Set & File

A Practical Guide to Saw Sharpening

by Matt Cianci

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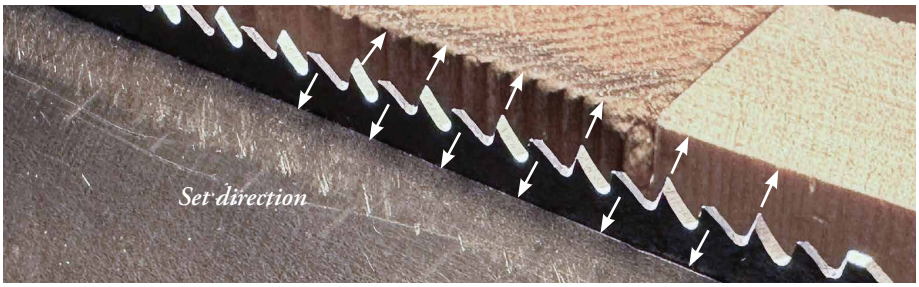
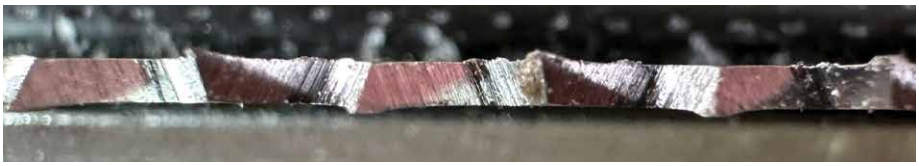
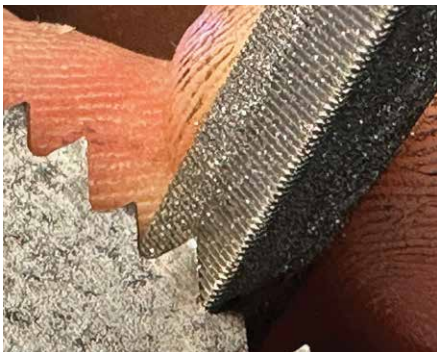
Sharpening Crosscut



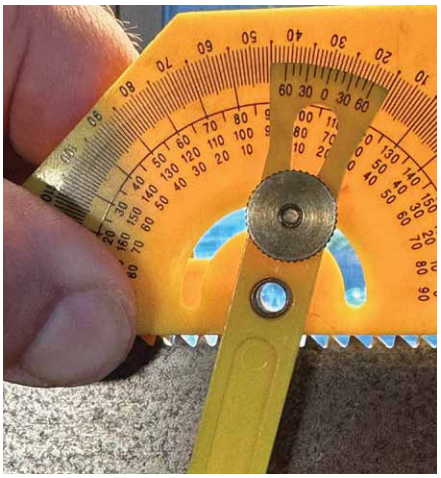
Finding the set pattern on crosscut teeth should be easier than on a ripsaw. The bevels are the key. On this saw the first tooth is set towards me, so I begin setting on the second tooth. (The heel bevel is not a tooth.)



These teeth have the right amount of set for a crosscut saw. It can be hard to see, so rely on your test cut at the end to confirm your results.



The correct size file. These teeth are 8 ppi.



With all of the contentious topics in the saw world, it is amazing that we all agree on crosscut tooth rake: 15° is universal.

This chapter describes how to sharpen any saw with crosscut teeth that are dull from normal use. The saw should have a straight or appropriately crowned toothline as well as accurate and uniform tooth geometry. Like in the previous chapter on filing rip teeth, I will cover the four basic steps beginning with setting the teeth, but much of the process is the same.

Step 1: Setting the Teeth

To begin, clamp the saw in your vise and focus your task light directly over the teeth to identify the existing set pattern. With crosscut teeth, the set pattern matches the bevel pattern.

With the pattern identified, adjust your setting device to just a bit more than its finest setting. Rest the casting firmly on the toothline, center the hammer on the first tooth set away from you and squeeze the trigger. Remember to only set every other tooth, and then flip the saw around and set the teeth you skipped in the opposite direction.

