

The Secrets of Hand Sawing

With Veritas launching Crosscut and Rip versions of their sleek-looking tenon saws, John Lloyd discusses saws and sawing and explains why and how he cuts tenons by hand

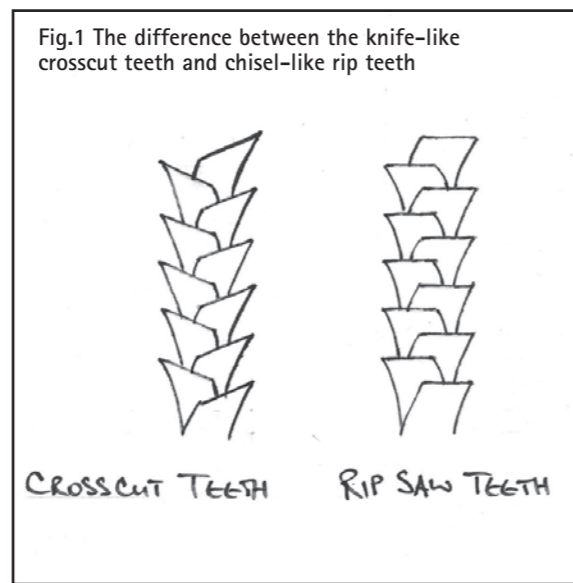
There are so many machines available these days for sawing wood, fitted with razor sharp, tungsten tipped blades and high-tech twin lasers, that you might be forgiven for thinking that a hand saw is just a rather quaint concept that was used when there were no other viable options. But over the twenty or so years that I have been attacking wood on a professional basis, there has been a dramatic increase in the production of excellent hand saws, and presumably, if they are taking the trouble to make all these saws, someone must be buying them.

In fact, Veritas have recently launched two new hand saws, a Fine-Tooth Dovetail saw (20tpi) and a Crosscut saw (16tpi), following on from the successful launch of their first (14tpi) Dovetail saw a year or so ago. There's really no need for a crosscut saw for dovetailing, but these saws got me thinking about the difference between rip and crosscut saws, particularly for tenoning, when it certainly is an advantage to have both types for cutting the shoulders and then the cheeks.

Japanese saws
The first saw that I used during my training was a Japanese Dozuki, which at the time had the double novelty of cutting 'on the pull', and being sharp; it's amazing the advances that can be made in a fledgling woodworker's career when the secret of sharp tools has been disclosed! So why is there this resurgence in the art of making exceptional hand saws, when 200 years after

the onset of the Industrial Revolution there can surely be no further need for them. Well, at the risk of appearing to be a Luddite, you might perhaps ask yourself, "Do I want to be a woodworker or a machinist?" If 'machinist' wins, then that's fine, but I bet there will be an occasion when it is impractical or impossible to use a machine to make a vital cut; so the ghastly truth of the matter is that when practising the gentle art of woodworking, in whatever form, sawing by hand is still a necessary skill; and if it is embraced and practiced a bit, it is one of the most rewarding skills that can be mastered. There is a certain sense of achievement when using machines, for example cutting dovetails using a router and a jig, but that

might be mainly because the mysteries of how the jig works have been successfully unravelled; the sense of achievement when making an accurate cut by hand, particularly when cutting dovetails, is I would suggest, on a completely different level. There is no joy to be found in trying to saw by hand with a poorly made, blunt saw, but then the same is likely to be true of a machine, which would be just as frustrating, although perhaps a little less taxing on the arm muscles. It can also, I think, be argued that sawing by hand saves time, although not always of course; in my book the pit saw is definitely a thing of the past, but with good hand skills and the right saw, components can often be produced more quickly, possibly more accurately and



definitely with a greater sense of achievement when using a hand saw in preference to a machine.

