## Tip #26 Drill Press

Mastering the techniques in this chapter will enable you to perform operations that you might have thought impossible. Layouts and setups are featured that will add a professional dimension to your projects.

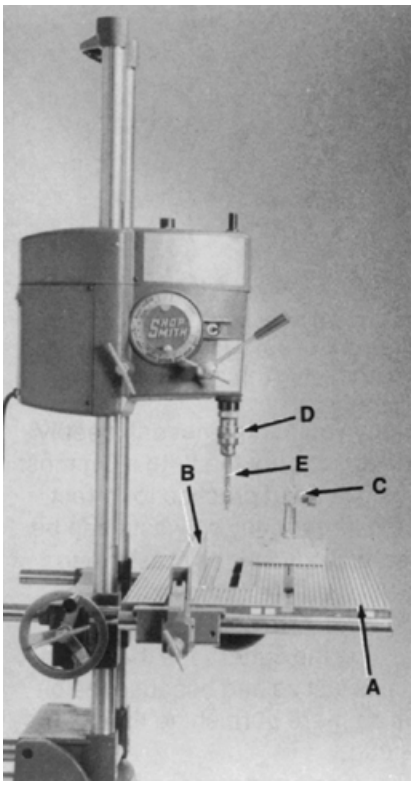


**Figure 7-1**. The accessories that are used for drilling operations are the (A) worktable, (B) rip fence, (C) miter gauge, (D) drill chuck and (E) drill bit.

### DRILL PRESS MODE- SETUP AND FEATURES

Use the accessories shown in Figure 7-1 for drilling operations. To set up your Mark V in the drill press mode, follow the instructions in the Owners Manual that came with your machine.

As you work in the drill press mode, you'll find that the Mark V is an extremely capable drill press with several special features:

- The distance from the chuck to the table can be ad justed to 26" and from the chuck to the floor to 58".
- The drill chuck holds bits with shanks 3/64" to 1/2" in diameter.
- The quill extends up to 4-1/2", and the depth control (quill feed stop) can be set to automatically stop the quill at any point from "0" to 4-1/4".
- The table tilts from "0" to 90-degrees (Figure 7-2).
- The rip fence and miter gauge can be used to help hold and position workpieces.
- With a wide range of speeds, the Mark V can drill a wide range of materials-wood, plastic, and metal

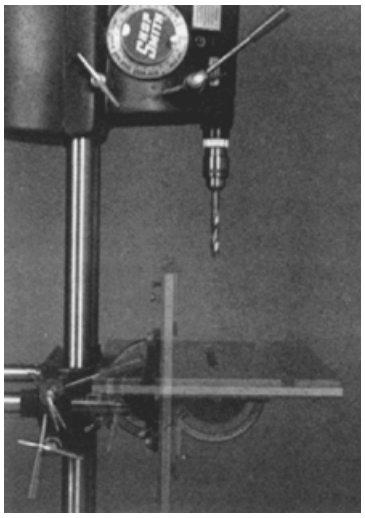

**Figure 7-2**. In the drill press mode, the table tilts from “0” to 90-degrees.

### DRILL BITS

There are three types of drill bits commonly available to woodworkers: twist bits, used to drill both wood and metal; spade bits, used when rough splintered holes are acceptable; and power auger bits, which drill slower and leave a smoother hole than either twist or spade bits (Figure 7-3). There are also specialty bits: brad-point, Forstner, multispur, screw drills, and plastic-drilling.

Most woodworkers aren't half as concerned with the type of bit they use as they are with the quality of the hole it leaves. As mentioned, in the course of a single project you might drill dozens of different holes for many difterent functions. For almost every hole you can imag-ine, there is a bit designed to make it a little better and a little easier to drill.

**General Purpose Holes**-Brad-point bits (also called machine spur bits) are a vast improvement over twist bits. A small point at the bottom of the bit bites into the wood first, hold-ing the bit on center so it will not wander. Two side spurs slice through the wood grains to make a clean entrance, leaving a clean hole. Brad-point bits are your best choice for general drilling in wood. However, they should not be used to drill other materials.

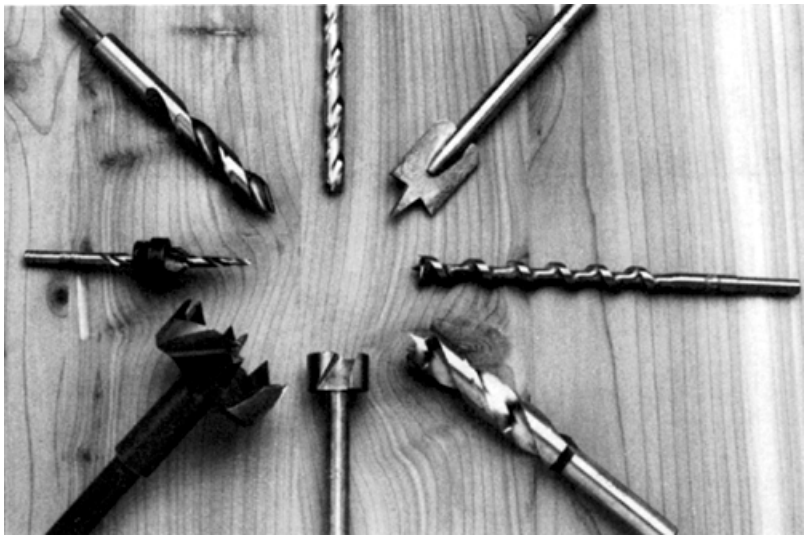

**Figure 7-3**. The most common types of drill bis are: (A) twist bits, (B) spade bits, and (C) power auger bits. Examples of specialized drill bits include: (D) brad-point bits, (E) Forstner bits (F) multispur bits, (G) screw bits, and (H) plastic-drill bits.

