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# EQUIPMENT

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# MANUALS

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# **SAFETY STANDARDS AND PRACTICES**

Before a student may use the shop, he or she must first successfully complete a written safety exam.

**THERE WILL BE A ZERO TOLERANCE POLICY TOWARDS UNSAFE WOOD PRACTICES!**

Follow all safety standards at all times; they are there to help you avoid injury. If you do not know, do not use; ask the shop manager or technician.

The shop manager should be notified if a safety violation is observed.

## **Personal Protection**

- Safety glasses must be worn at all times when working in the shop. Safety glasses are provided for you in the cabinets!
- Ear plugs are provided in the woodshop, and it is suggested that they be used at all times. It is recommended that ear muffs be worn as well.
- Dust masks are provided in the shop and it is strongly recommended that these be worn at all times when cutting or sanding materials.
- **DO NOT WEAR LOOSE CLOTHING OR JEWELRY IN THE STUDIO.** LONG HAIR MUST BE TIED AT ALL TIMES! Loose clothing can be a hazard in the shop. Fasten or remove loose clothing while working with machinery. Make sure all sleeves are rolled up past the elbow. Jewelry, such as watches, rings, or necklaces can be dangerous. They can catch in machines, and rings can be smashed on the finger. Remove all jewelry when working on machines.
- No open toe or open heel shoes allowed in the shop. No high-heeled shoes will be allowed in the shop. This rule remains even if you are not working. Even while visiting the studio, only appropriate footwear is to be worn.
- Do not operate equipment while under the influence of drugs or alcohol.
- Do not operate equipment when fatigued, ill, emotionally taxed, or distracted.

## **Safe Tool Usage**

- Always use the appropriate tool for the job.
- **TURN ON THE DUST COLLECTOR BEFORE USING MACHINERY!**
- Maintain a 6" minimum safety margin with power tools. Line of cut refers to the path that a blade or bit will travel to cut your material. Hands and body parts must never cross this line either before or during a cut.
- Make sure your work is not touching the blade, bit, cutter, or sanding disc before starting the machinery.

- Don't overreach when using tools, keep proper footing and balance at all times.
- Allow machinery to come to full speed before engaging work piece.
- Feed material at a rate that allows the machine to do the work. Never force material into blade or bit. This can cause machine failure or serious personal injury.
- Never remove or adjust safety guards without the consent of the studio technician or the professor.
- When you have completed an operation on a machine, shut off the power and wait until it stops moving before cleaning up or setting up for another cut
- If a machine breaks, makes an unusual sound, is dull or out of adjustment, or in some way not working properly, shut off the power and report it to the shop manager or professor immediately.

## **Clean Up**

- Nothing may be left on the workbenches or machines overnight.
- Keep the work area clean. There are too many people who need to use the space to waste any of it with messy areas. Messy areas invite accidents!
- Always clean up your scraps with a brush. Scraps might have sharp or jagged surfaces that can cut you.
- It is the STUDENTS RESPONSIBILITY to clean up the tools and work areas they use. Always use a broom or the shop-vacuum to clear scraps. Always allow machinery to come to a complete stop before cleaning.
- Sharp edges, such as old X-ACTO blades should be stuck into a piece of foam or other scrap material before being disposed of.

## **Emergency Procedures**

- All accidents and injuries, no matter how slight, must be reported to the shop manager or professor immediately!
- In the event that there is an accident in the shop, stay calm. Listen to what the shop manager or professor says to do.
- Never touch someone else's blood; disease can be spread this way.
- Make yourself aware of the locations of fire extinguishers, first aid kits, eye wash stations, and emergency exits.



