Course Number: TS102

Course Title: Table Saw Operations

Course Hours: 4

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Safety is a personal issue. The Guild and the author do not accept responsibility for any accidents that may occur while using this guide.

# I. COURSE OBJECTIVES

- To learn the basic safe practices while operating the table saw
- To learn the operating practices that are prohibited due to safety
- To learn when and how to use the rip fence
- To learn how to use multiple cuts for dimensioning thick stock
- To learn when and how to use the miter gauge
- To learn when and how to use a crosscut sled
- To learn the procedures for bevel cuts
- To learn the procedures for tapering stock
- To learn the procedures for using a tenoning jig
- To learn the procedures for making cove cuts
- To learn how to setup and use a dado set

# II. CLASS MATERIALS

- At least one ‘zero clearance’ insert blank
- One splitter device mounted to the zero clearance insert
- One piece of 12” X 12” blueboard insulation
- One piece of 6” X 24” or larger piece of dimensioned lumber
- One piece of 24” X 24” or comparable piece of plywood (any thickness)
- Push sticks of varying sizes and/or designs

- One piece of 4” X 4” X 18” piece of lumber

# III. LESSON PLAN

A. Explain Safety issues

- Never operating any machinery when tired, sleepy or under the influence of any medications which may cause drowsiness
- Wear clothing which holds close to the body. Shirts should be short sleeved. Pants should not snag on machinery
- Remove all jewelry possible. This includes watches, rings, and especially necklaces
- Footwear should be sturdy, have good traction and protect the toes. Sandals should be avoided
- Long hair should be secured under a cap so as not to hinder vision and pony tails should be tucked into the shirt
- Always wear approved safety glasses or goggles
- Always use hearing protection
- Always keep tool surfaces clean & clear of misc. materials
- Always be aware of other people operating in your vicinity
- Always provide proper support for materials as outlined later in this training plan
- Always make sure the tool is in proper working order
- Never use a dull tool
- Always seek assistance when handling heavy or awkward materials or anytime you are unsure about how to proceed
- Always respect the tool for what it may do to you or someone nearby if there is a lapse in safe operating procedures
- Never approach or distract another person operating a machine

B. Show the location of

- The power on/off switch
- The location of the circuit breaker for hardwired equipment

C. Show how to

- Raise and Lower the blade
- Tilt the blade
- Insert the miter gauge into the table slot
- Loosen, move and tighten the rip fence
- Position and adjust mobile supports

D. Show how to prevent kickback

Explain: That the kickback zone is that area between the saw blade and the rip fence. It extends beyond the rear of the blade for several feet and in front of the blade all the way to the nearest wall.

Demonstration: Adjust the blade height so the bottom of the gullet on the blade is just above the thickness of the material. Remove the splitter from the saw insert. Take a piece of blueboard and adjust the rip fence to cut approximately 1" off to the left of the blade. Stand to the left of the blade. Turn the saw on, apply pressure to hold the material against the rip fence and feed it through the saw. Now adjust the rip fence again and perform the same operation. As the material clears the rear of the blade apply slight pressure towards the blade and create kickback. Now attach the splitter, adjust the rip fence and try the same operation again. Show how the splitter prevents the material from contacting the rear of the blade.

IMPORTANT NOTE: Stress that you never use the rip fence and the miter gauge together for thru cutting.

E. Explain the reasons for using a zero clearance insert

- Safety when ripping thin strips
- Avoids underside tear out when crosscutting
- Allows the use of a splitter without anti-kickback pawls

Demonstration: Place the insert plate that came with the saw in place. Take a piece of material 4 to 6 inches wide and at least 12" long. Adjust the rip fence so as to remove about 1/8$^{th}$ " of material from the left side of the blade. Rip the piece and observe the cutoff enter the saw or get trapped in the slot around the blade. Now replace the insert with a zero clearance insert and repeat the operation.

Explain that all material must be supported by either the rip fence, a miter gauge or a sled.

