

# **This guide covers essential safety and operation points to review with members before they use the Powermatic 20-Inch Planer**

Models 209HH  
Volunteer Checkout Guide

## **Quick Overview**

The Powermatic 209HH is a heavy-duty 20-inch planer with a 5 HP motor. It surfaces boards to uniform thickness and can handle stock from 1/8 inch to 8 inches thick. The 209HH features a helical cutterhead with replaceable carbide inserts. This guide covers essential safety and operation points to review with members before they use the machine.

## **CRITICAL SAFETY REMINDER**

**The cutterhead spins at 5,000 RPM with 4 knives making 20,000 cuts per minute. At this speed, the cutterhead will instantly destroy anything it contacts - including fingers, hands, and arms. Planers are among the most dangerous machines in the shop and demand absolute attention.**

## **Pre-Operation Safety Checklist**

Review these items with every during the planer checkout:

- ☐ Safety glasses are on and properly fitted
- ☐ Hearing protection is available (planer is extremely loud)
- ☐ No loose clothing, jewelry, gloves, or long hair that could catch
- ☐ Member understands to stand to one side, never in line with the table
- ☐ Member knows location of power switch and emergency stop
- ☐ Dust collection system is connected and running
- ☐ Work area is clear and no one else is in the kickback zone
- ☐ Stock is inspected and acceptable for planing

## Stock Inspection - Critical Concept

Teaching members to properly inspect stock before planing is essential. Many dangerous situations result from attempting to plane unsuitable material.

### NEVER plane these materials:

- Boards with loose knots - knots can be ejected at high speed
- Wood with nails, screws, staples, or any metal
- Boards shorter than 6-3/4 inches (minimum length)
- Severely twisted, cupped, or bowed stock (joint one face first)
- Stock thinner than 1/8 inch
- Wet or green lumber (high moisture content causes tear-out)

### Stock preparation requirements:

- One face **MUST** be flat (jointed or sanded flat) before planing
- Twisted or warped boards will be pressed flat by rollers, then spring back after planing
- A planer makes boards uniform in thickness, it does NOT flatten them

## Understanding How a Planer Works

Help members understand the components and how they work together:

| Component             | Function                                                                               |
|-----------------------|----------------------------------------------------------------------------------------|
| Anti-Kickback Fingers | Prevent board from being thrown backward. Must move freely. Critical safety feature.   |
| Infeed Roller         | Serrated roller that grips and pulls wood into machine. Under spring tension.          |
| Chip breaker          | Breaks chips before they reach cutterhead. Prevents tear out. Set even with knife arc. |
| Cutter head           | Rotating cylinder with knives or inserts. Spins at 5,000 RPM. The cutting element.     |
| Pressure Bar          | Prevents stock from lifting after cutterhead. Set slightly above knife arc.            |
| Outfeed Roller        | Smooth roller that pulls finished board out. Under spring tension.                     |

## Setting Depth of Cut - Essential Skill

Teaching proper depth of cut is critical for safety and results.

**Depth Setting Procedure** (Maximum depth of cut: 3/32 inch (full width)):

### 1. Measure the board

- Use calipers or measure at thickest point
- Know exact starting thickness

### 2. Loosen lock knobs

- Two lock knobs on each side of machine
- Must be loosened before table moves

### 3. Raise table with handwheel

- One full revolution = 0.059 inches
- Set table height to desired final thickness
- Example: 3/4 inch board, want 11/16 inch final - remove 1/16 inch

### 4. Tighten lock knobs

- ALWAYS tighten both lock knobs before running an unlocked table can shift during cut - very dangerous

## Critical Safety Rules - Zero Tolerance

Members must follow these rules without exception:

### **NEVER reach into or under the machine while it is running**

If a board stops feeding, turn off machine and wait for complete stop. Never reach in to clear jams.

### **NEVER stand directly in line with the table (kickback zone)**

Always stand to one side. Boards can be violently ejected backward at high speed.

### **NEVER plane boards with your hand over the table opening**

As board enters, infeed roller will grab and pull down forcefully. Keep hands on edges or top of board, never underneath.

### **NEVER wear gloves when operating the planer**

Gloves can catch on rollers and pull hands into machine.

### **NEVER leave planer unattended while running**

Stay with machine until cutterhead comes to complete stop.

### **ALWAYS support long boards on both ends**

Use roller stands, extension tables, or helper. Unsupported boards can tip and jam.

