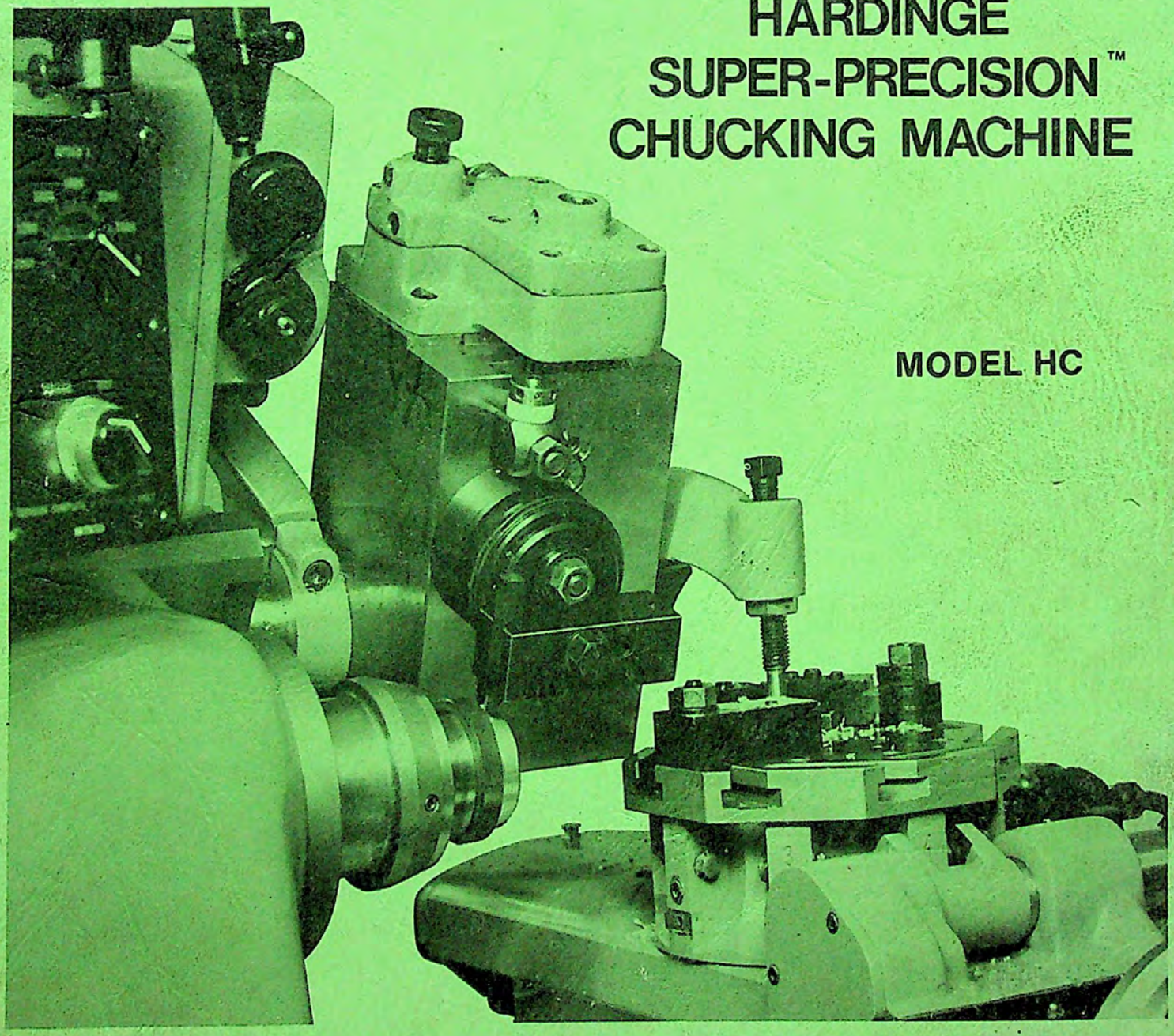
HARDINGE®

MAINTENANCE MANUAL

FOR AUTOMATIC THREADING UNIT ON

HARDINGE SUPER-PRECISION™ CHUCKING MACHINE

MODEL HC



READ MANUAL CAREFULLY BEFORE STARTING MAINTENANCE OR REPAIR ON AUTOMATIC THREADING UNIT

When this manual was printed, the information given was current. However, since we are constantly improving the design of our machine tools, it is possible that the illustrations and descriptions may vary from the automatic threading unit you received. This means that the unit you received is the latest improved model to better fulfill your requirements.

It is assumed those who use this manual will have a general knowledge of machine maintenance and repair. This general knowledge coupled with the following manual will greatly reduce or eliminate down time to allow you to receive maximum production from your Hardinge Automatic Threading Unit.

HARDINGE BROTHERS, INC.
ELMIRA, NEW YORK

CONTENTS

FOR OPERATION AND RELATED ADJUSTMENTS, SEE "OPERATOR'S MANUAL FOR AUTOMATIC THREADING UNITS ON MODEL HC CHUCKING MACHINES"

PREVENTIVE MAINTENANCE

DAILY

WEEKLY

SEMI-ANNUALLY

DEPENDING ON USE

Note: Oil Base Cutting Fluids are Recommended for Maximum Life of Automatic Threading Unit.

LUBRICANTS

(Use Recommended Product or Equivalent)

Product	Vendor
Die Makers Grease	Standard Die Set Co. (Div. of Dieco.)
Molylube #M-88	Alpha-Molykote Corporation
Velocite No. 6	Mobil Oil Corporation

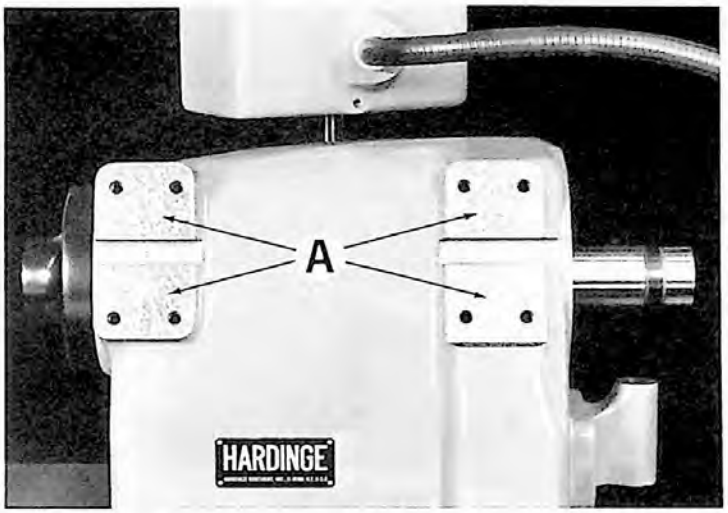


Figure 1 — Threading Unit Mounting Pads

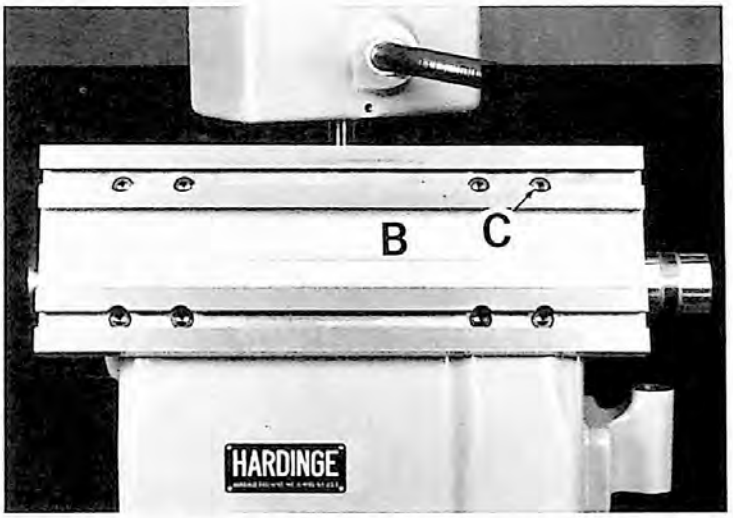


Figure 2 — Base Plate Mounting

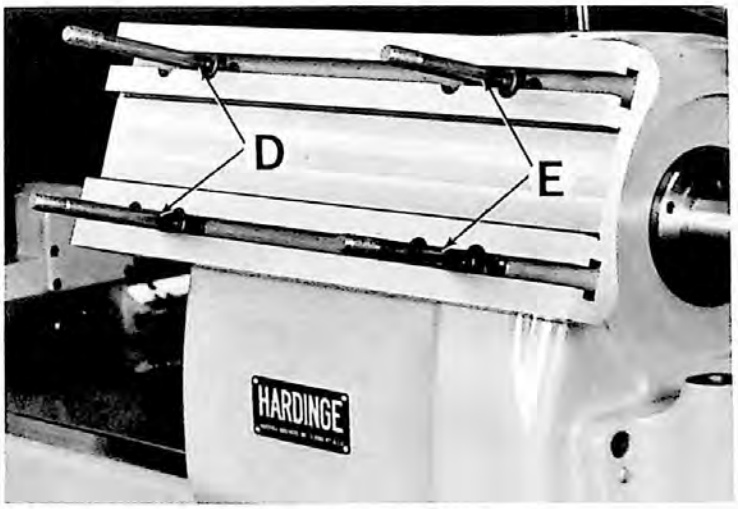


Figure 3 — Tee Bolts for Mounting Unit

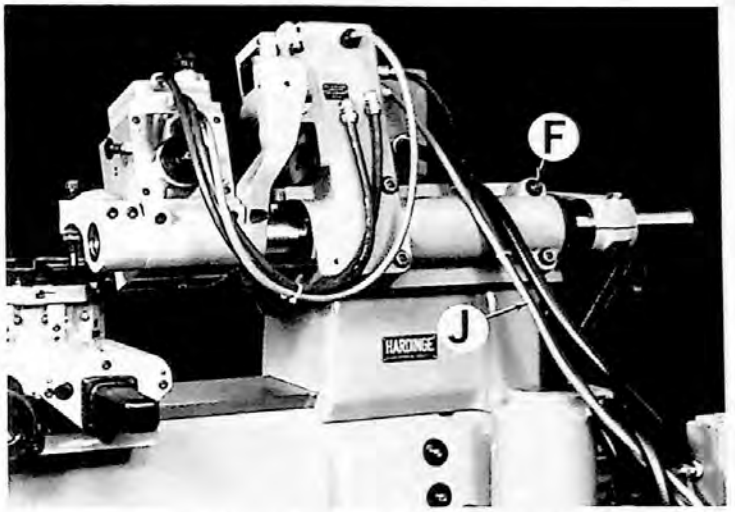


Figure 4 — Rear View of Threading Unit

INSTALLATION ON EXISTING MACHINES

1. Remove any paint or burrs from pads "A", Figure 1, and keyways in pads.
2. Position base plate "B", Figure 2, and assemble eight screws "C".
3. Set four T-Bolts "D" and "E", Figure 3, in base plate as shown. Bolts "D" are the longer ones supplied.
4. Position threading unit on base plate with hoist and sling and assemble four washers and nuts "F", Figure 4. **DO NOT OVERTIGHTEN NUTS "F", SNUG IS SUFFICIENT.**

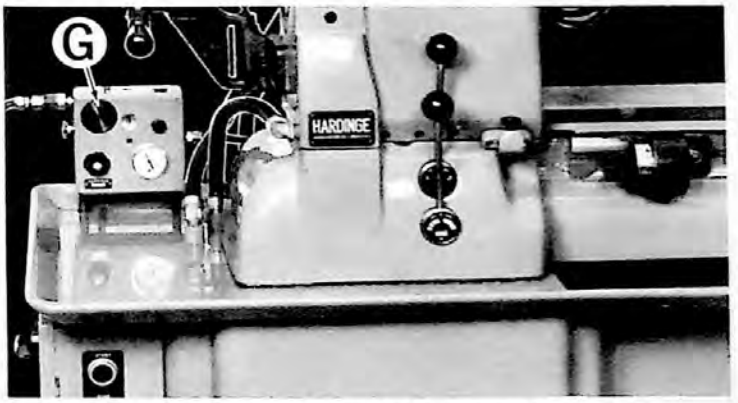


Figure 5 — Air Control Unit Location

AIR CONNECTIONS

1. Drill two ⅜" diameter holes 5⅛" apart at left rear of oil pan and mount air regulator "G", Figure 5.
2. Fill lubro-control unit with oil per instructions, Page 19. Connect air line from threading unit to lubro-control unit.
3. Connect lubro-control unit to air supply. If excessive water problem exists, add heavy duty filter to air line.

