Jointer

Keeping your jointer tuned up pays off in stock that’s flat, straight, and square.
Tuning up a Jointer

A jointer has two main jobs: to flatten the face of a board, and to straighten and square up the edge. Sure, you can use it to cut a bevel or rabbet. But the real “meat and potatoes” work of a jointer is getting stock flat, straight, and square.

That sounds pretty easy. After all, with the long, flat tables and fence on a jointer, it seems like it would be hard to go wrong.

Maybe that’s why it’s so frustrating when the wood fibers in the edge of a workpiece tear out. Perhaps there’s a scoop (snipe) in the end of the board. Or when you sight down the edge, it’s dished out (or there’s a hump) in the middle.

TUNE-UP. Fortunately, all it takes to solve these problems is a simple tune-up. This won’t require any special tools or materials. Yet it will make a big improvement in the quality of the cut.

The procedure for tuning up a jointer boils down to two main things: getting the tables and fence properly adjusted, and making sure the knives are set correctly in the cutterhead.

HOW IT WORKS. Before you make any adjustments though, it helps to understand how all the parts of a jointer work together.

The workpiece is supported by a long infeed and outfeed table, see drawing at left. In between these two tables is a rotating cutterhead that holds the knives.

If the jointer is set up properly, the knives are at the exact height as the outfeed table (at the top of their arc). And the infeed table is adjusted lower than the knives (usually 1/64" to 1/32").

It’s this difference (between the height of the infeed table and the height of the knives) that determines how much material is removed. As you make a cut, the knives slice a thin layer of material off the workpiece which rides smoothly onto the outfeed table.

DOVETAILS. Each table is secured to the base of the jointer by two pairs of interlocking dovetails, see detail. As you adjust the tables up or down, the dovetails ensure that they remain parallel to each other.

GIB. But over time, the dovetails can wear slightly which allows the tables to sag. To compensate for this, a flat, metal bar called a gib fits between the dovetails (usually in back of the jointer). Tightening (or loosening) the gib realigns the tables.

Keeping your jointer tuned up pays off in stock that’s flat, straight, and square. From ShopNotes Magazine © August Home Publishing Co.
Parallel Tables

It almost goes without saying. To produce a straight edge, the tables on a jointer need to be flat. But there’s more to it than that.

PARALLEL. The infeed table and the outfeed table must also be parallel to each other. If the tables slope toward the cutterhead, you end up with a hump in the jointed edge, see drawing and detail ‘a’ at right. If the tables sag at the ends, the edge will be slightly scooped, see detail ‘b.’

Now the tables may not be “off” by all that much. But even the thickness of a couple sheets of paper is enough to cause problems.

ADJUST TABLES. To adjust the tables so they’re parallel, start by raising the infeed table up to the level of the outfeed table. Then lay a long, metal straightedge across both tables, see Fig. 1.

The goal here is to get both tables to contact the straightedge uniformly along its entire length. That’s where the gibs come in, see drawing on previous page. By adjusting the amount of pressure against the gibs, you can raise or lower the appropriate end of each table.

To do this, loosen the lock nuts on the set screws that hold the gib in place, see Fig. 1a. Then tighten (or loosen) the set screws to raise (or lower) the end of the table. When the tables contact the straightedge evenly along its entire length, simply retighten the lock nuts.

Adjusting Outfeed Table

Another aggravating problem is when you get a heavy cut (snipe) at the end of a board, see drawing.

If the outfeed table is too high, the workpiece catches on the front edge of the table, see detail ‘a.’ This causes snipe on the front of the board. If the table is too low, the snipe occurs at the back end, see detail ‘b.’

ADJUST TABLE HEIGHT. To prevent either of these things from happening, you’ll want to set the outfeed table at the exact same height as the knives. Start by placing a straightedge on the table so it extends over the knife, see Figs. 2 and 2a. Then raise (or lower) the table until the knife barely touches the straightedge.

To check the adjustment, rotate the pulley (or belt) and listen for a “tick.” This indicates the knife is just touching the straightedge.
TOOL TUNE-UP

Setting Knives

Adjusting the tables on a jointer to produce a smooth, square cut is only half the story. The other half is making sure the knives in the cutterhead are sharp and properly adjusted.

Hone Knives. If the knives are dull (or there’s a small nick), you can restore the edges with a sharpening stone. To hold the stone at a consistent angle, I use a simple guide, see box below. But if the knives have a large nick, a honing guide isn’t the best solution. (You’ll have to remove too much material.)

Shift Knives. A better solution is to shift one of the knives in the cutterhead to the side. This offsets the nick by a small amount which results in a smooth cut.

Changing Knives

Eventually, the knives will get too dull (or nicked), and you’ll need to replace them with a set of sharpened knives. (I have a spare set of knives.)

Safety Note: Be sure to unplug the jointer before changing the knives. Also, to provide room to work, remove the fence and guard (or clamp the guard out of the way).

