

SMG 12 – 60PF Power Feed Bar Threading & Peeling / Stripping Machine

Operations Manual

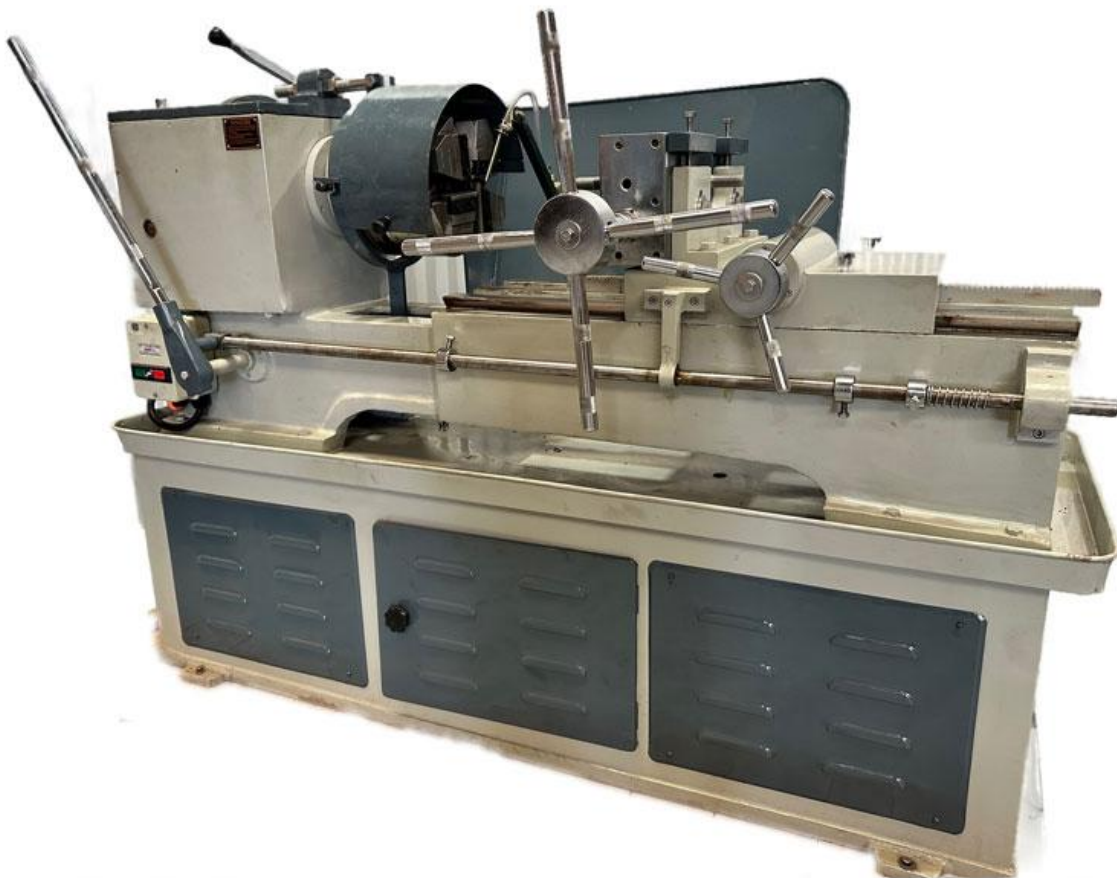


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SETTING UP

Fit the correct chaser holders into the die head for the workpiece to be threaded.

Proceed as follows:

1. Check the size marked on each chaser holder to confirm it matches the required thread size.
2. Using the supplied box-nut spanner, remove the screw studs.
3. Carefully withdraw the chaser holders from the die head. Take care not to damage the guide slot at the rear of each holder.
If the case-hardened guide block comes away with the holder, carefully remove it and refit it onto the guide block stud.
4. Select the correct set of chaser holders, ensuring:
 - The holders cover the diameter to be threaded, and
 - All holders are of the same capacity and thread type.
5. Insert chaser holder No. 1 into the die head, engaging the shank with the guide block. Take care not to damage the slot during installation.
6. Refit the screw stud using the supplied box-nut spanner and securely clamp the holder in position.
7. Install the remaining chaser holders in ascending numerical order, working clockwise for right-hand threads.