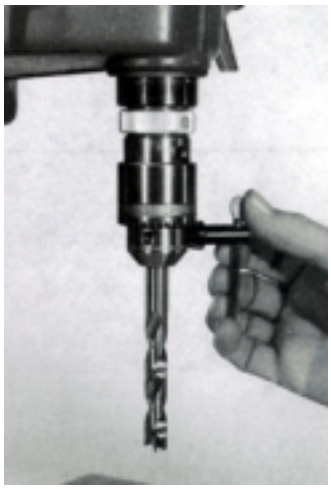

**Figure 7-4**. Drill bits are secured in the chuck with a special key.

Twist bits, usually associated with metal drilling, can be used to make holes in hard or soft woods. The hole will be rougher than you might want, and there can be considerable feathering or splintering when the bit breaks through, even when the work is supported on scrap stock.

**Super-Smooth Holes-** Decorative holes and holes for pivoting dowels need to have extremely smooth, splinter-free sides. Forstner bits were designed for just this purpose. They will bore small, shallow holes with flat bottoms and polished sides. Multispur bits will also bore flat-bottomed, smooth-sided holes, but they are designed to drill much deeper and much larger holes than Forstner bits.

**Screw Holes-**Screw bits will drill a pilot hole, shaft hole, and countersink for wood screws all in one operation. They can be ad-justed for different lengths of screws.

**Holes in Plastic**-To avoid cracks and splinters, use plastic drilling bits to drill holes in plastic. Plastic-drilling bits will drill clean holes in many types of plastic.

If you drill mostly in wood, we suggest you start with brad-point bits. While they can be purchased individually, it's a good idea to begin with an assortment that includes the most useful sizes-1/4", 3/8", 1/2", 5/8", and 3/4". A complete set of brad-point bits start at 1/8" and increases to 1" in increments of 1/16".

The flutes in a bit are channels that guide waste material out of the hole. If the channels are clogged, waste will back up and both bit and wood will burn. That is why you should not drill deeply enough to bury the flutes. On most jobs it is good practice to retract the bit frequently so waste can be ejected. Adjust feed pressure to the job you are doing and the speed you are using. A heavy feed will clog the cutter; one that is too light is just as bad because the bit will do more burnishing than cutting.

Provide good storage for your bits so they'll keep clean and can't be knocked around.

Drill bits are secured in the chuck with a key that causes the chuck's jaws to close firmly about the shank of the bit (Figure 7-4). Be sure to allow enough shank for the chuck to grip.Warning: Remove the key from the chuck immediately after securing the bit.

**DRILL PRESS SAFETY**

Warning: Before using the drill press, read and understand these important safety instructions:

**Danger Zone-**The danger zone on the Mark V in the drilling mode extends 3" all around the bit and chuck and 5" beneath the bit. The reason for the extended danger zone beneath the bit is that the quill moves the bit in that direction. Always keep your fingers and hands out of the danger zone.

When you work at the drill press, pay attention to where you put your hands. Be certain they aren't beneath the bit when you advance the quill. Never reach in toward the bit or beneath it to clear away scraps. Turn off the machine and let it come to a complete stop first.

- **Always wear proper eye and ear protection.**
- **NEVER leave the key in the chuck. Remove the key from the chuck IMMEDIATELY after securing the bit.**
- **Always use the proper drill bit for the operation you are performing.**
- **Never wear jewelry, gloves, ties, loose clothing or clothing with long sleeves. Keep long hair tucked under a hat. Jewelry, gloves, ties, clothing and hair could become entangled in the bit.**
- **Position the worktable at mid-chest whenever possible.**
- **Use the rip fence as a backstop and hold the stock firmly against both the worktable and the fence. If you can't use the rip tence, use tile miter gauge or clamp the stock to the worktable.**
- **Use only accessories and bits designed to be mounted in power drills.**
- **Never drill or bore metal or plastic freehand. Always clamp it to the worktable and back-up stock, or the rip fence and backup stock.**

**DRILL PRESS SPEEDS**

Before you begin any drill press operation, set the Mark V to run at the correct speed. To do this: turn the machine on, turn the speed dial to the correct speed and let the machine come up to speed.

The operating speeds for drilling are determined by the size of the hole you want to drill and the material you're drilling. Generally, you can use faster speeds with softer woods or smaller holes. Use slower speeds as the materials get harder or the holes get bigger.
To a lesser extent, the speed will also be determined by the type of drill bit you use. For example, twist bits will work better in wood at higher speeds. Spade bits must be used at slow speeds. Forstner bits must always be used at very slow speeds.

To help determine the right speed for the job, refer to Table 7-1. This table is intended as a general guide when using brad-point bits and twist bits. If you use other bits, follow the manufacturer's recommendations.

Note: A good rule of thumb is: The smaller the hole and the softer the material, the faster you can run the drill. But don't drill too fast or you may burn the wood and ruin the bit.