

# TABLESAW TUNE-UP

*What lies below the top needs attention, too*

In most cases the tablesaw is the heart of a woodworking shop. It comes in a wide variety of styles, power and in most cases accuracy. This article is dedicated to helping you achieve the maximum performance from your saw. Most open frame contractors saws are equipped with a single pulley drive system that drives a belt to the saw arbor. When you inspect an industrial saw such as Delta, Jet, Grizzly, Powermatic and others you will find that they are equipped with either a two or three belt drive system.

The transfer of power from the motor to the saw blade is what makes your saw perform. Using only one belt under heavy load conditions can incur slipping and the loss of power.

Most industrial supply houses carry pulleys and matched belt sets. Measure your pulleys and replace them with the same size that are double. Be sure and purchase machined pulleys rather than the inexpensive cast units. The machined pulleys track a set of belts much better than the cast. Don't increase the size of the pulleys as your manufacture has designed the saw to run at the proper speed for the blade size. Increasing the blade rim speed of the saw blade by increasing the pulley size can be dangerous to you and the saw.

If your budget will allow the expense, an up-grade in horsepower can be very beneficial. Many older saws came equipped with 1 HP motors. An up-grade to 2Hp or 3HP can make a real difference in performance.

## **Tablesaw Adjustments**

A properly aligned saw blade is one that is absolutely parallel to both the miter gauge slot and the rip fence so the blade is in line with the kerf that it makes in the wood as you cut.

When the blade is not aligned it is called heeling. A blade heels when it's out of alignment with the path of the cut. This is what happens when the blade is out. The front edge of the blade makes the initial cut in the work piece. Then as the work piece clears the teeth at the front of the blade and moves alongside the body of the blade, there's

a period of no contact. But as the work piece moves past the teeth at the rear of the blade there can be contact.

If there is contact, it is because it's heeling and the teeth at the rear are rubbing against either the right or left of the kerf.

The effect that heeling has on ripping stock is very apparent and in most cases can be very dangerous. If the rear of the blade is angled toward the rip fence the wood will be forced between the fence and the blade as the cut is made. This results in the cut edge being torn and usually burned as the teeth rub against the cut edge. In addition the motor is working harder and the blade may over heat.

The biggest problem is that a blade that heels to the right can be dangerous. During the ripping operation the workpiece is squeezed against the fence. As the cut continues, the workpiece contacts the teeth at the rear on the upward path and this tends to be lifted off the table. The combination of squeezing and lifting results in a nasty kickback.

If the rear of the blade heels away from the fence there are a different set of problems. The teeth press against the waste side of the workpiece. This pulls the piece away from the fence resulting in a slightly tapered cut.

When cross cutting with the blade out of alignment to the left, the blade will rub against the end of the cut. This causes the cut to either be rough or burned. When the blade is out to the right the effect is not as important as the blade does the damage to the cut off piece.

These problems are very easy to correct either with the contractors or industrial style saws. It will be necessary to move the trunions so the blade is parallel with the miter gauge slot. The trunions are the front and rear supports that holds, the saw arbor for the motor on direct drive saws to the table.

To align the blade to the miter slot you will need to fabricate a simple feeler gauge. This gauge is a small block of wood, attached to a runner that slides in the miter gauge slot. At the end of the block where it contacts the blade, is a small round head screw that allows you to make adjustments.

All measurements that you make have to be made on the same tooth of the saw blade. Use a black marking pen to mark the tooth. Place the adjustable feeler gauge in the left miter gauge slot and raise the

blade to its full height and rotate it so the marked tooth is just above the table. Then adjust the screw so that the head of the screw just touches the marked tooth.

Now rotate the blade so the marked tooth is at the rear of the table. Any gap or binding will indicate how much the blade is out of line.

To align the blade, loosen the bolts that secure the trunions to the bottom of the table. Then tap the rear of the trunion in the direction needed. Tighten the trunions and double-check both the front and the back. At this point the blade is aligned for cross cutting. The next step is to align the rip fence to the miter slot for ripping.

