



The Power of the Pull Stroke

One craftsman's passion for Japanese handsaws

BY ANDREW HUNTER

I must admit I'm reluctant to present myself as an authority on Japanese saws. I've never been to Japan, and I've never trained with a Japanese woodworker. If I have an excuse for writing about Japanese saws it could be simply that I love using them. Or that my perspective might be helpful: I'm an American who taught myself to use Japanese tools by watching and listening to and learning from the tools themselves.

My first experience as a woodworker was in my senior year of college, when I built myself a bookshelf. Made with a circular saw and a handful of nails, it wasn't the finest thing, but I enjoyed making it so much I was convinced I'd found my career. Soon afterward I bought my first collection of hand tools at the local hardware store—a Stanley handplane, a set of blue-handled Marples chisels, and a double-sided Japanese saw. It was a mixed bag of traditions: American, English, Japanese. I opened every book on woodworking I could get my hands on, learning from anybody who had something to offer.

Eventually I came across Toshio Odate's book, *Japanese Woodworking Tools: Their Tradition, Spirit and Use* (Linden Publishing, reprinted 1998), and it resonated right through me. I was immediately drawn to the beauty of the tools, and Odate's stories of his apprenticeship in Japan and his crystal-clear explanations

of Japanese tools and traditions inspired me enormously. I was in my 20s, searching out what I wanted to do in this world, and it was his book, in part, that led me to create a self-directed apprenticeship to teach myself to use Japanese tools. Most important, Odate's book taught me to be patient—to master steps 1 through 9 before attempting step 10.

Having acquired a basic understanding of Japanese tools from reading, I taught myself to use them through trial and error. I paid attention to how the wood responded to the tools and how the tools responded to me; eventually the three of us learned to get along.

As much as I love Japanese tools and techniques, I'm not a purist. My methods are a mixture of Japanese and Western ways of working. Japanese craftsmen may be comfortable working on the floor, for instance, but I was uncomfortable trying to adapt to this. As a result, the postures I use, along with many of my techniques, are a compromise between the advantages of the Japanese approach and the ability of a Western-trained body and mind to adapt.

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How to handle a Japanese saw

Japan's is the only culture in the world to have developed its saws to cut on the pull stroke. In the rest of Asia, as in the West,



JACK OF ALL KERFS

Japanese handsaws are known for their extremely fine cut, but they're equally valuable for their versatility. In addition to being superb joinery saws, they are up to the tasks of rough ripping, quick crosscutting, and flush trimming. Ryoba saws—two-sided saws with crosscut teeth on one edge and rip teeth on the other—are especially versatile.

RIPPING WITH A JAPANESE SAW



No vise required. Low horses provide a convenient way to use your body weight to secure the workpiece as you cut on the pull stroke. For a smooth start to a ripcut, begin at the heel of the blade—where the rip saw's teeth are finer—and with the handle raised only slightly (top left). For a faster cut once the kerf is established, raise the handle and cut with the larger teeth at the middle and toe of the blade (bottom left). If the kerf should close, tap in a wedge to keep the blade from binding (above).

a saw cuts when pushed. The genius of the Japanese approach is that pulling the saw through the wood puts the blade in tension. While the blades of Western saws must be beefed up to avoid buckling as they're pushed, in Japanese saws the steel can be very thin—making for a much narrower kerf and less resistance, a combination that improves both speed and accuracy. In addition, the steel can be harder, allowing sharper teeth and a finer cut. The tooth pattern of Japanese crosscut saws is also unique. Each alternating tooth has a three-bevel profile, ideal for cleanly scoring the end-grain walls of the kerf and releasing the chip between.

With its thin blade and sharp teeth, a properly set Japanese saw will cut a straight, clean line with minimal effort. But don't apply too much force—use fingertip pressure and let the teeth do the work. The same qualities that make these saws work so well on the pull stroke leave them vulnerable when pushing; the hard, thin steel is brittle and will break before it bends, so use a very light touch on the return stroke and be ready to release pressure if the saw catches.

Start each cut by placing your thumb at the entry point and using it to guide the saw. Hold the saw at a low



The impact of Japanese hand tools

I don't use my hand tools out of nostalgia. I use them because they make my work better. They offer precision that my power tools can't match, and with hand tools my work is not limited by the capabilities of my machines—if I can draw a line I can cut it. There is no need for flat reference surfaces or square edges. This allows the design to be what looks and feels good, not what is easy to machine. Using Japanese hand tools doesn't mean I have to build in a Japanese aesthetic. I do like the simple, clean lines in Japanese work, but that same honest, unadorned look is at the heart of other furniture styles I've built in, like Mid-Century Modern, American country, and classical Chinese (opposite page).



