

A woodworking machinery maintenance training program for beginners involves a structured approach to educate participants about the safe and effective maintenance of woodworking tools and equipment. This program will cover basic principles, safety procedures, and hands-on maintenance tasks.

Program Title: **Beginner Woodworking Machinery Maintenance Training**

Program Duration: 2-3 hours (adjustable based on the depth of content)

Target Audience: Beginners in woodworking with limited to no prior machinery maintenance experience.

Program Objectives:

- To teach participants the importance of machinery maintenance for safety and efficiency.
- To provide an understanding of basic woodworking machinery and their components.
- To impart hands-on skills for inspecting, cleaning, and maintaining woodworking machinery.
- To promote a culture of safety in the woodworking workshop.

## Hour 1: Introduction to Woodworking Machinery Maintenance

1. Welcome and Orientation:
  - a. Introduction to the program, trainers, and participants
  - b. Overview of the training facility and available machinery.
2. Safety First:
  - a. Importance of safety in woodworking.
  - b. Basic safety rules and personal protective equipment (PPE).
    - i. Disconnect the power.
    - ii. Wear eye protection
    - iii. Hearing Protection as needed.
    - iv. Dust protection as needed.
    - v. Disposable Gloves.
  - c. Familiarity and your Senses are the best indicators of proper machinery function and operation:
    - i. Look safe? Anything look out of place?
    - ii. Does the machine Sound like it's operating normally?
    - iii. Anything Feel rough? Are there excessive vibrations? Does it feel hot?
    - iv. Do you smell smoke or burning rubber?
    - v. Is there an acrid or gritty taste in your mouth?
3. Woodworking Machinery Overview:
  - a. Introduction to common woodworking machines (table saw, jointer, planer, bandsaw, router, etc.).

- b. Explanation of key components and functions. Feeders, Guides, Clamps, Hold Downs, Speed/Rate Controls, Circuitry & Power.

## General Checklist of Machines and Machine Components.

	Jointer	Planer	Table Saw	Band Saw	Miter Saw	Drill Press	Sanders	Compressor
Table								
Fence/ Guides								
Clamps/ Hold Downs								
Power								
Transmission								
Controls								

### Hour 2: Basic Maintenance Procedures

1. Machinery Inspection and Calibration (See Appendix A-Understanding Snipe):
  - a. Hands-on inspection of different woodworking machines.
  - b. Identifying wear and tear, loose parts, and potential safety hazards.
2. Cleaning and Lubrication:
  - a. Proper cleaning techniques for woodworking machinery.
  - b. Lubrication points and lubricants selection.
3. Blade and Bit Maintenance:
  - a. Sharpening and replacing saw blades.
  - b. Maintaining router bits and cutting tools
4. Belt and Pulley Maintenance:
  - a. Checking and replacing belts.
  - b. Alignment and tension adjustments.
5. Dust Collection and Safety Measures:
  - a. Overview of dust collection systems.
  - b. Dust management for a clean and safe workspace.

## Hour 3: Practical Workshop (Cross Reference Appendix B-Machine Maintenance Checklists)

1. Hands-On Maintenance:
  - a. Participants work on assigned machinery under supervision.
  - b. Practicing maintenance tasks learned in previous sessions.
2. Troubleshooting:
  - a. Identifying and addressing common woodworking machinery issues.
  - b. Quick fixes and when to seek professional help.
3. Final Assessment:
  - a. Written test to evaluate knowledge.
  - b. Practical test to assess hands-on skills.
4. Certification and Closing:
  - a. Awarding certificates of completion.
  - b. Q&A session and feedback collection.

### Post-Training:

- Provide participants with reference materials, maintenance checklists, and safety guidelines. (see Appendix C-MRO Sources)
- Encourage ongoing practice and offer additional resources for further learning.
- Establish a system for participants to seek guidance or assistance with machinery maintenance in the future.

Remember to adapt this training program to your specific woodworking machinery and workshop setup. Regularly update the content to incorporate new technologies and safety practices. Safety should always be a top priority in woodworking machinery maintenance, so reinforce this throughout the program.

