Millwork & Joinery Safety Clearance

Shop Rules

1. Be Safe

Get Safety Clearances
Wear Protective Equipment
Watch and Reset Equipment After Use

2. Take Care of the Tools

Get Clearances
Do Not Alter or Use Equipment Beyond Limits
Notify When Maintenance Is Needed

3. Keep the Shop Clean

Clean Up After Yourself
Return Tools to Their Original Locations
Pay for Overnight or Monthly Storage

General Safety

1. Always use eye and hearing protection.
2. Do not wear loose clothing, long sleeves, jewelry, or gloves. They will get caught in moving parts and cause severe harm.
3. Wear close toed footwear.
4. Clean as you go. Keep the floor free of debris and accumulated sawdust.
5. Use the appropriate Dust Collection.
6. Maintain a balanced stance at all times. Do not lean in to the cut or overreach.
7. Disconnect the power before servicing a machine.
8. Cuts should always be made **with the grain**. Cutting against the grain leads to tearout, chatter, and in extreme cases, tool binding and kickback.
9. If any adjustment crank feels stiff, STOP and check the lock-knobs or accumulated sawdust.
10. If you feel unsure of something, feel free to ask.

Jointer (AKA surface planer)

Usage Highlights:

1. DO NOT adjust the outfeed table. The machine will bind and kick back if it is not perfectly adjusted to the height of the cutter.
2. Keep hands well away from the cutter, and never push on stock above the cutter.
3. Do not turn the lateral fence movement crank without unlocking the ways. It will immediately strip the gears.
4. Chips will gradually build up behind in the dust collection boot. Watch for excessive chip ejection around the cutter and machine base. Clean the chute when needed.
5. Do not cut engineered products on the jointer as they are prone to chipping, causing kickback and projectiles. It is also particularly damaging to the cutters due to the staggered grain orientation.

Machine Anatomy:

On/Off/Emergency Buttons – The green button is used to turn on the machine and the red button is used to turn it off. The larger emergency stop button can be easily pressed to stop the machine. If the e-stop was used to stop the machine, you must twist the knob to deactivate the e-stop before the machine can be started again. It is spring loaded and will pop out towards you when deactivated. During normal usage it is better to use the off button instead of the e-stop.

Cutter – This jointer has a helical cutter head that holds many replaceable carbide inserts. Maintain a safe distance from the cutter. Never push downward above the cutter, and be aware that the cutter may throw the workpiece out of the machine, leaving the cutter exposed to nearby flesh.

Blade guard – This guard style is sometimes called a 'chopstick' style due to it's shape. It should be pushed easily out of the way by the workpiece when you are pushing it across the infeed table towards the cutter. Do not try to prop it open or open it manually while the cutter is moving.

Infeed table – The workpiece begins on this surface and is pushed towards the cutter head. The depth of cut is determined by how far the infeed table sits below the apex of the cutter head's arc.

Infeed height adjustment crank – Use this to raise and lower the infeed table to adjust the depth of cut. Take multiple light cuts for better control and cut quality.

Outfeed table – The workpiece ends on this surface after the cut is performed. The height of this table should always match the apex of the cutter head's arc.

Outfeed height adjustment crank – DO NOT USE THIS unless the jointer is out of calibration and you are familiar with fine-tuning the cut quality.

Fence Position Lock – Secures the fence in it's lateral position with regards to the cutter head.

Fence Position Crank – DO NOT USE unless you have unlocked the fence. The gears are VERY easily damaged. Used to move the fence back and forth across the length of the cutter head. It is preferable from a safety standpoint to have the fence close to the operator, as less of the cutter can be exposed. Always unlock the fence before moving it.

Fence Angle Lock – Secures the fence's angle with regards to the outfeed table.

Fence Perpendicular Stop – Provides quick indexing of the fence to perpendicular.

Fence – It can be moved laterally and angled with regard to the outfeed table. Normally the fence is set to be perpendicular to the outfeed table. Always check your desired angle with a quality square or gauge. The fence does not need to be perpendicular to the rotational axis of the cutter, only to the plane of the outfeed table.

