Finishing DIFFICULT threads

WORKSHOP HINTS and TIPS

By GEOMETER

WHILE standard methods of thread production take care of normal cases, problems occasionally occur when, for some reason, such methods are inapplicable. It is so if a thread needs to be cleaned at the far end or extended on a stud or bolt of unusual pitch (metric, perhaps); or if a bolt or component is hard -and so cannot be touched by a die or cleaned by screwcutting in the lathe. Again, if a thread is taper, it raises the problem, in the absence of special equipment, of how to produce it initially, or clean it up when it becomes worn and rounded at the crests.

When work should proceed straightforwardly, difficulties may occur if material is hard or tough-such as cast steel or stainless steel; and extra care is advisable, such as when using a die to bring the thread to depth in two or three cuts. For the first one, the die should be opened to its full extent and worked carefully-with lubricant.

Bursting force

Unless the die is a good fit in the holder, the two side screws should be tightened for support after the central expansion screw has been regulated; for without this support, hard or tough material can exert a bursting force on a die sufficient to break it at one of its clearance holes.

For the second cut, which may be all that is needed, the die can be closed as necessary. Then if the thread has to be full depth to the end, the die must be run on finally the reverse way; and again some care is required, since the non-throated end will encounter a thread or two of shallow depth, which can easily chip one of the cutting edges.

A thread which is uniformly tight throughout its length can be lapped as required at full form, in the roots, or on the crests. A nut cut through one side, fed with abrasive paste and gripped with pliers will serve at times for a full form lap, and drilled out for clearance at the bottom, it will deal with crests of threads. A component which can be rotated in a lathe can be lapped at the roots of its thread, drawing down on to them an abrasive-fed wire of suitable size.

A taper thread usually found on the ends of polishing spindles for mounting a cloth mop or felt bob, screwing it on as at ***A, can*** occasion a problem when it has to be cut or cleaned: Such a thread may, of course, be right-hand or left-hand, depending on which end of the spindle it is, to keep mop or bob fixed by normal rotation; and following it on a normal lathe calls for a sliding tool or separate movement of the cross-slide, since the angle is much too steep for the problem to be overcome by setting over the tailstock.

Cone and indicator

Given reasonable dexterity on the lathe, and an easily-read indicator, a solution is to be found as at ***B.*** A cone of the same angle as the nose of the spindle is made in a freely-turned material such as aluminium-alloy and attached by a grubscrew. The screw-cutting tool is set to the nose, and the indicator to the cone-and in the course of the cut a steady reading is maintained on the indicator by advancing the cross slide.

With a left-hand thread normally rotating, it is standard procedure to begin at the left and finish at the right so the taper thread is simply followed down with the feed. With a right-hand thread, however, it would be a risky procedure easing the tool back to the larger diameter, against continuous advance, and contending with backlash on the feedscrew. For this, then, it is advantageous for the lathe to rotate backwards and the tool to be mounted upside-down, to employ the " following down " technique as before.

A thread which must be ground to finish can be dealt with on a jig, as at C. A nut can be brazed or welded to a holder, mounted on the topslide, the shaped grinding wheel aligned, then the component screwed slowly in. On a more elaborate jig, as at ***D,*** location can be from a spring-loaded plunger.