

Metal Band Saw

1. Do not operate this machine before proper training and approval of MMM Instructor.
2. Do not run this machine without knowing the function of every control key, button, knob, or handle. Ask MMM staff or a qualified instructor for help when needed.
3. Protect your eyes. Wear approved safety glasses (with side shields) at all times.
4. Don't get caught in moving parts. Before operating this machine remove all jewelry including watches and rings, neckties, and any loose-fitting clothing.
5. Keep your hair away from moving parts. Long hair should be pulled up and tucked away.
6. Wear close toed shoes. No sandals or flip-flops.
7. Take off gloves before you start the machine. Gloves are easily caught in moving parts.
8. Remove all tools (wrenches, chuck keys, etc.) from the machine before you start. Loose items can become dangerous flying projectiles.
9. Never operate any machines after consuming alcoholic beverages, or taking strong medication, or while using non-prescription drugs.
10. Protect your hands. Stop the machine spindle and ensure that all movements have stopped:
 - Before changing tools
 - Before changing parts
 - Before you clear away the chips. Always use a chip scraper or brush
 - Before you make an adjustment to the part, fixture, or take measurements
11. Protect your eyes and the machine as well. Don't use a compressed air hose to remove the chips or clean the machine.
12. If you don't know, stop and ask.
13. Observe and practice all shop safety procedures.

SAFETY FIRST

KEEP IT SAFE

THE MILLING MACHINE MAKES PRECISION CUTS IN METALS AND PLASTICS.

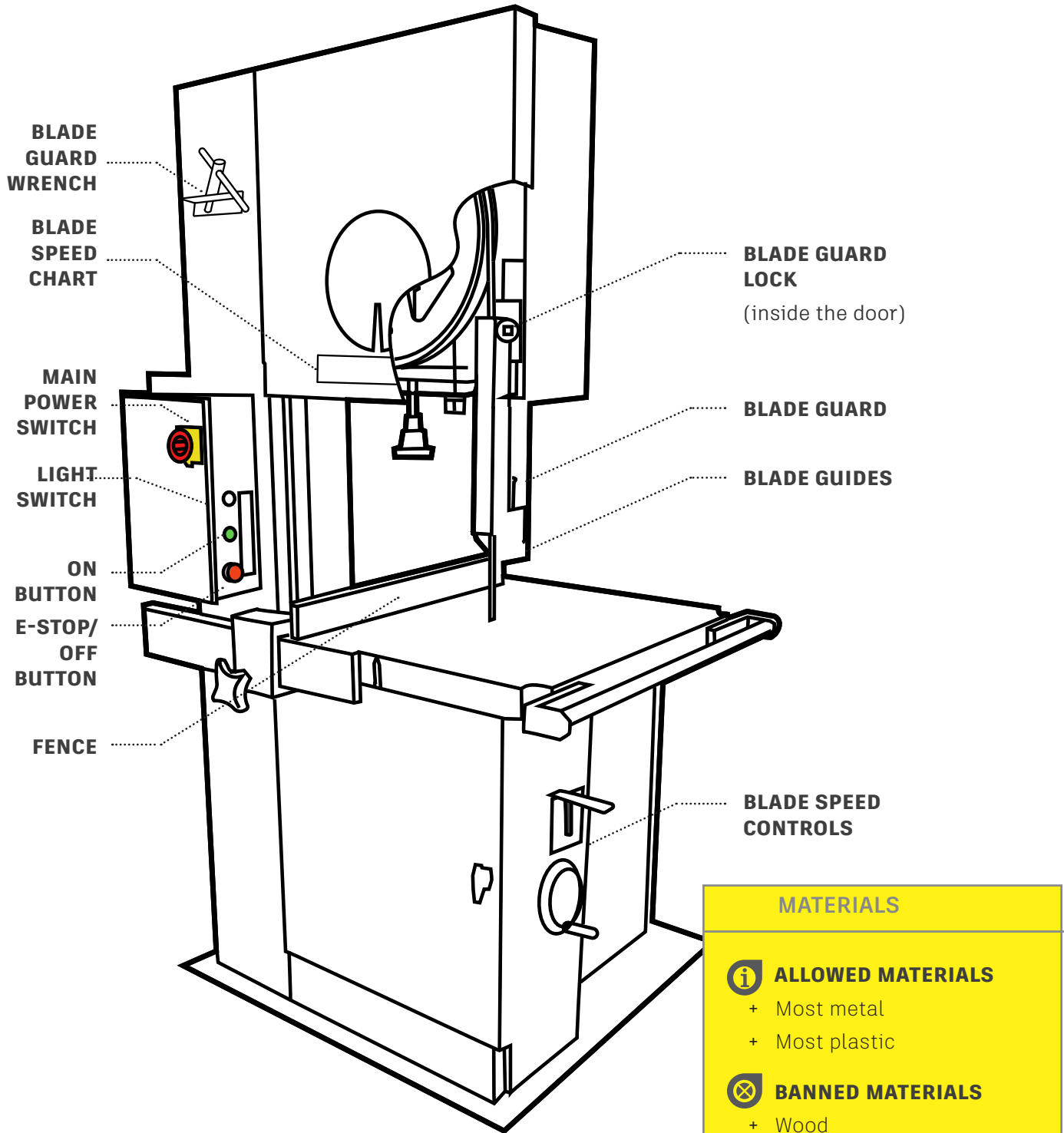
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14. Prevent slippage. Keep the work area dry and clean. Remove the chips, oil, coolant and obstacles of any kind around the machine.
15. Avoid getting pinched in places where the table, saddle or spindle head create "pinch points" while in motion.
16. Securely clamp and properly locate the workpiece in the vise, on the table, or in the fixture. Use proper holding clamping attachments and position them clear of the tool path.
17. Use proper cutting tools for the job. Pay attention to the rotation of the spindle: Left hand tool for counterclockwise rotation of spindle, and right hand tool for clockwise rotation of spindle.
18. Prevent damage to the workpiece or the cutting tool. Never start the machine (including the rotation of the spindle) if the tool is in contact with the part.
19. Check the direction (+ or -) of movement of the table when using the jog or power feed.
20. Don't use dull or damaged cutting tools. They break easily and become airborne. Inspect the sharpness of the edges, and the integrity of cutting tools and their holders. Use proper length for the tool.