### BAND SAW SAFETY

- The blade action on the band saw is straight down, therefore, your work must either be flat on the table, or be otherwise supported on the table. Cutting cylindrical or irregular stock on the band saw may be done ONLY with a special jig such as V-blocks.
- Before cutting, adjust the blade guard to NO MORE than  $\frac{1}{2}$ " above the thickness of the stock, with the machine at a full stop.
- Always keep your work flat on the table; never get your fingers between your work and the table.
- When feeding work, never put fingers or hands in line with the saw blade (line of cut). Otherwise, if you slip, or as you break through the material, your hand is liable to go into the blade.
- Plan cuts carefully. Layout and make relief cuts before cutting long curves and curves of small radii. Turning holes should be pre-drilled whenever possible. Plan work so the majority of all cuts will be made in the forward position.
- If the stock pinches or binds the blade, do not attempt to back out until the power has been shut off and the machine completely stops.
- If it is necessary to clear the table of scraps of lumber, make sure the blade is completely stopped. Use a brush, push stick, or scrap of stock to clear the chips. Do NOT use your hands!
- If the blade breaks, stand clear, shut off the power and keep others clear until the machine stops completely. Notify the shop manager IMMEDIATELY!
- Make all cuts under power, never while the machine is coasting.
- Never adjust the saw while it is running.
- Students must not allow their fingers to come dangerously close to the saw when cutting stock. A 6" margin of safety should be maintained. Use a push stick or guide for cuts near the saw blade.
- If it is necessary to back the blade out of long cuts, turn the power off first and allow the machine to come to a dead stop.
- Keep upper and lower doors closed and all guards in place.
- If you hear a clicking noise, turn off the machine at once. This indicated a crack in the blade as it passes through the guides. Notify the shop manager.

- Choose the saw with the blade best suited for your job. Wide blades cut straighter, narrow blades can make sharper turns. Choose a blade with teeth farther apart for cutting thicker stock, and teeth closer together for cutting thinner stock.
- Make sure your stock is not touching the blade when you start the saw.
- Allow saw to reach maximum speed before feeding stock.
- Feed work through blade at a moderate rate.
- Leave the machine only after the power has been turned off and the blade has stopped moving completely. When you are finished cutting, shut off the machine and allow it come to a complete stop. Clean up chips and sawdust with a dust broom or shop vacuum, NOT your hands.

### **General Information**

The band saw is almost indispensable in making items where many curves need to be cut. The band saw is also used for re-sawing operations (cutting across thickness). Twisting, binding, and pulling the saw off the heels while backing out of a cut are the most common causes of a broken saw blade. Only the shop manager should replace blades or adjust blade tracking.



#### OSCILLATING SPINDLE SANDER SAFETY

- Make sure work is not touching the spindle before starting the machine. Allow machine to come to full speed before feeding work to abrasive.
- Choose sanding drum which best matches the size of the curve on the work piece to be sanded.
- Be careful when sanding exceptionally small pieces, as the force of the spinning drum may want to pull the piece from your hands.
- When you are finished sanding, shut off the machine and allow it to come to a complete stop, then clean up with a dust broom or shop vacuum, not your hands.

#### **General Information**

The spindle sander is used for sanding curved work pieces and interior cuts. To change the sanding drum, turn hex key CLOCKWISE to loosen and COUNTER-CLOCKWISE to tighten. If you are unsure about this operation see the shop manager for assistance.



#### BRAD NAILER SAFETY

- The operator and all persons in the work area must wear safety glasses. Nails can shoot all the way through or be deflected and ricochet through the shop.
- Disconnect tool from air before adding or removing fasteners, moving to another location, handing the tool to another person, etc.
- Avoid accidental fire; remove finger from trigger when not driving fasteners.
- Fasteners can accidentally go all the way through the material. Never have hands and body parts behind the work. Make sure no one is in the guns path.
- **Fasteners can also come out the side of surface of the material unexpectedly. Maintain a *minimum 6"* safety margin.**
- Never use a tool that is leaking air.
- Never point the gun at ANYONE!
- Do not drive fasteners on top of other fasteners, or with the tool at a steep angle. The fasteners can ricochet and cause personal injury.
- Do not drive fasteners close to the edge of a work piece. The piece is likely to split allowing fastener to fly free or ricochet.
- **Be sure to add 1 or 2 drops of pneumatic oil to the inlet before use.**
- **Always make sure the compressor is set to 90psi. The compressor is normally always set at 90psi. Higher pressure can damage the tools.**
- Grip tool firmly, position nose of tool onto work surface, push forward on tool to depress safety, and squeeze trigger to fire fastener.

#### **General Information**

Nail guns use compressed air to "shoot" fasteners into a work piece. Choose the right gun and fastener for the job.

Brad nail gun: Small hole, weak nail, good for glue-ups.