DIE HEAD SIZE SETTING

The die head is graduated for all standard sizes within its operating capacity.

To set the die head to the required size, proceed as follows:

1. Loosen the six socket head cap screws.
2. Insert the supplied box-nut spanner into the socket head provided on the worm plate.
3. Rotate the worm plate until the depth indicator aligns with the required diameter, in accordance with the specified thread gauge setting.

CHASER SETTING

For right-hand threading, chasers must be installed in ascending numerical order. For ease of identification, each holder is marked with a number, and the chaser stamped with the corresponding number must be fitted to that holder.

Before installation, ensure all chasers are clean and free from packing oil.

It is not necessary to remove the chaser clamp except for cleaning purposes. Loosen the clamp screws just enough to allow the chaser to slide into position.

A setting gauge is supplied to position the chasers correctly for cutting. Apply the gauge as shown in Fig. 1.

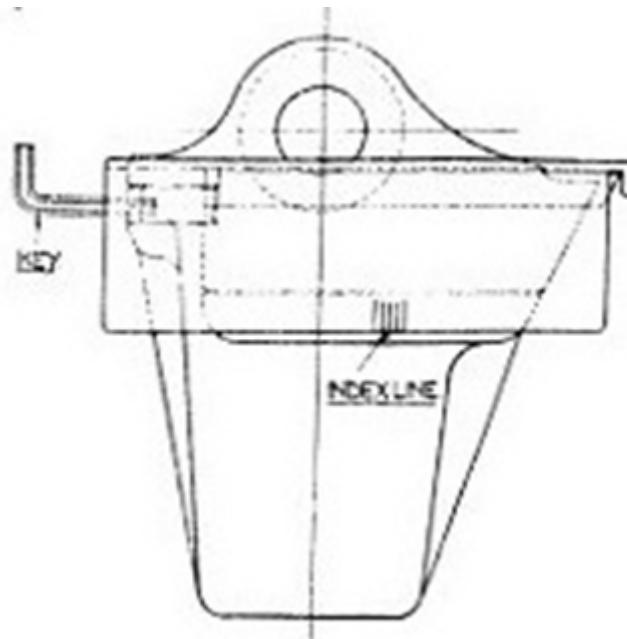


Fig.1

Adjust the chasers using a hex key until the line on the setting gauge for the required size aligns with the zero line on the chaser holder. This type of gauge allows the chasers to be set easily and accurately, and also permits minor adjustment of the cutting position. Chasers of different lengths may be used within the same set.

When clamping the chasers in the set position, always tighten the screws closest to the cutting edge first, followed by the rear screws.

To achieve satisfactory results, it is essential that the chasers are correctly seated in the holders and that all cutting edges are set uniformly. For most materials, the optimum cutting position is on the centre.

If the chasers are positioned too far forward, the thread will be formed by pushing rather than cutting. This generates excessive heat, accelerates wear, and may result in a tapered thread. If the chasers are positioned behind the centre, they will dig into the material, increasing the likelihood of chipped cutting edges and producing an out-of-round thread.

It cannot be overemphasised that most issues encountered during threading operations are caused by incorrect chaser setting. To obtain the best results, extreme care must be taken when carrying out this procedure.

SPEEDS

Two operating speeds are provided via sliding gears manufactured from EN9 material. The selector lever position required for each speed is indicated on the plate fitted to the headstock cover.

When changing gears, always press the Stop button first to slow the drive motor before engaging a different speed.

For mild steel, a cutting speed of approximately 16 feet per minute is recommended to achieve good results. Higher speeds may be used; however, this will reduce surface finish quality and shorten chaser life.

For most materials, the optimum cutting speed is best determined through experience under actual operating conditions. Cutting speed should be selected in relation to both the thread pitch and the workpiece diameter.

Note:

If variable speeds are required, an AC drive can be supplied, providing up to **40 selectable speed settings**.

