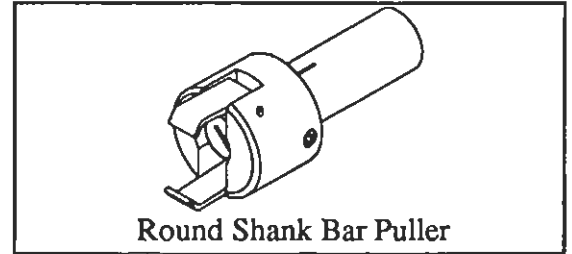
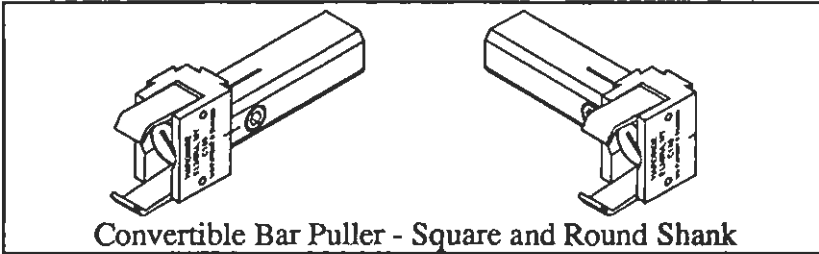


# Hardinge Bar Puller for All CNC, Automatic, and Manual Lathes



The Hardinge Convertible Bar Puller can be mounted in the square tooling slots of the machine's turret or tool holders and in the round shank holders used for drills, taps, reamers and round shank boring bars. The head of this bar puller has two male dovetails 90 degrees from each other allowing the unit to be mounted parallel to the shank, or perpendicular to it. The shank has a female dovetail clamp built into one of the ends.

The Hardinge Round Shank Bar Puller is mounted in the round shank holders used for drilling & boring, etc.

## For Use On Most CNC Lathes

- To use the Convertible Bar Puller in a round shank holder the scribe mark on the shank is aligned with the scribe mark on the head. In this position the center of the jaws will be on the centerline of the round shank. See Figure 1.

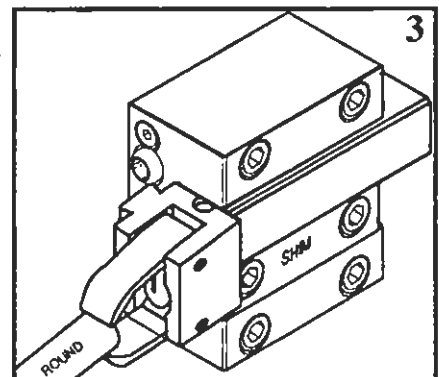
|  |          |
|--|----------|
| <p>— To Put Head on Centerline of the Shank —<br/>For use in Round Shank Holders:</p>  | <p>1</p> |
| <ul style="list-style-type: none"> <li>Loosen socket head cap screw on the shank</li> <li>Position scribe line on head to scribe line on shank</li> <li>Lock socket head cap screw securing head to the shank</li> </ul> |          |

- To use the Convertible Bar Puller ( 3/4" square/1" round shank, and 1" square/1-1/4" round shank) the top of the head is set flush to the top of the shank. In this position the bottom of the shank is on the centerline of the gripping jaws. See Figure 2.

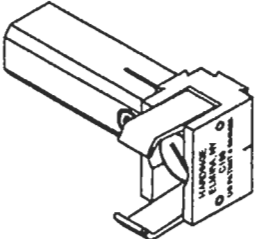
|   |                            |
|---|----------------------------|
| <p>— To Put Top of Head Flush with Top of the Shank —<br/>For use in Square Shank Holders and on Flat Turrets</p>   | <p>Flat Plate</p> <p>2</p> |
| <ul style="list-style-type: none"> <li>Loosen socket head cap screw on the shank</li> <li>Position flat plate on top of head</li> <li>Slide shank up until flush with plate and top of head</li> <li>Lock socket head cap screw securing head to the shank</li> </ul> |                            |

- When in use, the bottom of the shank is positioned on the same plane as the tip of the tool. A 3/4" shim is used under the shank of the bar puller for a machine which takes 3/4" square tool. A 1" shim is used under the shank of the bar puller for a machine which takes 1" square tools, etc. See Figure 3.

