STEEL MACHINERY GROUP

Threading Machine

Operator's Manual



SETTING UP

Fit the correct chaser holder in the die head for the work-piece to be threaded.

Then follow the steps provided below:

- ➢ Check the size mentioned on the chaser holder for the thread size to be cut.
- ➢ Remove the screw studs with the help of a box-nut spanner provided.
- ➢ The holders can then be extracted from the die head. Care should be taken not to damage the guide slot at the rear of each holder. If the case-hardened guide block comes away with the holder the guide block should be carefully removed and replaced on the guide block stud.
- ➢ Select the correct set of chaser holders, making quite sure that the diameter to be threaded is covered by the holders and that all the holders for the same capacity and type of thread.
- ➢ Select the chaser holder numbered 1, and insert the shank in the die head. Be careful not to damage the slot when engaging with the guide block.
- ➢ Using the Box-nut spanner provided, replace the screwed stud and clamp the holders in position.
- ➢ The rest of the chaser holders should now be placed in position in ascending numerical order in a clockwise direction for right hand thread.

DIE HEAD SIZE SETTING

The head is graduated for all standard sizes within its capacity. To set the die-head to the required size, slacken off the six-socket head cap screws and insert the box-nut spanner in six-socket head provided in worm plate and pull round until depth coincides with the desired diameter as per your required gauge setting of thread.

CHASER SETTING

The chasers for right hand threading should be fitted in ascending numerical order, for convenience each holder is marked with its number and the chaser stamped with the same number must be fitted to it. It is important to make sure that the chasers are clean and free from packing oil before fitting.

It is unnecessary to remove the chaser clamp except when cleaning. The clamp screws should be slackened sufficiently to enable the chaser to be slipped into position. A gauge is supplied for setting the chasers to the correct cutting position. This gauge is applied as shown in Fig.1.

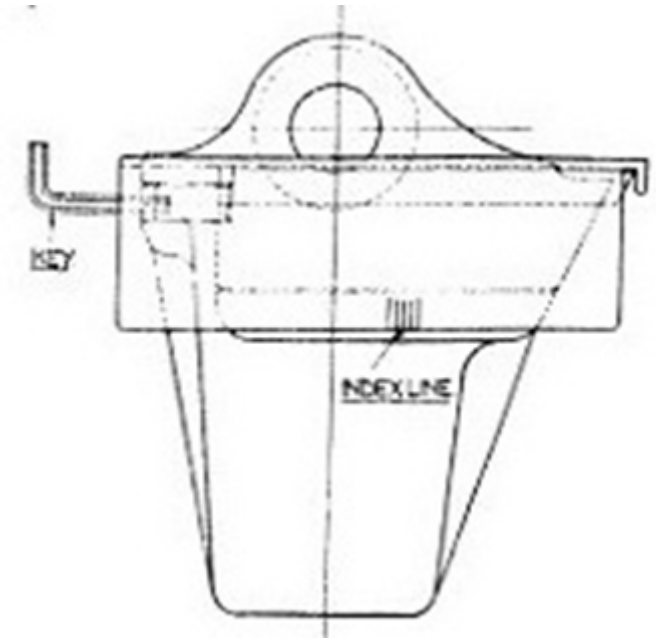


Fig.1

The chasers are to be adjusted by a hexagon key until the line on the setting gauge for the particular size required coincides with the zero line on the chaser holder. This type of gauge allow the chaser to be easily and accurately set and permits slight variation of cutting position. Chasers of different lengths can be used in the same set. When clamping the chasers in the set position always tighten the screws nearest the cutting edge before tightening the rear screws.

To obtain satisfactory results it is essential that the chaser set is properly in the holders and the cutting edges are set uniformly. For most materials, the best cutting position is on centre. If the chasers are located too far forward they will form the thread by pushing instead of cutting, thus generating heat and causing wear, and furthermore, it is probable that the thread will be tapered, if the chasers are behind centre they will dig into the stock and will tend to chip the cutting edges and proceed out of round thread.

It cannot be too strongly emphasised that most troubles encountered on a threading machine are due to incorrect setting of the chasers. If best results are to be obtained, it is essential that extreme care should be taken in this operation.

SPEEDS

Two different speeds are provided by means of sliding gears of EN-9 material. The position of one selector lever to obtain any particular speed is indicated by the plate on the headstock cover.
When changing gear, always first press the stop button to slow down the driving motor.

