Tablesaw Tune-up

Make the shop workhorse run like a champ

BY ROLAND JOHNSON

Ask woodworkers to name the busiest tool in their shop, and it's a safe bet many will point to the tablesaw. A machine that can rip sheet goods down to size, cut boards to length, and create a variety of joints is bound to carry part of the workload in almost any project.

Yet in many woodshops, tablesaw maintenance consists of little more than changing blades, cleaning the tabletop, and squaring fences. Only when the blade-tilt or -raise mechanism starts to screech in protest does anything beneath the table get attention.

Our shop workhorse deserves better. A yearly inspection and tune-up should be a basic requirement; saws kept in damp or unheated conditions should be cleaned and lubricated more often. The comprehensive tune-up presented here is basically the same for all tablesaws. Check your owner's manual for any details that might differ. □

Roland Johnson is a contributing editor.

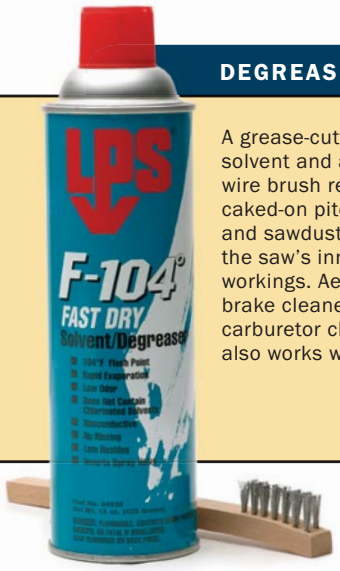
Assemble a tune-up kit

A well-stocked shop already should have many of the basic tools and supplies needed to perform tablesaw maintenance, but you might need to add a few.

DIAL INDICATOR

This device is crucial for the very fine measurements needed in checking the blade for runout and the miter slot for parallel.

DEGREASER



A grease-cutting solvent and a stiff wire brush remove caked-on pitch and sawdust from the saw's inner workings. Aerosol brake cleaner or carburetor cleaner also works well.

LUBRICANTS

To keep the blade-tilt and -raise mechanisms working smoothly, the author recommends quick-drying aerosols instead of grease, which tends to attract sawdust.

Photos, except where noted: Steve Scott

COMMON TABLESAW PROBLEMS

Tablesaws are so sturdy and powerful that they seem not to need any special attention. But like any complex tool, they can develop a variety of problems that erode performance. Keeping your saw clean, lubricated, and properly adjusted will make the machine safer, more accurate, and easier to use.

BURN MARKS WHILE RIPPING

A rip fence that's out of parallel can push stock into the side of the blade, scorching the wood, causing the blade to bind, and possibly causing kickback. See p. 53.

