Protohaven

Spindle Sander

Make/Model ?

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 spindle sander is necessary to sand concave profiles that you may cut with a bandsaw or router. The belt/disc sander is not capable of sanding concave profiles.

Usage Highlights

Spindle Sander Clearance or Class Equivalent Required Before Use

SAFETY	CARE	CLEANUP
1. Keep materials flat to the table	1. The top knob is reverse threaded.	1. Brush the dust from the machine surfaces
2. Use the appropriate throat plate for the installed drum	2. Do not use pliers to tighten or loosen the top knob.	2. Vacuum out any sawdust from the throat.
3. Do not install a washer larger than installed drum	3. If an abrasive sleeve spins freely on a drum, stop and address the problem.	3. Sweep the floor surrounding the machine
	4. Submit a maintenance request when needed.	

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

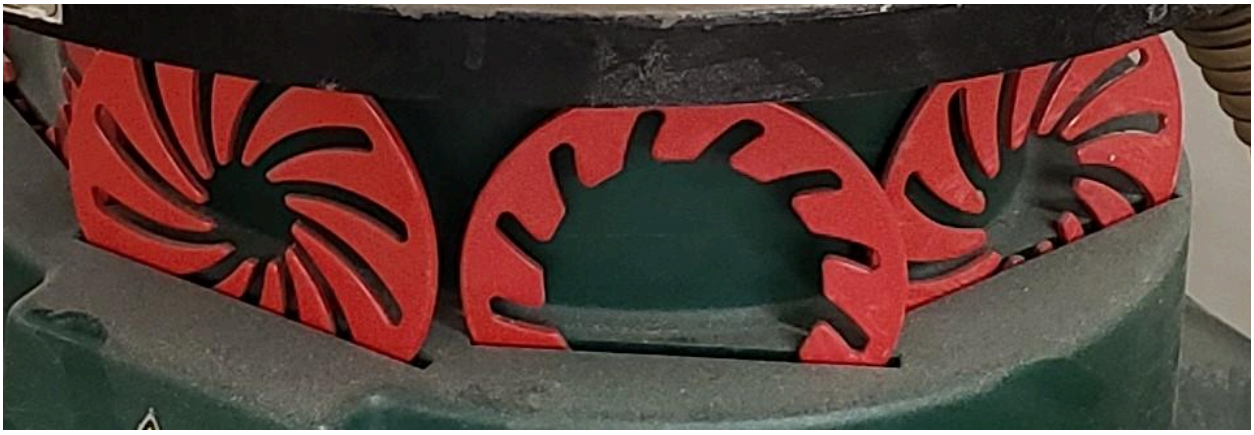
MACHINE ANATOMY

1. **Power Switch** - on/off switch. Pull to turn on, push to turn off.

2. **Maintenance Tag** - Manually tracks the usability status with Green/Yellow/Red cards
3. **Drums** - These fill the space between the spindle and the abrasive sleeves.

4. **Abrasive Sleeves** - These consumables slip over the drums.

5. **Throat Plates** - These prevent the workpiece from dropping between the table and the abrasive.



6. **Top Washers** - Keep the abrasive sleeve from sliding off the top of the drum during operation.

7. **Top Knob** - Keeps the washers and drums attached to the spindle. This is reverse threaded, and loosens by turning clockwise.

Tool Safety

COMMON HAZARDS

If a washer larger than the drum is installed below the drum, it will bump the bottom of the throat plate as the spindle oscillates up and down. This can cause the throat plate to become dislodged and contact the abrasive, potentially jamming the throat plate or injuring the user. Once the throat plate has become dislodged, the workpiece may enter the throat and become trapped, causing damage to the machine and potentially damaging the user. Never install a washer that is bigger than the drum below the drum.

If a washer larger than the drum is installed above the drum, it can cause a pinching hazard as the spindle oscillates up and down. If the workpiece is thicker than the washer's lowest point in the oscillation, it will crush against the top of the workpiece, causing damage to the spindle and the oscillating drive below the table. Even if the washer will not contact the top of the workpiece when oscillating, it poses a crush hazard if the user's hand gets between the over-sized washer and the workpiece or table. Never install a washer that is bigger than the drum on top of the drum.

