

Protohaven

Table Saw

SawStop ICS53230 5HP & SawStop PCS31230 3HP

Tool Tutorial

The [Setup](#), [Operation](#), and [Cleanup](#) Checklists of this guide are what instructors use to ensure that you can use the equipment according to community expectations.

The tablesaw is the main workhorse of the modern workshop and can be used to cut nominally sized lumber to precise lengths and widths. Some of the most common uses are making rip and crosscuts on boards and cutting panels to size. With appropriate setups and jigs, more complex joinery can be accomplished like cutting dadoes and rabbets on panels, tenons, bridle joints, box joints, and splines.

Usage Highlights

[Table Saw Clearance](#) or [Class Equivalent](#) Required Before Use

SAFETY	CARE	CLEANUP
1. Take all possible preventative measures to avoid kickback	1. Do not cut anything with uncured glue or resin	1. Place any accessories like miter gauges, featherboards and sleds back in their storage
2. Keep your hands at least six inches away from the blade.	2. Always run dust collection to prevent clogging the dust port	2. Brush off all machine surfaces
3. Keep a push-stick accessible at all times	3. Ensure that all nails and screws have been removed from any reclaimed materials	3. Sweep up the floor around the machine
	4. Submit a maintenance request when needed	4. Check that the dust collection port below the blade is not clogged

Personal Protective Equipment

Safety glasses must always be worn. Hearing protection is highly recommended in the workshop, especially when the dust collection fan is active.

Tool Anatomy

MACHINE ANATOMY

1. **Power Box Switch** - Switch for the electrical box. The yellow switch must be 'on' for the motor switch to work. Each time it is turned 'on', the box will go through a boot process. When the boot process is complete the green light will glow solid.
2. **Start/Stop Paddle** - Switch for the motor. Pull out to turn on, push to turn off.



3. **Maintenance Tag** - Manually tracks the usability status with Green/Yellow/Red cards
4. **Table** - This is precision ground cast iron and will rust and damage easily. Do not expose to moisture, use for hammering, or as a glue-up surface.
5. **Blade** - Can be raised and lowered, and tilted up to 45 degrees to the left.
6. **Blade Guard** - Covers the blade as a safety measure and has an integrated splitter. Cannot be used when making dadoes or rabbets, or for cuts very close to the fence.



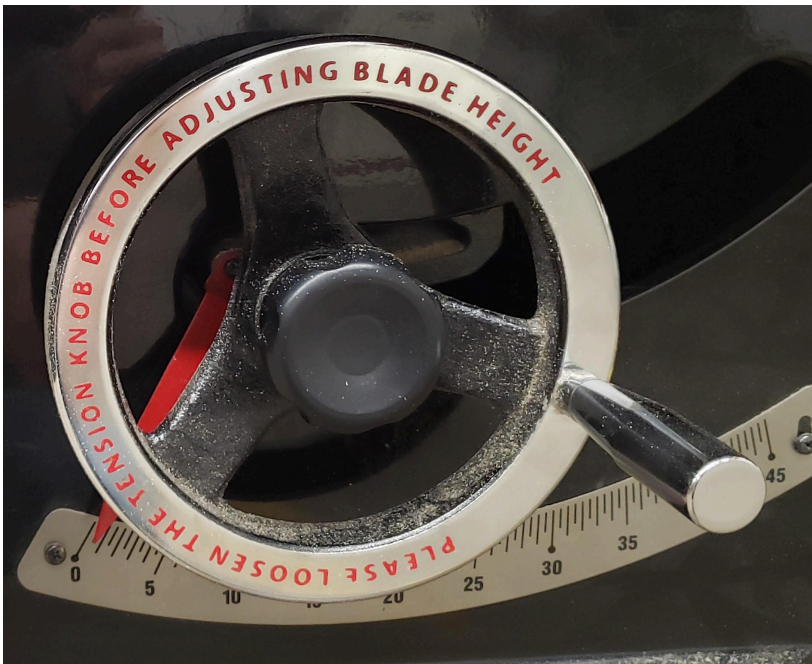
7. **Riving Knife** - Used as a splitter that follows the height of the blade. Must be installed if not using the blade guard.



8. **Throat Plate** - Maintains a tight clearance between the blade and the table surface. There is a separate throat plate for use with dado stacks.



9. **Brake Module** - Sits below the blade and is activated whenever the blade senses something that might be contact with flesh.
10. **Height Adjustment Crank** - Raises and lowers the blade. Found on the front of the cabinet. Unlock the knob before turning, and lock the knob in place when adjustment is complete.



11. **Angle Adjustment Crank** - Tilts the blade between 45 degrees and 90 degrees from the table. Found on the side of the cabinet. Unlock the knob before turning, and lock the knob in place when adjustment is complete.
12. **Fence** - Provides a surface parallel to the blade to use as a reference when making long cuts. The fence should never be pushed up against the blade.
13. **Miter Gauge** - a small jig that allows cross-cuts and miter cuts.

