

# Basic Woodshop Safety

## Table Saw Overview

The table saw is one of the most versatile, but also one of the most dangerous tools in the shop. The Sawstop blade brake technology lessens the likelihood of a catastrophic injury due to contact with the blade, but does not eliminate the danger of working on a table saw.

**To cut safely, stay focused on the forces exerted by the spinning blade or bit.**

### Usage Highlights

SAFETY	CARE	CLEANUP
1. Keep fingers 6" away from the blade	1. Avoid nails, metal, & any wet/conductive material	1. Sweep the floor and vacuum debris
2. Always use the blade guard or riving knife	2. Alert a staff member if the blade is dull	2. Check the cabinet for dust accumulation
3. Always power off before changing a blade or working in the cabinet	3. Submit a <a href="#">maintenance request</a> when needed	3. Empty scrap bin and dust collection when full

### Basic Anatomy

**Power Switch** – The yellow safety key must be inserted to turn the switch on. The brake system takes a few seconds to reset between each use. When the left light is solid green, the saw may be used.

**Start/Stop paddle** – This activates the blade and is designed to be shut off with your leg in case of emergency. It will only turn on after the brake system has initialized.

**Table** - This is precision ground cast iron and will rust if exposed to moisture, including condensation! To care for this surface, never use it for gluing or hammering.

**Blade Brake Module** – If a conductive material contacts the blade, the brake will be triggered. Wet wood, especially pressure-treated wood, can trigger the brake during normal cutting.

**Blade** – Rotates toward the user and should be kept sharp for safe cuts.

**Blade Guard** - The safest system to prevent accidental contact with the blade. This works for most through-cuts that don't use a sled. Cannot be used on very narrow or blind cuts (dadoes, rabbets).

**Height gauge** – Prevents stock that is taller than the blade from going under the blade guard. This locks into a dent on each side of the blade guard.

**Anti-kickback Pawls** – Helps prevent stock from being thrown towards the user if there is kickback. These should be locked in their up position when installing the blade guard into the saw.

**Riving knife** – Used in place of the blade guard when making blind cuts. Prevents stock from rotating into the back of the blade. Cannot be used with a blade smaller than 10".

**Throat plate** – Maintains a tight clearance between the blade. This must be flush with the table to be installed correctly.

**Height Adjustment Lock Nut** – Prevents the blade from raising or lowering due to vibrations during a cut.

**Height Adjustment Crank** – Adjust only with the blade off. The blade should be approximately 1/4" taller than materials being through-cut. Loosen the lock nut before adjusting and lock before performing a cut.

**Angle Adjust Lock Nut** – Prevents the blade from tilting due to vibrations during a cut.  
Fence

**Angle Adjustment Crank** – Adjust only with the blade off. Rotate to change the blade angle anywhere between 45 degrees to the left and 90 degrees. Loosen the lock nut before adjusting and lock before performing a cut.

**Fence** – Provides a guide surface parallel to the blade. Lift lock to be able to slide it left or right, push lever down to lock the fence in place. Never push the fence up against the blade or use the fence when "cross-cutting". Material pinched between the blade and the fence is likely to kick back.

# Kickback Safety

Kickback is when a workpiece is forcefully ejected from the table saw. This happens when:

**1. Workpiece is lifted by the rear portion of the rotating blade, and thrown towards the user.**

This is most common with sheet goods since they're lightweight and easily lifted by the saw (which is at a low angle during shallow cuts). This is mostly preventable by using the blade guard which prevents stock from sitting atop the blade.

This form of kickback is also more likely to occur during blind cuts than through-cuts. Ensure downward pressure is maintained while feeding the cut.

**2. Workpiece pinches the rotating blade if the kerf closes behind the cut.**

When ripping boards, the release of internal stresses in the material can cause the two sides of the cut to warp towards each other. This can be prevented by using the blade guard or riving knife—both of which hold the kerf open.

**3. Workpiece rotates into the side of the rotating blade.**

If pushed improperly or allowed to sit between the blade and the fence, the workpiece may get jammed against the side of the blade and flung towards the user. Always follow through and push the stock completely past the blade when making a cut.

The blade guard and riving knife can only help prevent this once the cut is deep enough that the stock has passed the rear of the blade.

**4. Kerf pinches the rotating blade if it becomes non-parallel to the blade**

If stock is warped and does not sit flush to the table, or significantly overhangs the edge of the table or sled, it is possible for the kerf to be out-of-plane with the blade. This forces the workpiece to pinch the blade and results in kickback.

- Ensure the fence is parallel to the blade.
- Do not cut warped lumber on the table saw without a proper jig.
- Always support your work throughout the cut
- Never make a cut 'free hand'. Always use the fence, miter gauge, sled, or jig.

