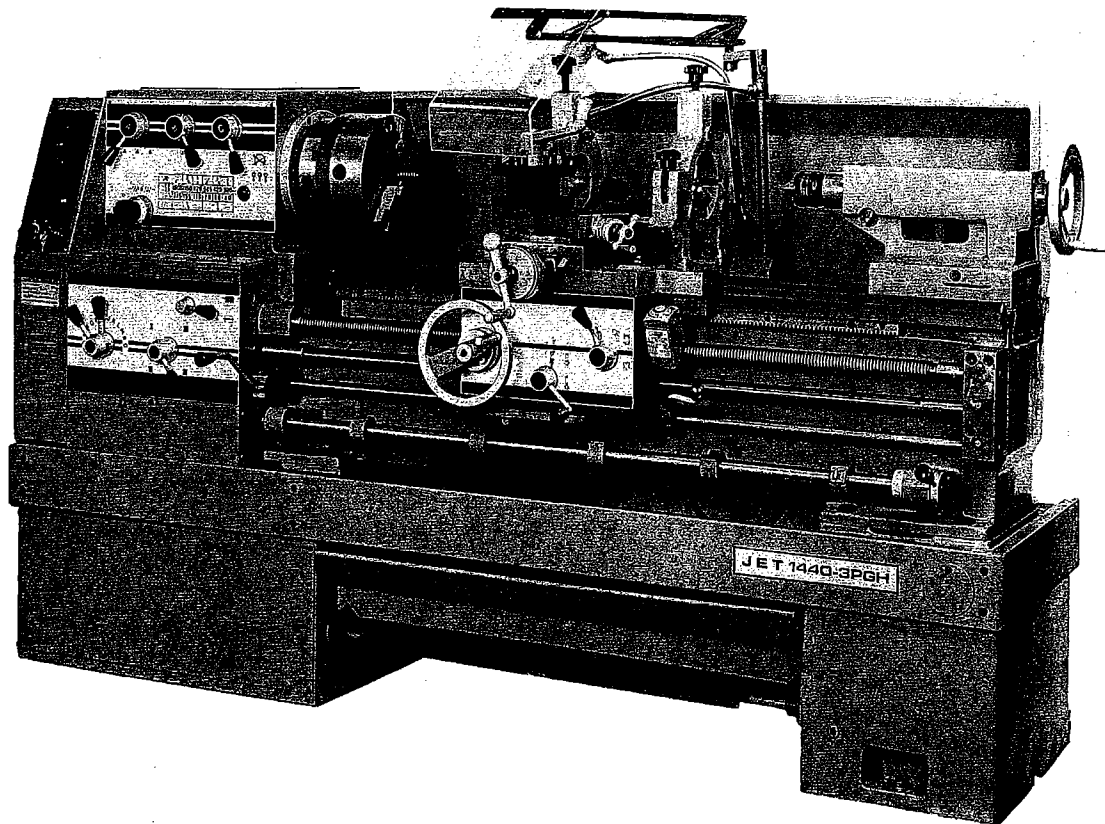


JET

EQUIPMENT & TOOLS

OPERATOR'S MANUAL

3PGH Series Lathes



JET EQUIPMENT & TOOLS, INC.
A WMH - Walter Meier Holding Company

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No. M-321323-1 9/94

Important Information

**1 YEAR
LIMITED WARRANTY**

JET offers a one year limited warranty on this product

REPLACEMENT PARTS

Replacement parts for this tool are available directly from JET Equipment & Tools. To place an order call **1-800-274-6844**. Please have the following information ready:

1. Visa, MasterCard or Discover Card number
2. Expiration date
3. Part number listed within this manual
4. Shipping address other than a Post Office box

REPLACEMENT PARTS WARRANTY

JET Equipment & Tools makes every effort to assure that parts meet high quality and durability standards and warrants to the original retail consumer/purchaser of our parts that each such part(s) be free from defects in materials and workmanship for a period of thirty (30) days from the date of purchase.

PROOF OF PURCHASE

Please retain your dated sales receipt as proof of purchase to validate the warranty period.

LIMITED TOOL AND EQUIPMENT WARRANTY

JET makes every effort to assure that its products meet high quality and durability standards and warrants to the original retail consumer/purchaser of our products that each product be free from defects in materials and workmanship as follows: **1 YEAR LIMITED WARRANTY ON THIS PRODUCT**. Warranty does not apply to defects due directly or indirectly to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities or to a lack of maintenance. **JET LIMITS ALL IMPLIED WARRANTIES TO THE PERIOD SPECIFIED ABOVE FROM THE DATE THE PRODUCT WAS PURCHASED AT RETAIL. EXCEPT AS STATED HEREIN, ANY IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS ARE EXCLUDED. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG THE IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. JET SHALL IN NO EVENT BE LIABLE FOR DEATH, INJURIES TO PERSONS OR PROPERTY OR FOR INCIDENTAL, CONTINGENT, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING FROM THE USE OF OUR PRODUCTS. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.** To take advantage of this warranty, the product or part must be returned for examination, postage prepaid, to an authorized service station designated by our Auburn office. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection discloses a defect, JET will either repair or replace the product or refund the purchase price, if we cannot readily and quickly provide a repair or replacement, if you are willing to accept such refund. JET will return repaired product or replacement at JET's expense, but if it is determined there is no defect, or that the defect resulted from causes not within the scope of JET's warranty, then the user must bear the cost of storing and returning the product. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

 **WARNING**

1. Read and understand the entire instruction manual before operating machine.
2. Always wear approved safety glasses/face shields while using this machine.
3. Make certain the machine is properly grounded.
4. Before operating the machine, remove tie, rings, watches, other jewelry, and roll up sleeves above the elbows. Remove all loose clothing and confine long hair. Do **not** wear gloves.
5. Keep the floor around the machine clean and free of scrap material, oil and grease.
6. Keep machine guards in place at all times when the machine is in use. If removed for maintenance purposes, use extreme caution and replace the guards immediately.
7. Do **not** over reach. Maintain a balanced stance at all times so that you do not fall or lean against blades or other moving parts.
8. Make all machine adjustments or maintenance with the machine unplugged from the power source.
9. Use the right tool. Don't force a tool or attachment to do a job which it was not designed for.
10. Replace warning labels if they become obscured or removed.
11. Make certain the motor switch is in the OFF position before connecting the machine to the power supply.
12. Give your work undivided attention. Looking around, carrying on a conversation, and "horse-play" are careless acts that can result in serious injury.
13. Keep visitors a safe distance from the work area.
14. Use recommended accessories; improper accessories may be hazardous.
15. Make a habit of checking to see that keys and adjusting wrenches are removed before turning on the machine.
16. Never attempt any operation or adjustment if the procedure is not understood.
17. Keep fingers away from revolving parts and cutting tools while in operation.
18. Keep belt guard in place and in working order.
19. Never force the cutting action.
20. Do not attempt to adjust or remove tools during operation.
21. Always keep cutters sharp.
22. Always use identical replacement parts when servicing.
23. Read and understand all warnings posted on the machine.
24. This manual is intended to familiarize you with the technical aspects of this lathe. It is not, nor was it intended to be, a training manual.
25. This machine is designed and intended for use by properly trained and experienced personnel only. If you are not familiar with the proper safe use of lathes, do not use this machine until proper training and knowledge has been obtained.
26. Failure to comply with all of these warnings may cause serious injury.

Specifications:**1440-3PGH**

Stock Number	321350
Capacities:	
Swing Over Bed	14"
Swing Over Cross Slide	7-1/8"
Swing Through Gap	23-5/8"
Length of Gap	10-5/8"
Distance Between Centers	40"
Headstock:	
Hole Through Spindle	3-1/8"
Spindle Nose	D1-8
Spindle Nose Sleeve	MT-6
Spindle Bearing Type	Taper Roller and Ball Bearing
Number of Spindle Speeds	12
Range of Spindle Speeds	40-1,600 RPM
Gearbox:	
Number of Longitudinal and Cross Feeds	24
Range of Longitudinal Feeds (inch/rev.)	0.002" - 0.064"
Range of Cross Feeds (inch/rev.)	0.001" - 0.032"
Number of Inch Threads	28
Range of Inch Threads	1-7/16 - 80 T.P.I.
Number of Metric Threads	22
Range of Metric Threads	1 - 20 mm
Leadscrew	1-1/2" x 4 T.P.I.
Feed Rod Diameter	1"
Compound and Carriage:	
Toolpost Type	4-Way
Maximum Tool Size	1" x 1"
Maximum Compound Slide Travel	5-1/8"
Maximum Cross Slide Travel	8-5/8"
Maximum Carriage Travel	35"
Tailstock:	
Tailstock Spindle Travel	5"
Diameter of Tailstock Spindle	1-25/32"
Taper in Tailstock Spindle	MT-4
Miscellaneous:	
Steady Rest Capacity	1/4" - 2-5/8"
Follow Rest Capacity	1/4" - 2-3/4"
Length of Bed	54-1/4"
Width of Bed	8"
Height of Bed	11"
Overall Dimensions	71-3/4"Lx31"Wx48-5/8"H
Main Motor	7-1/2 HP, 3 Ph
.....	230/460V, prewired 230V
Net Weight (approx.)	4,070 lbs.
Shipping Weight (approx.)	4,620 lbs.