Choosing a saw

As I said earlier, there are now many outstanding hand saws to choose from and these fall in to two distinct types, Japanese and Western, and in simple terms these are both available with either 'rip' or 'crosscut' blades. Generally the big differences between Japanese and Western saws is that Japanese saws cut on the 'pull' and Western on the 'push'. Cutting on the pull allows a saw blade to be thinner, and while this can

mean that the saw cuts quickly and with less effort, because it is removing so little wood as it cuts, it also means that the blade is rather delicate and prone to buckling, especially in inexperienced hands. The majority of Japanese saws, which are generally cheaper than their Western equivalents, are razor sharp when they come 'out of the box', but they can't be sharpened and are therefore disposable. Western saws, of necessity, need slightly thicker blades and a solid strip on their top edge to prevent them from buckling as they are pushed forward to make the cut. The higher initial outlay of a good Western saw



Pic.1 Cutting tenons with a double-bladed Japanese saw

Starting the Cut



Pic.3 Using just a thumb as a guide

The secret to starting any saw cut is to support most of the weight of the saw in the hand and make VERY light initial strokes. This is particularly important with Western saws. The generally recognised way to control the position of the blade at the start of the cut is to run the blade against the thumb of the free hand (above). While this is a perfectly valid technique, there is a chance that the saw will skip away. When cutting dovetails I prefer to 'pinch' the blade with my thumb and second finger, not too tight though or there will be blood!

A Western saw should be started using the tip of the saw, on the far corner of the work. Conversely a Japanese saw is started using the heel of the blade on the near corner. The other thing that I do is to start the cut by pushing a Western saw rather than dragging it backwards; dragging is a common practice but the blade won't cut very effectively like this; as I said earlier, the vital thing is to take most of the weight off the saw at the start of the cut so that the teeth don't dig into the wood and get stuck, also position the wood low in the vice to reduce vibrations and give a smoother cut.



Pic.4 By pinching with thumb and index finger you get better control at the start, but beware the risks of injury!

Pic.2 Various styles of Japanese saw. In the centre is the double-bladed Ryoba-Dozuki, with its rip and crosscut teeth, and its depth setting

can be offset by the fact that it can be sharpened; a skill in itself, but one that it is worth mastering if Western saws turn out to be your thing. A good quality Western saw will last a lifetime and as a result might also, I suppose, be considered to have better 'Green' credentials than its Oriental counterpart. In my experience, the other issue with Japanese saws is that they are not all able to cope with cutting the hardwoods that we typically use in the West, it's not uncommon to find that after a little use there are teeth missing from some makes/types of Japanese saw, but the saws that I am using in this article have proved themselves to be manly enough to survive the rigours of most hardwoods.



Pic.5 John likes an open handle to his hand saws



Teeth configuration

The next big difference on any saw is the type of teeth, which simply means that they are good at either 'Ripping' or 'Crosscutting' i.e. cutting along the grain or across the grain. These two different types of cut require different types of teeth and different angles filed on them and between them. Teeth that are good at crosscutting look, and behave, like a series of 'knives' which are able to slice through the fibres that they are cutting at right angles to.

Rip teeth, by contrast, are like a series of 'chisels' which are much more efficient at removing what are, in effect, tiny shavings, when cutting along the grain. Both saws will of course make an impact on any piece of wood, from whichever angle that they are presented, they just won't be so efficient or accurate when they are not playing to

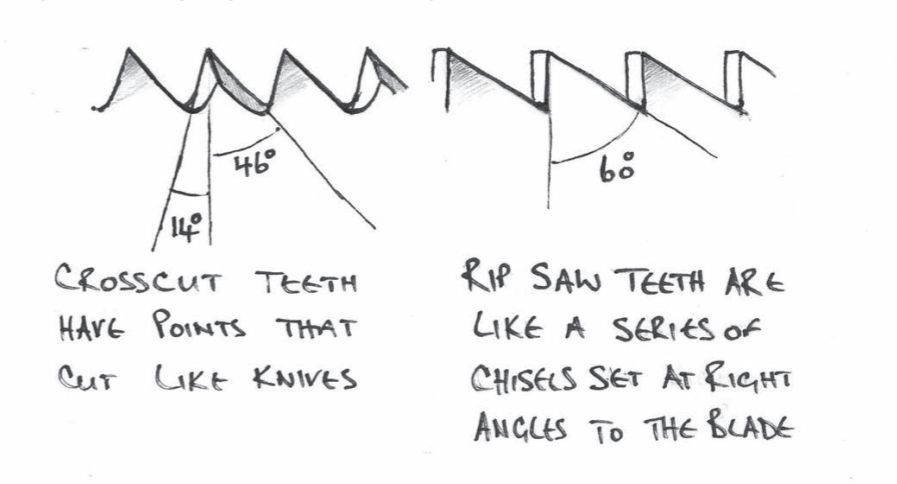
their strength. The saw that is the better 'all-rounder' though, is the crosscut saw, but the rip tooth profile is much more straightforward to sharpen! Even more complex than the Western crosscut is the tooth profile of the Japanese crosscut saw. The contrast between the Japanese rip and crosscut tooth profile can easily be compared on the Ryoba-Douzuki saw that has been mentioned several times in BW over the last couple of years. Along one edge of this saw are standard Japanese rip teeth. On the other edge are the more complex crosscut teeth. The rip teeth are pretty similar to a Western saw, but the crosscut tooth shape is rather longer and thinner, and the shape is reversed on each alternate tooth as normal, but instead of the normal two bevels forming a simple point on each tooth, there is an additional

