

Avoiding Accidents on the Tablesaw

It's the most dangerous tool you own. Here's how to get the most from your saw without getting hurt.

BY GARY M. KATZ

A short time ago, a good friend of mine cut off the tip of his thumb on his tablesaw. He's a good guitar player, too. We're the same age; both of us have been working in this business about the same amount of time. I felt terrible about the whole situation, but it just reinforced to me the importance of tablesaw safety. Reminders like this one have made me develop techniques to protect myself from mistakes. So far, those habits have saved me from disaster.

Any article on tablesaw safety would be remiss if the issue of blade guards weren't faced honestly. Of the carpenters I've met around the country, I'd say 99% never use a blade guard on their tablesaws. In more than 30 years of working on job sites, I've never seen anyone use a guard on a portable saw. But I've seen and heard about a lot of tablesaw accidents. Lots of numbers are batted around, but here's a conservative estimate: According to the Bureau of Labor Statistics, tablesaws caused more than 2,000 reported injuries during 2004, and most of those accidents probably could have been prevented if a guard had been in use.

Does that mean we're all going to start using the guards on our tablesaws? No, I don't think so, although some blade guards definitely work better than others. Most of us will continue using our saws without guards for numerous reasons. A guard makes it impossible to rip narrow pieces, or to cut dados and rabbets. It's troublesome to take a measurement between the fence and the sawblade with the guard in place, and—maybe most aggravating for carpenters on job sites—you can't see through a guard.

The reality of using a portable tablesaw is that it's important to learn how to work safely with the guard off the saw. This article highlights some of the most important tablesaw-safety techniques I use every time I turn on the tool. I start by listening to the little voice inside my head. When something feels wrong, I don't do it. I go get some coffee and think up another method. At the end of the day, I count my blessings on all 10 fingers.

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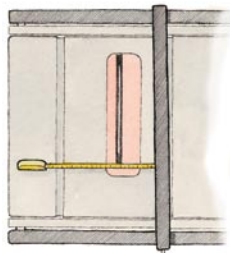
ESTABLISH A SAFE WORK ZONE BEFORE YOU START TO CUT

- Be sure that the area around your feet is clear of cords, debris, and other material.
- You can't do good work when you're on your knees, so always use a saw stand coupled with an out-feed table or extension rollers (the continuous support of an out-feed table is better). It's also important that the table and stand be the exact same height, in this case, about 34½ in.
- Make sure that push sticks are within easy reach.
- Always wear eye and ear protection.
- Have a dust-collection system in place, or wear a respirator when using a tablesaw.

