

OPERATING PROCEDURE FOR:

Powermatic 16-32 Wide Belt Sander

INTRODUCTION:

The wide belt sander is a very valuable tool. It can be used to quickly sand boards up to 32" wide, and provide an exceptional finish. The finish obtained is better than that which can be obtained by an orbital sander, belt sander, or oscillating sander. The only additional sanding that should be done is after the project is assembled and ready for finishing. This sanding should be done by hand, using a sanding block, to remove any blemishes that occurred during fabrication and to remove any glue squeeze out.

The sander uses a sanding belt 17" wide and 54" long. This belt is installed over three horizontal rollers arranged in a triangular shape. The bottom right roller is rubber covered and drives the belt. The height of this roller above the conveyor belt determines the thickness of the sanded board. The bottom left roller is an idler and mounted slightly higher than the drive roller. The top roller is also an idler roller, but it also pivots laterally, left and right, at a regular frequency. This oscillation causes the belt to track left and right about 1/2" and prevents straight line scratches that would otherwise be noticeable. The board to be sanded rests on a horizontal conveyor belt. As the conveyor runs, it feeds the workpiece below the drive roller and causes the workpiece to be sanded. There are hold-down rollers at the infeed and outfeed of the sander that hold the workpiece tight against the conveyor belt so that the conveyor belt can feed the workpiece through the sander.

SAFETY RULES:

WARNING: Willful violations of these safety rules, disruptive actions or horseplay may result in loss of the privilege to use the tools and machinery in the workshop.

As with all machines, there is a certain amount of hazard involved with the use of this sander. Use the machine with the respect and caution demanded where safety precautions are concerned. **You are responsible for you own safety.**

Read and understand the operating procedures for this machine before attempting operation.

Personal Protective Equipment. At a minimum eye protection and hearing protection must be worn when operating this machine. Eye protection must be safety glasses with side shields, goggles, or face shield, which meet ANSI Z87.1. Remove tie and loose jewelry. Button sleeves or roll up sleeves above the elbow. Remove loose outer clothing and confine long hair. **Do not wear loose fitting gloves.** If gloves are worn, they must fit tightly to the hand.

Use the appropriate NIOSH approved respirator in dusty work conditions (N95, N100, P95 or P100). Wood dust has been listed as a known carcinogen by the U.S. government.

Guards. Ensure that the cabinet doors are closed when the sander is in operation.

Work Area. Keep the floor around the machine clean to minimize the danger of tripping or slipping. Make sure the dust collector is hooked up and operating.

Operator Position. Maintain a balanced stance and keep your body under control at all times, so that you do not fall or lean against the cutter or moving parts. Do not overreach or use excessive force to perform any machine operation.

Careless Acts. Give the work you are doing your undivided attention. Looking around, carrying on a conversation and “horseplay” are careless acts that can result in serious injury and loss of work shop privileges.

Disconnect machine before performing any service or maintenance. A machine under repair or when changing sanding belts must be Locked Out following the Club Lockout Procedure until the maintenance is complete.

Maintain Tools In Top Condition. Do not operate the sander with a worn-out sanding belt, or a belt that is torn. A worn-out belt generates excessive heat and can cause the belt to come apart. A torn belt is likely to break. In either case, the belt may get caught up in the sander and damage the drive roll or other machine components.

Hand Safety. Follow the 3” rule. Keep hands clear of the entrance area. Do not allow your hands to come within 3” of the opening into the sanding cabinet. Avoid awkward operations and hand positions where a sudden slip could cause your hand to enter the sanding cabinet. An orange Safety Bar is located at the front of the conveyor belt on the infeed side. Pushing or leaning against this bar will shutdown the sander and apply a brake that will stop the drive roller immediately.

Material Condition. Reclaimed or pressure treated wood is not to be sanded in this machine. Sand only flat, straight stock. Tapered workpieces can be sanded only if the workpiece is mounted in a Team Leader approved jig. Do not attempt to sand twisted, warped, bowed or “in wind” stock. Do not attempt to sand long or wide boards unless adequate supports are used to support the “off-conveyor belt” portions of the workpiece.

Stock Length. Never sand stock less than 14” in length unless it is secured in a Shop Leader approved jig or fixture. When possible, sand long stock and then cut it to length. Short boards can get stuck in the sander and cause the belt to break or damage the platen.

Machine Adjustments. Adjustments to the infeed and out feed pressure rollers and the platen are to be made only under the direction of the Shop Leader.