Basic Operation:

- ☐ Turn on dust collection.
- ☐ Adjust the depth of the cut.
- ☐ Place the workpiece with its widest, most stable surface on the infeed table. If it is cupped, place the cupped side facing down.
- ☐ Turn on the motor.
- ☐ Using a push block to gently keep the workpiece from being lifted off the table by the cutter, push the workpiece across the cutter to the outfeed table. Do not push down on the middle of the workpiece as it passes over the cutter head or you will not be

flattening the workpiece. Use a push block at the trailing end of the workpiece to finish the cut without endangering your fingers.

- [ ] Repeat until the cutter takes off an even amount across the entire width and length of the workpiece.
- [ ] Flip the workpiece on edge so the flattened side is against the fence.
- [ ] Repeat the cutting procedure until the second edge is also flat.

Resaw BandSaw

Usage Highlights:

1. Tension the blade before use. Loosen blade when done.
2. Do not put round stock through the saw unsupported. When cutting cylinders, Use a jig to prevent them from spinning or twisting, and keeping their orientation straight and true as the cut is made.
3. Do not cut lumber that has nails or loose knots.

Machine Anatomy:

On/Off/Emergency Buttons – The green button will turn the machine on, and the red button will turn it off. The larger emergency stop button can be easily depressed to stop the machine in an emergency. Pull the knob towards you to deactivate the emergency stop. During normal usage it is best to use the off button instead of the e-stop.

Tension Lever – Allows the blade tension to be quickly applied or released. It must always be fully tensioned before the saw is turned on. Please release the tension from the blade after cutting in order to prevent blade fatigue and flat spots on the wheels.

Guard Door – The upper and lower doors must be closed when operating the machine. They prevent accidental contact with the blade as well as contain the majority of the blade when the blade breaks.

Blade guard lock knob – Always loosen this before adjusting the blade guard height and tighten after the blade guard is at the appropriate height to prevent it from moving during a cut.

Blade guard – unlock the blade guard before adjusting the height. Keep the guard at a height that will allow the stock to pass below it without making contact, but will prevent your hand from fitting between it and the stock.

Thrust Guide – Should be positioned approximately 1/16th inch behind the blade. This provides a small amount of flex towards the rear, but prevents the blade from either rubbing against the guide when idling, or being pushed off the wheel when in a cut.

Blade Guides – Should be positioned as close to the blade as possible without scraping the blade when idling. The front edge of the guides should be close to, but should not cover any part of the tooth profile.

Blade – The resaw blade has a large tooth spacing, allowing thick stock to be cut without the swarf getting packed into the gullet. Stock should be checked to make sure that at least two teeth will be buried in the material at all times during a cut. Failure to do this can result in individual teeth getting knocked off of the blade, damaging it irreparably. If a tooth is broken, stop using the saw immediately and report the issue.

> **** Safety Hazard****
> If the blade binds in the cut, POWER THE MACHINE OFF IMMEDIATELY! Keep the workpiece stable until the motor has been disconnected from power and has stopped completely.
>
> Under normal use, the blade will eventually break. This will usually be preceded by a rhythmic pulsing as a developing crack in the blade passes through the workpiece. If you experience this pulsing, stop and inspect the blade for damage. Remove a cracked blade from service immediately.
>
> Do not back out of a cut while the blade is running. The blade will be pulled off of the front edge of the wheels, creating a safety hazard and causing irreparable damage to the machine.

Table – Anything put through the saw should have at least one flat surface that can be presented to the table. Any twisting of the material will result in the blade binding in the cut, breaking the blade, and possibly breaking critical parts of the machine. Any workpiece that does not have at least one flat edge MUST be secured in a jig or sled in order to safely perform a cut. Once a single cut has been made, that fresh edge can be used against the table when making subsequent cuts.

Fence – Once a workpiece has two straight edges, use the fence to cut parallel slices off of the workpiece. The tall fence provides significant support when ripping tall, thin stock and making veneers. Often a dull or misaligned blade will cause the workpiece to wander away from the fence, causing a crooked cut. Watch your cut carefully and support your workpiece firmly against the fence to prevent this.

Throat – The saw passes through the table via the throat. No material should be used that is thin enough to be pulled down into the throat. Do not attempt to clear debris out of the throat unless the blade is fully stopped.

Brake Pedal – After turning off the motor, the brake pedal may be used to bring the blade to a stop before leaving the machine.