Explain that you should never put crooked, twisted or bowed stock through the table saw and why. All material should be first prepared on the jointer and/or thickness planer.

F. Rip Fence Operations

Explain that the amount of material contacting the rip fence must exceed the distance between the blade and the fence or the operation would be unsafe!

- Show the various styles of push sticks and blocks that may be used to secure material while ripping.
- If Available, show the GRIPPR and its features

Demonstration: Set the blade height and rip fence and make a rip cut while standing to the left of the blade. Stress maintaining a balanced stance and using a steady feed rate while staying clear of the blade. Examine the quality of the cut.

Performance: Have the student perform a rip cut.

G. Dimensioning thick stock

Demonstration: Adjust the blade height to approximately one half the thickness of the material and adjust the fence to the size desired. Make one cut, then reverse the material and make the other cut.

H. Using the miter gauge

- Place the miter gauge in the miter slot
- Use a square to check the angle of the gauge face
- For multiple cuts, set the stop
- Show how to reverse the miter gauge for sizing panels

Demonstration: Move the rip fence well out of the way. Measure and mark to cut a 3" piece from a longer board. Secure the material to the miter gauge, keeping the hands away from the blade. Make the cut.

I. Using the crosscut sled

- Place the sled on the saw
- Explain that the rear fence is for strength in the jig but is not square to the blade
- Show the long front fence support which covers both sides of the blade
- Make the student aware of the exposure to the blade at the end of the cut
- Show how a stop block may be clamped to the fence for multiple cuts
- Show how to secure small parts using a push stick or auxiliary block of wood

Demonstration: First rip some ¾" X ¾" stock of any length. Then using the sled cut as many 6" long pieces as can be cut.

J. Bevel Cuts

- Stress the importance of removing the zero clearance insert from the saw before tilting the blade
- Explain that the rip fence must be positioned on the side away from the tilted blade so that the off cut material won't get trapped between the blade and the fence
- Explain the need to add an auxiliary tall fence before attempting to bevel panels on the vertical

Demonstration: Move the rip fence to the correct side of the blade. Remove the zero clearance insert and install the original insert in the saw. Tilt the saw to 45 degrees. Adjust the rip fence and make a cut. Move the rip fence out of the way and make a cut using the miter gauge.

K. Tapering stock

Show the student how to lay out a taper on leg stock of your choice. Place the tapering jig on the saw and explain how to secure the stock

Explain the need to re-attach the cutoffs if tapering will be performed on all four faces of the material.

Demonstration: Taper two faces of a piece of stock.

K. Making tenons on the table saw

- Show the student how to secure stock in the tenoning jig
- Show how to adjust the jig to the saw blade

L. How to make cove cuts

- Layout the rough outline of cove on a piece of stock
- Measure the width and height of the cove
- Raise the blade to the full height of the cove
- Adjust the inside width to the width of the cove and apply the jig to the saw top
- With a pencil draw lines on the saw top
- Measure and draw the centerline on the saw top
- Lay the stock to be coved on the saw top, centered on the marked centerline and oriented to the layout lines
- Clamp a fence to the saw top
- Lower the saw blade so only 1/8$^{th}$ inch of blade is exposed
- Cut the cove by raising the blade 1/8$^{th}$ inch on each pass

M. Making Dado Cuts

- Cut off the power at the circuit breaker
- Remove the zero clearance insert
- Raise the saw blade to its maximum height
- Remove the nut and washer form the saw arbor
- Carefully remove the blade
- Install the dado set
- Set the width of the dado set as close as possible
- Lower the arbor to its lowest setting
- Install and secure a new zero clearance insert
- Restore power to the saw
- Turn the saw on and slowly raise the arbor until the blade height approximates the depth of the dado to be made
- Make the dado cut and perform a test fit
- Adjust the rip fence and make a rabbet cut

N. Review with the student the operations that have been covered in this lesson plan.

O. Performance testing and Certification

Secure appropriate materials and have the student perform:

- A rip operation
- A crosscut operation with the miter gauge
- A crosscut operation using the crosscut sled