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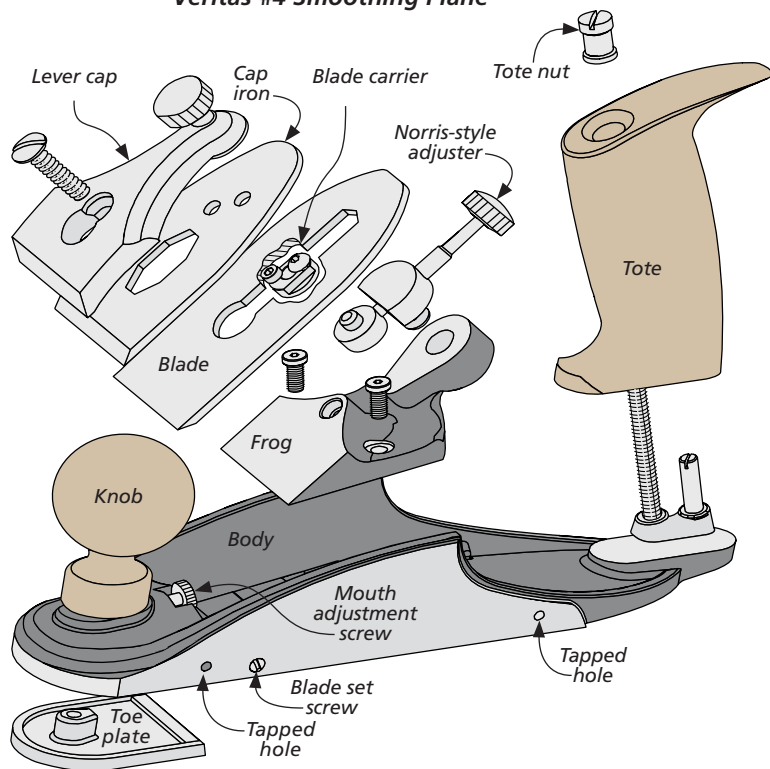




creating a

Custom Bench Plane

Veritas #4 Smoothing Plane



In the fall of 2014, *Lee Valley* introduced a line of *Veritas* custom bench planes with the claim that they could be made in over 9,000 different combinations. As you can see in the photo above, the styling is sort of a blend of modern and retro looks. But I was more curious about how these planes can be customized and, more important, how they perform on the workbench.

TRADITIONAL SIZES. You can order a plane in the following sizes based on the conventional *Stanley/Bailey* bench plane numbering system: 4, 4½, 5, 5½, and 7. Prices range from around \$270 to \$380. Once you choose the size of plane you want, you have a number of choices to make to design your custom plane.

FROG ANGLES. The cutting angle of the plane blade is one of the most important considerations to make. And the frog of the plane dictates this angle. A frog is simply the bed where the blade rests. It's shown in the illustration at left. Lower frog angles are great for trimming end grain. Higher angles can

help you get a smooth finish without tearout on figured woods, as shown in the photo on the opposite page. I had no tearout issues while smoothing the face of a curly maple workpiece. I used a 55° frog and adjusted the mouth of the plane for a thin shaving. (I'll talk more about the mouth adjustment later.)

Lee Valley supplies three standard frog angles of 40°, 45°, and 55°, as shown below. A 45° angle is what you'll find on most bench planes and makes it more of an all-purpose tool.

One unique aspect of the planes is you can order a custom frog in 1/2° increments from 40° to 65° for only a \$10 surcharge. They're also available separately. The frogs are interchangeable, so I can see having a few different ones on hand for various planing tasks. As you'll notice in the drawing on the opposite page, the frog is held in place with just a pair of cap screws, so it's easy to remove and replace.

TOTE OPTIONS. The next choice to make is the size and style of tote you prefer (upper right photos). The totes are available in two styles and three sizes. The traditional-style tote is for those who are comfortable with the style found on older hand planes. The *Veritas* style is a little more upright to allow your forearm to be more parallel with the direction of the planing stroke. I've used both, and the *Veritas* style does take a little getting used to if you've been using traditional planes for a while.

The designers at *Veritas* did their homework to come up with the three sizes of totes. They designed a device that measures a hand across the knuckles. They placed this device in their retail stores in

A traditional tote is similar to the style found on older Stanley/Bailey-style bench planes



Traditional tote



Standard Veritas tote

Veritas totes are more upright to allow your arm to be more parallel with the stroke of the plane



Tall knob



Standard knob



Wide knob

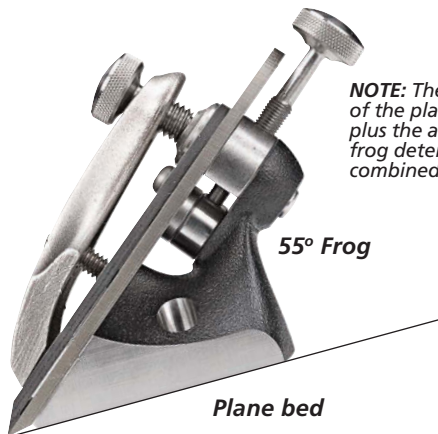
▲ You can customize the feel of a hand plane by choosing a traditional-style tote or a *Veritas* tote. Totes are available in small, medium, and large sizes for a custom fit. Your choice of knob boils down to personal preference and how you grip your plane during use.

