

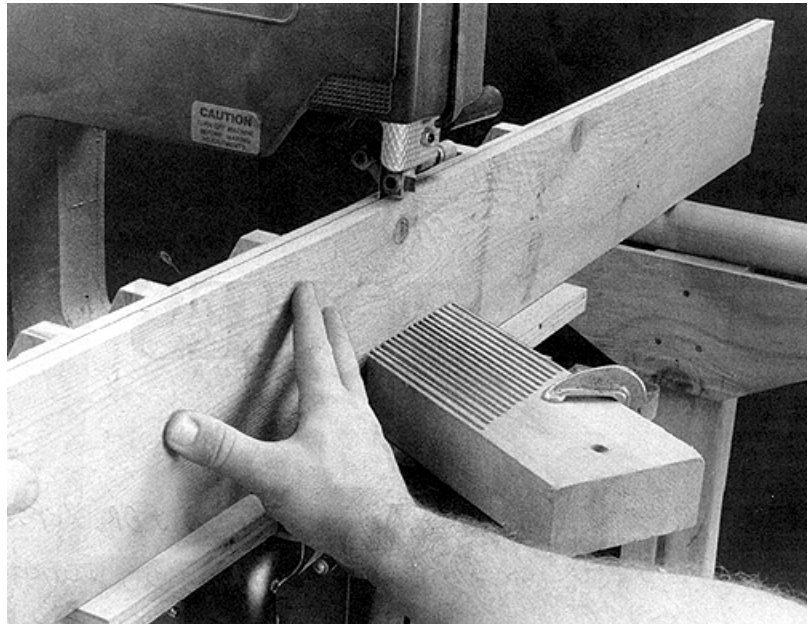
Tip #47 Resawing

by Nick Engler

There's a fine art to making thin boards out of thick ones.

Resawing is the art of slicing large boards into smaller ones. And it is an art - any woodworker who has done a lot of resawing will testify to that. To resaw a board - and do a good job of it - you have to know your machine intimately and develop a "feel" for the wood. This blend of knowledge and skill is what elevates this simple technique to an art.

It's a useful art, well worth the time it takes to learn it. Most woodworking projects call for several different thicknesses of stock, while lumberyards usually only sell 4/4 (1" thick) and 8/4 (2" thick) cabinet-grade woods. It takes forever to work 4/4 lumber down to 1/4" thick on a small planer. Resawing saves an enormous amount of time. It also saves wood. You can get two, possibly three 1/4"-thick boards from a single 4/4 board.



The Best Tool for the Job

The art of resawing-and the tools needed to do it - have developed over hundreds of years. Medieval "joyners" used a primitive rip saw. (I'm told that the average joyner could resaw about four boards in his lifetime-five, if he started young.) In the late eighteenth century, European cabinetmakers developed the "veneer" saw to resaw expensive, imported mahogany lumber. Then, in the mid-nineteenth century, toolmakers developed the first band-saws. This saw was tailor-made for resawing. The kerf of the bandsaw blade was narrow (so there was little waste), and the action of the tool kept the wood pressed against the table. For over a hundred years, the bandsaw has remained the best tool for the job.

But even though nothing does it better, resawing "pushes the envelope" of the bandsaw. Often times, when you resaw a board, you're sawing through as much wood as the tool was meant to handle. On most homeshop bandsaws, the depth-of-cut is 6"-a little less than the typical width of a board in the hardwood bins of a hardwood store puts enormous demands on every part of the machine-the frame, the guides, the blade, and the motor.

Because of this, if there is anything out of whack on your bandsaw, the effects will be magnified when you're resawing. If the best tool for the job is to be an adequate tool for the job, all the parts have to be properly aligned, adjusted, and balanced to work in harmony.

Back to the Basics

To understand how the part of your bandsaw work together-and what could go wrong when they don't-we need to review a few basics. Let's start with a definition: The bandsaw is a thin, continuous blade, running under tension between two or more wheels. A frame supports the wheels and the blade, while a table supports the work and keeps it at the proper angle to the blade.

Since the blade is thin, it can be distorted or deflected easily. Feed the work too quickly or turn it too abruptly, and the blade will bend or twist. To keep the blade running true, most bandsaws have two sets of blade guides and thrust bearings, above and below the table. These support the blade from three directions. The bearings back up the blade and keep it from bending when you feed the stock. The guides rub against the guides and keep it from twisting.