## Appendix A-Understanding Snipe

### **2 types Physical and Mechanical**

1. Physical Snipe is caused by the physics of a cylinder cutting head in motion with mass and momentum coming into contact with a workpiece/material that is significantly softer, that initial contact will cause the cutter to take a marginally larger chunk out of the front of the wood. The machine & cutter head achieve an equilibrium through the middle of the piece. Nearing the end of the workpiece, there is significantly less material resisting the cutter, so it takes a larger chunk off the tail end of the piece. With planers, this is most evident with "lunch boxes". Until humans can defy gravity. This should be understood as a constant reality.
2. Mechanical Snipe is most evident on Industrial Planers and caused by the guide rollers in the table, directly underneath the infeed and outfeed roller in the cutting head. Industrial Planers tend to be much larger and utilize more force to move a workpiece through the cutting mechanism. This cutting mechanism consists of 4 main components. The first are pawls that prevent a workpiece from shooting back at the operator. The second is a serrated infeed roller which creates dimples in the wood to overcome the forces exerted by the cutting cylinder. The cutting cylinder is the business end of the planer, which shaves off material and the dimples created by the infeed roller. The outfeed roller, which is either textured or rubberized, grips the material and propels it out the back. In order to ease the counteracting forces of all these mechanisms, guide rollers are built into the table of industrial planers directly under the infeed and outfeed rollers. In order for these rollers to be effective, they must be marginally prouder than the table. Otherwise imprecise wood would hang up on the edges. Because these rollers sit above the table, when a piece comes into contact with the guide roller under the infeed roller, it causes wood to angle up directly into the cutter head and causing a deeper cut in the front. It reaches equilibrium in the middle. Upon passing the cutter head, the piece angles downward, pitching the tail of the lumber into the cuttinghead, causing a deeper cut in the tailend of the piece. This is the 4" of snipe in front on our Powermatic in the shop and 2" in the back.
3. Mechanical Snipe can be minimized using a sled that is 4" longer in the front and 2" longer in the back, but there is still physical snipe that occurs. A super long sled may not be feasible with long boards.
4. What does NOT minimize mechanical snipe is feeding at an angle. The only thing this accomplishes is to angle the line of snipe.

## Appendix B-Machine Maintenance Checklists

Detailed instructions for each piece of woodworking machinery is crucial for a comprehensive training program. Here are specific instructions for some common woodworking machines:

### **Table Saw:**

- Blade Inspection and Maintenance:
  - Ensure the saw is unplugged.
  - Remove the blade guard and throat plate.
  - Visually inspect the blade for damage, dullness, or bent teeth.
  - Replace or sharpen the blade as needed.
  - Reassemble the blade guard and throat plate securely.
- Fence Alignment:
  - Check the alignment of the rip fence.
  - Adjust the fence to be parallel to the blade using a reliable measuring tool.
  - Lock the fence in place securely.
- Miter Gauge Maintenance:
  - Inspect the miter gauge for wear or damage.
  - Lubricate the miter gauge slide if necessary.
  - Ensure it slides smoothly and locks securely.
- Safety Checks:
  - Verify that the anti-kickback pawls and splitter are in place.
  - Ensure the riving knife or splitter aligns with the blade.
  - Confirm that the emergency stop button is functional.

### **Jointer:**

- Cutterhead and Blades:
  - Unplug the jointer.
  - Remove the cutterhead guard.
  - Inspect the cutterhead and blades for nicks or dull edges.
  - Rotate or replace the blades as needed.
- Fence Adjustment:
  - Check the fence for proper alignment.
  - Adjust the fence to be 90 degrees to the table.
  - Lock the fence in place securely.
- Dust Collection:
  - Ensure that the dust collection system is connected and functioning.
  - Clean the chip chute and dust collection ports regularly.

### **Planer:**

- Blade Inspection and Replacement:
  - Unplug the planer.
  - Open the access panel and remove the blades.
  - Inspect blades for damage or dullness.

- Replace or sharpen the blades as necessary.
- Reassemble and secure the access panel.
- Infeed and Outfeed Tables:
  - Keep the infeed and outfeed tables clean and free from debris.
  - Lubricate any moving parts or adjusters.
  - Ensure tables are level with the planer bed.
- Safety Checks:
  - Confirm that the depth adjustment and feed rollers are functioning correctly.
  - Check that the emergency stop button is operational.

