

Bench Planes

U.S. Pat. No. 6,615,497

Veritas® bench planes represent the evolution of a traditional tool, addressing shortcomings such as blade chatter and throat adjustment, while making use of modern materials for the castings and blade. The body and frog are ductile cast iron, a material much more durable as well as more stable than gray iron, having been fully stress relieved. The body is accurately machined so that the sole is flat, the sides are square to the sole, and the bed is flat and square to the sides. The large side wings increase stability for shooting. The unique, large frog features a fully machined fit with the body and is designed to support the blade right down to the sole of the plane. It is adjustable to let you close the mouth to a narrow slit for fine shavings with minimum tear-out or open it for heavier cuts. All of this is done quickly and easily without having to remove the lever cap or anything else from the plane. The $\frac{1}{8}$ " (0.125") thick lapped blade, combined with the fully extended frog support, virtually eliminates chatter under all conditions. The generous hardwood front knob and rear handle provide a comfortable grip and improved control. The adjustment mechanism, with its combined feed and lateral adjustment knob, makes blade setting easy and accurate.

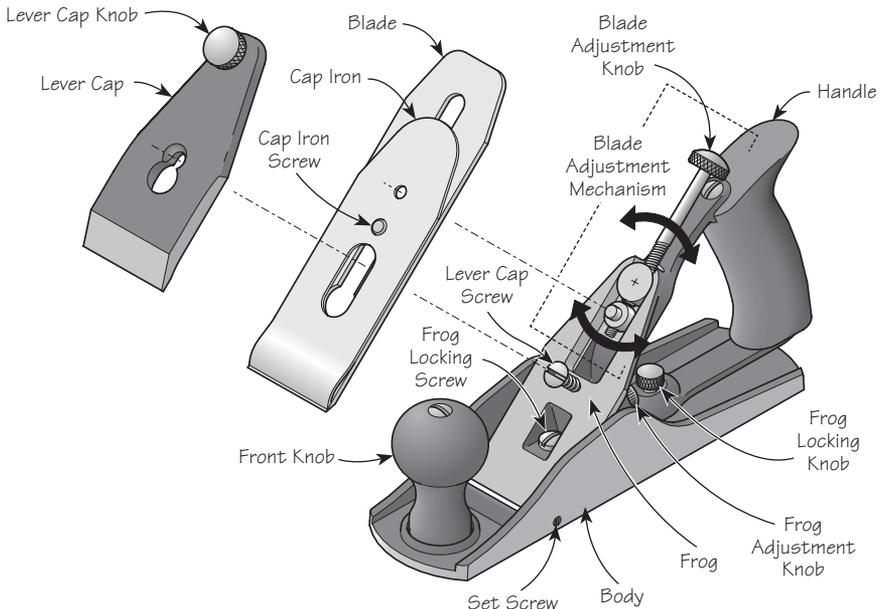


Figure 1: Bench plane components.

There are three adjustments that can be made with this plane. They are:

- Cap iron setting
- Blade adjustment (depth and lateral)
- Mouth adjustment

The setting of each of these is usually done based on the feedback you get as you plane. They are listed here in a sequential order to help you become familiar with each of their actions.

Cap Iron Setting

In addition to the mouth, the position of the cap iron on the blade should be set appropriately for the type of planing to be done. The distance from the leading edge of the cap iron to the cutting edge of the blade should be $\frac{1}{64}$ " or less for smoothing, particularly when working difficult grain in hardwoods, to as much as $\frac{1}{16}$ " for rough work in softwoods.

To remove the cap iron, loosen the lever cap knob and withdraw the lever cap followed by the blade assembly, which includes the cap iron. Loosen the cap iron screw and reposition the cap iron as required. Retighten the screw to secure the cap iron in place, being sure to keep the leading edge parallel to the cutting edge of the blade.