If any of these parts are poorly aligned or adjusted, the quality of the cut will suffer. The thicker the stock, the greater the effect of the misalignment or maladjustment. When cutting thin stock, you may be able to live with a bandsaw that's seriously out of whack-the problems may not even be discernible. But they will become all too apparent when you try to resaw. So, before beginning a resawing operation, take the time to check your saw. If necessary, realign or readjust the blade tracking, blade tension, angle of the table to the blade (It must be precisely square. See Figure 1.), relationship of the upper and lower blade guides (they must be in line), position of the thrust bearings, and the position of the blade guides.

All of these things should be discussed in-depth in your owner's manual. There's no sense in giving them more than a mention here. But there is one common problem that you won't find in your manual-vibration. No manufacturer likes to admit that their machine vibrates, but they all do. And this vibration can affect the quality of the cut as much or more than anything else on the checklist.

Vibration is the cumulative effect of all the tiny problems with all the moving parts on the bandsaw. It starts at the motor and travels up the pulleys, belt, and the wheels to the blade itself. The blade picks up the vibrations of the machine and slaps back and forth in the kerf, the teeth scraping one face of the cut and then the other. If the vibration is too great, this will produce a "washboard" effect-the cut will be rough the uneven. (See Figure 2.)

Many things add to the problem of vibration. Motors are sometimes out of balance, pulleys wobble, belts may not be out of round. If you suspect one or more of these may be causing your bandsaw to vibrate excessively, track down the problem and fix it.

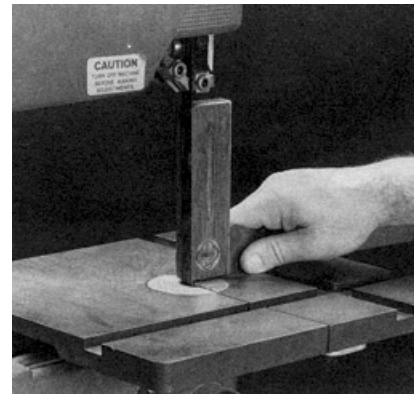


Figure 1. Before you resaw, check that the "cutting length" -- the portion of the blade between the guides -- is perfectly square to the bandsaw table.

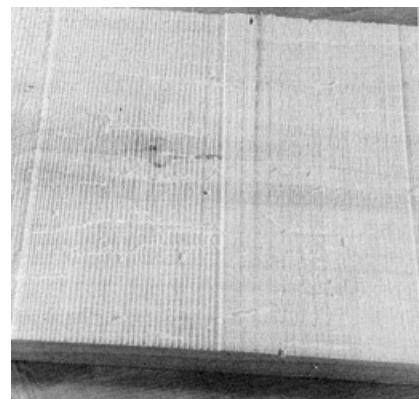


Figure 2. Here's an example of what a little vibration can do to the quality of your cut. The motor pulley that came with my bandsaw had a bad wobble that caused the blade to vibrate. I resawed the left half of this board using the wobbly pulley, and the right half using a better pulley that I bought as a replacement.

Choosing and Using a Blade

Once you're certain that your bandsaw is running smoothly, the next step in resawing is to choose an appropriate blade. There's no way to over-emphasize the importance of this. As surprising as it may sound, choosing a good blade is more important than choosing a good bandsaw. Traditionally, the best choice for resawing is the widest blade your bandsaw will handle, with as few "teeth per inch" as you can find. For most homeshop bandsaw, this is a ½"-wide blade, with 3 to 4 teeth per inch.

In addition to the number of teeth, you must also select the type of teeth on the blade. There are three choices-regular or raker, skip-tooth, and hook-tooth. (See Figure 3.) Ordinary woodcutting bandsaw blades have raker teeth. The teeth are close together with a minimum set to produce a fairly smooth cut. They cut well in thin stock, but there isn't enough "chip clearance" between the teeth to cut thick stock. The gullets fill up quickly with sawdust, and the resulting friction generates a lot of heat. The wood burns and pitch loads up on the blade. As you might imagine, raker teeth are not well-suited for resawing.

Skip-tooth blades (sometimes called "buttressed" blades) have only half as many teeth as a same-size raker blade. There is more room for chip clearance between the teeth, and consequently the blades cut well in thick stock. Many experienced woodworkers prefer these for resawing, although the advantages over hook-teeth are debatable.

Hook-tooth blades have more teeth than the skip-tooth variety, but fewer than the ordinary raker. The gullets are fairly deep, so there is adequate chip clearance for cutting thick stock. The tooth design makes the blade cut aggressively-the stock almost feeds itself. You don't have to pay quite so much attention to the feed pressure, and this frees you to concentrate on tracking the cut. There is a hidden danger, however. Because the cut is aggressive, you may feed the stock too fast without knowing it. This may cause the motor to bog down or the blade to cup.

