OPERATING PROCEDURE FOR:

POWERMATIC® Stationary Hollow Chisel Mortiser

The mortiser is used to cut square or rectangular holes, typically for mortise and tenon joinery. It consists of a table that the workpiece is clamped to using the table vise, and a motor frame that moves up and down. A motor attached to the frame turns a drill chuck that holds the mortising drill bit. The bit rotates inside a hollow chisel that is independently attached to the motor frame. A feed lever is used to move the motor frame up and down. As the motor frame is pushed down with the feed lever, the drill bit cuts a round hole in the workpiece to remove the bulk of the material. The chisel surrounding the bit removes the remainder of the material and leaves a square hole. The table can be moved laterally by rotating a handwheel. This allows repetitive square hole to be drilled to form a rectangular hole, the mortise. The table can also be moved in and out by turning the cross-feed handwheel. This allows the workpiece to be positioned so that the distance of the mortise from the edge of the workpiece can be adjusted. The table can also be tilted to make angled mortises.

Because the chisels are only available is standard sizes, the mortises must be cut first and then the tenons cut to fit the mortise.

SAFETY RULES:

Warning: Willful violations of these safety rules, disruptive actions or horseplay may result in loss of the privilege to use the tools and machinery in the workshop.

As with all machines, there is a certain amount of hazard involved with the use of this mortiser. Use the machine with the respect and caution demanded where safety precautions are concerned. **You are responsible for you own safety.**

WARNING! The drill bit and chisel are very sharp and can easily cut you. The bit and chisel can easily cut a hole, not necessarily square, through you hand or finger.

Read and understand the operating procedures for this machine before attempting operation.

Personal Protective Equipment. At a minimum eye protection and hearing protection must be worn when operating this machine. Eye protection must be safety glasses with side shields, goggles, or face shield in combination with safety glasses, which meet ANSI Z87.1. Remove tie and loose jewelry. Button sleeves or roll up sleeves above the elbow. Remove loose outer clothing and confine long hair. **Do not wear loose fitting gloves**. If gloves are worn, they must fit tightly to the hand.

Use the appropriate NIOSH approved respirator in dusty work conditions (N95, N100, P95 or P100). Wood dust has been listed as a known carcinogen by the U.S. government.

Perform all maintenance, including adjusting or changing the drill bit and chisel with the machine disconnected from the power source and locked out following the Club Lockout Procedure. In this case, unplug the motor and keep the plug within sight and under your control.

Remove all materials from the table surface before turning the mortiser on, except for the stock to be machined. Remove scraps, chips and debris using a brush.

Guards. Keep the chuck guards in place.

Work Area. Keep the floor around the machine clean to minimize the danger of tripping or slipping. Be sure the worktable is free of scrap or foreign material.

Dust Collection. Use the shop vacuum to catch the chips and dust generated during the cutting action.

Operator Position. Maintain a balanced stance and keep your body under control at all times, so that you do not fall or lean against the moving parts. Do not overreach or use excessive force to perform any machine operation.

Careless Acts. Give the work you are doing your undivided attention. Looking around, carrying on a conversation and "horseplay" are careless acts that can result in serious injury.

Maintain Tools In Top Condition. Keep drill bits and chisels sharp and clean for safe and best performance. If a drill bit or chisel breaks, or is believed to be dull, notify the Shop Leader.

Secure the workpiece. The workpiece must always be tightly held in place using the table vise.

Turn off machine before cleaning the table. Use a brush to remove chips or debris --- do not use your hands.

Material Condition. Reclaimed or pressure treated wood is not to be used on this machine. The workpiece must have smooth, machined surfaces that are straight and flat. If a mortise is needed in a turned part, cut the mortise first and then turn the workpiece to the desired shape.

Job Completion. If the operator leaves the machine area for any reason, the mortiser should be turned "off" and the drill bit should come to a complete stop before his departure. In addition, if the operation is complete, the operator should clean the mortiser and the work area.

If you are not thoroughly familiar with the operation of mortiser, obtain advice from a Shop Leader

Drugs, Alcohol, Medication. Do not operate this machine while under the influence of drugs, alcohol, or any medication. Do not operate this machine if you are tired, sick, or distracted.

Familiarize yourself with all caution and warning decals used on this machine.