Specifications:**1660-3PGH**

Stock Number	321352
Capacities:	
Swing Over Bed	16"
Swing Over Cross Slide	8-5/8"
Swing Through Gap	25-5/8"
Length of Gap	10-5/8"
Distance Between Centers	60"
Headstock:	
Hole Through Spindle	3-1/8"
Spindle Nose	D1-8
Spindle Nose Sleeve	MT-6
Spindle Bearing Type	Taper Roller and Ball Bearing
Number of Spindle Speeds	12
Range of Spindle Speeds	40-1,600 RPM
Gearbox:	
Number of Longitudinal and Cross Feeds	24
Range of Longitudinal Feeds (inch/rev.)	0.002" - 0.064"
Range of Cross Feeds (inch/rev.)	0.001" - 0.032"
Number of Inch Threads	28
Range of Inch Threads	1-7/16 - 80 T.P.I.
Number of Metric Threads	22
Range of Metric Threads	1 - 20 mm
Leadscrew	1-1/2" x 4 T.P.I.
Feed Rod Diameter	1"
Compound and Carriage:	
Toolpost Type	4-Way
Maximum Tool Size	1" x 1"
Maximum Compound Slide Travel	5-1/8"
Maximum Cross Slide Travel	9-5/8"
Maximum Carriage Travel	55"
Tailstock:	
Tailstock Spindle Travel	5"
Diameter of Tailstock Spindle	2-3/4"
Taper in Tailstock Spindle	MT-4
Miscellaneous:	
Steady Rest Capacity	3/4" - 4-3/4"
Follow Rest Capacity	1/2" - 2"
Length of Bed	100"
Width of Bed	13-5/8"
Height of Bed	15-3/4"
Overall Dimensions	113"Lx43"Wx50"H
Main Motor	7-1/2 HP, 3 Ph
.....	230/460V, prewired 230V
Net Weight (approx.)	4,400 lbs.
Shipping Weight (approx.)	4,950 lbs.

Specifications:**1860-3PGH**

Stock Number 321323

Capacities:

Swing Over Bed 18"
 Swing Over Cross Slide 10-5/8"
 Swing Through Gap 27-5/8"
 Length of Gap 10-5/8"
 Distance Between Centers 60"

Headstock:

Hole Through Spindle 3-1/8"
 Spindle Nose D1-8
 Spindle Nose Sleeve MT-6
 Spindle Bearing Type Taper Roller and Ball Bearing
 Number of Spindle Speeds 12
 Range of Spindle Speeds 40-1,600 RPM

Gearbox:

Number of Longitudinal and Cross Feeds 24
 Range of Longitudinal Feeds (inch/rev.) 0.002" - 0.064"
 Range of Cross Feeds (inch/rev.) 0.001" - 0.032"
 Number of Inch Threads 28
 Range of Inch Threads 1-7/16 - 80 T.P.I.
 Number of Metric Threads 22
 Range of Metric Threads 1 - 20 mm
 Leadscrew 1-1/2" x 4 T.P.I.
 Feed Rod Diameter 1"

Compound and Carriage:

Toolpost Type 4-Way
 Maximum Tool Size 1" x 1"
 Maximum Compound Slide Travel 5-1/8"
 Maximum Cross Slide Travel 8-5/8"
 Maximum Carriage Travel 55"

Tailstock:

Tailstock Spindle Travel 5"
 Diameter of Tailstock Spindle 2-3/4"
 Taper in Tailstock Spindle MT-4

Miscellaneous:

Steady Rest Capacity 3/4" - 4-3/4"
 Follow Rest Capacity 1/2" - 2"
 Length of Bed 100"
 Width of Bed 13-5/8"
 Height of Bed 15-3/4"
 Overall Dimensions 93"Lx41"Wx50"H
 Main Motor 7-1/2 HP, 3 Ph
 230/460V
 Net Weight (approx.) 4,510 lbs.
 Shipping Weight (approx.) 5,060 lbs.

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 **WARNING**

Read and understand the entire contents of this manual before attempting set-up or operation!

Failure to comply may cause serious injury!

**Contents of the Shipping Container
(all models)**

- 1 Lathe
- 1 Steady Rest
- 1 Follow Rest
- 1 10" Three Jaw Chuck w/ Backplate
- 1 12" Four Jaw Chuck with Backplate
- 1 20" Face Plate
- 1 Drive Plate
- 1 Tool Box
- 2 Brake Bands
- 1 Operator's Manual
- 1 Parts Manual
- 1 Accessory Box

Tool Box Contents (all models):

- 1 No. 2 Cross Point Screwdriver
- 1 Flat Blade Driver for Plugs
- 4 Open End Wrench Set
(10-12, 11-14, 17-19, 22-24mm)
- 1 Accessory Package (fuses, shear pins, and hole
plugs)
- 4 Change Gear (1860 only)
- 3 Change Gear (1440, 1660 only)
- 1 Chuck Key w/ Handle (3-jaw chuck)
- 1 Carriage Lock Wrench
- 1 Chuck Keys (4-jaw chuck)
- 1 Hex Cap Wrench
- 1 Handle
- 1 Live Center
- 1 Center Sleeve
- 2 Dead Center
- 1 Flat Blade Driver (for plugs)
- 1 Warranty Card

Accessory Box Contents (all models):

- 6 Leveling Pads
- 1 Touch-Up Paint
- 1 Drive Plate

Uncrating and Clean-Up

1. Finish removing the wooden crate from around the lathe.
2. Unbolt the lathe from the shipping crate bottom.
3. Choose a location for the lathe that is dry, has good lighting, and has enough room to be able to service the lathe on all four sides.
4. Sling lathe as diagrammed in Fig. 1. **Do not lift by spindle.** With adequate lifting equipment, slowly raise the lathe off the shipping crate bottom. Make sure lathe is balanced before moving. Fig. 1 also shows suggested lathe anchoring system.
5. To avoid twisting the bed, the lathe's location must be absolutely flat and level. Check for a level condition using a machinist's precision level on the bedways both front to back and side to side. The leveling pads included in the tool box and the leveling screws in the lathe base will help you to reach a level condition. **The lathe must be level to be accurate.**
6. Clean all rust protected surfaces using a mild commercial solvent, kerosene or diesel fuel. Do not use paint thinner, gasoline, or lacquer thinner. These will damage painted surfaces. Cover all cleaned surfaces with a light film of 20W machine oil.
7. Remove the end gear cover. Clean all components of the end gear assembly and coat all gears with a heavy, non-slinging grease. Replace cover.

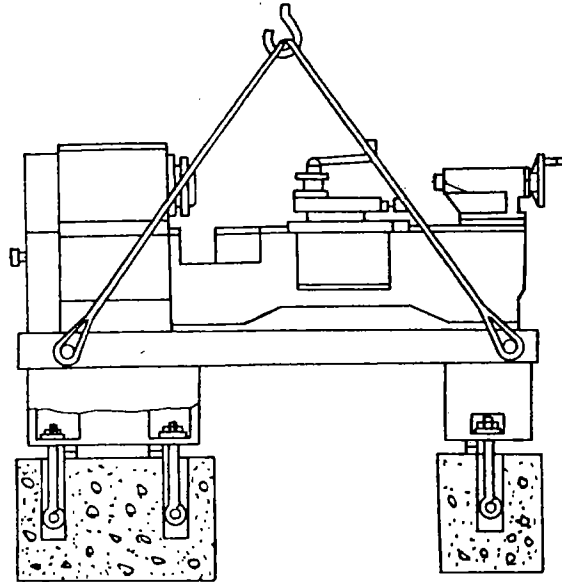


Fig. 1

Chuck Preparation (Three Jaw)

 **WARNING**

Read and understand all directions for chuck preparation!

