Band Saw Safety Rules

20” MiniMax and 28” Felder 710

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.

The Band Saw has a thin vertical blade that allows cutting curves, resawing, and large depth cuts on thick material. To avoid accidents, the following operational safety rules must be observed by everyone using the CLUB’s 20” Mini Max and Felder 28” Band Saw’s. Failure to follow the safety rules will result in a loss of shop privileges.

These bandsaws are designed solely for sawing wood and similar machinable materials. This includes all wood-based materials like chip-board, OSB panels, MDF, and plywood.

As with all machines, there is a certain amount of hazard involved with the use of these band saws. Use the machine with the respect and caution demanded where safety precautions are concerned.

DANGER! The blades on these saws are very sharp and can easily cause serious bodily injury or death.

Read and understand these operating procedures and safety rules for these machines 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 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 (N95, N100, P95 or P100). Wood dust has been listed as a known carcinogen by the U.S. government. The dust collection system on these saws only captures a portion of the sawdust generated. A respirator must be worn while using these saws.

Guards. Keep the machine guards in place for every operation for which they can be used. Ensure that both wheel cover doors are closed when the saw is in operation. They are interlocked with the starting circuit and the machine will not run if either is open.

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

Keep bystanders away from the work area of the saw. Broken blades have a tendency to fly out to the right.

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 blade 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. Day dreaming, 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 must be Locked Out following the Club Lockout Procedure until the maintenance is complete.

Maintain Tools In Top Condition. Do not operate the band saw with a dull or badly worn blade. Keep the blade sharp and clean for safe and best performance. If the blade is dull, please notify the Shop Leader.

Hand Safety. Keep hands clear of the cutting area. Maintain a distance of 3" from the blade. Use a stick to move off-cuts away from a moving blade. Never clear small pieces with your hand while the blade is moving.

Never use your thumbs to push toward the blade. Use a push stick.

Material Condition. Reclaimed or pressure treated wood is not to be cut on this machine. Don't cut stock that is not flat on the bottom without a jig that will hold the work in a stable position.

Blade Changes. All blade changes are to be performed under the direction of the Shop Leader**. The teeth of the band saw blade should point down toward the table and facing the operator.**

After changing the blade, the alignment of the blade on the wheels must be established and the blade guides and thrust bearing must be reset to their correct position.

DANGER! Always wear gloves when replacing the blade and coiling/uncoiling the blade. The blade teeth are very sharp.

Blade Guides: Both bandsaws use blade guides to support the blade laterally and a thrust guide to provide support to the back of the blade. The minimax bandsaw used tungsten carbide guides on either side of the blade and a thrust bearing behind the blade. The Felder bandsaw uses ceramic guides on both sides of the blade and behind the blade. Functionally, both guide systems work the same, but the setup is different and will be done by the Shop Leader. The lateral blade guides should be very close to the blade, but not touching. The blade should be 1/64" from the thrust bearing, or ceramic block, behind the blade. If this is not the case, ask the Shop Leader for assistance.

Machine Adjustments. Make all blade guide adjustments with the band saw locked out following the Club Lockout Procedure. Blade tracking, blade guide thrust bearings and blade guide adjustments are only to be made under the direction of the Shop Leader.

Work Area. A three-foot perimeter around the saw should be kept clear of people, debris and sawdust that might impair traction or footing to avoid slips and falls.

Remove loose fitting clothing, jewelry, and tie back long hair.

Give the work your undivided attention.

Job Completion. If the operator leaves the machine area for any reason, the bandsaw must be turned "off" and the blade should come to a complete stop before his departure. In addition, if the operation is complete, the operator should clean the bandsaw and the work area. Never clean the bandsaw with the power "on" and never use the hands to clear sawdust and debris; use a brush.

If you are not thoroughly familiar with the operation of the bandsaw, 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, 20" MiniMax:

Throat Capacity (left of blade)	18-1/2"
Height Capacity	20"
Table Tilt	-10º L, 45º R
Blade Size Range	1/8"- 1-1/2"
Standard Blade Length	171"
Blade Speeds	5000 FPM
Horsepower	4.8

Capacities, 28" Felder 710:

Throat Capacity (left of blade)	27-1/8"
Height Capacity	18-1/8"
Table Tilt	-5° L, 45º R

Blade Size Range .....1/4"- 1-3/16"
Standard Blade Length.....201-1/2"
Blade Speeds.....4055 FPM
Horsepower.....7.5

The band saw is one of the most versatile wood cutting tools in the shop. It is capable of performing many different cutting functions including but not limited to:

Straight Cuts

- Miters
- Angles
- Compound Angles
- Resawing
- Ripping
- Crosscutting

Irregular Cuts

- Simple and Complex Curves
- Duplicate Parts
- Circles
- Beveled Curves

When making straight cuts, the rip fence or miter gauge should be used. Use a push stick to push the stock past the blade when using the rip fence.

