centuries people planed less and the planing stop became

a rare accessory.



In the industrial age, there were a bunch of not-very-good manufactured stops. The Stanley #207 Bench Stop (1929-1974) was a small stop on top of a round shaft that could fit into a round hold in your bench. The Stanley #207 we have is very dull and doesn't dig deep enough (or at all actually). Also for reasons that don't make sense, it has a 9/16" shaft not a ¾" shaft.

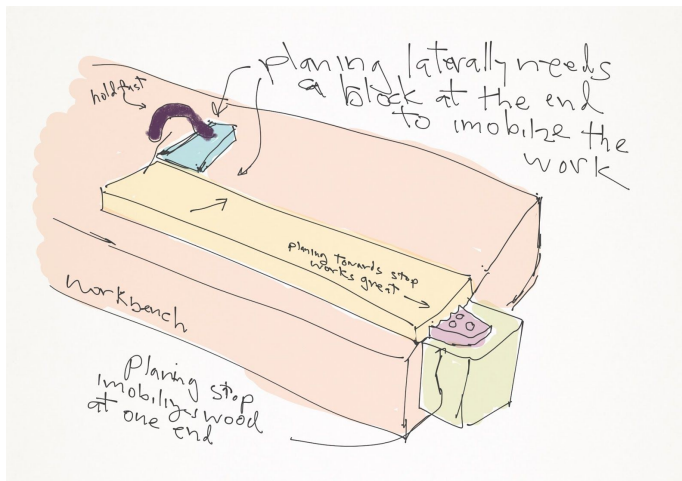
English ironmongers sold a stop that was recessed into the bench top and could be raised for use or lowered for storage. We have one somewhere, but the only one we have seen embedded in a bench didn't work well. The mechanism clogged and its beveled teeth didn't dig into the wood. This type of stop is still in production, in aluminum. In general, people don't like modifying their benches for stuff like this anyway.



While the “modern” production versions might have not succeeded, it’s a mistake to blame the decline in hand milling

wood for the disappearance of planing stops. Any operation - for example, power sanding - can be made easier if there is a way of anchoring one end of a board quickly and without hassle. The modern versions disappeared because they did not work well enough.

Usage



Using a planing stop is pretty easy. Take the piece of wood you are working, put it on your bench and jam it into the planing stop. As long as you are planing towards the stop, all will be wonderful. If you are face-planing across the grain, or at an angle, the work will want to swing away from you and disengage with the stop. The simple solution is to clamp down a batten at the free end (a great application for holdfasts) so the work can't swing away and disengage from the stop. As the board is just jammed into the stop and not actually held down at the other end, you can flip the board over to work on both sides or edges or

switch boards without having to move a clamp or anything. Planing stops make for a fast setup. The stop will work great with board standing on edge or flat on the benchtop.

Conclusion

Planing stops have been around for centuries. Methods of woodworking and workholding have evolved, as the woodwork and tool making has evolved. That planing stops have largely fallen out of favor is a shame. We hope that taking the basic traditional design and just making it

modern enough so installation is much easier will entice more people to try using them. Perhaps they will return to a status of being a standard piece of woodworking kit, as they were for most of history.