Failure to comply may cause serious injury and/or damage to the lathe!

1. Support the chuck while turning three camlocks 1/4 turn counter-clockwise with the chuck key enclosed in the tool box.
2. Carefully remove the chuck from the spindle and place on an adequate work surface.
4. Inspect the camlock studs. Make sure they have not become cracked or broken during transit. Clean all parts thoroughly with solvent. Also clean the spindle and camlocks.
5. Cover all chuck jaws and scroll inside the chuck with #2 lithium tube grease. Cover the spindle, cam locks, and chuck body with a light film of 20W oil.
6. Lift the chuck up to the spindle nose and press onto the spindle. Tighten in place by turning the cam locks 1/4 turn clockwise.

Lubrication

⚠ CAUTION

Lathe must be serviced at all lubrication points and all reservoirs filled to operating level before the lathe is put into service!

Failure to comply may cause serious damage to the lathe!

1. **Headstock** - Oil must be up to indicator mark in oil sight glass (A, Fig. 2). **Caution:** Do not confuse oil sight glass with the oil flow indicator (B, Fig. 2) Top off with Shell Turbo T-68 or equivalent. Fill by removing headstock cover (C, Fig. 2). To drain, remove drain cap (A, Fig. 3). Drain oil completely and refill after the first three months of operation. Then, change oil in the headstock annually.
2. **Quadrant** - Open end gear cover and remove plug (B, Fig. 3). Fill hole with #2 tube grease monthly.
3. **Feed Gearbox** - Oil must be up to indicator mark in oil sight glass (D, Fig. 2) Top off with Shell Turbo T-68 or equivalent. To add oil to the gearbox, remove red plug (A, Fig. 4) under speed chart lid and add through hole. To drain, remove drain plug (C, Fig. 3). Drain oil completely and refill after the first three months of operation. Then, change oil in the gearbox annually.
4. **Apron** - Oil must be up to indicator mark in oil sight glass on right side bottom of apron. Top off with Shell Turbo T-68 or equivalent. Remove oil plug on upper left of apron to fill. To drain, remove drain plug on bottom of apron. Drain oil completely and refill after the first three months of operation. Then, change oil in the apron annually. Remove red oil plug (A, Fig. 5) on top of apron and fill with one shot of 30W oil daily.

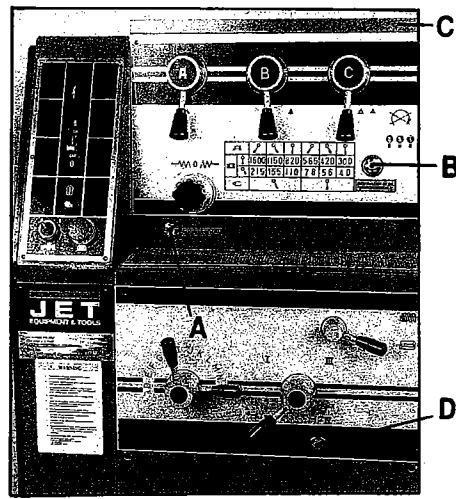


Fig. 2

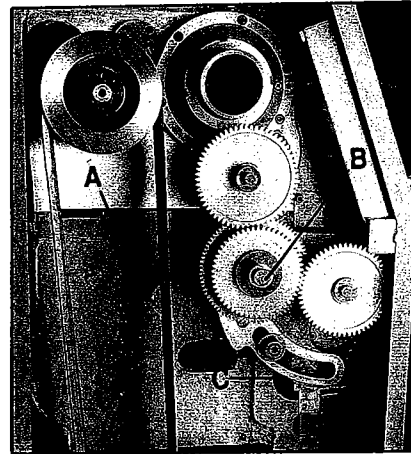


Fig. 3

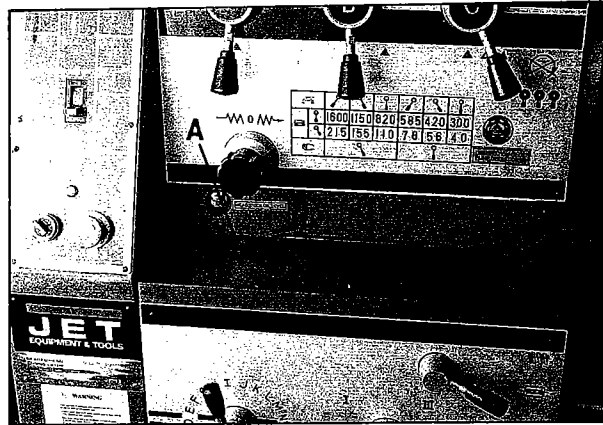


Fig. 4

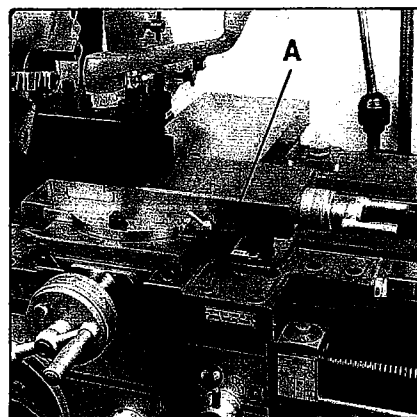


Fig. 5

5. **Leadscrew Feed Rod** - lubricate leadscrew and feed rod where they enter rod bracket (A, Fig. 6) with 30W machine oil once daily.
6. **Saddle** - Remove two caps (A, Fig. 7) and keep reservoirs full with 30W oil to lubricate ways on a daily basis. Lubricate ball oiler (B, Fig. 7) on handwheel shaft daily.
7. **Compound Rest** - lubricate one oil ball on top of handle (C, Fig. 7) with 30W machine oil once daily. Lubricate two ball oilers (D, Fig. 7) on top of compound slide with 30W machine oil once daily.
8. **Cross Slide** - lubricate three oil balls (E, Fig. 7) with 30W machine oil once daily.
9. **Carriage Stop Assembly** - lubricate two ball oilers (B, Fig. 6) at either end daily. **Note:** Figure 6 only shows one end of carriage stop assembly.
10. **Tailstock** - lubricate two oil balls (A, Fig.8) on top of tailstock with 30W machine oil once daily.

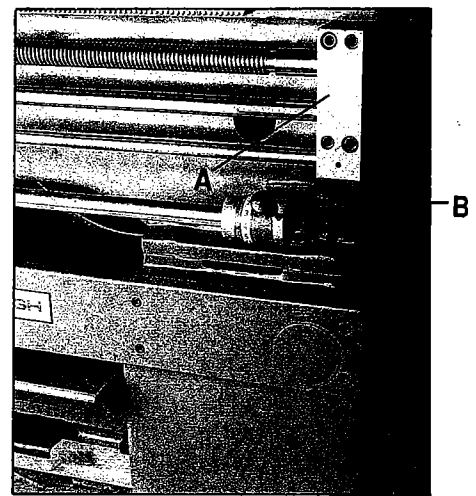


Fig. 6

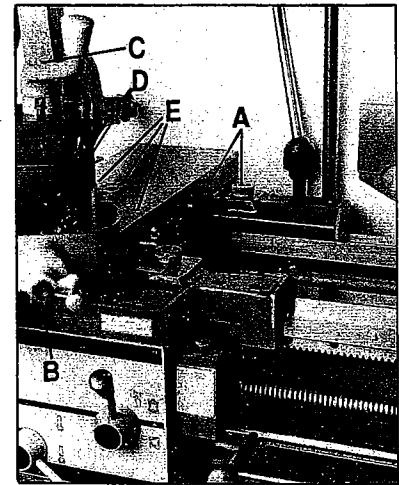


Fig. 7

Coolant Preparation

⚠ CAUTION

Follow coolant manufacturer's recommendations for use, care, and disposal.

1. Remove access cover (A, Fig. 9) on tailstock end. Make sure coolant tank and pump have not shifted during transport and are located properly under the drain in the drip pan.
2. Pour four gallons (approx.) of coolant mix into drip pan.
3. After machine has been connected to power, turn on coolant pump and check to see coolant is cycling properly.
4. Replace access cover.