### **Bandsaw:**

- Blade Inspection and Tension:
  - Unplug the bandsaw.
  - Check blade tension by tapping it with a finger.
  - Adjust tension if necessary to produce a clear "ping" sound.
  - Inspect the blade for any damage or dullness.
  - Replace or sharpen the blade as needed.
- Guide Bearings and Thrust Bearings:
  - Inspect the guide and thrust bearings for wear.
  - Lubricate or replace bearings as required.
  - Adjust the guide bearings to provide minimal blade clearance.
  - Guide Bearings should not contact the blade while in operation.
- Table Tilt and Fence Adjustment:
  - Verify that the table is level and the fence is perpendicular to the blade.
  - Make any necessary adjustments for accurate cuts.
  - Some tables have a removable alignment pin to facilitate blade removal. Make sure this is snug.

Always stress the importance of following safety guidelines, wearing appropriate PPE, and unplugging machinery before performing maintenance. Encourage participants to consult the machine's manual for specific maintenance procedures and safety instructions, as these can vary by manufacturer and model. Additionally, provide hands-on demonstrations and supervised practice sessions to reinforce these maintenance tasks.

### **Belt Sander:**

- Belt Inspection and Replacement:
  - Ensure the sander is unplugged.
  - Open the belt access cover and remove the old sanding belt.
  - Inspect the sanding belt for wear, tears, or excessive clogging.
  - Replace the belt with a new one, following the manufacturer's instructions for proper tensioning.
- Belt Tracking Adjustment:

- Turn on the sander (without any material) and observe the belt tracking.
- Adjust the tracking knob or lever to ensure the belt runs centered on the rollers.
- Dust Collection:
  - Ensure the dust collection system is connected and functioning correctly.
  - Clean the dust chute and filter regularly to maintain optimal dust collection.
- Sanding Platen and Table:
  - Keep the sanding platen and table clean and free from dust and debris.
  - Lubricate any moving parts or adjusters.
  - Ensure the table is set at the correct angle for the desired sanding result.

### **Disk Sander:**

- Disk Inspection and Replacement:
  - Unplug the sander.
  - Open the disk access cover and remove the old sanding disk.
  - Inspect the sanding disk for wear, tears, or excessive clogging.
  - Replace the disk with a new one, following the manufacturer's instructions for proper installation.
- Disk Table Adjustment:
  - Check the alignment of the disk table with the sanding disk.
  - Adjust the table to be square with the disk's surface.
  - Lock the table securely in place.
- Dust Collection:
  - Ensure the dust collection system is connected and functioning.
  - Clean the dust chute and filter regularly to maintain optimal dust collection.
- Safety Checks:
  - Verify that the emergency stop button is functional.
  - Ensure the disk brake mechanism is working correctly to stop the disk quickly.

### **General Safety Tips for Both Belt and Disk Sanders:**

- Always wear safety goggles and hearing protection when operating these machines.
- Keep hands and loose clothing away from moving parts.
- Feed material into the sander against the rotation direction of the belt or disk.
- Do not apply excessive pressure when sanding; let the machine do the work.
- Regularly clean the machine's exterior, controls, and switches to prevent dust buildup.

Incorporate hands-on practice sessions for participants to change sanding belts or disks and adjust tracking or table angles. Emphasize that belt and disk sanders are powerful machines, and proper maintenance is essential to ensure their safe and efficient operation. Encourage participants to follow the manufacturer's recommendations for maintenance intervals and procedures, as these may vary between different brands and models.

## Appendix C-MRO Sources

### Maintenance Repair Operations (MRO):

- [McMaster-Carr https://www.mcmaster.com/](https://www.mcmaster.com/)
  - [Ball Bearings https://www.mcmaster.com/products/bearings/ball-bearings~/permanently-lubricated-stainless-steel-ball-bearings/](https://www.mcmaster.com/products/bearings/ball-bearings~/permanently-lubricated-stainless-steel-ball-bearings/)
- [Grainger https://www.grainger.com/](https://www.grainger.com/)
- [MSC Direct https://www.mscdirect.com/](https://www.mscdirect.com/)

## Appendix D-Machine Tune up Videos

▶ [Band Saw Clinic with Alex Snodgrass](#)

▶ [Jointer Set-Up for Perfect Cuts!](#)