Finish nail gun: Larger hole, stronger nail.

Stapler: Very noticeable hole, strong connection.

Frame nail gun: Noticeable hole, very strong nail.



### DRILL PRESS SAFETY

- Select proper drill bits. Avoid using dull drill bits. Make sure that the correct speed is used for the bit selected. The larger the bit; the slower the speed. If uncertain, check with the shop manager.
- If it is necessary to change the spindle speed on the drill press, ask the shop manager for assistance.
- Verify that the belt guard is securely in place.
- Insert the drill bit in the chuck properly and tighten it securely with the chuck key before starting the drill press.
- Remove the chuck key before the power is turned on. If the chuck key is not removed, it will be thrown from the chuck at tremendous speed when the power is turned on.
- A few drops of cutting oil should be applied when drilling metal to prevent burning.
- Make sure that no one but you is inside the safety zone.
- Keep hands away from revolving spindle.
- Obtain approval of shop manager for any special setups on the drill press before beginning the operation.
- If work comes loose and is seized by the drill press, shut off power immediately if you are not endangering yourself. If impossible to shut power off, move away from the machine and move others away.
- A 6" margin of safety should be maintained.
- Secure work with drill press vice or clamps.
- When cutting all the way through a board make sure it is backed by a piece of scrap material. This is done to prevent breakout at the bottom of the board as well as to ensure the drill bit does not damage the table.
- Be certain that the table and head of the drill press are secure.
- Make sure your work is not touching the bit when starting the machine.
- Turn on power and allow the machine to come to full speed before drilling.
- Operate feed handle at a smooth pace to ensure even cutting.



- Occasionally back out the drill bit to allow shaving to be cleared and to help cool the bit.
- Back drill out as soon as hole is drilled.
- Turn drill press off and allow it to come to a complete stop before attempting to remove work. Remove chips and sawdust only when the power is off and the machine has come to a complete stop. Use a dust broom or shop vacuum, not your hands!



### JOINTER SAFETY

- The guard must be kept over the knives at all times while the jointer is being operated.
- **Only the shop manager may adjust the depth of cut. Depth of cut is adjusted on the in feed table only and is limited to 1/32".** Several passes are typically made to remove material.
- **On the jointer, stock must be a minimum of 8" long, 2" wide and ½" thick.**
- A push stick or push block must be used when jointed narrow or flat pieces of stock.
- The shop manager must approve all special setups on the jointer.
- The rear (out feed) table of the jointer is NEVER to be adjusted, except by the shop manager, and this is usually only done after the blades have been sharpened. The rear out feed table must be at the same level as the knives. Any adjustments to the out feed table will severely affect the safety of the operator.
- End grain jointing is dangerous, especially on narrow pieces. The jointer has a tendency to splinter the work at the end of the cut. **DO NOT JOINT END GRAIN!**
- Examine stock and check for knots or splits. If possible, do not joint these.
- Operations involving "stop cuts" are not allowed.
- The jointer is not used for planing stock to even thickness (planer), nor is it used to make stock parallel in width (table saw).
- On stock that is severely warped, the best procedure is to band saw the stock into smaller pieces, if possible. This will eliminate much of the warpage.
- Only new, clean wood should be put on the jointer. Old, used, painted or glued lumber or composite material (i.e. plywood, MDF, etc.) will nick the knives and may NOT be jointed.
- Maintain at least a 6" margin of safety.
- Start the machine and let it come to full speed before cutting.

- Stock should be held flat against the in feed table, well in back of the cutter head, concave side down.
- Pass the work over the cutter head using moderate downward and forward pressure.
- Make sure that all stock is pushed completely passed the knives, far enough to where the safety guard has returned over the throat, before picking up stock.
- Make repeat passes as needed to straighten stock.
- Remove chips and sawdust only with the power shut off and the machine at a complete stop. Use a dust broom or shop vacuum, not your hands!

#### General Information

The jointer is, next to the table saw, the most necessary and useful machine in woodworking. Jointers take the place of the hand plane, are used in production work, and are useful in straightening faces on warped boards, jointing the edges of boards to be glued, rabbeting, squaring, beveling and tapering. The most common use of the jointer is jointing face and edge grain.