Remove Knives. The first step is to remove the dull knives. Actually, to make it easy to keep track of things, I only work on one knife at a time.

On most jointers, the knife is held in place by a metal bar (gib) and a bolt, see Fig. 1a. To remove the knife, loosen the bolts. Then carefully lift out the knife and the gib.

Usually, you’ll find gunk on the knife, gib, and in the slot in the cutterhead. So I clean these with mineral spirits. Note: Be careful when you clean the knife. Even a dull cutting edge can give you a wicked cut.

Install Knife. Now you’re ready to install the sharp knife. Start by putting the gib back into the slot in the cutterhead. Then slip the knife between the gib and the side of the slot. Note: The bevel on the knife should face the outfeed table.

With the knife in place, tighten the gib bolts until it’s snug (not tight). To prevent the knife from twisting, it’s best to start with the center bolts and work toward the ends.

Adjust Height. The next step is to adjust the height of the knife. To support the workpiece as it slides onto the outfeed table, the knife has to be perfectly level with the table.

I start by roughly positioning the knife. The goal is to have the “heel”

Honing Guide

A honing guide makes it easy to “touch up” a dull edge on your jointer knives. This honing guide has two sharpening stones that are sandwiched between wood blocks, see photo below.

Stones. If the knives only need a bit of work, I use the 400-grit stone. But for small nicks, the 180-grit stone is best. Just be sure to follow up with the finer grit. Either way, apply a few drops of oil to the stone as a lubricant.

Use. To use the honing guide, set it on the knife so the stone rests against the bevel, see detail.

Now hold the pulley (to keep the cutterhead from rocking) and make a smooth, firm stroke across the knife. It’s important to remove the same amount of material from each knife. So count each stroke and make the same number of passes on each knife.
TOOL TUNE-UP

of the knife project about 1/16" above the cutterhead, see Fig. 1a.

LEVELING SCREWS. To accomplish this, you may have to raise or lower the knife. This is just a matter of turning a pair of leveling screws to push the knife up, see Figs. 1 and 1a. Or, to lower the knife, turn the screws the opposite way and tap the knife down with a wood block.

All it takes is a slight turn to adjust the leveling screws — maybe just an eighth of a turn. The important thing is that the knife projects the same amount at each end.

GAUGE. To check the adjustment, I use a simple gauge. It's just a scrap that's laid on the outfeed table so it rests on the knife, see Fig. 2a. (Be sure the scrap has a straight edge.)

To use the gauge, make a pencil mark on the scrap that aligns with the front edge of the outfeed table. Now rotate the pulley (or belt) so the edge of the knife "catches" the scrap and drags it forward, see Fig. 2b.

The actual distance it travels isn't critical. (I adjust the outfeed table as needed so the scrap moves about 1/8") Now make a second mark on the scrap that aligns with the outfeed table, see Fig. 2b. This creates a reference that's used to check the opposite end of the knife.

To check the adjustment on this end, align the first mark with the outfeed table and rotate the pulley again. Ideally, the knife will drag the scrap the same distance. If the second mark aligns with the outfeed table, it means that both ends of the knife are set at the same height.

At this point, it's just a matter of tightening the bolts securely. There's only one problem. As soon as you tighten them, the knife creeps up. The trick is to anticipate this movement. This is a trial and error process. But after a few tries, you'll get a feel for how much the knives will move.

To adjust the remaining knives, simply repeat the process. Then adjust the outfeed table so it's level with the newly installed knives, refer to page 3.

TIME. So just how long does all this actually take? Well, on a good day, I can change the knives in an hour. But to be honest, it may take longer. I've spent as long as four hours setting the knives. (For information about a knife-setting jig that speeds up the process, see box below.)

FENCE, GUARD, & BELT

Once the knives are set, there are just a few more things to check.

SQUARE FENCE. First of all, after you reinstall the fence, don't forget to square it up to the table, see Fig. 3. Otherwise, you'll end up with a beveled edge instead of one that's square to the face of the workpiece.

GUARD. You'll also want to check the guard. For safety, it's important that there's enough tension on the spring that the guard swings all the way back against the fence at the end of a cut, see Fig. 4. Note: Check your owner's manual to see how the tension is adjusted on your guard.

V-BELT. The last thing to do is to adjust the tension on the V-belt. The V-belt doesn't have to be "drum tight." To reduce the amount of vibration that's transferred to the jointer, I leave it loose enough to squeeze the belt together as shown in Fig. 5.

Magna-Set

If you change jointer knives frequently, a Magna-Set will allow you to do it very quickly.

The Magna-Set consists of two plastic bars that rest on the outfeed table and a pair of metal rods that connect the bars, see drawing at right.

MAGNET. To position the knives level with the outfeed table, there's a magnet in each bar, see detail. The magnet holds the knives at the correct height while you tighten the gib bolts.

Note: Reference lines on the fence make it easy to position the Magna-Set.