METAL BAND SAW

MACHINE
CONTROLS

THE BAND SAW MAKES CURVED CUTS IN METAL & PLASTIC.



MATERIALS



ALLOWED MATERIALS

- + Most metal
- + Most plastic



BANNED MATERIALS

- + Wood
- + Carbon fiber and composites



SEE SHOP STAFF FIRST

- + All other materials

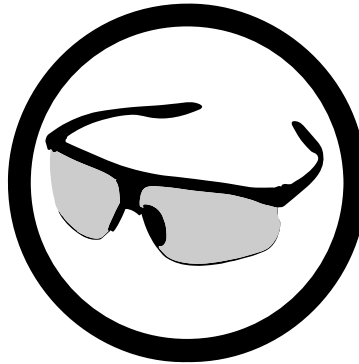
MANUAL MILL

KEEP IT SAFE

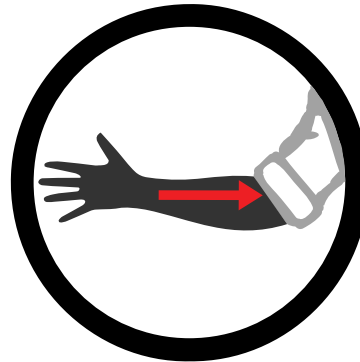
VERSION 3.1

USE PERSONAL PROTECTIVE EQUIPMENT WHEN OPERATING THE MILL.

P4

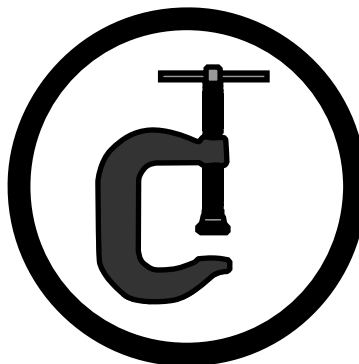


Always wear safety glasses.



Always wear short sleeves, or rolled sleeves, pull back and tuck in long hair, remove jewelry and lanyards, etc.

