

**Table 7-1: Drill Press Speed Chart**

Size of Hole	Hardwood	Softwood
1/4" and less	H (1600 RPM)	I (1750 RPM)
1/4" to 1/2"	F (1300 RPM)	G (1450 RPM)
1/2" to 3/4"	D (1050 RPM)	E (1150 RPM)
3/4" to 1"	B (850 RPM)	C (950 RPM)
Over 1"	SLOW (700 RPM)	A (750 RPM)

Boring Metals (twist bits only) —Slow (700 RPM)

Note: These speeds are for 60 hz operations.

### LAYING OUT THE WORK

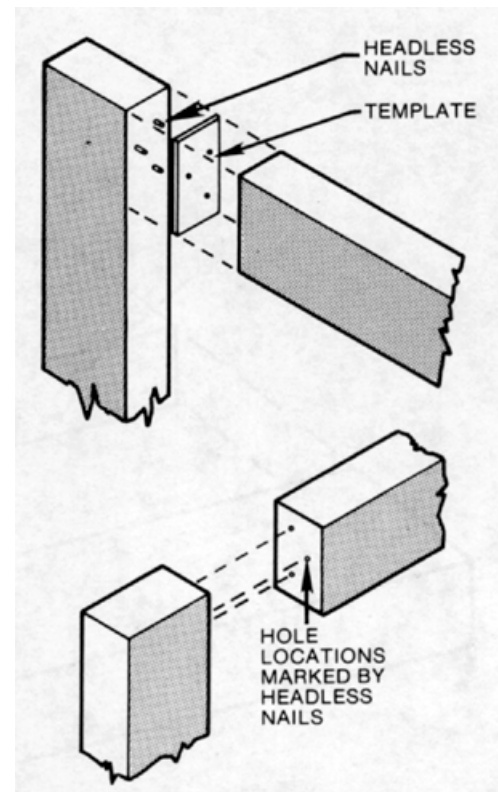
Work carefully and slowly when measuring and scribing lines. The simplest and most accurate method of marking a hole location is to draw two lines that intersect at the center of the hole. A combination square is a good tool to have since it is used to draw lines square with the edge of the work and as an edge-marking gauge. Dividers work best when it is necessary to transfer a measurement from one piece to another or to mark off a line into a number of equal spaces.

Other methods may be used according to the job and the number of pieces to be drilled. Templates may be made of illustration board, hardboard, plywood, or metal, depending on how long they will be used. Some pieces of hardware are their own templates, for example, a hinge or a drawer pull.

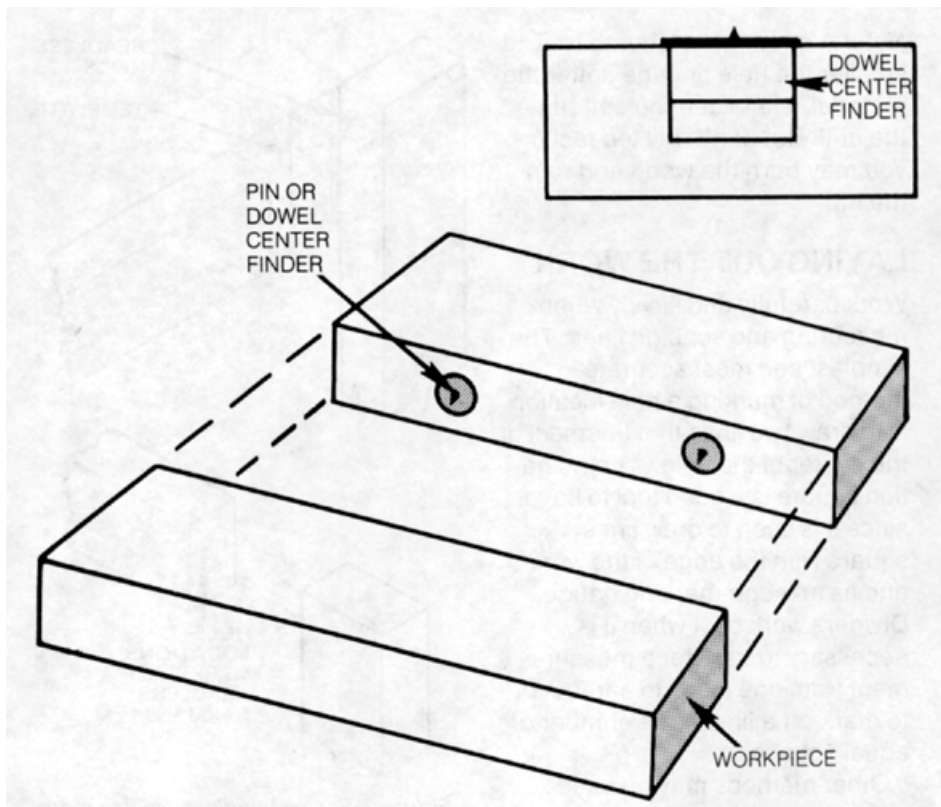
One little trick that should be remembered for use on mating pieces, when ordinary layout may be impractical or time-consuming, is to insert headless nails in small holes drilled in one of the pieces (Figure 7-5). Let the points pro-trude about 1/16" and then press the piece against the mating part.