WOBBLING BLADE

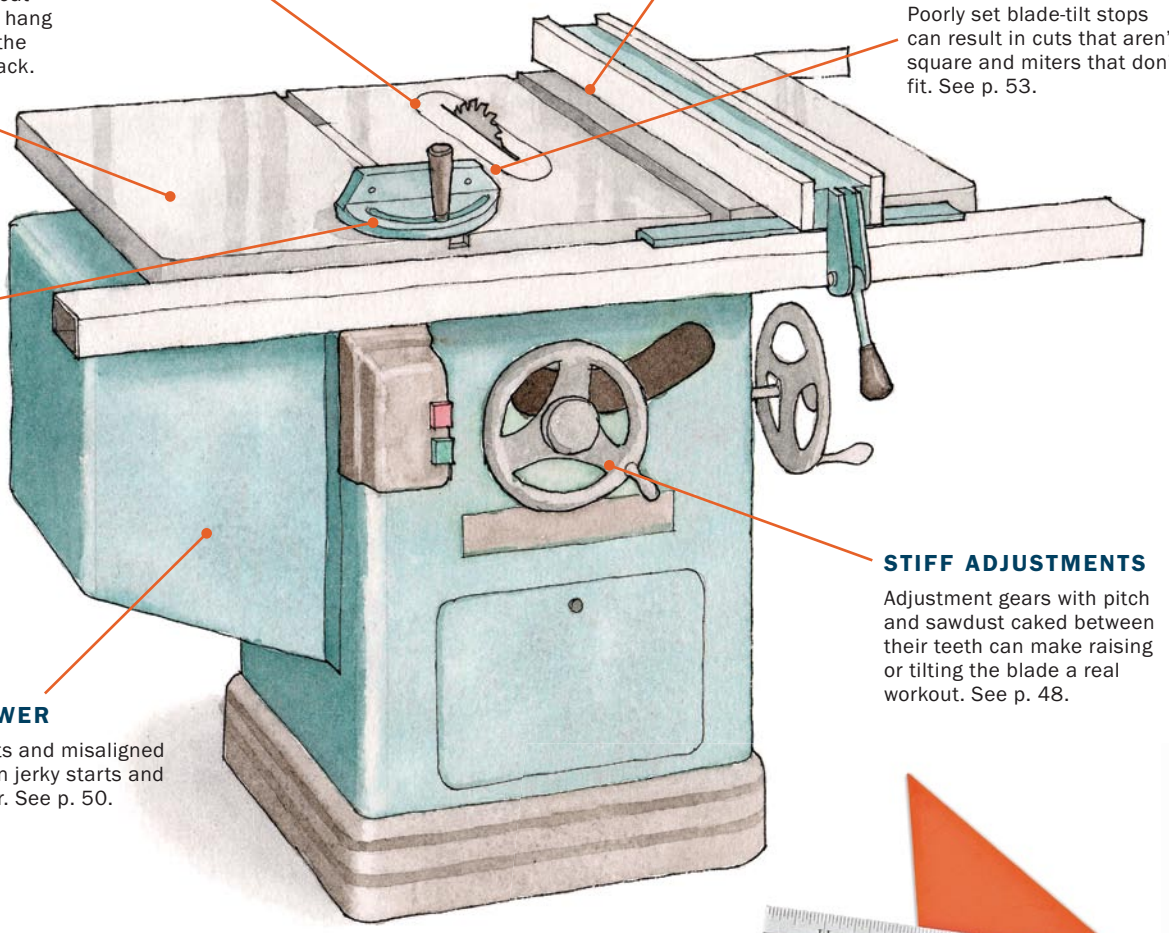
A wobbling blade runs hotter, cuts less precisely and smoothly, and can cause kickback. See p. 50.

STOCK CATCHES ON TABLE

If the extension wings and throat plate aren't flush, lumber can hang up or bind as you feed it into the blade, possibly causing kickback. See p. 52.

INACCURATE ANGLES

Poorly set blade-tilt stops can result in cuts that aren't square and miters that don't fit. See p. 53.



ROUGH CROSSCUTS

If the miter-gauge slot isn't parallel with the blade, you can't make accurate 90° crosscuts. Tilting the blade to 45° also can throw it out of parallel. See p. 51.

STIFF ADJUSTMENTS

Adjustment gears with pitch and sawdust caked between their teeth can make raising or tilting the blade a real workout. See p. 48.

LOSS OF POWER

Worn or stiff belts and misaligned pulleys can mean jerky starts and decreased power. See p. 50.

TOPCOAT

There are several spray-on products designed to protect the tabletop from rust and to reduce friction. Paste wax is also effective.

SHIM STOCK

For leveling a tabletop or extension wings, brass shim stock is available in different thicknesses from hobby and machine-supply stores.

MEASURING

You'll need a variety of measuring implements, most of which you probably have on hand. They include a drafting triangle with 45° and 90° angles, a combination square, and a long level or straightedge.