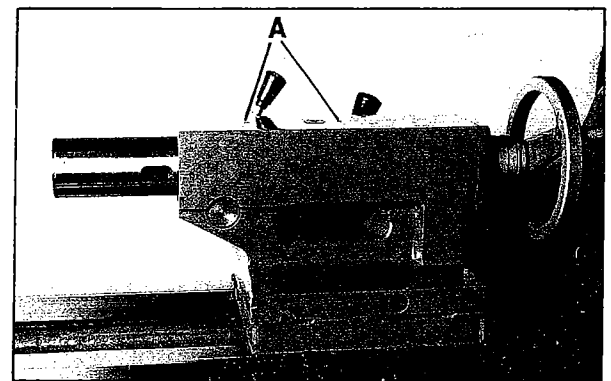


Fig. 8

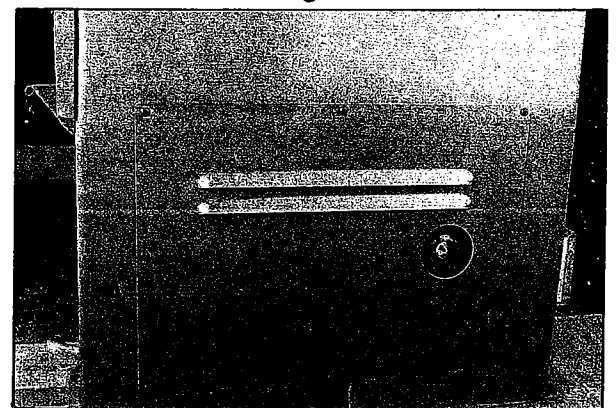


Fig. 9

Electrical Connections

⚠ WARNING

All electrical connections must be completed by a qualified electrician!

Failure to comply may cause serious injury and / or damage to the machinery and property!

The 3PGH Series lathes are rated at 7-1/2HP, 3Ph, 230/460V and come from the factory prewired at 230 volt. Confirm power available at the lathe's location is the same rating as the lathe.

Power is connected properly when pulling up on the forward-reverse lever causes the spindle to rotate counter-clockwise as viewed from the tailstock. If the chuck rotates in the clockwise direction, disconnect the lathe from the power source, switch any two of three power leads, and connect the lathe to the power source.

To switch from 230V to 460V operation:

- **Main Motor** - change the wires according to the diagram on the inside of the motor junction box.
- **Transformer** - open electrical panel on rear of machine on the headstock side. Switch wire from 230V terminal (A, Fig. 10) to 460V terminal (B, Fig. 10).
- **Coolant Pump** - open access panel on tailstock end. Change wires in coolant pump junction box according to diagram on the inside of the junction box cover.

Make sure the lathe is properly grounded.

General Description

Lathe Bed

The lathe bed (A, Fig. 11) is made of high grade cast iron. By combining high cheeks with strong cross ribs, a bed with low vibration and high rigidity is realized. Two precision ground vee slideways, reinforced by induction hardening and grinding, are an accurate guide for the carriage and headstock. The main drive motor is mounted in the stand below headstock.

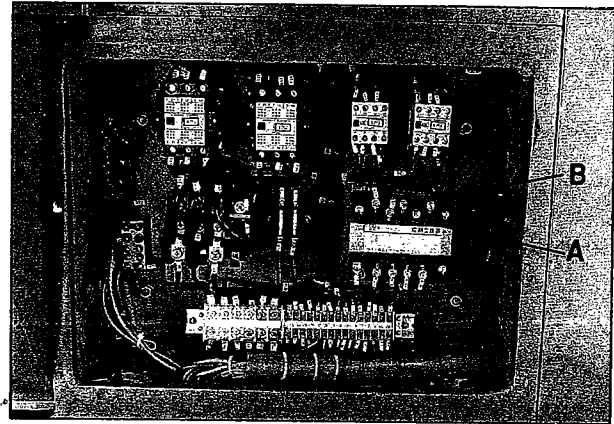


Fig. 10

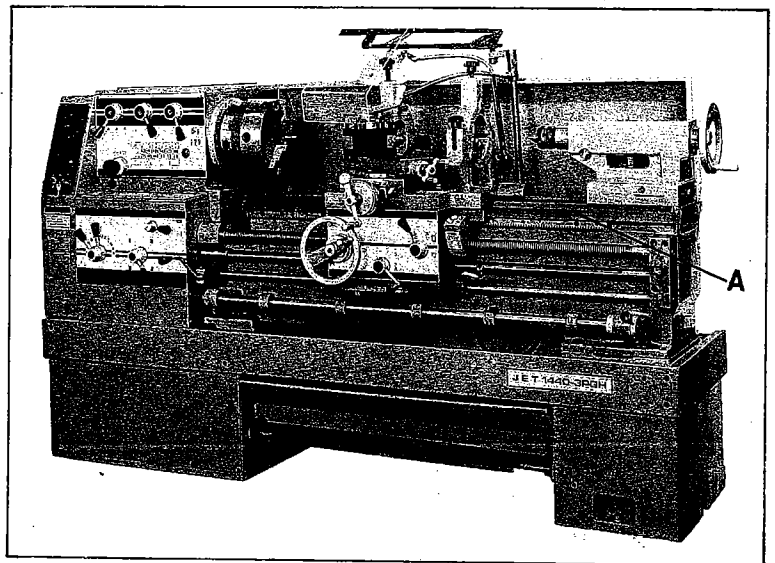


Fig. 11

Headstock

The headstock (A, Fig. 12) is cast from high grade, low vibration cast iron. It is bolted to the bed by five screws with an adjusting screw for alignment. In the head, the spindle is mounted on two precision taper roller bearings. The hollow spindle has Morse Taper #6 with a 3-1/8" bore.

Carriage

The carriage (B, Fig. 12) is made from high quality cast iron. The sliding parts are smooth ground. The cross-slide is mounted on the carriage and moves on a dove tailed slide which can be adjusted for play by means of the gibs.

The compound slide (C, Fig. 12), which is T-slotted and mounted on the cross slide (D, Fig. 12), can be rotated through 360°. The top slide and the cross slide travel in a dovetail slide and have adjustable gibs. A four way tool post is fitted on the compound slide.

Four Way Tool Post

The four way toolpost (E, Fig. 12) is mounted on the top slide and allows a maximum of four tools to be mounted simultaneously. Remember to use a minimum of two clamping screws when installing a cutting tool.

Apron

The apron (F, Fig. 12) is mounted to the carriage. In the apron a half nut is fitted. The half nut is engaged by use of a lever. Quick travel of the apron is accomplished by means of a bed mounted rack and pinion, operated by a hand wheel on the front of the apron.

Tailstock

The tailstock (G, Fig. 12) slides on a v-way and can be locked at any location by a clamping lever. The tailstock has a heavy duty spindle with a Morse Taper #4.

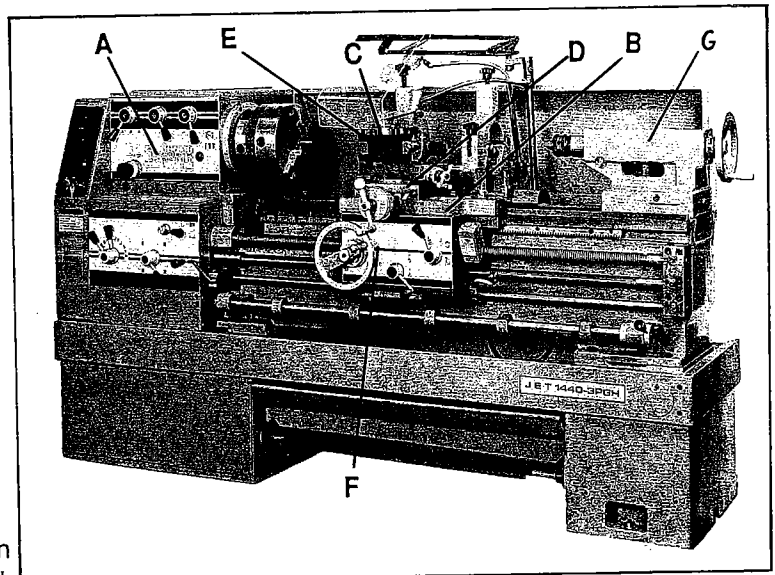


Fig. 12

Leadscrew and Feed Rod

The leadscrew (A, Fig.13) and feed rod (B, Fig. 13) are mounted on the front of the machine bed. They are connected to the gearbox at the left for automatic feed and lead and are supported by bushings on both ends. Both are equipped with shear pins.

Gear Box

The gear box (C, Fig. 13) is made from high quality cast iron and is mounted to the left side of the machine bed.