THREADING

1. Machine Readiness

- Confirm the machine is a **non-lead screw model**.

(For lead screw models, refer to the relevant setup section of this manual.)

- Ensure the correct chasers are fitted, set, and securely clamped.
- Verify the die head size and cutting speed are correctly set.

2. Secure the Workpiece

- Insert the workpiece into the vice.
- Clamp securely using the hammer-action clamp.
- Ensure the workpiece is square and firmly held to prevent movement during cutting.

3. Set Die Head Speed

Select the die head speed based on the workpiece diameter:

Fast Speed:

3/8", 7/16", 1/2", 9/16", 5/8", 3/4" and 7/8"

Slow Speed:

1", 1 1/8", 1 1/4", 1 3/8" and 1 1/2"

4. Close the Die Head

- Move the die head operating lever to the right to close the die head (refer to page 12 if applicable).

5. Commence Threading

- Start the machine.
- Allow the die head to engage the workpiece.
- **Do not apply pressure** to the carriage handwheel — the cutting action will automatically draw the carriage forward.

6. Cut to Required Thread Length

- Monitor the threading operation.
- Most standard threads can be completed in a single pass, depending on the finish required.

7. Open Die Head and Retract

- Once the required thread length is reached, move the die head lever to the left to open the die head.
- Manually traverse the carriage away until the workpiece is clear of the die head.

8. Inspect the Thread

- Stop the machine if required.
- Check the thread using the appropriate gauge to confirm correct size and quality.

9. Make Fine Adjustments (if required)

- If the thread diameter requires adjustment (increase or decrease within tolerance), this can be carried out while the machine is running using the supplied box-nut spanner.
- Repeat the threading operation as necessary.

10. Completion

- Open the die head.
- Traverse the carriage fully away from the workpiece.
- Remove the finished workpiece from the vice.

AUTOMATIC DIE HEAD OPENING

For high-volume production, the die head can be set to open automatically at the completion of the threading operation.

This is achieved by adjusting the front stop (refer to page 12). When the required thread length has been reached, the front stop contacts the bracket at the front of the carriage. This action causes the trip rod to actuate the die head lever, automatically opening the die head.

The rear stop may also be set so that reverse movement of the carriage automatically closes the die head.

Adjustment of the automatic operating stops does not interfere with manual opening or closing of the die head, and hand operation remains available at all times.

LEAD SCREW MODELS

1. Machine Readiness

- Confirm the machine is a lead screw model.
- Ensure the die head and chasers are correctly set and clamped.
- Check that the work area is clear and all guards are in place.

2. Select and Fit Change Gears

- Identify the required thread pitch.
- Select the correct change gears as indicated on the gear markings for the desired pitch.
- Assemble the gears in the correct sequence.
- Ensure the intermediate gear is securely locked in place.
- Store any unused gears in the end-of-bed compartment.

3. Secure the Workpiece

- Insert the workpiece into the vice.
- Clamp securely using the hammer-action clamp.
- Ensure the workpiece is square and firmly held.

4. Set Die Head Speed

- Choose the die head speed according to the workpiece diameter:

Fast Speed: 3/8", 7/16", 1/2", 9/16", 5/8", 3/4" and 7/8"

Slow Speed: 1", 1 1/8", 1 1/4", 1 3/8" and 1 1/2"

5. Close the Die Head

- Move the die head lever to the right to close the die head.

6. Start Threading

1. Manual Carriage Feed:

- Traverse the carriage by hand until the workpiece is approximately 1/2" to 1" from the die head.

2. Engage Lead Screw Nut:

- Engage the lead screw nut to commence automatic carriage feed.

3. Automatic or Manual Die Head Operation:

- If using automatic operation, the die head will open at the end of the cut.
- If operating manually, always open the die head before disengaging the lead screw nut.

7. Complete Threading

- When the required thread length is reached, the die head lever will open the die head (automatically or manually).
- The lead screw nut disengages simultaneously if automatic operation is enabled.
- Manually traverse the carriage away from the workpiece until clear.