## Miter Saw Overview

A miter saw is used to make easily repeatable miter cuts. A compound miter saw can adjust the cut angle on two axes. A sliding miter saw lets the saw blade be drawn towards the user before plunging into the workpiece, allowing for wider stock to be cut.

### Usage Highlights

SAFETY	CARE	CLEANUP
1. Keep fingers 6" away from the PATH of the blade, not just the blade	1. Push to cut, don't pull it toward you	1. Sweep the floor and vacuum debris
2. Support both sides of a cut to prevent shifting	2. Alert a staff member if the blade is dull	2. Recycle waste in the scrap bin
3. Wait for the blade to stop spinning before raising the blade out of a cut	3. Submit a <a href="#">maintenance request</a> when needed	3. Empty scrap bin and dust collection when full

### Basic Anatomy

**Blade** – spins toward user, pushing the workpiece down and to the rear

**Blade guard** – retracts automatically as the blade is lowered into the cut. do not lift manually to make a cut

**Table and Fence** – together, these provide a stable place to hold stock so it will not be thrown by the blade. Never make a cut without the stock being held firmly against both surfaces

**Clamp** – Allows stock to be held securely. Use as often as possible in order to keep your hands clear of the path of the blade and to secure the stock in case of kickback.

**Miter gauge** – indicates at what miter angle the cut will be made

**Miter lock** – depress to move the miter angle of the saw past the popular pre-set angles

**Miter knob** – lock down the current miter angle to prevent movement during cutting

**Bevel gauge** – indicates at what bevel angle the cut will be made

**Bevel lock** – lock down the current bevel angle to prevent movement during cutting

**Slide rail** – rails along which the saw slides in order to cut wide stock

**Slide lock** – prevents the saw from sliding along the slide rails when cutting narrow stock

**Depth stop screw** – limits how deep into the stock the blade will travel when the depth stop switch is engaged.

**Depth stop switch** – engages or disengages the depth stop. Push to the left to engage (limit depth of cut). Push to the right to disengage (allow full cut).

**Head lockdown pin** – prevents the head from being raised or lowered. Used during maintenance or transportation

**Handle** – used to plunge the saw into the workpiece

**Trigger lock** – must be depressed before the trigger can be pulled.

**Trigger** – depress to start the saw. Release to stop the saw.

## Miter Saw Safety

1. Always keep your fingers 6 inches away from the path of the blade (not just the blade itself).
2. When cutting wide stock, pull the saw towards you before plunging, then slide the saw towards the fence to complete the cut. Failure to do this may result in the saw forcibly climbing the workpiece towards the operator.
3. Always make sure the work piece is firmly against both the table and fence of the saw to prevent dangerous twisting and pulling during a cut.
4. Wait for the blade to stop spinning before raising the blade out of a cut, removing cut pieces from the table or leaving the machine.
5. Support both sides of a cut to prevent the stock from shifting when parted.

## Band Saw Overview

A band saw is a great tool for making curved cuts. Its thin, narrow blade can be used to cut out complex cuts that are impossible for the table saw or miter saw. It is worth noting that band saws are heavily utilized in the meat processing industry. Keep your fingers clear of the blade!

### Usage Highlights

SAFETY	CARE	CLEANUP
1. Keep fingers 3" from the blade & stand to the left	1. Allow the blade to cut at it's own pace. Don't force it	1. Sweep the floor and vacuum debris
2. Ensure material is properly supported	2. Alert a staff member if the blade is dull	2. Recycle waste in the scrap bin
3. Immediately power off if the blade brakes	3. Submit a <a href="#">maintenance request</a> when needed	3. Empty scrap bin and dust collection when full

## Basic Anatomy

### Table

- Supports the work piece
- If the table can tilt, use a fence or jig that prevents the work piece from pinching the blade

### Throat

- Where the blade passes through the table
- The insert is replaceable
- Small bits of cutoff can get jammed in the throat, pinching the blade

### Blade

- continuous loop with teeth on one edge, pointing towards the table
- the width of the blade determines the minimum achievable radius

### Blade guard

- covers the unused portion of the blade
- adjust to approximately ¼ inch above the workpiece

### Blade guard lock screw

- locks the blade guard at the desired height

**Blade guard height crank**

- raises or lowers the blade guard.
- always loosen the lock screw before adjusting to avoid permanent damage

**Blade guides**

- prevents twisting
- keeps the blade on the wheels
- should be as close as possible to the stopped blade without touching it
- clearance on upper guides should be checked when the guard height is adjusted
- upper guides found in blade guard, lower guides found below table

**Wheels**

- provide the path for the blade
- provide tension for the blade
- slightly crowned to allow blade to self-track

**Wheel covers**

- prevent accidental contact with the blade or wheels
- contain the blade if it breaks

## Bandsaw Safety

1. Maintain a minimum 3 inch distance between your fingers and the moving blade
2. Do not push in such a way that your hands are ever in the path of the blade
3. Do not attempt to clear small pieces from the throat of the blade while it is moving
4. If the blade breaks, turn the machine off and step away until everything stops
5. Stay away from the right of the blade, which is the most likely place the blade might lash if it breaks.
6. Keep the covers closed when operating the saw.
7. Keep the workpiece flat against the table.
8. Do not force the work into the blade. Allow the blade to work at it's own pace.