14. **Push Stick** - A stick to help push stock through the saw to help keep your fingers away from the blade.
15. **Featherboard** - Flexible fingers that clamp into the miter slot and help push the stock against the fence.

Tool Safety

COMMON HAZARDS

Lacerations - The stories of fingers lost to tablesaws are plentiful. Keeping your fingers at least six inches away will help prevent accidental contact with the blade. Do not reach across the blade to prevent contact with your arms.

Entanglement - Do not wear long sleeve shirts or bracelets. Tuck in any necklaces, and tie back long hair.

Kickback - Anytime a workpiece binds on the blade it runs the risk of violently kicking the work out the front of the saw. When this happens it can pull the user's hand into the path of the blade.

There are several ways kickback can happen:

1. Kerf closing mid-cut. Due to internal forces in the wood, the stock may warp as it is cut, and the resulting pieces may close in on the path that the blade has made through the wood, known as the kerf. When the kerf closes on the blade, it will bind on the blade and stall the saw or eject the workpiece. If you feel the blade start to provide resistance as you cut, stop the saw immediately. Remove the workpiece from the blade and inspect the cut. It may be possible to re-make the cut now that some of the tension has been released.
2. Wood twisting mid-cut. If wood is not perfectly flat, it may tip back and forth as it is pushed through the cut. If the kerf tilts against the blade it will pinch and bind. Only use stock that lays perfectly flat to the table.



3. Stock rotating into the back of the blade will lift the stock with the rear tooth, then shoot it out the front of the saw. In order to prevent this, stock must be locked in place rotationally either by having one straight edge against the

fence, or by holding the workpiece firmly using the miter gauge, a sled, or some other jig. Even with those aids in place, an unexpected shift while feeding due to a knot in the wood or some other hiccup may still result in the wood turning into the saw. To mitigate this risk a splitter must always be used, either the splitter built into the blade guard or if the blade guard is removed, the riving knife MUST be installed.

4. Stock riding on top of the blade - Sometimes the stock will be pushed up the front of the blade, and then be thrown when the teeth at the top of the blade re-engage with the stock. This can happen more easily when the blade height is very low to the table, creating a low ramp. A dull blade will also make it more likely that the stock will ride up the blade instead of being cut as expected. Make sure the blade is set to a minimum height of one inch when cutting very thin stock. Check the blade sharpness. Maintain firm downward pressure to keep the stock against the table at all time.

PROHIBITED MATERIALS

Reclaimed wood often has embedded nails or screws which can damage the blade, cause the workpiece to kick, and can scratch the table. All reclaimed wood should be checked with the hand-held metal detector before being sawn.

Reclaimed materials may be painted with lead paints. Lead paints are prohibited in the shop as the dust created is toxic.

No metals shall be cut on the table saws. They will trigger the brake system, and potentially shatter the saw blade, throwing debris at the user.

Initial Setup

SETUP CHECKLIST

1. Check that the dust port below the saw blade is not clogged
2. Turn on the electronics box switch and allow the system to boot up

SETUP BREAKDOWN

Check the dust port

Remove the throat plate and look past the blade to the bottom of the blade housing. The dust port should be visible with no dust build-up. If there is dust and debris blocking the port, unplug the saw and use a shop-vac to remove the blockage. It may be necessary to open the left access panel and remove the dust hose from the blade housing in order to remove heavy blockages from the hose itself.



Turn on the electronics box switch

Turning on the yellow switch will cause the electronics to boot up. The red light will flash slowly until the bootup process is complete, at which point the green light will go solid. If the electronics box finds a fault with the machine setup it will flash a series of lights. The light code can be looked up on the chart on the left side of the electronics box in order to determine the cause of the fault.

COMMON SETTINGS

N/A

CONSUMABLES

General purpose 10" diameter $\frac{1}{8}$ " thick saw blades are provided by the shop. Any specialty blades like thin-kerf blades or flat-toothed blades needed for a lot of joinery cuts must be provided by members.

Basic Operation

OPERATION CHECKLIST

What is the [step-by-step walkthrough](#) of basic operation?

1. **Open** dust gate
2. **Power on** Dust Collection
3. Mark the cut line on the workpiece
4. Raise the blade to the proper height
5. Line up the cut line with the saw blade
6. Turn on the blade
7. Make the cut
8. Stop the saw blade

OPERATION BREAKDOWN

Check the dust gate

Verify that the dust gate that corresponds to the table saw you are using is open.

Turn on the dust collector

Mark the cut line on the workpiece

At the back, bottom edge of the workpiece, make a mark at the start of the cut. Making the mark on the back, bottom edge will allow you to perfectly line up the edge of a blade tooth with your mark, which would be impossible to do if you make your mark on the top surface. It is good practice to indicate which side of the mark is the waste side so that you do not accidentally remove the kerf width from the piece you want to keep.

