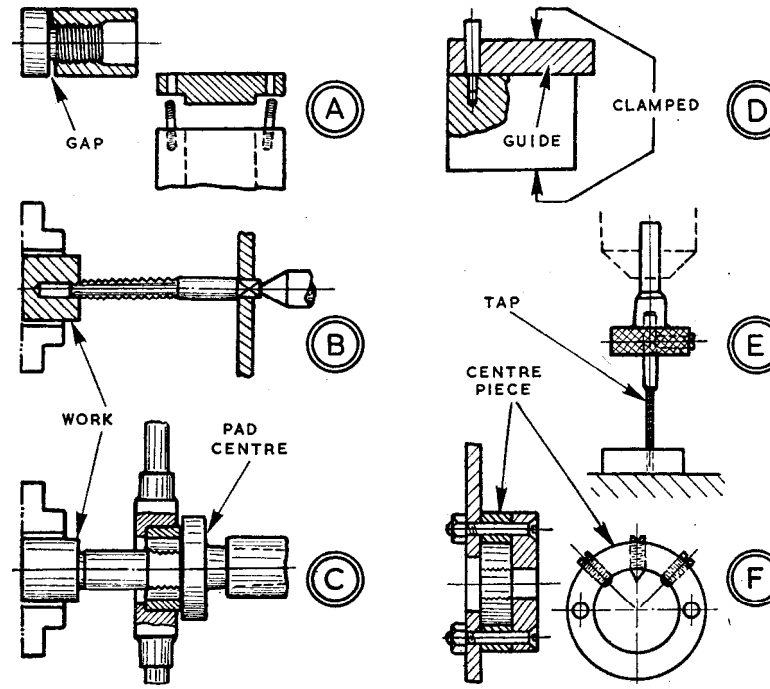
# Accuracy in thread cutting

WORKSHOP HINTS and TIPS

**By GEOMETER**




It is a merit of a screwcut thread that, whatever faults it may possess, it is always true with the end face or any shoulder on the work-assuming, of course, that all operations have been performed at a single setting, or that for the screwcutting operation the work has been properly set up. The thread may he fine or coarse, badly-shaped, undersize or taper, but at least it is never out-of-square.

This inherent squareness can be an important or even vital feature in the practical construction and assembly of components. It does not follow automatically when, for speed or convenience, threads are produced by other means such as taps and dies; and in its absence, assembly or functional diiculties may occur.

Two faces, whether shoulder-type or taper, pulled together by accurate screw-threads, abut extremely firmly, and the reaction is a purely axial one completely free from tilt. Parts such as caps and plugs, or screwed-on heads of engines, can be pressure-tight without effort or precaution; and squareness of alignment follows when, for example, such a construction is employed for attaching a web on a crankshaft.

In the absence of squareness and accuracy, a wedge-shaped gap is left between the faces of screwed components, as at ***A,*** and this can result in pressure leakage, or difficulty in making a joint with a washer; or strain, malalignment and insecurity in the case of a constructional feature. Where the fault is on the thread of studs, or in the directional alignment of tapped holes, there may be direct assembly difficulty from inability to fit a cover.

For correction, a component with an internal thread can sometimes be mounted on an accurate threaded mandrel in the lathe, and the face trued by a light cut. A faulty stud can be renewed; but if a tapped hole is out of true, about the only thing to do is fit a stud tightly, screw on a nut, and with hammer blows bring the stud up square.

Better than correction at any time is to ensure that threads are produced squarely, or at least as closely as possible approaching that condition. In many instances, particularly if components are already on the lathe, it may be convenient to screwcut threads to about three-quarter depth, then clean and size them with a die-which will be relieved of a considerable amount of work. The same is true for internal threads large enough to be screwcut before finishing with a tap-a procedure essential for threads too large to tap straight out, but needing to be quickly and uniformly sized.

On work of a size normally tapped, accuracy can be ensured, as at ***B,*** by supporting the tap from the tailstock centre with the tap wrench resting on the topslide, pulling the chuck round by hand, and feeding up the tailstock barrel. If there is no centre at the end of the tap, a small hollow centre must be used in the tailstock. For work requiring an external thread, as at C, the principle can be employed with an ordinary die-holder, supporting this from the topslide, and backing up the die from a flat or pad centre in the tailstock-when the die should be fitted the reverse way to normal for its throat, as usual, to run first on the work.

Accuracy of threads in medium and small tapped holes follows from using a guide either tapped squarely itself or drilled square to the nominal diameter of the tap. Location to the hole to be tapped can be obtained from a short length of rod of core diameter when the guide hole is tapped, or stepped when it is plain, as at ***D.*** Then guide and work can be clamped.

A bench or pillar drill, its chuck locating, not gripping, the shank of a tap wrench, may be used for accurate tapping as at ***E,*** the work held or clamped on the table, and the tap holder turned by fingers. Starting a die squarely, as at C, it will often continue truly on work transferred to the vice, or a guided die-holder can be used, of which a simple example is as at ***F.*** ❑