A cutting speed of 16 feet per minute is recommended for mild steel to give good results, but faster speeds may be used at the expense of finish and chaser life. The cutting speed for most materials

is however, best found by experience under actual working conditions, and should have relation to the pitch as well as diameter.

Note: If the variable speeds are required, then an AC drive can be provided which can facilitate 40 different speeds.

THREADING

If the machine is Non-Lead Screw Model, it is now ready to be placed into production. For further instructions on setting up Lead Screw Model see page no.

Insert the work piece in the vice and grip securely by means of the hammer action clamp. Close the die-head by pulling lever, see page no 12, to the right. Most standard threads can be produced by one cut, according to quality of finish required. Set the speeds of the die- head in accordance with the diameter as denoted follows:

- Fast speed for diameters : 3/8", 7/16", 1/2", 9/16" , 5/8" , ¾" and 7/8".
- Slow speed for diameters: 1", 1.1/8", 1.1/4", 1.3/8" and 1 ½".

Once cutting has started, it is unnecessary to apply pressure to the traversing handwheel as the cutting action will draw the carriage along. When the desired length has been threaded the die-head lever should be moved to the left, thus opening the head, and the carriage hand traversed away until work-piece is clear of the die-head. On completion open the die-head and traverse the carriage away as before.

The work-piece should now be gauged for correct size. Any adjustments necessary, either to increase or decrease diameter to suit limits required can be made whilst the machine is still running by means of the box-nut spanner.

OPEN THE DIE-HEAD AUTOMATICALLY

Where large quantities are required, it is convenient to arrange for the die head to be opened automatically at the completion of the threading. This is done by setting the front stop shown on page no.12, so that when the desired length has been threaded, it makes contact with the bracket on the front of the carriage, causing the trip rod to push over the die-head lever and thus open the die-head. The rear stock can also be set so that backward movement of the carriage closes the die-head. The setting of the automatic operating stops, does not interfere in any way, with the hand opening and closing of the die-head.

LEAD SCREW MODELS

When the machine is to be used on coarse pitch threads, special form threads, or threads which must have accurate lead and perfect start, a lead screw is fitted to the carriage. Change gears to cover the range of pitches of threads required are supplied with the machine. When in use they are housed in a compartment at the end of the bed. When setting up for a particular pitch care must be taken that the correct gears are used in the sequence as denoted on the gears for required pitch. When assembling the train ensure that the intermediate gear is securely locked. On Lead Screw Models operating is exactly as described under the heading 'OPERATION' except that the carriage

is traversed by hand until the work-piece is about ½" to 1" from the die-head and lead screw nut is then engaged. As in the case of Non-Lead Screw Models the die-head can be set to open automatically by setting the stop or can be operated by hand. When set to work automatically the lead screw nut is tripped open simultaneously with the opening of the die-head. If operating a lead screw model by hand, always open the die-head before tripping open the lead screw nut and it is preferable, and easy, if both operations are done together.

TAPER THREAD MECHANISM

This mechanism is supplied only to the customer's order and enables taper threads for perfect pitch and form to be proceed. One set of chaser holder producing taper thread of 1" in 16 on diameter for pipe thread are provided as per requirement.

MAINTENANCE

LUBRICATION

Take care that all oil levels are maintained but do not overfill the oiling points. It is recommended that headstock oil be changed twice per year.

Lubrication is done manually through an oil cup. There were points mentioned about the frequent use of an oil can. The die-head has a plug with the word 'oil' stamped on it. This should be removed occasionally and the hole filled with oil. The oil pockets on the vice carriage should be filled with oil periodically to maintain oil flow to the slides.

Recommended Lubricant

- KwikKut 33
- ISO Viscosity Grade: ISO 46

Only approved or equivalent lubricants of the correct viscosity should be used.

DIE-HEAD

The die-head is the most important part of the machine and if accurate threads are to be produced, all moving parts must be kept clean and free from swarf.

CHASER HOLDERS

The chaser dovetail and its seating in the holder, together with clamp seating, must be kept clean and free from foreign matter. If dirt is allowed to collect on the chaser holders, the chasers are distorted due to incorrect clamping, and inaccurate threading results.