The nail points will mark the hole locations on the second piece. Pull the nails with a pair of pliers and drill the holes to full size.

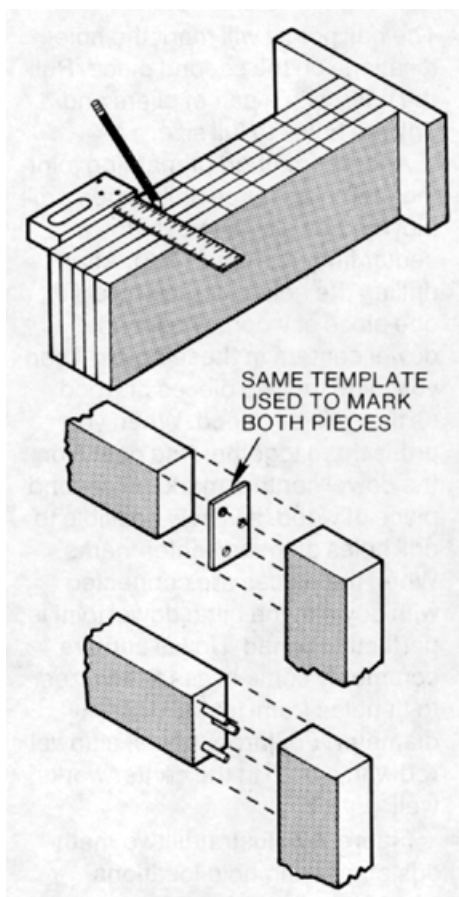
Another method of marking joint-ing members (especially when employing dowels) is to use dowel center finders (Figure 7-6). After drilling the holes for the dowels in one piece of wood, you insert dowel centers in these holes. Then you align the two pieces of wood as they will be joined. When you press them together, the points on the dowel centers mark the second piece of wood. It is now possible to drill holes at these center marks. When the pieces are connected with dowels, the blind dowel joint is perfectly aligned. Dowel centers commonly come in assorted sizes to fit holes from 1/4" to 1/2" in diameter. For larger holes, a dowel rod with a brad in the center works well.



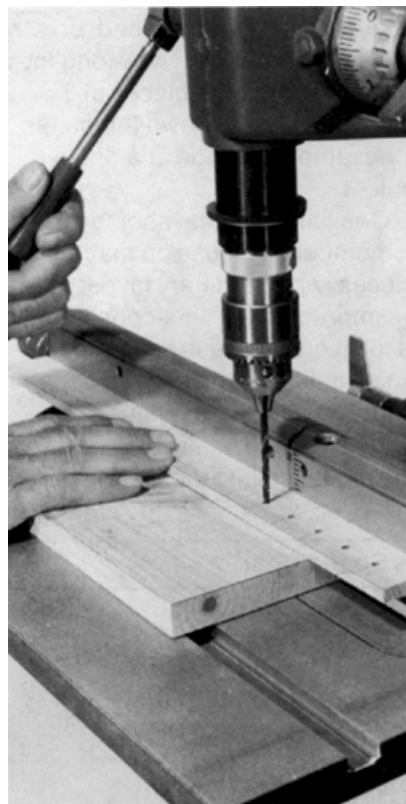
**Figure 7-5.** Use headless nails to mark hole locations for the second piece.



**Figure 7-6.** Joining members can also be marked by using dowel center finders.



**Figure 7-7.** Drilling accuracy depends on layout. Two methods are shown.



**Figure 7-8.** Place a scrap block of wood between the work and the table when drilling holes through the workpiece.

Figure 7-7 illustrates two methods of marking hole locations when boards are to be joined edge-to-edge by doweling.

### **SUPPORTING THE WORK**

When drilling through holes place a scrap block between the workpiece and the table (Figure 7-8). This protects the table and lets the bit point cut through into the scrap block so that it does not splinter the back of the workpiece as it emerges.