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### KNIFE SAFETY

- Always be sure that blades are properly seated in knives and that knives are properly closed and/or fastened together before use.
- Never leave a knife unattended with the blade exposed. Consider using a self-retracting knife with a spring-loaded blade that automatically retracts when the knife is released.
- Always use sharp blades. A dull blade requires more force and is more likely to slip than a sharp one. Change the blade whenever it starts to tear instead of cut.
- Whenever possible, always use a cutting mat. DO NOT cut on the tables. Always find a suitable backing board/mat so as not to scar the tabletops.
- Always keep your free hand away from the line of the cut.
- When making cuts on a surface below you, stand or kneel to one side of the line of the cut.
- Always pull the knife towards you when you are cutting. A pulling motion is stronger and more positive than pushing the knife away from you. The knife is less likely to slip.
- When using a straightedge to guide a cut, either clamp is down or keep your free hand well away from the cutting path of the knife. Be sure the straight edge is thick enough to prevent the knife from “riding up” over the edge and cutting you.
- Do not bend or apply side loads to blades by using them to pry loose objects. Blades are brittle and snap easily.
- When using a knife to cut through thick materials do not try to cut material in one pass. BE PATIENT! Make several passes, cutting a little deeper into the material with each pass.



### WOOD LATHE SAFETY

- Students must receive training before using the lathe; see shop manager.
- Remove or fasten all loose articles of clothing or jewelry.
- Make sure stock is free from warp, checked ends, loose knots or other defects.
- Make certain that all glued work is strong and dry, at least over night.
- Be sure stock is securely and correctly mounted in the lathe.
- Clamp tool rest holder firmly.
- Check sharpness of turning tools and condition of handles; sharp tools permit greater control. Dull tools are dangers because they require too much pressure.
- Be certain the tool rest is adjusted between 1/8" below center and center for most operations.
- Adjust and maintain tool rest as close as reasonably possible to the stock; adjust frequently with machine at a full stop. Make adjustments of tool rest only when lathe is at a dead stop.
- Concave cuts inside a cylinder are made with a round nose tool.
- The gouge is primarily used for roughing spindles to a round shape.
- Always wear a full-face shield whether operating the lathe or just watching.
- Always revolve the lathe at least one full turn by hand before turning on power to make sure that stock will not strike any part of the lathe.
- Stand to the left side when turning on power (in case stock flies off machine).
- If the speed needs to be adjusted, ask the shop manager for assistance.
- Start lathe at lowest possible until stock is balanced and does not vibrate. Unbalanced stock may break apart or fly off the lathe at high speeds.
- Use low speeds for roughing and for long or large diameter work. If vibration occurs, stop the machine and correct the cause.
- Don't stand in line with any large diameter parts being turned or allow anyone else to do so.
- Hold turning tool flat against tool rest holding firmly with both hands.
- Keep hands away from stock while it is revolving.
- Use correct amount of tool pressure against stock.
- Stop lathe when measuring with calipers.
- Completely remove tool rest when sanding, polishing, or finishing.
- For polishing, use a small rag folded into a pad to back the abrasive paper. Never wrap the rag or sand paper around your fingers. In case of a catch, you want the paper or cloth to slip out of your grasp rather than pull you in.
- Sanding and polishing must only be done on the underside of objects.
- Never touch moving parts of the lathe (to slow it down, etc.).

- Never use the lathe for anything other than its intended purpose.

### **General Information**

The wood lathe rotates the work piece on a driven center while the operator uses hand held tools to symmetrically carve, shape, sand or finish, producing items such as spindles or bowls.

### **Spindle Turning**

- Spindles or any long work will normally be held between centers. A chuck or a spur drive goes in the head spindle, and a live (contains bearings) or dead (no bearings) center goes in the tailstock.
- Clamp tailstock firmly in place and tighten lever.
- See that center is properly imbedded in the stock; otherwise stock could fly off lathe.
- Use beeswax or oil if using a dead center.
- Adjust tool rest and be sure to keep it correctly maintained by frequent adjustment.
- Check clearance by turning spindle one full revolution by hand.
- Stand to the left and start lathe at lowest speed possible.
- Rough stock to cylindrical form before using a higher speed.
- Govern speed according to diameter of stock.

