



9-Step Table Saw Tune-Up

In one afternoon you can tune up your table saw for peak performance and precision results.

Like most things with moving parts, a table saw requires periodic maintenance and upkeep to keep it running at peak performance. Unfortunately, it's all too easy to put off a tune-up to the point where your cuts aren't accurate or the controls become stiff and stubborn to adjust.

But there is an upside. Keeping your table saw clean, well-adjusted, and lubricated doesn't take all that much effort, time, or a lot of specialized tools. As a matter of fact, you really don't need much more than what you see in the photo above. In a short afternoon, you can have your table saw running great, with smooth and precise cuts to show for your efforts.

1. Start with a Good Scrub

One of the most important things you can do to keep your table saw in top shape is a simple cleaning once a month. If sawdust, pitch, and resin are allowed to build up inside the cabinet, it won't be too long before worm gears are gummed up and cranks become difficult to operate. This can be a constant source of frustration any time you try to adjust the saw blade.

To start the process, the first thing to do is unplug your saw and then use an air compressor to blow off sawdust

► **Keep It Clean.** Common shop solvents are all you'll need to clean off the caked-on pitch and resin that builds up inside a table saw.



trapped around the trunnion area, below the table top, and inside the cabinet. Then once that's complete, you can go right to work on the trunnion with a toothbrush and solvent to scrub away the pitch and resin build-up (photo at right).

Just about any shop solvent will work here (see bottom of preceding page). Just be sure to avoid lacquer



thinner which can strip the paint off the metal. And keep the solvent away from any bearings. The solvent can penetrate the bearings and dissolve the lubricants inside, shortening the life of the bearings.

If you're working a really stubborn area, you may find it necessary to use a brush to saturate the area with solvent and then let it set for a while (left photo). And if the build-up is really difficult to remove, you can try to break it free with a brass or wire brush.

With the inside of the saw all cleaned up, this is a good time to add some lubrication. I like to use a dry lubricant like the spray version shown in the main photo. It's less likely to attract dust and chips.

At this point, you can turn your attention to the top of the table saw. Although it's not likely to be caked with pitch and resin, it can have a different kind of build-up — rust.

◀ **Sweep Up.** Use a bristle brush to soak pitch and resin build-up with solvent and help loosen it up.



The most effective way to deal with this is to use a fine grit (400 - 600) sandpaper or abrasive pads. I like to use mineral spirits as a lubricant and “wet sand” any area with rust on it.

Once all the rust is removed, apply a coat of paste wax to the top of the table. And while you're at it, it doesn't hurt to wax the fence rails, and fence face. You'll notice the difference when adjusting the position of the fence or sliding a workpiece along its face.

▲ **Brush It Away.** Heat the handle of a toothbrush and bend it an angle to get at hard to reach areas.

2. Adjust Blade Raising & Tilt Mechanisms

A couple of the most important parts of the table saw are the mechanisms that allow you to adjust the height or angle of the blade.

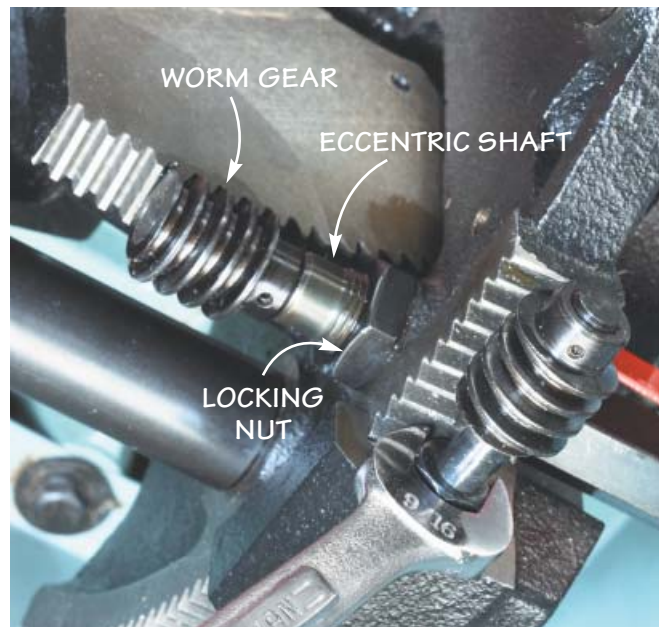
Have you noticed that the crank turns a little bit (or maybe a lot) before the blade starts to raise? Or the angle of cut changes slightly after a few cuts? This extra “freeplay” is commonly called backlash and it's something you'll want to take care of to improve the accuracy of the cuts you make.