angled bevel cut at the tip of each tooth, creating a razor-sharp knife-like point at the end of each tooth, pointing towards the handle. The teeth on all Japanese saws are profiled to cut on the pull stroke, which allows the blade to be kept thinner than a Western saw. As mentioned earlier, the big idea is that thin saws require less effort.

How to hold & standing

For Japanese and Western saws, I like to point my index finger along the saw, which gives more stability and control. In Western saws I prefer an 'Open' handle, referred to as a 'Pistol Grip', I can't get on with the straight handled or 'Gent's' type of Western saw; although I find the straight handles of Japanese saws comfortable to use and easy to control, but this is because they have an oval, rather than a round handle. For all

Fig.2 Contrasting shape of crosscut and rip teeth on Western saws



saws, a light grip is vital; if you can see the whites of your knuckles, your eyes are bulging and your brow is furrowed, when you are about to start a cut, you might as well just put the saw down and not bother. If you're not gentle with your saw, it won't be gentle with you!

Sitting on a stool while sawing is probably rather frowned upon, although I do indulge in this rather lazy approach at times. Standing obviously shows rather more commitment and is really the better option. Stand comfortably, with feet wide apart, left leg in front if right handed, and get positioned in such a way that the arm that is doing the work can swing back and forth, with the arm making a nice straight line along the saw and the line of the cut. Dropping the shoulder of the cutting arm can help to develop a nice smooth action

and holding either the workpiece or the front edge of the bench with the free hand will make everything more stable.

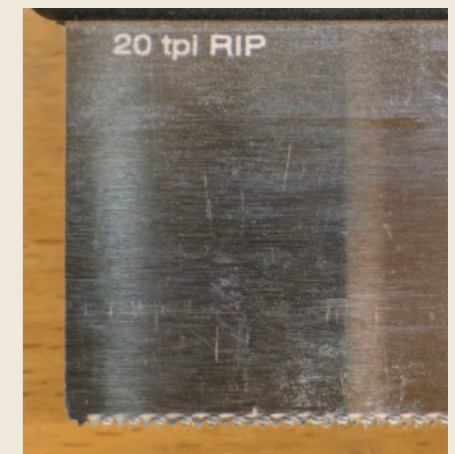
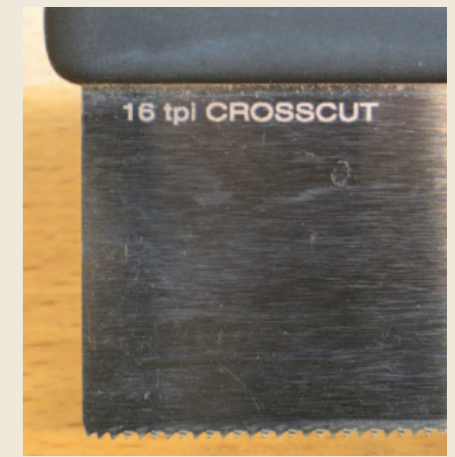
Some Western saws are worse at getting stuck than others but the new Veritas saws seem to have a particularly sweet, user-friendly demeanour; lightness of touch and sensitivity at the start of the cut is the key with any saw though! When the cut has been established with the first few gentle strokes you can get a bit more brutal with the saw to complete the cut.