### **Faceplate Turning**

- Faceplate turning is normally done shorter, and sometimes larger, diameter pieces, bowls for example. The work piece is screwed to the faceplate, and the faceplate is attached to the head spindle. The tailstock may or may not be used.
- First, make stock circular using bandsaw.
- Select proper faceplate; make sure it is large enough.
- Select proper size and number of screws according to the design of the work. A screw should be in each hole of the faceplate.
- Fasten stock (or sub-base glued to stock) to faceplate with screws. Make sure screws are tight.
- Ask shop manager to check fasteners and adjustments.
- Adjust tool rest and make sure to keep it properly maintained by frequent adjustment.
- Revolve work at least once by hand.
- Stand to the left and start machine at lowest speed.
- Rough stock down at a lower speed until stock is completely balanced.
- Set speed in relation to diameter of work.
- Keep an accurate check on depth of cut to avoid hitting screws.
- Make frequent inspection of screws to be sure they remain tight.



### COMPOUND MITER SAW SAFETY

- The miter saw may be used for cross cutting only (cutting across the length).
- Work must be large enough to be stable and secure against the fence.
- Always secure the work piece to the fence of the table. Use clamps or a vice to hold the work piece in place.
- Be certain your work is flat down on the table and flat into the fence before starting.
- Always check the guard and all other components for damage before using the tool to assure that they will function properly.
- Always keep your hands out of the path of the saw blade.
- Your arms must never cross each other (to secure stock, etc.) when using the miter saw.
- Avoid accidental starts; don't have your finger on the trigger while lining up cuts.
- Always lock the saw blade in the down position when finished.
- Maintain a safety margin of at least 6" or more on the miter saw.

#### **To use the miter saw:**

Move the cutting head up away from the work piece.

Start the machine and allow it to come to full speed before cutting.

Make your cut at a moderate rate, allowing the saw to do the cutting. Lower the blade fully until you hit the stop.

Release the trigger with the blade still down, and allow the blade to come to a complete stop before raising it. Never raise the saw blade from the work piece until it comes to a complete stop.

When you are finished cutting: lower the blade, lock it down, and then use a dust broom or shop vacuum to clean up.

#### **General Information**

The compound miter saw is designed to work on wood, plywood and some composites. It is one of the most accurate specialty machines found within the woodworking facility. It has taken the place of most of the operations previously done by a hand miter box or picture frame miter box. It is extremely useful for making 90 degree and 45-degree cuts on drawer, door and face frames.



### PLANER SAFETY

- **Do not remove more than 1/32" of wood at a time (One half turn).**
- **Stock must be a minimum of 10" long, 3/4" wide and 1/4" thick.**
- When operating the planer, students must not allow their hands to come near the feed rollers, cutting head, or any moving parts. **KEEP ALL HANDS CLEAR!**
- Students must not attempt to move or shift boards after the feed rollers have gripped the boards. This is dangerous because the fingers are likely to get pinched between the board and bed of the planer. Release hold of the stock and it will feed automatically into the machine.
- Never change the depth of cut after the stock has been started through the planer. To do so will cause damage to the planer head.
- Make sure the stock has no large cracks, loose knots, nails, dirt or paint on any of its surface.
- Only new, clean wood may be put on the power planer. Old, used, painted or glued lumber or composite material (i.e. plywood, MDF, etc.) will nick the knives and may NOT be planed.
- Plane pieces of varying thickness in progressive order, the thickest or the largest first.
- On a planer, it impossible to place across the grain. The machine will shred the wood.
- Looking into the planer head while the machine is in motion is forbidden because of the possibility of flying particles. Stand in an upright position and to one side while you are operating the machine.
- A planer will only produce two parallel faces when the surface that put on the table (or "down" side) was flat and smooth to begin with. It will not produce two flat surfaces if the bottom face that was put on the table was warped.
- Be sure your work is not touching the rollers or cutting head when you start the machine.
- When finished with the planer, clean only with the power shut off and the machine at a complete stop. Use a dust broom or shop vacuum, not your hands.



## **Operation**

Star the cutter head and allow the motor to reach maximum speed before entering wood. Stand to one side, out of the line of the stock, as it enters the surface planer.