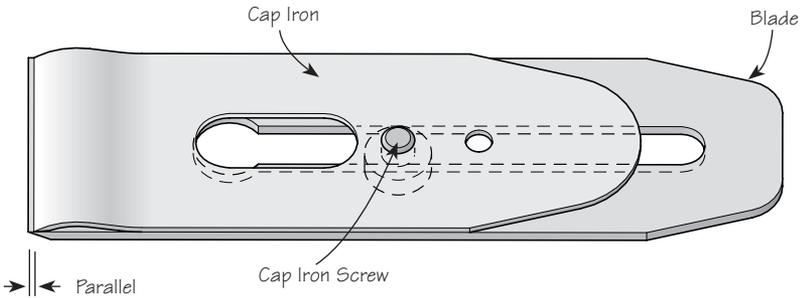


Figure 2: Blade assembly.

Blade Adjustment

⚠ Caution: Be aware that the blade is sharp; careless handling can result in serious injury.

To initially set the blade, place the plane on a flat wood surface (e.g., a scrap of stock). Open the mouth fully by loosening both the frog locking screw and the frog locking knob that secure the frog to the body as shown in **Figure 3** (a quarter turn should be adequate) and turn the frog adjustment knob. Lightly clamp the blade with the lever cap knob and advance the blade until it just touches the wood.

Flip the plane to a sole-up position, then sight along the sole to ensure the blade edge is parallel to the sole and advance or retract it as required using the blade adjustment knob. Tighten the lever cap knob (a quarter turn should be ample – **do not overtighten**) and take a test cut. If all is well, advance the set screws on either side of the body until they just touch the blade, not to clamp it but to create a guide so that you do not have to be concerned about the blade shifting sideways at the front. All lateral adjustment will now be governed solely by the blade adjustment mechanism. This is a substantial advance over all other designs, which have room for the blade to shift sideways at the tip every time you change your depth of cut or even when you lay the plane on its side.

Note that a full turn of the blade adjustment knob will change the blade projection by 0.012". Knowing this, you can make fine and predictable changes with fractional turns (e.g., a quarter turn will change the shaving thickness by 0.003", the thickness of a piece of paper). You will quickly get accustomed to setting depth of cut by sighting along the sole, but for setting very fine shavings, you will need to take test cuts.

Two cautionary notes

1. The lever cap knob has tremendous mechanical advantage. For normal use, it needs to be tightened only a quarter turn after full engagement with the blade. **Never torque it down as hard as you can or you can damage the plane.**
2. Before advancing the blade at any time, check the mouth to be sure you don't run the blade into the body. It is a simple matter to close the mouth to the desired opening **after** you have reached the right blade projection. Better to dull the blade in use than when adjusting it.

Backlash and How To Avoid It

To eliminate the possibility of the blade shifting backward unpredictably as the backlash is taken up, the final setting should always be made with the blade being advanced by the clockwise movement of the blade adjustment knob. If you need to retract the blade slightly, retract it more than required, and finish by **advancing** it to its desired position. This takes up all the play in the forward direction, resisting the backward forces experienced by the blade.

Mouth Adjustment

The mouth may be varied from very narrow for fine smoothing cuts to wide for heavy stock removal. Usually, the mouth is set slightly greater than the shaving thickness. Due to the unique design of the frog, you can adjust the mouth opening without having to remove the blade or reset the depth of cut. Loosen both the frog locking screw and the frog locking knob that secure the frog to the body (a quarter turn should be adequate). Turn the frog adjustment knob to move the frog forward or backward to resize the mouth. As described in *Blade Adjustment*, the mouth adjustment also has backlash to contend with. However, unlike adjusting the blade for depth of cut, the final setting for the mouth should be **backward**. To achieve this, adjust the mouth so

it is smaller than desired, then open it up to the desired setting. If this precaution is not taken, the backlash can be taken up in use, reducing the mouth, which will then become jammed with shavings. Retighten the screws to secure the frog in position.

