

HIGH SPEED THREADING UNIT

Introduction

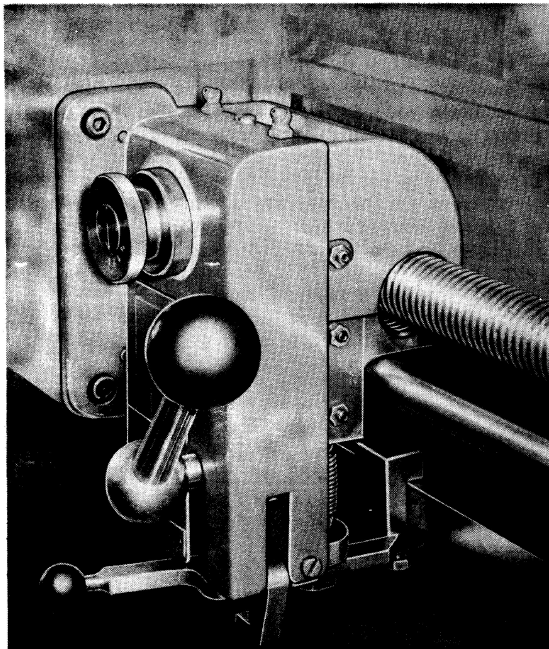
This attachment is designed to replace the existing screwcutting mechanism of the lathe. It is secured to the right hand side of the lathe apron by socket head screws and accurately positioned by dowels.

The attachment contains its own half-nut mechanism and obviates any possibility of the thread being picked up incorrectly. A threading dial is eliminated; the operator merely presses on the handle and the half-nut will engage at the correct point to pick up all American and English threads, including fractional threads per inch.

Once fully engaged, the half-nut is locked positively in mesh with the lead screw and always at precisely the same depth of engagement until disengaged automatically or manually.

When the knock-off lever encounters the stop which is fitted to the lathe bed, the half-nut is disengaged automatically, safely and with great accuracy.

As engagement of the half-nut is controlled and release is automatic, threads can safely be cut at high spindle speeds, the only limiting factors being considerations of tool life and the speed at which the carriage can be picked up without undue strain on the lathe mechanism.



Setting and Operation

The setting dial can be pulled out and turned to four different positions, the settings being as follows:

0—"Safe". Impossible to engage half-nut with lead screw

1—Odd-quarter threads per inch (e.g. $4\frac{1}{4}$)

2—Odd-half threads per inch (e.g. $4\frac{1}{2}$)

4—Whole numbers of threads per inch (e.g. 8 or 13)

Move the knock-off control to the "Screwcut" position and set the adjustable stop to engage the knock-off lever so the half-nut is disengaged at approximately the required position. Now, with the tool clear of the work and the lathe running, engage the half-nut and allow the knock-off to operate. Fine adjustment may then be made by using the compound slide.

Threads may be cut either by feeding the tool straight in or by using the top slide at half the thread angle. When using the latter method, however, allowance must be made for the fact that the tool will have moved forward by half the pitch when the thread is completed.

The tool may be allowed to form its own annular groove at the end of the cut, but should be withdrawn without delay to avoid rubbing.

It is important that the lead screw be clean and free from swarf for high speed screw cutting.

INSTRUCTIONS FOR FITTING NEW HALF NUT

Access to the screws securing the half nut is through two holes in the main casting of the attachment.

IT IS IMPORTANT to check that synchronisation of the nut and pinion is correct and, if necessary, adjustment must be made as detailed in the Maintenance section.

Mounting Instructions

1. Remove covers from the High Speed Threading unit.
2. Remove threading dial from carriage apron.
3. Loosen steady adjusting nut (B) and slide steady (C) up slightly.
4. Fit threader over lead screw, near the tailstock end of the lathe and hold in place. Engage threader half nut (E).
5. Move carriage back until it contacts face of threader. Attach threader to apron with three mounting bolts (A). Tighten bolts just enough to hold while aligning threader.
6. Ensure half nut is fully engaged with lead screw by applying gentle pressure upwards (taking care not to deflect leadscrew). Tighten bolts (A).
7. Position Steady (C) so that it just clears lead screw (.003 in. maximum); tighten steady adjusting nut (B).
8. On 17 in. lathes only, adjust lower steady (located next to apron) to bear lightly on underside of leadscrew.
9. Position stop bar (H) below knock-off lever (F) (about $\frac{1}{8}$ in. clearance) and parallel to feed rod. Locate mounting holes on lathe beddrill and tap $\frac{1}{4}$ in. UNC for mounting screws.
10. Attach stop bar to bed using flat head machine screws and spacers provided.
11. **Note:** When knock-off lever (F) is in "screwcut" position (i.e. knob moved to left) the knock-off lever should engage the stop (K) by approximately $\frac{5}{16}$ in. and when in the "lock" position (i.e. moved to right) it must be clear of the stop. Make any adjustment necessary by altering length of knock off lever or stop bar spacers.
12. Check the correct fitting of the threading unit as follows:—

Set the stop to engage the knock-off lever with the tool clear of the work. With the lathe running at about 300 r.p.m. and set to cut say 12 T.P.I., engage the nut, as described under "engaging the half-nut" and allow the knock-off to operate. It will be seen that the initial action of the knock-off mechanism is to rotate the locking lever clockwise and release the selector pin.