Directing the cut

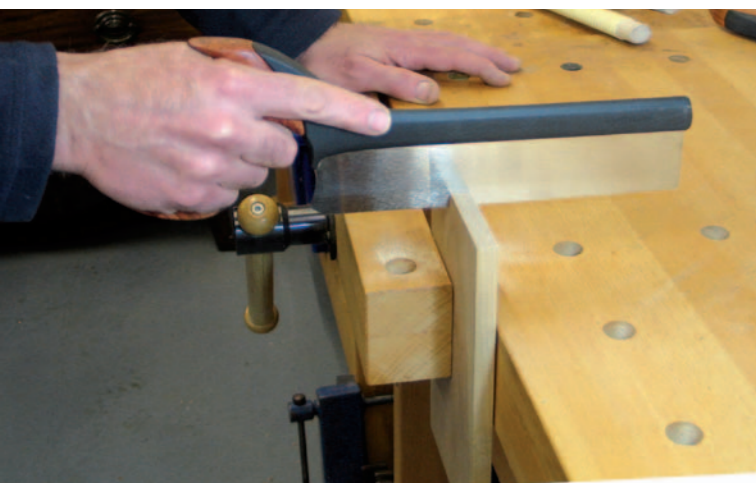
A good quality Western saw will have only the minimum 'set' to the teeth to prevent the blade from binding in the kerf, this ensures that the cut stays fairly straight, but there is still the opportunity to change the direction of the cut slightly by leaning the saw over to one side or the other in the kerf. Japanese saws, though, have even less 'set' so, with the blade being so flimsy, changing the direction of the cut when the cut has been established is almost impossible; fighting with a Japanese saw will only ever result in one winner, and it won't be you! It sounds a bit daft, I know, but using a Japanese saw requires a bit of Zen-like thought transfer into the blade, just relax and 'think' the blade down the line, I know this sounds like hippy clap-trap but it seems to work!

Ultimately any of the above tips and getting into a Buddhist trance are not going to be effective unless you get hold of a good quality, sharp, saw that feels comfortable in your hand and you practise, practise, practise. It's the only way.