Sanding Belts. Use only sanding belts approved by the Shop Leader. Do not use sanding belts that are worn-out or torn. Use a sanding belt grit that is appropriate for the amount of material that needs to be removed.

Job Completion. If the operator leaves the machine area for any reason, the sander should be turned “off” and the belt should come to a complete stop before his departure. In addition, if the operation is complete, the operator should clean the sander and the work area. Never clean the sander with the power “on” and never use the hands to clear sawdust and debris; use a brush or shop-vac.

If you are not thoroughly familiar with the operation of the sander, obtain advice from the Shop Leader.

Drugs, Alcohol, Medication. Do not operate this machine while under the influence of drugs, alcohol, or any medication. Do not operate this machine if you are tired, sick, or distracted.

Familiarize yourself with all caution and warning decals used on this machine.

Capacities:

| | |
|----------------------------|-----------------------------------|
| Working Width | 16" (32" with rotation) |
| Working thickness | 5" |
| Minimum board length | 14" |
| Feed Speed | 15 ft/min (32.5 ft/min, optional) |
| Sanding belt speed | 2,200 ft/min |
| Sanding belt size | 17" wide x 54" long |
| Net weight | 996 lbs |
| Horsepower | 5 Hp, 1 phase, 230 volt |

ADJUSTMENTS:

Changing the sanding belt:

The sanding belt is tensioned using air pressure that raises the top roller, which is supported by a pneumatic cylinder. To change the sanding belt:

1. Lockout the sander using the Club Lockout Procedure.
2. Open both access doors. Both doors must be open to be able to see if the belt is installed properly.
3. Ensure that there is compressed air at the sander (you will hear the air flowing).
4. Release the air pressure that is supporting the top roller by turning knob (A) counterclockwise to the down position. Refer to Figure 1.
5. Grab the sand paper on both the infeed and outfeed sides and pull it from the sander.
6. The sandpaper belt is bi-directional. It can be inserted with either edge towards the inside. The direction of rotation arrows on the back of the belt are can be disregarded. Slide a new belt over all three rollers and push it in until the back edge of the belt cuts the air stream of the belt positioning monitor (the top roller will rotate forward). **CAUTION!** Check to ensure that the belt is in-between the forks of the belt position monitor. If the belt is not between the forks, it will tear when the machine is started. The torn/broken belt can do severe damage to the sander.
7. Rotate belt tensioning knob (A) clockwise to tighten the belt.
8. Grab one side of the sanding belt and pull down. If the belt does not move easily, check to see if the belt is in-between the forks of the belt position monitor. If the belt does not rotate easily, release the air pressure, remove the sanding belt and reinstall the belt as noted in step 6.
9. Close both access doors.
10. See below for how to set the table height for the initial sanding pass.

Platen height: The platen is an aluminum bar with a rubber strip attached to it that runs the width of the conveyor belt. There is also a graphite impregnated canvas sheet that covers the aluminum bar and rubber strip which rubs against the back of the sanding belt. The platen pushes down on the back of the sanding belt and is used to perform the final sanding after the drive roller removes most of the stock. The platen can be adjusted up and down to control how much stock removal is done with the drive roll and how much is done by the platen. If the platen is too high, the drive roll may leave waves in the surface of the workpiece that are not completely removed by the platen. If the platen is too low, the drive roller may not remove enough of the stock from the workpiece, resulting in an uneven surface. Ideally, the platen should remove about two-thirds of the material removed in each pass. If you inspect a sanded board in a raking light and can see a wavy surface, the platen may be too high. The waves left by the sander are much further apart than the ripples left by the jointer or planer, which are typically about 1/8" apart.