When making curved cuts, circle cuts, or other cuts where the fence or miter gauge are not used, extreme care should be taken to keep your fingers away from the blade.

The number of TPI and the blade type will determine the smoothness of the cut. In general, the more TPI, the smoother the cut surfaces will be. However, as the number of TPI increases, the tendency of the blade to bind, heat up and burn the stock increases because the blade has trouble removing the sawdust from the cut. This can also result in a broken blade and personal injury. As a result, a slow or very slow feed rate may be needed. If this is the case, it may be better to go to a blade with fewer TPI. Regardless of the blade used, the blade will not produce a smooth finished surface. After cutting out the stock, it will be necessary to sand or machine the stock to the final size. When feeding stock into the blade, keep the blade just outside of the cut line. This will permit sanding or machining to the cut line to obtain a smooth surface.

In general, the widest blade that will permit cutting the radii should be used because this minimizes the flexing of the blade (in the direction of the cut) which increases the life of the blade and minimizes the potential for the blade breaking. The number and type of teeth on the blade will affect the quality of the cut and the ability of the saw to make the cut. For thick stock or resawing, a blade with few teeth and large gullets should be used, such as a 2 or 3 teeth per inch (TPI) hook tooth blade. For stock about 2" thick or thinner, a 6 or 8 tooth per inch blade usually works well. For additional recommendations, refer to Figure 1.

Figure 1. Band Saw Blade Recommendations

Blade width x TPI	Stock Thickness Range, inches	Radius of Cut, inches
1/8 x 14	0 – 2	7/32

3/16 x 4	0 – 6	3/8
¼ x 4	2-1/2 - 6	5/8
¼ x 6	¾ x 2-1/2	5/8
¼ x 8	¾ x 1-1/2	5/8
¼ x 10	0 – ¾	5/8
3/8 x 3	6 – 10	1-1/4
3/8 x 4	2-1/4 – 6	1-1/4
3/8 x 6	¾ x 2-1/2	1-1/4
3/8 x 8	¾ x 1-1/2	1-1/4
3/8 x 10	0 – ¾	1/1-4
½ x 3	6 – 10	2-1/2
½ x 4	2-1/2 – 6	2- 1/2
½ x 6	¾ - 2-1/2	2- 1/2
½ x 8	¾ - 1-1/2	2-1/2
¾ x 2/3	8 – 12	5-7/16
¾ x 3	6-10	5-7/16
¾ x 4	2-1/2 – 6	5-7/16
¾ x 6	¾ - 2-1/2	5-7/16
1 x 3	3-10	7-1/8
1-1/4 x 1.6 Carbide VT	3-15	N/A

Data from Suffolk Machinery; www.suffolkmachinery.com

When making a curved cut, turn and feed the stock carefully so the blade follows the cut line without twisting. When making curved cuts, try to pivot the stock around the center of the arc that is being cut. This will help in obtaining a smooth curve and following the cut line. Always push the stock so that the cutline is aligned with teeth of the blade and the back of the blade. There must be no sideways pressure on the blade. It is difficult to backup when making curved cuts and when doing so, the blade may be pulled off the wheels causing it to break and possibly causing personal injury. In order to minimize the need to back up, ensure that the blade width is small enough for all of the radii to be cut (Refer to Figure 1). It is also helpful to make relief cuts from the edge of the stock to the cut line. This will allow waste material to be removed as the cuts are made, and prevent the blade from binding. If you need to back out of a cut, shut the machine off, wait for the blade to stop, and then carefully back out. If the stock cannot be easily removed: Lockout the band saw; slowly rotate the upper wheel backwards by hand as you pull the stock back through the cut. Verify that the blade has not come off of the wheels prior to restarting the band saw.

Never back out of a cut containing curves while the machine is running. However, if the cut is straight, with no curves, you may be able to slowly back up. Watch the blade closely. If it starts to hang-up, stop the saw.

The position of the blade on the wheels is adjusted by tilting the upper wheel with the tracking adjustment knob. Tilting the upper wheel towards the operator causes the blade to track towards the back of the wheel. Tilting the wheel away from the operator causes the blade to track towards the front of the wheel. For best performance, the blade should be positioned at the center of the upper wheel. This position also minimizes and may eliminate drift, the tendency of the saw to cut

at an angle instead of straight. Tracking at the center of the wheel may not be possible with narrow blades due to the limitations of the thrust bearing position. Every time a blade is changed, the position of the blade on the wheel should be checked and adjusted as necessary. A blade change also necessitates resetting the blade guide rear thrust bearing and the guide blocks.

