

Most haven't changed much in a generation, but a few are breaking new ground for safety and convenience

ROLAND JOHNSON

# Finally, safer saws

Three saws relatively new to the market-Laguna TS-10, Powermatic PM2000, and SawStop 31230 -have put safety on the front burner. That's not a bad idea when you consider that in 2001, the tablesaw was the source of 38,000 visits to U.S. hospital emergency rooms, according to the **Consumer Product** Safety Commission.



Riving knife reduces the chance of kickback. A riving knife, found on the Laguna TS-10, Powermatic PM2000, and SawStop 31230, helps prevent the workpiece from pivoting onto the rear of the sawblade during a cut.



enerally speaking, 10-in. cabinet saws have much in common. But, given a closer look, notable differences begin to show. A few saws offer improved safety features; for example, three now have riving knives, a big improvement over traditional splitters. Some manufacturers are improving convenience, with features such as easy-access switches and one built-in mobile base. In addition, there are big price differences, from a low of about \$975 to a high of almost \$3,300.

To find out if any of the saws stand out from the bunch, I looked at 13 popular models side by side in the *Fine Woodworking* shop. For testing consistency, I reviewed left-tilt models. The Laguna was an exception, because it is available only as a right-tilt model. All of the saws are 3-hp, 220v models.

### Safety is getting its due

A 10-in. tablesaw spins sharp, hard teeth at around 120 miles per hour. Used properly, it can make all sorts of useful cuts safely. Used improperly, it can cut through skin and bone in an instant or shoot a cutoff at you like it was fired from a cannon. So it was encouraging to see safety getting its due on some machines.

**SawStop senses skin, stops blade instantly**—The SawStop saw features a remarkable safety device, a brake that stops a spinning blade within 3 to 5 milliseconds when the blade touches skin. At the same time, the entire arbor and blade drop below the tabletop to further reduce the risk of injury. The brake works so quickly that an errant finger pushed into the blade would end up with only a shallow nick rather than a deep cut or an amputation.

When the safety device fires, it ruins the brake and the blade. A replacement brake cartridge costs about \$80. But the cost of a cartridge and blade is a whole lot less than that of a hand surgeon and hospital stay. Or, even worse, the loss of a finger.

**A riving knife is important**—Talking to people who have had tablesaw injuries, I've learned that most of them were hurt by kickback, not body contact with a spinning blade. Kickback generally



**SawStop blade brake.** This ingenious device on the SawStop stops a spinning sawblade the instant the blade is touched. Instead of a trip to the hospital, the user ends up with only a shallow cut.



**Kneeable switch.** In an emergency, the jumbo-size switch on the Powermatic PM2000 can be easily reached with a knee. The green-glowing center lets you know that the saw is powered up.

**Tabletop flatness.** To make sure the tabletops were acceptably flat, Johnson used a testing-quality straightedge and feeler gauges to check them.

Fence deflection. With the rip fences locked, Johnson applied force to the end of the fences and measured deflection.

## Measuring up close

Johnson used a collection of measuring tools to check the accuracy of tabletops, miter slots, arbors, and fences.



Blade/miter slot parallelism. A 10-in.dia. flat plate and dial indicator were used to find out if the sawblade is parallel to the mitergauge slot when the blade is at 90° (shown) and 45°. Misalignment can be corrected.



**Arbor runout.** An arbor that wobbles will cause vibration and rougher cuts, so Johnson looked under the hood to check each one.

occurs when the workpiece makes contact with the teeth at the back of the blade—the ones just coming up from under the table. Under certain conditions, those back teeth can grab the workpiece and fire it back at the operator's body at high velocity.

The riving knife is one of the best tablesaw safety features, because it greatly reduces the likelihood of kickback. Unlike the splitter found with most blade-guard systems, a riving knife is curved for close location to the blade's teeth and remains in close proximity throughout the blade's range of travel. With a riving knife, the workpiece is much less likely to bind on the back of the blade or to make solid contact with the rear teeth. A short riving knife (no taller than the blade), allows the saw to be used for blind cuts such as rabbeting or grooving with the knife in place. The manufacturers of the Laguna TS-10, Powermatic PM2000, and SawStop saws deserve kudos for including riving knife/blade guard assemblies. A short riving knife is included with the SawStop and is optional with the PM2000.

Still, riving knives must be removed for some operations, so they should go on and off easily. Powermatic and SawStop use locking handles to secure the knife. It took seconds to reach through the throat-plate opening, rotate the handle, and free the knife. Laguna relies on a socket-head screw, so it wasn't quite as quick and easy.

**Better blade guards**—A blade guard is important because it provides a physical barrier between your fingers and the blade. The Laguna, Powermatic PM2000, and SawStop have guards that are well-designed because they work with riving knives and can