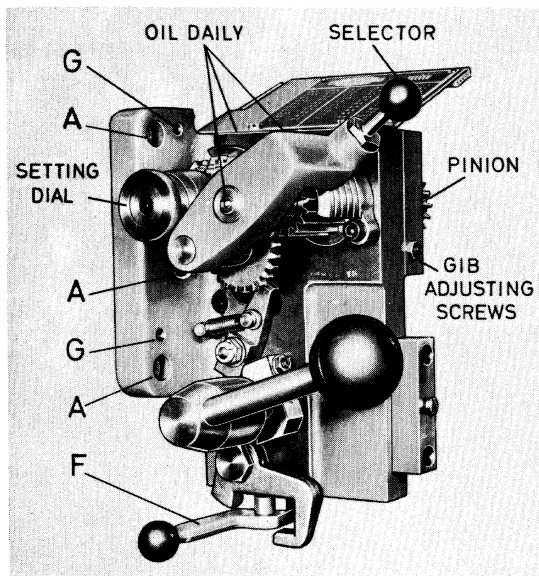
Immediately the selector pin is released it should fly out of the dial slot and the nut should disengage from the leadscrew.

If this action is sluggish it must be corrected by altering the position of the attachment on the apron in such a way to ensure that the nut is fully engaged and bearing against the front of the lead-screw (i.e. move the attachment away from the operator).

It is important to note that the half-nut has been designed so that it is thrown clear of the leadscrew immediately the slide pin is released. If the attachment is fitted incorrectly and the nut is pressing against the back of the leadscrew (i.e. tending to bend the leadscrew towards the operator) the servo action will not operate and the release mechanism is liable to act sluggishly.

This fault can be easily discovered by observing the slide pin when the knock-off mechanism operates with an increased load applied to the carriage by applying slight hand pressure to the traversing hand wheel. If the slide pin flies out of the dial slot **immediately** it is released the action is satisfactory, but if there is a slight pause the servo action is not operating and the nut is being forced out of engagement with the leadscrew by the safety device incorporated in the attachment.

13. After any necessary adjustments have been made, and repeated trials show that the attachment is working satisfactorily, drill dowel holes in lathe apron through holes "G" in threader, ream to dowel size and fit dowels.
14. Replace the covers and the attachment is ready for operation.



Engaging the Half-Nut

With the lathe running at required speed, hold down the handle with a steady pressure. Engagement will not be possible until the right moment, which is indicated by a movement of the handle. At this moment the handle should be depressed fully and released. If the half-nut is not properly locked in engagement, the handle will fly back and the procedure should be repeated.

The handle must be held down firmly and steadily until the half-nut engages; it should not be depressed intermittently or engagement will be delayed. The handle *must* be released on engagement. Before screw cutting, it is recommended that the operator carry out a few runs with the tool clear of the work to get the "feel" of the mechanism.

Manual Release

If it is required to cut a thread without using the automatic knock-off, the half-nut can be disengaged manually.

Safety Lock

If it is required to advance the carriage beyond the stop, this may be done without interfering with the setting, by moving the knock-off control to the "lock" position. It will then be retained in a position which will allow the stop to be by-passed, at the same time locking the attachment so that it will not be possible to engage the half-nut until the knock-off control is returned to the "screw cut" position.

Left Hand Threads

Left hand threads should be cut by reversing the lathe and inverting the tool. The lead screw can then be set to run in the normal direction of rotation and the automatic knock-off can be used. If a screw-on chuck is used, care must be taken, of course, to ensure that it does not unscrew while running.

Lubrication

Medium lubricating oil, not grease, should be used at the points indicated.

The double ball bearing on the pinion shaft is packed with grease and will not require attention.

Maintenance

Adjustment for wear in the half-nut slide is by three socket head screws with lock nuts operating on a gib on the right hand side of the attachment. It is essential, however, that this slide works freely over the full range of its travel.

Initially the attachment will either be fitted by a trained service engineer, or will be supplied with the mounting bracket drilled to correspond with existing locations on the lathe apron, but the following points should be noted:

1. When the half-nut mechanism is locked in engagement, the half-nut should be deeply meshed and the steady set to prevent the lead screw distorting upwards.
2. The half-nut should not bow the lead screw horizontally, a slight deflection away from the attachment is acceptable, but there must be no deflection towards the attachment.
3. With the cover of the attachment removed, it will be seen that a pin enters one of the slots in the control disc when the half-nut is engaged. With back lash taken up, this pin should be approximately central in the slot, with a slight bias towards the side of the slot nearest the mounting flange of the attachment. On no account must it bear against the side of the slot.

Should this fault develop through wear, it may be corrected by re-synchronizing the pinion as follows. Withdraw the pinion from the shaft after removing the retaining screw. The pinion is located on the driving collar by a pin which will engage any one of a series of holes arranged to give a vernier action. By moving the pinion round one hole at a time, the best position can easily be found by trial and error. A second pin, fitted to the reverse side of the pinion, may be used to give a further set of positions if necessary.

No other adjustment should be attempted without consulting the suppliers and the serial number of the attachment must always be quoted in case of difficulty or when ordering replacements.