Do not wear gloves.



Using the mill vise or strap clamps is required for all work.

METAL BAND SAW

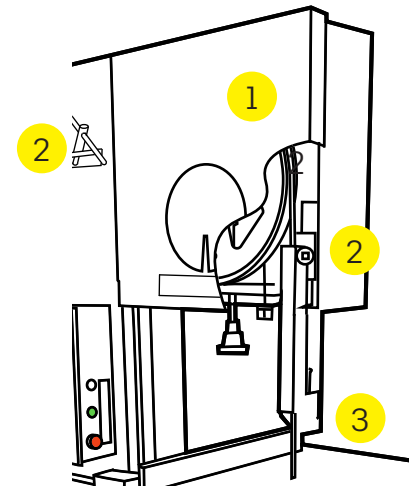
THEORIES & TIPS

THE BLADE GUARD, GUIDES AND SPEED CAN ALL BE ADJUSTED.

ADJUSTING THE BLADE GUARD & GUIDES

The blade guard helps to prevent contact with the exposed blade. Adjust the blade guard and guide every time you use the saw.

1. Open the upper door.
2. Loosen the blade guard lock with the blade guard wrench.
3. Adjust the blade guide to be 1/4" above your material.
4. Snug the blade guard lock.
5. Close the door.



ADJUSTING THE BLADE SPEED

The blade speed should be adjusted for each cut.

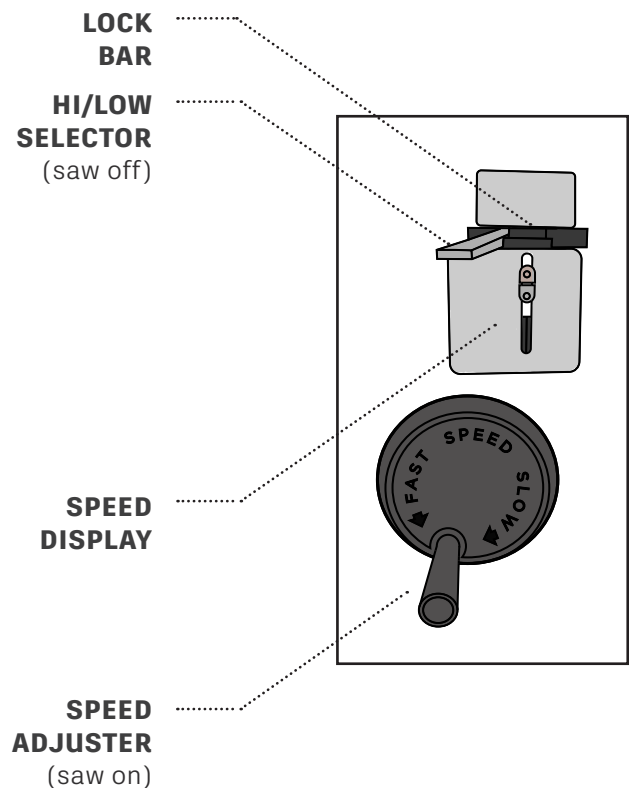
1. Use the chart on the front of the saw to determine the correct speed for your material; slow (steel) or fast (aluminum).
2. Clear the table.
3. Lower the blade guard.

The speed adjuster must be changed with the saw on.

1. Turn on the saw.
2. Adjust the speed by rotating the handle.

The hi/low selector must be changed with the saw off.

1. Using the instructions above, adjust the saw to its slowest speed.
 - ▶ The lock bar between hi and low will move out of the way when the saw is in the slowest position.
2. Turn the saw off.
3. Lift the gear change lever, and slide it to the desired setting.
 - ▶ You may need to open the cabinet and hand rotate the wheel while trying to fully engage the gears.