Kickbacks are infrequent, but possible, on a surface planer.

When feeding your work into the planer, be careful not to let your hands get pinched between your work and the planer table as the feed roller engages the work piece.

If material does not want to feed into the machine, check the following:

- A. The machine is engaged (by pulling the lever down).
- B. A gentle push on the stock may be needed. Do not force the material.
- C. Sometimes it is necessary to shift the stock at a slight angle.
- D. If none of these procedures work, then loosen the depth of cut lever, raise the cutting head to the point where the knives are no longer cutting, and then shut off the machine. Ask the shop manager for assistance. Do NOT shut power off when cutter head is still in contact with the wood.

## **General Information**

The planer is a machine which planes boards smooth and to an even thickness.

Single planers have the cutting head above the table. When surfacing boards, always place the smoothest side down for the first cut.



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### BELT/DISC SANDER SAFETY

- When you turn the power on it starts the disk and the belt. If you are using the disk, be aware of the belt. If using the belt, be aware of the disc.
- **NEVER USE GLOVES WITH THE SANDER!** This creates an entanglement hazard.
- Hold the work securely and always keep your work flat on the table, never get your fingers between your work and the table where they can be trapped and pinched.
- Be aware that a sander can grab your work and pull it down with great force. Never hold your work angled so that the edge being sanded is higher than your hands, your hand can be smashed.
- Make adjustments only when the sander is at a dead stop.
- Always sand on the down travel side of the disc/belt. Working on the up travel side of the disk causes your work to want to go flying.
- Keep fingers away from the abrasive surface of the sander.
- **Stock that is 1" or smaller in length should NOT be sanded.**
- Use the disc sander for sanding outside curves or angles only.
- The disc sander is NOT to be used for joinery, squaring stock, etc.
- **The table should be adjusted so that it is no more than 1/8" from the disc/belt.** Be careful not to get your fingers or work pulled into this gap, it is a BAD pinch point.
- Make sure the disc is on properly. A dull or loose disc should be replaced or repaired immediately.
- Any disc that is loose or torn should be repaired or replaced immediately. Notify the shop manager when the disc is loose or torn.
- A 6" margin of safety should always be maintained.
- Make sure your work is not touching the sandpaper when you start the machine. Allow machine to come to full speed before sanding
- Feed stock into the abrasive material at a moderate rate of feed and pressure. Excessive pressure against the disc should be avoided.

- When you are finished sanding shut off the machine and allow It to come to a complete stop, then clean up with a dust broom or shop vacuum, not your hands!

**General Information**

The combination sander has a 12" disk and a 6" wide belt. It is mostly used some sanding edges of wood or plastic. It is often a good approach to cut parts larger than needed and leave room for sanding the edges smooth.



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### SCROLL SAW SAFETY

- Make sure the blade is properly tensioned before operating the saw.
- Make sure the blade teeth point downward toward the table.
- Avoid awkward hand positions where a sudden slip could cause a hand to move into the blade.
- Make sure the table tilting lock is tightened before starting the machine.
- Never reach under the table while the machine is running.
- Be aware of the pinch points that exist between the stationary arm and the other arm that moves up and down.
- A 6" margin of safety should be maintained.
- The blade on the scroll saw moves up and down. The saw features a work hold down keep the blade from lifting the work while cutting, but you will have to hold it down by hand as well. Loosen the work hold down knob, raise the hold down, slide your work under it, lower the hold down until it rests on top of the work, and tighten the knob.
- Make sure your work is not touching the blade.
- Press the start button to start the machine and turn knob to adjust speed.
- Feed your work at a moderate rate that will allow the blade to do the cutting.
- Always shut off the machine and allow it to come to a complete stop before removing scraps. Clean up with a dust broom or shop vacuum, not your hands!

### General Information

The scroll saw is used for making cuts with sharp turn in thin woods. It can also make interior cuts, a window, for example.



### TABLE SAW SAFETY

BEFORE USING THE TABLE SAW STUDENTS MUST NOTIFY THE SHOP MANAGER!