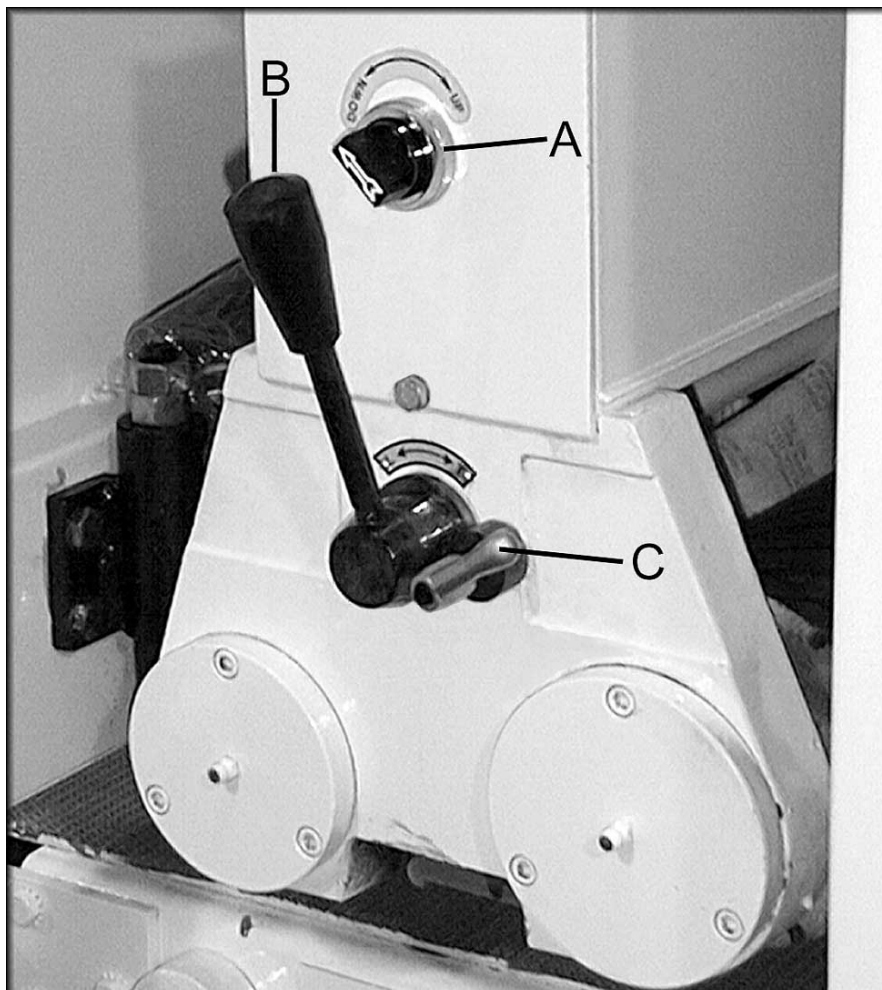


Figure 1. Sanding belt and platen adjustment controls.

Any adjustments to the platen height must be done under the direction of the Shop Leader.

To set the height of the platen:

1. Raise the platen all the way up by loosening the platen lock lever (C), and rotating the platen adjustment lever (B) counterclockwise. Refer to Figure 1.
2. Place a 6" or wider board, at least 12" long, that has been joined and planed on the conveyor belt and raise the bed until the sanding belt touches the top surface of the board. The board must be held tight against the conveyor bed by both the infeed and outfeed rollers.
3. Bring the platen into contact with the board by rotating the platen height adjustment lever clockwise, and while maintaining moderate pressure on it, tighten the platen lock lever (C).
4. Remove the board from the sander.

Adjustment of the side support arm:

The sander can sand a board up to 32" wide if the board is rotated 180 degrees after each pass. When sanding wide boards, keep as much of the board as possible on the conveyor belt. The remainder of the board rests on a support arm. The support arm runs parallel to the conveyor belt and is supported by two rods.

The position of the support arm can be moved laterally by pulling it away from or towards the conveyor belt. When sanding wide boards, the support arm should be positioned so that the board overhangs it by a few inches.

If the elevation of the support arm is higher than the conveyor belt, the sanded board will have a groove sanded into it. If the support arm is too low, the sanded board will have a hump in it. To prevent these defects, the support arm must be at exactly the same elevation as the top of the conveyor belt.

Adjustments to the support arm are to be done under the direction of the Shop Leader.

To adjust the support arm:

1. Cut a piece of 3/4" MDF to 20" wide by 32" long. MDF is required because the board must be perfectly flat. Do not use hardwood boards or plywood for this.
2. Pull the support arm out to the position needed to support the workpiece.
3. Place the MDF on the conveyor belt so that the 20" wide portion is centered under the infeed and outfeed rollers.
4. Raise the conveyor up so that the sand paper is just touching the MDF.
5. Loosen the bolts that attach the support arm to the rods.
6. Raise the support arm so that it is tight against the MDF and clamp the MDF to the support arm using quick grip clamps. Do not use large, heavy clamps. They may cause the MDF to deflect.
7. Tighten the bolts that attach the support arm to the rods.
8. Remove the clamps and remove the MDF from the sander.