Canada and had customers measure their hands. Then the customer was asked to try different sizes and styles of totes. Their feedback was recorded and analyzed to come up with the final design.

When you order a tote for your plane, you'll need to measure your hand. The distance across the palm at the knuckles determines the size of tote that fits best.

KNOB CHOICES. The knobs are available in the three styles shown above. The choice comes down to what's comfortable for you and what type of grip you typically use when planing. *Lee Valley* recommends the wide knob for larger, heavier planes to make it easier to lift the front of the plane on the return stroke. For a No. 4 plane, I prefer the standard knob.

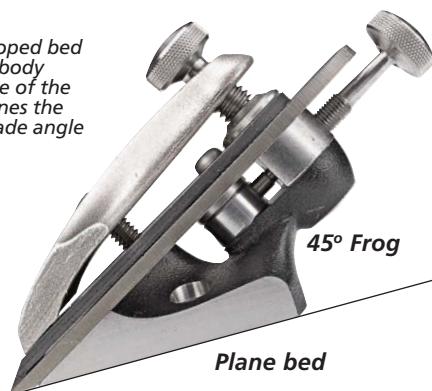
NOTE: The sloped bed of the plane body plus the angle of the frog determines the combined blade angle



55° Frog

Plane bed

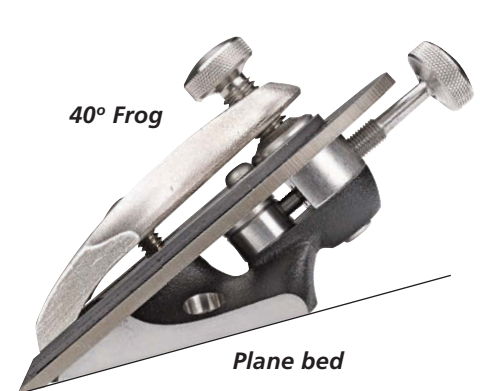
▲ A high-angle frog positions the blade to provide more of a scraping action for smoothing figured grains.



45° Frog

Plane bed

▲ On most traditional and antique hand planes, you'll find a 45° bed angle that's suitable for general planing tasks.



40° Frog

Plane bed

▲ A low-angle frog places the blade at an angle that slices through end grain more easily for a smooth surface.

Completing the Final Details

After you've chosen the size of plane, tote, and knob, the next decision to make for your plane is the type of steel used for the blade. Your choices of blade material are O1 oil-hardened carbon steel or *PM-V11*, a powdered metal alloy that *Veritas* uses in a lot of its cutting tools. I like O1 steel because it's easy to sharpen to a fine edge and it costs a little less. But I've recently become a fan of *PM-V11*. It holds an edge much longer, in my experience. Plus, sharpening and honing *PM-V11* is relatively easy with diamond stones.

SETTING UP & USING YOUR PLANE

As I mentioned earlier, the blade ultimately rests on the frog of the plane. The upper left photo shows how the frog is installed with two screws. *Veritas* recommends loosely installing one of the screws then sliding the toe plate back to help align the frog parallel with the mouth before tightening the screws.

ADJUSTER. Once the frog is installed, the adjuster mechanism snaps into the frog, as shown in the upper right photo. This two-in-one (or Norris-style) adjuster allows you to adjust the depth of the blade by turning the knob at the top. Simply nudging the knob side-to-side pivots the blade to adjust the cutting edge parallel to the sole of the plane.

A minor complaint I've had with older *Veritas* planes is that the adjustment mechanism for the blade depth was too coarse. In other words, barely turning the knob would extend the blade further than I wanted. For this new line of planes, *Veritas* researched several different thread pitches to arrive at a good compromise between a fast or slow blade depth adjustment. A slow adjuster mechanism with finer threads is available separately.



▲ The frog is held in place with a pair of cap screws. The toe plate is used to align the frog during installation.



▲ The bottom pin on the adjuster mechanism snaps into the frog and is held secure by an internal retaining spring.



▲ The blade carrier nestles in the blade slot (top inset) and is secured to the blade with a single screw. The cap iron is attached to the blade carrier with a pan head screw. Adjusting the position of the carrier on the blade can be done with the cap iron installed (bottom inset).

This makes precise depth adjustments easier when turning the knob.