CHASERS

Grinding is a simple operation, one angle only being involved. The chasers should be ground on the rake or cutting angle only, and never on the lead, see Fig. 2. It is NOT necessary to remove the same amount from each chaser but the cutting angle must be the same on all four.

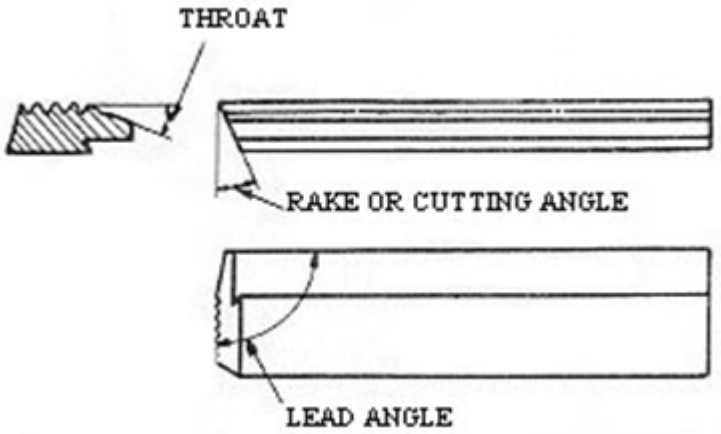


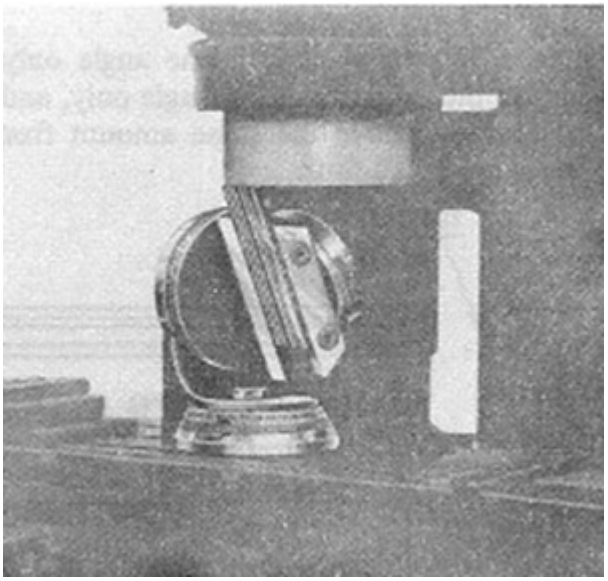
Fig. 2 The rake or cutting angle will vary with the machinability of the material and should be determined by experiment using the following table as a guide

MATERIAL	RAKE ANGLE	MATERIAL	RAKE ANGLE
Cast Brass	5' Negative	Steel	25" Positive
Drawn Brass	10' to 22' Positive	Stainless Steel Tubes	25' Positive
Cast Iron	15' Positive	Nickel Steel	25' Positive
Wrought Iron	18' Positive	Nickel Steel Heat Tested	18 to 22' Positive
Malleable Iron	18' Positive	Memel Metal	28' Positive
Cast Aluminium	10' Positive	Manganese Bronze	8 to 10' Positive
Drawn Aluminium	28' to 33' Positive	Copper	28' Positive

Bronze	10' Positive	Bakelite	Zero

In addition to grinding the rake or cutting angle it is essential to grind the Lead Angle, so that the chaser is presented to the work-piece normal to the helix angle of the thread being screwed. All chaser holders are not only stamped with their particular capacity but also bear the angle to which they are manufactured. The chasers should be ground to conform to this Lead angle but ONLY on extra wide taper chasers.

All chasers, unless otherwise specified, are supplied with a 25' cutting angle, and long throat. The chasers should be ground on a dry wheel grinder, and should not be dipped in water for cooling. This practice may develop water cracks which will cause the edges to chip.



Chaser grinding fixture Fig. 6

It is essential that the cutting angle be correctly and uniformly ground on each chaser.
We manufacture a chaser grinding fixture which is illustrated in Fig. 6 with a chaser shown set up for grinding. Full details of this Chaser Grinding Fixture will be supplied on application. The types of grinding wheels recommended are Norton 384618B or 3846J8B, or their equivalent.

Short throat chasers should be only used when absolutely necessary. Very often it is possible for designs of the work-piece to be slightly altered, to enable long throat chasers to be used, and it is recommended that this be done in all possible cases.

