

# The saw doctor will see you now

## Mark Harrell continues his tutorial on clock-sharpening your saw

In the previous issue we looked at the principles of clock-sharpening and the equipment you need to get started. Now it's time to get down to the practicalities. Any paratrooper will tell you that half the game is to leap out of the aircraft door with assertive vigour, keep a sharp lookout for other chutes while descending and then land in a tuck-and-roll fashion to avoid breaking a leg. The same holds true with how you hold and push a saw file. Here are some tips that will enable you to push a file consistently, and at the proper angle, every time.

### Mark your teeth

Remember how we dotted each tooth during the hammer-setting process? Now is a good time to re-dot the teeth; again, dot the teeth set away from you only. Flip the saw around, and repeat by dotting the teeth set away from you. Now mount your sawplate into the vice.

### Orientation

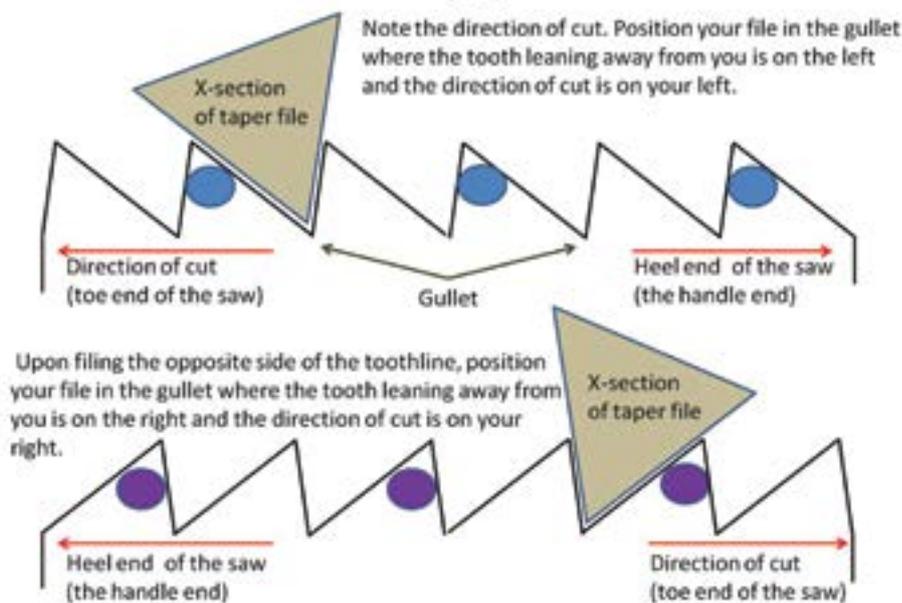
Note the graphic direction. See how the toothline presents the toe (leading end of the toothline/direction of cut) on the left, and that the heel of the saw (handle end) is on the right? Lock your file in the first gullet with the tip pointing towards two o'clock for a crosscut filing (or one o'clock for hybrid, or 12 o'clock for rip).

## Observe

If you're right-handed, then you're holding the file with your right hand, and standing offset well to the left of the work. Examine the relationship of the file to the gullet and the pair of teeth that gullet shares. In this orientation, the dotted tooth set away from you is to the left of your file,

and the tooth set towards you is on the right of your file. Now let your eyes travel over two gullets to the next location where you will land your file — again, the tooth on the left of your file is set away from you, and the tooth to the right of your file is set towards you.

## Positioning your File



## Stance

Plant your feet about shoulder-width apart, and stand well offset to the left of your file. Keep your core tight to the action. If you're left-handed, the same applies, only you'll be standing to the right of your file, and will be holding the file with your left hand.

## Dry run

Any successful combat unit conducts a rehearsal before commencing with actions on the objective for real, so before actually sharpening metal at this point, it's a very good idea to spend about 30 minutes making a dry run to condition yourself to maintain a consistent sight picture and file placement. Practise picking up your file and placing it into every other gullet, without actually grinding metal. Keep your wrist locked, and when lifting to jump, just barely clear the tips of the teeth, so you don't wipe out the momentary muscle memory that comes with this sequence. Now, some pointers that will keep you from getting lost in the fog of war...