Drawings: Jim Richey

PROBLEM: STIFF OR SQUEAKY HEIGHT AND ANGLE ADJUSTMENTS

Clean and lubricate the inner workings

On most cabinet saws, removing the tabletop exposes the inner workings and makes a tune-up much easier.

First, unplug the saw, then remove the throat plate and the blade to avoid damaging the blade or yourself. Measure and record the distance from the left-hand miter slot to the blade. You'll need this measurement to reassemble the saw accurately.

Now undo the bolts that hold the top to the base and remove any extension tables or fence rails. If a strong friend is helping, you might be able to lift the top with all of its accessories, but it will be awkward and heavy.

The inside of a tablesaw is a grimy, dusty place. Without regular cleaning, wood resin and sawdust can cake up and stiffen a saw's inner workings, especially the blade-height and -angle adjustments.

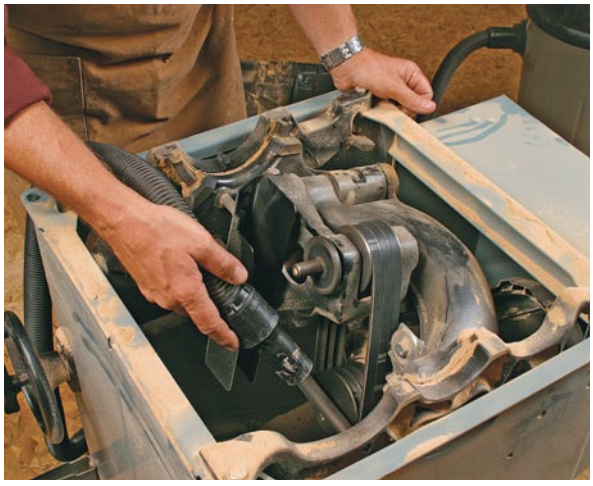
Use a shop vacuum and compressed air to get rid of the sawdust, then attack the gears and pivoting parts with grease-cutting solvent and a wire brush. I like to use LPS-brand solvents because they cut grease aggressively and don't leave an oily residue (available at National Supply Source, www.nolansupply.com; call LPS at 800-241-8334 for retailers near you). Aerosol brake cleaner or carburetor cleaner also will work. Although the bearings in a tablesaw are sealed, avoid getting solvent directly on them. Some of these products also can damage paint, so buy and apply them carefully. In any case, buy a high-quality solvent that will evaporate quickly.

Remember, when using volatile solvents, make sure you have an adequate fresh-air supply and wear a vapor mask.

Finish the cleaning process with a compressed-air blowdown to speed drying and remove crud softened by the solvent. The overall goal in all of these steps is to clear away as much dust and pitch as possible, leaving clean, dry surfaces for an effective lube job. Be sure the solvent is completely cleaned out or dry before applying new lube to the contact surfaces.

Before moving on, give some attention to the motor. Blow compressed air through the housing until the exhaust air is clean.

Mark your place before removing the top. *Measure the distance between the blade and the left-hand miter slot. Realigning the slot to this measurement during reassembly will ensure that jigs, such as a crosscut sled, will still fit.*