## Feed Speed Settings

The planer has two standard feed speeds, controlled by a shift lever:

- 24 FPM (feet per minute) - slower, for rough stock or deep cuts
- 31 FPM - faster, for finish passes and lighter cuts

### Important:

- Feed speed can ONLY be changed while machine is running
- NEVER change speed while stock is passing through
- Change between boards, not during a cut

## Safe Operating Sequence

### Before Starting:

- Inspect stock - **no metal**, loose knots, or unsuitable material
- Ensure one face is flat (jointed)
- Measure board thickness
- Set table height for desired final thickness
- Tighten both table lock knobs
- Check that dust collection is running
- Set up roller stands if needed for long boards

### During the Cut:

- Turn on machine, let come to full speed
- Stand to one side, never in line with table
- Place board flat side down on infeed table
- Push board until infeed roller grabs it
- Let machine pull board through - do not force
- Support board as it exits (if needed)
- Never reach over or under table while board is moving

### After the Cut:

- Turn off machine
- Wait for complete stop before cleaning
- Measure result, verify thickness
- Clean table and area with brush (never hands)

## Understanding Snipe

Snipe is a common planer issue that members need to understand and manage.

### What is snipe?

- Deeper cut at beginning or end of board
- Cannot be completely eliminated, but can be minimized
- Caused by board lifting slightly as it enters or exits

### Minimizing snipe:

- Support long boards with roller stands
- Feed boards end-to-end when possible
- Take lighter cuts (less than 1/16 inch)
- Cut boards slightly long, trim snipe off ends

## Common Problems Encounter

| Problem                  | Solution                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------|
| Board stops feeding      | Turn off, wait for stop. Check for: cut too deep, dull knives, pitch buildup on rollers, table not level.          |
| Torn or fuzzy grain      | Planing against the grain. Flip board and run through other direction. Take lighter cut. Check if knives are dull. |
| Board comes out curved   | Board was curved going in. Planer cannot flatten - it only makes parallel faces. Joint one face flat first.        |
| Glossy or burned surface | Knives are dull or feed rate is too slow. Increase feed speed or sharpen knives.                                   |
| Thickness varies         | Table lock knobs not tightened. Table shifting during cut. Always lock table before running.                       |

## Reading Grain Direction

Reading grain direction to prevents tearout:

- Look at edge of board - grain should point up and forward
- Think of petting a cat - smooth with the grain, rough against
- If getting tearout, flip board end-for-end and try again
- Some boards have reversing grain - may get some tearout either way

## **Taking Multiple Passes**

A common mistake is to attempt to remove too much material at once.

- Maximum cut is 3/32 inch, but this is too much for most situations
- Recommended: 1/32 to 1/16 inch per pass for best results
- Last pass should be very light (1/64 inch) for smooth finish
- Multiple light passes are safer, quieter, and produce better results
- Deep cuts can overload motor, cause kickback, or tear grain

## **Table Rollers - When to Adjust**

The planer has adjustable table rollers on the bed. These are usually left alone, but it is good to understand their purpose:

- Rollers reduce friction as board feeds through
- High position - for rough stock (more support needed)
- Low position - for smooth stock (less interference)
- Factory setting works for most planing - rarely needs adjustment

## **Emergency Procedures**

Make sure you know what to do in emergencies:

### **If Board Jams:**

- Turn off machine immediately
- Wait for complete stop
- Lower table completely to release board
- Remove board carefully - may have damaged edges
- Inspect for cause before continuing

### **If You Hear Unusual Sounds:**

- Turn off immediately
- Metal-on-metal sound could indicate knife hit metal
- Check for loose knives or damaged cutterhead
- Do not restart until inspected by qualified person

## Quick Specifications Reference

|                      |                            |
|----------------------|----------------------------|
| Maximum Width        | 20 inches                  |
| Maximum Thickness    | 8 inches                   |
| Minimum Thickness    | 1/8 inch                   |
| Minimum Length       | 6-3/4 inches               |
| Maximum Depth of Cut | 3/32 inch (full width)     |
| Cutterhead Speed     | 5,000 RPM, 20,000 cuts/min |
| Feed Speeds          | 24 FPM and 31 FPM          |
| Motor                | 5 HP, TEFC                 |

## Additional Resources

- [Full manual](#)
- Website: [www.powermatic.com](http://www.powermatic.com)
- Makerspace specific details can be found in the My Checkout Wizard application @ <https://mycow.concordmakerspace.com>
- Report any issues in SLACK #woodshop channel

*Remember: Planers are powerful, dangerous machines. Never rush a member through training. Better to spend extra time ensuring they understand safety than to risk injury. When in doubt, stop and review procedures.*