## Anticipate gullets

The idea here is to get used to looking ahead after each file placement and repositioning your file while maintaining proper rake and bevel orientation. See the emerging pattern? Every time you move your file and reposition it, you are landing in a gullet where the dotted tooth — the tooth set away from you — is on the left, and the tooth set towards you is on the file's right. Start marching your file down the entire toothline, getting used to the motion, and eyeballing the next targeted gullet before hopping over to it.

## Locking in your file for consistent rake

Each time you land the tip of your file into a gullet, rock the handle slightly in a clockwise/anti-clockwise fashion until you feel the tip of the file lock in place. Remember that the file's cross section constitutes a 60° angle and that the gullet you're locking the file into is again a 60° angle. Get used to locking the tip of the file into the gullet every time you jump a gullet.

## Sight picture

Get used to looking at the teeth from the side by crouching until you're almost at eye-level with the teeth. Lock your file into the next gullet. If you can see the teeth from the side, you'll maintain proper rake orientation; this is critical. Pop up occasionally and accustom yourself to looking at file placement from above as this is where you can more easily see jointing flats. This will pay dividends when you start sharpening.

## Baby steps

Keep your filing hand's elbow close to your torso and take a baby step after ever three or four file-to-gullet placements. In short, keep your core tight to the work. Again, we're articulated beings, so think about it: if you find yourself reaching out with your arms as you



Check your stance is correct before you begin sharpening

reposition your file further down the toothline, without taking baby steps to ensure your torso catches up to your arms, you will completely throw off your rake and bevel angles. This will result in an inconsistently filed toothline.

## Finish your first dry run

With each file placement, let your eyes seek out the next targeted gullet, then move to it. Do this again and again. Take a baby step. Move the file. Seek out the next foxhole. Move out. Repeat until you are at the end of the toothline.

## Flip the plate

Once you have completed the dry run down the toothline, flip your plate around in the saw vise. Now everything completely changes: sight picture, core positioning, file-placement, everything. Don't let it wig you out. In military jargon, it's time to 'embrace the suck'. Here's where the quitters of the world do what they do best: quit. Don't worry, you'll adapt.

## Reorientation

Now the toe of your saw is on the right and the heel end is on your left. Starting at the toe, position your file in the first gullet. This



Crouch until you're almost at eye-level with saw teeth, viewing them from side-on

time, the dotted tooth set away from you is on the file's right, while the tooth set towards you is on the file's left. Orient the tip towards 10 o'clock. Your body's core is now roughly centred on the work, since you are still holding the file with your right hand.

## Conduct another dry run

Now you're getting used to using a completely different set of muscles and a very different stance. Keep it up. The dry run on which you've spent the past 10-15 minutes practising will pay off enormous dividends when you actually begin sharpening.

## Flip the plate (again), and repeat

Yes, do it again, from the original posture and positioning. When the Sergeant Major is in front of your formation, you snap-to and do the hard stuff because we're not made of sugar candy, right? March down the toothline again. Look at the toothline primarily from the side. Flip the plate and repeat. By now, you should be getting pretty used to file placement on both sides of the sawplate. Now our bird is approaching the drop zone and it's time to jump.

## Sharpening



Use light, fluid strokes to file for rip

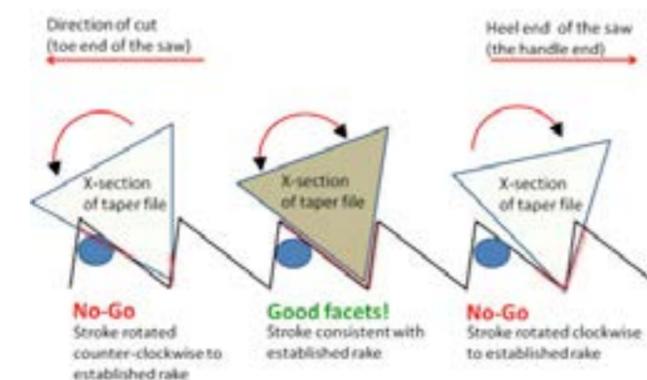
Let's start off by filing for rip. You've oriented your file perpendicular to the toothline at 12 o'clock, and you've found the manufacturer's rake by wiggling the tip of your file and locking it into place. In one fluid stroke, lightly pass about half the file's length through the gullet. The key here is one swift, brisk, tip-half brush stroke through the gullet. You'll find that you have carved a facet inside the gullet without actually grinding fresh metal across the entire thickness of the sawtooth. As the narrower tip end of the file passed through the gullet, the broader rear of the file (hence the term taper file) encountered more resistance as it ground metal away from both teeth. What you have done is sharpened both the tooth set away from you (on the left) and the tooth set towards you (on the right).