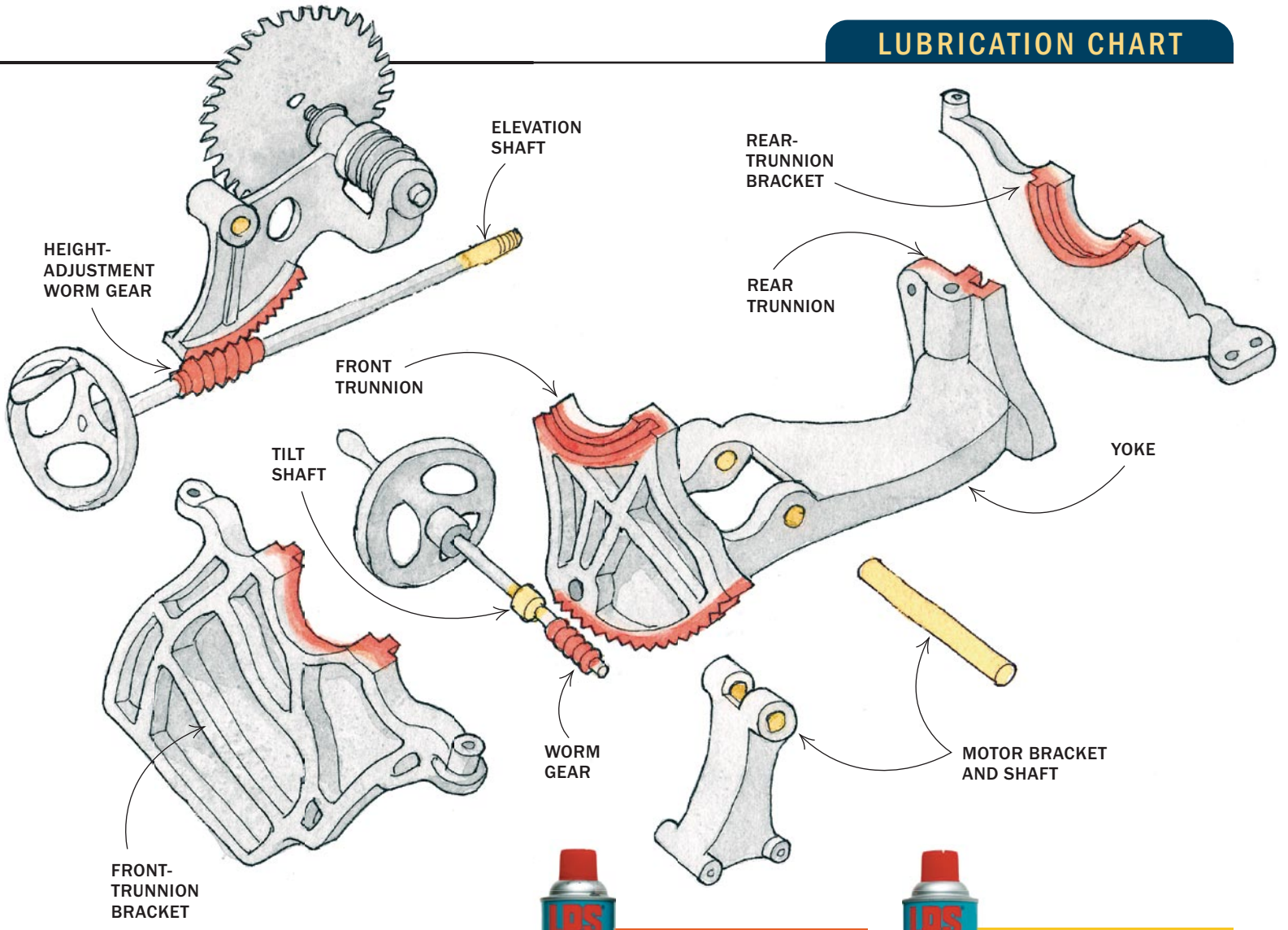


Remove loose sawdust. *Two good vacuumings, with a blast of compressed air in between, should eliminate loose sawdust inside the cabinet. Clean the motor and/or fan thoroughly with compressed air to ensure cooling efficiency.*

Contractor-saw tip

To get inside, remove the motor and—with a friend's help—turn the unit upside down on a low bench or short sawhorses. You also might need to remove a bottom panel, as on this saw.

Photo, top right: Michael Pekovich



HEAVY-DUTY LUBRICANT

Orange indicates high-wear areas that require a heavy-duty lubricant.

PENETRATING LUBRICANT

Yellow indicates hard-to-reach areas that require a penetrating lubricant.

Clean before lubricating

To help remove minor pitch buildup and rid the gears of old grease, use a quick-drying aerosol degreaser and scrub with a wire brush. Surfaces need to be clean and dry before lubricants can adhere well and do their work.

