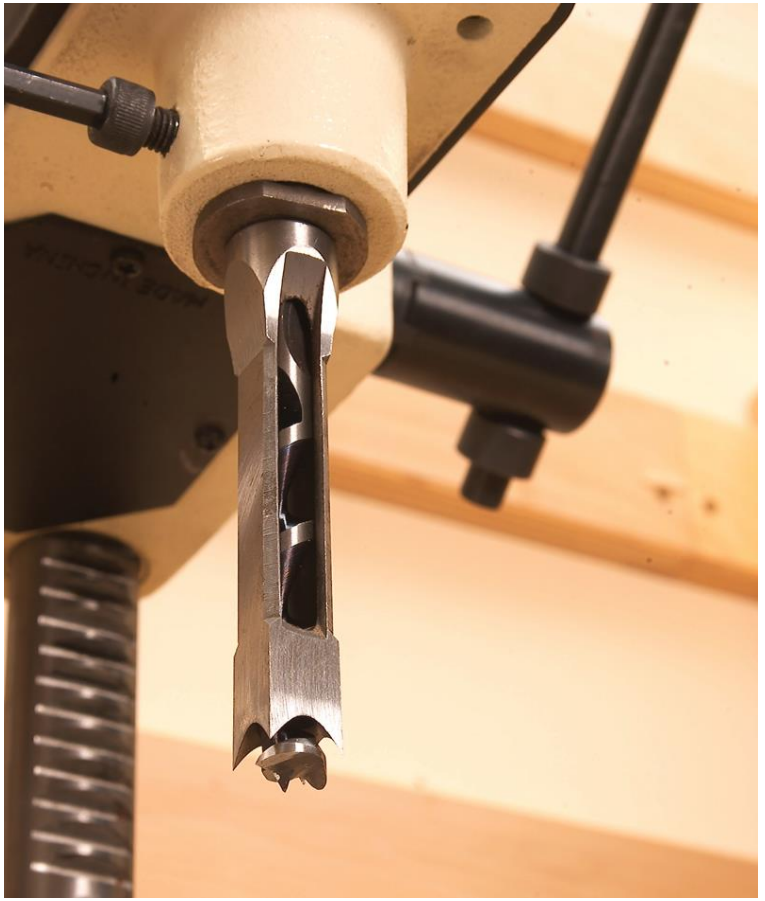
THE SHED
KU-RING-GAI COMMUNITY WORKSHOP

# Kushed Procedures

## Chisel Mortiser | W9

Axminster Chisel Morticer AW19FM




The Shed provides items such as welding masks and gloves.

Members are required to provide their own footwear, eyewear, hearing protection and masks.

## Safety

This is a very high priority for our Shed members. There are some aspects that are mandatory under our insurance policies and some which the The Shed requires members to adhere to for everyone's benefit.

## The Shed Safety Induction

It is a requirement of attendance at The Shed that members have reviewed the Safety Induction Presentation

## Personal Protective Equipment

This is required in various forms depending upon the equipment being used or the activity being undertaken.

Protective eyewear is always mandatory when using machinery.

The Shed schedules a Coordinator and a First Aid Safety Officer for each day of attendance and their safety directions are final and must be adhered to.

