

TESTING LATHE ACCURACY

THE most important test of a lathe lies, no doubt, in the accuracy of the work and the manner in which it is produced—a skilled operator being able to overcome considerable basic inaccuracy. Even if the work is of a relatively simple character, ample scope for error exists—provided there is sufficient variation to test all aspects of alignment.

This is to say, a lathe may be accurate for one type of work but not for another, and experience of it can indicate where to expect errors, though the reason why may not always be immediately apparent. However, there are various simple tests which are largely a substitute for “work experience” and which can be useful for discovering errors, for tracing the machine (if possible), or on occasion for setting up.

A simple but important test, **A**, is the meeting of headstock and tailstock centres. When the fixed centre has noticeably dropped, wear of the underside of the tailstock and possibly of the bed itself is indicated. The effect on between-centre turning may be small or non-existent, but care will be necessary when using centre drills or boring cutters from the tailstock—a degree of “lift” then being necessary for the tools to centre.

The same effect also obtains when supporting chucked work from the tailstock. This test should be made with the barrel both close in and well extended. A sideways error of the same kind can often be corrected by adjusting the tailstock.

A more severe test of the same sort, **B**, can be made with an indicator, which can be a dial type or one of the small inexpensive varieties. The indicator is mounted in a chuck or on

a driving plate with its plunger bearing on the fixed centre. Then the machine spindle is turned, when a steady reading shows perfect alignment, using a small mirror to see the instrument upside down and from behind.

Where there are variations in readings, as is virtually always the case, it can be seen in which direction (vertically or sideways) they occur, and the tailstock adjusted to correct sideways error.

A live centre test for running truth, **B**, can be made of the one normally in the spindle and of others of the same taper with the indicator mounted on the slide-rest. This can sometimes reveal that the centres themselves have not been ground true; and in use it may be advisable to keep them to one position—spindle or tailstock—marking for fitting in a certain manner.

GENERAL ALIGNMENT

A test for general alignment of headstock and tailstock for between-centre turning can be made employing a mandrel, **C**. Any suitable piece of rod can be used, carefully centred, reduced in its length, and with the ends turned the same size.

A tool mounted on the slide-rest can be brought close to one diameter, leaving a small gap, then the gap checked on the other diameter, a piece of white paper on the bed providing a light background against which to see the gaps. Finally, the tool may be set to touch the diameters lightly when traversing the saddle. This aids reasonable setting of a lathe before work begins, and as an alternative to a tool an indicator can be used.

A faceplate may be checked with a rule, **D**, and when mounted on the spindle and rotated is tested for face wobble. If chuck work is machined true, a test can be made on the faceplate of cross-slide alignment in two stages, **E** and **F**, using a tool or an indicator.

Testing along the near side along line X-X1, no error may be shown if the faceplate was machined on the lathe, for alignment corresponds to the cross-slide. Testing on the far side, however, on line X2-X3, any error is doubled and can be easily seen.

Topslide setting can be tested as **G**, an indicator on a mandrel and a rounded rod on the slide-rest. With the slide out of alignment, movement is along such as X4-X5, and checking with saddle traverse, variations are shown, whereas with a true setting readings will be all the same.

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