

Testing and truing angle plates

A FEATURE of lathe work-in general irrefutable-is that components tend to reveal the accuracy or otherwise of the machine and its equipment. Thus, the platform for components which an angle-plate provides when mounted on the faceplate must, of necessity, be in correct alignment with the lathe axis.

If the platform tilts so as to make an angle with the axis inaccuracy is clearly present, and a component machined on the plate will carry a similar error.

Given, however, that the angle-plate is true and mounted the correct distance from the axis, two important conditions of setting up are fulfilled. In confidence of the result, a component can be stood on the plate, positioned sideways, squared-perhaps from the front edge of the plate-and clamped. Any face machining

will then be square on the component, while the axis of a bore will run parallel to its base. The latter condition is shown at *A*, where the distance from the centre of the bore to the base is the same each end, *X* being equal to *XI*.

This type of accuracy depending on alignment chiefly affects overall dimensions-and through them assembly of a component with others. For example, the bore and piston-rod-cover face of a small steam cylinder may be true; but if they are out of alignment with the base mounting-face, trouble will be experienced with the cross-head binding when the cylinder is attached to the bedplate. Again, flat-base bearings bored out of alignment will result in tilt and tightness of the crankshaft.

Faults mainly occur when there is an error in alignment of the angle-plate on the faceplate, as at *B*, since for practical purposes most faceplates

are sufficiently flat and true-running. In any case, they can be easily checked and the methods to be suggested counteract even a wobble error.

Theoretically, of course, the functional faces of an angle-plate should be at right-angles, but it should not be taken for granted they are unless the plate has been checked and proved to be accurate. Usually there is some error, though it may be small; and even should the error be considerable it can be eliminated when mounting the plate-which, incidentally, is often necessary in production shops.

The common method of testing is as *C*. The angle-plate is attached to the faceplate in approximately the position it will occupy, then an indicator is mounted on the topslide, for its plunger or lever attachment to bear on the plate. Saddle movement to and fro should then produce no difference in indicator reading.

Making corrections

Tests should be made with the plate horizontal and in two vertical attitudes, near to and away from the operator, to search any error in spindle alignment, for which allowance could then be made. An error being present on the plate, as at *B*, packing is introduced, as at *C*, until a uniform reading obtains on the indicator.

On occasion a small cheap or home-made indicator will serve almost as well as a dial type, and with careful observation a bar or pointer will often suffice. Packing may be shim-stock or tinsplate, or strips of paper.

Once trued in this manner-which also allows for faceplate wobble-the angle-plate can be finally adjusted for position; and if the job is to be a recurrent one, dowels can be fitted as at *D*, removing the faceplate from the spindle for drilling and reaming.

Tests of angle-plates alone, though less important than on the lathe, can be made on a surface plate, as at *E*. A parallel cylinder with a square end is clamped to the angleplate, and checks at *Y-YI* with dial indicator or surface gauge should reveal the cylinder to be horizontal.

Instead of a cylinder, a steel mandrel can be turned, as at *F*, pressed into a base, then this is faced and the test diameters turned with the mandrel running between centres.