Take a moment to look at what you've just done — this very first pass is important. Take your visual cue from the dotted tooth set away from you. Of the two teeth you are simultaneously sharpening, the tooth set away from you is the one with which you can actually see and assess the result of your stroke. It is practically impossible

to see what you're doing to the tooth set towards you, but rest assured that you are achieving the same result.

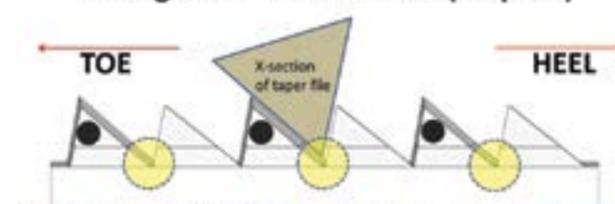
If you remained true to the manufacturer's rake, you have created a gleaming facet on that tooth from tooth tip to the gullet. If you rocked your file too far clockwise, you have carved a facet along the upper part of the tooth. If you rocked your file too far anti-clockwise, you have carved a facet along the lower half of the tooth. What you want is a facet that matches the entire length of the tooth, from gullet to tip. Once you've established a consistent facet, you've simultaneously established a few seconds of visual and muscle memory; now push the file through the gullet in one, smooth, assertive stroke. Don't grind down hard — let the teeth of the file do the work. What you're looking for now is whether you've managed to file off about half the flat you jointed on the tip of the tooth leaning away from you. Don't overdo it. If it takes another stroke to affect the flat, then push the file through the gullet again with another light stroke. Take note, and don't try to get it 100% right during the first pass — you can always take away, but you can't put back. Move on to the next sharpie-marked tooth and gullet and repeat.

## Carve Facet in Accordance with Manufacturer's Established Rake



## Use the clock method to establish bevel

### Using the Clock Method (1<sup>st</sup> pass)



Let's practise hybrid and crosscut filing by adding bevel to the equation and using the clock method for positioning the angle of your file. Again, note that the tip of the file follows the heel when the toe of the saw is on your left. Rest the first inch of your file in the gullet and wiggle it slightly in a clockwise and anti-clockwise motion to find the manufacturer's rake. Make a very light stroke to establish your facet. Eyeball your gullet and, once again, see whether your facet has ground the entire length of the tooth. If your facet is good, then follow through with a more assertive sharpening stroke; look to see how it affects

the flat at the tip of the tooth leaning away from you. If necessary, make another light brush stroke with the upper half of your file to dress up your facet; then skip over a gullet to your next sharpie-marked tooth and gullet; and repeat.

When you have completed your first run down the toothline, release your vice and your plate/back assembly. Cinch it back up. Now sharpen the gullets on the other side. This time, you're going to reverse the positioning of your file, since the toe end of the saw is now pointing to the right. Now, the tooth set away from you should be to the right of your file and

the tooth set towards you will be on the left. The tip of your file will once again be pointing in the direction of the saw handle. Again, use the clock method for reference, only this time you're filing high noon for rip, 11 o'clock for hybrid and 10 o'clock for an x-cut filing.

Keep at it. It's only natural for you to feel hesitant and unsure of yourself, but don't despair. The Sergeant Major will remind you to keep doing the hard stuff. If you're not ready to abrade metal yet, then go back into dry run mode. Re-familiarise yourself with positioning and movement. Then put the file to metal and jump out of the door.

## Stoning

Something you don't hear much about when it comes to saw filing is stoning the toothline. Stoning evens out any discrepancies that exist in the set, evening out the kerf as precise as the Sergeant Major's salute. It's a simple procedure: once you're done sharpening, break out your callipers and measure the brand-new kerf width your toothline of bayonets now presents. Chances are it's a little proud of what you want and there may be some burrs in the way. Lay down some painter's tape (low tack and smooth surface, as opposed to masking tape, which has a corrugated surface), to avoid stoning scratches on your sawplate, and to 'float' the stone about 3mm above the surface of the plate.