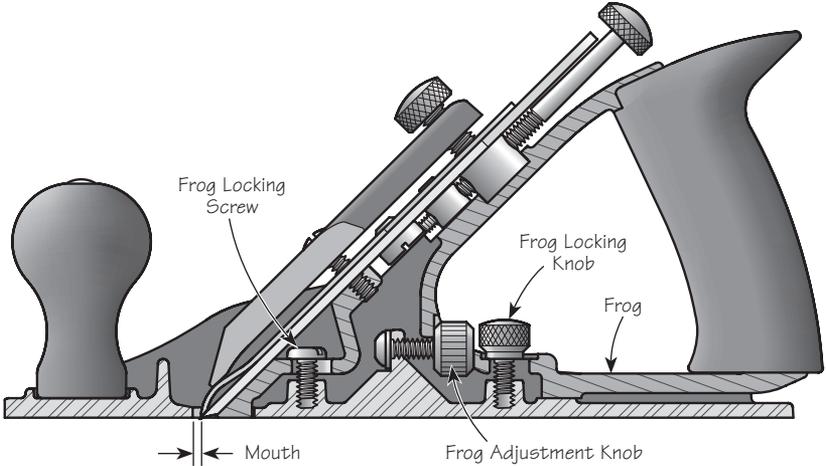


Figure 3: Mouth adjustment.

Blade Sharpening

The Veritas® bench plane blade comes honed ready for use, with a 30° primary bevel and a 35° micro-bevel. This configuration provides a strong, long-wearing edge that can be quickly honed many times before the primary bevel needs to be reground. The 35° micro-bevel leaves a 10° relief angle; more than adequate to accommodate the springback of the wood fibers.

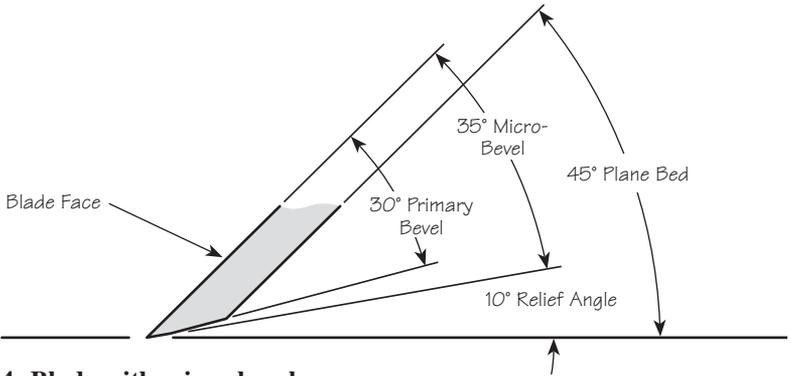


Figure 4: Blade with micro-bevel.

In a bench plane, the blade is used bevel down, so the bevel angle has no bearing on the cutting angle. This is determined by the angle of the bed which, in this case, is 45°. In the past when steeper cutting angles were desired, particularly for smoothing, special planes were produced with bed angles of 50° or 55°. However, the same net effect of altering the cutting angle can be achieved by introducing a back bevel on the face of the blade. In this way, a 5° back bevel will yield an effective cutting angle of 50° (commonly known as a York pitch). A back bevel of 15° will yield a cutting angle of 60° (see **Figure 5**); this will result in an entirely different cutting action from the standard 45°, producing what is known as a Type II chip (or shaving) as opposed to a Type I (reference: *The Complete Guide to Sharpening*). With this type of chip the wood shaving falls right at the cutting edge, eliminating tear-out and enabling the working of difficult grain patterns. This type of cutting action is similar to that produced by a scraper. The higher cutting angle increases the force necessary to propel the plane and is not required when working with the grain. However, when you have to work wood with widely varying grain (e.g., bird's-eye maple) it's handy to have a back bevelled blade at hand. Changing blades has the same effect as using a high-pitch plane.