- In this position the bottom of the shank is on the centerline of the gripping jaws. When in use, the bottom of the shank is positioned on the same plane as the tip of a cutting tool.



- When pulling hex, square and octagonal stock, and when pulling round stock where there is no tailstock, the head is mounted with the jaws parallel with the bar stock.

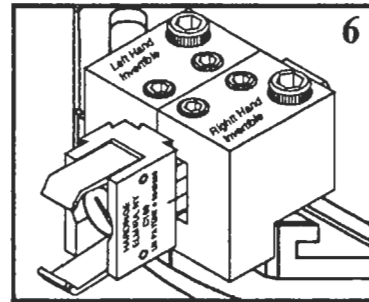
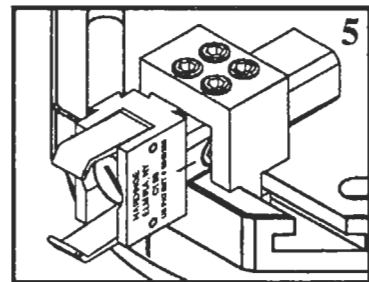
|  |   |
|--|---|
| <p>— To Put the Top of the Head 90° to of the Shank —</p>  |  |
| <ul style="list-style-type: none"> <li>• Loosen socket head cap screw on the shank</li> <li>• Remove head from shank and slide on other dovetail</li> <li>• Depending on use, align using procedures on page 1</li> <li>• Lock socket head cap screw securing head to the shank</li> </ul> |   |

## For Use on Flat Top Turret Plates

- The Bar Puller can be used on a flat top turret, such as a Hardinge CHNC®, AHC®, or HC™ lathe. The 3/4" Square/1" Round Convertible Bar Puller is used on turrets that require 3/8" square cutting tools. The shank and head are set using the scribe marks. See Figure 1.

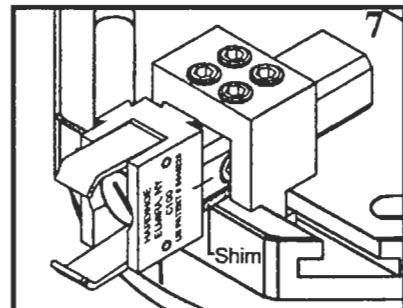
### 3/8" Top Plates

- An Invertible Double Tool Holder can be used to lock the shank to the top of the turret. The back face of the head is be located against the face of the turret to square up the unit. See Figure 5.
- An alternate method is to use a Right Hand Invertible Holder along with a Left Hand Invertible Holder. These holders are perpendicular to the face of the turret. See Figure 6.

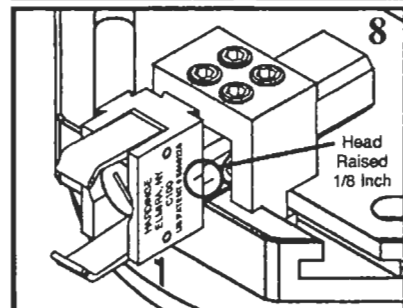


### 1/2" Top Plates

- If your lathe uses 1/2" square cutting tools, the 1" Square / 1-1/4 Round Convertible Bar Puller can be used directly on the top plate by the same methods shown in Figures 5 and 6.
- When using the 3/4" Square/1" Round Shank Convertible Bar Puller, put a 1/8" shim put under the shank to bring it to the spindle centerline, See Figure 7.

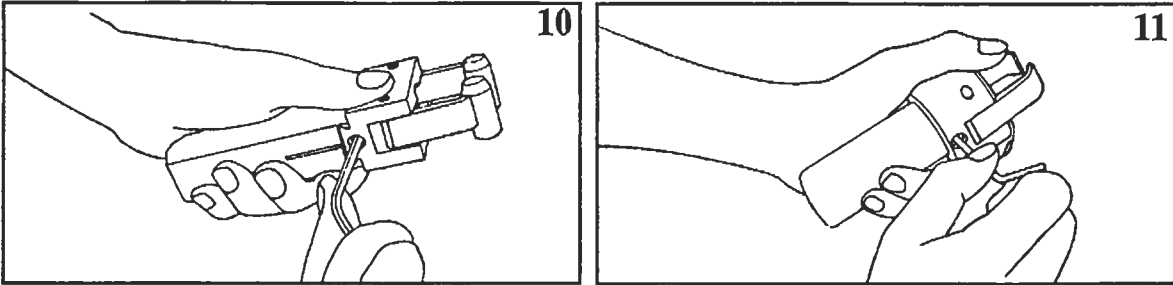


- An alternative method is to adjust the head vertically 1/8". A round bar can be used in the spindle of the machine as a guide for centering. See Figure 8.