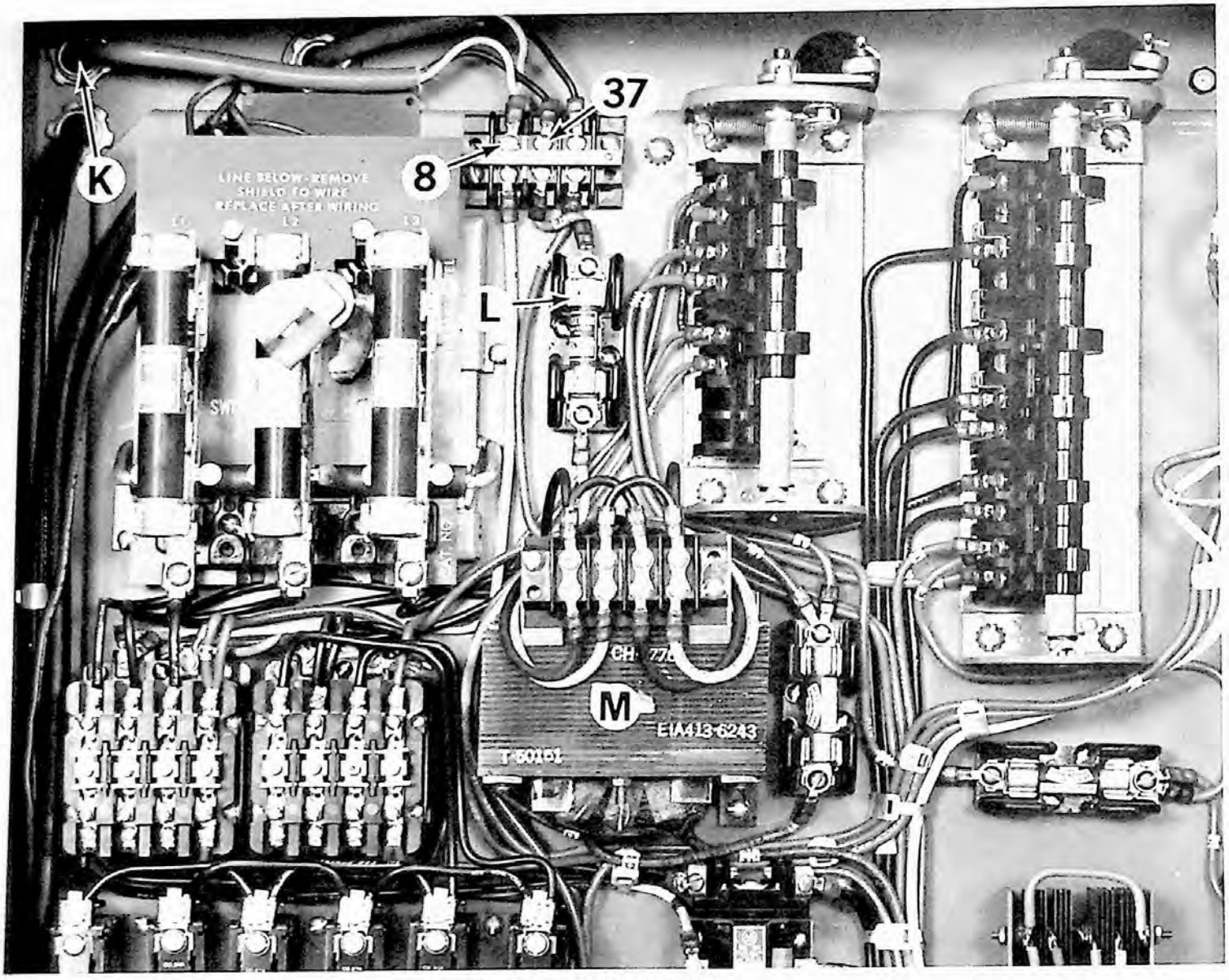


Figure 6 — Main Switch Case

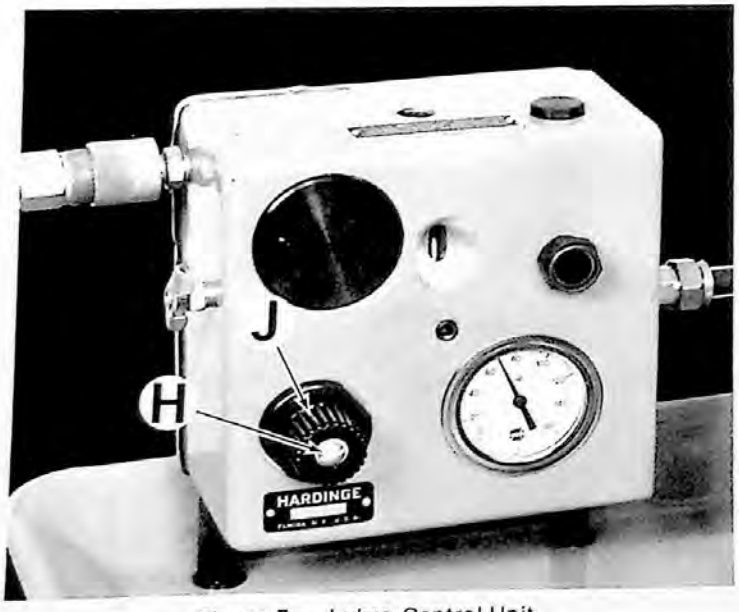


Figure 7 — Lubro-Control Unit

4. Set pressure regulator knob "J", Figure 7 to provide a minimum of 65 pounds and a maximum of 75 pounds of air pressure. Tighten lock screw "H" against control knob to maintain setting.

5. Follow steps 1 & 2 on this page under "Electrical Connections".

ELECTRICAL CONNECTIONS

1. Disconnect power source. Feed cable "J", Figure 4, through hole "K", Figure 6.

2. Attach white wire to terminal 8 and black wire to terminal 37 of terminal board. Tighten cable grip at "K".

NOTE: THREADING UNIT REQUIRES ONLY 10 VOLTS FOR OPERATION. Machines manufactured after Serial No. 100A are wired to include 10 volt tap on transformer.

FOR INITIAL SETTING OF AUTOMATIC THREADING UNIT, SEE OPERATOR'S MANUAL FOR AUTOMATIC THREADING UNITS ON MODEL HC CHUCKING MACHINE.

ELECTRIC CONTROL FUNCTIONS (Figure 6)

L—Fuse for automatic threading unit. (FRN 1-¼)
M—Control voltage transformer (115 volt output with 10 volt tap for automatic threading unit).

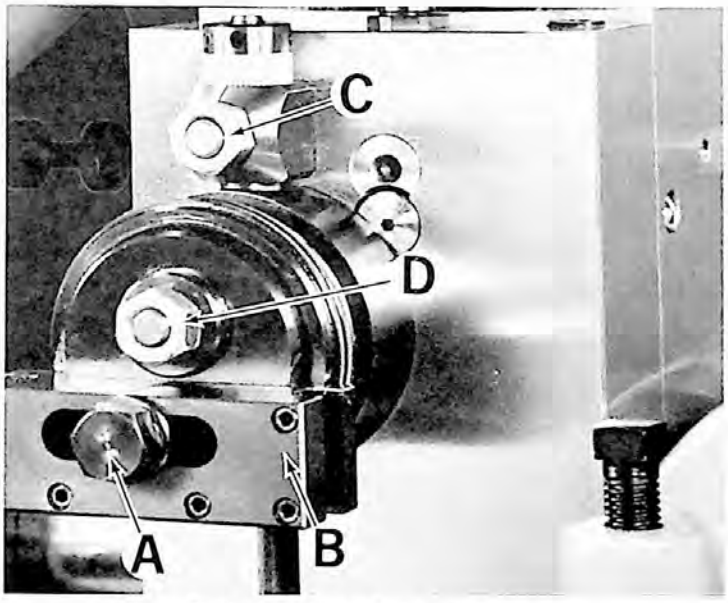


Figure 8 — Tool Post Assembly

Figure 9 — Fine Adjustment Dial Removal

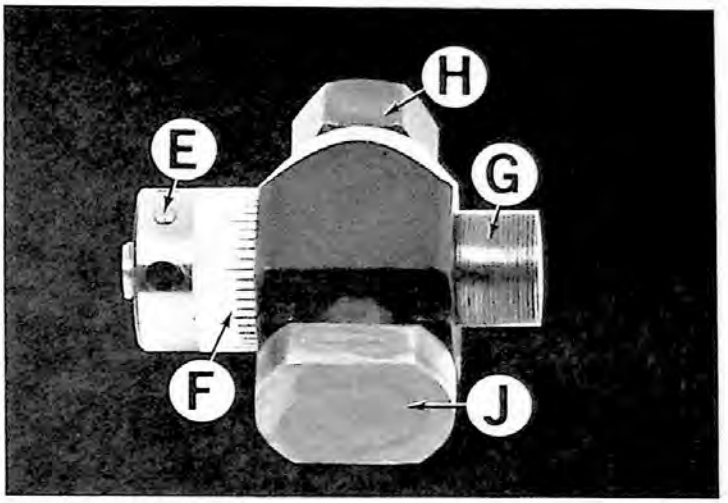


Figure 10 — Fine Adjustment Dial Assembly

AUTOMATIC THREADING UNIT REMOVAL

1. Disconnect electrical power source and remove wires at terminals 8 and 37, Figure 6.
2. Loosen cable grip at "K" and remove cable from main switch case.
3. Disconnect air pressure and remove air line from threading unit at lubro-control unit.
4. Remove four nuts and washers "F", Figure 4, and remove complete threading unit with hoist and sling.
5. If necessary, remove the T-Bolts "D" and "E", Figure 3, and base plate "B", Figure 2.

TOOL POST DISASSEMBLY

1. Remove bolt "A", Figure 8, washer and tool block "B".
2. Loosen nuts "C" and "D", Figure 8, and slide tool post assembly down keyway to remove.
3. Unscrew fine adjustment dial assembly, Figure 9.

NOTE: FINE ADJUSTMENT SCREW HAS LEFT-HAND THREADS.

4. To disassemble fine adjustment dial assembly:
   (a) Remove taper pin "E", Figure 10, and unscrew dial "F".
   (b) Remove adjusting bolt "G", nut "H" and T-Bolt "J".
5. Remove nut "K", Figure 11, washer and spring "L", Figure 12. Remove T-Bolt "M", Figure 11.
6. Unscrew adjusting nut "N", Figure 11, from tool post support "O".
7. Reassemble. **NOTE:** Fine adjustment dial assembly which has left-hand threads, can be threaded into either one of two threaded holes, depending on set up.

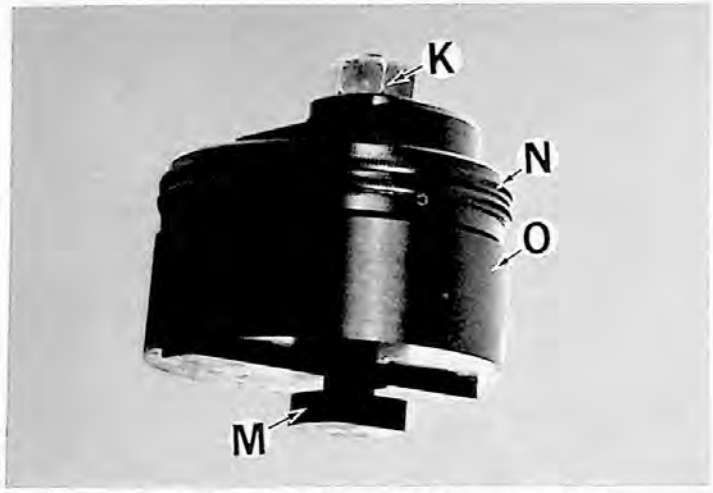


Figure 11 — Tool Support and Components

Figure 12 — Spring for Tool Post

CHASING HEAD CYLINDER HOUSING

Feed Rate Adjusting Screw Removal

NOTE: Feed rate adjusting screw "B", Figure 13, is factory set and sealed. Removal is not recommended unless absolutely necessary.

1. Disconnect air pressure at control unit. Remove wax seal from screw "A", Figure 13, and remove lock screw "A". Loosen set screw under lock screw "A".

2. Unscrew piston stop assembly "B". Remove roll pin "C", Figure 14, knob "D", adjusting nut "E" and O-ring "F". Do not misplace brass plug under screws "A", Figure 13.

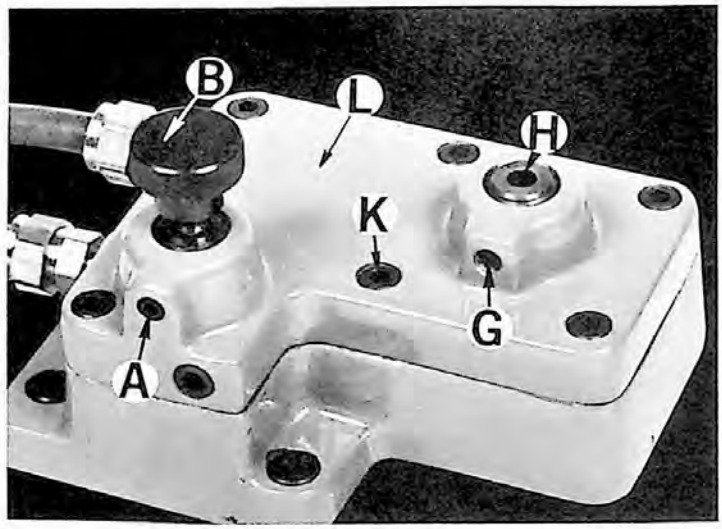


Figure 13 — Chasing Head Cylinder Housing

Feed Rate Adjusting Screw Replacement

1. Replace O-ring "F", Figure 14, adjusting nut "E", knob "D" and roll pin "C".

2. Thread piston stop assembly "B", Figure 13 into casting until adjusting nut "E", Figure 14, is flush with casting. Turn knob "D" down until it just contacts nut "E". Connect air pressure at control unit.

3. Cycle threading unit. If unit, fails to cycle and slide to advance, turn large white dial clockwise by hand to stop passes. Thread adjusting nut "E" out gradually per following instructions until pawl can enter ratchet and operate chasing head.

(a) Turn knob "D", Figure 14, counter-clockwise until adjusting nut "E" moves a fraction of a turn. Tighten set screw under lock screw "A". Turn knob "D" down until it just contacts nut "E". Cycle threading unit.

4. When chasing head cycles, tighten set screw under lock screw "A", Figure 13, and replace screw "A".

Slide Travel Adjusting Screw Removal

1. Disconnect air pressure at control unit. Loosen set screw "G", Figure 13. Do not misplace brass plug under set screw.

2. Remove adjusting screw "H", Figure 15, and remove O-ring "J".

Slide Travel Adjusting Screw Replacement

1. Replace O-ring "J", Figure 15, and start adjusting screw "H". Connect air pressure at control unit.

2. Set thread depth control dial at 70. Turn adjusting screw "H", Figure 15, slowly to its limit under normal pressure and back off ⅛ turn. Relock set screw "G", Figure 13.

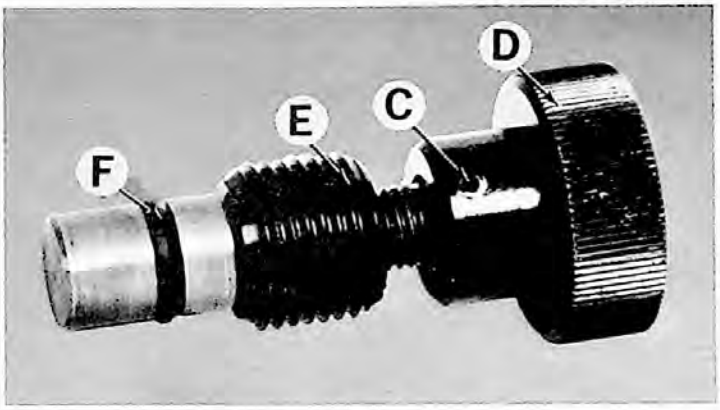


Figure 14 — Feed Rate Adjusting Screw

Cylinder Housing Disassembly

1. Disconnect air pressure at control unit. Remove seven screws "K", Figure 13, and remove cover "L". **DO NOT REMOVE HOSE CONNECTORS** "M", Figure 15, unless absolutely necessary as they are extremely tight to prevent air leakage and removal is most difficult.

2. Remove O-rings "N", "O", and "P", Figure 16.

3. Remove piston "Q", Figure 17, cylinder liner "R" and two u-cups "S".

4. Remove two screws "T", Figure 16, and two screws "U".

5. Using open end wrench, unscrew piston rod "V", Figure 18, from tool post slide "W" and remove cylinder housing "X".

6. Remove nut "Y", Figure 16, washer "Z", Figure 19, piston rod "A", piston plate "B". Remove O-ring "C", Figure 20, piston body "D", seal "E" and two O-rings "F". Remove cylinder liner "G".

7. If necessary, remove O-ring "H", Figure 21.

Cylinder Housing Reassembly

NOTE: Lubricate O-rings, seals and cylinder walls with Mobil Velocite No. 6 or equivalent during reassembly.

