Shopmade Tablesaw Inserts

Get cleaner, safer cuts with every blade you use

BY BOB VAN DYKE

The throat-plate insert that comes with most tablesaws can give you headaches. The main problem is that the wide opening doesn't back up the fibers in the wood being cut, which leads to excessive tearout as the blade exits the wood. That big gap also allows small offcuts to fall into the opening and get jammed. And when ripping, thin strips of wood can jam in the gap and kick back very easily. The same can happen with a thin offcut.

The answer to these problems is simple: Use a zero-clearance insert, in which the opening is custom-sized to the blade, eliminating gaps. As a result, wood fibers don't tear out and there is no space to trap offcuts.

While you can buy insert blanks, they can cost a lot. A better option is to make your own. It's cheaper, and you can make one for every blade you might use (standard and thin-kerf, dadoes) and for every common angle (90°, 45°, etc.). The method I'll show you

Make a batch while you're at it. *With Van Dyke's method you can easily make a bunch of inserts at once, enough to cover your standard blade, any common angled cuts, and for the dado set sizes you use the most.*

Photos: Dillon Ryan

is fast and so easy you might as well make a dozen blanks to cover every situation. The increased safety and precision will be well worth the short time spent.

Use the stock insert as a template

For the insert material, I use plywood that is a little thinner than the actual depth of the opening, typically ½ in. thick. I prefer Baltic-birch plywood because it's more stable, stronger, and holds the threads I tap into the inserts very well. Make sure that the plywood is flat. The first insert I make is always a master blank that all subsequent inserts will be taken from.

To make the master blank, use the stock insert that came with your saw as the template. Using the tablesaw or bandsaw, cut a plywood blank about ¼ in. bigger than the insert. Take the leveling screws out of the insert, and trace its profile onto the blank. Transfer the leveling screw hole locations to the blank at the same time. Use a bandsaw to rough out the shape.

Screw the stock insert to the blank using the holes that the leveling screws were in. Use the router table and a flush-trimming bit to rout the blank flush to the insert. The stock insert has a cutout to accommodate the splitter or riving knife. Because the flush-trimming bit could jam in that cutout and kick back, I fill in the opening with a piece of pine and temporarily tape it in place.

After routing, take apart the two pieces and drill a ¾-in. finger hole into the master blank. It should fit easily into your saw's throat opening. Repeat this process using the master blank in place of the stock insert to make as many insert blanks as you need.

Level the insert flush with the table

The new insert must be flush with the top of the tablesaw. In most cases, the

ROUGH OUT THE INSERT BLANK

A simple tracing. *Use the plate that came with the saw to transfer the outline to the plywood.*

Use the original as a routing template. *After roughing out the master blank, screw the original insert to the blank. Then use a flush-trimming bit at the router table to get a perfect replica (left). A wood filler strip in the open end of the insert prevents the bit from catching. Once the master is done, screw it onto another blank to make more insert blanks (right).*

LEVEL FROM ABOVE

Threads in ply. *Predrill the adjustment holes in the insert and then use a tap to make the ¼-20 threads in the plywood.*

Get the inserts flush with the table. *Using a straight rule and Allen key, bring the plate up until it's flush against the ruler and doesn't rock on the adjusters.*

CUT THE BLADE SLOT

Make way with a dado blade. *A standard 10-in. blade won't let the insert sit flat, so use a single blade from an 8-in. dado set (above) to make a clearance slot for a standard 10-in. blade. Clamp a strip of scrapwood to the fence and position it right over the blade (right). The dado-blade kerf should go a little more than halfway through the insert (below).*

Finishing cut. *With the 10-in. blade installed and the scrap block clamped over the blade, raise the blade to its full height to create a perfect zero-clearance slot.*

½-in. plywood will be just below the top, and will need to be raised flush. For that job, I use ¼-20 Allen leveling screws. I drill and tap through-holes for those screws so that I can adjust the height quickly while the insert is in place.

Knowing where to drill is easy. Just use the holes you drilled to attach the stock insert to the plywood blank. Set up a 3⁄16-in. bit in the drill press and drill through-holes in those spots. Tap them using a standard ¼-20 machinist's tap. You may be surprised that you can thread Baltic-birch plywood, but it works great. Thread a ¼-20 by ⅜-in.-long Allen-head set screw into each hole. Remove the blade, install the new insert, and level it.