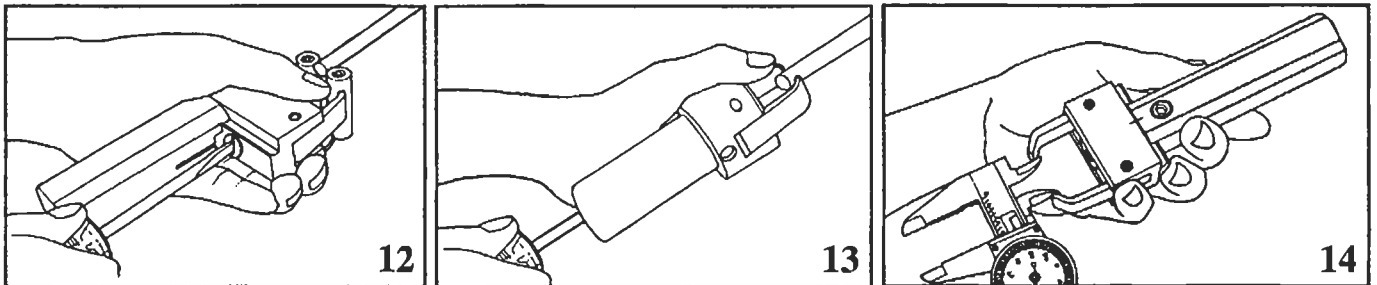


## Adjusting Jaws to Bar Stock

- Loosen the lock screw for the Adjusting Screw. See Figures 10 and 11



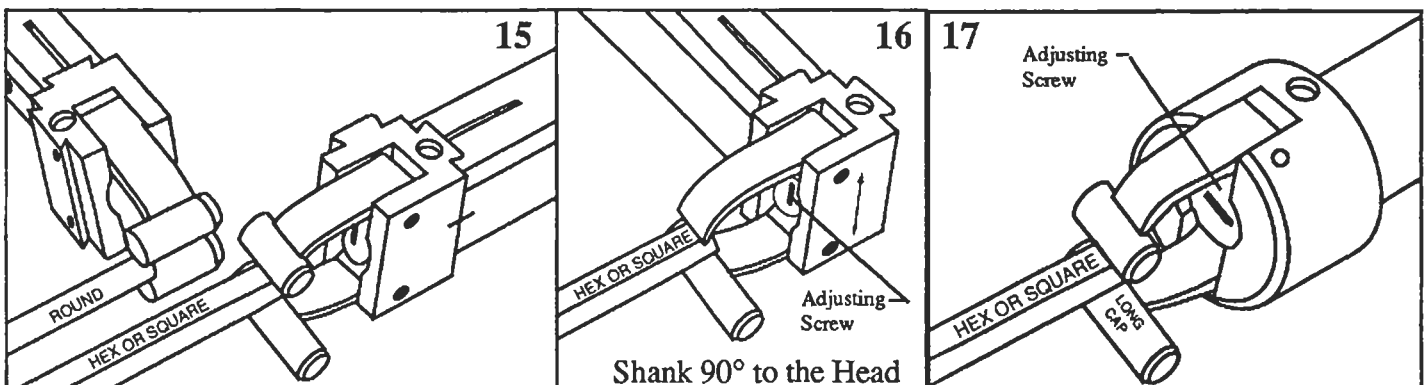
- Place a short piece of the bar stock between the jaw (when using hex and square bar stock, the caps should already be installed on the jaws if they are required) and turn the adjusting screw with a screwdriver until the jaws lightly touch the outside of the stock. See Figures 12 and 13.
- Remove the stock and continue to turn the adjusting screw 1/16 to 1/8 of a turn tighter (Counter-Clockwise.)
- Tighten the lock-screw. See figure 10 and 11.

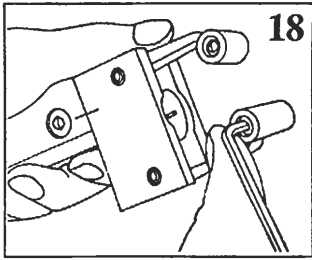


- Use a Dial Caliper and check the jaw opening. The opening should be at least .010" under the stock size and no more than .040" under the stock size. See Figure 14.