1. Replace O-ring "H", Figure 21.

2. Replace cylinder liner "G", Figure 20, (chamfered side down).

3. Replace seal "E" and two O-rings "F" on piston body "D". Replace piston body.

4. Replace piston rod "A", Figure 19, O-ring "C", piston plate "B", washer "Z" and nut "Y".

5. Replace cylinder housing "X", Figure 18, and using open end wrench, thread piston rod "V", Figure 18, into tool post slide "W".

6. Replace two screws "T", Figure 16, and two Screws "U". **NOTE:** Screws "T" are ⅛" longer than screws "U".

7. Replace two u-cups "S", Figure 17, on piston "Q". Replace cylinder liner "R" and piston "Q".

8. Replace O-rings "N", "O", and "P", Figure 16.

9. Replace cover "L", Figure 13, and seven screws "K".

10. Connect air pressure at control unit.

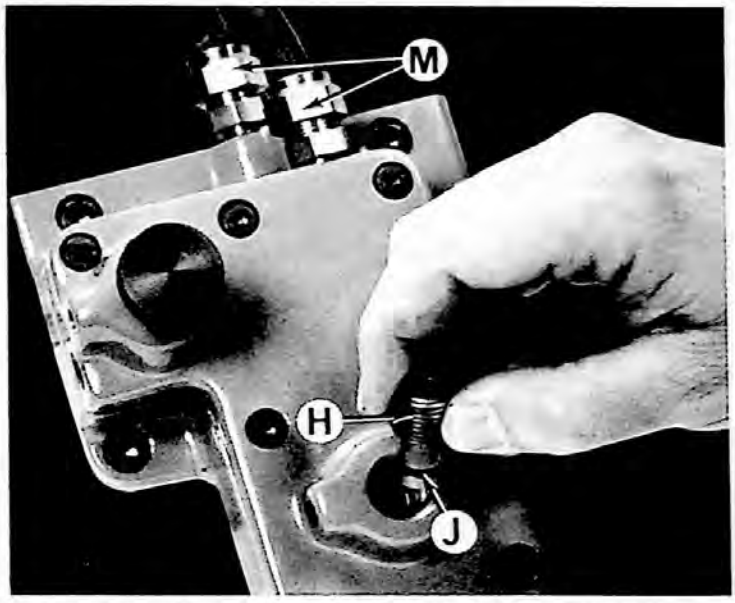


Figure 15 — Slide Travel Adjusting Screw Removal

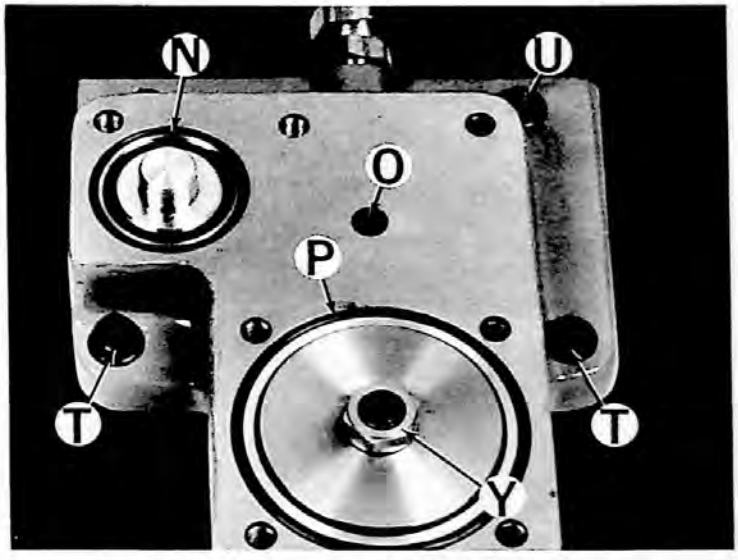


Figure 16 — Cylinder Housing with Cover Removed

CYCLE STOP MICRO SWITCH REPLACEMENT

1. Disconnect air line at control unit and turn disconnect switch on main control case to "Off".

2. Remove two screws "T", Figure 16, and two screws "U".

NOTE: Screws "T" are ⅛" longer than screws "U".

3. Using open end wrench, unscrew piston rod "V", Figure 18, from tool post slide "W" and remove cylinder housing assembly "X".

4. Remove two screws "B", Figure 22, and, remove micro switch "A". Remove wires from micro switch.

5. Connect wires to normally closed and common terminals of new micro switch. Replace switch "A" and two screws "B". Do not tighten screws.

6. Pull cycle start knob, set micro switch with activator just touching plunger "C" and tighten screws "B".

7. Turn disconnect switch on main control case to "On". When threading unit is lowered to operating position a click will be heard from solenoid in knockout housing with cycle start knob "Out" and will not be heard with cycle start knob "In", if micro switch "A" is operating properly. Turn large white dial right-handed to retract cycle start knob.

8. Reassemble other components by reversing steps 1, 2, and 3.

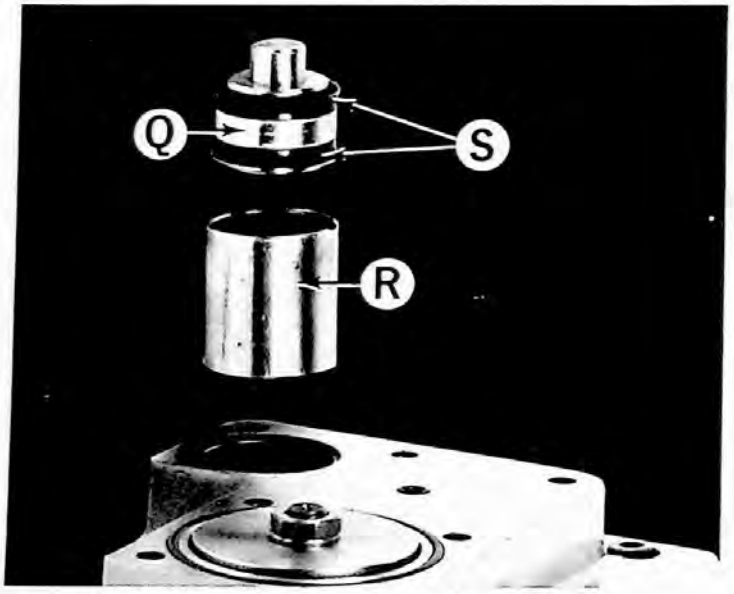


Figure 17 — Piston for Feed Rate Adjusting Screw

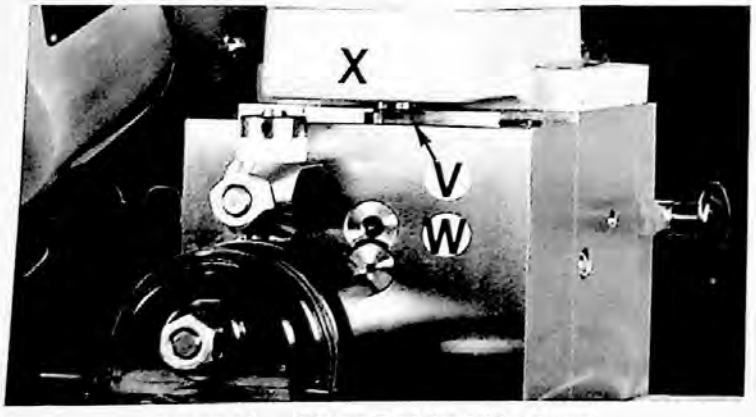


Figure 18 — Piston Rod for Slide Travel

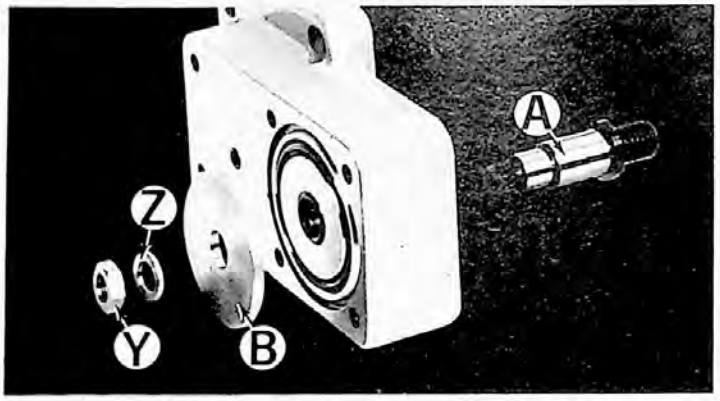


Figure 19 — Piston for Slide Travel Adjusting Screw

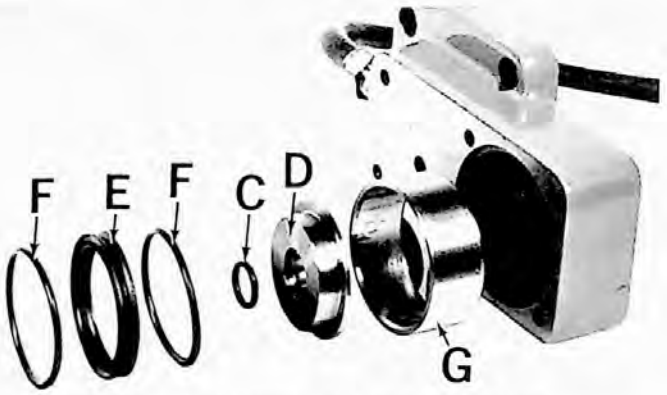


Figure 20 — Cylinder Housing and Components

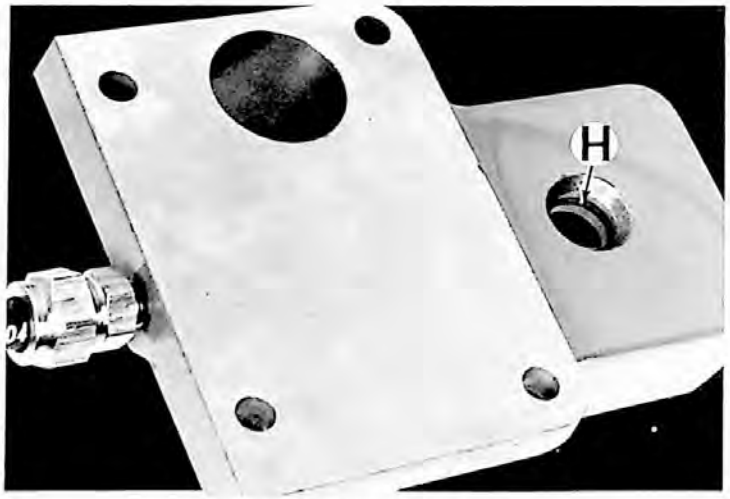


Figure 21 — Cylinder Housing

CHASING HEAD DISASSEMBLY

1. Support guide bar bracket "F", Figure 23, by hand and loosen two bolts "G". Remove guide bar bracket.

2. Follow steps 1, 2, and 3 under "Cycle Stop Micro Switch Replacement" on previous page.

3. Remove two screws "B", Figure 22, and remove micro switch "A". Remove wires from micro switch. Remove O-ring seal for micro switch.

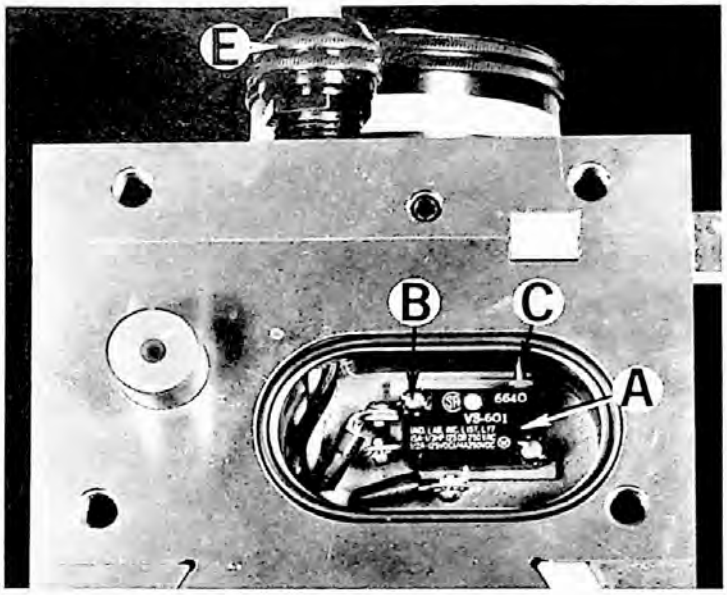
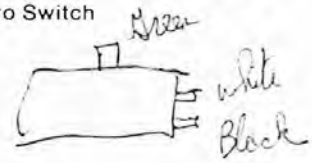


Figure 22 — Cycle Stop Micro Switch



4. Remove cable grip "E", Figure 22, and pull micro switch wires from chasing head.

5. Support chasing head by hand to prevent it from dropping down, and loosen two bolts "H", Figure 23. Remove head from chasing bar. **NOTE: TWO PEOPLE ARE SUGGESTED FOR STEP 5).**

6. Loosen two screws "J", Figure 24, and remove dial nut "K". Remove dial assembly "L".

7. Remove key "M", Figure 25.

8. Remove four screws "N", Figure 25, and remove cover "O". Remove plunger pin "P", Figure 26 and spring "Q".

9. To Disassemble cover "O":
   (a) Remove pawl "A", Figure 27, and O-ring "B", if necessary.
   (b) Remove screw "C", block "D", spring "E" and plunger release bar "F".
   (c) Remove lock screw "G", Figure 28 and loosen stop screw under screw "G".
   (d) Remove lock plunger "H", Figure 27.
   (e) Remove lock screw "J", Figure 29, and remove set screw "K", spring "L" and pin "M".
   (f) To remove pawl block "N", Figure 27, remove two screws "O", Figure 30, and drive dowel pin "P" from cover.
   (g) Needle bearing "Q" and seal "R" are pressed into cover.