**Warning:** Clamp the workpiece to a supporting surface to keep the bit from grabbing in the hole and jerking the workpiece out of your hands, particularly when the point is about to break through.

Use of the rip fence or miter gauge as a guide and support will lessen the need for clamping. When the workpiece being drilled is held against the rip fence or miter gauge, the twisting force exerted by the bit is taken by the fence or miter gauge and not by your hands.

The grain on some woods, such as fir, may pull a bit off center. When this happens, try clamping the work, drilling a small pilot hole, and then enlarging the hole to full size by drilling half-way through from each side.

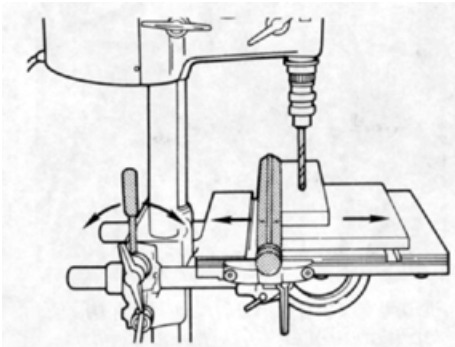
## GENERAL DRILLING

There are two basic types of holes: holes that you drill completely through the workpiece and holes that you drill only partway through the workpiece.

### Drilling Through

Mount the rip fence on the worktable. It will be used as a backstop. Adjust the rip fence to help you accurately position the hole where you want it. Make fine adjustments with the table height lever (Model 500) or crank (Model 510) (Figure 7-9). If there's no room for the rip fence, use the miter gauge. Caution: Place a scrap of wood, wider than the workpiece, on the table to keep the bit from drilling into the table after it goes through the workpiece. It will also help keep the workpiece from splintering where the bit exits.

Hold the carriage so that it won't drop against the base mount. Loosen the carriage lock and adjust the table height so that the tip of the bit is 1/4" to 1/2" above the workpiece. Then tighten the lock.



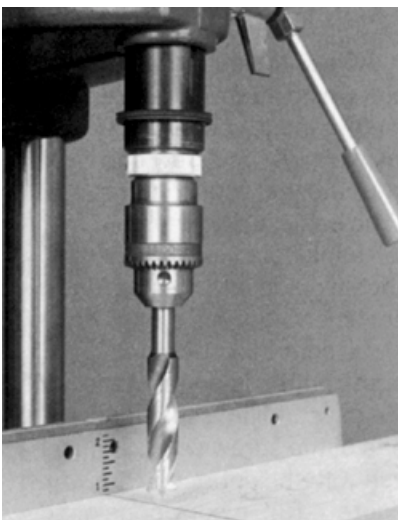
**Figure 7-9.** When drilling, use the rip fence to accurately position the holes. Make fine adjustments with the table height lever (Model 500) as shown or with the table adjustment crank (Model 510).



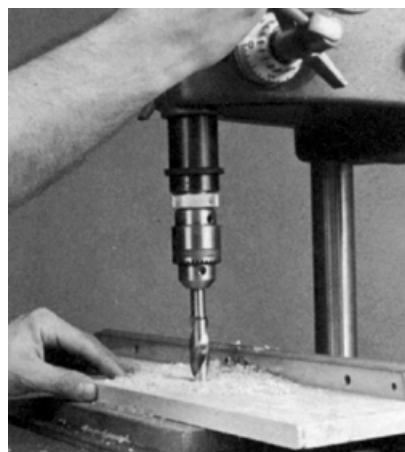
**Figure 7-10.** Use the depth control to keep the bit from biting through the scrap block and into the worktable.

Extend the quill so that the tip of the bit touches the scrap block. Set the depth control to approximately 1/8", and tighten the depth control lock (Figure 7-10). Then retract the quill. When you drill the hole, the depth control will keep the bit from biting through the scrap block and into the worktable.

Make a five-point check. Four of the five locks—power plant, carriage, table height, and table tilt—should be secure. The quill lock should be loose.



**Figure 7-11.** Before turning on the machine, extend the quill to be sure the bit will drill a hole where you want it.



**Figure 7-12.** Feed the bit into the wood slowly and evenly, maintaining a light, steady pressure. Stop when you feel the depth control halt the quill.

Place the workpiece on the worktable and position it under the bit. Hold it firmly against the table and rip fence. Extend the quill with the machine turned off to be sure the bit will drill a hole right where you want it (Figure 7-11).

If the bit lines up correctly, turn the Mark V on and adjust it to the correct running speed. Feed the bit into the