OPERATING CONTROLS:

Compressed air supply. The sander uses compressed air to tension the sanding belt and to oscillate the belt from side-to-side. Operating the sander with no compressed air can cause the sanding belt to break and cause severe damage to the sander. Prior to starting the sander, turn on the air compressor, open the block valve at the outlet of the air compressor tank and open the block valve at the inlet to the pressure regulator mounted at the rear of the sander. Refer to Figure 2. Adjust knob (A) to maintain a pressure of about 75 psig. An interlock will prevent the sander from starting if the air pressure is less than 75 psi. If the sander abrasive belt drive roller or the feed conveyor will not start, verify that the air is turned on and above 75 psi.

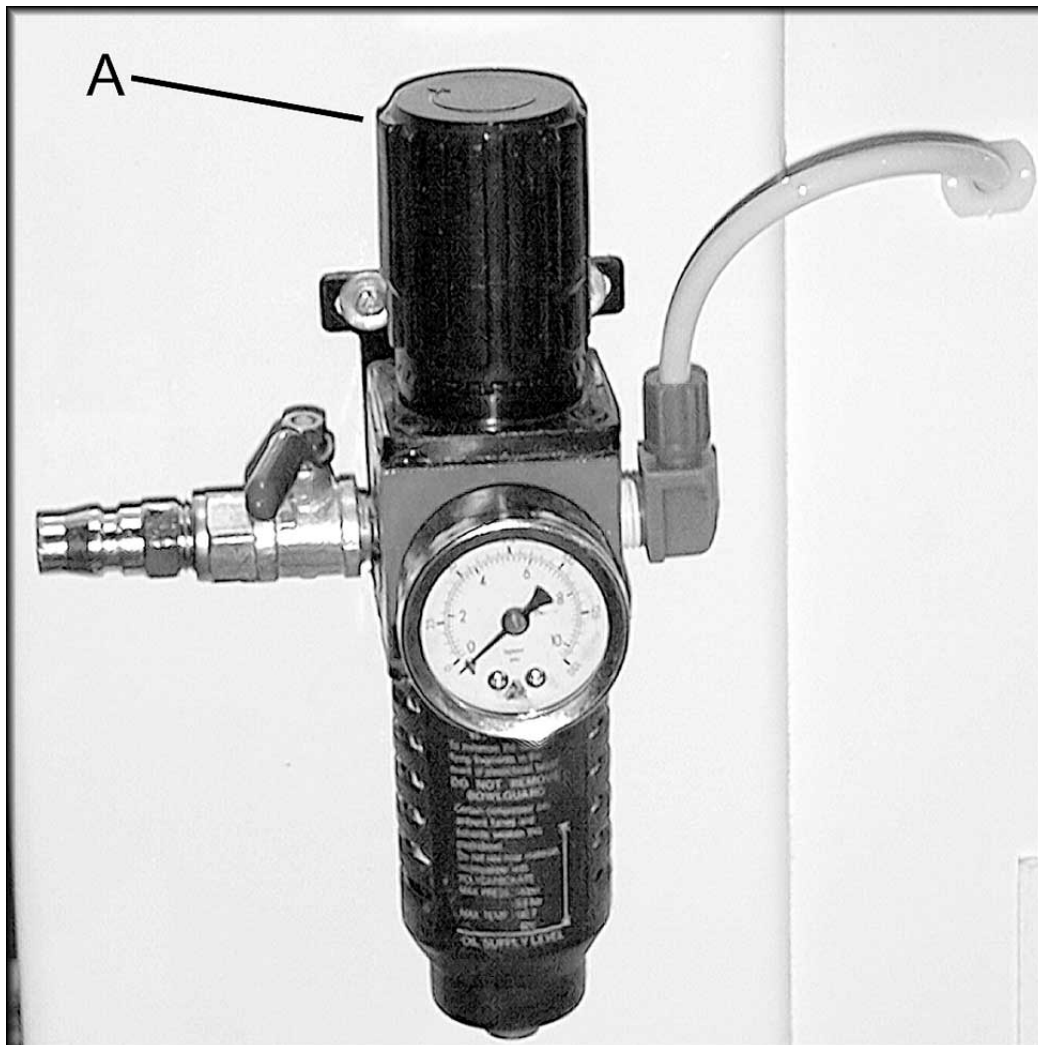


Figure 2. Air pressure regulator for sander

Start – Stop Switches. The Start-Stop switches are located on the control panel above the infeed side of the conveyor (Refer to Figure 3). There are separate start switches for the conveyor belt (feed) (C) and the sanding belt (E). There are also separate stop switches for the conveyor (D) and the sanding belt (F). During normal operation, start the sanding belt first and

then the conveyor belt. As a general rule, it is best to start the larger motor first to minimize the high current draw when the second motor is started. An emergency stop button (A) is located at the bottom of the panel. Pushing it stops both the sanding belt and the conveyor belt and applies a brake that stops the sanding belt in a second. Use this button for emergency stops only, to minimize the wear of the brake system. The orange bar at the inlet end of the conveyor also activates the emergency stop if pushed.