The blade tension of the blade is adjusted with the blade tension adjustment wheel. Turning the wheel clockwise tightens the blade on the MiniMax and loosens the blade on the Felder. The amount of tension on the blade is measured by means of a scale on the inside of the upper wheel support column. The tension should be adjusted so that the scale reads the blade width. The blade should be tensioned at the same time the blade tracking is adjusted because the blade tension affects how a blade tracks and the blade tracking affects the blade tension. If the blade tension is too loose, the blade may wander in the cut; if the blade tension is very loose, the blade may come off the wheels or break. If the blade tension is too tight; the saw and its bearing can be over stressed and cause permanent damage or failure or blade breakage. Over tightening also can deform the rubber tires around the wheels and cause flat spots that can cause vibrations, rough cuts and difficulty in maintaining proper blade tracking. When done using the saw for the day, the blade tension is to be removed by turning the blade tension wheel such that the tension reading is zero.

The upper and lower blade guides steady the blade and keep it from moving out of position. The blade guides should be positioned so that they are as close to the workpiece as practical. Lower the blade guides so that you can see the cut line, but no more. About ½" is usually the right height. Remember to tighten the guide height lock wheel prior to beginning to cut or make any adjustments to the guides. The blade guides on the side of the blade should be positioned so that there is a small amount of clearance on each side equal to about the thickness of a sheet of paper. If the blade guides are too close, or not centered on the blade, the blade will rub hard against them and become work hardened. This can cause the blade to break. If the guides are too loose; the blade will wander and make it more difficult to follow the cut line. The front edge of the blade guides should be positioned about 1/32" behind the gullet of the blade teeth to achieve maximum blade support. The rear blade guide thrust bearing should be positioned about 1/64" from the blade. This is equivalent to the thickness of a dollar bill if folded in half, twice, or 0.015"). The blade should not rub against it when stock is not being fed. These guides provide support against the force applied when the stock is being fed. If the guides are too close, the blade will rub against them continuously, which will cause work hardening and possible blade breakage. If they are too far away, the blade tracking may be affected and the thrust on the blade can cause excessive stress. Every time a blade is changed, the position of the blade guides should be checked and adjusted as necessary.

OPERATION:

Ensure that both wheel cover doors are closed. They are interlocked with the starting circuit and the machine will not run if either is open.

Adjust the blade tension so that it is appropriate for the width of the blade and remove the "Loose Blade" tag.

Adjust the blade guard & guide no higher above the stock than necessary to see the cut line. ½" is usually sufficient.

Felder Band Saw: Open both blast gates to the band saw before starting the saw. This will start the Powermatic dust collector. Close the blast gates when you are finished using the band saw and

turn off the Powermatic dust collector if no one else is using it. There is an interlock on the blast gate. This will stop the dust collector if no other equipment serviced by the Powermatic dust collector is being used. To start the Felder bandsaw, push the green START (I) button. To stop it, push the red (O) OFF button.

MiniMax Band Saw: Ensure that the Onida dust collector is running and that the blast gate to the band saw is open before starting the saw. Close the blast gate when you are finished using the band saw and turn off the Onida dust collector if no one else is using it. To start the MiniMax saw, twist the red STOP button clockwise and gently pull it outward. Then push the green START button.

To stop the saw, push the red STOP button. It will lock the MiniMax bandsaw in the STOP position and must be twisted clockwise to be released. Applying the blade brake will also turn the Felder saw off, but there is no mechanism to prevent restarting the saw when the START button is pushed.

Always keep your fingers and hands away from the path of the blade.

If you hear a rhythmic click as the wood is being cut, this often indicates that the blade is cracked. Turn off the saw, lock it out and inspect the blade. A crooked blade weld can also cause a click and cannot be corrected. If the blade is cracked or the blade weld is crooked, the blade must be replaced.

To control the stock, use push sticks, feather boards, or any other safety device when cutting small or short stock.

DANGER! Cutting cylindrical stock is very dangerous. It is difficult to control the workpiece and it may start to rotate. This may cause the blade to break and the workpiece to be energetically thrown from the bandsaw. Use a "V" block to support the stock when cutting cylindrical stock. The V-block is to be deep enough for the cylinder to be well supported. In general, you want a minimum of about two-thirds of the cylinder to be in the V-block. The V-block needs to be attached to a board that has a miter slot bar on the bottom to ensure that the V-block passes straight past the blade. A wide blade with 2 or 3 TPI is recommended.