METAL BAND SAW

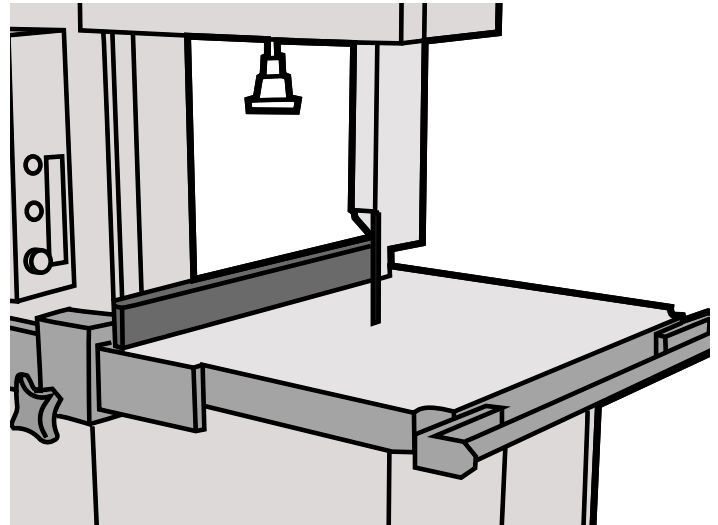
THEORIES & TIPS

BAND SAWS ARE USEFUL FOR MAKING BOTH STRAIGHT AND CURVED CUTS.

MAKING STRAIGHT CUTS

Every band saw has some amount of *drift*. While cutting straight with the blade, it will pull to one side or the other.

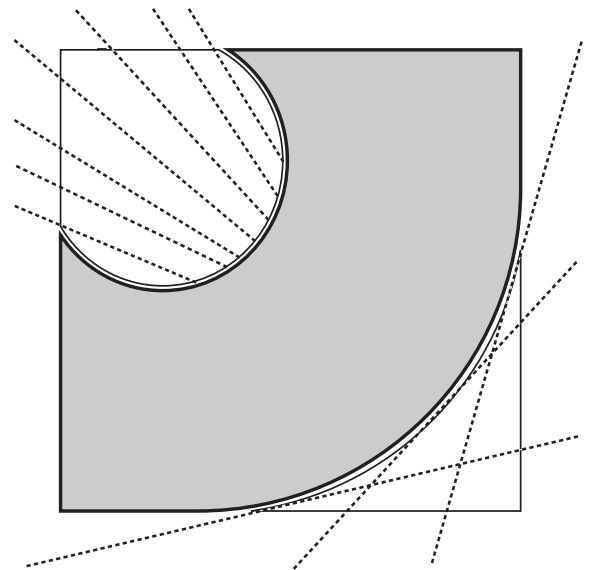
- + Adjust the angle of your work to make a straight cut.
- + Using the fence can help to make a straight cut.



MAKING CURVED CUTS

Blades have a *minimum cut radius* depending on the width of the blade.

- + Forcing a blade to make too tight of a radius will result in friction that heats the work and blade, causing damage to both.
- + Make *relief cuts* to create a small radius.
- + When making relief cuts you must stop the blade completely before backing it out.



METAL BAND SAW

HANDS ON

OPERATING THE BAND SAW.

AREA AND MACHINE PREPARATION

1. Clean and clear the table.
2. Make sure there is sufficient room around the saw for your workpiece.
3. Have a push stick ready and within easy reach.
4. Adjust the blade guard height.
 - ▶ The height of the blade guide should be about $\frac{1}{4}$ " above your material.
 - ▶ The blade guard covers the blade and helps reduce the chance of injury.

ADJUST THE BLADE GUARD EVERY TIME.

MAKING THE CUT

1. Turn on the blade and wait for the saw to come up to speed.
2. Adjust the speed, according to the chart.
3. Slowly push the material into the blade.
 - ▶ Experience will help determine the correct speed for the material, thickness, blade type and other variables.
4. Keep at least one hand on the material; if blade is under strain, release forward pressure.
5. Stay in control of the material until it is past the back of the blade.
6. Turn off the blade, and wait for it to stop.

ALWAYS ADJUST THE BLADE SPEED FOR YOUR MATERIAL.

CLEANUP

1. Double check that the blade is not moving.
2. Lower the blade guard all the way down.
3. Brush off the table and clean up the area.
4. Recycle scraps and put reusable pieces in the storage bin in the metal shop.

DO NOT CLEAN OFF THE TABLE WITH YOUR HAND WHILE THE BLADE IS MOVING.