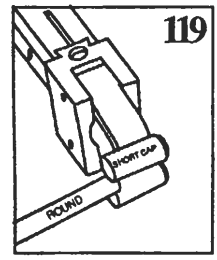
## When And How to Use Jaw Caps

- Jaw caps are used for pulling hex, octagon and square stock. The centerline of the cylindrical cap is always perpendicular to the centerline of the stock being pulled. A short cap is used on the top arm and a long cap is used on the bottom arm when using the round shank puller or when the head of the combination holder is set to the centerline of the shank. See figures 15 and 17.
- A single long cap can be used, on the bottom arm of the combination holder when the arms are parallel to the bar stock. The shank can be either perpendicular to the head (figure 15) or parallel to the head (not shown).
  - When the single long cap is used the head must be adjusted on the shank to center the top arm and the bottom cap on the centerline of the bar stock.
- Jaw Caps are used when pulling small diameter stock close to a tailstock center. See Figure 15.



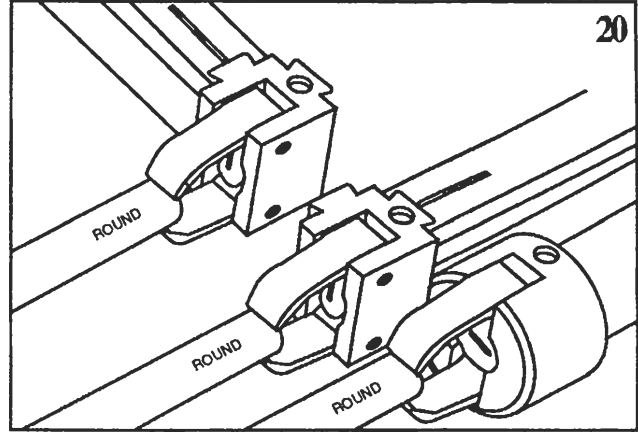


- To secure the cap on the jaws, loosen the lock screw in the cap. Place the arm into the slot in the cap. Tighten the lock screw. See Figure 18.
- When working with round stock which is to be pulled out close to a tailstock center, the head and jaws are positions perpendicular to the stock; the caps will be parallel to the stock. See Figure 19.



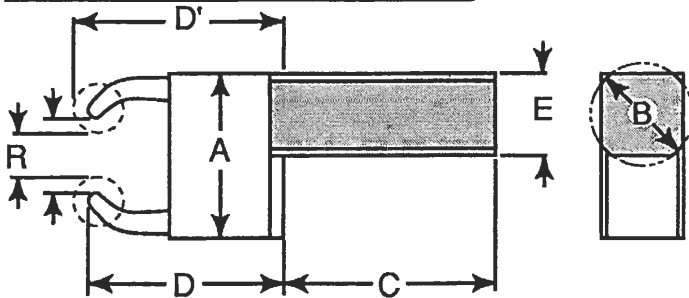
## When to Use the Standard Jaws Without Caps

- The standard jaws are used for round bar stock. Figure 20 shows the proper placement of the Bar Puller in relationship to the bar stock. The Bar Puller can grip bar stock very close to the spindle (Normally within .125"). The standard jaws allow for maximum diameter bars to be pulled.