When required for threading left hand, the chasers should be ground at the opposite end to that used for right hand threading. There is no reason why sets of chasers should not be ground at both ends, so that they are ready for either hand as required.

THREADING GALVANISED REBAR – LIMITATIONS AND REQUIREMENTS

This machine is primarily designed for threading standard round pipe and bar. Threading galvanised rebar introduces additional stresses that can result in premature wear or breakage of tangential chasers if not managed correctly.

APPLICATION LIMITATIONS

- Rebar is not precision round stock and contains ribs and irregularities.
- Galvanised coatings introduce an abrasive surface layer.
- This combination creates intermittent cutting loads and increased resistance during threading.

RESULT: Increased likelihood of chaser chipping, cracking, or complete failure.

MANDATORY PREPARATION

Before attempting to thread galvanised rebar:

- Remove Galvanising at Thread Start
- Grind back the zinc coating in the area where the thread will begin.
- Chamfer the Workpiece
- Apply a clean, even chamfer to reduce initial impact on the cutting edges.
- Inspect Material
- Ensure the section being threaded is as straight and consistent as possible.

OPERATING REQUIREMENTS

- Reduce Cutting Speed
- Operate at a lower RPM than standard pipe threading.
- Apply Generous Cutting Oil
- Use a high-quality thread cutting oil continuously throughout the operation.
- Apply Controlled Feed Pressure
- Do not force the cut. Allow the chasers to cut progressively.

- Ensure Rigid Clamping
- Secure the workpiece firmly to prevent movement or vibration.

TOOLING CONSIDERATIONS

- Expect reduced chaser life when threading galvanised rebar.
- Inspect chasers regularly for signs of wear or damage.
- Replace chasers at the first sign of chipping to avoid further damage.

WARNING

Threading galvanised rebar is outside typical operating conditions for pipe threading machines.

Incorrect setup or operation may result in:

- Repeated chaser failure
- Damage to the die head
- Poor thread quality

RECOMMENDATION

For regular or production-level threading of rebar, use equipment specifically designed for this application (e.g. rebar threading or roll threading machines).

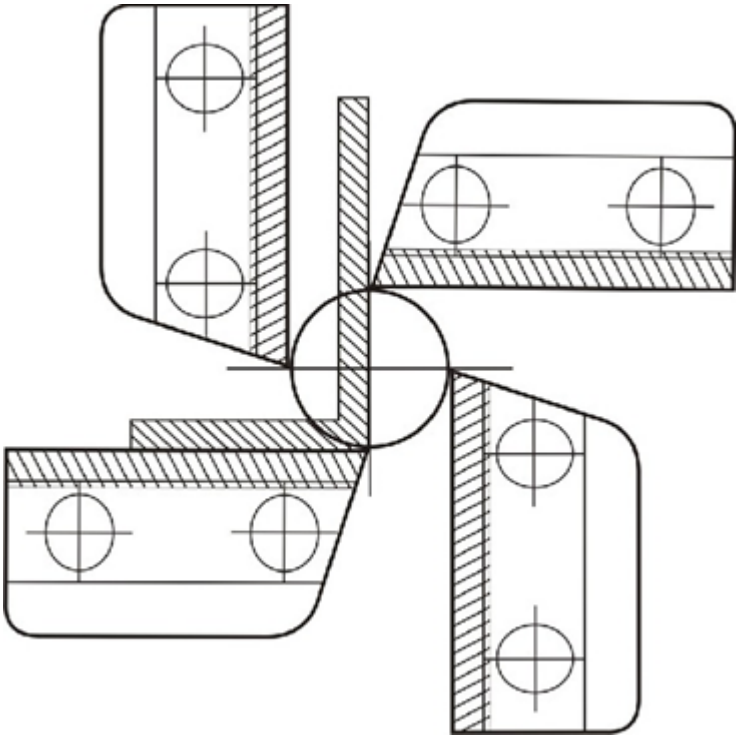
Note: Failure to follow the above procedures will significantly increase the risk of tooling damage and reduced performance.