New angle on joinery. Angling the workpiece up on one horse makes it simpler to follow layout lines on the end grain. Begin the cut at the back edge (above) to establish the kerf, then angle the saw back toward you to continue the cut (right).



angle to the workpiece as you begin; this will engage more teeth and give you more control. As you progress, raise the handle to a higher angle, which engages fewer teeth and requires less force. Concentrate on cutting straight and maintaining smooth, even strokes. Alignment of the saw at the start is critical, because you shouldn't steer a Japanese saw once you've begun the cut. These saws cut in straight lines only. If you find yourself off course, either try to widen the kerf by sawing in again from the top, or cut away the waste if possible and begin anew just next to the miscut.

Grip: one hand or two

Japanese saws are sometimes gripped with one hand, sometimes with two. Smaller cuts where accuracy is paramount are typically made one-handed, with the hand held back on the handle. This positioning makes for more sensitivity to the cut and allows you to sight the length of the handle to see that your motion is straight. When sawing with one hand, I use a handshake grip with my index finger extended along the top of the handle. You want the

TIP **FIXING A FOUL-UP**



You can't steer a Japanese saw the way you can a Western one. This puts a premium on getting the cut started right. If the cut does go off-line, it's best to stop sawing, cut off a waste piece, and establish a new kerf.



Bottom photos: John Waldie

SAWING AT THE BENCH



Sight for a straight cut. For fine cuts, saw one-handed, gripping toward the end of the handle and sighting to be sure the handle and blade remain in line as you saw.



Thumb stop. Use your thumb to guide the blade as you make the first few strokes.



Stable setup. Holding the workpiece against a pair of benchdogs with your free hand provides plenty of stability as you crosscut on the pull stroke.

handle and the top edge of the blade to move in a straight line, while keeping the face of the blade in plane with the cut, and all the while keeping an eye on the line. It is truly a state of Zen, seeing everything without focusing on anything.

The saw's long handle also allows for a two-handed grip when making larger, more aggressive cuts. For optimal control and power when using the two-handed grip, separate your hands, one at the front of the handle, the other at the back.

Posture and work holding

Although a light touch is best with Japanese hand tools, working with them is still a very physical activity. I once watched a highly skilled Japanese craftsman in California doing a demonstration, and his movements reminded me of a martial artist. He generated much of his power with his legs, and it was instantly clear to me that I was not using my whole body as I worked. After that I started taking tai chi so I would be more nimble and more aware of my whole body while I worked.

Like most Japanese craftsmen, I rarely use vises when I'm sawing. My posture and work-holding method vary, depending on the type of cut I'm making. For more aggressive cuts, like long rips, I recommend placing the workpiece on low sawhorses and holding it in place with your foot. The teeth of a rip saw are smaller at the heel, so start the cut there. Once the kerf is estab-

lished, engage the full blade. Pull the saw in toward the center of your chest while counteracting the upward force with your body weight. This posture allows for the greatest power. Use the large muscles of your abdomen to draw the saw in. In this bent-over posture, support yourself with the muscles of your legs, not your back.

For smaller ripcuts, such as the cheeks of tenons, it is helpful to elevate the end to be cut on a single low sawhorse, allowing a clear view of the layout lines on the end-grain surface as well as on the face of the board. Here again, your foot provides the downward pressure to hold the workpiece still and to counteract the pulling force of the saw. Like Japanese craftsmen, I wear slippers while I work so the wood is not marred by grit from outdoors. Alternately, you can protect the workpiece with a cloth.

For maximum precision in smaller crosscuts or ripcuts, I'll often place the workpiece on the bench, brace it against a pair of dogs, and hold it in place with my free hand. I make these cuts while standing, pulling the saw up through the wood.

For repetitive short cuts such as for dovetails, I'll place the workpiece flat on my bench and pull downward through the wood to make the cut. This way, the sawing action pulls the workpiece tight to the bench, eliminating vibration—and the need for a clamp or vise. I can easily hold the piece still with my free hand



The lowdown on dovetails. Hunter does some repetitive joinery while sitting on a low block or stool. This posture brings his eye close to the layout lines, and the downward stroke pulls the workpiece to the benchtop, eliminating vibration.



as I saw. For this type of cut, I saw while kneeling or sitting on a low block beside the bench. This puts the workpiece at eye level, permitting me to easily see the layout lines on both faces of the board. It also lets me work far longer without fatigue. Although the workpiece is easier to stabilize when cutting downward in this way, you do sacrifice some control. It's easiest to control a Japanese saw when the cut is progressing toward you. Here it is progressing away from you. I only use this technique for short cuts, say 2 in. long or less.

Buying Japanese saws

The tradition of saws made by hand in small shops is still alive in Japan. These tools were originally designed for craftsmen who studied for many years how to use them and wanted to push them to their limits. And the balance of performance and convenience still tends to lean toward performance in saws made in these shops. The blades on craftsman-made saws are forged from high-quality steel that will take a sharper edge but is brittle and more vulnerable to breaking. The blades are hand-scraped so the sides are slightly dished, reducing friction in the cut.