With the teeth properly set, you can select the proper size taper file and measure the teeth for their rake angle. Crosscut saws have 15°. Make a rake guide accordingly and affix it firmly on the end of your file.

Step 2: Jointing

Make sure the saw is firmly clamped with a couple inches of clearance above the vise jaws and joint the toothline. Remember to keep the file square to the side of the blade. With beveled teeth, the mill file can hang up a little more on the points, so your first stroke should be very light. Take a look after the first pass or two to judge your progress. Stop jointing when each tooth has a distinct flat. Move your light back and forth across the toothline and watch for the flash of light reflecting the flat to your eye.

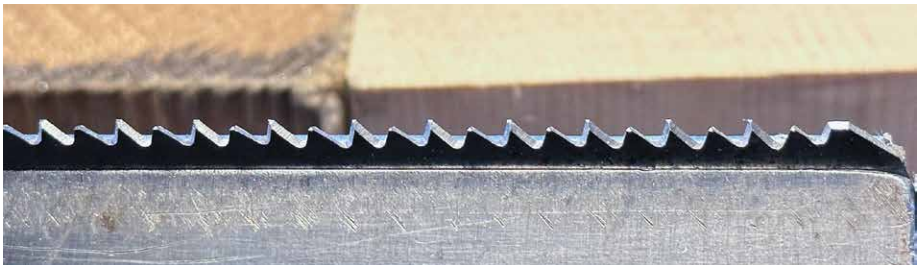
Step 3: Sharpening

Re-clamp the saw for filing the teeth. Make sure the saw is as low as possible in the vise to minimize tooth deflection. Next, decide what degree of tooth bevel your saw will have (see Chapter 2) and make your bevel guide. With the rake guide and bevel guide installed, orient your file to the toothline for rake, bevel and slope.

Focus on the teeth at the heel, and identify the bevel pattern. If you are looking straight down at the toothline, you should be able to pick out how the gullets are filed alternately toward the heel and toward the toe.

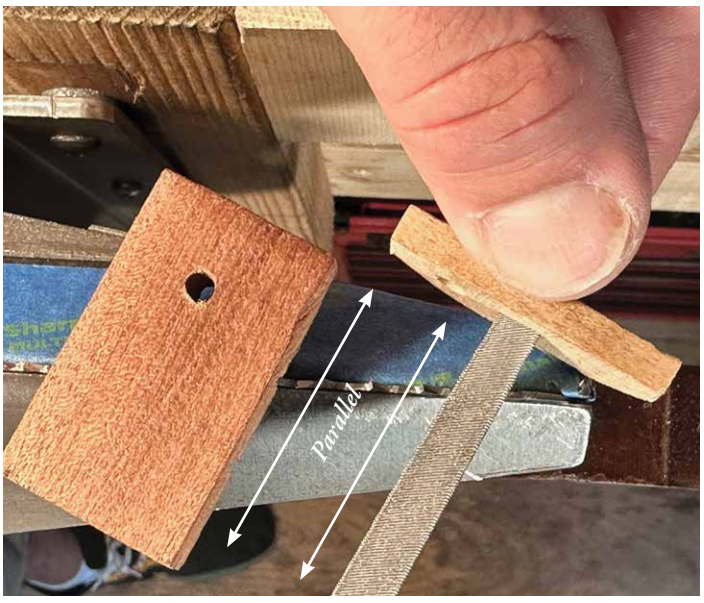
Place the file in the first gullet that matches the angle of your bevel guide (the second gullet on this saw). You will be filing both the face of the tooth on the heel side of the file and the back of the tooth on the toe side. Make note of the size of both flats. While maintaining correct rake, bevel and slope orientation, take a light pass with the file. Keep your file pressure even and centered in the gullet. You want to remove steel evenly from both sides. Take a look after the first file stroke. You should be able to see how the flats have shrunk in width. Continue filing until you remove about half of the width of both flats then stop. Neither of the teeth are brought to a sharp point in this step. Move to the next parallel gullet (skip the ones angled the opposite direction) and repeat. Make sure to keep your file orientation and control for sim-matre. Again, remove half the width of both flats. Make your way down the toothline for a couple of inches repeating this process of removing half the width of the flats on either side of the file.

