Protohaven

# Scroll Saw

Hawk MB-26 Precision Scroll Saw

## 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.

Scroll saws excel at making tight curves with small kerf. Ideal for making jig saw puzzles, architectural scrollwork, and ornaments. The scroll saw is able to make interior profile cuts, which are impossible on the band saw.

# Usage Highlights

Scroll Saw Clearance or Class Equivalent Required Before Use

| SAFETY | CARE | CLEANUP |
|---|---|---|
| 1. Ensure proper blade tension | 1. Do not start the machine unless a blade is installed | 1. Brush off the machine surfaces |
| 2. Keep material flat to table and use the pressure foot. | 2. Only start the machine at a medium speed to prevent burning out the motor or damaging the armatures | 2. Sweep up the floor and surrounding area |
| 3. Keep fingers clear of the blade | 3. Submit a maintenance request when needed. | |

# Personal Protective Equipment

Eye protection should be used while operating this machine.

# Tool Anatomy

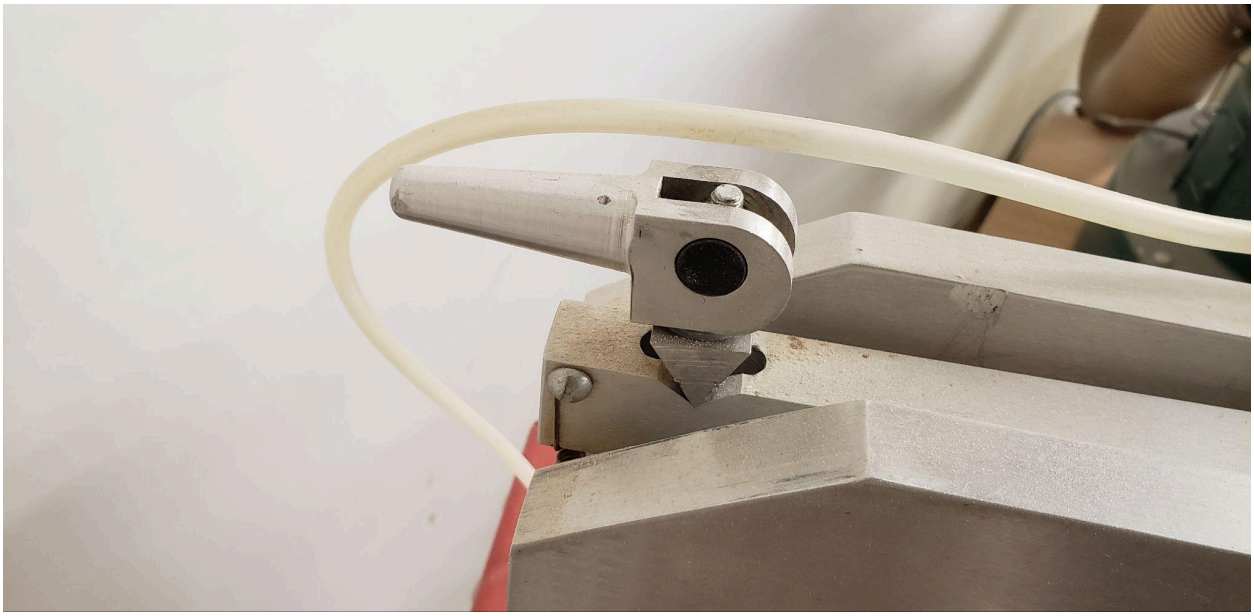
## MACHINE ANATOMY

1. **Power Switch** - on/off switch

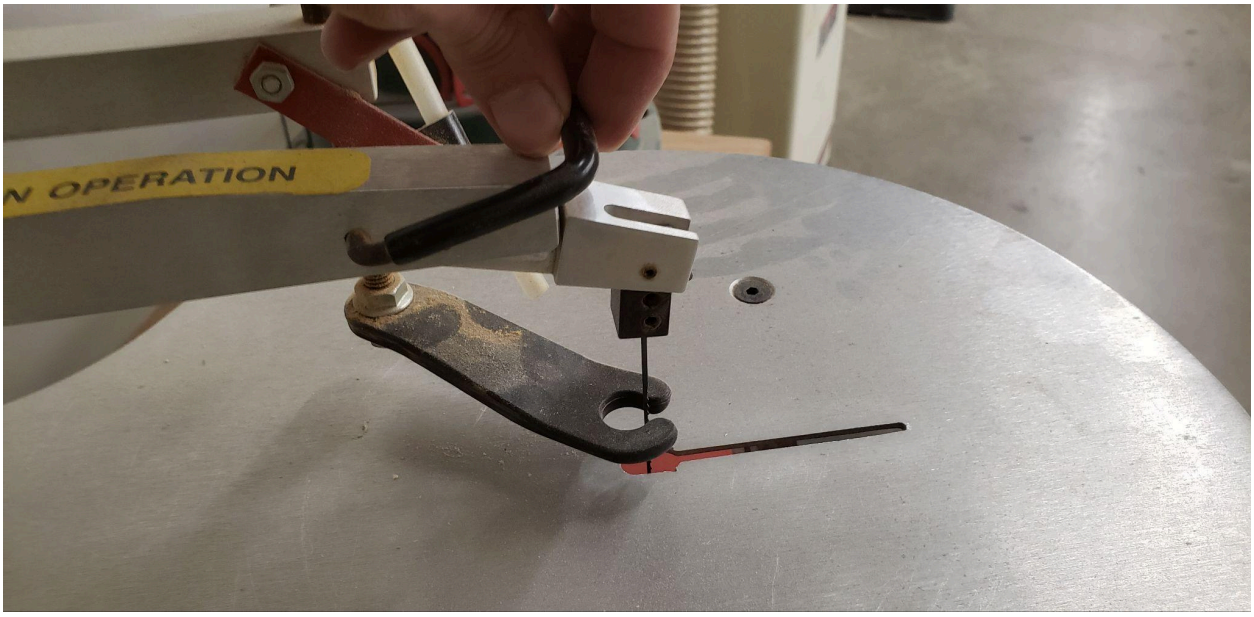

2. **RPM Knob** - Adjusts the motor speed, which changes how fast the blade oscillates.
3. **Table** - Supports the workpiece. Keep all work flat to the table.
4. **Pressure Foot** - Keeps workpieces securely pushed against the table to prevent vibration in the workpiece.

5. **Top Blade Holder** - Holds the top portion of the blade above the table. Be careful not to get your hand pinched under any part of the arm while the machine is running.
6. **Bottom Blade Holder** - Holds the bottom portion of the blade below the table