8. Inspect and Adjust

- Check the workpiece with the appropriate gauge to ensure the thread is correct.
- Adjust the cutting position or chaser settings if the thread diameter is outside tolerance.
- Repeat the threading process as required.

9. Finish and Remove Workpiece

- Open the die head fully.
- Traverse the carriage completely away from the workpiece.
- Remove the finished workpiece from the vice.
- Clean the die head, carriage, and work area after completion.

TAPER THREAD MECHANISM

The taper thread mechanism is supplied only on customer request. It allows taper threads to be cut with accurate pitch and form.

One set of chaser holders, capable of producing a 1:16 taper on pipe threads, is provided as required.

MAINTENANCE

LUBRICATION

- Ensure all oil levels are regularly maintained, but do not overfill any oiling points.
- It is recommended to change the headstock oil twice per year.
- Lubrication is performed manually via oil cups and oiling points. Frequent use of an oil can is advised.

- The die head has a plug marked 'OIL'. Remove this plug periodically and fill the hole with oil.
- Oil pockets on the vice carriage should also be filled regularly to maintain proper lubrication to the slides.

DIE HEAD

- The die head is the most critical component of the machine.
- To ensure accurate threads, all moving parts must be kept clean and free from swarf.

CHASER HOLDERS

- Keep the chaser dovetail, its seating in the holder, and the clamp seating clean and free of debris.
- Accumulated dirt on the chaser holders can cause distortion during clamping, resulting in inaccurate threads.

CHASERS

- Chasers should be ground only on the rake or cutting angle; 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 consistent across all chasers.

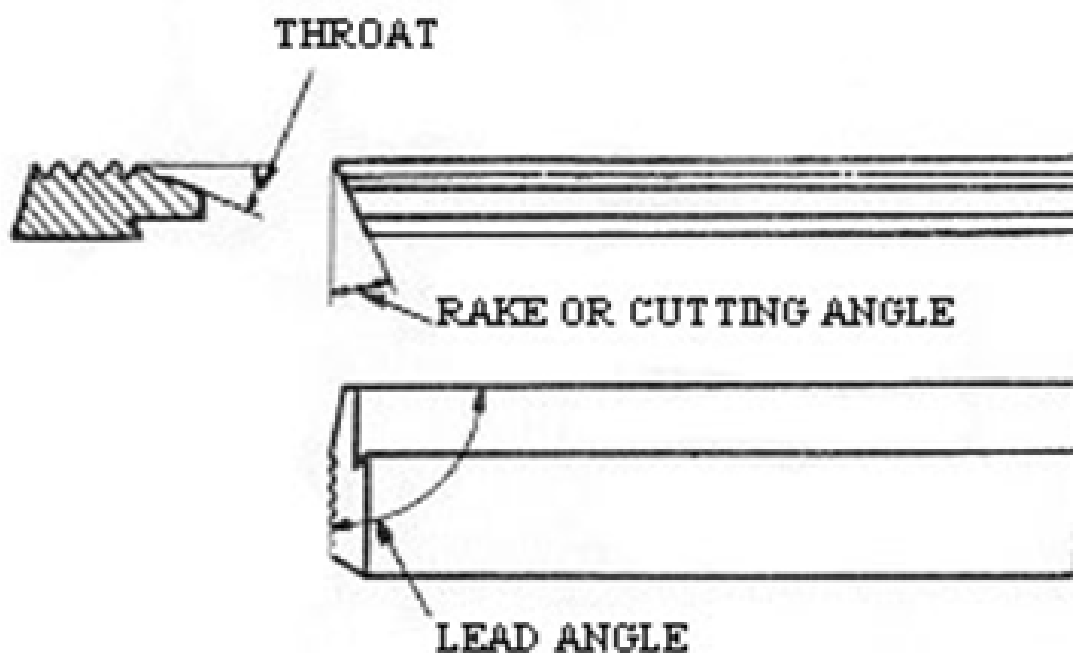


Fig. 2 The rake (cutting) angle of the chaser will vary depending on the machinability of the material being threaded. The optimal angle should be determined through practical experimentation. Use the following table as a guideline for initial settings.