Cut at a moderate feed rate into the blade. Do not force a cut.

Cut relief cuts prior to cutting long or tight curves. The relief cuts will free the blade of the tension of the tight curve and the wood will fall away. The blade size will dictate the radius of the cut.

If you need to back out of a cut, shut the machine off, wait for the blade to stop, and then carefully back out. If the stock cannot be easily removed: Lockout/Tagout the band saw; slowly rotate the upper wheel backwards by hand as you pull the stock back through the cut. Verify that the blade has not come off of the wheels prior to restarting the band saw.

If a blade breaks, shut the machine off and move to the left and away until everything stops. Notify the Shop Leader.

If the work is too large for one person to handle, get help holding the stock or use infeed or outfeed supports.

Lockout/Tagout the saw before changing the blade or performing any other maintenance operation. All blade changes and guide block settings must be done under the direction of the Shop Leader.

When the job is complete, shut off the machine, apply the blade brake until the blade stops and close the blast gate(s). The massive wheels on these saws will allow the blade to continue to rotate for a long time after the STOP button is pushed. Letting the blade coast to a stop presents an unnecessary hazard. Turn off the Oneida dust collector if it is not being used by someone else. Use a brush to clean the saw table and clean up the area. If the saw will not be used again that day, reduce the blade tension to zero and clean the area. Hang a "Loose Blade" tag on the upper wheel door knob.

Scroll work, free-hand work and cutting curves:

Hold the workpiece firmly against the table. Do not attempt to saw stock that does not have a flat surface that can rest on the table, unless a suitable support (jig) is used.

Carefully feed the work piece through the blade with even and steady pressure, keeping the fingers a safe distance from the blade.

Making straight cuts:

Aligning the fence to the blade. When making straight cuts where the fence is used to guide the workpiece past the blade, the fence must be parallel to the blade. If it is not, the cut will move either towards or away from the fence, binding the blade and results in a tapered cut. The Carter Band Saw Alignment Tool is a 6" long piece of aluminum with a magnet embedded in it. This magnet will hold the tool to the blade. The tool has a groove in it that the blade teeth fit into since the teeth are set and are wider than the blade. Place the alignment tool on the left-hand side of the blade with the blade teeth in the groove and the magnet on the blade. Bring the fence up close to, but not touching the alignment tool. Loosen the Fence Alignment Clamp Bolt and rotate the fence until it is parallel to the alignment tool. Move the fence so that it is about 1/16" from the alignment tool and verify that it is parallel to the alignment tool. Make another adjustment to the fence if necessary. This procedure will need to be followed every time a new blade is installed on the saw.

DANGER! When making straight cuts where the workpiece is guided by the rip fence, the workpiece must have a straight edge against the fence. If the edge is not straight, the workpiece will push on one side of the blade or the other and this will create high stresses that can break the blade. **Always joint the edge of the workpiece straight prior to placing it against the fence and making a cut.**

Resawing:

Resawing can be done on either band saw. However, the MiniMax saw will usually be setup for this operation. Install a wide blade in the band saw. Use a blade at least ¾" wide and preferably 1" wide. The thicker the board is to be resawed, the wider the blade should be. Wide blades provide more "Beam Strength" and do not bend as much as a narrower blade. When resawing, the fence must be parallel to the blade. If it is not, the blade will make a tapered cut. When resawing heavy boards, it may be necessary to clamp a stop to the table at the far side of the fence to prevent it from moving to the left.

Align the fence to the blade using the blue Carter alignment bar. The Carter bar has a slot in it near the middle of the bar. Place the bar on the table and magnetically couple it to the blade, with the blade teeth in the slot. Bring the fence near the bar and check to see if the bar is parallel to the fence. If not, Notify the Shop Leader and work with him to adjust the fence so that it is parallel to the Carter alignment bar.

Joint the face of the workpiece that will run along the fence.

Attach a MDF fence to the cast iron fence with a height at least two-thirds the width of the board to be resawed.

Use a resawing jig to hold the stock tight against the fence. Your hand should not be used to hold the stock against the fence, even if a push block is used. However, the resaw jigs work much better than using a push block. We have two types of resaw jigs that can be used to hold the board against the fence. One uses a single foam finger. The other uses multiple plastic fingers. Position the single finger foam jig in front of and near the blade so that the finger is compressed about ¼". Clamp the multi-finger resawing jig to the table of the band saw. Position it so that the fingers are to the left of the blade or slightly overlap the blade. Position it so that the fingers are compressed about ¼" when the board to be resawed is in place. Adjust the elevation of the fingers so that one is near the bottom of the board and the other is towards the top of the board.