With the first set of bevels filed in one direction, rotate the bevel guide to rest on the toothline angled toward the toe.

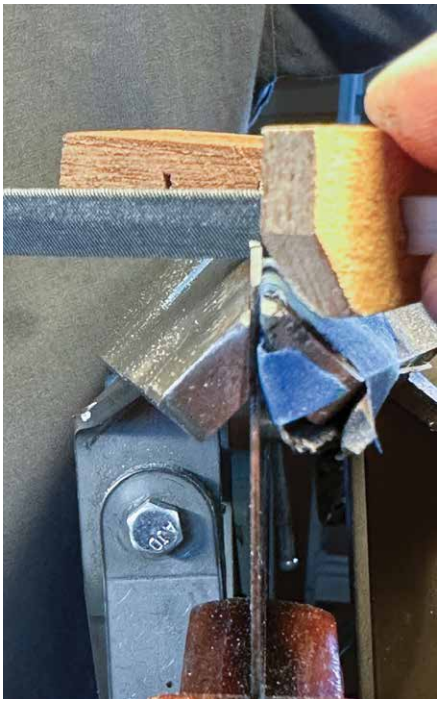


Ready to file. Can you see the flats?

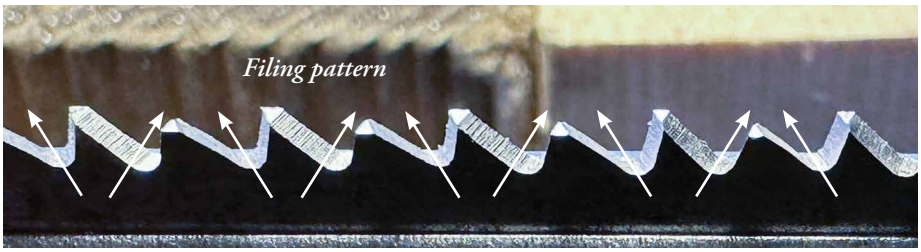
Rake: 15°.



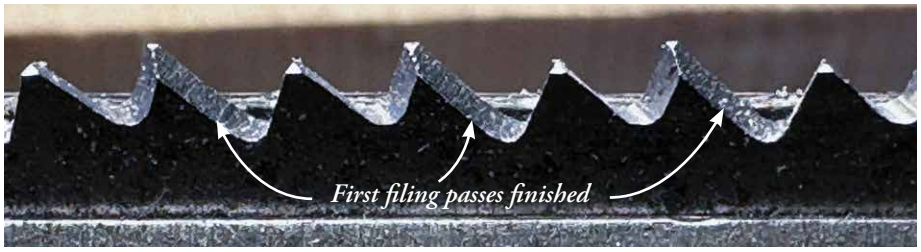
Bevel: 25°. Keep your file parallel with the long edge of the guide. Sharpening beveled teeth is a two-step process. First, file one set of bevels in one direction, then rotate your guide and file the other set of bevels in the opposite direction. I like to start filing toward the heel, but it doesn't make a difference which you do first.



Slope: 0°.

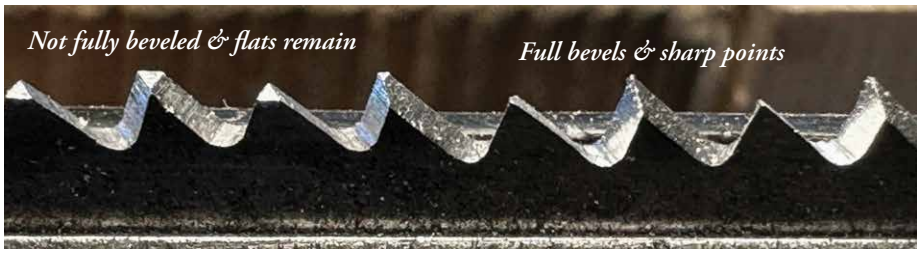


Can you see how the gullets match the bevel pattern? That's your guide. Follow the direction of the gullets as you file the teeth.