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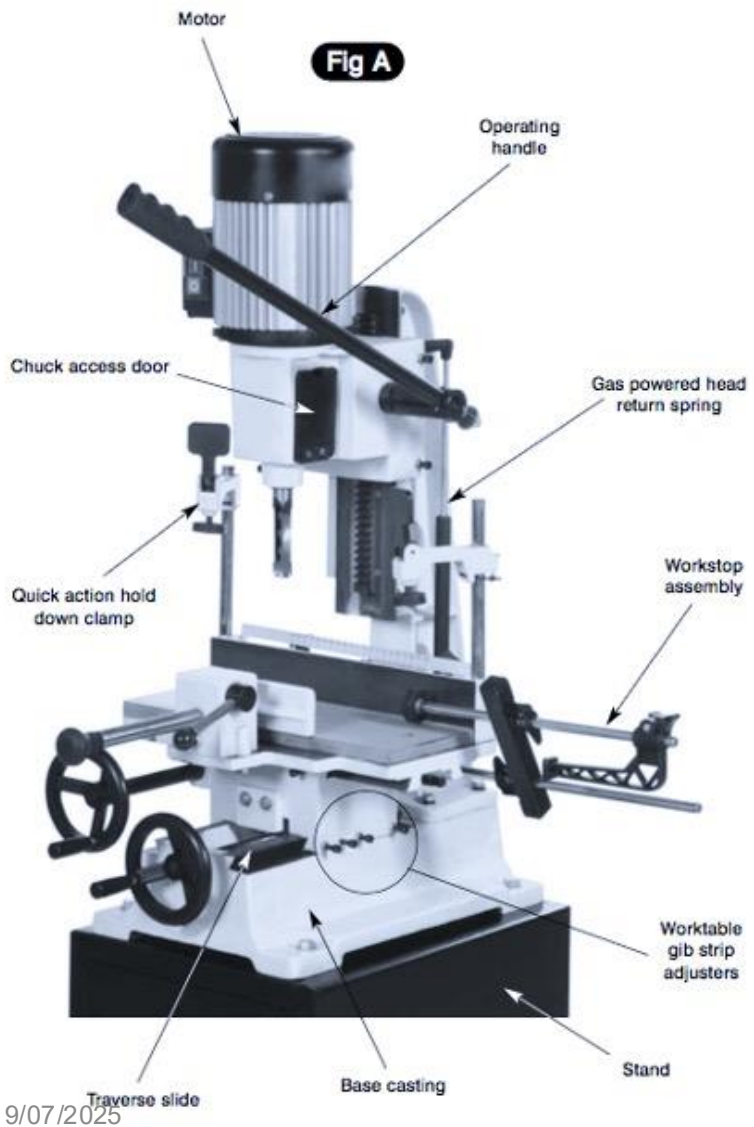


## Key Features of the Chisel Mortising Machine

This machine is used to cut square or rectangular holes in timber. These can become mortises to house tenons in joint construction and thus form strong joints. A wide variety of mortise & tenon joints can be used for various applications, especially framing.

The workpiece is securely held onto a sliding worktable with a firm tightening of the clamping mechanisms. It is important to see that clamps are positioned close to the cut but to clear the operation of moving machine parts especially the lowering lever. There is a strong tendency for the work piece to lift as the cutting bit is raised from the cut if the work is not securely held down.

The back fence of the worktable can be adjusted to gauge the distance between the back of the workpiece and hole and is also useful to assist setting the bit “square” in the machine.

Accurate lining up of a series of holes which can be joined to form a rectangular hole is achieved using a hand wheel operated slide to progressively feed the work piece between cuts to a new cutting position.

It is very important not to move the workpiece sideways while the chisel is in the workpiece as this may result in bending the chisel.

- The machine operates by using a motor driven auger bit running in the centre of a square chisel which is lever driven into the work piece. The chisel corners are very sharp such that a supporting block of timber is recommended when inserting the chisel into the machine. Care is also required when handling the chisels.
- A depth gauge on the machine can be set to determine the maximum depth to which the hole can be cut. This is usually set at the final depth setting for the mortise.
- As the chisel is lowered it cuts and pushes the waste towards the bit which then clears these shavings while at the same time cutting the centre of the hole (mortise) with a twist bit or drilling action.
- Waste is exited from the hole via a slot in the side of the square chisel. The chisel should not be forced into the work as it may become jammed and difficult to remove.
- A series of shallower cuts is recommended especially for harder timbers and holes should not initially overlap if cutting rectangular mortises. A “bridge” between holes is usually left and removed with a second cutting pass.

