

# WORKSHOP HINTS AND TIPS

## MACHINING SMALL CRANKCASES

By Geometer

To ensure alignment of the major component parts of a single cylinder internal combustion engine, it is essential for the cylinder seating face of the crankcase to lie parallel with the mainshaft axis.

Transversely, at right angles to this position, alignment is less important, since an error would merely direct the prolongation of the cylinder axis one side or other of the mainshaft axis. On some engines, this may be done deliberately; so an error here, providing it is reasonable, is unlikely to have any mechanical ill effects.

But in the 'other direction, malalignment would set up binding in the piston-connecting-rod-crankshaft assembly.

Apart also from the need for reasonable accuracy in this direction, a small crankcase may be by no means an easy object to set up for machining the cylinder seating face; and in the

along the machined face of the chucking piece. For this work, a sharp V-tool may be set sideways at centre height, and the crankcase adjusted by moving the chuck to equalise any slight inaccuracies.

At the extremities of the line-after unchucking-V-nicks can be made with a small file. When the other half is joined up, positions can be marked from these nicks, and similar ones made in the other half-dismantling for this, of course. Thus, the joined up crankcase has a small centre in the rough face where the cylinder will seat, and another in the end of the chucking piece.

These positions are then opened into orthodox centres, feeding the crankcase from the tailstock on to a centre bit running in the chuck, holding the case by hand.

If the crankcase is a type on which the chucking piece is circular, centre positions can be marked before unchucking, then these positions are centre-punched and orthodox centres produced. On either crankcase, the next operation is to machine the outside of the chucking piece, on a set-up as at A, when a toolmaker's clamp, for example, may be attached to the top of the crankcase to take the drive.

Using the machined chucking piece, a set-up for the next operation can be made as at B. Supporting from the tailstock centre, the cylinder seating face can be machined almost to position, a check being made measuring down to a mandrel passed through the main bearing bosses. Then the centre can be drilled out and the mouth of the case bored to size.

For an endplate type of crankcase or one where the crankchamber and main bearing housing are integral—the front end closed by an endplate—a set-up can be made without a chucking piece, employing an angle plate on the faceplate as at C. The face machined at the first set-up goes down to the angle plate, and a bolt, nut and washers can be used for holding. Before unchucking from the first set-up, a centre line can be marked on the case, and this set to a similar line on the angle plate.

Alternatively, provision having been made on the pattern, this case, too, can be machined holding on a circular (solid) chucking piece.

The undersides of mounting lugs can, on occasion, be machined on a set-up as at A, but the driving end held in a four-jaw chuck. Areas, however, remain as at D, Y and Z, to be finished by careful tiling. Alternatively, as at E, a set-up can be made on a mounting plate on the vertical slide, and the lugs machined by a cutter in the chuck!

articles on patternmaking, touching on crankcases, chucking pieces have been mentioned as facilitating the operation.

Of course? the preliminary work of boring the interior of the crankcase, machining the main bearing boss, facing the front, and turning any step or recess for the register of the other half, can be done at one setting with the casting held in a three-jaw or four-jaw chuck by the main bearing boss, or, on occasion, over the outside.

With the crankcase-half at this stage, before unchucking, a fine line can be scribed on the machined face where the cylinder will seat, and also

