Use test cuts for accurate machine setups

BY DAVID HYATT

Building furniture or other projects with strong, square-fitting joints requires woodworking machines that are set up to make accurate 90° cuts. Checking with an accurate square might seem like all that's needed, but it's really just a starting place.

A square won't register some factors such as variations in the flatness of a tabletop. Some squares aren't as square as they should be. And, using a square alone, very small errors can be hard to see. The following test cuts can finish the job that the square started, making errors more visible by multiplying them.

Tablesaw: Square the blade and miter gauge

1 ***Start with a square.*** *An accurate square can help set the sawblade at a 90° angle, but this is only the start of a precise setup. Very small errors can be hard to see with a square alone.*

2 ***A test cut is more revealing.*** *Use two pieces of lumber or medium-density fiberboard (MDF). Stand the pieces on edge and cut them in the same pass.*

3 ***The moment of truth.*** *Butt the two cut ends together. Any error will reveal itself as a tapered gap between the two ends.*

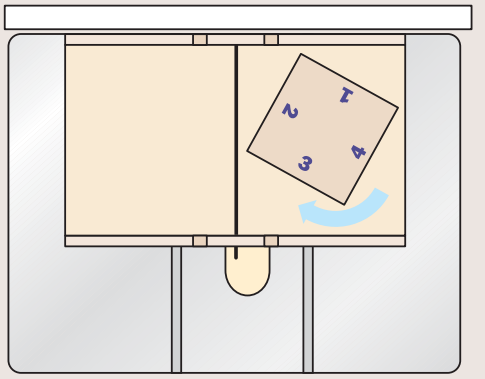
4 ***A similar test for crosscuts.*** *Lay the boards flat to check the 90° stop on the miter gauge.*

A very reliable way to check a tablesaw blade for an accurate 90° angle is to cut two test strips and then check the squareness of the cut by placing them end to end.

Raise the blade to maximum height. Use two strips of sheet goods (I prefer ½-in.-thick melamine) that are slightly narrower than the height of the blade and 18 in. to 20 in. long. Hold the two strips together on edge and trim one end of them using a miter gauge. Open the two strips in a book-match (like opening a book) and place them on a known flat surface. Any deviation from 90° will show up as a tapered gap between the ends as they touch. Once the blade has been adjusted to 90°, the 90° stop can be set and locked in place. Lay the same two strips flat, trim, and mate the ends again to check the 90° stop on the miter gauge. If the miter gauge is set at exactly 90°, there will be no gap between the ends of the test strips as they meet.

Photos: Mark Schofield

Tablesaw: Square your crosscut sled



1 *Make a test piece.* *Number the edges on a square of MDF. With edge 1 against the sled fence, trim each side in turn, rotating the piece clockwise between cuts.*

2 *Make five cuts in all.* *Finish the sequence by taking a second, wider strip from edge 2.*

Larger pieces such as panels are usually crosscut on the tablesaw with a shopmade crosscut sled. The accuracy of these cuts can be checked with a large square, but a better and more accurate method is to use the "five-sided" test cut.

Begin with a piece of sheet goods that is roughly 18 in. to 24 in. square. Number the edges 1 to 4, going counterclockwise. Place edge 1 against the fence of the sled and trim edge 2. Then place edge 2 against the fence and trim edge 3. Continue around until you have trimmed edge 1. Then place edge 1 against the fence and trim a ½-in. strip from edge 2. Label one end of the strip "A" and the other end "B." Snap the strip in half and place A and B side by side on a flat surface. If the sled is set square to the blade, then the strip will be exactly the same thickness at A and B. Even very small deviations from 90° will show up using this method.

If the sled does not produce 90° cuts, then you should adjust the fence on the sled until it cuts accurately.

3 *Mark the ends of the strip.* *This identifies the front and back of the final cut. Make corresponding marks on the MDF square for future reference. Snap the final strip in two, lay the pieces on their sides, and compare the thickness of the two ends. Any variation means the crosscut sled's fence needs adjustment.*

Drawings: Rodney Diaz

Tablesaw: Set up for accurate miters

1 ***Make a series of cuts.*** *Cut 45° miters at both ends of four pieces of stock, just as you would for a picture frame.*

A similar set of tests can help verify the accuracy of the 45° miter-cutting setups on a tablesaw.

Cut a 45° miter at both ends of four test pieces of equal length. Tape the four pieces together to form a picture frame. Any deviation from 45° will be apparent, as the last corner will not fit together tightly. Adjust your setup, and recut the four test strips until they form a frame with no gaps at the corners.

For standing miters, cut with the blade set at a 45° angle. For flat miters, cut with the blade set at 90° and the miter gauge set at 45°.

2 ***Tape the corners.*** *This helps hold the pieces in place as you assemble the frame.*

3 ***Look for the gap.*** *If the final corner doesn't fit snugly, it means the miter gauge isn't set at precisely 45° to the blade.*

Jointer: Check the fence

Prepare test pieces. *Joint the face and edge of two pieces of stock, checking them on a flat surface. Place the jointed edges down and jointed faces together. A gap shows adjustment is needed.*

The fence on a jointer also can be set to 90° by using test cuts.

Take two 16-in. to 18-in. lengths of 8/4 stock and joint a face and then an edge of each piece. Set the two pieces on a flat surface with the jointed edges down and the jointed faces together. If the jointer fence is not set at 90°, then a tapered gap will be visible between the two faces. Another check can be made by clamping the two pieces with the jointed edges together. Place a straightedge across the two jointed faces. If the jointer fence is not at 90°, then the straightedge will rock when placed across the jointed faces or it will show a gap where the two pieces touch.

These methods will work only if the jointer is producing a smooth cut. If the jointer blades have been nicked and are leaving small ridges, the test pieces will not sit flat. You might solve this problem by moving one jointer blade slightly to one side.