Push Stick – As you approach the end of a cut, you do not want your fingers to get close to the blade. Use a push stick to push your workpiece all the way past the blade. They are often sacrificial, and you can push the tip of the stick straight into the blade (assuming it is of an appropriate size for the tooth pitch)

Basic Operation:

- ☐ Loosen the blade guard lock knob.
- ☐ Adjust the blade guard to just above the height of the workpiece.
- ☐ Adjust the fence to the desired cut width.
- ☐ Make sure there will be sufficient support available at the infeed and outfeed through the entire cut.
- ☐ Turn on dust collection.
- ☐ Turn on the saw and let it spin up to full speed.
- ☐ Holding the workpiece firmly against the table and the fence, feed it into the blade.
- ☐ Feed slowly but consistently through the length of the cut, making sure the workpiece does not twist or wander away from the fence.
- ☐ As you reach the end of your cut, be mindful to keep your fingers away from the blade. Use a push stick to feed the trailing end of the workpiece past the blade.
- ☐ Turn off the saw and ensure that the blade stops before leaving the area.

Planer (AKA thickness planer)

Usage Highlights:

1. Do not over-tax the motor. Be prepared to quickly lower the table if the motor starts to bog.
2. Turn the crank no more than half a turn between cuts. 1/3 crank is often plenty.
3. Once a piece has started, it must pass completely through the machine.
4. If the table was lowered to relieve the motor, start the next cut from the current table position, not the height of the front of the material.
5. Never attempt to plane engineered products like MDF, plywood, particleboard or chipboard. They will splinter and the resulting shrapnel can injure you and damage the machine.
6. Do not attempt to plane stock shorter in length than the distance between the feed rollers.

Machine Anatomy:

On/Off Switches – The green button is used to start the machine and the red button is used to stop the machine. There is no e-stop on the planer.

Screw Posts – Adjusts all four corners of the table simultaneously, keeping it flat regardless of the height.

Lock Knobs – Locks the table to the screw posts. These must be loosened before adjusting the table height, and should be tightened while cutting to keep the table from drifting during an operation and to help prevent chatter. In daily use these are often not locked (against manufacturer's instructions) when making a series of cuts at different thicknesses to the same workpiece, but should definitely be locked if feeding multiple pieces through that should end up being the same size.

Height Adjustment Crank – Moves the bed up and down. A half of a crank is the maximum depth adjustment that should be made between cuts. Limiting the depth change to a third of a rotation will help prevent bogging.

Cutter housing – Stays stationary over the table. Houses the cutter head, infeed and outfeed rollers, and kickback pawls.

Kickback Pawls – Prevent the workpiece from being ejected from the front of the machine. Once they engage with the workpiece, the workpiece should be run through the machine. In severe situations when the material has bound or failed in some fashion, the machine should be turned off, the table lowered, and the material manually pulled out the back of the machine.

Infeed Roller – The infeed roller is a toothed roller powered by the motor that pulls the material toward the cutter head. At no time should your hand be remotely close to the infeed roller. The roller will embed itself into the surface of the workpiece, so if the depth of cut is too shallow, perpendicular lines will be visibly imprinted in the surface of the workpiece when it exits the machine. When the infeed roller first grabs the workpiece, it can sometimes lift it off of the infeed table briefly, creating a pinching hazard. Keep your hands away from the bottom of the workpiece when feeding it.

Cut Depth Limiter – This prevents the user from running a wide board at the maximum depth of cut. Narrower boards can be run through to one side or the other at a deeper cut, but it can be used as a good guide for determining a good height for your first cut. Do not crank the workpiece upward underneath this, potentially damaging the height screws or table. Instead, adjust the table height, then check to see if the workpiece fits under the limiter.

Power Feed Handle – Adjusts the speed at which material is fed past the cutter head. Leave this pulled out to the 16FPM position. It is less taxing on the motor and yields a better surface finish. This should only be moved when the machine is running.

Support Rollers – Use to easily return stock to the front of the machine for subsequent cuts.

Digital scale – Conveniently measure the depth of your cuts. Take a skim cut and zero the scale. Measure the thickness of your workpiece and determine how much material you wish to remove. Move the table until the scale indicates the appropriate distance has been moved.