10. Push down on pawl post "A", Figure 31, and remove pawl "B" from pin "C".

11. Remove pawl post "A", Figure 32, and remove spring "D" and spacer "E".

12. Remove nut "G", Figure 33. Remove spring retainer "H", Figure 34, and remove spring "J" and dial sleeve "K".

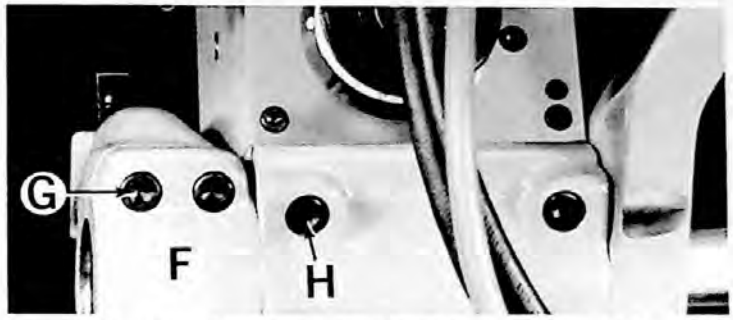


Figure 23 — Clamping Bolts for Chasing Head and Guide Bar Bracket

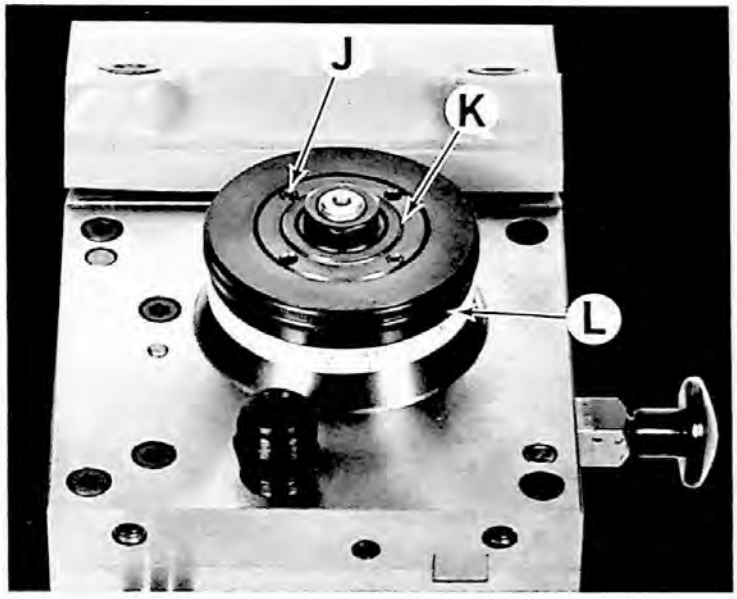


Figure 24 — Thread Depth Control Dial

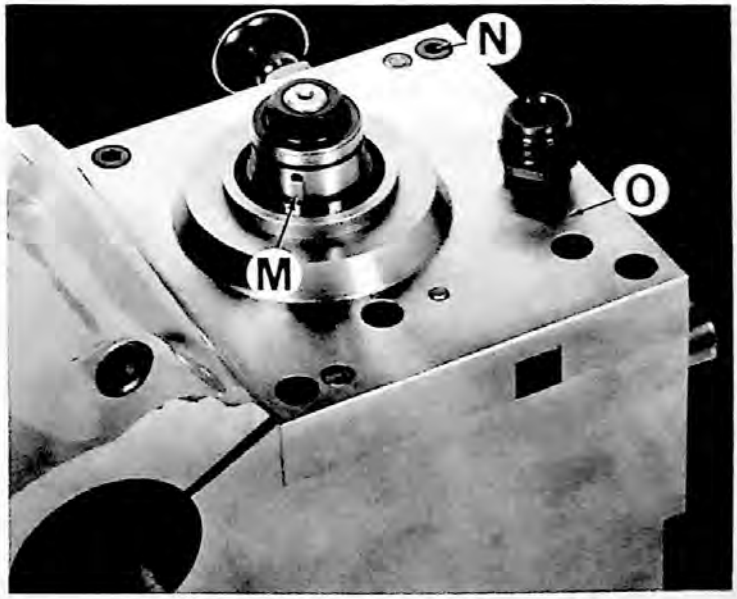


Figure 25 — Cover for Chasing Head

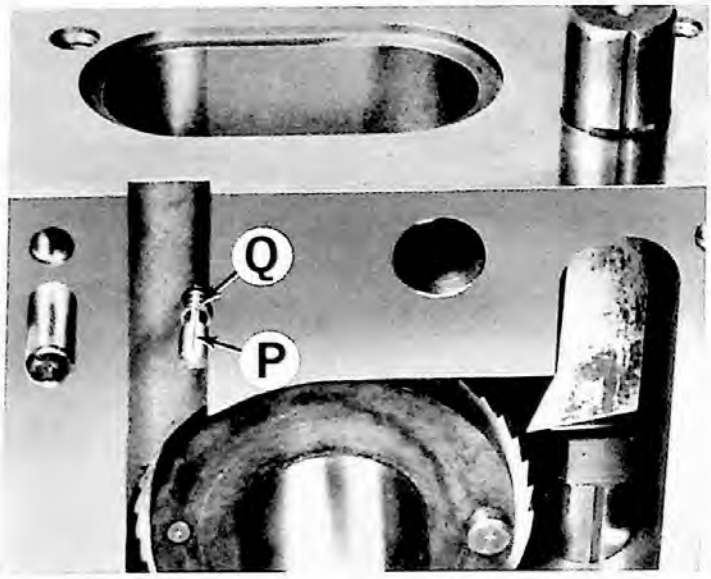


Figure 26 — Plunger Pin for Micro Switch

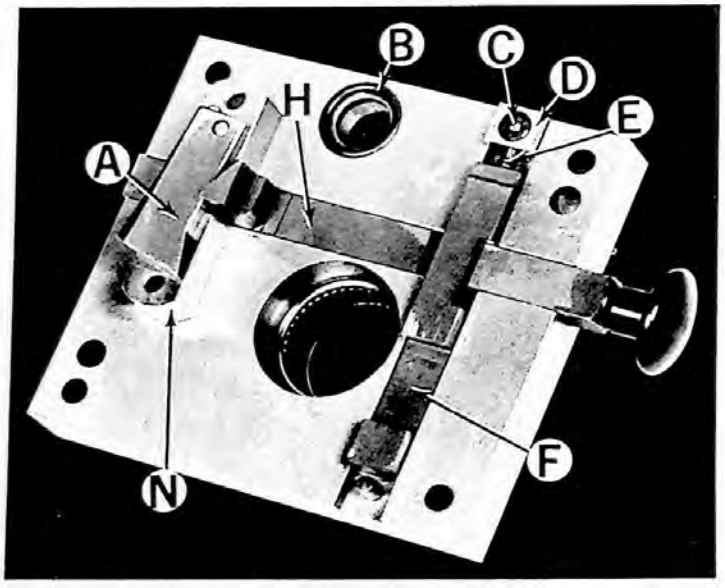


Figure 27 — Cover for Chasing Head

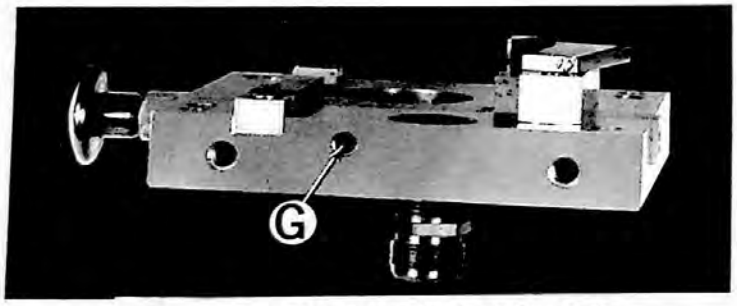


Figure 28 — Stop Screw for Lock Plunger

Figure 29 — Lock Plunger and Components

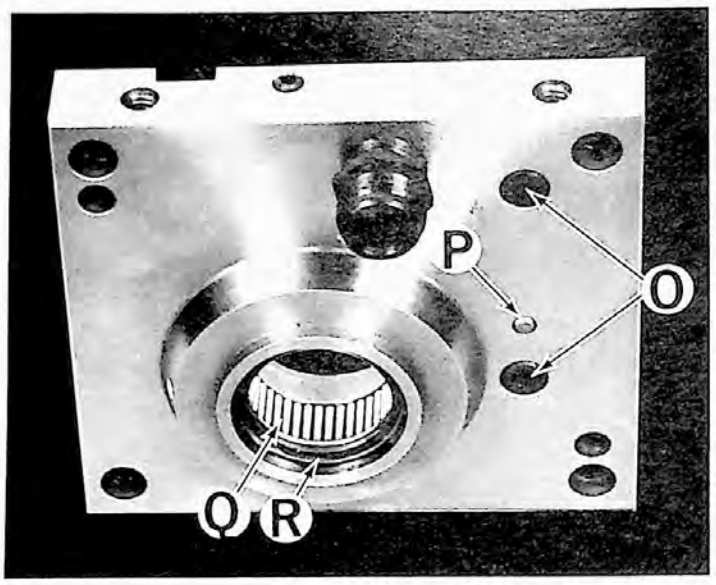


Figure 30 — Cover for Chasing Head

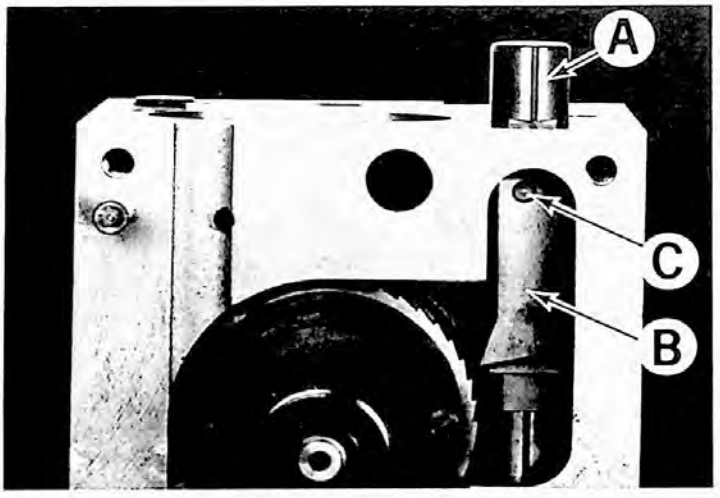


Figure 31 — Pawl and Pawl Post

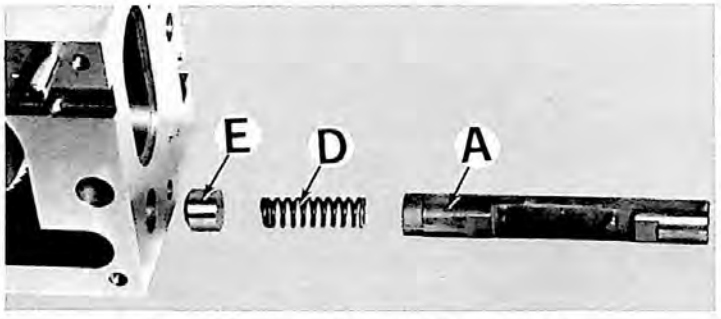


Figure 32 — Pawl Post and Components

13. Remove screw "L", Figure 35, and loosen stop screw under screw "L" until ratchet releases. Remove key "M", Figure 35 and retaining ring "N".

14. Remove ratchet "O", Figure 36. **CAUTION: Remove ratchet slowly while pushing in hole as shown, Figure 36, with a small rod to keep ratchet spring in place.**

15. Remove ratchet spring "P", Figure 37. Use needle nose pliers, Figure 38, to remove spring over pin "Q", Figure 37, and out of casting. **CAUTION: Release spring slowly.**

16. Remove lock screw "R", Figure 39. Remove slide stop pin "S". Use one screw "N", Figure 25, to pull slide stop pin as shown, Figure 40.

17. Remove tool slide "T", Figure 41.

18. Remove three screws "U", Figure 42. Remove cam "V", Figure 43, and camshaft "W".

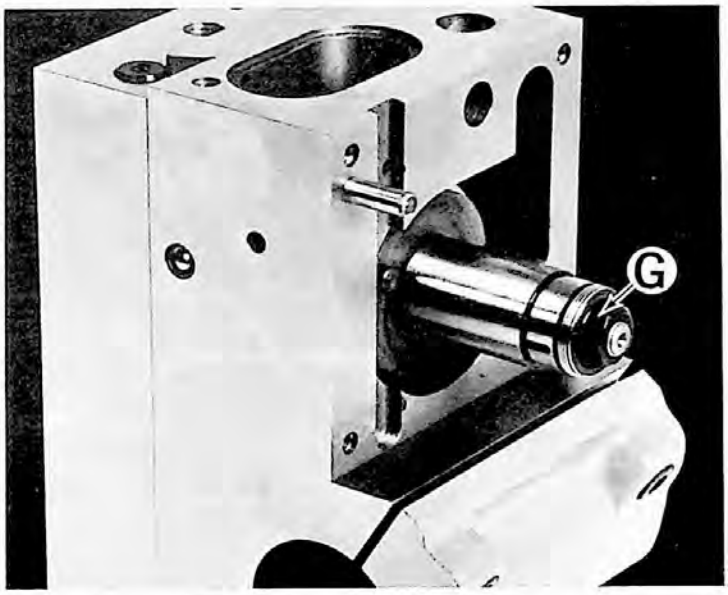


Figure 33 — Nut for Dial Sleeve

CHASING HEAD ASSEMBLY

1. Replace cam shaft "W", Figure 43. Line up keyway with key and replace cam "V". Replace three screws "U", Figure 42.

2. Lubricate matching dovetails on slides with M-88 Molylube and replace tool slide "T", Figure 41. If necessary for assembly loosen gib screws and readjust tool slide gib per instructions under "Tool Post Slide Gib Adjustment", on Page 14.

3. Replace slide stop pin "S", Figure 39, and replace lock screw "R". **NOTE:** Position tool slide by viewing through hole to properly locate slide stop pin with cam.

4. **CAREFULLY** coil ratchet spring "P", Figure 37, by hand, and replace spring with needle nose pliers, placing outside end over pin "Q".

5. Replace ratchet "O", Figure 36. Use small rod in hole, Figure 36, to line up inside end of ratchet spring with hole in backside of ratchet.

6. Replace retaining ring "N", Figure 35, and replace key "M".

7. Replace dial sleeve "K", Figure 34. Turn dial sleeve and ratchet "O", Figure 35, three full turns to the right. Hold ratchet and turn stop screw in hole "L" in until it prevents ratchet spring from unwinding.

8. Replace spring "J", Figure 34, spring retainer "H" and nut "G". Tighten nut "G" by turning until contact is made with stop screw in hole "L", Figure 35.

