A methodical approach and a few accessories make the task easier

By Thomas Clark

Thanks to a variety of new accessories, tuning up a tired table saw has become a job easily within the realm of small shop woodworkers and weekend warriors. The accessories not only make the job easier, but provide greater accuracy than traditional seat-of-the-pants methods often used. By providing the tools that allow woodworkers to return many older saws to a factory level of accuracy, the new accessories also help encourage more regular maintenance and longer tool life.

Newer saws, however, shouldn’t require all the operations of this tune-up. The accessories can be used to fine-tune the rip fence and miter gauge on new saws. But the crucial “under-the-hood” alignment of the saw trunnion shouldn’t need to be changed on a new saw.

The trunnion adjustment is crucial to table saw alignment because it lines up the saw blade parallel with the miter gauge slot. If that alignment is off, the rear of the saw blade will graze the sides of the kerf. This, of course, makes it difficult to get a perfectly square cut, and increases the likelihood of a kickback.

These accessories are specifically designed to tune up virtually any table saw with an accuracy to within a thousandth of an inch. One type is based on the dial indicator, a machinist’s tool that measures dimension changes in 0.001” intervals. The intervals are measured with a pointer and dial system that magnifies change enough to easily hold very precise measurements. Another accessory provides extremely accurate reference surfaces for those measurements. Used alone or in combination, they take the fear out of disassembling a table saw.

These tune-up accessories can be used for a thorough disassembly and tune-up and for regular fine-tuning. If your saw is fairly new, you may want to do the disassembly and cleaning and move on to the fine-tuning section on the other side. The saw used for illustration is a 20-year-old Rockwell Contractor’s Saw. But the method is very similar for most popular contractor’s and cabinet saws.

Before you start

The use of the accessories is only part of the job when tearing down and tuning up a table saw. The other key ingredient is the basic approach used for taking machinery apart and successfully putting it back together. But most woodworkers are largely familiar with the drill here: having had to tackle various similar chores to keep their equipment running.

In a word, it’s neatness. By maintaining a neat and methodical approach, and carefully keeping all the parts together in their respective groups (see photo on the other side), it’s possible to tear down your saw and reassemble them in reverse order. Again, it helps to be methodical. When you remove a series of bolts, for example, don’t leave the washers and nuts in a pile. Instead, put them back on the bolts in the proper order right away, with the nuts on last to hold them in place.

The main reason for the schematic is to identify and order replacement parts. But even there, the parts you’re most likely to need are the nuts and bolts you mangle during disassembly and most of those are available at any good hardware store.

The tune-up procedure can be broken down into two primary operations: disassemble and cleaning - followed by reassemble and alignment of the saw blade parallel to the miter-gauge slot. There are other adjustments along the way, of course, but those operations are the key to a well-tuned saw.

What you’ll need

Part of the tune-up process involves making a few things, such as fresh table inserts and a miter-gauge extension fence. You may want to make up those items ahead of time, before you take the saw apart and temporarily lose its services. That way, you’ll be able to install and use the new pieces as you complete the tune-up procedure.

Table inserts are easily made by using the existing insert as a template for the replacement. Scrap pieces of plastic laminate and 1/4” plywood provide the material.

First, cut and fit the plywood, and then apply and trim the laminate to both sides. Use small flat head screws as levelers. Making up two inserts at a time is a good idea. That way you can always have a zero-clearance insert for use with a specific saw blade. Cutting thin strips is much safer when the pieces can’t get sucked down into a wide gap around the saw blade.

For the miter gauge fence, it’s best to use medium density fiberboard, 3/4”-thick plywood or straight-grained hardwood. Everybody has their own preference for a suitable size but a good compromise seems to be about 4” high and wide. A fresh miter gauge fence also promotes safety by sweeping cutoffs scrap past the saw blade.

While you’re making these up, you may also want to fabricate a new wood face for your saw’s rip fence. Not everybody uses these, but they allow you to sink a dado blade into the rip fence for rabbeting cuts along the edge of a board. Again, use clean, straight stock.

The tools you’ll need fall into two groups: wrenches and other basic tools and the tuning accessories. You’ll need a set of wrenches, plus a couple of extensions. Some of the nuts and bolts will be in tight spots that are inaccessible with only a wrench or box end or open end.

Adjustable wrench is handy, of course, as well as a pair of pliers. You’ll also need a set of Allen wrenches and a small drift for knocking out pins. (You can often use a small bolt or nail as a makeshift drift for driving out pins.) For the tune-up illustrated here, we used a set of reference bars that bolt onto the saw arbor in place of the saw blade. The pair of bars, made from machined aluminum, essentially extend the plane of the saw blade into a long straightedge just above the table top. The manufacturer, Exact Cuts Tool Co., makes the system specifically for tuning up table saws and radial arm saws.

The tune-up procedure uses these machined bars in conjunction with a dial indicator assembly specifically designed for tuning up table saws. The specially designed tool, the TS-Aligner, simplifies the job - but a dial indicator with a magnetic base can also be used.

Disassembly and cleaning

There’s not much of a mystery to the process. The parts...
Precise adjustment of the table saw rip fence using the dial indicator.

have to come off at a time and be kept neatly in order. It helps to have a bench top within reach so you can set parts down as you work. It’s helpful to have some means to give the saw a preliminary cleaning with a shop vacuum before disassembly. Make sure you unplug the saw and remove the saw blade before you start. The nice part is that there aren’t many parts, so it’s easy to keep track of everything.