Raise the saw blade to the proper height

Place your stock on the table surface next to the blade and raise or lower the blade so that the entire tooth profile of the highest teeth completely clear the top of the workpiece.

Line up the cut line with the saw blade

With the workpiece held appropriately for whatever operation you will be performing (rip, crosscut, etc), line up the hash mark you made to delineate the cut with the frontmost tooth on the saw blade. Lock the fence in place if using the fence, otherwise move the fence out of the way. Be aware that locking the fence may cause the angle of the fence to shift, changing its distance from the blade. Double check your alignment after locking the fence and adjust if necessary.

Turn on the blade

Make sure there are a few inches of clearance between the workpiece and the blade so it is not thrown as soon as the saw is turned on. Pull the red paddle gently towards you until it clicks and the blade turns on. Allow the blade to come up to full speed. If the blade does not turn on, check the lights for error codes and push the paddle back to its off position.

Make the cut

Push the workpiece at a constant speed into and past the blade. Be sure to keep your hands out of the path of the blade, and at least six inches away from the blade as you push the workpiece past the blade. As the blade reaches the front edge of the stock, the left and right halves of the cut will separate. If one of those pieces is between the blade and the fence, be sure to push that piece completely past the back tooth of the blade to prevent the piece from pinching and being ejected forcefully from the saw. Small pieces sitting next to the blade may be able to be knocked away from the blade by a push stick, but should not be picked up by hand unless the blade has come to a complete stop.

Unless you are working with large stock it will be necessary to use a push stick to push the stock past the blade while keeping your fingers at a safe distance.

Stop the blade

Push the paddle back to its original 'off' position and wait for it to come to a complete stop.

Cleanup

CLEANUP CHECKLIST

1. **Brush off all surfaces**
2. **Sweep the floor surrounding the machine**
3. **Note** any maintenance needs or concerns on the tag and at protohaven.org/maintenance
4. **Recycle waste** in the single-stream scrap bins

SCRAP BREAKDOWN

Place any scrap larger than 2"x4"x2' in the black scrap bin next to the back door. Any scrap smaller than that in any dimension should be thrown in the trash. If you notice any unusable scrap or trash in the scrap bin, please move it to a trash can.

MAINTENANCE REQUESTS

1. Update the physical Maintenance Tag at the machine
 - **Green** can be used without issue
 - **Yellow** can be used with caution
 - **Red** cannot be used without hazard to either the user or the equipment
2. Record issues at protohaven.org/maintenance. This notifies our staff and volunteer maintenance crew of any issues

Troubleshooting

Common Issues	Possible Causes	Resolutions
The saw's control box will not turn on	The machine does not have power	Check the wall plug, and on the 5HP machine, check the mains lockout switch on the left side.

<p>The saw blade will not start</p>	<p>The paddle may have been turned on before the saw blade came to a complete stop.</p> <p>The right-side access door may be ajar, preventing the interlock switch from closing.</p>	<p>Return the paddle to the 'off' position and try again to turn on the blade.</p> <p>Check that the access door is completely closed and that the switch is activated.</p>
<p>Stock is hard to push through the blade</p> <p>The machine generates smoke while cutting</p>	<p>The blade is dull</p>	<p>Replace the blade with a fresh one</p> <p>Clean the pitch from the blade</p>

Special Setups

Round stock should be placed in a sled or v-block to prevent it from being spun by the blade.

Dado stacks may be used, but the special dado brake for 8" blade stacks must be installed instead of the standard 10" brake module.

Additional Resources

Tablesaw kickback prevention - Stumpy Nubs - (in-depth discussion of the causes of kickback) <https://www.youtube.com/watch?v=8f8VWwtaudU>

Tablesaw kickback - 42 fab - (accident breakdown of thrown sheet stock) <https://www.youtube.com/watch?v=9hZ78pKoEwU>

If this is a CNC tool, where can one learn more about the CAD, CAM or CAD software?

Staff-Use

AUTHORIZED MAINTENANCE CREW ONLY

If you are part of the maintenance group please log on to the #maintenance channel of our Discord server to:

- Perform a Maintenance Action
- Request a Maintenance Purchase
- Review complete Maintenance Logs for each machine
- Generally chit-chat about maintenance

Hippocratic Oath

- Start with the Manual
- Ask questions
- Do no harm
- Know your limits
- Document your actions

What [preventative maintenance areas](#) does the manual indicate? For example, a regular oil schedule, how often to tension belts/blades, and when to change a filter.

This is the area to simply name the topic, frequency, and page number where more information can be found in the manual.

Links to helpful videos or additional resources would be a helpful secondary source.