On the worm gears and racks, use a molybdenum-based drying lube. *The spray, which withstands heavy pressure, is dense enough to stay in place without running.*

Use a penetrating lubricant on hard-to-reach areas. *For the worm-gear shafts on the arbor-pivot and -raising assemblies, Johnson uses a penetrating spray that dries quickly.*

PROBLEM: WOBBLING BLADE, EXCESSIVE VIBRATION

Check the arbor and bearings

Use a dial gauge with a magnetic base to check the arbor for runout—imperfections in the straightness of the shaft or the flatness of the blade-mounting flange connected to it. An arbor with excessive runout will cause the blade to wobble. This robs power, heats up the blade, and can increase the chance of kickback.

This check can be done before or after the top is removed, as long as there is a stable surface on which to mount the dial gauge. Start by tilting the arbor to 45°, which makes it easier to reach.

Take and compare several measurements from both the inner face of the arbor flange and from the nonthreaded portion of the arbor shaft. Turn the arbor to get readings from different points. There should be no variation at all in measurements taken from the shaft itself. Acceptable runout on the arbor flange is a maximum of 0.0015 in.

Check for runout. *Set the pointer of the dial indicator perpendicular to the rim of the arbor flange. Rotate the flange to check for variations in flatness.*

If the arbor shows runout, replacing it is the best option, but check the bearings first to make sure they're not causing the problem. It's a good idea to check them anyway.

With the belts removed, turn the arbor shaft by hand and listen to the bearings. The sound should be smooth and rolling, and the shaft should turn freely. If there is a dry or scraping sound, or even slight roughness in their operation, replace the bearings. Doing so is inexpensive and easy, and will greatly increase the life and performance of your saw.

An old hot-rodder's trick. *A long screwdriver, with the tip held firmly on the bearing housing, makes a good listening device for checking the condition of the bearings.*

You can order replacement bearings from the tablesaw manufacturer or check a local automotive-supply house or machine shop. Once you've removed the arbor assembly, all that's needed to remove the old bearings and install the new ones is an arbor press. Machine shops, electric-motor repair shops, and even most automotive-repair shops will have an arbor press and the expertise to use it.

To replace the arbor, check with the manufacturer for a new part. If the saw is out of production, search old-tool Web sites for a used or old-stock arbor. As an expensive last resort for a saw that's really worth saving, a machine shop could make a replacement arbor.

PROBLEM: LOSS OF POWER

Check belts and pulley alignment

Align the pulleys. *Use a length of drill rod or other straightedge to determine whether the motor and arbor pulleys are aligned with one another.*

On most cabinet saws, three short belts transfer power from the motor to the arbor. Misalignment can make the belts drag on the pulley, robbing power, building up heat, and wearing out the belts. Replace worn or stiff belts as a matched set to ensure that all three share the load.

To check pulley alignment, I lay a straightedge across the side of one pulley and check how squarely—if at all—it meets the surface of the other wheel. Make adjustments by first loosening the setscrews that hold the motor pulley to its shaft. Carefully pry the pulley away from the motor or use a deadblow hammer to tap it farther onto the shaft.

Use care: Excessive force could damage the motor's armature bearings. Once alignment is accurate, tighten the setscrews.

Contractor-saw tip

The pulleys on a contractor's saw are much farther apart, increasing the chance of unwanted vibration. On many older saws, performance can be improved by installing a high-quality segmented belt and a good pair of machined and balanced pulleys.

PROBLEM: POOR-QUALITY CROSSCUTS

Align the miter slots with the blade

One common tablesaw problem happens when the blade is not running parallel to the miter slots. In such a situation, if the miter gauge is set to 0° for a 90° crosscut, the actual cut won't be accurate.

