



Woodsmith[®] **PLANS**

BENCH PLANE TUNE-UP

BENCH PLANE TUNE-UP

If you're restoring an old bench plane, chances are it's in need of a little tune-up. But that's also true for a brand new plane right out of the box. Either way, a simple tune-up will turn a bench plane into a precision tool.

SHARPEN THE BLADE

The best way to end up with good results is to start with a sharp blade.

THE EDGE. The cutting edge of the blade is formed by the intersection of two surfaces — the back and the bevel of the blade. To get a sharp edge, you want these surfaces smooth and flat.

FLATTEN BACK. When flattening the back, I “sand” it on a flat surface like a piece of glass, see Step 1 above. Start with 220-grit silicon-carbide sandpaper and sand until there's a consistent set of scratch marks. Then polish the back using progressively finer grits. (I work up from 400 to 2000-grit).

This takes some elbow grease. But the nice thing is you only have to do it one time. Once the back is flat, you just need to concentrate on the bevel the next time you sharpen the blade.

NOW THE BEVEL. Now it's just a matter of making the bevel as flat and smooth as the back. The secret is to hold the blade at a consistent angle. To do this, I use a honing guide, see Step 2. Basically, this is a rolling clamp that holds the blade at the desired angle.

Here again, the idea is to proceed from a coarse to a fine grit. The trick is

SHARPENING THE BLADE



1 Using oil as a lubricant, sand the back of the blade across a piece of silicon-carbide sandpaper.

2 A honing guide ensures that the blade remains at a consistent angle as you're sharpening.

knowing where to start. This requires matching the grit to the condition of the bevel. If there's a nick in the edge, I start with 180-grit sandpaper. But this is too coarse for most work. For example, 220-grit sandpaper is fine for a new blade. If you're just touching up an edge, you may want to start with 800-grit.

EVEN PRESSURE. Regardless of the grit, the key is to apply pressure evenly across the blade. The only exception is if the blade is out of square. In that case, apply a little extra pressure on the “high” corner to square the blade as you sharpen.

BURR. As you work with each grit, a burr will start to form on the back of the blade. You can't see it, but you can feel the burr by running your finger up the

back of the blade. When you get a nice even burr across the entire width of the blade, remove it by alternately sanding the back and bevel with the final grit of sandpaper used to polish the back.

FITTING THE CAP IRON

It takes more than a sharp blade to plane a surface smooth. The cap iron that's attached to the blade also needs some attention.

The purpose of the cap iron is simple. To prevent tearout, it “breaks” the shaving as the blade slices through the wood. To do this, the nose of the cap iron is curved.

SAND EDGE. The problem is that if the edge of the cap iron doesn't sit flat against the blade, the shavings can wedge under the cap iron. This can create a “log jam” of shavings, making it difficult to plane a surface smooth. To prevent this, the curved edge of the cap iron needs to be sanded smooth and even, see Step 1 at left. Here again, I use 220-grit silicon-carbide sandpaper.

POSITION CAP IRON. Once the edge is sanded smooth, it's important to position the cap iron properly. In general, I attach the cap iron so it's about $\frac{1}{16}$ " from the front edge of the blade. But for fine work, when I want paper-thin shavings, I set it about $\frac{1}{32}$ " from the front edge.

FITTING THE CAP IRON



1 Lower the back end of the cap iron slightly, then sand the front edge by making a few smooth strokes.



2 After smoothing the edge of the cap iron, tighten it in place behind the leading edge of the blade.

ADJUSTING THE FROG



1 To adjust the opening of the throat, first loosen the screws that hold the frog in place.



2 Then turn the screw at the back of the frog to adjust the size of the throat opening.



3 To check the size of the opening, tighten the frog down and then reinstall the blade.

ADJUSTING THE FROG

With the cap iron in place on the blade, you're almost ready to start planing. But first you'll need to adjust the throat opening where the blade projects through the bottom of the plane.

The goal here is to size the opening so it "matches" the position of the cap iron on the blade. This way, they both work together to create nice even shavings.

ADJUST FROG. To do this, you'll need to adjust the position of the frog. Start by loosening the screws on the top of the frog, as shown in Step 1 above. Then turn the adjustment screw at the back of the frog to adjust the opening, see Step 2. After reinstalling the blade, check the size of the opening, see Step 3. **Note:** Tighten down the frog before reinstalling the blade.

So how do you know that the frog

is adjusted just right? Basically, it's a trial and error process.

As a rule, start by adjusting the opening so it's about twice the setting of the cap iron. For example, for fine work, I'll open the mouth to $\frac{1}{16}$ " (twice the cap iron distance of $\frac{1}{32}$ ").

Then after reinstalling the blade, check the setting by planing the edge of a scrap. The shavings should come off the workpiece smoothly and evenly without jamming in the opening of the mouth.

FLATTENING THE SOLE

There's one last thing to consider when tuning up a plane — the flatness of the sole.

If there's a slight bump in the sole, it will prevent the cutting edge of the blade from making full contact with the workpiece. And if the sole is dished out, it's almost impossible to plane a surface flat.

REFERENCE SURFACE. To check whether the sole is flat or not, you need a flat reference surface. Here again, a piece of glass works fine.

To check the sole, draw lines across it with a marker, see Step 1 below. Then sand the plane across a piece of silicon-carbide sandpaper, see Step 2. After a few strokes, check your progress. Any low spots will show up as dark lines, see Step 3.

Note: Be sure to sand the plane with the blade in place (and retracted). This will "stress" the body of the plane as if it's in use.

The idea is to continue sanding until the lines disappear. Then polish the sole on progressively finer grits of sandpaper (up to 400-grit).

Finally, give the metal surfaces a coat of paraffin wax. Unlike a machine oil, the wax will protect the plane without leaving a residue on the workpiece that can ruin a finish.

FLATTENING THE SOLE



1 To flatten the sole, start by drawing squiggly lines across the sole of the plane with a permanent marker.



2 Then "scrub" the plane on a sheet of 220-grit silicon-carbide paper that's taped to a piece of glass.



3 Any dark lines that remain indicate low areas. So continue sanding until the marks disappear.