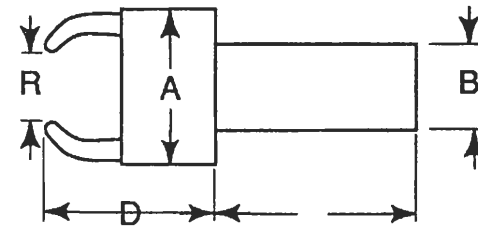


## Dimensional Information For Programming and Machine Set Up

**Combination Bar Puller - Side and End Working**



**Round Shank Bar Puller**



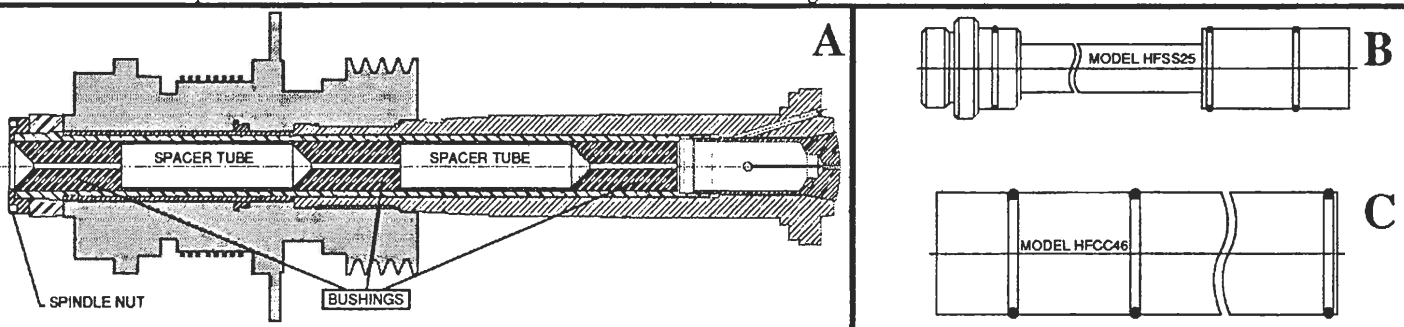
|                                  | A                | B                | C                | D                 | D'                      | E               | R                          |
|----------------------------------|------------------|------------------|------------------|-------------------|-------------------------|-----------------|----------------------------|
| <b>MODEL</b>                     | Head Diameter    | Shank Diameter   | Shank Length     | Head Length       | Head LENGTH TO Rd. GRIP | Shank Flat      | Grip Range                 |
| <b>C100</b><br>1821-00-00-000000 | 1-1/2"<br>38.1mm | 1"<br>25.4mm     | 2-1/2"<br>63.5   | 2-1/16"<br>52.4mm | 2-5/32<br>54.25mm       | 3/4"<br>19.05mm | 0" to 1-5/8"<br>0 - 38.1mm |
| <b>C125</b><br>1823-00-00-000000 | 2"<br>50.8mm     | 1-1/4"<br>31.8mm | 3-1/8"<br>79.4mm | 2-3/8"<br>60.3mm  | 2-1/2"<br>63.5mm        | 1"<br>25.4mm    | 0 to 2"<br>0-50.8mm        |
| <b>CM30</b><br>1824-00-00-000000 | 51mm<br>2.005"   | 30mm<br>1.181"   | 63mm<br>2.480"   | 60mm<br>2.362"    | 63mm<br>2.480"          | 23mm<br>.905"   | 0-52mm<br>0-2.005"         |

|                                  | A              | B                | C                | D                | R                  |
|----------------------------------|----------------|------------------|------------------|------------------|--------------------|
| <b>Rd. Shank</b>                 | Head Diameter  | Shank Diameter   | Shank Length     | Head Length      | Grip Range         |
| <b>MODEL</b>                     | Head Diameter  | Shank Diameter   | Shank Length     | Head Length      | Grip Range         |
| <b>F125</b><br>1817-00-00-000000 | 2"<br>50.8mm   | 1-1/4"<br>31.8mm | 2-3/4"<br>69.9mm | 2-3/8"<br>60.3mm | 0 - 2"<br>0-50.8mm |
| <b>FM30</b><br>1819-00-00-000000 | 51mm<br>2.005" | 30mm<br>1.181"   | 63mm<br>2.480"   | 60mm<br>2.362"   | 0-51mm<br>0-2.005" |

