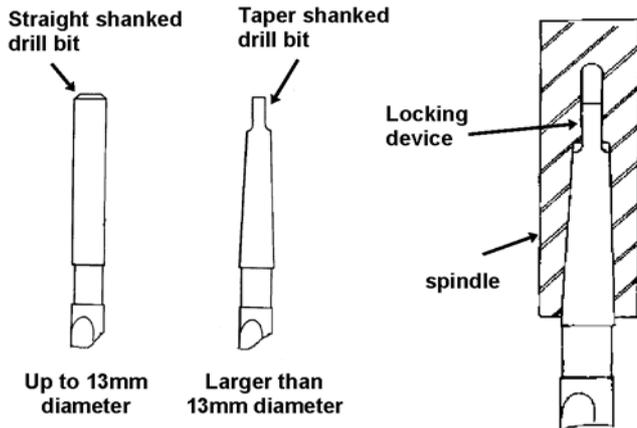


DRILLING METAL

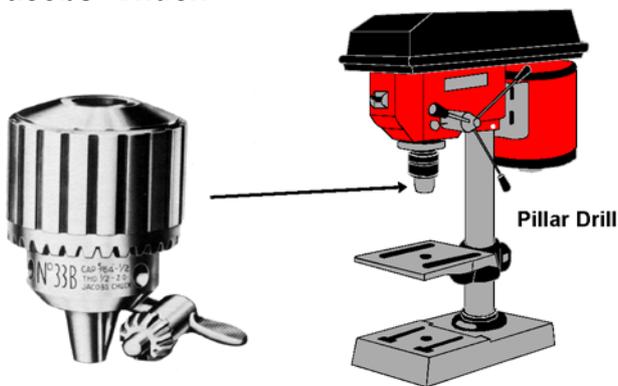
Metals are drilled by **Jobber Drill Bits**, made from HSS.



The smaller diameter bits have a straight shank and are held in a **chuck**. The larger diameter bits have a tapered shank and are held directly in the pillar drill spindle. The thin part at the end locks into the spindle and cannot slip under pressure, like a straight shank could in a chuck.



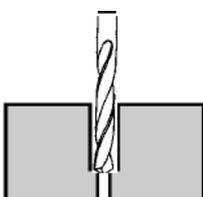
A 'Jacobs' Chuck



Note: For efficient cutting - Small diameter bits should turn at a fast speed. Large diameter bits should turn at a slow speed.

Pilot Holes

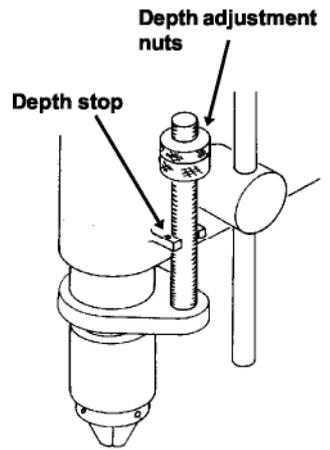
For holes in metal of 8mm diameter or larger, it is better to use a smaller drill bit first (4 or 5mm dia.). The smaller drill is less likely to wander off the centre punch mark. It also provides a hole that can guide (pilot) the larger drill.



A pilot hole guiding a larger drill bit

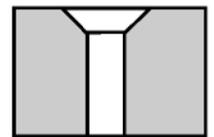
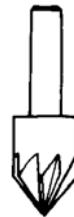
Depth stop

The depth stop on a pillar drill is useful for drilling holes to a given depth and for drilling a number of holes that have to be the same depth. The adjusting nuts hit the stop and cannot move down any further.



Countersink Bit

The bit is made from HSS. It is used to widen a previously drilled hole so that a countersunk screw head or rivet head can lie level with the surface.



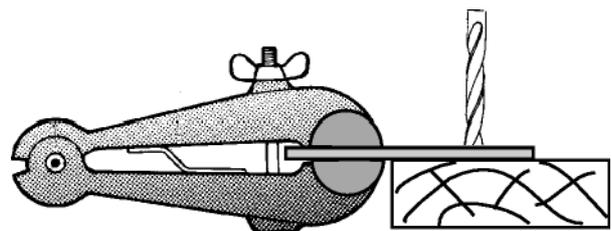
Cone Bit

Used for cutting and enlarging holes in thin sheet metal. This design does not catch in the metal and gives perfectly round holes.



Hand Vice

A hand vice should be used to safely hold thin metal (up to 3mm thick), while it is being drilled.



KEY WORDS Shank: Chuck: Pilot hole: Depth stop: Hand Vice: Cone bit:

1. What is the purpose of a chuck on a pillar drill?
2. What is the advantage of the taper shank design for larger diameter drill bits?
3. Explain what a pilot hole is used for.
4. You need to drill three holes that are 6mm diameter and 10mm deep. How can you be sure that they will be identical?
5. A jobber bit will cut a near triangular hole in thin sheet metal, instead of a round hole. How can you deal with this problem?
6. Illustrate a way of holding thin metal safely for drilling.