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

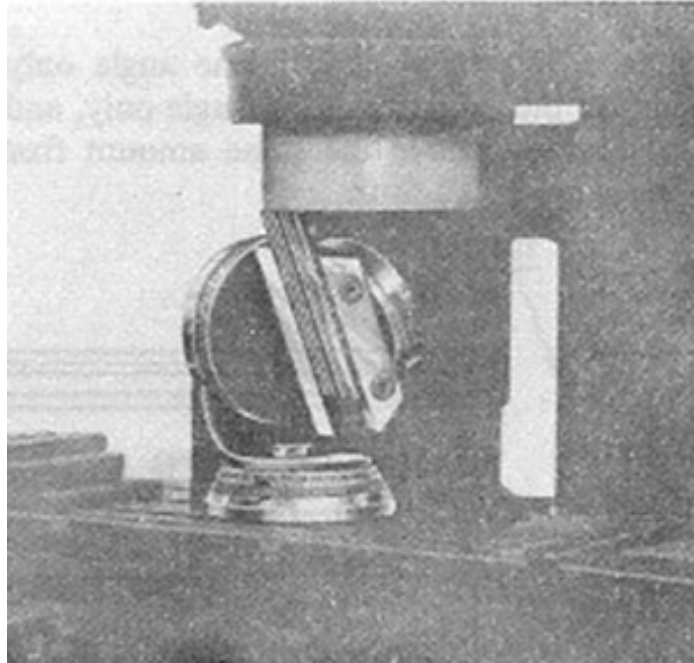
CHASER GRINDING - LEAD ANGLE

In addition to grinding the rake (cutting) angle, it is essential to grind the lead angle so that the chaser engages the workpiece normal to the helix angle of the thread being cut.

- All chaser holders are stamped with their capacity and the lead angle for which they are manufactured.
- Chasers should be ground to match this lead angle, but only for extra-wide taper chasers.

Unless otherwise specified, all chasers are supplied with a **25° cutting angle** and a **long throat**.

- Chasers should be ground on a dry wheel grinder.
- **Do not dip chasers in water** during grinding, as this can cause water cracks, leading to chipping of the cutting edges.



Chaser grinding fixture Fig. 6

CHASER GRINDING - CUTTING ANGLE

It is essential that the cutting angle is ground correctly and uniformly on each chaser.

- We supply a chaser grinding fixture, illustrated in Fig. 6, showing a chaser set up for grinding. Full specifications and instructions for this fixture are available upon request.
- Recommended grinding wheels are Norton 384618B, 3846J8B, or their equivalents.

Throat Length Considerations:

- Short-throat chasers should be used only when absolutely necessary.
- In many cases, small adjustments to the workpiece design can allow the use of long-throat chasers, which is recommended wherever possible.

Left-Hand Threading:

- For left-hand threads, chasers should be ground at the opposite end to that used for right-hand threads.
- There is no restriction on grinding sets at both ends, allowing them to be ready for either right- or left-hand threading as required.

SETTING THE CHASERS

Many threading problems are caused by incorrect chaser settings. It is therefore recommended to check gauge settings periodically to ensure accuracy.