Steady Rest

The steady rest (D, Fig. 13) serves as a support for shafts on the free tailstock end. The steady rest is mounted on the bedway and secured from below with a bolt, nut and locking plate. The sliding fingers require continuous lubrication at the contact points with the workpiece to prevent premature wear.

To set the steady rest:

1. Loosen three hex socket cap screws.
2. Loosen knurled screw and open sliding fingers until the steady rest can be moved with its fingers around the workpiece. Secure the steady rest in position.
3. Set the fingers snugly to the workpiece and secure by tightening three hex socket cap screws. Fingers should be snug but not overly tight. Lubricate sliding points with lead based grease.
4. After prolonged use, the fingers will show wear. Remill or file the tips of the fingers.

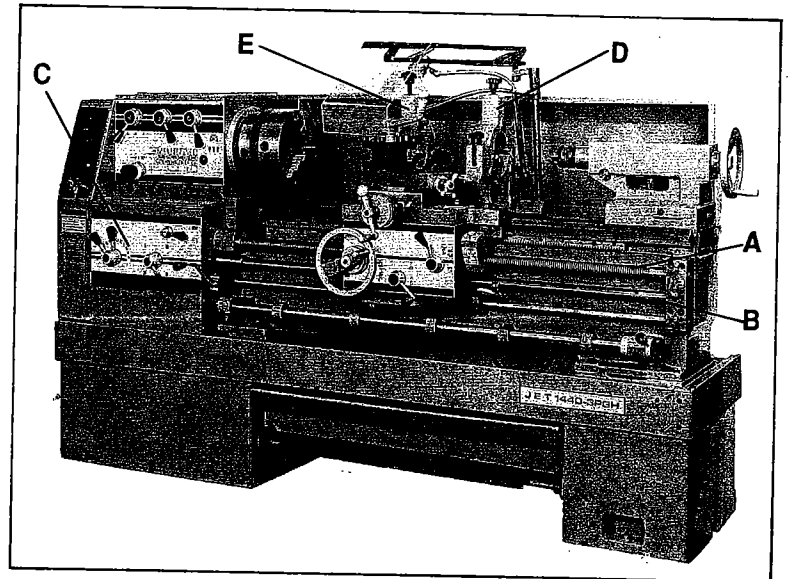


Fig. 13

Follow Rest

The traveling follow rest (E, Fig. 13) is mounted on the saddle and follows the movement of the turning tool. Only two fingers are required as the place of the third is taken by the turning tool. The follow rest is used for tuning operations on long, slender workpieces. It prevents flexing of the workpiece from the pressure of the cutting tool.

The sliding fingers are set similar to the steady rest, free of play, but not binding. Always lubricate adequately with lead based grease during operation.

Controls

1. **Control Panel** -located on front of headstock.
 - A. **Coolant On-Off Switch** (A, Fig. 14) - turns coolant pump on and off.
 - B. **Power Indicator Light** (B, Fig. 14) - lit whenever lathe has power.
 - C. **Emergency Stop Switch** (C, Fig. 14) - depress to stop all machine functions. (**Caution:** lathe will still have power). Twist to re-set.
 - D. **Main Power Switch** (D, Fig. 14) - turns power to machine on and off.
2. **Headstock Gear Change Levers** (E, Fig. 14) - located on front of headstock at the top. Move levers left or right to desired spindle speed.
3. **Leadscrew/Feedrod Directional Knob** - (F, Fig. 14) - located on front of headstock. Changing knob changes direction of feed. Do not move knob while machine is running.
4. **Feed/Lead Selector Lever** (G, Fig. 14) -located on the front of the gear change feed box. Used whenever setting up for threading or feeding.
5. **Feed/Lead Selector Lever** (H, Fig. 14) - located on the front of the gear change feed box. Used in setting up for feeding and threading. Position levers for desired feed or lead according to the thread/feed chart on top of the gear box.
6. **Compound Lock** (A, Fig. 15) - lever located on left side of compound slide. Turn clockwise to lock and counter-clockwise to unlock.
7. **Carriage Lock** (A, Fig. 16) - lock handle located on top right of carriage. Turn clockwise to lock. Turn counter-clockwise to unlock. **Caution:** carriage lock must be loose before moving carriage or damaged to lathe may occur.
8. **Cross Slide Lock** (B, Fig. 16) - lever located on right side of cross slide body. Turn clockwise and tighten to lock. Turn counter-clockwise and loosen to unlock. **Caution:** cross slide lock screw must be unlocked before moving cross slide or damage to the lathe may occur.

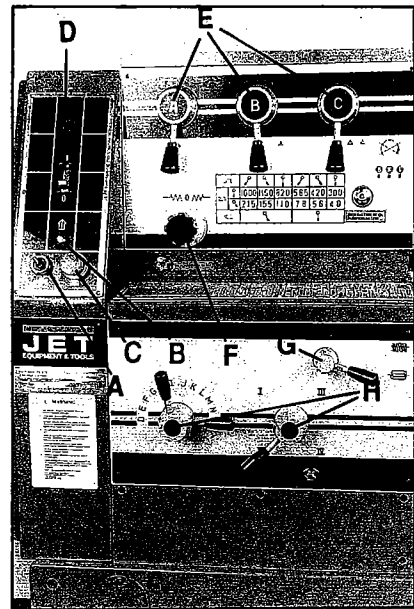


Fig. 14

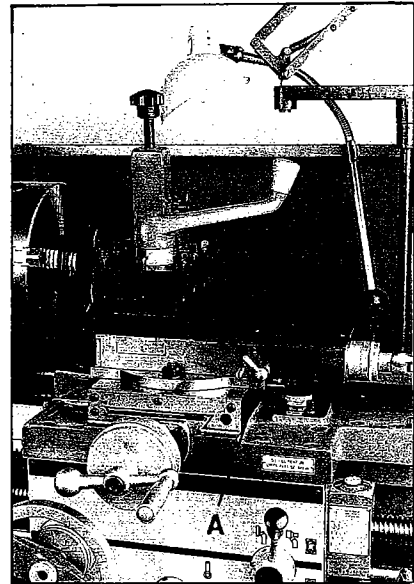


Fig. 15

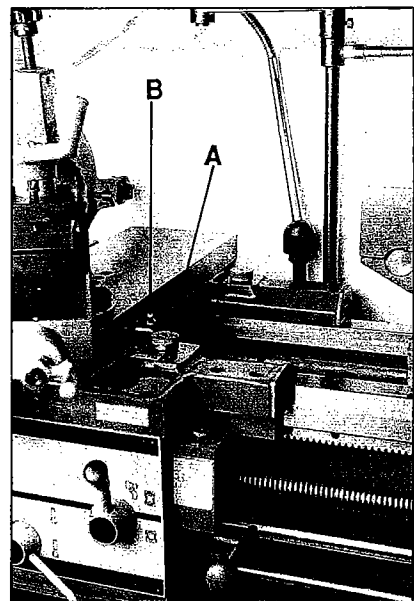


Fig. 16

9. **Longitudinal Traverse Hand Wheel** (A, Fig. 17) - located on the apron assembly. Rotate hand wheel clockwise to move the apron assembly toward the tailstock (right). Rotate the wheel counter-clockwise to move the apron assembly toward the headstock (left).

10. **Feed Selector/Half Nut** (B, Fig. 17) - located in the front of the apron assembly. 11 o'clock position activates cross feed. 1 o'clock position activates the longitudinal feed. 2 o'clock position disengages the half nut. 4 o'clock position engages the half nut.

11. **Feed Engage Lever** (C, Fig. 17)- located on front of the apron. Pull lever up to engage. Push lever down to disengage.

12. **Cross Traverse Handwheel** (D, Fig. 17) - located above the apron assembly. Clockwise rotation moves the cross slide toward the rear of the machine.

13. **Compound Rest Traverse Handle** (A, Fig. 18) - located on the end of the compound slide. Rotate clockwise or counter-clockwise to move or position.

14. **Tool Post Clamping Lever** (B, Fig. 18) - located on top of the tool post. Rotate counter-clockwise to loosen and clockwise to tighten.

15. **Tailstock Quill Clamping Lever** (A, Fig. 19) - located on the tailstock. Lift up to lock the spindle. Push down to unlock.

16. **Tailstock Clamping Lever** (B, Fig. 19) - located on the tailstock. Lift up lever to lock. Push down lever to unlock.

17. **Tailstock Quill Traverse Handwheel** (C, Fig. 19) - located on the tailstock. Rotate clockwise to advance the quill. Rotate counter-clockwise to retract the quill.

