

# TAILSTOCK HOLDERS AND CENTRES

**C**ENTRING and drilling from the tailstock are operations that are usually followed by others in lathe work. Shafts, after centring, may be machined between centres, or may be drawn from the chuck to be supported by the tailstock for turning. Holes which are drilled, after centres have been made, may be tapped, reamed, or finished by being bored with a tool from the topline.

For a newcomer to lathe work, centring and drilling represent two important steps in his progress to

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the operations which follow. Until you can take the first steps with reasonable confidence, you live with the thought that you may be hindered, if not baulked, in your ends by having a centre drill break or a drill snap off. With either mishap, you may scrap the work in addition to the tool, and so add to the immediate problem which faces you, as well as to the expense.

Some breakages are inevitable, as the price of gaining experience; but the number which would otherwise occur can be greatly reduced with suitable equipment and methods—though he would be a skilful and lucky lathe operator who could be completely immune.

At the outset, successful centring on the lathe demands a flat surface on the work, or a truly symmetrical surface—for with care you can centre a ball in the chuck. If the work is rough or slanting, it should be trued with a facing cut that preferably leaves no pip to oppose the centre drill. A tiny pip is no great concern, as the centre drill can remove it, but a large one, by deflecting the drill, can cause trouble.

You can set the facing tool to centre height against a centre, or with a height gauge or scribing block. By another method, you adjust it after taking a trial cut.

A further point in the matter of centring occurs when you have the outer end of the work supported by the fixed steady. Its axis must be brought to that of the lathe, which you do by adjusting the steady jaws,

testing by methods similar to those for centring the tool.

To mount a centre drill, there is a choice of a tailstock chuck or a holder, as at A. The shank of a chuck usually has a tongue at the end to engage in a sleeve. To tighten the chuck firmly, you can hold it by this tongue in the vice. If your tailstock barrel is not a centre-extracting type, or bored right through, make a chuck extractor X from stout flat material, bending it, or from angle, cutting off the surplus. File a hollow radius to suit the shank, and hold the extractor on the barrel as you bring this back in the tailstock.

A holder for a centre drill you can turn from mild steel bar, machining the taper first, so that the hole for centre can be drilled and reamed, or bored, with the holder in the headstock spindle. For the taper, you set the topline to angle from a centre between the headstock and tailstock.

If the lathe centre has a hollow end, the tailstock centre engages it. Otherwise, fix a centred block with sticky tape, as at B. Hold the other

end in the chuck and true the centre with taps from a soft drift. Set the topline so that the tool moves at equal distance along the shank. White paper underneath helps you to see the gap. After you have machined the taper on the mild steel bar, you can smooth it with a fine file and emerycloth.

To secure the centre, the holder can be drilled and tapped for a set-screw—the usual method. Other methods just as practical are shown at C. A tapped collar can be fitted over the end of the holder; or you can split the holder and employ a clamp. If square bar is used for the holder, a flat sided cotter will secure the centre drill by a ground flat. Without grinding, you can use a grooved cotter.

By using a small hollow centre in the tailstock chuck, or a shanked hollow centre directly in the barrel, **D1** and 2, a twist drill can be held by hand with a carrier. This helps on occasion as you can feel what is happening. Conversely, by using a pad centre with wood backing, work can be held by hand and drilled from the chuck 3. □