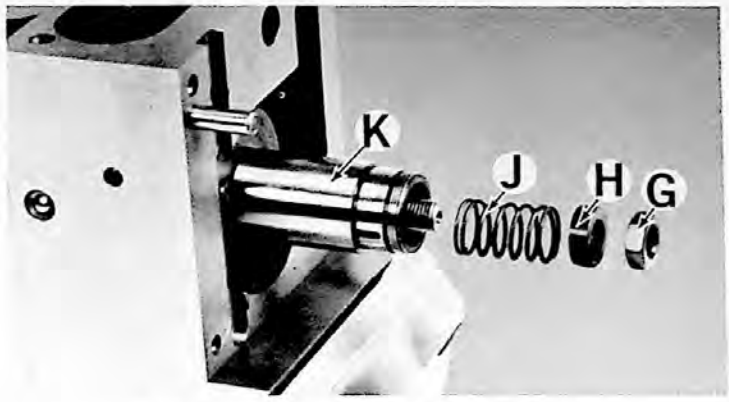


Figure 34 — Dial Sleeve and Components

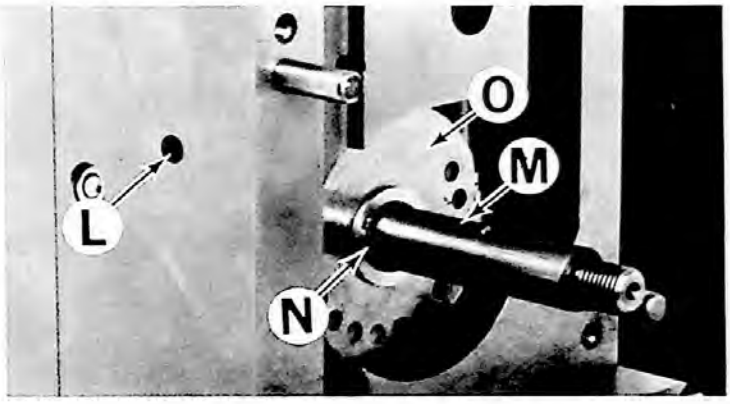


Figure 35 — Ratchet and Stop Screw

Figure 36 — Ratchet Removal

9. Replace spacer "E", Figure 32, and replace spring "D". Coat with M-88 Molylube and replace pawl post "A".

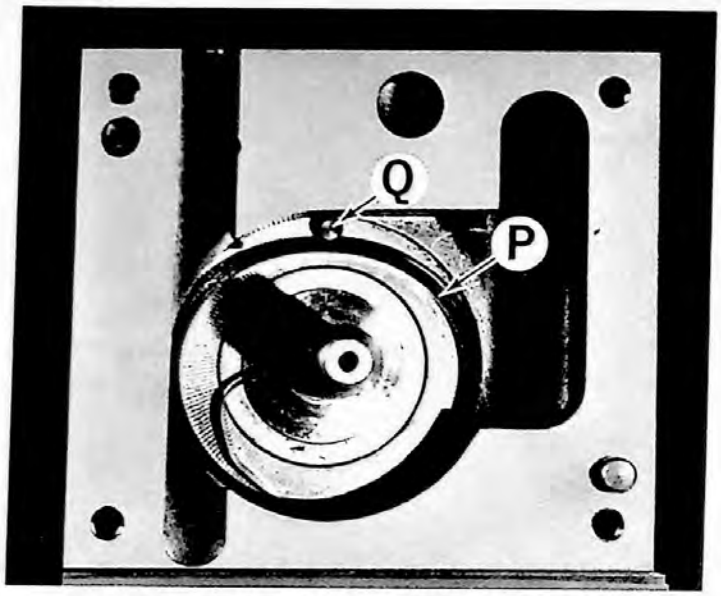


Figure 37 — Ratchet Spring

Figure 40 — Slide Stop Pin Removal

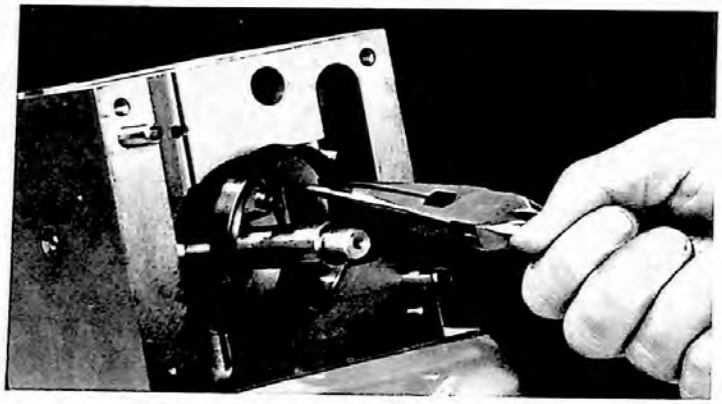


Figure 38 — Ratchet Spring Removal

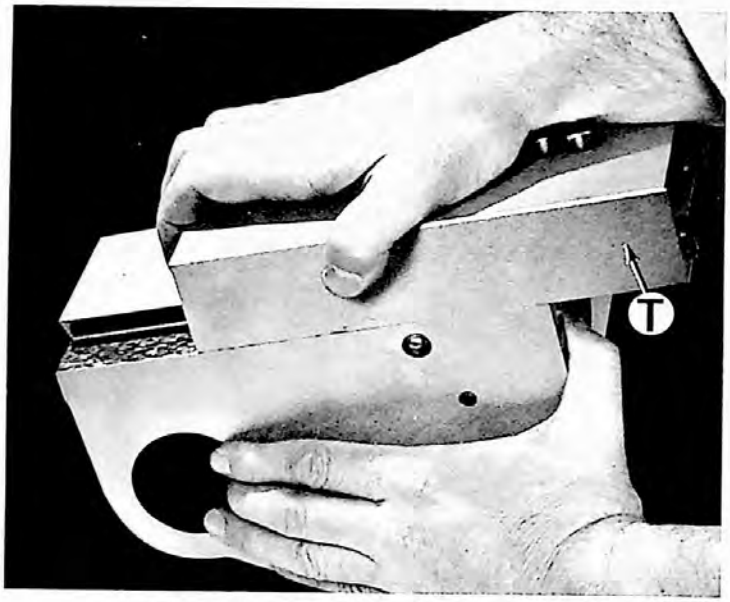


Figure 41 — Tool Post Slide Removal

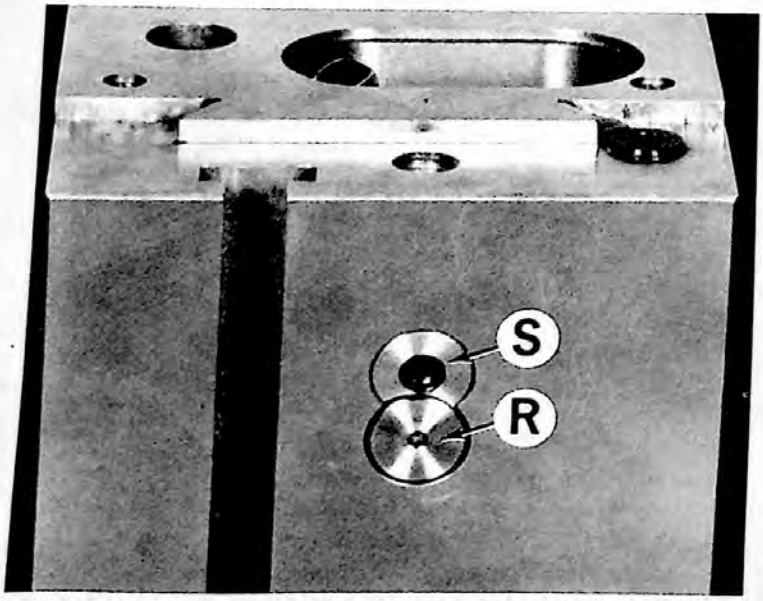


Figure 39 — Lock Screw and Slide Stop Pin for Tool Post Slide

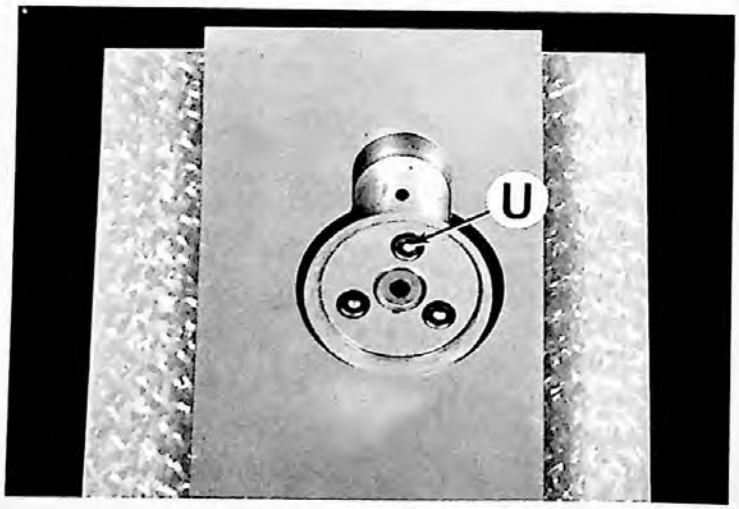


Figure 42 — Mounting Screws for Cam

10. Coat pawl "B", Figure 31, with M-88 Molylube and replace.

11. To reassemble cover "O", Figure 25:

(a) If removed, press needle bearing "Q", Figure 30, and seal "R" in cover.

(b) If removed, replace pawl block "N", Figure 27, dowel pin "P", and two screws "O", Figure 30.

(c) Coat with M-88 Molylube and replace lock plunger "H", Figure 27. Turn stop screw in hole "G", Figure 28, into elongated slot in plunger "H", Figure 29. Bottom stop screw and back off approximately one turn. Replace lock screw "G", Figure 28.

(d) Replace pin "M", Figure 29, spring "L" and screw "K".

(e) Coat plunger release bar "F", Figure 27, with M-88 Molylube and replace. Replace spring "E", block "D", and screw "C".

(f) Replace O-ring "B". Coat with M-88 and replace pawl "A".

12. Replace plunger spring "Q", Figure 26, and plunger "P".

13. With plunger release bar "F", Figure 27, in unlocked position as shown in Figure 27, start replacement of cover "O", Figure 44. As cover "O" is advanced push pawl "A" in to clear casting, pull cycle start knob "B" and push pawl post "C", in that order. Replace four screws "N", Figure 25. Adjust set screw "K", Figure 29, for six pounds pull to cock plunger "H". Replace lock screw "J".

14. Replace key "M", Figure 25.

15. Replace dial assembly "L", Figure 24, replace dial nut "K" and tighten two screws "J".

16. Pull and set white dial as close to 70 as it will engage. Turn stop screw in hole "L", Figure 35, to bring the 70 graduation line to the center of zero plug in cover. Replace lock screw in hole "L".

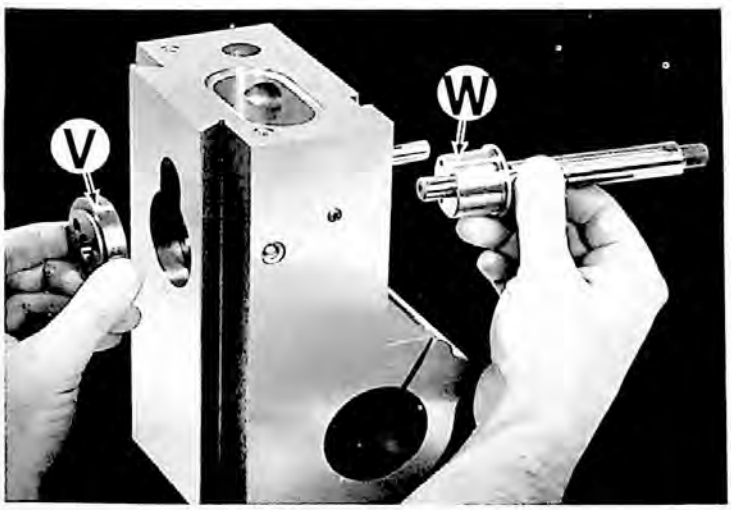


Figure 43 — Cam and Camshaft Removal

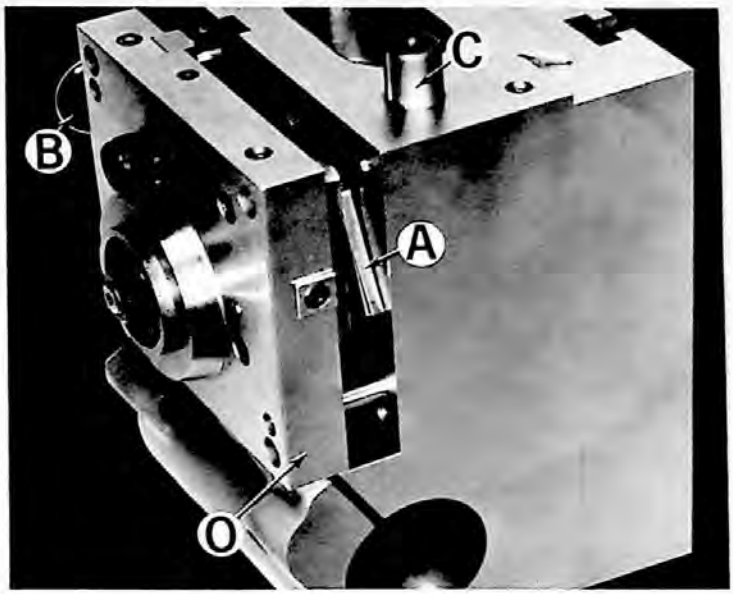


Figure 44 — Cover Replacement

17. Replace chasing head on chasing bar and tighten two bolts "H", Figure 23.

18. Replace micro switch cable and cable grip "E", Figure 22. Replace O-ring for micro switch.

19. Follow steps 5 through 8 under "Cycle Stop Micro Switch Replacement" Page 8.

20. With threading head engaged pull cycle start knob and while holding threading head, loosen two bolts "H", Figure 23. Set threading head at 20° off vertical Figure 45. Tighten bolts "H".

21. Replace bracket "F", Figure 23 per instructions under "Guide Bar Support Bracket" in operator's manual.

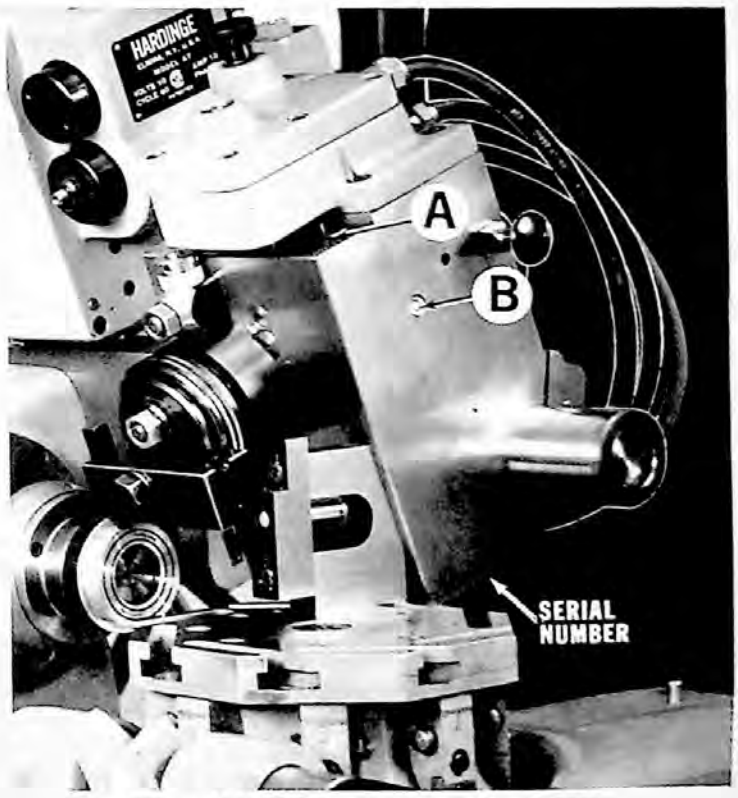


Figure 45 — Setting Threading Head Angle

TOOL POST SLIDE GIB ADJUSTMENT

After considerable use it may be necessary to adjust the tool post slide gib. The gib is the tapered type and adjustment is made from the large end shown in Figure 45.