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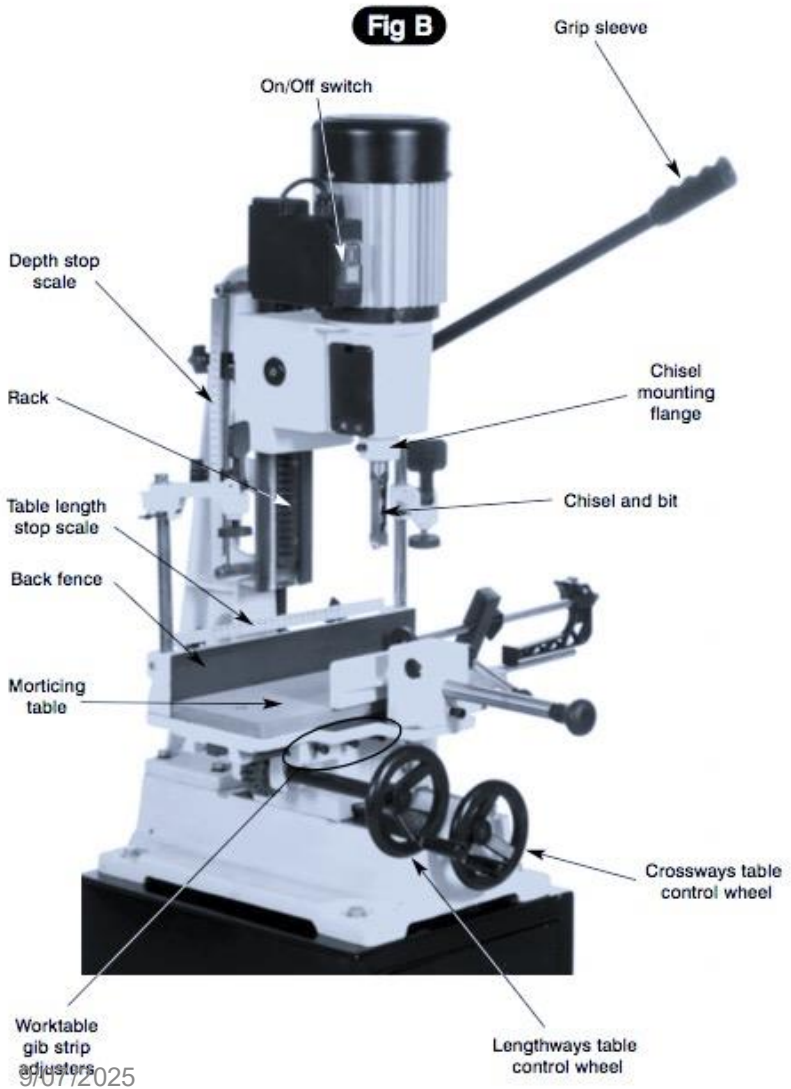


## Before using the Chisel Mortiser

If in doubt about the operation you are about to do, seek a Coordinator's assistance.

- Ensure that the mortiser is firmly fixed to its base and in a stable position as the force exerted through the operating handle could otherwise be enough to over balance the machine.
- When positioning the machine in the workshop, ensure that there is adequate room on either side for the size of timber you plan to use.
- Mortise chisels have very sharp ends, handle them with great care.
- Ensure timber is free of knots or fixings at the site of the mortise
- Ensure the dust/vacuum extractor system, if fitted, is turned on and operational