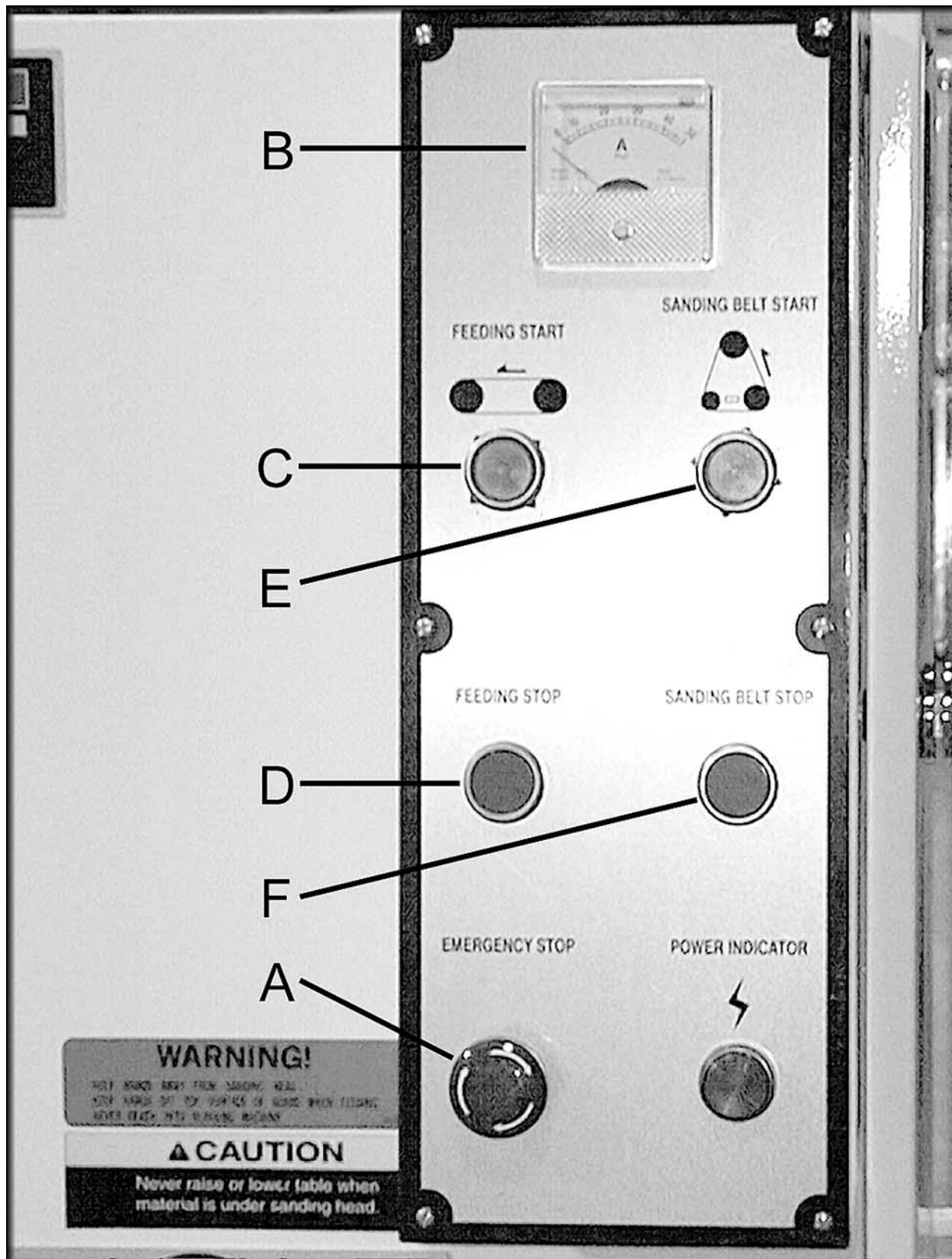


Figure 3. Control panel

Safety Switches - There are safety switches mounted near the top roller on both sides of the belt that will stop the sander if the belt touches either one while it is oscillating back and forth. The safety switches are there to prevent the belt from tracking off of the top idler roller. If the sanding belt trips one of these switches, loosen the sanding belt by turning knob (A) in Figure 1 counter clockwise. Reposition the belt and retighten the sanding belt. Restart the machine. If the problem persists, notify the Shop Leader so he can adjust the tracking mechanism.