1. Follow steps 2 and 16 under "Chasing Head Disassembly", Page 8.
2. Insert ¼" hexagon wrench in adjusting screw "A", Figure 45 and Figure 46. Loosen one full turn.
3. Push wrench on through into adjusting screw "B", Figure 46. Advance adjusting screw "B" a fraction of a turn.
4. Pull wrench out of "B" and tighten "A" until snug. Do not overtighten.
5. Test tool slide for "feel"—the slide should have a slight drag but should not bind.

NOTE: Excessive gib pressure or drag does not improve performance.

LUBRICATION

LUBRICATE LEAD SCREW AND FOLLOWER with Die Makers Grease. Clean lead screw and follower daily during a production run and relubricate.

OIL CUP "B", Figure 45, ON SIDE OF CHASING HEAD should be filled weekly with Mobil Velocite No. 6 for lubrication of slide stop pin and cam.

For proper lubrication, AUTOMATIC THREADING UNIT SHOULD BE CYCLED AT LEAST ONCE A WEEK when not in regular use.

KNOCKOUT ARM GUIDE BAR "C", Figure 47, is a solid carbide strip. To insure proper operation of arm, it should be kept lubricated with Die Makers Grease. Clean guide bar daily and re-lubricate.

NOTE: Oil base cutting fluids are recommended for maximum life of automatic threading attachment.

THREADING UNIT SERIAL NUMBER

The serial number for the automatic threading unit is located on the underside of the attachment on the dovetail of the main casting, Figure 45. This serial number should be included in all correspondence regarding this unit.

CHASING KNOCKOUT CONTROL DISASSEMBLY

1. Disconnect air line at control unit and turn disconnect switch on main control case to "Off".
2. Loosen cable grips "A" and "B", Figure 48.
3. Remove air line connector "C". Push electric cables into housing to allow slack for valve housing removal.
4. Remove four screws "D", Figure 49, and remove valve housing over two dowel pins "E".
5. Remove screw "F", Figure 50, and white wire. Remove black wire from "common" terminal on micro switch "G".
6. Remove wire from terminal screw "J" and remove wire from "normally open" terminal on micro switch "G".
7. If necessary, remove two O-rings "K".
8. To remove air valve "L":
   (a) Remove red wire from terminal "M", Figure 51.
   (b) Remove three remaining screws "F", Figure 50, and remove air valve.
   (c) Remove coupling "N", felt "O", washer "P", spring "Q" and nipple "R".
   (d) Remove exhaust silencer "S", coupling "T", nipple "U" and elbow "V".
9. To remove micro switches:
   (a) Remove remaining wires from micro switches.
   (b) Remove two screws, nuts and washers "W", Figure 52, and remove micro switches "G" and "H", Figure 50.

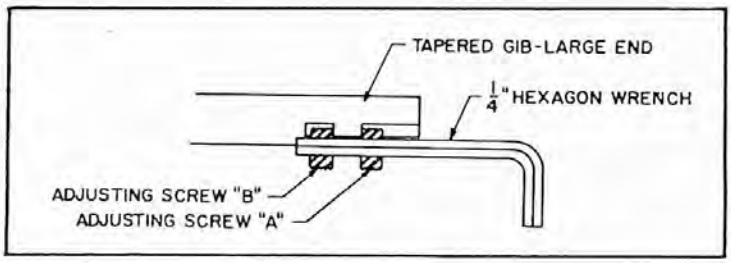


Figure 46 — Taper Gib Adjustment

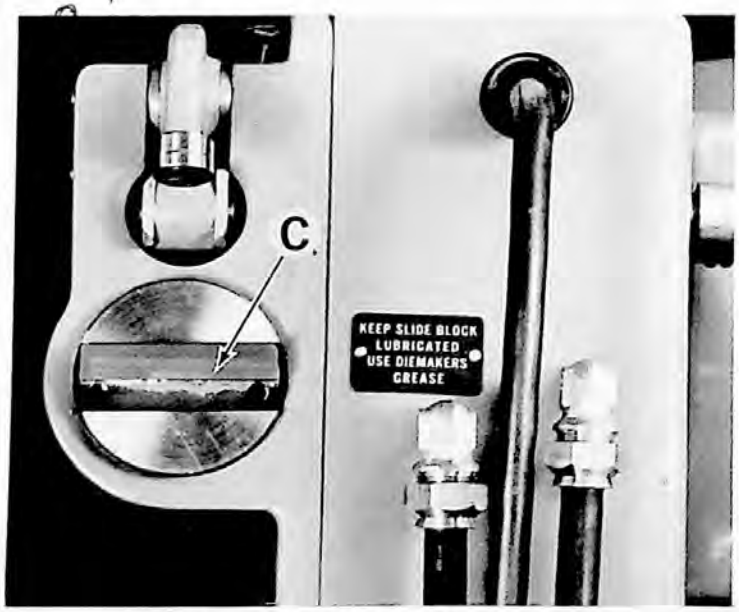


Figure 47 — Knockout Guide Bar

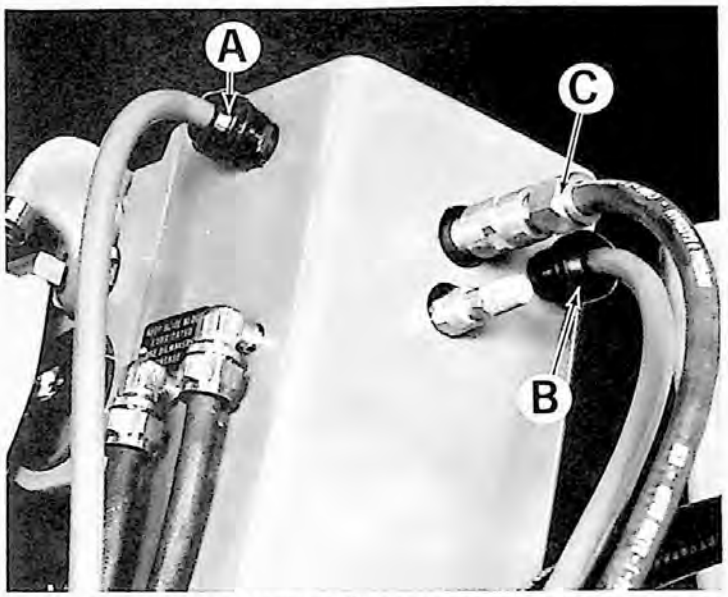


Figure 48 — Air and Electrical Connections for Knockout Control

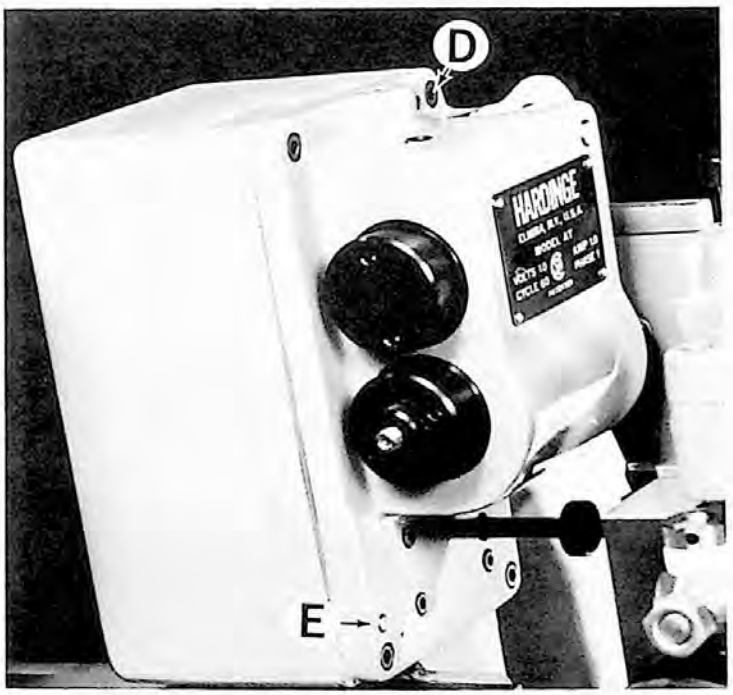


Figure 49 — Knockout Control

10. To remove micro switch mount "X", Figure 52:
    (a) Remove two set screws "Y" and remove stop collars "Z" and "A" from trip screw. **DO NOT MISPLACE BRASS PLUGS** under screws "Y".
    (b) Remove four screws "B", Figure 53, and remove mount for micro switches.
    (c) Remove retaining ring "C", Figure 54. Push trip screw "D" down inside mount and remove retaining ring "F". Loosen set screw "G", remove trip screw "D", cam "H" and springs "J".
11. To remove guide bar and knockout piston:
    (a) Remove set screw "A", Figure 55. Remove adjusting collar "B". **DO NOT MISPLACE BRASS PLUG** under set screw "A".
    (b) Use face spanner wrench to remove nut "C".
    (c) Remove spring "D", Figure 56, and remove nut "E", Figure 57.
    (d) Remove piston shaft "F", Figure 58.
    (e) If necessary, loosen two screws "G" and drive out pin "H" to remove guide bar "J".
    (f) Remove piston plate "K", Figure 59, O-ring "L", piston-ring "M", seal "N" and O-ring "O".
    (g) Remove O-ring "P", Figure 60, if necessary.
12. To remove roller clamp piston:
    (a) Use face spanner wrench to remove nut "Q", Figure 55. Remove spring "R", Figure 61.
    (b) Remove nut "S", Figure 62.
    (c) Loosen set screw "T", Figure 61, and drive out dowel pin "U" from opposite side shown. Remove piston shaft, Figure 63.
    (d) If necessary, loosen set screw "V" and drive out dowel pin "W" to separate piston shaft "X" and bracket "Y". Cam follower "Z" is removed with a standard screw driver.
    (e) Remove piston plate "A", Figure 64, O-ring "B", piston ring "C", seal "D" and O-ring "E".
    (f) Remove O-ring "F", Figure 65, if necessary.

CHASING KNOCKOUT REASSEMBLY

NOTE: Lubricate O-rings, seals and cylinder walls with Mobil Velocite No. 6 or equivalent during reassembly.

1. To replace roller clamp piston:
    (a) Replace O-ring "F", Figure 65.
    (b) Replace cam follower "Z", Figure 63. Replace dowel pin "W" through bracket "Y" and piston shaft "X". Tighten set screw "V".
    (c) Replace piston shaft, Figure 63. Replace dowel pin "U", Figure 61, and tighten set screw "T".
    (d) Replace O-ring "E", Figure 64, in seal "D". Replace O-ring and seal on piston ring "C" and replace piston ring "C". **NOTE: Use nut "Q", Figure 55, to start these parts in cylinder wall liner.**
    (e) Replace O-ring "B", Figure 64, piston plate "A" and nut "S", Figure 62.
    (f) Replace spring "R", Figure 61, and nut "Q" Figure 55.