The nice thing is, most contractor and cabinet saws have a means to adjust the mechanisms and remove the backlash. It's best to check your owner's manual to verify the correct procedure for your saw. But in most cases, this requires a little “tweaking” of the fit between the worm gears and cogged “wheels” inside the saw. You can see what this looks like in the photo at right.

In many saws, the worm gear is mounted slightly off-center on the end of a shaft that runs through a sleeve. This allows you to loosen the locking nuts on the sleeve and adjust the position of the worm gear and fit the cogged wheels more tightly.

Once that's complete, it's just a matter of retightening the locking nuts to hold the sleeve in place. Then be sure to double-check any adjustments by running the blade height and tilt mechanisms through their full range of motion to check for any backlash. You shouldn't feel any looseness anywhere in that range.

As you adjust each of the mechanisms, you'll want to be sure you don't make things too tight. If the gears are too tight, it will be hard to adjust the blade. Plus, you'll put extra wear and tear on your saw — and that will just cause more problems down the road.



▲ **Backlash.** You can take out the backlash in the blade raising and tilting mechanisms by simply adjusting the worm gears inside the saw.

3. Checking for Runout

There are a number of things that play into how smooth a table saw runs. But if the arbor, flange, and blade exhibit any “wobble,” or runout, due to misalignment or looseness, all the tuning in the world won’t make a lot of difference.

You can do a “rough” check of the arbor by pulling up and down on the shaft, and then moving it in and out. You shouldn’t feel any play. And rotating the shaft by hand should be smooth and quiet.

For a more accurate check of the arbor, you can use a dial indicator and a shop-made holder, like you see in the upper photo at right. The holder is nothing more than a couple pieces of hardwood held together with a carriage bolt and knob. A hole and bolt at the end of the assembly allow you to

position the dial indicator exactly where you need it.

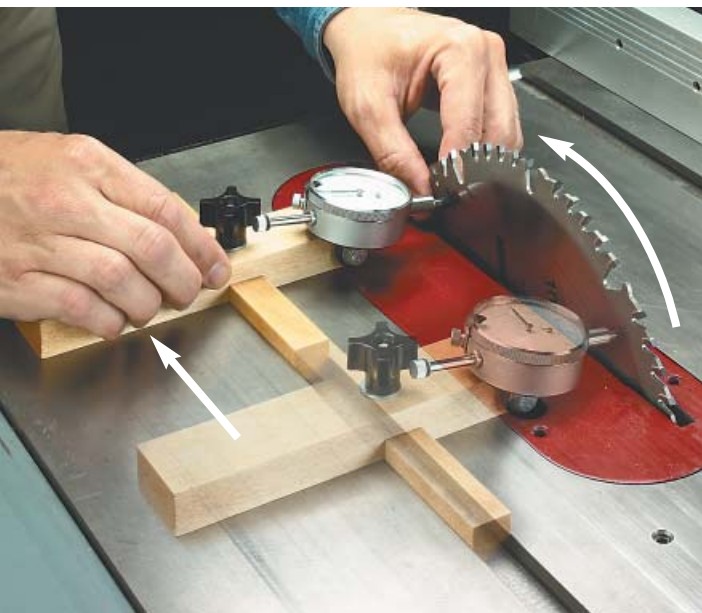
With the indicator resting on the arbor, rotate the shaft (upper photo). Any runout will show up as movement on the indicator. In a similar manner, you can position the indicator to check the flange (lower photo).