BLADE ATTACHMENT. Next comes the blade and cap iron assembly. *Veritas* uses an unusual method of connecting the cap iron to the blade and then registering the blade on the adjustment mechanism. This "blade carrier" is illustrated in the drawing on page 14 and shown in the inset photos above. It's a ring-shaped piece that locks into the slot in the blade with a small cap screw. The cap iron is then held tight to the blade carrier with a single panhead screw.

One nice benefit about this arrangement is that when you remove the blade for honing, the blade carrier automatically registers the blade in the same position

when it's reinstalled back onto the frog. This makes getting back to work a quicker task without having to fuss with major blade adjustments.

CAP IRON. *Veritas* uses A2 tool steel for the cap iron because it doesn't warp or twist during heat treatment. Like the blade, it's lapped flat. This guarantees a seamless fit with the blade.

To install the blade, the center hole in the blade carrier fits over a pin on the adjuster. Then center the blade side-to-side by adjusting a set screw on either side of the plane body, as in the lower left photo. Once you do this, there's no need to fuss with the screws after that.

The final steps in assembly are installing the screw for the lever cap into the frog and adding the lever cap. The lever cap's keyhole-shaped opening drops



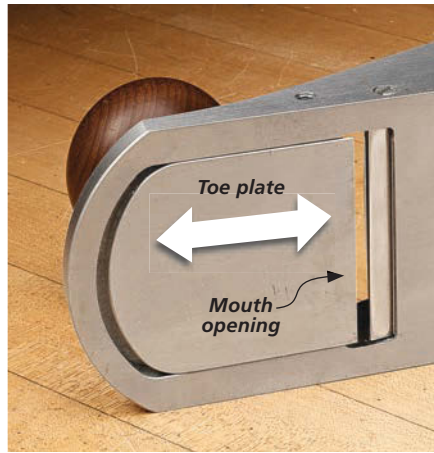
▲ A set screw on each side of the plane allows you to center the blade in the mouth opening. You typically only make this adjustment once.

over the head of the screw and slides into place. Then you lightly tighten the lever cap over the blade and cap iron assembly. You'll want just enough pressure to hold the blade's position and still allow easy adjustment. It doesn't take much pressure to hold the assembly secure.

ADJUSTABLE MOUTH. If you take a look at the photos on the right, you'll see how the toe plate on the right, you'll see how the toe plate on the bottom of the plane slides to create a wide or narrow mouth opening. When removing a heavy shaving, it helps to open up the mouth. But when it comes time for smoothing a surface and producing thin shavings, I like to set the mouth pretty tight. This helps prevent tearout as the blade slices through the wood.

To adjust the mouth opening, simply loosen the knob and slide it forward or backward. The knob is attached to the toe plate with a stud through a slotted hole in the plane body. A knurled adjustment screw right behind the knob allows you to set the width of the mouth opening. You can see this screw being adjusted in the far right photo. This screw also serves as a stop to prevent you from accidentally damaging the blade by sliding the toe plate back too far.

You'll back this screw out when installing a frog to allow the back edge of the toe plate to contact the front edge of the frog. This aligns the frog before you



▲ The planes feature an adjustable mouth. Loosening the knob allows the toe plate to slide, closing or opening the mouth.



▲ An adjustment screw serves as a stop to prevent the toe plate from damaging the blade when adjusting the mouth opening.

tighten the screws used to secure it. Slide the toe plate all the way forward to install the blade assembly and lever cap. Then adjust the stop screw to set the desired mouth opening.

IMPRESSIONS. *Veritas* hand planes have had some of these features for a lot of years. But combining them with the new features that you can customize to your liking is pretty significant.

But what matters more to me is how the plane performs. After a light honing, I gave the No. 4 plane a thorough workout on a variety of hardwoods. The 40° low-angle frog sliced through end grain easily without requiring a lot of muscle.

The 55° high-angle frog made quick work of smoothing curly maple. With a sharp blade and tight mouth opening, it removed the tearout that occurred while running it through a thickness planer.

The 45° frog performed well in a variety of general planing tasks. I had no complaints about its performance.

If you're happy with your current plane, there may not be a compelling reason to upgrade to a *Veritas* custom plane. But if you're looking for an heirloom-quality investment that you can use right out of the box — and for decades to come — you won't be disappointed. These new planes are solid performers. **W**

Accessories: PLANE FENCE

Each side of a new *Veritas* custom plane is drilled and tapped with a pair of holes that can be used for attaching accessories.

Currently, the only accessory available is a fence. It comes with two steel rods that thread into the side of the plane. The fence is positioned and locks onto the rods with knobs that act much like the collet on your router.

Here, I'm using the fence to bevel the edges of a panel. To set the desired angle, I've attached a beveled auxiliary fence. It guides the plane along the edge of the workpiece.

Veritas has hinted that there may be more accessories to come. One possibility is a knob for using the plane with a shooting board.

► An accessory like a fence turns your plane into a multipurpose tool. Use the fence to square the edge of a workpiece or create a beveled edge.