7. **Blade Tension Adjustment Knob** - Determines the tension on the blade when the tension release lever is engaged. This is not normally unlocked or adjusted when changing the blade, but is used to fine-tune the machine if the blade tension is slightly too tight or slightly too loose.



8. **Blade Tension Release Lever** - Unlock this quick-release lever to release the tension on the blade during installation.




9. **Air Hose** - The built-in bellows provides a constant air stream while the machine is operating in order to clear sawdust away from your marked cut line.
10. **Maintenance Tag** - Manually tracks the usability status with Green/Yellow/Red cards

# Tool Safety

## COMMON HAZARDS

Contact with the blade can cause severe lacerations. Keep your fingers clear of the blade.

The reciprocating arms above and below the table can bruise or crush body parts. Keep your hands and arms clear of the reciprocating arms during operation.

The reciprocating action of the blade can cause the workpiece to shake vertically, and be lifted from the table. It is possible to get fingers pinched beneath the workpiece if it lifts, or lose control of the work if it is shaking. Use the pressure foot to keep the workpiece firmly against the table.

The arms may be unstable if the machine is run while no blade is installed. Do not turn on the machine if there is no blade installed, and turn off the machine as soon as possible when a blade breaks.

Turning on the saw at a high speed may over-stress the motor and linkages. Turning on the saw at a low speed may cause the motor to seize and overheat. Always set the motor to a medium speed when turning it on, then adjust to the desired operating speed.

## PROHIBITED MATERIALS

Lead paint should never be cut or sanded in the workspace.