We recommend a back bevel of 15° to 20° for most difficult planing situations, which yields a cutting angle from 60° to 65°. Note that even within this range, there is a significant difference in how the plane performs. At 60°, the plane will cut well against the grain, except around knots and the more dramatic grain swirls. Increasing the angle to 65° will all but eliminate tear-out, even around knots and rippled grain such as found in bird's-eye or curly maple. The 5° increase will, however, make the plane noticeably more difficult to push. We therefore recommend beginning with a 15° back bevel to produce a 60° cutting angle, and only increase it by another 5° to 65° if you still experience tear-out. It is also important not to skew the plane in use when a back bevel is employed as described here as this has the effect of **reducing** the included angle.

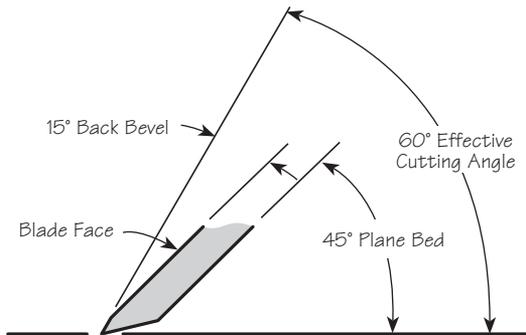


Figure 5: Blade with back bevel.

Note: It is the angle of the back bevel that will change the cutting characteristics, not its size. Thus, it need only be a micro back bevel.

If you are going to add a back bevel, we strongly recommend that you do so on a spare blade. This will save you from having to regrind the main bevel to eliminate the back bevel when reverting to a standard bevel-down-only blade.

The shape of the blade at the cutting edge will generally be straight across for jointing or planing the edge of a board. However, for smoothing or working wood wider than the blade, you would either round the blade corners or crown the blade. This will prevent tearing the wood at the edges of the blade. The best compromise for general-purpose use is to round the corners of the blade but not crown it.

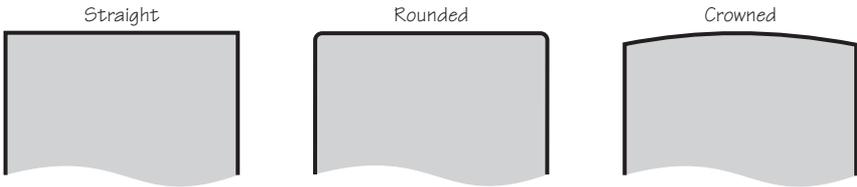


Figure 6: Blade shapes.

Care and Maintenance

The body of our Veritas planes is ductile cast iron and comes treated with rust preventative. Remove this using a rag dampened with mineral spirits. Clean all machined surfaces, including the area under the frog and the frog itself.

We recommend that you initially, then periodically, apply a light coat of silicone-free paste wax to seal out moisture and prevent rusting (as well as act as a lubricant for smoother planing). Wipe off any wood dust from the surfaces that you will be waxing, apply a light wax coating, let dry, then buff with a clean soft cloth. At the same time, the solvents in the wax will remove any harmful oils left from your fingers that can lead to corrosion. This is especially important with planes that are gripped on the machined surfaces, such as when using this plane for shooting.

If storage conditions are damp or humid, the plane should, in addition to the treatment outlined above, be wrapped in a cloth or stored in a plane sack. This precaution will also guard against dings and scratches.

Accessories

- 05P23.02** A2 Blade, 0.125" × 2³/₈"
- 05P23.52** O1 Blade, 0.125" × 2³/₈"
- 05P23.72** PM-V11[®] Blade, 0.125" × 2³/₈"
- 05P24.02** A2 Blade, 0.125" × 2"
- 05P24.52** O1 Blade, 0.125" × 2"
- 05P24.72** PM-V11[®] Blade, 0.125" × 2"
- 05P30.01** Jointer Fence
- 05P30.08** Universal Fence