So what’s too much runout? Since any runout here will translate into even more at the blade, it can affect the quality of the cut. So I don’t like to see anything over 0.001" on the arbor or 0.003" on the flange. Anything more could be a sign of a bent arbor or bad bearings — something you can’t take care of with a simple tune-up.

If you want to minimize any blade runout you do have, be sure to check out a couple of the after-market accessories shown on page 6.



▲ **Read the Runout.** A dial indicator is an accurate method for checking the runout of the table saw arbor (top) or flange (bottom).



No matter how well your saw checks out for runout, it still won’t make a smooth cut if the saw blade isn’t aligned parallel to the miter gauge slots.

To check this, start by marking an ‘X’ on the saw blade. Next, position the dial indicator so the tip of the spring-loaded shaft contacts the blade on the ‘X,’ as in the photo above.

After “zeroing out” the dial indi-

4. Blade & Miter Slot Alignment

cator, rotate the saw blade and slide the gauge back so the plunger contacts the blade at the ‘X’ once again. Note: Rotating the blade ensures that any small runout in the saw won’t affect the reading.

If the reading remains the same, the blade is aligned. If it doesn’t, you’ll need to align the saw blade. For most saws, this means adjusting the trunnions. (Cabinet saws are adjusted by shifting the table.)

Adjust Trunnions – The front and rear trunnions are bolted to the underside of the table and support the carriage and arbor assembly. Adjusting them is simply a matter of loosening the bolts that hold them in place and shifting them to bring the saw blade into alignment.

But first, it helps to remove the belt and motor. Besides reducing the excess weight, this also makes it easier to reach the trunnion bolts.

Now you’re ready to adjust the trunnions. The trick here is to just loosen the bolts. And I find it best to leave one of the front bolts slightly snug. This way, it acts as a pivot point and keeps things from moving too much.

The bolts should be just loose enough so you can tap the rear trunnion into alignment with a piece of scrap and a mallet (photo below).

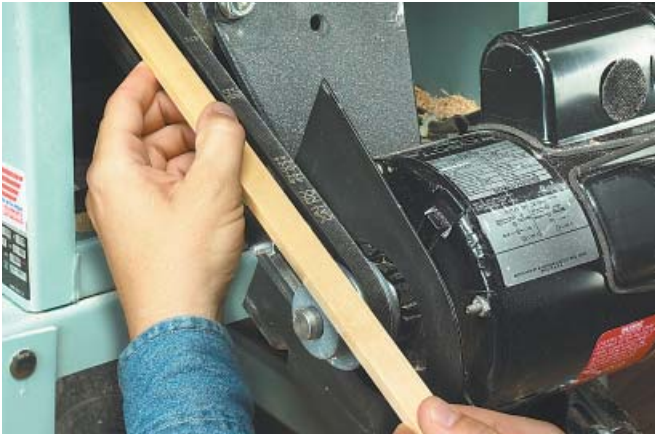
But the trunnion can move as you retighten the bolts. So it’s always a good idea to recheck the blade alignment as you did before to make sure the adjustment is correct.

Sometimes, no matter how hard you try to shift things into alignment, it just doesn’t work. If that’s the case, you might want to check out the trunnion alignment kit on page 6.

▼ **A Little Tap.** To align the blade with the miter slot, loosen the trunnion bolts and tap the trunnion into alignment.



5. Align the Motor & Pulleys



Now that the blade is aligned, you can reinstall the motor and belt. And to make sure your saw runs smooth and vibration-free, you'll want to check the alignment of the motor and arbor pulleys.

I did this by resting a straightedge against the outside faces of the two pulleys (see photo). What you want is for the straightedge to rest flush against each pulley. If it doesn't, you can bring them into alignment by shifting the pulleys on the shafts, or by readjusting the motor on its mounting plate.

Finally, give the drive belt a quick check. If it's worn, cracked, or frayed, you might want to consider upgrading to a link-belt and a set of machined pulleys (refer to page 17).