The workpiece may fall into the throat if there is a gap between the throat plate and the abrasive. Always use the appropriate throat plate for the installed drum to ensure a minimal gap.

PROHIBITED MATERIALS

Materials that are reclaimed may be painted with lead paint. Do not sand any materials that might possibly contain lead.

Metals are not permitted on the wood shop sanding equipment. Sparks generated pose a fire hazard due to the sawdust around the machine and in the dust collection system. Metals will also quickly wear out the abrasives and the graphite platen found behind the belt sander.

Initial Setup

SETUP CHECKLIST

1. Remove any installed abrasives
2. Select the appropriate size drum
3. Install new abrasive on drum
4. Install drum on spindle
5. Install throat plate

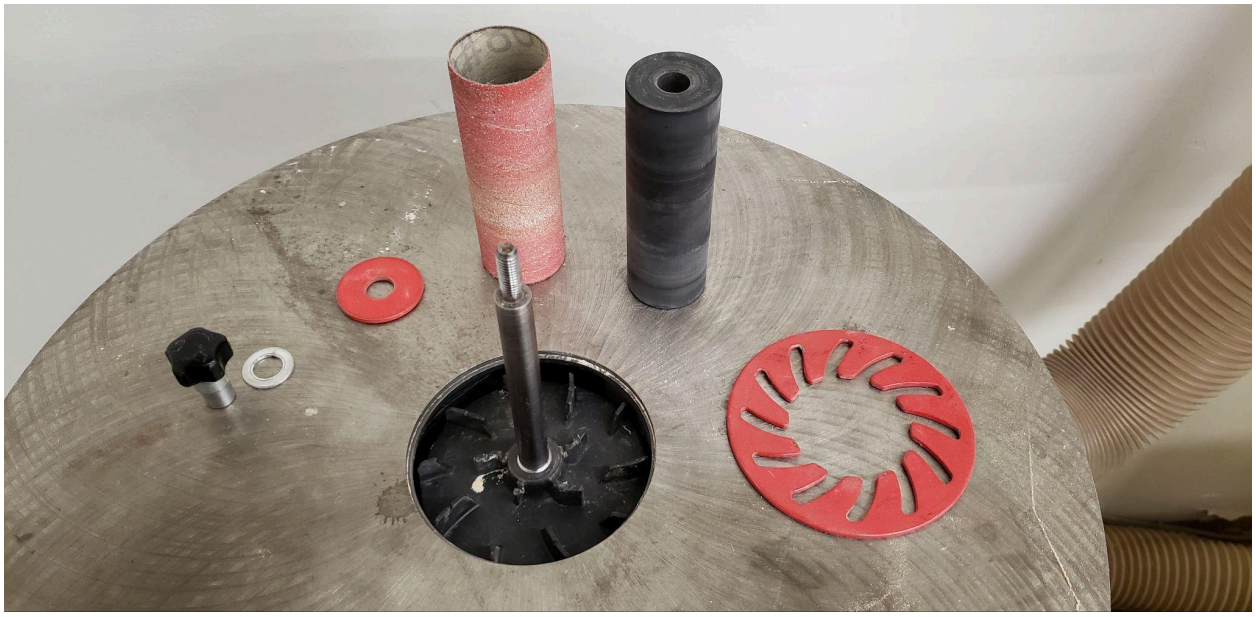
SETUP BREAKDOWN

Remove any installed abrasives

Even if the abrasive installed is the size you want, it is best to disassemble the abrasive sleeve and drum from the spindle to ensure the previous owner did not install something improperly.

Unscrew the top knob by turning it clockwise. This is OPPOSITE the usual direction you would use to unscrew something.

Lift off the drum and any washers you find on top or beneath the drum.