- The 10" table saw is equipped with a safety system that detects when someone accidentally contacts the spinning saw blade, and then stops the blade in milliseconds. The SawStop brake system is designed to greatly reduce bodily injury. However, devastating bodily injury can still occur in other forms, such as kickback. This system does nothing to prevent kickback so good habits are still important.
- This saw is equipped with sensitive electronics and should not be handled roughly.
- On-edge re-sawing should be done on the band saw, not the table saw.
- On end sawing is not allowed on the table saw.
- You must never lower stock directly down over the saw blade.
- Reaching over the saw blade or passing wood over the saw blade while the saw is running is forbidden.
- Never back the wood away from the blade while the saw is running, it will throw the wood back towards you with great force (kickback). If the wood becomes jammed, or it is necessary to remove the wood, always stop the saw first.
- When you are using the table saw, you must stand to the left of right of the saw blade, never directly behind it (kickback).
- **Make sure the area behind the saw is clear before using the saw. Anything directly behind the saw is in danger if kickback occurs.**
- Freehand cutting (not using the fence, miter gauge, or crosscut carriage as a guide) will cause the material to kickback and therefore ABSOLUTELY FORBIDDEN on the table saw.
- The saw guard must always be in place over the blade except when the shop manager has authorized its removal for special setups.
- All adjustments are to be made only while the saw is at a complete stop.
- Do not use a blade that is not properly sharpened or set. Lack of tool set will cause pieces to be thrown back or overheat the saw, causing the saw to warp or become slightly convex on one side.
- After completing a cut on the table saw, lift your free hand up from the table. Do not drag your hand across the table.

- NEVER put fingers or hands in line with the saw blade (line of cut), either in front of or behind the blade. If you slip, or if there is a kickback, you could suffer a DEVESTATING injury.
- Arch your fingers when you are feeding instead of laying your hands flat.
- Don't get in a hurry. Slow, methodical movements are safer than fast, jerky ones.

### **General Information**

The table saw is capable of making very accurate cuts in wood and plastic. Its strong points include rip cutting and making repetitive cuts. The table saw is one of the most dangerous machines made and should never be operated by a careless person or one who has not made a study of its capabilities and limitations. Specific instructions should be obtained from the shop manager before special work or set-ups are made.

- When helping someone with a large or awkward piece, the helper must remember their only purpose is to support the stock. Only the operator pushes and guides the stock through the machine.
- If it is necessary to clear the table of scraps of lumber, make sure the blade stopped and completely lowered. Use a brush, push stick, or scrap stock to clear table. Do not use your hands.
- Before the power is turned on, the shop manager must approve all special setups.
- Never use the fence as a cut-off gauge when crosscutting. Kickback will result.
- **Maintain a safety margin of at least 6" or more on the table saw.**
- Stock should always have a jointed or surfaced face against the table, miter gauge or fence.
- Stock should be free of knots, splits, warp, or defects.
- Never overreach. Always keep proper footing and balance.
- Before starting the saw, adjust the blade to project about 1/4" above the stock you are cutting.
- Make sure your work is not touching the blade before starting the machine.
- Allow the machine to come to full speed before feeding your work.

### **Ripping: Cutting a board parallel with the grain or with the length.**

When using the rip fence on the table saw, there is the danger of kickback (when the work binds on the blade and is suddenly thrown back at you). When this happens you can be struck with GREAT FORCE by the flying object, or be pulled into the blade. To help avoid this, your main point of focus (besides not touching the blade) is keeping your work well-secured, flat on the table, and flat against the fence at all times. **Feed your work at a moderate rate until it completely clears the blade. You must use a push stick when using the rip fence to cut narrow pieces that are 6" or less in width. Always keep your hands at least 6" from the blade.** When ripping, the scrap wood should be to the outside of the blade to reduce the possibility of kickback.

### **Crosscutting: Cutting a board perpendicular to the grain or the length.**

When using the miter gauge on the table saw, the work should be held firmly against the miter gauge and down to the table to prevent kickback. The work piece is moved forward with the miter gauge at a moderate pace past the blade. Never back the miter gauge away from the moving blade while the work piece is in contact with the blade. The rip fence is NEVER to be used with the miter gauge, except when multiple cuts of the same size are made. This is accomplished by means of a clearance block and must be approved by the shop manager.

When you are finished cutting, make sure the blade has completely stopped, lower the blade all the way, and then use a dust broom or shop vacuum to clean up.