# Drill Press Overview

## Usage Highlights

SAFETY	CARE	CLEANUP
1. Keep hands 3" from the drill bit	1. Do not use excessive force	1. Sweep the floor and vacuum debris
2. Always clamp to table	2. Never leave the chuck key in the chuck	2. Recycle waste in the scrap bin
3. Long stock should be braced securely	3. Submit a <a href="#">maintenance request</a> when needed	3. Empty scrap bin and dust collection when full

## Basic Anatomy

### Table

- used to support the work piece. Make sure not to drill into the table surface.

### Table adjustment handle

- used to adjust the height of the table
- unlock the table support lock before adjusting the height.

### Table support lock

- locks the table at the current height and position around the column.
- always lock the table in place before drilling

### Chuck

- holds the drill bit. The bit should be centered relative to all three fingers.
- do not attempt to drill if the bit does not spin true.
- always unplug the machine before inserting or removing a drill bit.

### Chuck key

- used to open and close the fingers of the chuck

### Quill

- contains the rotating spindle and moves up and down

### Feed handles

- used to move the chuck up and down to perform the drilling process

### Pulleys

- used to select the speed at which the spindle turns
- Larger bits should be run slower than smaller bits
- Always unplug the machine before changing the pulley configuration.



**Belt guard**

- Keeps dust and body parts away from the pulleys. Should be closed when the machine is plugged in, and especially when running.

**Tension lock**

- loosen to give slack to the pulleys when changing the speed. Tighten to lock the pulleys into position

**Depth scale**

- shows the depth of the hole being drilled

**Bevel scale**

- shows the angle of the table

**Bevel lock**

- locks the table to the angle shown on the bevel scale

**Power switch**

- turns the motor on and off

**Drill bit**

- performs the actual removal of material
- only sharp bits should be used to prevent binding and heat generation
- will often be hot after drilling a hole. Use caution when removing a recently used drill bit to prevent burns

## Drill Press Safety

1. Keep hands at least 3 inches away from the bit when drilling. A bit can fragment, or throw the head sideways.
2. Always clamp work to the table. Your fingers are not stronger than the motor and you can be seriously injured if the bit binds in the hole.
3. Long stock should be braced against the column to prevent it from spinning into the operator.
4. Never leave the chuck key in the chuck. It can be flung from a spinning chuck and cause injury.
5. Do not use excessive force on the feed handle or you risk breaking the bit.

## Basic Operation

- When drilling deep, periodically lift the bit to clear the swarf from the hole and flutes
- Center punching the location of a hole will help keep a drill bit from wandering
- When drilling large holes, a pilot hole will help larger chisel-tip bits cut properly
- Placing a sacrificial piece of stock below the workpiece can help prevent tearout
- If drilling thick material, drilling from both sides using a pilot hole as a positioning guide can also be useful

# Belt/Disc & Spindle Sander Overview

## Usage Highlights

SAFETY	CARE	CLEANUP
1. Keep fingers 3" from the abrasives	1. Allow abrasive to sand at it's own pace. Don't force it	1. Sweep the floor and vacuum debris
2. Only use the left hand side of the Disc Sander	2. Alert a staff member if the abrasive is overworn	2. Recycle waste in the scrap bin
3. Workpieces large or small must be fully supported	3. Submit a <a href="#">maintenance request</a> when needed	3. Empty scrap bin and dust collection when full

## Basic Anatomy

### Abrasive belt

- spins down toward the table
- belt itself is designed to be turned in a specific direction

### Table

- the workpiece should be supported by the table at all times

### Table angle gauges

- indicates the angle of the tables

### Table angle locks

- should always be lock the tables at the desired angle

### Belt tensioning handle

- should only be used by approved staff & must be locked during use
- used to loosen the top guide roller for replacement of the belt

### Belt tracking adjustment screws

- adjusts the belt left or right on the rollers
- should only be used by approved staff

### Abrasive disc

- spins counter clockwise
- only use the left hand side of the disc
- using the right hand side of the disc will result in kickback and potential injury

## Belt/Disc & Spindle Sander Safety

1. Keep fingers a minimum of 3 inches from moving abrasive surfaces
2. Do not sand on the up side of the disk sander
3. Position the workpiece so that it will not kick back during sanding
4. Sand with the direction of the grain
5. Do not use to sand work that is too small to properly support or large work that is improperly supported
6. Thin stock may be pulled into the gap between the abrasive and the support table.  
Keep thin stock flat against the table, or perpendicular to the table.