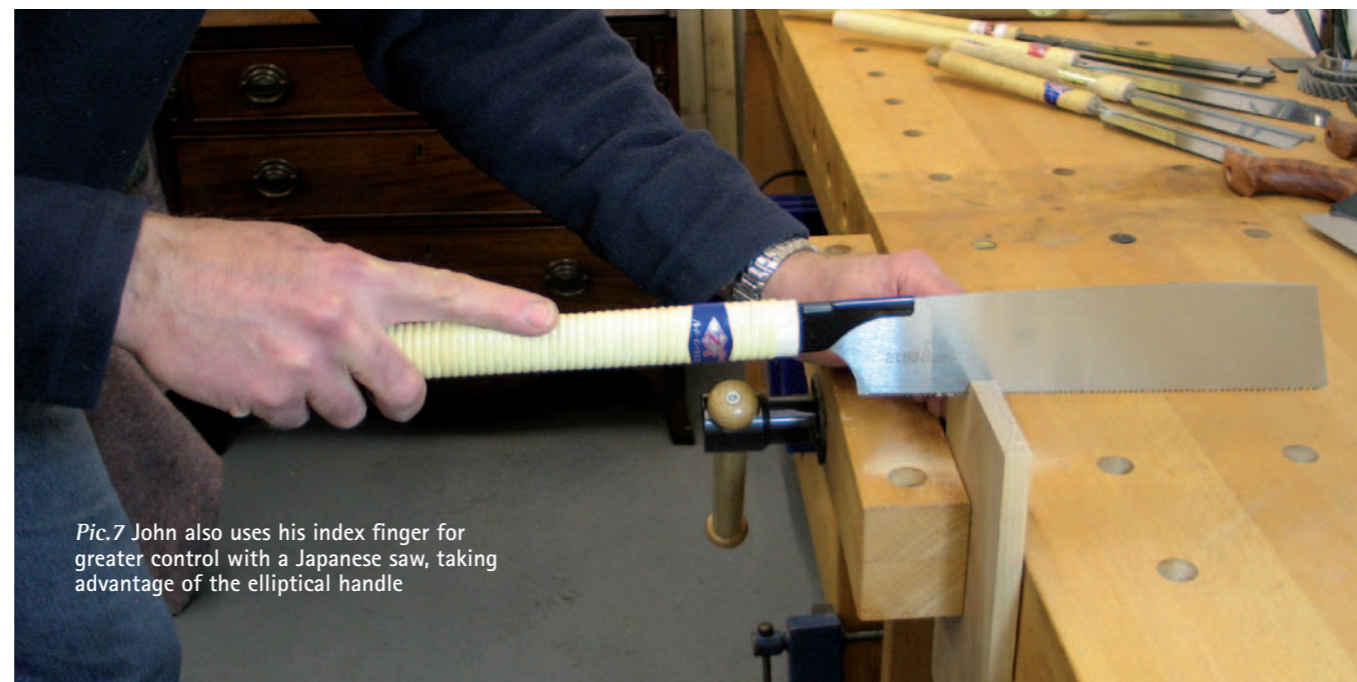
Rip & Crosscut



The Veritas saws are now available in a Crosscut and finer Rip version. The Veritas rips saws are primarily aimed at dovetailing but can also be used for cutting smaller stub tenons; all of these saws are really easy to use with the Fine-Tooth 20tpi version being particularly smooth to start, but it doesn't cut as quickly as the 14tpi model. The Ryoba-Douzuki saw (below, available from Classic Hand Tools) has rip (top) and crosscut teeth (below), and it can be adjusted for depth. It can't cut long tenons either, but is great for cutting small joints.



Pic.6 Ripping with one of Veritas's new Fine-Tooth Dovetail saws, with ripping teeth. Notice John's extended index finger for control



Pic.7 John also uses his index finger for greater control with a Japanese saw, taking advantage of the elliptical handle

Fundamentals Fact File

No.4 Tenons cut by hand

Cutting a tenon by hand can be faster

The big secret to cutting a tenon that looks perfect is to get the shoulders crisp and straight, mainly because that's the bit that's seen! That isn't to say that the cheeks can be a sloppy mess because they're out of sight in the mortise; despite any amount of gap-filling glue, a loose joint will ultimately fail!

The first part of cutting a tenon is marking out the shoulders. This can be done with a marking knife and a square, working with the stock against the face-side or face-edge for all cuts. Alternatively, a cutting gauge can be used, working from a nicely squared end. The critical part is that the shoulder line is a cut, and the cut must be reasonably deep for the next part of the process to work. The vertical cut that has been made is turned into a V on the waste side of the line with a nice wide chisel (Pic.1). It's advisable to put the rail in the vice for this bit so that both hands can be used to control the chisel. The idea of the V is that the blade of the saw will

sit in the bottom of the V and the saw cut for the shoulder made without the teeth of the saw blade ever making contact with the shoulder line (Pic.2).

Marking the tenon itself can be done with a traditional mortise gauge or a wheel marking gauge fitted with a pair of mortise blades. These lines can be made more obvious by running a pencil along the gauge marks.

Cutting the tenon

With the tenon marked out, the shoulders can be cut with a crosscut saw and because the original knife line is not actually touched by the teeth of the saw, the resulting visible shoulder line can only be perfect, that's if the person holding the saw has done a bit of practice of course!

Obviously in an ideal world the sawcut for the shoulders (Pic.3) should follow the marking out lines exactly, but if the cut line drifts a little into the waste it's not the end of the world. If everyone managed to cut shoulders

Pic.1 Having used a marking gauge to cut a deepish line, cut a V with wide chisel as a guide for the saw



perfectly they wouldn't have bothered making shoulder planes!

Having cut both shoulders, the cheeks of the tenon can be cut. Once again the rail needs to be held in the vice, but at an angle so that the gauge lines along the end of the rail and down one face can be seen. Which way the rail points depends on whether a Japanese or a Western saw is being used (Pic.4); if Japanese, the rail should be angled towards you; a Western saw is the opposite. This orientation is vital for a smooth cut and the cut is started on the top corner of the rail, just on the waste side of the gauge line. Just relax and keep an eye on the two gauge lines as the cut is made, and when the cut extends right across the top of the rail, re-set the rail vertically in the vice and complete the cut (Pic.5).

The resulting tenon can be adjusted with a shoulder plane and/or rebate block plane, if you have such a thing, otherwise a very sharp, wide chisel, will work really well to make these final

adjustments. Mortise and tenon joints are actually notoriously tricky to get absolutely right, but you know what you need to do to get closer to perfection on a regular basis; and I don't mean, go out and invest in some machinery!



Pics.2&3 The saw sits in the chiselled V, without damaging the vital shoulder line (above). Cut the whole way down the shoulder to the cheek (right)



Pic.4 For Western saws the rail needs to be angled away from you, but towards you for Japanese saws (left)



TIP

Pic.5 John only cuts one diagonal before sawing straight down the cheek (above). He says the blade is more stable that way



Pics.6&7 Complete the cut down to the shoulder (above) and then tidy up the junction between the shoulder and the cheek with a sharp (of course) chisel (right)



Pics.8&9 Tidy up paring across the cheek and you should have a perfect tenon ready for fitting