# Initial Setup

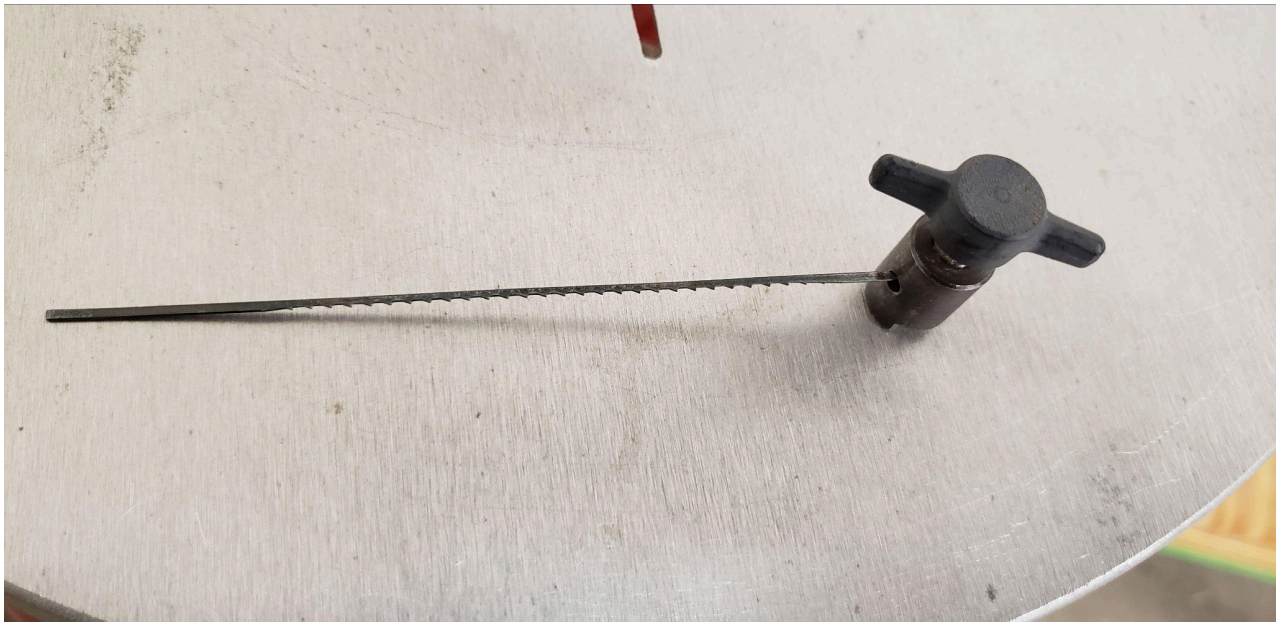
## SETUP CHECKLIST

1. Install a blade into the lower holder
2. Install the lower holder into the saw
3. Install the blade into the top holder
4. Engage the tension lever
5. Adjust the tension
6. Adjust the pressure foot

## SETUP BREAKDOWN

### Install a blade into the lower holder

Select a blade from your collection. Remove the lower blade holder from it's cradle in the lower arm below the table. Insert the bottom tip of the blade into the lower blade holder and tighten the knob. You may need to use a 5/16" wrench to stabilize the blade holder while tightening the knob.



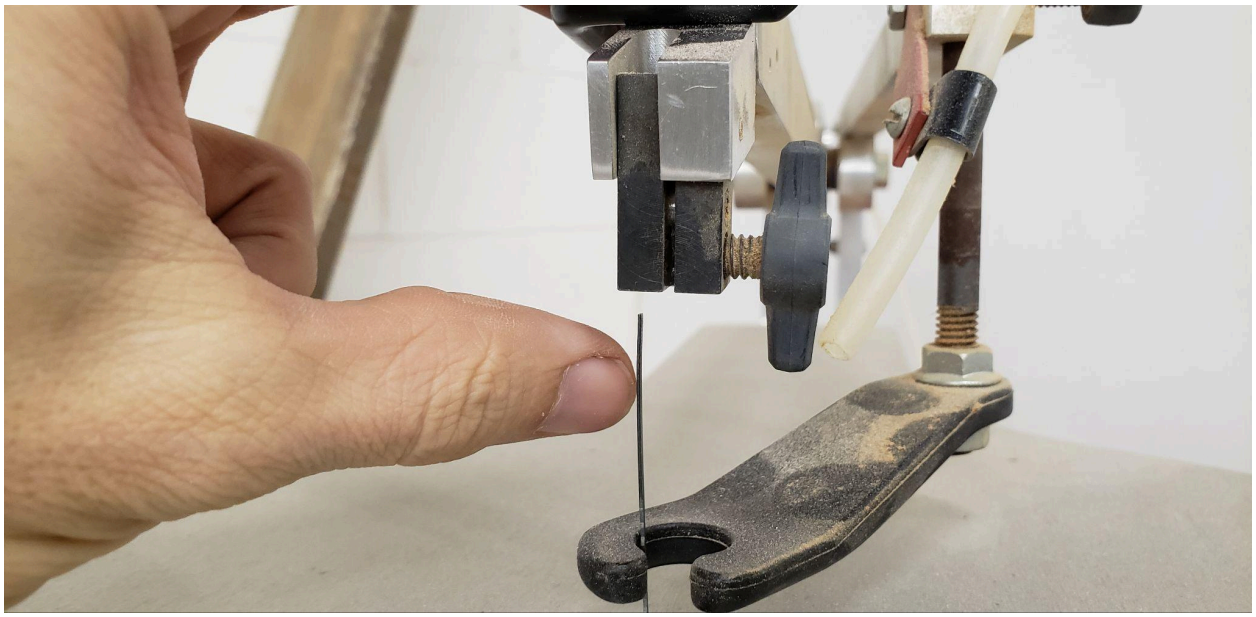
## Install the lower holder into the saw

Feed the free end of the blade upward through the throat of the table, and place the lower blade holder into it's cradle. The blade should point straight up from the holder, through a slot in the cradle, and then up through the throat.