18. **Tailstock Off-Set Adjustment** (D, Fig. 19) - two hex socket cap screws located on the tailstock base are used to off-set the tailstock for cutting tapers. Loosening one screw while tightening the other off sets the tailstock. Tailstock lock handle must not be clamped down when adjusting.

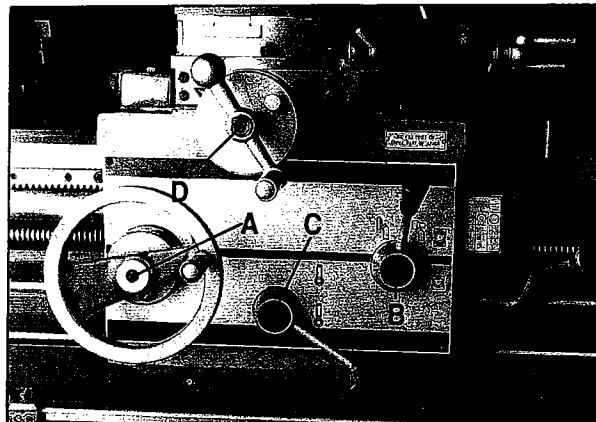


Fig. 17

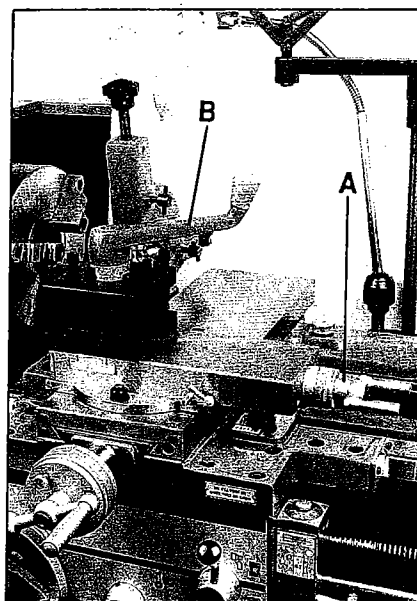


Fig. 18

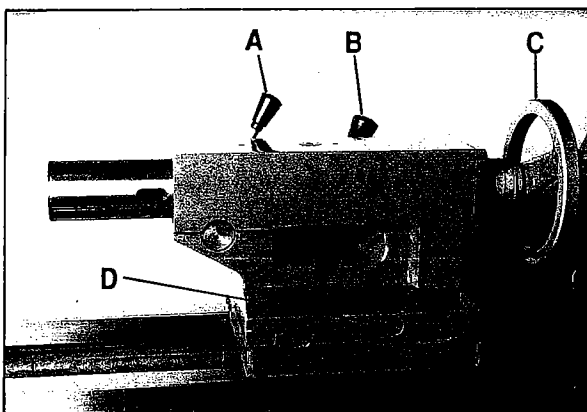


Fig. 19

19. **Foot Brake** (A, Fig. 20) - located between stand pedestals. Depress to stop all lathe functions.
Caution: lathe will still have power.

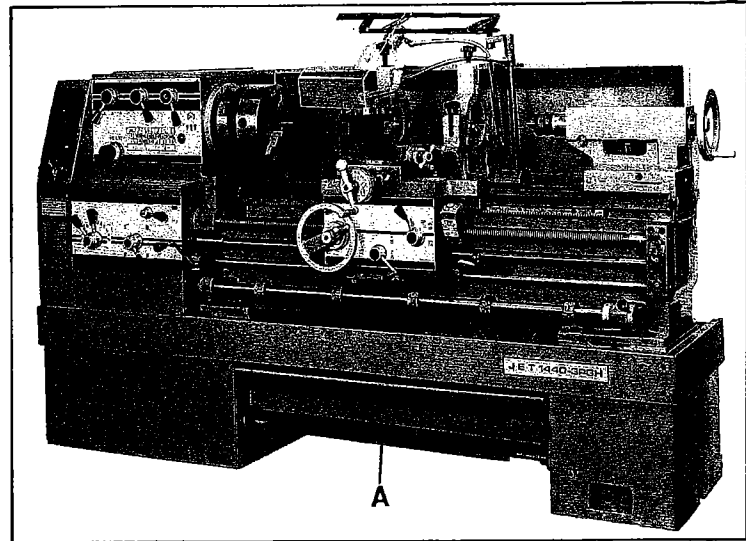


Fig. 20

Operation

Feed and Thread Selection

1. Reference the feed and thread tables (A, Fig. 21) found on the gear box faceplate.
2. Move levers (B, C, D, & E, Fig. 21) to the appropriate positions according to the chart.

Change Gears Replacement

1. **Disconnect the machine from the power source.**
2. Open the end cover on the left end of the headstock.
3. Loosen bolts (A & B, Fig. 22) and remove gears (C & D, Fig. 22).
4. Loosen nut (E, Fig. 22) and move quadrant (F, Fig. 22) out of the way and hold in place temporarily by tightening nut (E, Fig. 22).
5. Refer to lead/feed table on top of gear box for desired gear arrangement. Place gear(s) back on to shaft and replace retainer clip(s) and nut(s). Tighten nut(s).
6. Loosen nut (E, Fig. 22), move quadrant back so teeth mesh on gears, and tighten bolts (A & B, Fig. 17). **Caution: Make sure there is a backlash of .002-.003 between gears. Setting the gears too tight will cause excessive noise and wear.**
7. Close and latch the cover and connect the machine to the power source.

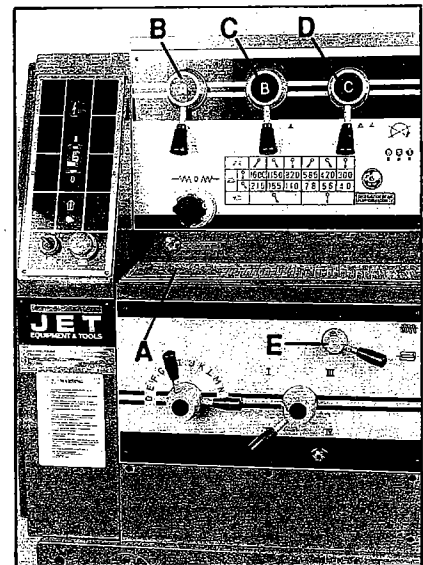


Fig. 21

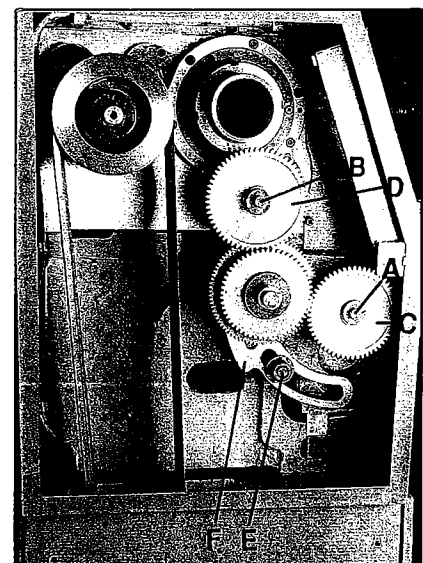


Fig. 22

Thread Cutting

1. Set forward/reverse knob (A, Fig. 23) to desired direction.
2. Set selector levers (B, C, and D, Fig. 23) to desired RPM.
3. Select desired thread using levers E, F, and G (Fig. 23).
4. Engage the half nut lever (A, Fig. 24).
5. Make a test cut with scrap material and check results before cutting regular material.
6. To cut inch threads, the half nut lever and the threading dial are used to thread in the conventional manner. The thread dial chart specifies at which point a thread can be entered using the threading dial. Refer to the chart located on the threading dial (B, Fig. 24)
7. To cut metric threads, the half nuts must be left continually engaged once the start point has been selected and the half nut is initially engaged (thread dial cannot be used). This involves reversing the whole drive by means of the spindle control lever at the end of the thread cutting pass, while, at the same time, relieving or increasing the cut as required.

Compound Slide

The compound rest (A, Fig. 25) is located on top of the carriage and can be rotated 360 degrees. There are calibrations (in degrees - B, Fig. 25) below the rest to assist in placement of the compound to the desired angle.

Adjustments

After a period of time, wear in some of the moving components may need to be adjusted:

Saddle

1. Remove splash guard.
2. Loosen four hex nuts found on the bottom rear of the cross slide and back off one full turn each.