To check for parallel, I use a dial micrometer mounted on a modified miter gauge or hardwood runner in the left-hand miter slot. This is the time to retrieve that baseline measurement of the miter-slot distance that you made before removing the top. Adjust the table position to set the miter slot to that original measurement.

With the blade at full height, mark a tooth at the front. Measure from this tooth to the miter slot, then rotate the tooth to the back of the throat opening and measure again. Adjust the tabletop (or the trunnions on a contractor's saw) to bring the measurements in line. Repeat the parallel-checking process with the blade set at 45°, shimming the top or trunnions if needed. Then recheck for parallel at 90°. Sometimes this will take a few cycles before both positions are parallel. When you reach nirvana, tighten the bolts and recheck once more.

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Visit our Web site to see the author adjust a saw for perfect rips and crosscuts.


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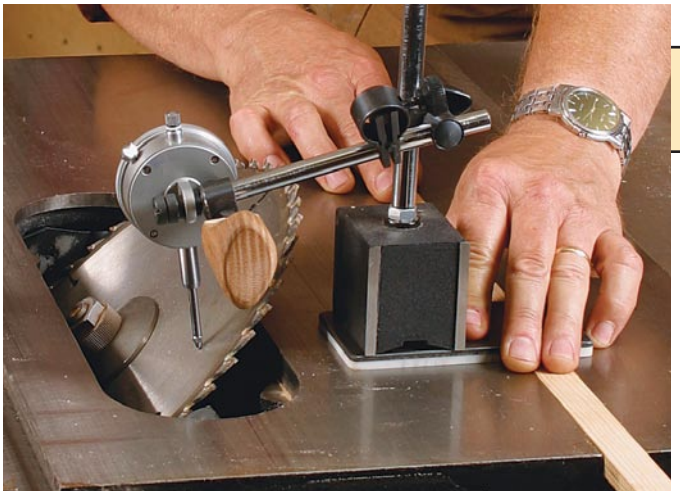
Adjusting the tabletop. *A sandwich of plastic (plywood may be substituted) and steel, screwed to a wooden runner, creates a sliding platform for the micrometer's magnetic base (1). Use the micrometer to measure the distance from the miter slot to the front and rear of the blade (2). Measurements should differ by 0.005 in. or less. Snug the tabletop bolts, then use a dead-blow hammer to make minute adjustments to the top (3).*



Check again for parallel. *After bringing the miter-gauge slot parallel with the blade, tilt the blade to 45° and repeat the process.*

PROBLEM: POOR-QUALITY MITERS

Level the tabletop

If the blade is parallel to the miter slot at 90° but not at 45°, it means the table is out of level from front to back. Shim the top (or the trunnions on a contractor's saw) to compensate. I use automotive alignment shims and brass sheet stock. I buy 1/64-in. and 1/32-in. alignment shims and sheets of 0.005-in., 0.010-in., and 0.015-in. brass for a combination that results in very accurate adjustments.

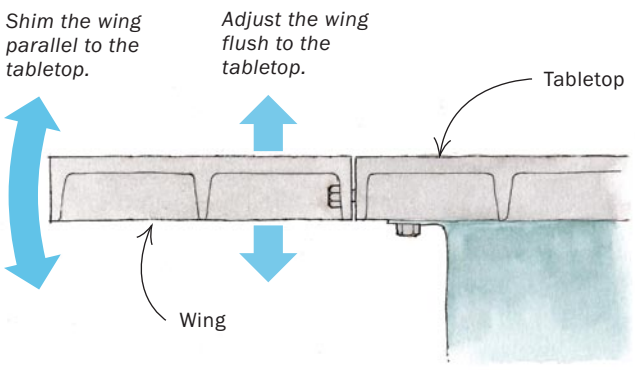
PROBLEM: STOCK CATCHES ON TABLE

Level the wings and throat plate

Feeding lumber over the saw is easier and safer when the throat plate and extension wings (and extension table) are flush to the saw table. Lifting a hung-up board to clear the tabletop can cause a jam, possibly resulting in a ruined cut or dangerous kickback.