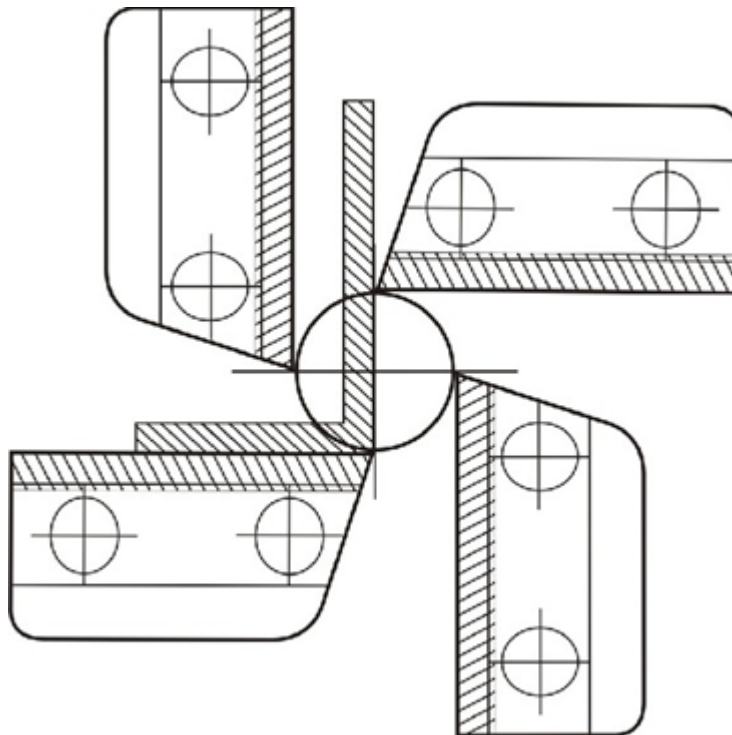
A simple method uses a small set-square, which can be fabricated in any workshop. It is recommended that each operator has a square of approximately the following dimensions:

- Height: 5"
- Base: 2"
- Width: 1/4"

Checking Procedure:

1. Insert the square along the first full thread of any one chaser so that the front edge aligns with the cutting edge of that chaser.
2. In this position, the cutting edge of the chaser diametrically opposite should just touch the blade of the square, as illustrated in Fig. 7.

This method ensures that the chasers are correctly positioned for accurate and uniform threading.



Method of checking chaser setting Fig. 7

SETTING THE CHASERS

1. Prepare the Holders

- Ensure the chaser holders are clean, paying particular attention to the die pockets where the chasers sit.
- Loosen the clamp plates sufficiently to allow the chasers to slide into position.

2. Install Chasers

- Chasers are numbered and must be fitted in ascending order, rotating clockwise.
- Lightly tighten the clamp plates at this stage, ensuring the chasers sit snugly in the pockets, but remain adjustable.

3. Adjust Chaser Position

- Each chaser is adjusted using the grub screw at the rear, which moves the chaser forward into position.
- Use a setting gauge hooked over the front end of the chaser. Adjust until the line on the size mark on the gauge aligns with the zero line on the holder (see sketch below).

4. Optimal Cutting Position

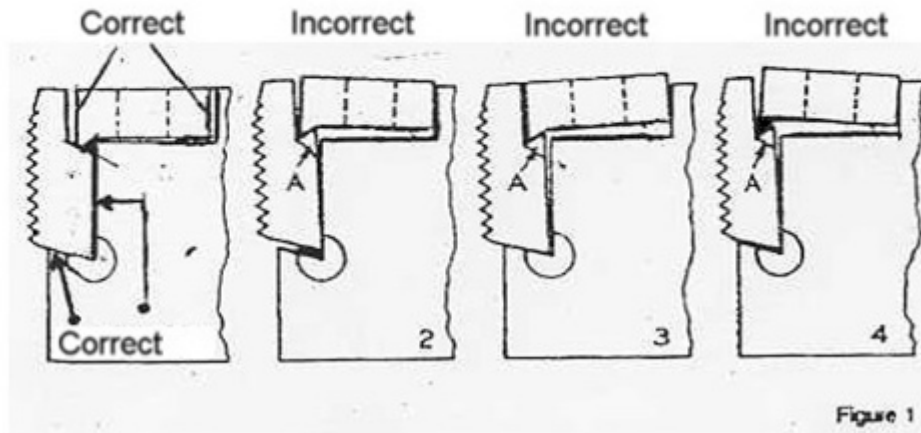
- For most materials, the best cutting position is on centre.
- Some adjustment may be needed depending on the material and thread pitch; operator experience will guide fine-tuning.

Guidelines:

- If chasers are too far forward, the thread will be formed by pushing rather than cutting, generating heat and causing premature wear.
- If chasers are too far back, they will dig into the material, causing chatter and potential damage.

Note: Most threading issues arise from incorrect chaser setting. Careful attention during this stage is essential to achieve accurate and consistent threads.