There are so many different fences on the market today and this explanation will fit most. Loosen the bolts that hold the head of the fence to the left miter gauge slot. One thing to keep in mind is that the left and the right slots may not be parallel. For this reason, align the fence on the edge of the left slot, which is the same as slot used to align the trunions.

Fine tuning a tablesaw has to be done occasionally. If you are getting rough or burned cuts, or if they are not square it is time for a tune-up.

## **Tablesaw Safety**

Most woodworking machines are dangerous to operate. The tablesaw and the shaper, in my opinion, are the two most dangerous machines in the shop. Shapers just because of the size of the cutters and the noise are very intimidating. Since we use a tablesaw 90% of the time, we many times become complacent in the operation that we are doing. Let me tell you that tablesaw has no conscience. It really could care less if it cuts off your fingers or the wood.

Kickback is the number one cause of most accidents and occurs when the board drifts away from the fence and pushes against the back of the blade. As the teeth come out of the backside of the saw, they lift the board off the table and launch it over the top of the blade. When this happens, the board is propelled with 3HP or more behind it into your body. After being a woodworker for over 25 years this happened to me. After a week in the hospital and over a month in recovery I'm firmly convinced that we can be careless in our operation, by being too confident. **Again tablesaws have no conscience!**

Splitters are designed to prevent kickbacks, and they do. They can be a real problem for many woodworkers, as they are not very well made in many cases. For the splitter to do its job, it has to be the same width as the blade. If the splitter is narrower than the blade, then it allows room for the board to slide away from the fence. If it is thicker than the blade, it forces the stock into the front of the blade and jams the board.

These are the rules at AFD for tablesaw usage. We, as in the past use zero clearance tablesaw inserts, feather boards and push sticks. We keep a well-tuned saw and the shop follows the following rules.

- Never stand directly behind the blade
- Make sure the blade is never more than 1/8" above the board being cut.
- Be aware of what the wood is doing at all times and be ready to react.
- Never back a board out of the cut.
- At the slightest hint that the board is bowing away from the fence, lift it out of the cut and above the blade. Then start again.

### **Things that you really need in your shop.**

Push sticks, push paddles, and push shoes. Push sticks lend leverage when guiding material through the cut. The notch allows you to hold the stick at an angle and keep your hand above the blade for safekeeping. Wider push sticks give more contact with the work piece. Just make sure the grain runs lengthwise so it will not break. On narrow stock a push shoe holds the stock flush to the tabletop. Push paddles offer the most control. If the material is heavy or wide, use the paddle for better control.

Zero clearance insets. A tablesaw insert prevents the loss of those thin strips in the wide clearance allowed by most factory inserts. They also reduce tear out by supporting the stock all the way through the blade. These can easily be made from cutting boards that are 1/2" thick. For \$5.00 you can purchase a cutting board from most stores and you will be able to cut at least three inserts on the bandsaw for your tablesaw. Drill a 3/4" hole in the insert to serve as an easy finger pull.

Feather boards. When they are clamped to your tablesaw they help the board ride the fence throughout the cut. Even if a board does wander from the fence, the feathered end helps prevent it from kicking back. They are easily made with scrap material and the bandsaw. The angled end should be about 30 to 40 degrees and the feathered kerfs bandsawn at about ¼" intervals. For heavy stock use wider and thicker featherboards.

Ripping. Before ripping a board to size, make sure you have a flat side against the fence. Do not stop the cut or reduce pressure until you have pushed the material through the blade. A sharp clean blade goes a long way toward keeping the operation safe. For general ripping use a 30 to 40 tooth blade.

Cross cutting. The safest and easiest way to cross cut is with a radial arm saw. But when you use the tablesaw, a sled is the safest method. There have been many articles written on how to build a sled. A basic sled is made of ½" plywood with runners in the miter guides slots and a square fence at the rear of the sled.

Observations. American Furniture Design does not recommend the removal of splitters, blade guards or other safety devices from tablesaws. We have found through the years that many woodworkers choose to operate tablesaws with out such devices. In some cases woodworkers own older machines or used tablesaws that came without the safety equipment. In these cases safety should be your number one concern.