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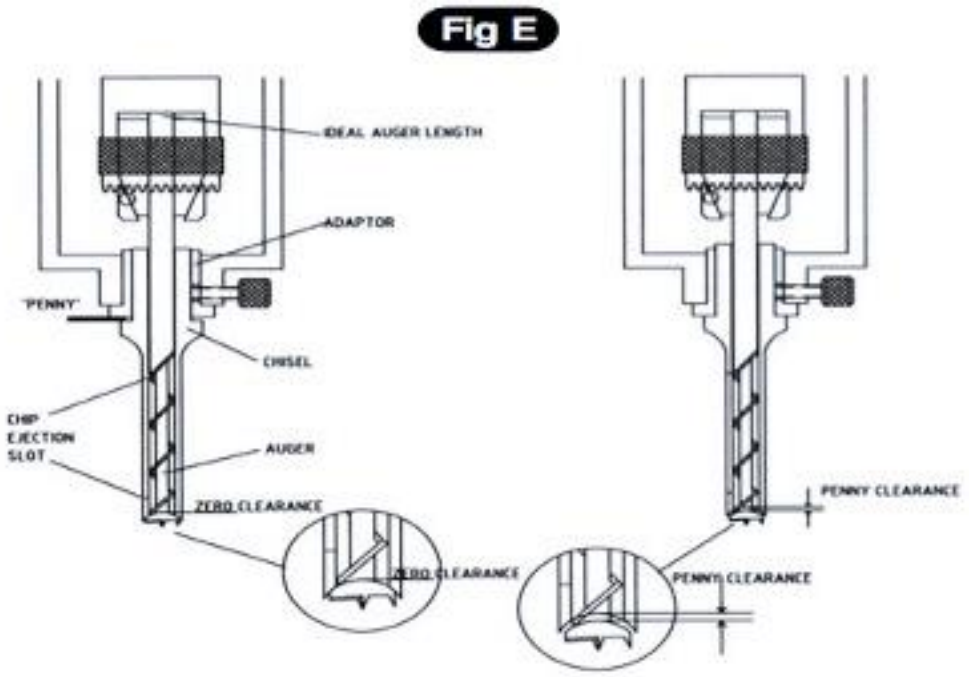


Push the chisel fully into the bush and then retract it by about 1.5 mm, using a spacer such as a coin as shown in Fig E to establish the correct position. Tighten up the locking screw.

## Installing the Chisel and Bit into the machine

- Choose a chisel that is the desired width of the mortise or if cutting wider mortises than bits available, choose one which will allow multiple non overlapping cuts. That is, cut the mortise with multiple plunges rather than a single plunge. For M&T joints, it is usual to cut the mortise first and then cut a tenon to suit the size of the mortise.
- Select the size of mounting bush to suit the chisel being used and fit into the morticing head.
- Insert the chisel into the bush and tighten the screw just enough to hold the chisel in place.
- Rotate the chisel so that the slot in the side of the chisel is positioned so that it is visible from the front and clearance of shavings can be observed during cutting.
- Waste can be directed to the side or to the front but must be able to escape freely when cutting. Having shaving exit at the front allows vision of the workpiece on each side of the bit and can help facilitate locating a subsequent cut.