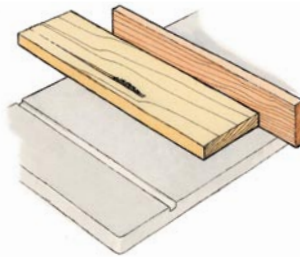


PREVENT KICKBACK AT ALL COSTS

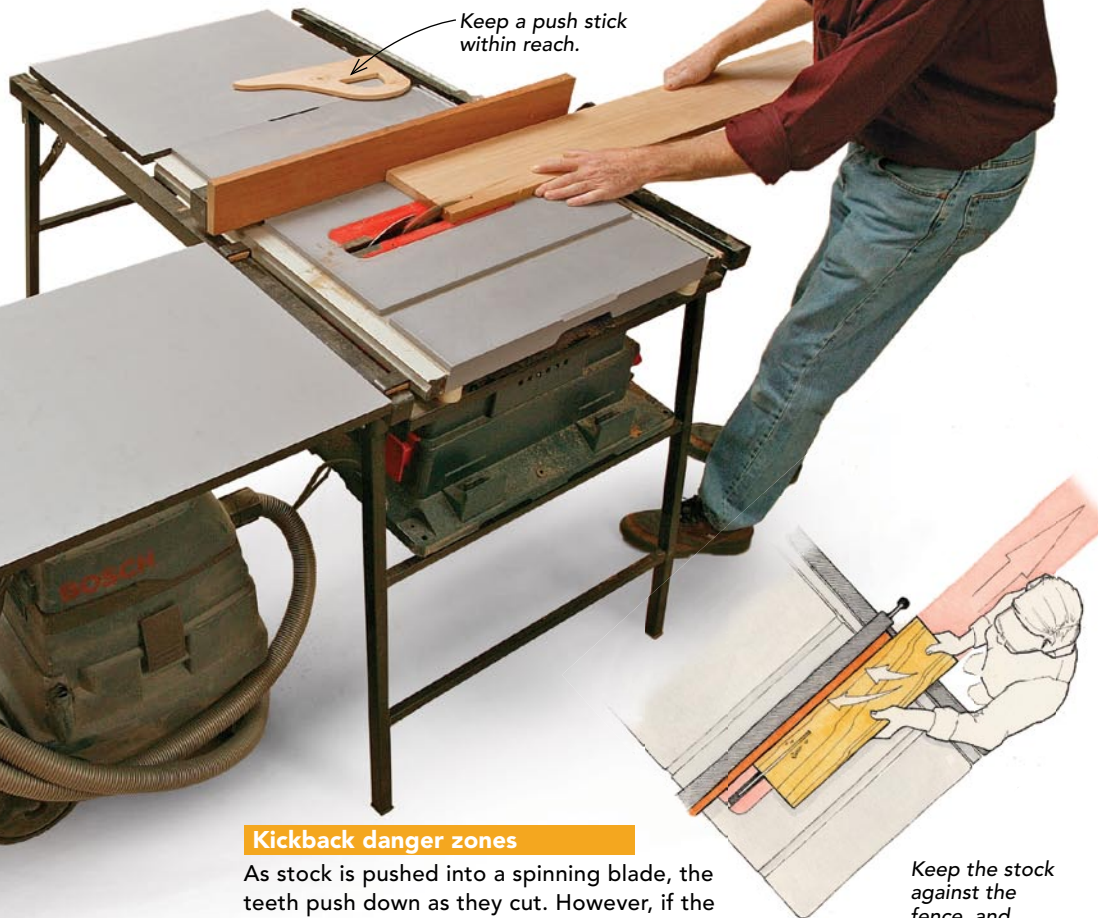
Many tablesaw accidents are caused by kickback, when the blade catches and throws the stock back into your face or pulls your hand into the blade. Some major causes? When the rip fence isn't parallel to the blade, stock being ripped can be forced against the back section of the blade (see "Kickback danger zones," below). The same pinching can happen when an uneven edge runs against the fence, or when internal stresses in the wood cause the kerf to close as a board is being cut (drawing far right). The remedy? First, make sure the fence is parallel to the blade by checking the measurements between the fence and the miter slot at the front and rear of the saw table. When ripping, make sure the board edge guided by the fence is straight. If it isn't, you can cut a straight edge using a sled as shown on p. 90. Finally, always use a splitter or a riving knife to keep the kerf open (sidebar right).



Keep the fence parallel to blade.



Use a riving knife to prevent blade-pinching.



Keep a push stick within reach.

Kickback danger zones

As stock is pushed into a spinning blade, the teeth push down as they cut. However, if the stock makes contact with the back of the blade, the force of the blade coming up out of the table can throw the stock back into the operator. Because kickback can occur at any time, always stand to the left of the area between the rip fence and the blade.

When ripping stock, always apply steady pressure against the fence.



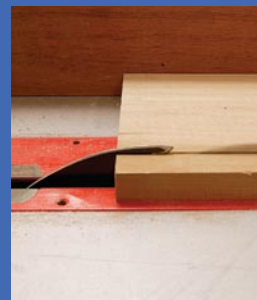
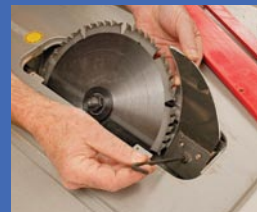
Keep the stock against the fence, and stand to the left of the blade.

A riving knife helps to eliminate kickback

A typical blade guard consists of a splitter, a blade cover, and antikickback pawls. The guards on the Porter-Cable 3812 and the Bosch 4000-07 portable tablesaws are the best I've seen because they can be removed and reinstalled quickly. Even more important, these guards are mounted on the blade-carriage assembly rather than on the saw's chassis, which allows the splitter to move up and down with the blade.

On my own saw, I converted the splitter into a riving knife. Often seen on high-quality cabinet saws, a riving knife is a smaller splitter that follows the tilt of the blade; it always follows the blade into the stock, where it keeps the kerf from pinching the blade, a major cause of kickback. A riving knife is never in the way.

To make the riving knife, I removed the blade cover and pawls from the splitter, then cut down the splitter so that when it's bolted back onto the blade carriage, it's about 1/4 in. below the height of the blade. This modification means that I can no longer use my blade cover and antikickback pawls, but for me, the protection of a riving knife that is always in place outweighs the protection of a blade cover that I invariably remove and forget (or don't bother) to reinstall.





