Lapping bores

WORKSHOP HINTS AND TIPS

By GEOMETER

As a process following machining, lapping is employed to remove tool marks, correct slight taper or ovality in the work, bring it to required size, and provide a smooth accurate surface. Given reasonable care, success is assured, for the process is a leisurely one and-in common with grinding-has the advantage of being able to deal with hard materials.

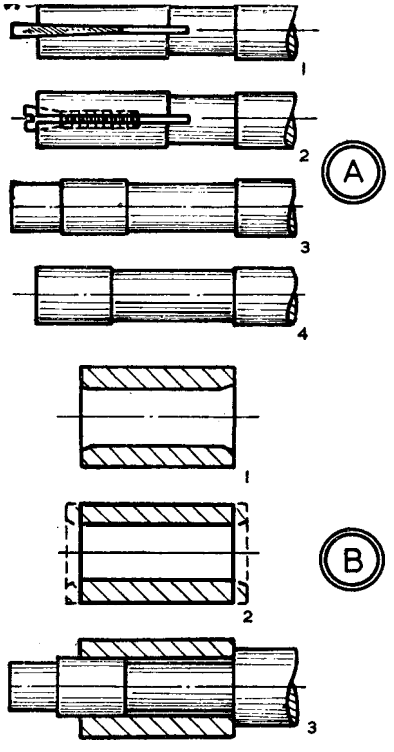
A common application of lapping is to finish the cylinder bores of small engines; and for such a purpose for a one-off amateur job, absolute size of the bore is of less importance than its smoothness and geometrical accuracy-for on the latter the success of the model will depend,. in the good steam or gas sealing achieved by the piston.

A great variety of materials can be used for laps. But for'workshop use for small and medium sized bores, materials like aluminium alloy, brass, copper and mild steel are probably best. Lead and white metal can be used in special cases, generally when bores are large. With these some care is required to avoid burring or other damage.

As with materials, so with abrasives ; a considerable choice exists for special purposes, though the general run of work can be performed with ordinary fine valve grinding (lapping) paste as used for car and motor-cycle engine valves. This leaves a smooth, matt, unpolished surface,. which can be further smoothed with a liquid metal polish-particularly the sludge to be found in the bottom of the tin.

Parffin oil or thin lubricating oil may be used to incite the abrasive to cut, and may be used after lapping to help work out particles of the abrasive. The same lap may be used for the whole process, but it should be used until the abrasive has ceased to cut, then scrubbed and wiped thoroughly before using for polishing otherwise particles of abrasive may scratch the surface-and abrasive left in the surface of the component will naturally result in wear.

Either the lap or the component may be rotated when lapping in the lathe. A part which is already securely



set up can be lapped holding the lap by hand, especially where such part may be a bush difficult to hold otherwise. The lap may then be somewhat shorter than when it is itself run in the lathe and the part applied to it.

In all cases, protection should be afforded the lathe by covering the bed and slides with newspapers or cloth, and the chuck should be plugged with rag from the back. Speed of rotation should be moderate, and the lap moved to and fro in the bore, or the part slid forwards and backwards on the lap.

For small laps adjustment can be made through a wedge in a slit Al, or by a conically-headed screw, along with a slit A2. To work through a bore, the end of a lap can be reduced as a guide, and the shank for clearance A3, while to work in a blank bore the reduced end can be omitted A4.

To avoid bell-mouthing in a bore Bl, extra material can be left to machine off afterwards B2. Pushing through or jamming in a bore can be avoided on a lap with a shoulder B3.

Abrasive may be held in a lap in a spiral groove, hacksaw grooves or drill dimples Cl, 2 and 3; or abrasive may be supplied in use If the lap C4 has a central hole filled with grease, a feed screw at the handle end, and at the working end radial holes filled with abrasive.

Again, a soft lap may be impregnated with abrasive by distributing this over a hard plate, and rolling the lap in it with downward pressure Dl. To facilitate applying sufficient pressure, a roller can be used with the lap, with a plate on both D2. ❑