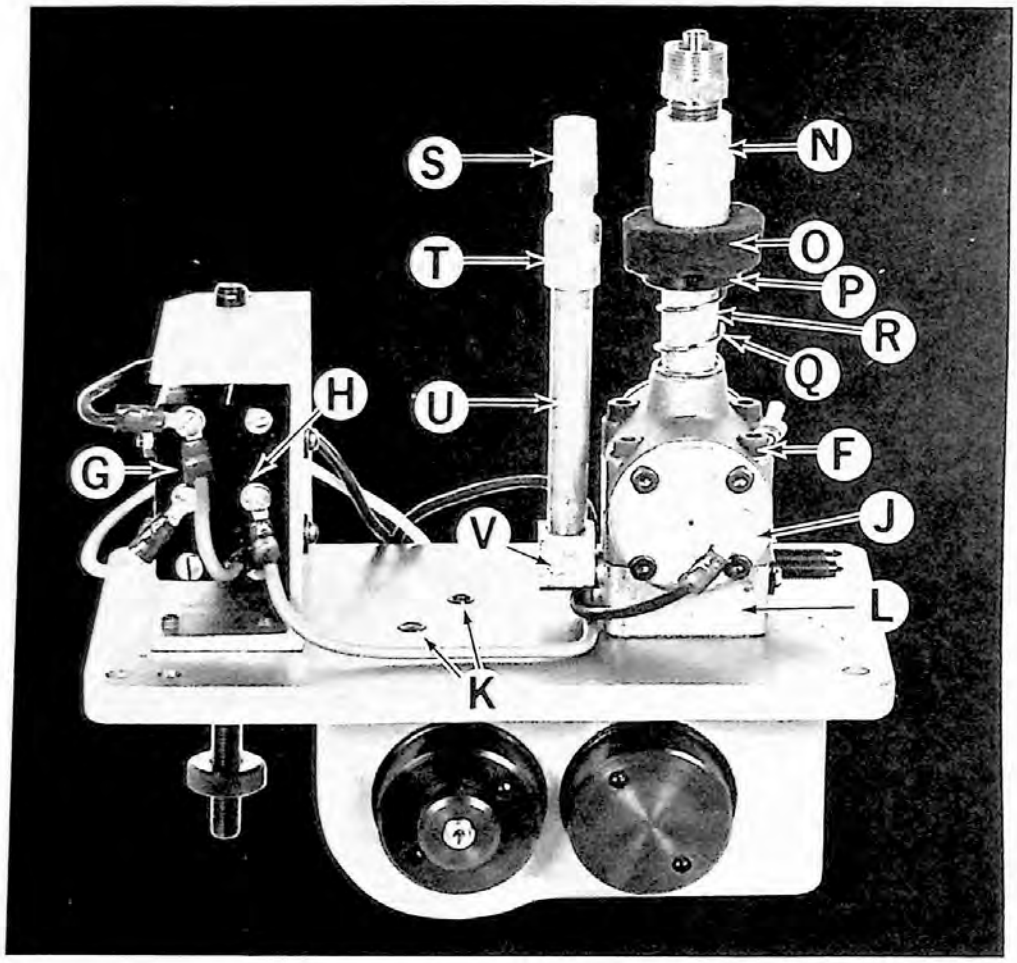


Figure 50 — Knockout Control

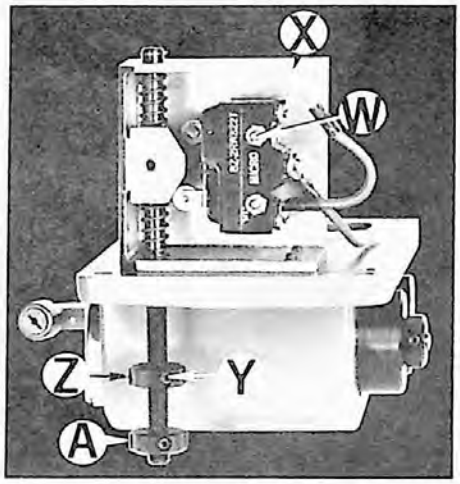


Figure 52 — Micro Switches and Trip Collars

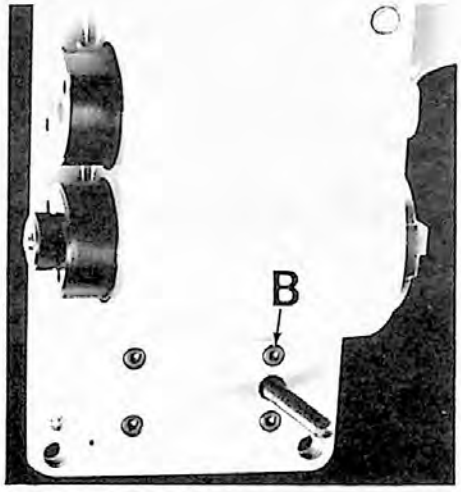


Figure 53 — Bolts for Switch Mount

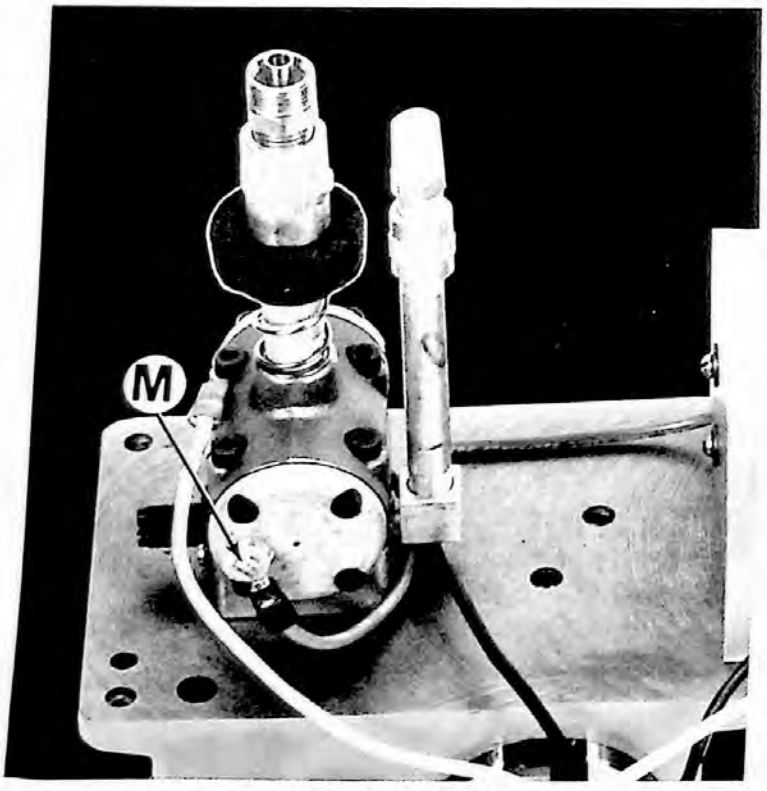


Figure 51 — Knockout Control Air Valve

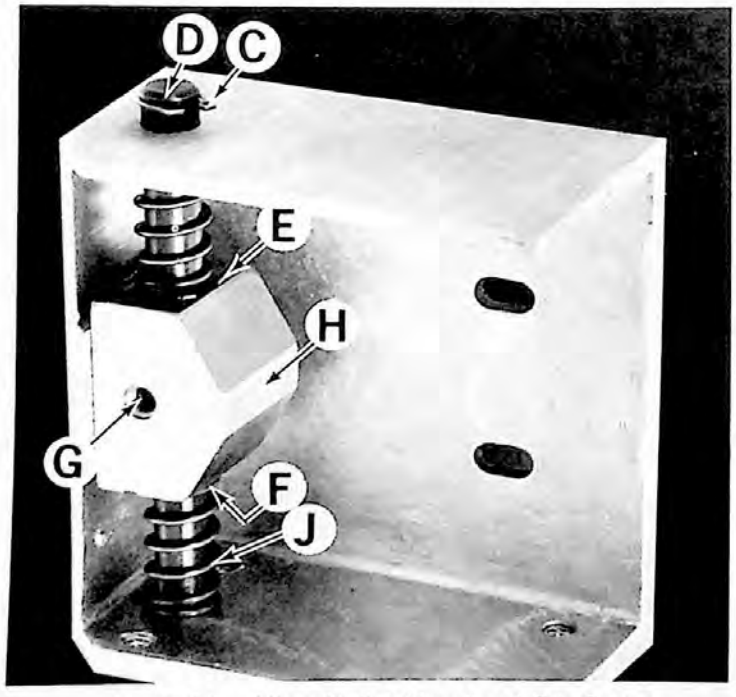


Figure 54 — Micro Switch Mount and Trip Screw

2. To replace guide bar and knockout piston:
   (a) Replace O-ring "P", Figure 60.
   (b) Replace guide bar, "J", Figure 58, and replace pin "H". Adjustment of two screws "G" will be made after knockout assembly is replaced on machine.
   (c) Replace piston shaft "F", Figure 58. Line up dowel pin "Q", Figure 60, with locating hole in piston.
   (d) Replace O-ring "O", Figure 59, in seal "N". Replace O-ring and seal on piston ring "M" and replace piston ring "M". **NOTE: Use nut "C", Figure 55, to start these parts in cylinder wall liner.**
   (e) Replace O-ring "L", Figure 59, piston plate "K" and nut "E", Figure 57.
   (f) Replace spring "D", Figure 56, and nut "C", Figure 55.
   (g) Replace adjusting collar "B". Replace brass plug and set screw "A". Adjustment of collar "B" will be made after knockout assembly is replaced on machine.
3. To replace micro switch mount "X", Figure 52:
   (a) Replace trip rod "D", Figure 54, in mount while replacing springs "J", three retaining rings and cam "H". Tighten set screw "G".
   (b) Replace mount and four screws "B", Figure 53.
   (c) Replace stop collars "Z" and "A", Figure 52, two brass plugs and two screws "Y". Adjustment of stop collars will be made after knockout assembly is replaced on machine.
4. To replace micro switches:
   (a) Replace micro switches "G" and "H", Figure 50, two screws, washers and nuts "W", Figure 52. Mount micro switches as shown Figure 52. Clearance in mounting holes will allow micro switches to be set so that movement of trip rod in either direction will trip the intended switch and both will be released at rest position.
   (b) Replace red wire from air valve on "normally open" terminal of micro switch "H", Figure 50. Replace red jumper wire on "common" terminal of switch "H".

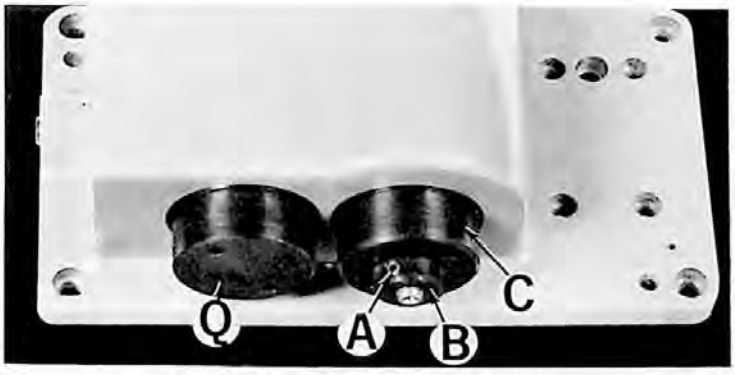


Figure 55 — Cover Nuts for Pistons

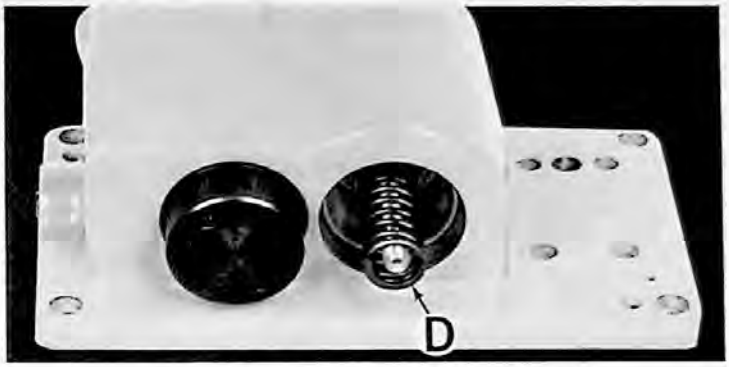


Figure 56 — Spring for Knockout Piston

5. To replace air valve:
   (a) Replace air valve and three screws "F", Figure 50. **NOTE: Spring "A", Figure 66, must be in hole "B".** Adjusting screws "C" control air exhaust rate and are set in "open" position. Turn screws "C" counterclockwise to limit.
   (b) Replace elbow "V", Figure 50, nipple "U", coupling "T" and exhaust silencer "S".
   (c) Replace nipple "R", spring "Q", washer "P", felt "O" and coupling "N".
   (d) Replace red wire on terminal "M", Figure 51.
6. Replace two O-rings "K", Figure 50.
7. Replace final screw "F" and white wire from main switch case. Replace black wire from same cable and red jumper wire on "common" terminal of micro switch "G".
8. Replace wire from chasing head on terminal screw "J" of air valve. Replace wire from same cable on "normally open" terminal of switch "G".
9. Replace valve housing over two dowel pins "E", Figure 49, and replace four screws "D".
10. Pull slack from electric cables out of housing and tighten cable grips "A" and "B", Figure 48.
11. Replace air line connector "C".
12. Turn disconnect switch on main control case to "On".
13. To adjust stop collar "A", Figure 52:
   (a) Raise automatic threading unit and push the threading attachment toward headstock. Place 1/32" shim at "A", Figure 67, and lower threading unit in to operating position. Pull cycle start knob.
   (b) Turn collar slowly into trip fork until click is heard from solenoid in air valve. Tighten lock screw in collar to maintain setting and remove shim. Connect air line at control unit.
14. Adjust guide bar "J", Figure 58, stop collar "Z", Figure 52, or adjusting collar "B", Figure 55, per instructions in "Operator's Manual for Automatic Threading Units on Model HC Chucking Machines" under "Parallelism", "Thread Length Adjustment" and "Threading Tool Retraction" respectively.