Specifications:

Model …… 719T"

Motor ……1 HP, 1725 RPM

Maximum Mortising Capacity ……..……...…… 1"

Chuck Size ..……..…… 1/2"

Maximum Spindle Travel ……..……...10-3/4"

Maximum Distance From Center Of Chisel to Fence ……..…...…… 4"

Longitudinal Table Travel ……..…… 15-1/2"

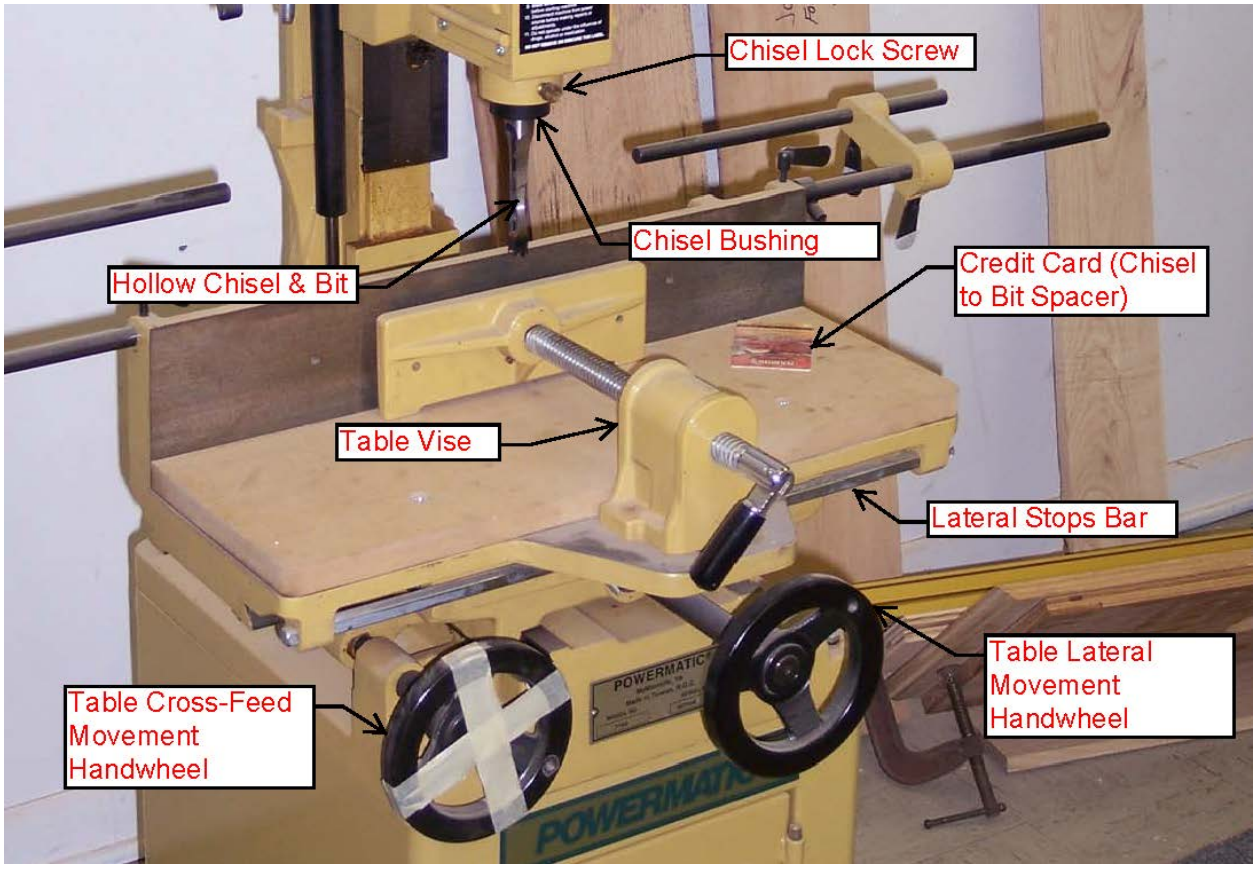
Cross Table Travel ……...……..…….. 4"

Table Size ……..……..……...……. 20-1/4" x 7"

Table Tilt ……..……..……...…….…. 0° - 35°

OPERATION:

The heart of the hollow chisel mortiser consists of the hollow chisels and the boring bits. The chisel has openings at the top so that chips can escape freely. The shank of the chisel fits into the motor frame and does not rotate. The cutting end of the chisel has a bevel on the inside to make a shearing cut into the wood. Boring bits are made to match the size of the chisel and generally must be made by the same manufacturer as the chisel in order for it to fit properly. The boring bits are similar to augers, but do not have a lead screw on the end. The end of the bit is flared so that the largest diameter is almost equal to the outside of the chisel. It is designed this way so that the bit will remove as much of the material as possible. All the chisel has to do is square up the hole. Because of the flared end, it is extremely important that the cone tip of the bit does not rub against the chisel. If it does, both the end of the chisel and the bit will overheat and lose their hardness. There must be about 1/32" clearance maintained between the bit and the chisel.



Install the bit and chisel. This procedure ensures that the drill bit has sufficient clearance from the chisel to prevent excessive heat and loss of temper due to friction between the bit and chisel.

1. Insert a drill bit up through the matching chisel.
2. Insert the chisel & drill bit into the bushing that matches the shank size of the chisel so that the drill bit is in the drill chuck.
3. Place a credit card between the chisel and the bushing.
4. Use a wood block to push the drill bit and chisel up as far as possible and tighten the drill chuck.
5. Remove the credit card, push the chisel up as far as it will go and tighten the chisel locking screw.

Square the chisel. The chisel must be square to the fence to produce mortises that will properly fit the tenons. Lower the motor frame so that the chisel is approximately centered on the height of the fence. Place a small square against the fence with the blade touching the chisel. Loosen the chisel locking screw and rotate the chisel as needed to bring it square to the fence. While holding the chisel square and tight up against the bushing, tighten the chisel locking screw.

Adjust the depth of cut. Position the table laterally so that the desired location of the mortise is in the center of the table and below the chisel. Place the workpiece on the table and clamp it in place using the table vise. Bring the chisel down so that it is touching the workpiece. Raise or lower the nuts on the depth control rod so that the distance from the bottom of the rod to the rod stop is equal to the desired depth of the mortise plus 1/16". Lock both the upper and lower nuts

in place. The additional 1/16" is to compensate for the difference in height between the corners of the chisel and the cutting edge of the bit.

Adjust the distance of the mortise from the edge of the workpiece. Rotate the cross table handwheel as needed to bring the chisel to the desired distance from the fence. Turn the cross feed locking screw to maintain the table in this position.

Adjust the lateral position of the mortise. Rotate the lateral travel handwheel so that the left-hand side of the chisel is even with the left-hand side of the mortise. Bring the right hand lateral travel stop up to the center stop and lock it is place. Rotate the lateral travel handwheel so that the right-hand edge of the chisel is even with the right-hand edge of the mortise. Bring the left-hand lateral travel stop up against the center stop and lock it is place.

Adjust the workpiece stop. Position the workpiece stop so that it touches the end of the workpiece and lock it in place. Identical mortises can be cut in, for example the other three table legs, by positioning them against this stop as they are clamped in place. If the mortises are not centered on the legs, a spacer will be needed to be added or removed between the workpiece and the leg as adjacent sides of the leg are mortised.

Position the vacuum hose near the mortise.

Position the table at the left-hand stop. Do not hit the stop too hard or it will move.

Start the motor and pull the feed lever down until the depth rod hits the stop.

Feed the bit into the material with only enough force to allow the bit and chisel to work. Excessive pressure may cause the bit to slip in the chuck and contact the chisel. If a squealing sound is heard, turn off the machine and check the gap between the bit and chisel.

Raise the feed lever and move the table to the right-hand stop. Do not hit the stop too hard or it will move.

Pull down on the feed lever again until the depth rod hits the stop.

Move the table over and continue to drill square holes that are spaced with about one-half to three-fourths of the chisel width between them until the end of the mortise is reached. Then go back and drill out the rest of the mortise. This method ensures that the stresses on the chisel are even on all sides during the cut. Cutting the square holes side-by-side has the potential to crack the chisel.

When Mortises are to be cut at an angle, the table can be tilted. Otherwise, the mortising procedure is the same.

When job is complete, shut off machine and clean the area.