One of my first really good Japanese saws was a handmade dozuki. It had very fine, super-sharp teeth on an ultrathin blade. This saw quickly taught me how insensitive I was. I had to stop using it; it was evident that if I kept using it without the necessary



A good guide. The azebiki saw, with its short, wide blade, easily follows a guide block for straight or angled cuts.

A few saws to start with

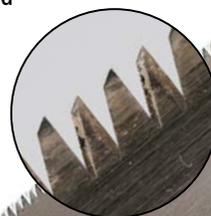
Japanese saws are very specialized. Whether you are ripping or crosscutting, working hardwood or softwood, making aggressive cuts or fine, there is a specific Japanese saw designed for each cut. There are even saws for cutting plywood. And a saw designed for a specific type of cut will always outperform a general-purpose saw. That said, you can get a lot of work done with just a few versatile saws.

RYOBA

A ryoba is the first Japanese saw I recommend buying. With crosscut teeth on one edge and rip teeth on the other, the ryoba is the workhorse of Japanese saws, suited to everything from rough carpentry to fine furniture work. One-sided rip saws and crosscut saws are also available, but the ryoba puts the two together, providing cost savings, convenience in use, and little downside. One minor disadvantage of the ryoba is that on deep cuts the teeth of the opposite edge will enter the kerf and can cause some tearout. If the quality of the cut is critical, you should use a one-sided saw, or open the kerf with a wedge.



Versatile virtuoso. The ryoba saw has crosscut teeth on one edge and rip teeth on the other, making it extremely handy. Like other Japanese saws, ryobas are available in versions expressly for hardwood or softwood.



CROSSCUT TEETH



RIP TEETH

DOZUKI

Your next purchase might be a pair of dozuki saws. Suited for the finest work, the dozuki has an extremely thin blade supported by a heavy steel spine. There is very little set to the teeth, and the saw leaves a remarkably clean surface. Dozukis come in both rip and crosscut versions, and I recommend buying one of each. One limitation of the dozuki, as with any backsaw, is that its depth of cut is limited by the spine.

King of the clean cut. Like Western backsaws, the dozuki, with its heavy spine, extremely thin blade, and small teeth, is made for the finest work.





Quick switch. Many Japanese saws have replaceable blades, and switching to a new one takes a minute or two. Old blades can be kept and remounted for cutting plywood or gnarly boards, or they can be cut up and used for scrapers.

AZEBIKI

The third type of saw I'd recommend is an azebiki. Available in single-sided or double-sided versions, the azebiki has a curved blade that enables you to start or stop a cut in the middle of a board. The blade is short, so following a guide block is simple, making this a great choice for cutting dadoes and sliding dovetails, including stopped ones. Because of its short blade, the azebiki is harder to sight, and so for unguided cuts it is less accurate than longer saws.



Stop-cut specialist. The azebiki saw's short, curved blade enables it to start and stop cuts in the middle of a board, as when making stopped dadoes or sliding dovetails.

skill I would ruin it. Modern factory-made Japanese saws strike a balance that is far more inviting to the new user. By backing off on the hardness of the steel, manufacturers make saws that are easier to use for the beginner while still delivering the advantages of cutting on the pull stroke.

The blades of factory-made saws are of more forgiving, softer steel, and often only the teeth are hardened. Although these saws lack the rigidity and subtle profile of the more expensive saws, they are still very effective and I use them for much of my work. Most of these inexpensive saws have replaceable blades. Should they be misused or become dull, they are easily replaced. When learning, it is better to go through a few replacement blades at \$25 apiece than to break a high-quality saw, wasting your money and dishonoring the skill of the maker.

In general, the geometry of Japanese tools is more aggressive than in Western tools. Saws have longer teeth with more radical rake angles and sharper fleam angles. Their extrahard teeth are designed

to cut cleanly and quickly. But all this comes at a cost. The hard steel is brittle, and the longer, more aggressive teeth are more likely to break if used incorrectly.

One misconception about Japanese saws is that they are only suited to soft woods. That's not true. Most of these saws are available in versions intended specifically for sawing hardwoods or softwoods. Hardwood saws have shorter teeth filed to a less aggressive pitch than softwood saws. The number of teeth per inch coincides with the length of the saw and determines the coarseness of cut—shorter saws have more and smaller teeth, producing a finer cut.

There's a wide variation in the price of Japanese saws. Factory-made saws range in price roughly from \$30 to \$75, and that includes a lot of great saws. For a handmade saw, you can expect to see prices starting around \$75 and going up to many hundreds. All of the saws I use cost less than \$200, and some of my most-used saws were less than \$50.

If you own a saw with a handmade blade and it is dull or out of straight, it can be sent back to the maker for retuning. Most reputable dealers will offer this service.

To be honest, when just learning to cut on the pull stroke, it is usually not the quality of the saw that will keep you from making a straight cut. It takes time to get used to this mode of working. Be patient and remember that the best thing you can do is relax. A few deep breaths before beginning a cut will go a long way. □

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