SETUP and OPERATION:

Adjusting the table height. The height of the conveyor belt determines the gap between the conveyor belt and the drive roller. This determines how much material will be removed in each sanding pass. The height of the conveyor must be set so that the proper amount of material is removed in each pass. If too little is removed, the time to sand the workpiece will be extended. If too much is removed, the belt can become clogged with resin, which will then burn a line on all boards that are subsequently sanded. As the belt contacts the workpiece, it not only removes material, it also generates heat. As the belt leaves the workpiece, travels up to the top idler roller and back down to the drive roller, it cools as air flows past it from the dust collection system. If the amount of material removed is too high, the belt will not cool sufficiently before it contacts the workpiece again. This results in a hot belt that melts the resin in the wood. Some of this melted resin remains on the belt and forms a hard deposit. This deposit covers the sanding grit and prevents it from doing any sanding. The hard resin just rubs against the wood and generates more heat, which melts more resin, and clogs up the belt more. The result is burn stripes on the workpiece. Once the belt has resin stuck on it, it is ruined and must be replaced. At a cost of about \$50 each, this is not acceptable.

To set the height of the conveyor for the initial pass:

1. Ensure that the air is on to the sander and that the sanding belt is tight.
2. Lower the conveyor so that the board can be easily slid in.
3. Place the board to be sanded on the conveyor belt so that it is located below both the infeed and outfeed rollers.
4. Raise the conveyor belt until the sanding belt appears to almost touch the workpiece.
5. Start only the conveyor belt and immediately start raising the conveyor. When the sanding belt starts to drag on the workpiece (you will see the drive roller start to rotate), stop raising the conveyor belt. This is the setting for the first pass.
6. If the board exits the sander before the drive roller starts to turn, refeed the board and continue to raise the conveyor.
7. Shut off the conveyor belt.

Once the table height is set, the sander can be used to sand all boards of this thickness. If additional boards are to be sanded that are another thickness, you will need to go through steps 1 – 7 again.

The amount of material that can be removed per pass is dependent on the type of wood, the feed rate, and the grit of the sanding belt. Refer to Table 1 for recommendations on how much to raise the conveyor table for each pass.

CAUTION! Removing too much material in one pass will cause the sanding belt to overheat. This will cause the resins in the wood to polymerize and stick to the sanding belt. These globs of resin on the belt will prevent the sanding belt from sanding in those areas and will cause burn streaks on the wood. If this occurs, the sanding belt is ruined and so is your workpiece.

Sanding a board. Prior to sanding the board:

1. Make all adjustments described above.
2. Turn on the dust collector and open the blast gate at the sander.
3. Open the air supply to the sander

When you have completed the above:

1. Start the sanding belt drive.
2. Start the conveyor belt drive.
3. Feed the board into the sander. As you make additional passes, try to use the entire width of the sanding belt so that it wears uniformly.
4. Retrieve the board from the outfeed rollers.
5. Inspect the board to determine if additional sanding is needed. If so, continue to step 6.
6. Raise the conveyor table by no more than the amount shown in Table 1, and feed the board through again.
7. Repeat steps 5 & 6 as necessary.
8. Turn the board over and repeat steps 5 & 6 until the desired thickness and finish is achieved.

Multiple boards may be fed side-by-side, if desired. Multiple boards may be fed end-to-end if desired.

Table 1
Wide Belt Sander Guidelines

| Belt Grit | Depth of Scratch | Turns of Handwheel to Remove Scratch from This Grit | Maximum Stock Removal | Turns of Handwheel |
|-----------|------------------|---|-----------------------|--------------------|
| 60 | 0.013" | 1-5/8 | 0.024" | 3 |
| 80 | 0.011" | 1-3/8 | 0.020" | 2-1/2 |
| 100 | 0.007" | 0-7/8 | 0.012" | 1-1/2 |

| | | | | |
|-----|--------|-------|--------|-----|
| 120 | 0.006" | 0-3/4 | 0.008" | 1 |
| 150 | 0.004" | 0-1/2 | 0.009" | 1 |
| 180 | 0.003" | 0-3/8 | 0.004" | 1/2 |
| 220 | 0.002" | 0-1/4 | 0.003" | 3/8 |