For the contractor’s saw, the guard and the motor come off first. Since there’s no bolt tension adjustment, the motor can simply be lifted to disengage and remove the belt.

Next, you’ll loosen two sets of bolts: four that hold the cast iron top to the saw cabinet and four that hold the trunnion assembly to the underside of the cast iron table. (Note, however, that most cabinet saws mount the trunnion assembly directly to the saw cabinet.)

You’ll want to tilt the saw arbor to ease access to the rear bolts. Loosen them to finger-tight, but don’t remove them yet. Also remove the hand wheels and drive belt. (Your best) and use the gauge block to set those stops.

When you get the setting as close as possible, adjust the set screw at the back of the saw arbor. The square held in a 45-degree position will tell you, for example, that a surface is no more than 0.0005” off. (See Woodshop Tips in the February issue for a tip on reducing backlash.)

The parts under the hood of a contractor’s saw are relatively few. The trunnion-assembly at the rear is the guts of the machine. The assembly has a few cast-iron components and two worm gears controlled by the hand wheels at the front and side of the saw and belt cover, the pulleys, the rip fence rails and the splitter/guard assembly. Note that there are aftermarket pulleys and belts available that make contractor’s saws run more smoothly by cutting down on vibration.

Align saw blade

This operation lines up the saw blade so it’s perfectly parallel to the miter-gauge slot.

This sets up the crucial reference that all other saw adjustments depend on. But rather than use the saw blade, with its possible warp, to complicate matters, we’ve bolted on a set of reference bars. These machined bars make the job easier by providing a long straightedge attached to the saw arbor.

First, the trunnion assembly needs to be loosened so it can be adjusted. Pick one bolt to serve as a pivot point, and keep it firmly snug. The pivot bolt should be one of the two in the front of the saw. Then loosen the other three to finger-tight or a little more. The idea is to allow the

and belt cover, the pulleys, the rip fence rails and the splitter/guard assembly. Note that there are aftermarket pulleys and belts available that make contractor’s saws run more smoothly by cutting down on vibration.

The actual adjustment is made by lightly tapping the cast iron trunnion at the back of the saw, using a wood block for a cushion. When you get a reading within a thousandth of an inch, tighten down the bolts. Do this incrementally, going from one bolt to the next one diagonally across from it. Do this several times, increasing torque slowly until the bolts are locked down.

This final tightening can throw off your measurement, which is probably the biggest reason for using such sensitive measuring tools for the job.

Without a dial indicator, for example, it’s very difficult to tell what’s happening as you tighten those bolts. You won’t know until you think you’re done and do a test cut to see if it’s aligned properly. But with a dial indicator, you can watch the dial as you tighten the bolts and adjust the order of tightening as needed. It can make a huge difference in your frustration index.

As an alternative to tapping the rear trunnion for adjustment, you can install a retrofit system that provides a mechanism for precisely moving the trunnion. In-Line Industries sells a Precision Alignment and Locking System for contractors’ saws. A set of L-brackets with adjustment screws mounts at the rear of the saw and allows very fine adjustment using an Allen wrench.

After setting the alignment, mount the saw blade (your best) and use the gauge to test runout on the saw arbor. Turn the saw blade slowly, with the point of the dial indicator toward the outside of the blade. The runout should be several thousandths of an inch. If it’s more than 0.015” you may have excessive runout.

Try the test with a new blade to be sure the bearings. If the saw bearings do need replacement, the saw manufacturer or a machine shop can handle the job. (Delta specifies a 0.0005” tolerance for runout on the outside of the arbor flange.) You may also want to snug-up the back-lash adjustment for the blade-tilt mechanism. Many saws use a locknut setup for this. But the systems do vary a lot, so you may need to study the saw and manual.

Blade-tilt adjustment

Most people just use the blade-tilt indicators and stops built into the saw as a rough guide. The final adjustment is normally done with a square because the stop systems can have some built-in play. But it’s nice to have that starting point set as close as possible to perfect. You can use the dial indicator or an accurate square with the alignment bars set vertically. The built-in adjustment points allow you to fine-tune the setting of the fence. The contractors saw fence in the photo uses bolts on the top. Other fences use a variety of methods, such as set screws, to fine-tune the adjustment.

Aligning rip fence

The rip fence is checked and adjusted by turning the dial indicator to face the other way (see top left photo on this page). Readings can be done at several spots to check front and back alignment as well as any possible deflection. The built-in adjustment points allow you to fine-tune the setting of the fence. The contractors saw fence in the photo uses bolts on the top. Other fences use a variety of methods, such as set screws, to fine-tune the adjustment.

Adjusting miter gauge

Miter gauge adjustment with a dial indicator may very well be overkill. But as long as the tool is out, you may as well set the stops for 90 and 45 degrees. A quality square is used to ensure that you’re not just incorporating a tooling error into your setting. Ed Bennett, who manufactures the TS-AAligner, recommends a tool-room quality square, and supplies one as an optional accessory with the Aligner. The method is much the same as aligning the saw trunnion. The square held tightly against the miter gauge will create a straightedge surface parallel with the rip fence.

Take readings at the front and back of the square, adjusting so the difference is within a thousandth of an inch (see photo on the other side). When you get your reading, loosen and adjust the set screw in the miter gauge that controls the stop. Do the same thing with an accurate 45-degree block to set those stops.