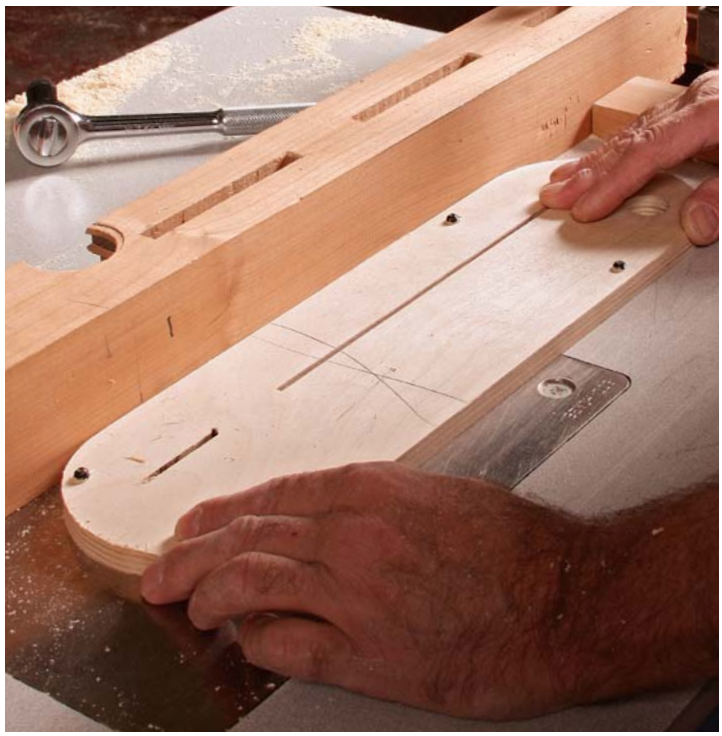
Cut the zero-clearance slot

When the insert is level, it's time to cut the blade slot. Do this by raising the spinning blade through the insert. Because a 10-in. blade doesn't fit under the insert, I use a single 8-in. dado blade first to create a clearance groove to get the slot started, then change to the 10-in. blade to finish.

Firmly clamp a piece of scrapwood to the fence and then position the fence so that the scrap is directly over where the blade will come through. This holds the insert down as you raise the blade to full height. It also backs up the cut and minimizes tearout.

Cut the slot for the riving knife or splitter— For the standard blade insert, you'll need to cut

Drawings: Michael Pekovich



Extend the slot. *With a fence and a ⅛-in. spiral bit, extend the kerf from the blade toward the back of the insert to allow the use of a riving knife or splitter. Use the blade kerf to set up the fence and use a stop block to safely start the plunge cut.*

a slot to receive the splitter or riving knife. After marking where it starts and stops, I cut this slot with a ⅛-in. spiral router bit using a router table with a stop attached to the fence.

Saws that require special inserts

Some saws use a thin insert. For these, make the standard ½-in.-thick insert in the same way as above, including drilling the holes for the Allen screws. When you put the insert in place, it will project above the saw table. Measure the amount of projection, add 1/16 in. to that measurement, then use a router table to cut a rabbet to that depth along the bottom edge of the insert. A ¾-in. rabbet is usually sufficient to clear the adjustment tabs on most saws. The leveling screws will let you raise the insert flush with the saw table.

SawStop brand saws also require a bit more work to be done to the basic insert to clear the arbor washer, a part of the cast-iron trunnion, and the dust-collection shroud. I mapped out the required cuts and holes, so you don't have to (see drawing, right).

Try making inserts for your saw. Not only will you get cleaner, safer cuts, but you can also see exactly where the blade is cutting—that slot in the insert tells you everything. □

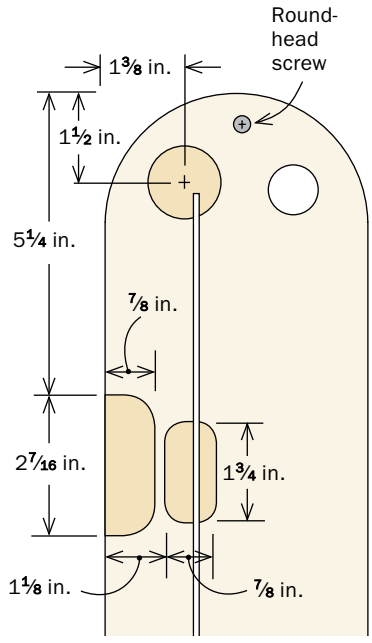
Bob Van Dyke is the founder and director of the Connecticut Valley School of Woodworking.

TIP Adding a splitter

If your saw doesn't have a splitter or riving knife, you can add a shopmade splitter by routing out behind the blade and gluing in a piece of ⅛-in. plywood. Van Dyke installs an oversize splitter so that when the blade is raised, it will cut the splitter to perfectly match the blade.

INSERTS FOR SAWSTOP SAWS

The insert for the SawStop is no different than for any other saw, except for a few clearance cutouts on the underside that allow the blade to raise up fully (below). Use a Forstner bit or router bit to waste away the wood that is in the way. The drawing below serves as a map. To prevent the insert from tipping, install a short round-head screw in the bottom at the front (bottom). It bears against a cast-iron ledge and when properly adjusted prevents downward deflection.



Recesses are ¼ in. deep.