Fig. 23

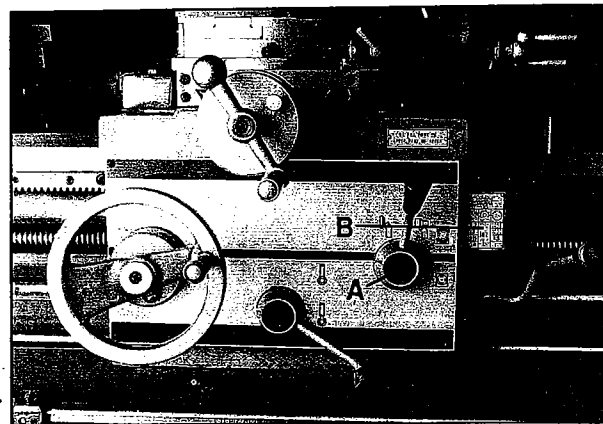


Fig. 24

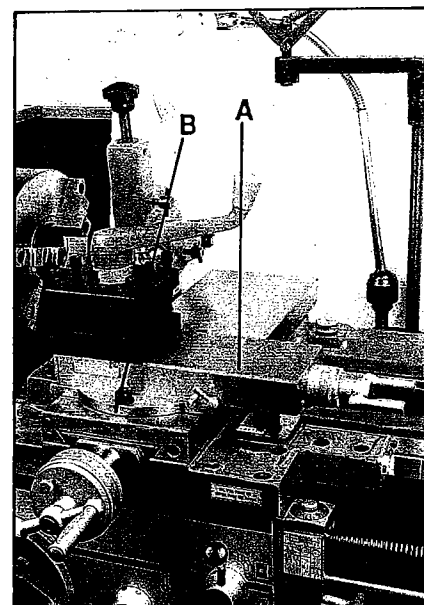


Fig. 25

3. Turn each of the four bolts with a hex wrench until a slight resistance is felt. Do not over tighten these screws.
4. Move the carriage with the hand wheel and determine if the drag is to your preference. Readjust the bolts as necessary to achieve the desired drag.
5. Hold the bolts firmly with a hex wrench and tighten the hex nut to lock the bolts in place.
5. Move the carriage again and adjust again if necessary. **Note:** over adjustment will cause excessive premature wear.

Cross Slide

If the cross slide is too loose, follow the procedure below to tighten:

1. Loosen the rear gib screw approximately one turn.
2. Tighten the front gib screw (A, Fig. 26) a quarter turn.
3. Tighten the rear gib screw.
4. Turn the cross slide handwheel to see if the cross slide is still loose. If it is still loose, repeat steps one through three. Do not over tighten. This will cause premature wear on the gib and mating parts.

Compound Slide

Follow the same procedure as the cross slide adjustment to adjust the compound rest. Front gib screw (A) is shown in Fig. 27.

Tailstock

If the handle will not lock the tailstock, follow the procedure below :

1. Lower the handle to the unlocked position.
2. Slide the tailstock to an area that allows access to the underside of the tailstock.

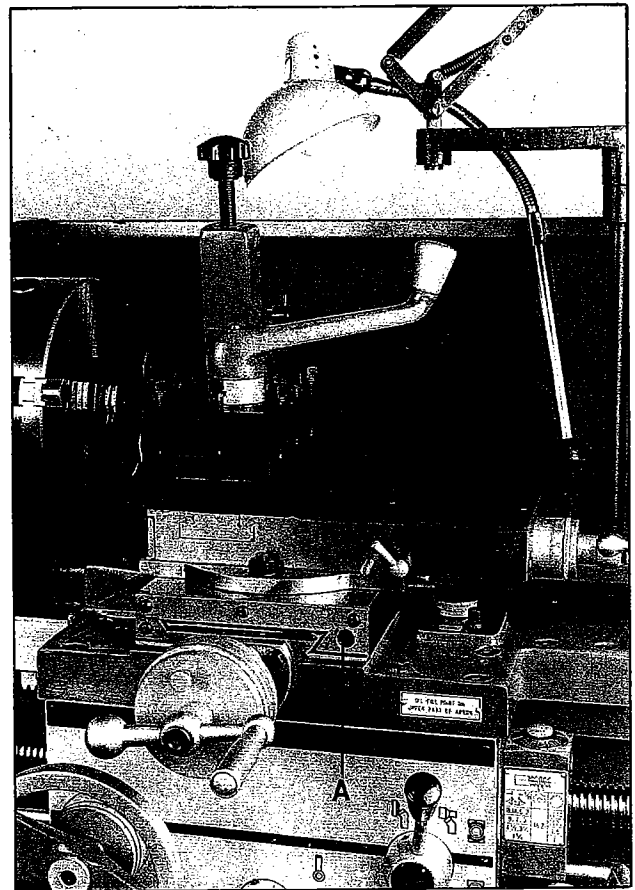


Fig. 26

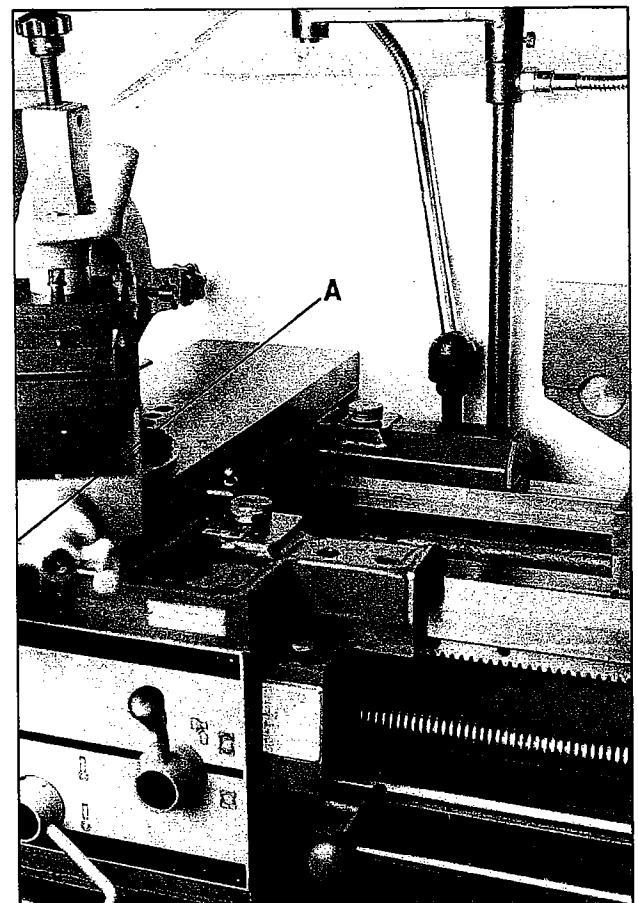


Fig. 27

3. Tighten tailstock clamping nut 1/4 turn. Test for proper locking. Repeat as necessary.
4. Tailstock can be more firmly locked by tightening nut (C, Fig. 28). Nut will have to be loosened before releasing clamping lever.

Tailstock Off-Set

Follow the procedure below to off-set the tailstock to cut shallow tapers:

1. Loosen tailstock in position by lowering locking handle (A, Fig. 28).
3. Alternately loosen and tighten front and rear hex socket cap screws (B, Fig. 28).

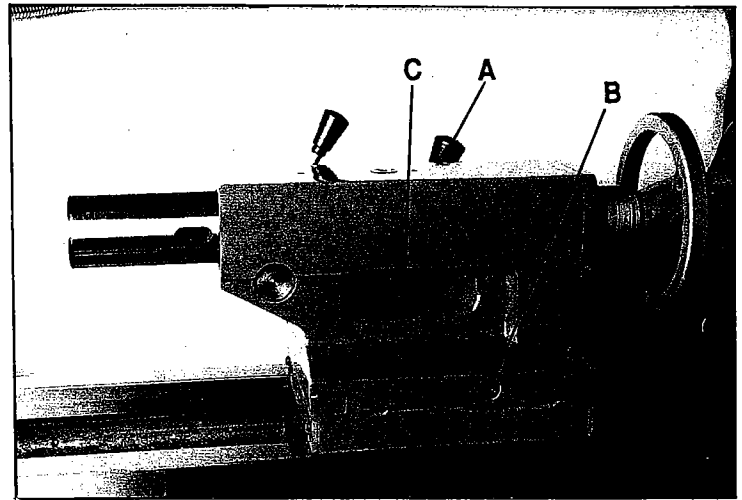


Fig. 28

Headstock Alignment

The headstock has been aligned at the factory and should not require adjustment. However, if adjustment is deemed necessary, follow the procedure below to align the headstock:

1. Using a machinist's precision level on the bedways, make sure the lathe is level side to side and front to back. If the lathe is not level, correct to a level condition before proceeding. Re-test alignment if any leveling adjustments were made.
2. From steel bar stock of approximately two inches in diameter, cut a piece approximately eight inches long.
3. Place two inches of bar stock into chuck and tighten chuck. Do not use the tailstock or center to support the other end.
4. Set up and cut along five inches of the bar stock.
5. Using a micrometer, measure the bar stock next to the chuck and at the end. The measurement should be the same.
6. If the measurements are not the same and adjustment is required, loosen five hex cap bolts which holds the headstock to the bed. **Note:** quadrant will have to be removed to allow access to the fifth hex cap bolt. Do not loosen completely; some drag should remain.