6. Keep it on the Level

Aligning the motor and arbor pulleys completes the inside work. The next step is to start working on the outside by "aligning" the entire working surface of the table saw. This is just a matter of leveling the throat insert and extension wings to the saw table.

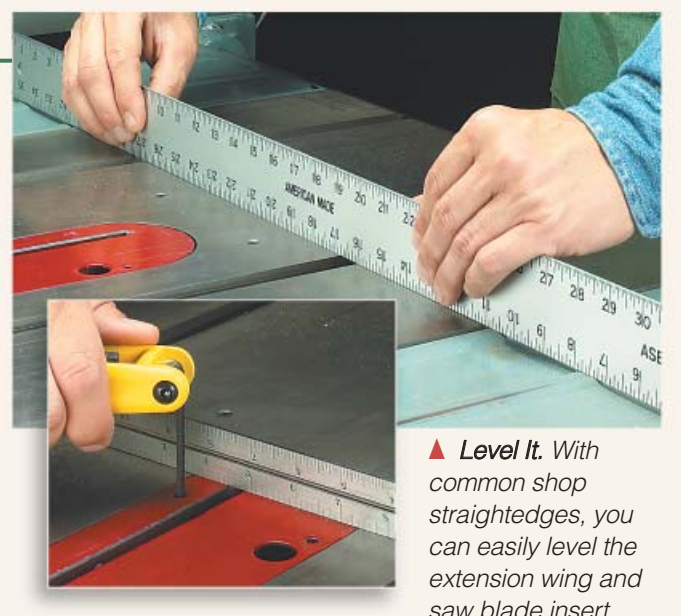
Insert – To prevent the workpiece from catching as you make a cut, the insert needs to sit flush with the saw table. In addition, it should be stable so it doesn't rock back and forth as a workpiece slides over it.

On most saws this adjustment is made using four set screws located in

the insert, as you can see at right. To check your adjustment, a straightedge placed across the saw table should lie flat against the insert.

Extension Wings – Leveling the extensions wings isn't all that different than adjusting the insert — all you need is a longer straightedge.

This time, lay the straightedge so it spans the table and wings (see photo). If either wing needs adjustment, loosen the bolts underneath, shift the wings, and then retighten the bolts. Be sure to recheck the wings after making any adjustment.



▲ **Level It.** With common shop straightedges, you can easily level the extension wing and saw blade insert.



7. Set the Stops

Aligning the saw blade is only one part of getting an accurate cut. To make precise cuts at common angles, like 45° and 90°, most saws have built-in stops. The problem is, these stops can move out of adjustment over time.

Making Adjustments – There are several different methods for adjusting the stops depending on the table saw model. So you'll need to check the manual for your saw.

One of the more common methods uses set screws tapped into the top of

the saw table. So all you need is an Allen wrench to make this simple adjustment.

Start by raising the blade to full height. Then use a drafting triangle to check and set the blade to 90°. Finally, adjust the set screw to match that setting (see photo).

Once you've set the stop, make a quick check by tilting the saw blade and then returning it to 90°. For the 45° stop, simply repeat the process, as shown in the photo at right.



◀ **Setting Stops.** A drafting triangle can be used for checking the 90° (left) and 45° (right photo) settings.

8. Miter Gauge & Rip Fence Check

Rip Fence – Just like the miter gauge, the rip fence needs to be aligned with the saw blade to accurately rip a board to width. If it isn't, a number of things can occur.

For starters, you'll end up cutting a wider kerf than necessary. This puts a heavier load on the motor and requires more effort to push a workpiece through the saw blade. It can also produce a rough or burnt edge, or even result in kickback.

To check the alignment of the fence, I used my shop-made holder and a dial indicator, as in the photo below.

Here again, the distance from the face of the fence to the miter slot should be the same all along the fence. If it isn't, you'll need to make an adjustment. For specific instructions, it's best to consult the owner's manual for your table saw.

The rip fence also needs to be square to the top of the saw table. A plastic triangle makes quick work of this check (inset photo below).



Now that the stops are adjusted, you can focus on tuning up the two most important accessories you'll use with your table saw — the miter gauge and rip fence.