Once you select a blade for resawing, you may want to "tune" it slightly so that it runs as smoothly as possible. Some blades-especially new ones-have a slight "tick" when they're running. This is usually caused by a bad weld. Either the weld is slightly misaligned, or it hasn't been properly ground. In either case, it will affect the quality of the cut. It may also cause the blade to break prematurely if you don't eliminate the tick.

Unless the weld has been badly botched, you can smooth out this tick by "stoning" the blade while it's running. Turn on the machine and let it get up to speed, then hold a soft India (fast cutting) sharpening stone lightly against the back of the blade. You'll feel the weld bump each time it comes around. Continue to feed the stone very gently until you feel the bump disappear. After you stone the back, do the same thing on each side of the blade. Be careful not to stone the teeth, just the band.

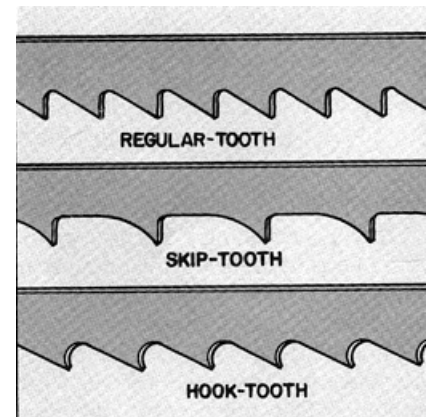


Figure 3. There are three types of woodcutting bandsaw blades, as these are classified according to the type of teeth on the blade -- (1) regular or raker tooth, (2) skip tooth, and (3) hook tooth.

Adjusting the Speed

Once you've mounted the proper blade for resawing on your bandsaw, adjust the running speed of the blade. (This may not be possible on some machines.) The standard speed for a homeshop bandsaw is approximately 3000 feet per minute (fpm), and the conventional wisdom is to slow this down to somewhere between 1000 and 1500 fpm for resawing. The slower speed increased the effective torque of your motor. There is less chance that the machine will bog down while cutting through thick stock. The slower speed also reduces the friction of the blade in the cut. Since the blade does not get quite so hot, it stays sharp longer, doesn't load up with pitch quite so fast, and there is less chance that it will burn the wood.

But, as I said this is just the conventional wisdom. In experimenting with different blade/speed combinations, I found that the bandsaw leaves a smoother cut on the resawn board if you run it at the standard 3000 fpm or even slightly higher. The blade has to be sharp, and you have to resist the temptation to feed the stock too quickly. As long as you keep the feed rate slow, there are more cuts per inch and the normal washboarding evens out. Each tooth takes a smaller bite, carrying away fewer chips, so the temperature of the blade stays within limits.

By the way, if you don't know the speed of your saw, it's easy enough to figure out. Divide the diameter, in inches, of the motor pulley (MP) by the diameter of the bandsaw pulley (BP) to get the pulley ratio. Multiply this ratio times the rpm of the motor (RPM) and the circumference of the bandsaw drive wheel. (The circumference is the diameter of the wheel (DW) times pi (3.1416) since the answer is in inches, divide by 12 to get feet per minute. Here's the equation: $MP/BP \times RPM \times DW \times 3.1416/12 = FPM$.

Preparing the Stock

Once you've adjusted the speed, square two adjacent sides of the boards that you want to resaw. This is important! Since the table is square to the blade, the stock must sit square on the table. The stock must also have a flat side to help you guide it past the blade. To square the stock, first run it through your planer to smooth one face. Then joint an adjacent edge, keeping the smooth face pressed against the jointer fence. When you resaw, rest the jointed edge on the table and keep the smooth face flat against the bandsaw pivot or fence-whatever you're using to help guide the wood.

Final Preparations

Adjust the upper blade guide so that it's just 1/8" to 1/4" above the upper edge of the wood. This, too, is very important. The closer together the blade guides, the less chance there will be that the blade will distort in the cut. Also, any exposed blade is a safety hazard.

Finally, gather up the safety tools you'll need—a push stick or a push shoe, a feather board, a saw stand, safety glasses, and a dust mask. The push stick or push shoe will help you finish the cut, keeping your fingers out of harm's way. Most woodworkers use a push stick, but I prefer the shoe—the pressure from the sole of the shoe helps keep the stock flat against the pivot or fence. When resawing with a fence, I use a thick featherboard for the same reason.

If you're resawing long stock without shop help, you'll need a saw stand—maybe two, one for infeed and one for outfeed. These support the portions of the stock that hang over the sides of the table. You'll also need safety glasses and a dust mask because, as you're about to find out, resawing kicks up a lot of sawdust. If you have a dust port on your bandsaw, hook this up to a shop vacuum or dust collector.