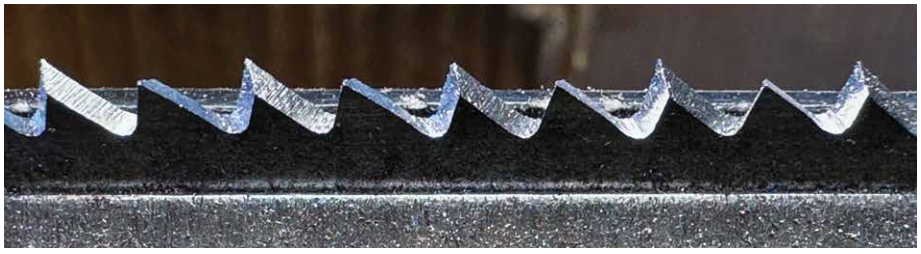


Here's what it should look like after the first filing passes with one set of bevels filed. You can clearly see how every other gullet is deeper, and that the flats are about half the width they were before. None of the teeth is sharp yet.

Reorient your file parallel with the bevel guide. The rake and slope orientation are the same.



Here's the first couple of fully sharpened teeth. The points and gullets are even.

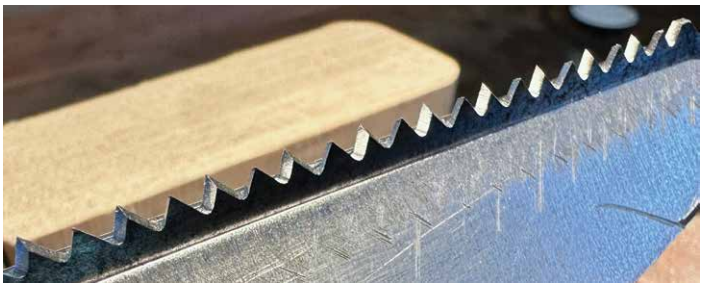


The first section completed with full bevels, sharp points and even gullets.

Go back to the heel and rest the file in the first gullet that you skipped before. Take a light stroke and focus on the flats on either side of the file. After each light stroke make note of how fast the file is removing steel. The goal is to remove both flats at the exact same moment. This will leave a sharp point on both teeth and ensure they are the same height. If one flat is removed before the other and you keep filing with even pressure, you will shorten one tooth and it will be useless.

Move to the next gullet and repeat. The learning curve here is all about controlling for sim-mat-re. It is easy when the flats on either side of the file are the same size and you can file them away at the same rate. But when one flat is bigger than the other, you have to accentuate your stroke toward the larger flat. This is different from filing rip teeth, because now you do want to bring both teeth to a point at the same time. This takes some getting used to. At first, I sucked at it, too. It took me about five or 10 saws worth of teeth to really figure it out.

Proceed down the rest of the toothline following this two-step process. File the bevels in one direction first, then switch



These freshly filed faces and backs meet at the apex of each tooth to make razor-sharp points. Wood fibers beware.

This is what your crosscut teeth should look like. (Hopefully, Daryl would approve.) Now for the real test.

Stone with even pressure from toe to heel. Repeat one to two times on both sides.

your bevel guide and file the other set of bevels in the opposite direction. Keep your file oriented for rake, bevel and slope, follow the flats and control for sim-mat-re. With a little practice, they should look like the teeth above.

Step 4: Stoning

Remove the saw from the vise, apply tape to the blade above the gullets, and stone the teeth as previously described. After stoning, apply a coat of paste wax and buff the blade.

Find a suitable piece of wood and make a cut. Remember that you can remove a little set by stoning if the kerf is a bit sloppy, but don't overdo it. If the blade is really swimming around, return to jointing and refile the teeth.

There is no gap in this kerf. A perfectly set saw just glides through the wood with only the minimum of set to let it pass.