Use the rollers behind you when cutting big panels

Horsing a full sheet of plywood onto a saw table can be strenuous at best, if not downright dangerous. I set up a roller stand behind my standing position, then pick up the sheet on edge. Setting it onto the roller, I can ease it onto the table (1), then lay it flat (2). With the back end of the sheet supported by the roller (3), I now can position the sheet against the fence and turn on the saw safely.

KEEP YOUR HANDS AWAY FROM THE BLADE

If you're using your hand to hold and press a board against the rip fence and kickback shoots the board across the room, in less than a microsecond your hand will be pressing on the spinning blade.

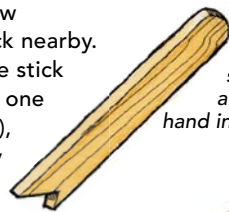
The only way to avoid this situation is never to place your hand in the danger zone (photo right). When ripping a board, keep your hand in front of the blade, use a tall push stick as the board nears the blade, and never reach over the blade to grab the waste.



Shopmade push stick

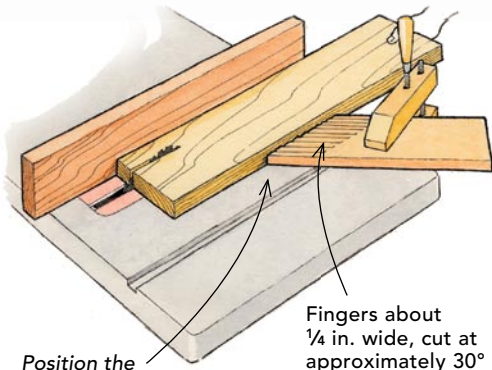


Never turn on a saw without a push stick nearby. I don't use a simple stick with a notch cut in one end (drawing right), and I never use my hammer handle or my carpenter's square. Instead, I prefer a tall, wide push stick (photo above) that extends the reach of my hand by 12 in. and exerts pressure downward, forcing the stock against the table. The handle gives good control over the stock, whether I'm cutting a 10-in.-wide board or a $\frac{3}{8}$ -in.-wide strip.



A notched stick can slip and lead your hand into the blade.

Shopmade featherboards



Position the featherboard in front of the blade.

Fingers about 1/4 in. wide, cut at approximately 30°

Shop- or factory-made, featherboards greatly reduce the chance of kickback and help to make cleaner, straighter rip cuts. No matter which type you use, position the featherboards correctly. The flexible fingers should apply light, steady pressure on the workpiece, allowing you to push it through the blade without a lot of force. A table-mounted featherboard needs to be placed in front of the blade; never position it even with the blade because it might close the kerf, causing kickback. Featherboards clamped to the fence as hold-downs (photo below) must be positioned in front of and in back of the blade. I sacrifice a thinner piece of stock as a push stick to move the stock past the featherboards.



Sacrificial push stick works with hold-downs in place.

Factory-made featherboards

Sometimes I need to rip a narrow strip from a wider board, and to keep the cut smooth, I use both featherboards and hold-downs. In this case, shopmade featherboards attached to the fence act as hold-downs, while a model from Bench Dog applies horizontal pressure that keeps the workpiece against the rip fence. Magnetic hold-downs and featherboards are available, too. Because it's so quick and easy to use, I prefer Grip-Tite, a magnetic hold-down system. A steel fence sleeve screwed onto a wooden auxiliary fence provides the attraction, so the hold-downs can be attached anywhere fore and aft of the blade. As the stock is pushed through, the hard rubber flaps and rollers hold the stock against the fence.



Bench Dog (www.benchdog.com) featherboards ride in the miter-gauge slot.



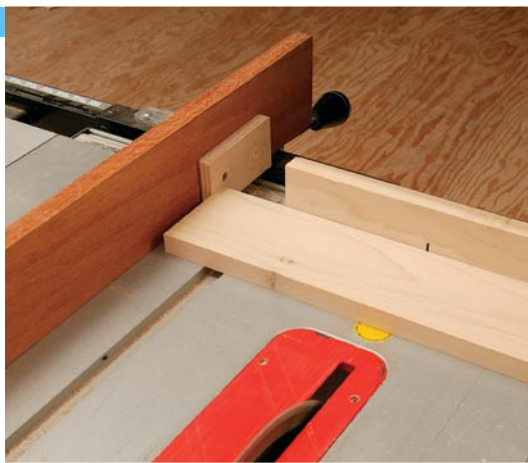
Grip-Tite (www.grip-tite.com) magnetic hold-downs stick to a steel auxiliary fence.