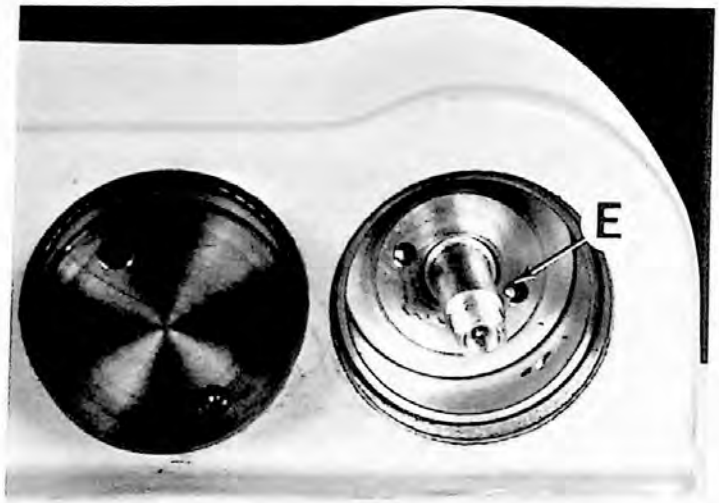


Figure 57 — Spanner Nut for Knockout Piston

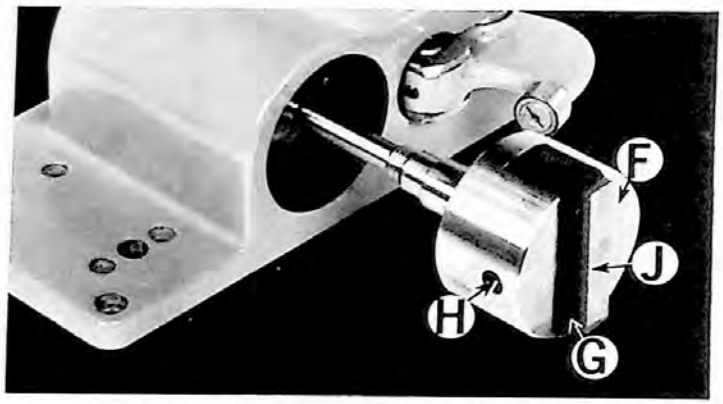


Figure 58 — Knockout Piston Shaft Removal

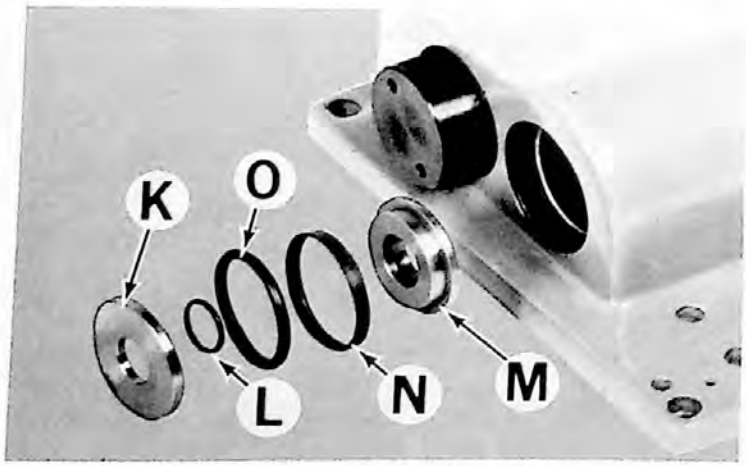


Figure 59 — Piston Rings and Seals for Knockout Piston

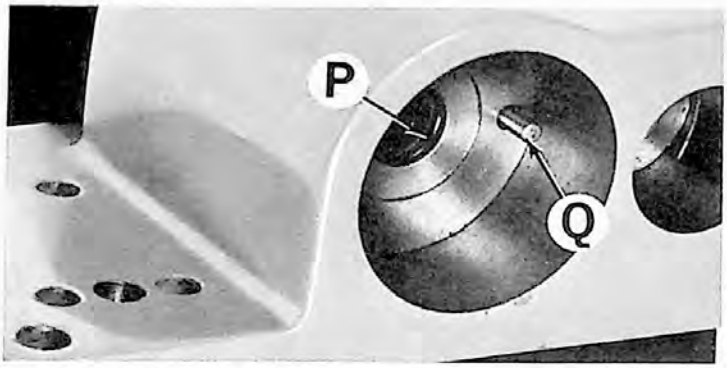


Figure 60 — Seal and Locating Pin for Knockout Piston

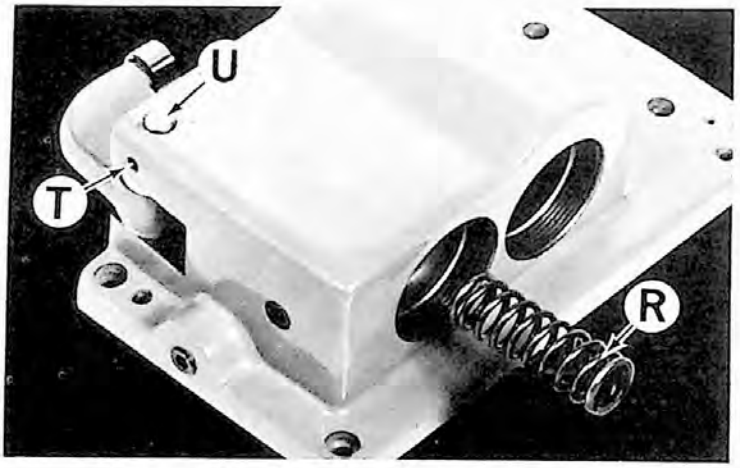


Figure 61 — Spring for Roller Clamp Piston

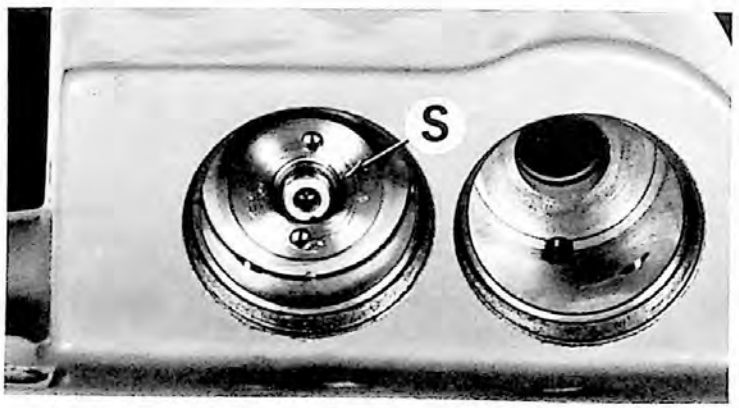


Figure 62 — Spanner Nut for Roller Clamp Piston

MOUNTING BRACKET AND CHASING BAR ASSEMBLY

The mounting bracket and chasing bar assembly "B", Figure 67, is housed as a unit and is properly sealed to exclude dirt and foreign matter. The super-honed chasing bar rides on 144 selected, properly greased, balls in two bearing races.

All adjustments, including spring tension are factory set in this proven trouble free unit.

If the chasing bar appears to be hanging up, mounting nuts "C" are probably unevenly or over tightened causing distortation in the mounting bracket.

Should this assembly ever require service, return threading unit to factory. Unit should be properly greased to prevent rust.

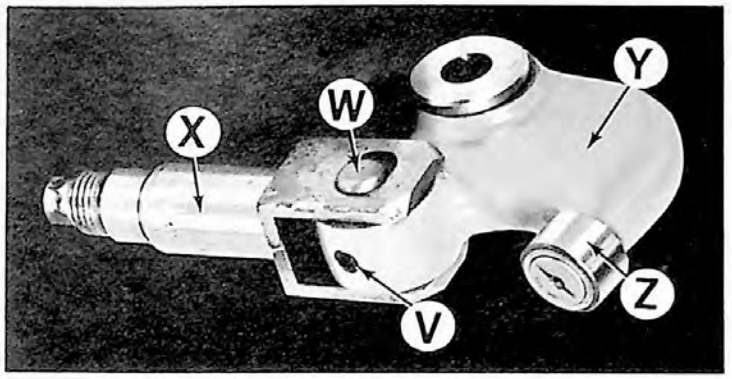


Figure 63 — Roller Clamp Piston Shaft

Figure 64 — Piston Rings and Seals for Roller Clamp Piston

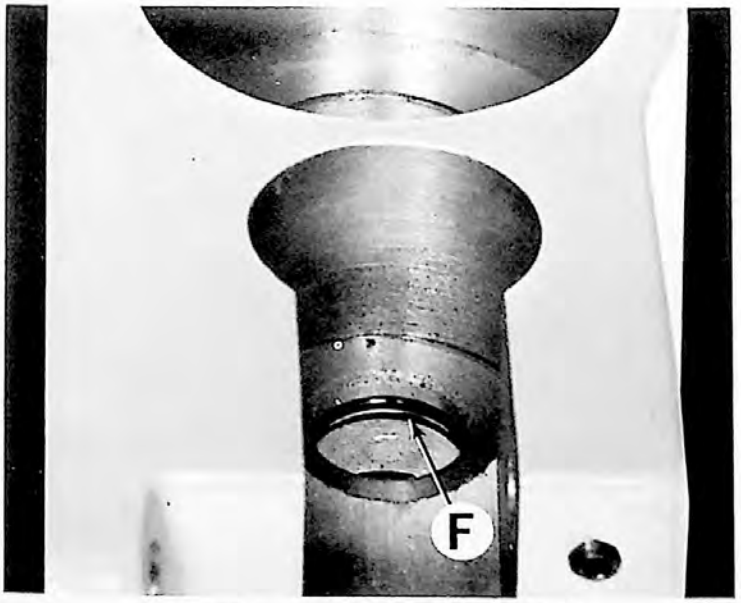


Figure 65 — Seal for Roller Clamp Piston

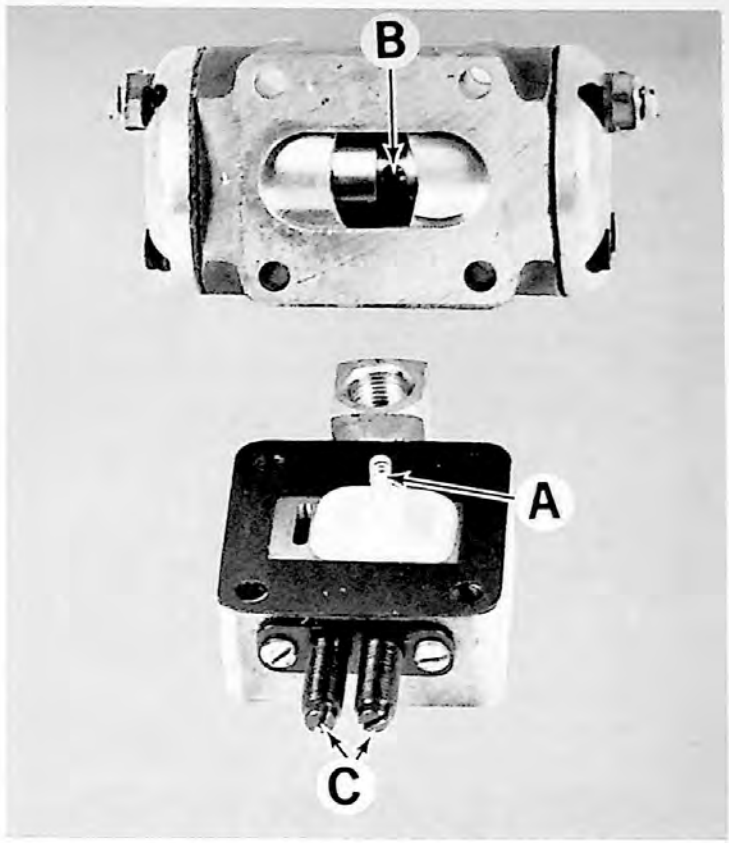


Figure 66 — Air Valve for Chasing Knockout

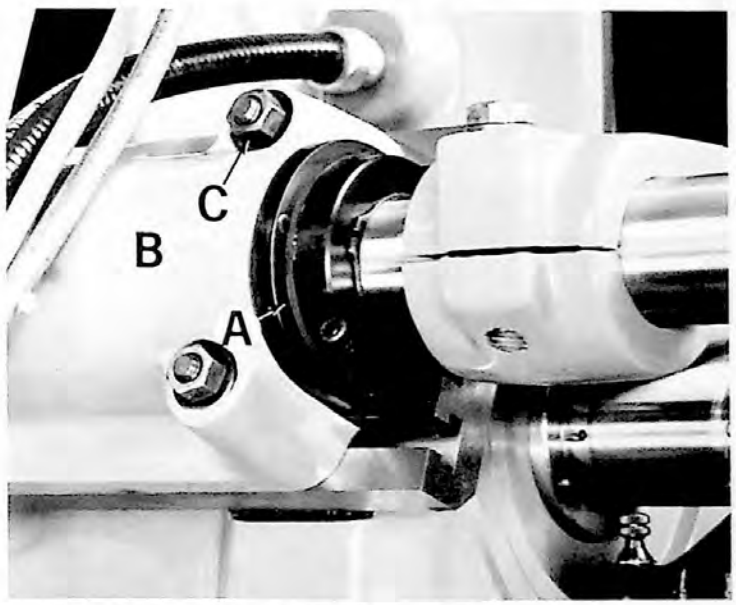


Figure 67 — Mounting Bracket and Chasing Bar Assembly

LUBRO-CONTROL UNIT

The chasing attachment or air collet closer, which is operated through the lubro-control unit, is lubricated automatically through an air-oil system. Lubricating oil is fed to the operated unit each time the air flow changes.

To fill reservoir, disconnect air source or set air pressure at zero and remove filler plug "B", Figure 68. Fill to bottom of filler hole with Mobil Vactra Oil #2 or equivalent. Maintain oil level above sight window "A", Figure 69.

Sight window "G", Figure 69, will visibly show oil passage through unit. Brass rod in window will move up and down with changes in air flow.

For effective performance, **DRAIN FILTER RESERVOIR WEEKLY.** Open drain cock "D", Figure 68, and permit flow of air until mist has stopped. If excessive water problem exists, add heavy duty filter to air supply line.

Incoming air for lubrication and collet closer or threading attachment operation is filtered at reservoir. **CLEAN FILTER ELEMENT EVERY SIX MONTHS.**

To clean filter:

Disconnect air line and remove cover "E", Figure 68, with face spanner wrench. Remove nut "C", Figure 69, strap "H" and shroud "J". Remove nut, washer and filter "F", Figure 70. Wash filter with Varsol and blow out with compressed air. Apply lubricant to O-ring on cover "E", Figure 68, when replacing.

FOR REPAIRS TO THIS UNIT, SEE SEPARATE INSTRUCTIONS AND PARTS LIST, FORM M-30.

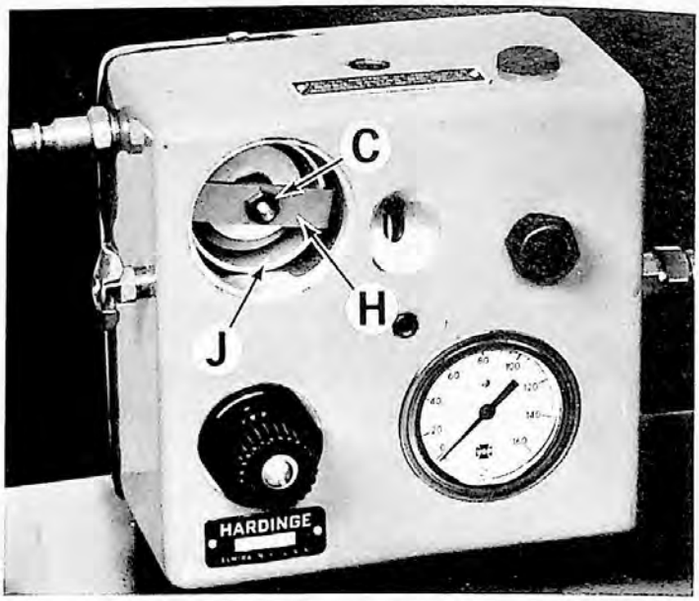


Figure 69 — Filter Removal

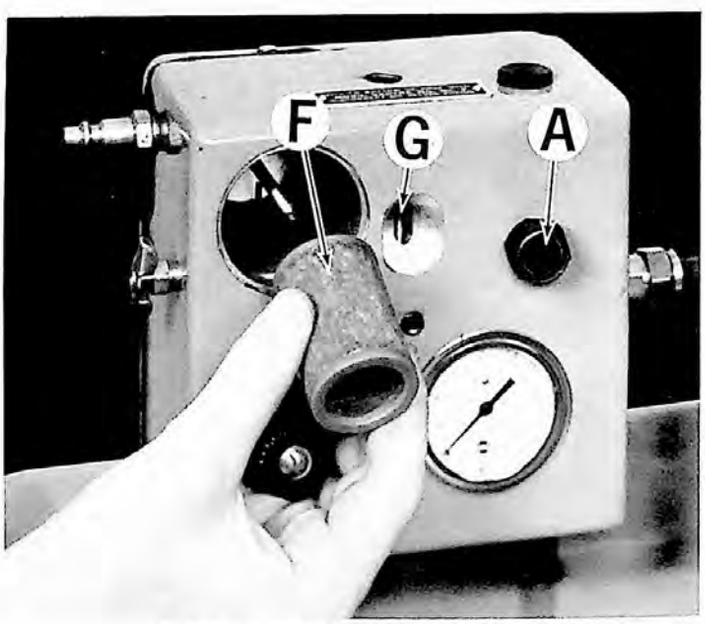


Figure 70 — Filter for Lubro-Control Unit

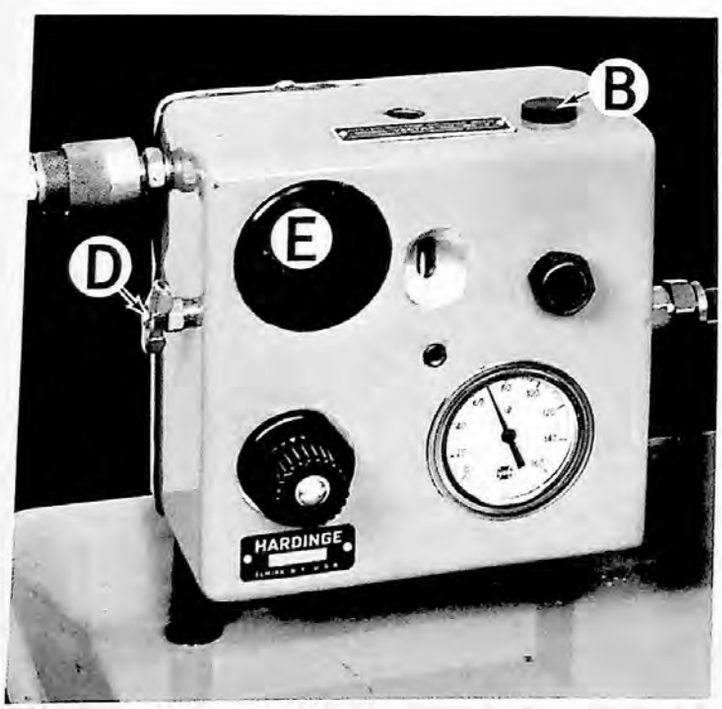


Figure 68 — Lubro-Control Unit