MODEL	BLADE-MITER SLOT PARALLELISM AT 90°/45°	ARBOR-FLANGE Runout	FENCE Deflection
BRIDGEWOOD BW10LTS	0.002 in. / 0.010 in.	0.0005 in.	0.008 in.
DELTA 36-L31X	0.002 in. / 0.015 in.	0.0030 in.	0.004 in.
GENERAL 650-T50 M2	0.003 in. / 0.003 in.	0.0005 in.	0.011 in.
GENERAL INTL. 50-260 M1	0.002 in. /0.008 in.	0.0005 in.	0.008 in.
GRIZZLY G1023SL	0.011 in. / 0.017 in.	0.0010 in.	0.003 in.
JET JTAS-10XL	0.001 in. / 0.001 in.	0.0005 in.	0.004 in.
LAGUNA TS-10	0.000 in. / 0.000 in.	0.0003 in.	0.006 in.
POWERMATIC 66	0.025 in. / 0.025 in.	0.0010 in.	0.006 in.
POWERMATIC PM2000	0.001 in. / 0.009 in.	0.0005 in.	0.006 in.
OLIVER 4015	0.009 in. / 0.013 in.	0.0005 in.	0.003 in.
SAWSTOP 31230	0.001 in. / 0.009 in.	0.0005 in.	0.002 in.
SHOP FOX W1677	0.014 in. / 0.016 in.	0.0010 in.	0.003 in.
W00DTEK 130-364	0.002 in. / 0.015 in.	0.0005 in.	0.011 in.

be removed relatively quickly. The other saws require that you remove a few bolts with a wrench before the guard will come out.

**Switches should be easy to shut off**—All of these saws have large, easy-to-reach switches. But occasionally I want to shut off the saw and must hold onto the workpiece with both hands. That's when it's helpful (and safer) to have a button I can hit with my knee. All these saws, except for the Jet, Woodtek, and Powermatic 66, can be shut off with a well-aimed knee. The Powermatic PM2000 and SawStop switches were especially easy to reach.

### Testing flatness, alignment, and runout

A number of factors affect the quality of a tablesaw. A few can be measured with the right tools. In particular, it's relatively easy to check a saw for tabletop flatness, whether the blade is parallel to the miter slot, and runout at the arbor shaft and arbor flange. A misaligned slot can be corrected by readjusting the table, but the other areas are difficult to address.

All the tabletops measured satisfactorily flat. When it comes to blade/miter-slot parallelism, I'd adjust the alignment on any saw that's out of parallel by 0.005 in. or more at either the 90° or 45° blade settings. Adjustment entails shifting or shimming the table a bit (for my guide to tuning up a saw, see "Tablesaw Tune-up," *FWW* #179, pp. 46-53). For arbor-flange runout and arbor-shaft runout, the numbers should be no more than 0.001 in. and 0.002 in. The Delta was the only saw that came up short on arbor-flange (0.003 in.) and arbor-shaft runout (0.005 in.).

All of these saws have Biesemeyer-style fences, which are sturdy and slide across the table with relative ease. The locking mechanisms worked effectively. Most of the fences needed routine tweaking to get them parallel to the blade.

I was curious to see if the fences, once locked, deflected when I applied force to the back end. After all, when ripping, especially large and heavy stock, the fence must withstand a certain amount of sideways force. I applied 6 lb. of sideways force to the back edge of each fence, then I measured the deflection. All of the fences proved sturdy, with the SawStop showing the best result.

### Plenty of power, across the board

Extra power is one of the main reasons to consider moving up to a cabinet saw. Granted, a contractor's saw with a sharp blade can rip 1¾-in.-thick oak—if you cut slowly. But a cabinet saw with a 3-hp motor lets you cut the same board at a much brisker pace.

To get a sense of how well a 3-hp motor can cut, I made ripping cuts using 6/4 hard maple and 6/4 white oak. To eliminate blade quality as a variable, I purchased three new, identical sawblades for the test to make sure that a sharp blade was always in play.

These machines had no trouble ripping the thick hardwood. They have plenty of power for just about any furniture-making cut.

### **Choosing favorites**

Anyone looking to upgrade from a contractor's saw won't be disappointed with any of these big boys. All of them offer more

## 10-in. cabinet saws







#### **BRIDGEWOOD BW10LTS**

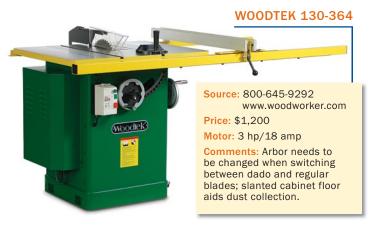


#### **GENERAL INTERNATIONAL 50-260 M1**



#### **OLIVER 4015**

















power, solid rip fences, and smoother controls. That said, the Laguna, Powermatic PM2000, and SawStop had extra appeal. Not surprisingly, they cost more. All have well-designed blade covers and riving knives for greatly improved safety and convenience.

The Laguna is the heaviest of the lot, tipping the scales at almost 1,000 lb. It has the third biggest tabletop (wings included) and it did above average in the measurement tests. However, its riving knife was fussier to remove and replace than the other two. A left-tilt model of the saw is not available.

In the end, two saws—the Powermatic PM2000 and the Saw-Stop—stood alone at the top. As a result, I selected them both as best overall. The PM2000 saw had good scores in the blade parallelism and arbor-flange runout tests. Also, it has a riving knife, an easy-to-reach switch, and a good insert. The tabletop is

the second largest in the test group. In addition, it's the only saw that includes retractable casters in the base, making it surprising easy to roll around the shop.

The SawStop scored well in the blade parallelism, arbor flange, and fence deflection tests. It has a riving knife, a convenient switch, and a good insert. No other blade guard was as easy to remove and replace. Its tabletop is the largest. Plus, it includes the revolutionary blade brake.

If your budget is tight, consider the Grizzly G1023SL saw. It is solid and accurate, and does everything a 3-hp, 10-in. cabinet saw is supposed to do, but at a bargain-basement price. It is my choice as the best value among all the saws.

Roland Johnson is a contributing editor.

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