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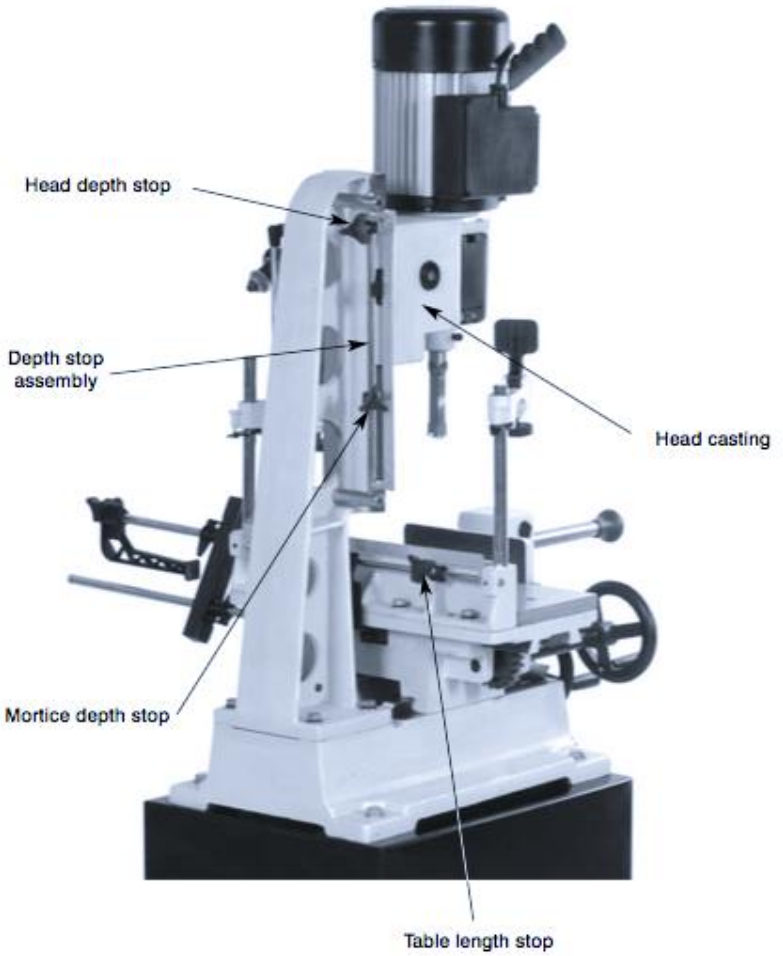
Fig C




- When the chisel has been installed, insert the auger into the chisel and push it fully up so that it contacts the recess in the end of the chisel and then fully secure the shank of the auger in the chuck using the chuck key.

**Be careful when handling morticing chisels as the ends are very sharp.**

- Now slacken off the chisel clamping screw, remove spacer and push the chisel fully home and re-tighten the screw. This procedure will ensure that there is a small clearance between the end of the auger and the chisel, essential in order to avoid waste jamming and overheating the chisel.
- The final operation is to check that the chisel is perfectly square to the table; this is best done by bringing the table forward until the vertical face just touches the back face of the chisel to act as a datum for aligning the chisel. The clamping screw may need to be loosened to allow rotating of chisel. Ensure that the chisel is securely clamped in fully inserted position before starting work.
- See https://www.youtube.com/watch?v=0Pf_vbnoFQ4

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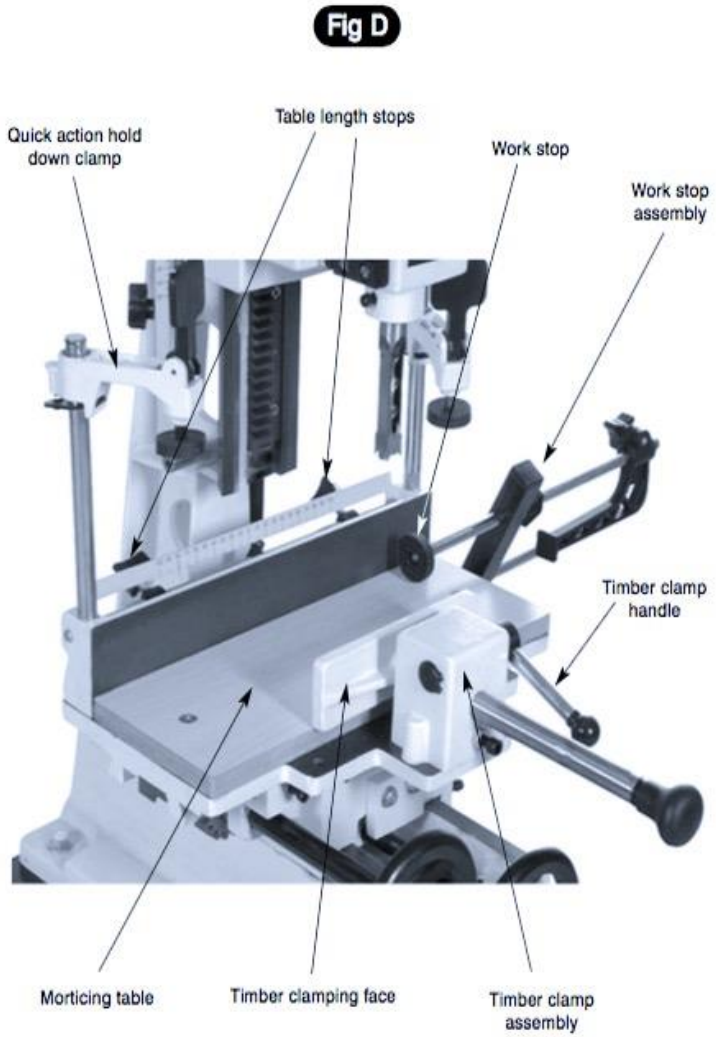