Some throat plates can be raised or lowered with setscrews, so a straightedge and Allen wrench are all you need to align the surfaces. A homemade plate can be shimmed with masking tape or trimmed flush with a block plane, if needed.

To adjust an extension wing or table, very slightly loosen the mounting bolts and tap the surfaces flush with a deadblow hammer. Check with a straightedge, tighten the bolts, and check again to make sure everything stayed put.



Level the wings. *Use a straightedge to check whether the extension wings are flush and parallel with the top (above). If necessary, shim the wing with brass sheet stock (right) until it is parallel with the tabletop.*

Clean and coat the tabletop

After all the mechanical components are operating in harmony, it's a good idea to dress the tabletop. Start with a thorough cleaning, using a spray solvent. Then polish with a fine-grit Scotch-Brite nylon pad or 600-grit sandpaper mounted on a wood block. Finish with a coat of nonsilicone wax or one of the topcoatings designed specifically for this purpose. I use Bostik TopCote, applying a couple of coats. I apply another coat whenever I notice the wood starting to drag as I feed it over the table.

PROBLEM: INACCURATE BLADE ANGLES

Adjust the 45° and 90° stops

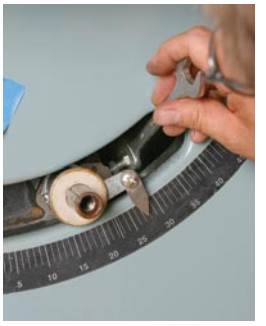
Virtually all tablesaws have adjustable devices that stop the arbor assembly when the blade is perpendicular to the table and when it's tilted at 45°. Most often these devices consist of a bolt and locknut mounted on the arbor-carriage assembly.

On the saw table we tuned up, the stop bolts are mounted on the front-trunnion assembly. The 45° tilt can be accessed through the slot on the front of the cabinet that is for the blade-lift crank handle. The 90° stop can be reached through the motor opening in the side of the cabinet.

To adjust the stops, set the blade to the desired angle, loosen the locknut, and then retighten it after repositioning the stop bolt. I use a plastic 45° drafting triangle to set the tilt angle and a 6-in. sliding square to set the 90° stop. Always recheck after tightening the locknut to make sure the adjustment stayed accurate.

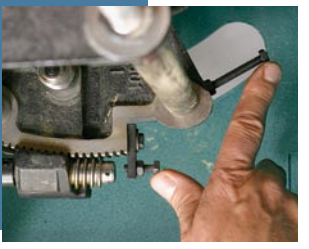
Setting the blade upright. *The 90° stop is usually easy to reach. Simply loosen the stop bolt and use a square to set the blade to exactly 90°. Then turn the stop bolt snug to the stop, and tighten the locknut on the stop bolt.*

Getting properly inclined. *The 45° stop bolt on many saws can't be reached when the arbor is tilted all the way to 45°, so setting it takes some finagling. Loosen the bolt so that the blade stops before 45°. Then tighten it a little, and check the angle with a drafting triangle. Repeat the procedure until you find the exact setting for 45°.*



Contractor-saw tip

Some contractor's saws allow adjustment via setscrews on the saw's top. Most saws, however, require you to reach in from underneath (right) to access the stops.



PROBLEM: BURN MARKS WHILE RIPPING

Adjust the rip fence parallel to the blade

One of the last adjustments I perform is to set the rip fence parallel with the miter slot and thus parallel with the blade. Some woodworkers angle the fence a few degrees away from the back of the blade to help avoid binding. I like to keep things parallel and rely on a well-tuned saw and stable, well-dried lumber to keep me out of trouble.

The sides of the fence also should be checked with a reliable square for an accurate 90° to the tabletop. Some fences don't have an easy means of adjustment. One solution is to attach a supplemental wood fence that is beveled or shimmed square to the saw table.