▲ Punch in the Fit.

To tighten up a loose miter gauge, use a punch to add a few "dimples" to the edge of the miter gauge bar.

Miter Gauge – To make accurate crosscuts, your miter gauge needs to be properly aligned.

The first thing to check is whether the miter gauge fits in the slot without any play. To tighten up a loose fit, check out the insert photo at left.

Once you have it sliding smoothly back and forth, use a drafting triangle to set the stops for the 45° and 90° settings on the miter gauge (main photo above). Just align the head with the saw blade, and then adjust the stops on the miter gauge to match.



9. Adjust Splitter, Pawls, and Guard



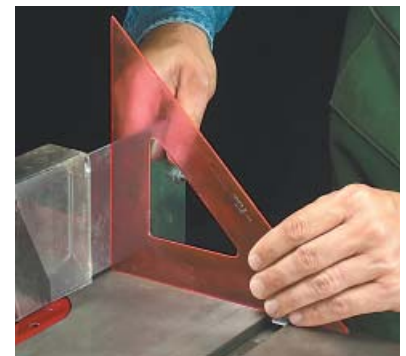
All that's left at this point in the table saw tune-up is to check and adjust the table saw splitter, pawls, and blade guard — a safety must.

Because the splitter, pawls, and guard help prevent mishaps, it's important to keep these items working properly all the time.

To make sure the workpiece doesn't catch the edge of the splitter as you make a cut, it needs to be aligned with the saw blade. A straight-edge makes it easy to check the alignment (left photo). And while you're at it, make sure that the splitter is perpendicular to the saw table (right photo). Then tighten all the mounting bolts and double-check everything.

Next, check that the blade guard

rides up smoothly over the workpiece as it moves past the blade. And finally, to prevent kickback, verify that the pawls "grab" the workpiece as you try to pull it back. You can sharpen the teeth for a better "grab."



Hi-Tech Tune-Up Tools

You can bring your table saw to peak performance by following the steps on the preceding pages. But there are some “hi-tech” products that can make the whole process easier and more accurate.


Dial Indicator Kit – One of the first I would recommend is the Basic A-Line-It kit from *In-Line Industries*. It’s shown in the photo at right. The kit consists of a dial indicator and a pair of machined aluminum bars that screw together. One bar fits the miter slot and can be adjusted for a snug fit. The cross bar holds the indicator at whatever position you need it. They also make a more advanced kit with a few more accessories.

Truing Disc – If your checks should indicate a runout problem, there is a product available that will allow you to minimize it. And that’s a truing disc by *Veritas* (see inset). The truing disc allows you to “tweak” the saw blade and correct the runout by tightening a series of set screws against the saw blade.

Dampener – Sometimes vibration from the motor or belt can cause a rough cut. *Forrest* makes blade stiffeners in three sizes (4", 5", and 6") that help dampen the vibration and improve the cut (right photo). But there

is one drawback to using either the truing disc or a blade stabilizer. Both will reduce the depth of cut of the saw blade.

Belt & Pulleys – You can also minimize vibration by replacing your belt and pulleys with a link belt and machined pulleys, as shown below. To determine if a kit is available for your saw, contact *In-Line Industries*.

There’s one last “hi-tech” product you’ll definitely want to look at if you’re having problems aligning your trunnions. It’s called PALS (lower right photo). PALS stands for Precision Alignment and Locking System. Attached to the rear trunnion, PALS makes it a simple task to align the trunnion to your saw blade and then lock it in place so the trunnion can’t move. Not bad for a \$20 product (again from *In-Line Industries*). 



▲ **Zero Out the Runout.** With this saw blade truing disc, you can reduce the runout of your table saw to a minimum.



▲ **Stiffener.** Although it reduces the depth of cut, a blade stiffener is an inexpensive way to reduce saw blade vibration.



◀ **Belts & Pulleys.** A link belt and machined pulleys will make your saw run smoother.



▲ **Trunnion Alignment.** For easy and precise trunnion alignment, nothing beats the Precision Alignment and Locking System (PALS).