Correct seating of chasers in their holders



SEATING THE CHASERS AND LEAD SCREW NUT ADJUSTMENT

1. Proper Seating of Chasers

- To achieve accurate threading with any gauge or rule, chasers must be firmly and correctly seated in their holders (see Fig. 1).
- Any condition that prevents proper seating must be corrected.
- Ensure that chasers, chaser holders, and chaser clamps are free from dirt, cuttings, nicks, or damage.

2. Lead Screw Nut Adjustment (Lead Screw Models)

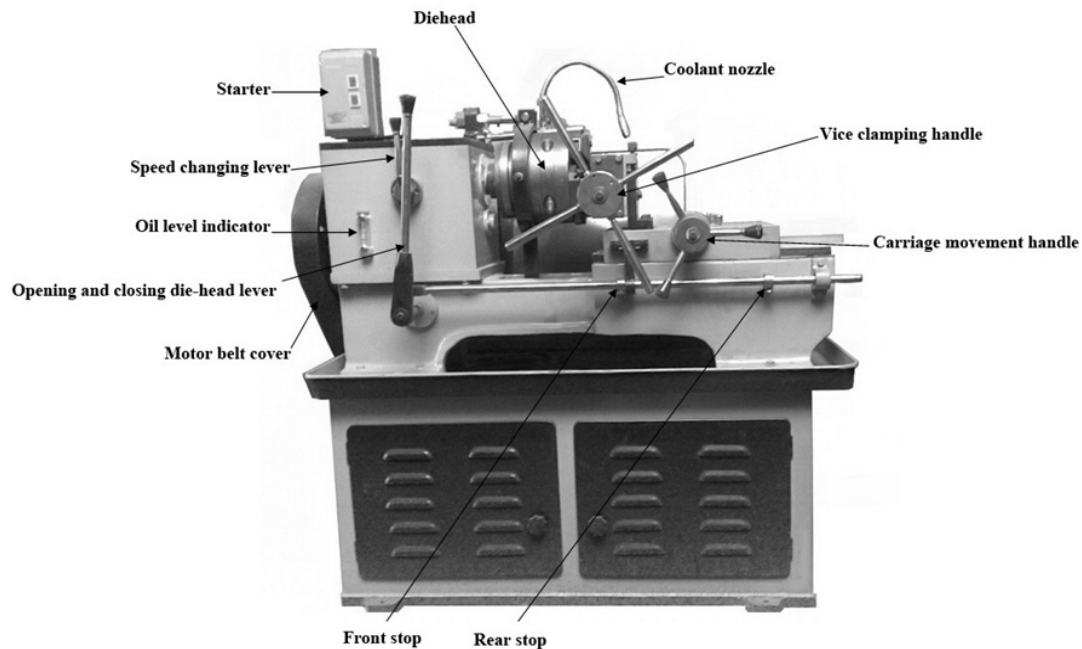
- On lead screw models, the lead screw nut engagement can be adjusted to eliminate backlash after prolonged use (see Fig. 11).
- The nut lever is pivoted on an eccentric pin with a pinion head, allowing the two half-nuts that engage the lead screw to be slightly closed to compensate for wear.

Adjustment Procedure:

1. Remove the adjustment cap to expose the pinion and the square end of the pin.
2. Lift the pinion from the engaging rack.
3. Turn the pin slightly in either direction until resistance is felt.
4. Drop the pinion back into engagement and replace the adjustment cap.

Testing the Adjustment:

- Disengage the gear train in the change gear box at the end of the bed.
- Rotate the lead screw by hand.
- The lead screw should turn smoothly without undue effort, and no play should be felt.



TROUBLESHOOTING THREADING ISSUES

If threads are not forming correctly, check the following:

1. Chasers
 - Ensure chasers are correctly set according to the required thread pitch.
2. Lead Screw Gear Settings (for Lead Screw Models)
 - Verify that the change gears are correctly installed for the required thread pitch before starting threading.
3. Phosphor Bronze Nut
 - Do not grease the phosphor bronze nut, as this can affect lead screw engagement and threading accuracy.

3-Phase Motor Starter Dual Diagram