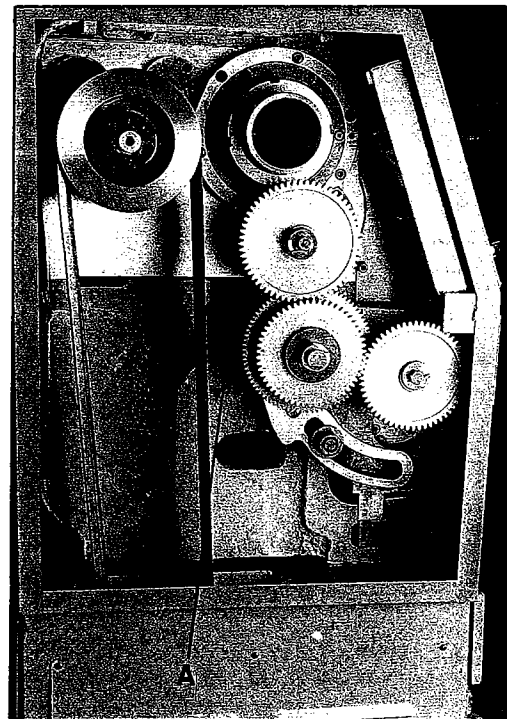


Fig. 29

- Turn adjusting screw in desired direction (A, Fig. 29). Reassemble lathe and make another cut. Keep adjusting screw nut after each cut until the bar stock measurements are the same. Tighten all headstock screws.

Removing Gap Section

- To remove gap section, remove seven hex socket cap screws (A, Fig. 30). **Note:** number seven is located horizontally in the center of the ways.
- Pull two locating pins (B, Fig. 30).
- Gap section can now be removed.

Installing Removable Gap Section

- Clean the bottom and the ends of the gap section thoroughly.
- Set gap section in place and align.
- Replace locating pins (B, Fig. 30).
- Replace seven hex socket cap screws (A, Fig. 30) and tighten alternately until all are tight.

Belt Replacement and Adjustment

- Disconnect machine from the power source.**
- Open end gear cover, remove lower rear cover, and lower side cover on the headstock side. This will expose the motor and v-belts.
- Loosen hex nut (A, Fig. 31). Place scrap piece of wood under motor to act as a lever. Lift up motor slightly, rotate belt tensioning assembly (B, Fig. 31) out of the way, lift motor up and block temporarily.
- Remove belts. Install new belts onto pulleys.
- Lift up on motor, remove temporary blocking, and carefully lower motor while rotating belt tensioning assembly to its original position.
- Tension belts by loosening nut (C, Fig. 31) and tightening nut (A, Fig. 31) until light finger

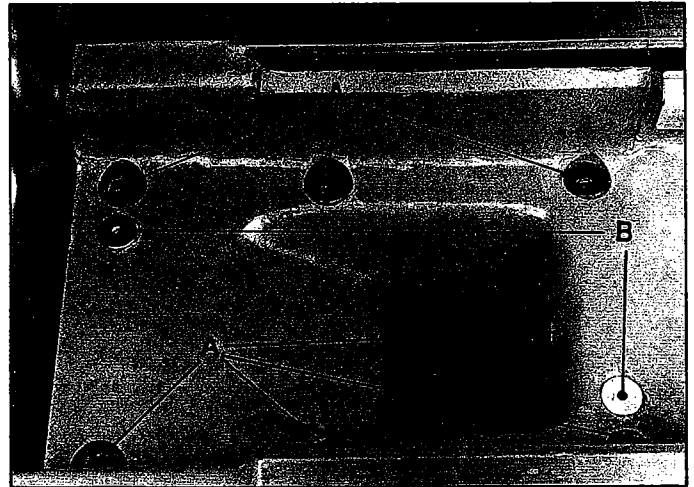


Fig. 30

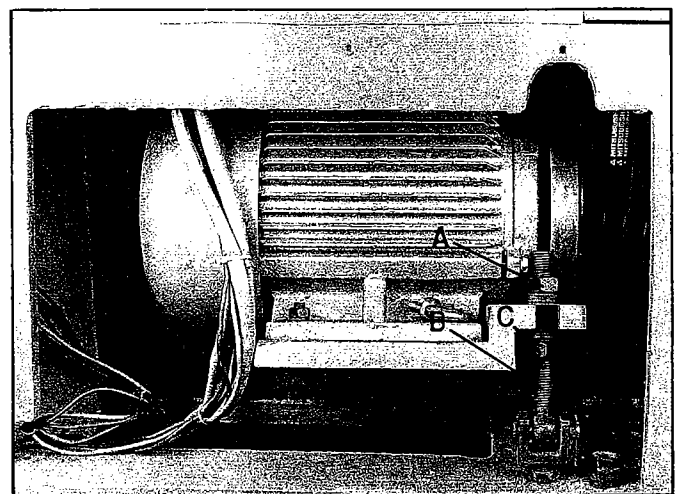


Fig. 31

pressure causes approximately 3/4" deflection on each belt.

6. Install covers and connect lathe to the power source.

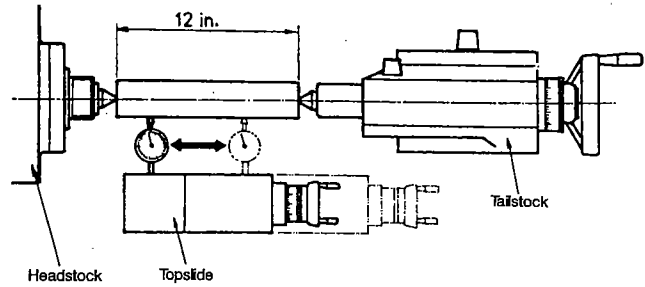


Fig. 32

Aligning Tailstock to Headstock

Before proceeding, headstock should be aligned. See section labeled "Headstock Alignment".

1. Fit a 12" ground steel bar between centers of the headstock and tailstock. (See Fig. 32)
2. Fit a dial indicator to the top slide and traverse the center line of the bar.
3. If adjustment is needed, align the tailstock using the off set screws (A, Fig. 33) until the tailstock is aligned.

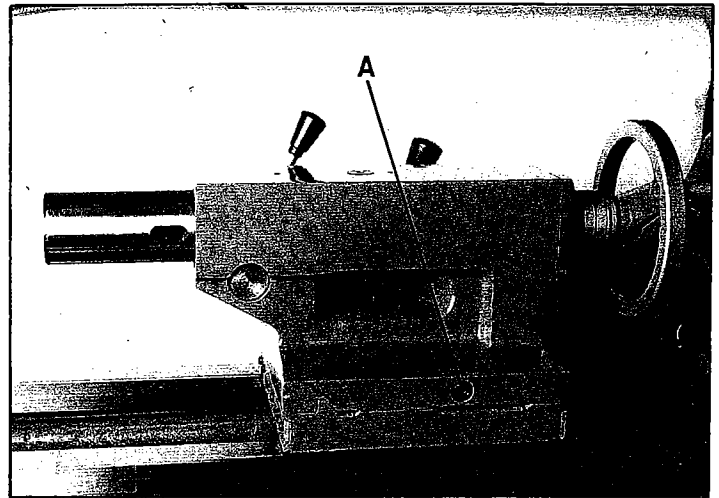


Fig. 33

Note: Your new lathe was tested at the factory before shipment. The enclosed test certificate shows each test that was performed as well as several mechanical and functional tests.

The test certificate shows the specifications for each test and the actual tested amount for your lathe. Tests are stated in millimeters. Tests are performed with the lathe leveled and anchored in place.

Before any adjustments are made during or after installation, check the lathe for level and perform tests in the same manner as shown in the test certificate.