Now run a medium-grit Arkansas stone (any knife-sharpening oilstone will do) up and down the toothline. Just the weight of the stone will suffice. Do not lean the stone into the teeth, but rather keep it flat on the sawplate. Now take another measurement with your callipers. You're shooting for a combined set about .005 to .007 in addition to the gauge of the plate. For instance, a .02-gauge plate is best served with between .024 and .026 combined set



Stoning evens out the toothline



Measure with callipers

for knifing through hardwoods, and around .025-.027 for softwoods. For a .025-gauge plate, somewhere between .03 and .032 is best for hardwoods, and a .0315-gauge plate's combined set should be around .037-.038. Just consider your own woodworking style, and the prevalence of wood species

you work more often than not. The interesting thing about stoning is that once applied, you can get a very nicely finished cut, even when using a rip filing in cross-cut mode. You'll be amazed at the result, and the Sergeant Major will undoubtedly put you in for promotion for exercising good initiative.

## A quick recap

Let's review the filing sequence per tooth:

- **Sight picture:** crouch with the first two passes on the plate so you are eyeballing your file placement from the side, not above.
- **Light brush stroke:** look for the facet, which should run from tooth tip to gullet.
- **Sharpening stroke:** this is where you take advantage of the muscle memory from your initiating light stroke to file at least half the jointing flat away from the tip of the tooth.
- **Follow-up brush stroke:** this is another light stroke to finish up any imperfections from the sharpening stroke, and to set up your visual and muscle memory for the next gullet you're going to sharpen.
- **File from tip to tang:** you should be pushing the file through gullets all the way from tip to tang on the second sharpening stroke. This will give you the ideal action for abrading metal consistently and cleanly.
- **Lock your wrist:** it's very easy as you're pushing the file through the gullet to rotate your wrist. This will deform your teeth.
- **Creep up on it:** your first pass should remove about half the flat. Upon flipping your plate, the second pass should remove much of the remaining flat. Don't attempt to finish sharpening your saw with just two passes — flip it around again and repeat. I've been doing this for years, and it still takes me at least four flips and frequently six to complete a saw. Better to creep up on filing off all the flats than pedantically and mindlessly grinding away until you are forced to completely retool the entire toothline. Remember, each tooth is a little different. Sharpen to joint, not to count.
- **Buy a saw vice:** while the angle iron is a fun, inexpensive and readily available method to clamp your plate/back assembly, you may

### Sawfiling safety

Filing dust is dangerous. Wear a dust mask and safety goggles unless you want this fine, micro-shrapnel abrading your corneas or digging in — for good — deep within the alveoli of your lungs.



The key takeaway with clock-sharpening is to file every other gullet along the toothline, taking your visual cue from the tooth set away from you that you've marked with the sharpie

opt either to buy a vintage saw vice found at flea markets and on eBay or Craigslist (Tools for Working Wood and Texas Heritage Woodworks have great vices for sale), or you can make a wooden vice based on plans available in the woodworking forums.

- **Good lighting really helps:** buy a good lamp, but remember you'll still need to move your head around frequently during the sharpening process to see the flats you're sharpening off the toothline. You can never move your lamp frequently enough while sharpening to locate any errant flat that remains towards the end of your session.
- **Keep a vacuum cleaner handy:** filing abrades a fine, metal dust that rises above your work in a dangerous little cloud before settling back down on your toothline and bench. It reflects light, and will obscure your sight as you file. Keep your toothline clean of this

stuff, and for heaven's sake don't breathe any of it in, or get it in your eyes!

## Conclusion

Don't psych yourself out. If you can sharpen a plane iron, you can sharpen a sawtooth. And that's all you're really doing — you're jointing, hammer-setting and sharpening a pair of saw teeth, one gullet at a time. Conduct a dry run. Use the brush, stroke, brush sequence when filing, and look for a nice, clean tip-to-gullet facet as you go. You'll find that muscle memory and knowing where to look really helps. Start learning how to sharpen saws on an old beater with which you won't mind working out your mistakes. And listen to what your inner Sergeant Major says: it's OK to make mistakes, but train hard and train well. Then bring Sheffield Steel to the battlefield, where you will prevail. *F&C*