## Operating Instructions

### Setting stops and holding work in place

- Make sure that the timber is held firmly down against the table, either with the vice or the hold down clamps. This prevents the possibility of the timber being pulled upwards as the mortise chisel is withdrawn from the hole. For larger pieces use clamps to hold the timber against the fence, in lieu of the vice
- Choose a chisel that is smaller than the finished mortise size. That is, cut the mortise with multiple plunges rather than a single plunge
- Set the depth of the mortise with the lower of the two depth stops (Fig C). The upward travel of the head can be limited by adjusting the upper stop; this prevents unnecessary movement of the operating handle when cutting shallow mortises
- Place the workpiece on the table and clamp in position with the vice or the hold down clamps. Make sure that the timber is held firmly down against the table, either with the vice or the hold down clamps. This prevents the possibility of the timber being pulled upwards as the mortise chisel is withdrawn from the hole.

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## Safety First

- Always select the correct hollow chisel and auger set for the mortise to drill.
- Tighten the chuck uniformly when the auger bit is inserted – using the correct key.
- Always remove the chuck key before starting the mortising machine.
- Keep clear of moving parts
- Handle bits with great care as they are very sharp

Adjust the two table stops shown in Fig D to give the required length of mortise and tighten up the two thumbscrews

## Operating the Mortice Machine

- Turn the machine on and make a shallow cut, feeding the chisel and bit steadily into the work by pulling down on the operating handle. The rate of feed of the chisel should be fast enough to prevent burning of the tip of the auger but not so fast as to risk breaking it.
- It is usual not to cut full depth in a single cut unless cutting shallow mortises or very soft timber. A series of shallower cuts allows shavings to clear and prevent blocking or wedging of the chisel. The handle can be re-positioned on its spindle so that it is in the most convenient operating position.
- After making the first cut, the table is moved along with the left hand wheel.
- The direction of movement of the table may depend on where the chisel slot is located - movement should be away from the slot if at side so that the shavings can clear freely and vision for the next cut is not impeded by swarf.

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## After Chisel Mortiser Use

- Turn the machine off
- Ensure that the operating handle is returned to the upright position after cutting a mortise.
- Remove chisel and auger from chuck taking care to protect the chisel edges and your fingers
- Return the chisel and auger to its box in the cupboard below the machine
- Return all associated tools to the cupboard below the machine
- Turn off the dust extractor, if fitted
- Clean shavings and dust away from machine using banister brush or vacuum cleaner

## Operating the Morticing Machine

- Ensure the chisel is clear of the timber before moving the table so as to avoid putting sideways pressure on the chisel/auger assembly. Allow gaps or small “bridge” spaces between cuts for successive cuts until the length mortise is reached. Subsequent cuts remove “bridges” and may involving a series of deeper cuts until full depth and shape of mortise is achieved
- The rate of feed of the chisel should be fast enough to prevent burning of the tip of the chisel but not so fast as to risk breaking the auger. The ideal speed for any combination of chisel size and timber type will be learned through experience.
- Deep mortises are best cut in a series of shallower cuts to allow the chippings to clear and prevent blocking of the chisel.