Basic Operation:

- ☐ Place the workpiece on the infeed table.
- ☐ Unlock both lock knobs.
- ☐ Adjust the table height so that the workpiece barely fits under the cut depth limiter.
- ☐ Lock the lock knobs.

- ☐ Turn on dust collection.
- ☐ Make sure the workpiece is not engaged with the kickback pawls or infeed roller.
- ☐ Turn on the motor.
- ☐ Push the workpiece slowly into the machine until the infeed roller engages.
- ☐ Allow the feed rollers to pull the workpiece completely through the machine.
- ☐ Support the workpiece at the front and rear of the machine as necessary.
- ☐ Remove the workpiece from the outfeed table once the outfeed roller has disengaged.

Drum Sander

Machine Anatomy:

Sanding Drum – Rotates as the workpiece moves past. Wrapped with a strip of abrasive (usually 80 grit sand paper) which is held in place on both sides with clips embedded in the drum. The abrasive should be inspected before each use to ensure that it is not scorched, overloaded, or loose on the drum.

Drum Power Switch – Turns the drum motor on and off

Feed Table – Moves the workpiece past the bottom of the sanding drum. The edge should be visually inspected before each use to make sure it is centered in the guide tracks.

Table Speed Knob – Adjusts the speed at which the table moves. Make sure the drum motor is turned on before engaging the table feed.

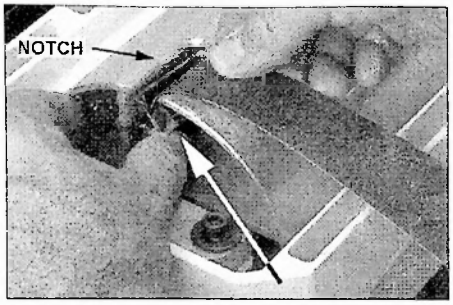
Height Adjustment Crank – Moves the drum up and down with respect to the feed table.

Basic Operation:

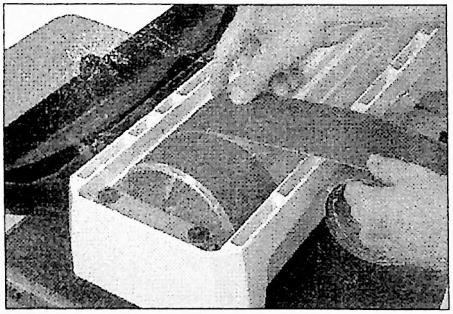
- ☐ Open the cover.
- ☐ Raise the drum using the Height Adjustment Crank.
- ☐ Place the workpiece below the drum.

- [ ] Lower the drum until the drum barely touches the top of the workpiece. Check this by moving the drum by hand. **DO NOT TURN ON THE DRUM MOTOR.**
- [ ] Use the table feed to move the workpiece out from under the drum.
- [ ] Close the cover.
- [ ] Turn on dust collection.
- [ ] Turn on the drum motor and feed the workpiece once all the way through.
- [ ] Adjust the drum height for the next pass and repeat as needed.

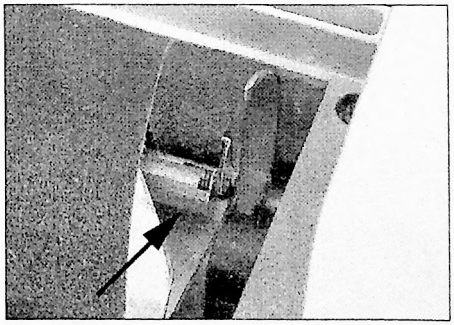
Installing & Tightening Abrasive Paper



- ☐ Press the fastener lever on the left end of the drum
- ☐ Insert the tapered end of your abrasive strip through the slit in the fastener until the right edge aligns with the reference notch
- ☐ Ensure the tapered edge of your strip is aligned with the left edge of the drum
- ☐ Release the lever to secure in place



- ☐ Wrap the strip in a spiral fashion by rotating the drum while you guide the strip
- ☐ Ensure the spiral does not overlap at any point
- ☐ Make sure it's flush and without large gaps



- ☐ Press the inboard take-up lever
- ☐ Insert the end of the strip as far as it will go
- ☐ If necessary, trim the tapered end of the strip
- ☐ Release inboard take-up lever to secure