## Install the blade into the top holder

Place the top tip of the blade into the top blade holder and tighten the knob. The blade should sit firmly against the top and back of the slot cut into the top blade holder. Failing to seat the blade properly will lead to poor clamping forces, and the

blade may pull free during operation. The edges of the top holder should be parallel square to the blade when viewed from the side, not tilted. If the blade seems too short to install, make sure it is not broken, and check that the tension lever is in it's released position.



## Engage the tension lever

Once satisfied with the installation of the blade in the holders, pull the tension lever forward to place tension on the blade.

## Adjust the tension

Pluck the blade to test it's tension. Proper tension will be learned with practice, but you should get a musical twang. A very high pitched not indicates too much tension, and a deep rattly note indicates too little tension. At the back of the top arm is a small lever/knob which can be released, then turned to add or remove tension. Release the tension lever at the blade before making any adjustments at the rear, and make sure this lever/knob is engaged before starting the machine.

## Adjust the pressure foot

Unlock the pressure foot and adjust it so it presses lightly against the top of your material without restricting it's lateral movement. Lock it firmly in place.

### CONSUMABLES

Members are expected to provide their own 5” **pinless** scroll saw blades. Pinned blades cannot be installed in this machine.

# Basic Operation

### OPERATION CHECKLIST

1. Set the motor speed to a **medium** speed
2. Turn on the motor
3. Adjust the speed to the desired operating speed
4. Make your cut

### OPERATION BREAKDOWN

#### Set the motor speed to medium.

If the speed is set too low, the motor will not turn and will quickly burn out. If the speed is set too high, the machine may start violently, causing damage to the armatures and linkages.

#### Turn on the motor

Turn the power switch on and allow the motor to come up to speed before making adjustments.

#### Adjust the speed

Once the machine is running, you can freely adjust the speed up or down to reach the desired cutting speed. The faster the blade moves, the more aggressive you can be with your cuts. The thickness, type of material you are cutting, and blade speed will all affect the cutting speed and cut quality. Avoid extremely fast cutting speeds as it will cause premature wear on the machine.

## Make your cut

Bring your material into contact with the blade slowly. Continue your cut smoothly, always providing some forward movement any time you are turning the piece. It is possible to back out of a cut slightly and then move forward again while eating away at the side of your previous cut, creating a small hollow space which you can rotate freely around the blade in order to make very tight corners in the middle of a cut. As you finish a cut, make sure you keep your fingers clear of the blade.

To make an interior profile cut, drill a hole through your workpiece, and then pass your blade through that hole when installing the blade. You can then cut the interior profile as you would any other line, and remove the blade again in order to release your workpiece from the saw.

# Cleanup

## CLEANUP CHECKLIST

1. **Turn off** the machine
2. **Remove your blade** if you wish to keep it for future use
3. **Brush off** the surfaces of the machine
4. **Sweep** the floor and surrounding area
5. **Note** any maintenance needs or concerns on the tag and at protohaven.org/maintenance

## SCRAP BREAKDOWN

There is a black scrap bin in the back corner of the wood shop. Maintaining this is a shared, communal responsibility.

Please do not throw trash or unusable items into the scrap bin. If you have generated scrap that you think would be a significant help to a future project, please place it in the bin. If you need some scrap while working on a project, please take whatever you need from the bin. We generate significantly more scrap than is used, so please throw away anything that is not project-worthy.

If the scrap bin is full, please enlist the help of other members in emptying it into the dumpster behind the building, keeping just a few of the best pieces.

## 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 blade broke | Blade tension too high<br>Blade tension too low | Adjust the blade tension at the rear of the saw. |
| Motor will not turn on | Motor speed too low | Make sure the motor is set to a medium speed when turning on, then lower the speed if needed. |
| Material shakes when cutting | The pressure foot is not keeping the material flat to the table | Lower the pressure foot to add more pressure to the material. |
| | | |
| | | |

# Special Setups

N/A

# Additional Resources

Manufacturer's website:
https://stores.bushtonhawkstore.com/bm-26-precision-scroll-saw/

Scroll saw blade instructional material:
https://scrollsawer.com/2017/09/06/choosing-the-right-blade/
Introduction to scroll saw skills:
https://www.youtube.com/watch?v=8WYw855pI04

Blade preparation and tensioning:
https://www.youtube.com/watch?v=2tKojGCeUkQ

# 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.