SETTING THE CHASERS

Many of the troubles experienced in threading are a direct result of bad setting. It is therefore advisable to check the gauge settings periodically to ensure accuracy. A simple method of doing this uses a small set-square which can be made in any workshop and it is recommended that every operator equips himself with one square of approximately the following sizes:

5" high x 2" base x 1/4" wide

This thin square should be used for checking as follows. Insert the square along the first full thread of any one chaser so that its front edge is in line with the cutting edge of that chaser. When in that position the cutting edge of the chaser diametrically opposite should be just touching the blade of the square as shown in Fig. 7.



Method of checking chaser setting Fig. 7

Setting the Chasers

Before fitting them, ensure the chaser holders are clean, paying particular attention to the die pockets where the chasers sit.

The clamp plate should be slackened sufficiently to enable the chaser to be slipped into position and it should be noted the matched set of chasers are numbered, they must be fitted in ascending order by clockwise rotation. Care should be exercised to ensure the clamp plates are tightened squarely ensuring the chasers are snug in the pockets. At this stage the clamp plates should only be lightly tightened to enable adjustment to be carried out.

The position of the chaser in the holder is adjusted by the grub screw which abuts the rear end, and when rotated moves the chaser forward into the correct position. To ascertain the position a setting gauge is used, this hooks over the front end of the chaser allowing the adjustment to be carried out until the line on the size mark on the gauge lines up with the zero line on the holder, see sketch below:

For most materials the best cutting position is 'ON CENTER', but some adjustment may be needed and the operator will soon gain experience on positioning. General guidelines are as follows:

If the chasers are too far forward they will form the thread by pushing instead of cutting, thus generating heat and causing premature were, if they are too far back they will dig into the material and cause chatter.

It cannot be emphasised too strongly that most problems encountered on a threading machine emanate from incorrect setting of the chasers, and if best results are to be obtained it is essential that care should be taken at this stage.

Correct seating of chasers in their holders

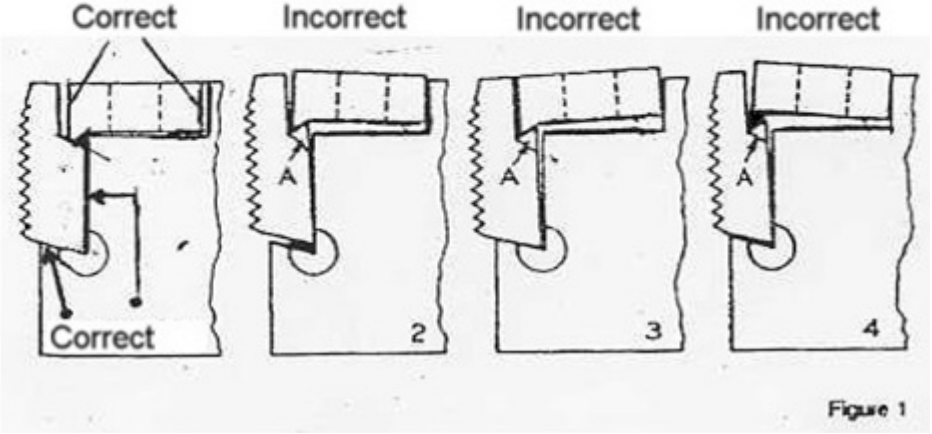


Figure 1

Obtaining satisfactory results with any kind of gauge or rule first requires that the chasers to be be seated firmly and properly in their chaser holders as shown in fig. 1. Any condition that interferes with proper seating must be corrected. Therefore the chasers, chaser holders and the chaser clamps must be free of dirt, cuttings, nicks or bruises.

On Lead Screw Models, adjustment for the Lead screw nut engagement is provided by means of which backlash can be eliminated after the machine has had a long period of use see Fig. 11. The nut lever is pivoted on an eccentric pin which has a pinion head, and by means of this the two half nuts which engage the leadscrew can be slightly closed to take up wear. To affect the adjustment remove the adjustment cap, thus exposing the pinion and the square end of the pin. Lift the pinion from the engaging rack and slightly turn in either direction until resistance is felt. Drop pinion back into engagement again and replace cap. To test whether the adjustment has been carried out correctly, disengage the gear train in the change gear box at the end of the bed, and rotate the lead screw by hand. It should be possible to do this without undue effort, and no play should be felt.

If the threading doesn't come properly then look for the following points

- ➢ Chaser must be checked as per pitch thread required, lead screws gear setting, should be checked as per pitch required before threading.
- ➢ Phosphor Bronze nut. Should not be greased.