Select the appropriate size drum

You will need to use an appropriate diameter drum for the radius of the curves on your project. Generally, the larger the diameter of the drum, the smoother the resulting surface will be. Smaller diameter drums can get into tighter spaces, but it can be challenging to use them without leaving a choppy surface finish.

Install abrasive on drum

Slide an abrasive sleeve onto the drum. The sleeve should fit very snugly on the drum, and you should not be able to easily spin the sleeve on the drum. With use, the abrasive sleeves will stretch slightly, and their fitment will become looser. If there is too much play between the sleeve and the drum, you can try wrapping the drum in painters' tape to take up the extra space, or get a new sleeve that hasn't been stretched.

Install drum on spindle

Slide the drum onto the spindle, letting it bottom out on the black plastic under the table. Loose abrasive sleeves in the past have worn away portions of the impeller below the table, so sanding with loose sleeves can cause them to slide downward on the drum. In an effort to combat this slippage, it is possible to put a washer THE SAME SIZE as the drum onto the spindle before installing the drum to provide a platform to support the sleeve from below. Do NOT install a washer larger than the drum below the drum.

Once the drum has been slid onto the spindle, place a retaining washer THE SAME SIZE as the drum on top of the drum. This prevents the drum from sliding upwards off of the drum while sanding. Do NOT install a washer larger than the drum below the drum. There are not currently enough washers to place one both on top and below the drum. When forced to choose, place the retaining washer on top of the drum.

In an effort to increase the gripping pressure of the drum against the inside of the abrasive sleeve it is common to place a secondary washer smaller than the diameter of the drum between the drum and the top retaining washer. This is acceptable and does not pose a danger to the user or the machine.

Screw the top knob onto the spindle. It is reverse-threaded and needs to be turned COUNTER-CLOCKWISE, to tighten. The knob should have a small silver washer that sits between the retaining washer and the shoulder of the knob.

COMMON SETTINGS

N/A

CONSUMABLES

Users are responsible for providing their own abrasive sleeves. These sleeves wear out quickly, and one cannot rely on the previous user leaving a sleeve in usable condition. An effort will be made to keep a supply of sleeves available for purchase in the store, but it is wise to purchase what you need from a third party in advance.

Basic Operation

OPERATION CHECKLIST

1. **Open** dust gate
2. **Power on** Dust Collection
3. Place the workpiece on the table
4. Touch the workpiece to the abrasive
5. Clean the abrasive as needed

OPERATION BREAKDOWN

Open dust gate

Power on Dust Collection

Place the workpiece on the table

Set the piece flat on the table and make sure you have free range of motion to complete your task.

Touch the workpiece to the abrasive

Allow the spindle to oscillate, and gently bring your workpiece into contact with the abrasive. With smooth, sweeping motions, pass your workpiece across the spindle. It is best to pass the workpiece from right to left, pushing against the direction the abrasive is spinning. Passing from left to right may cause the worpiece to kick back, pulling it from your hands.

Special care should be taken when sanding inside cutouts or deep contours as a loss of control can cause the workpiece to “helicopter”, causing bodily injury.

Clean the abrasive as needed

Keep an eye on the abrasive as you sand, and use the eraser to pull the sawdust out of the abrasive if it begins to get clogged.

Cleanup

CLEANUP CHECKLIST

1. **Brush** the dust off of the machine surfaces
2. **Sweep** the dust from around the machine

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 abrasive does not sand as fast as it should	Clogged abrasive	Use the eraser to unclog the abrasive Install new sleeve
Sleeve is creeping up off the drum	Improper installation of retaining washer	Install proper retaining washer on top of drum

Sleeve is creeping down off the drum	Inadequate interface between the drum and the sleeve	Tighten the top knob Install a new sleeve Wrap the drum in painters' tape Add a retaining washer the same size as the drum (if available) below the drum Add a small washer between the top of the drum and the retaining washer to help squish the drum out against the sleeve.

Special Setups

N/A

Additional Resources

Where can one find materials, tools, or other consumables (either local or online vendors)?

What helpful video tutorials are there where one can dive deeper into operating this tool?

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.