JIGS AND FIXTURES HELP YOU TO WORK SAFELY

With all the specialty tools available these days, it's easy to forget how much you can do with a tablesaw. Dedicated jigs allow you to perform repetitive production tasks safely and accurately; they also transform riskier operations into a risk-free routine.

Fence-registered stop block

If I have to cut multiple pieces of the same size, I can screw a small block to the auxiliary fence that acts as a gauge. (I never use the fence itself as a gauge.) I slide the stock over until it registers against the stop, then make the cut. The stop block is far enough away from the blade so that the piece isn't trapped between the block and the fence.



Crosscut sled

Outfitted with two fences, the sled's guides ride in the miter-gauge slots and make wide crosscuts accurate and safe. (See "Building Skills" on p. 108 for instructions on how to make a crosscut sled.)



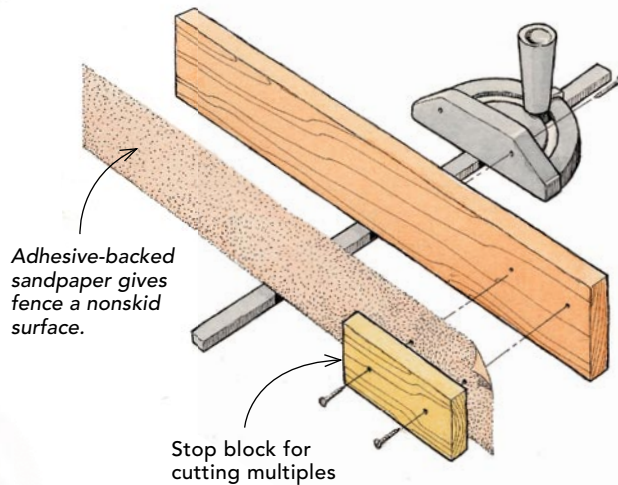
Ripping sled

Rather than run wany-edged hardwood through the jointer several times, I make a sled from a 16-in. by 96-in. piece of plywood. I screw two toggle clamps onto $\frac{3}{4}$ -in.-thick blocks, then screw the blocks to the sled so that the wany-edged board projects an inch or so beyond and as parallel as possible to the edge of the sled. After clamping down the board, I run the sled along the rip fence, cutting just enough off the board to make a clean, straight edge.



Miter-gauge fence and stop

I rarely use my miter gauge, but when I do, I always mount a wood auxiliary fence to it; the face of the miter gauge is too narrow to hold a board securely. Attaching a stop block to the wood fence gives you a foolproof way to produce identical-length parts. I use my right hand to pull offcuts away from the blade as they're cut.



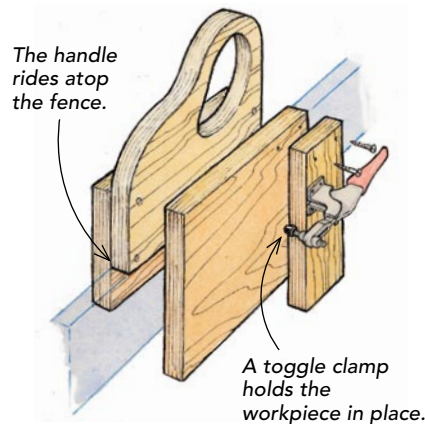
The safest saw gets smaller

It's like an airplane that won't crash or a boat that won't sink. People were skeptical when SawStop's manufacturers (www.sawstop.com) first came out with a cabinet saw whose blade, they claimed, would stop within 5 milliseconds of contact with an operator's skin (see the demonstration video on their Web site). However unlikely, the SawStop works like a charm, and I'm going to buy one for my shop as soon as I can scrape up the money. Even better news is that the company is about to introduce a contractor's saw that employs the same finger-saving technology, probably in the



Tenoning jig

Cutting tenons and chamfering the end grain on a narrow panel are dangerous jobs I frequently face. I never freehand these frightening cuts. Instead, I make a tenoning jig from scrap materials and a toggle clamp. My tenoning jig rides on the top of the wood auxiliary fence attached to the rip fence.



SawStop's contractor's saw

latter months of 2006. The 10-in. 1.5-hp model saw (photo above) will feature a cast-iron table with steel extension wings, a heavy-duty fence, and a riving knife to prevent kickback. Pricing for the basic model will be less than \$1,000, cheap at any price when you compare it to the cost of one finger, let alone a hand.