# Spindle Liners for Hardinge Machines

| Part Number            | Model Number | Bar Stock Range                                   | Inside Dia.  | DSM-Five-Nine® | HC™ & HCAT | HNC® | CONQUEST® GT | SUPERSLANT® | HXL® (16C) | CHNC® I/II+ | CONQUEST 42/SP | CONQUEST T42/SP | CONQUEST T42/SP- BB | CONQUEST 51 | CONQUEST 65 / 51BB | ILLUSTRATION |   |
|------------------------|--------------|---|--------------|----------------|------------|------|--------------|-------------|------------|-------------|----------------|-----------------|---------------------|-------------|--------------------|--------------|---|
| <b>HC-9086-T</b>       |              | Set of Four(4) Spindle Liners                     |              |                | <b>X</b>   |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| HC-0009072             |              | 3/32" to 9/64"(2.4 to 3.5)                        |              |                | X          |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| HC-0009073             |              | 5/32" to 15/64"(3.9 to 5.9)                       |              |                | X          |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| HC-0009074             |              | 1/4" to 23/64"(6.4 to 9.2)                        |              |                | X          |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| HC-0009075             |              | 3/8" to 1/2"(9.5 to 12.7)                         |              |                | X          |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| <b>AFA-0009086-T</b>   |              | Set of Four(4) Spindle Liners                     |              | <b>X</b>       |            |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| AFB 0009072            |              | 3/32" to 9/64"(2.4 to 3.5)                        |              | X              |            |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| AFB0009073             |              | 5/32" to 15/64"(3.9 to 5.9)                       |              | X              |            |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| AFB0009074             |              | 1/4" to 23/64"(6.4 to 9.2)                        |              | X              |            |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| AFB0009075             |              | 3/8" to 1/2"(9.5 to 12.7)                         |              | X              |            |      |              |             |            |             |                |                 |                     |             |                    |              | * |
| 16-0012017-25          | HFSS25       | .125" to .750"(3.2 to 19.1)                       | .782"(19.9)  |                |            | X    |              | X           | X          | X           |                |                 |                     |             |                    |              | B |
| 16-0012017-30          | HFSS25       | .776" to .906"(19.5 to 23.0)                      | 9.38"(23.8)  |                |            | X    |              | X           | X          | X           |                |                 |                     |             |                    |              | B |
| 16-0012017-35          | HFSS25       | .922" to 1.063"(23.4 to 27.0)                     | 1.094"(27.8) |                |            | X    |              | X           |            | X           |                |                 |                     |             |                    |              | B |
| CC-0012017-42          | HFSS25       | 1.078 to 1.281(27.4 to 32.5)                      | 1.313"(33.4) |                |            |      |              |             | X          | X           |                |                 |                     |             |                    |              | B |
| SB-0012017-42          | HFSS25       | 1.078 to 1.281(27.4 to 32.5)                      | 1.313"(33.4) |                |            |      |              | X           |            |             |                |                 |                     |             |                    |              | C |
| CC-0012017-46          | HFSS25       | 1.297" to 1.406"(32.9 to 35.7)                    | 1.438"(36.5) |                |            |      |              |             | X          | X           |                |                 |                     |             |                    |              | B |
| SB-0012017-46          | HFSS25       | 1.297" to 1.406"(32.9 to 35.7)                    | 1.438"(36.5) |                |            |      |              | X           |            |             |                |                 |                     |             |                    |              | C |
| <b>HG-0012017- S</b>   |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      | <b>X</b>     |             |            |             |                |                 |                     |             |                    |              | A |
| HG-0012017             |              | Bushing (3 Bushings required for each size stock) |              |                |            |      | X            |             |            |             |                |                 |                     |             |                    |              | A |
| <b>CS-0012017-S</b>    |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            |             | <b>X</b>       |                 |                     |             |                    |              | A |
| QS-0012017             |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            |             | X              |                 |                     |             |                    |              | A |
| <b>SG-0012017-S</b>    |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            |             |                | <b>X</b>        |                     |             |                    |              | A |
| SG-0012017             |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            |             |                | X               |                     |             |                    |              | A |
| <b>SG-0012017-BB-S</b> |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            |             |                |                 | <b>X</b>            |             |                    |              | A |
| SG-0012017-01          |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            |             |                |                 | X                   |             |                    |              | A |
| <b>CL-0012017-S</b>    |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            |             |                |                 |                     | <b>X</b>    |                    |              | A |
| CLA-0012017-01         |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            |             |                |                 |                     | X           |                    |              | A |
| <b>CL-0017017-BB-S</b> |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            |             |                |                 |                     |             | <b>X</b>           |              | A |
| CL-0012017-03          |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            |             |                |                 |                     |             | X                  |              | A |
| <b>CN-0012017-S</b>    |              | Spindle Liner Kit(Nut,2 Spacers,3 Bushings)       |              |                |            |      |              |             |            | <b>X#</b>   |                |                 |                     |             |                    |              | A |
| QS-0012017             |              | Bushing (3 Bushings required for each size stock) |              |                |            |      |              |             |            | X#          |                |                 |                     |             |                    |              | A |

\* Not Illustrated \* Spindle Liner Kits for machines with serial # CN-4267-T and Higher - Lower numbers use Draw Bar Liners shown above.



## — Draw Bar Liners (Spindle Reduction Liners) Or Spindle Liner Kits —

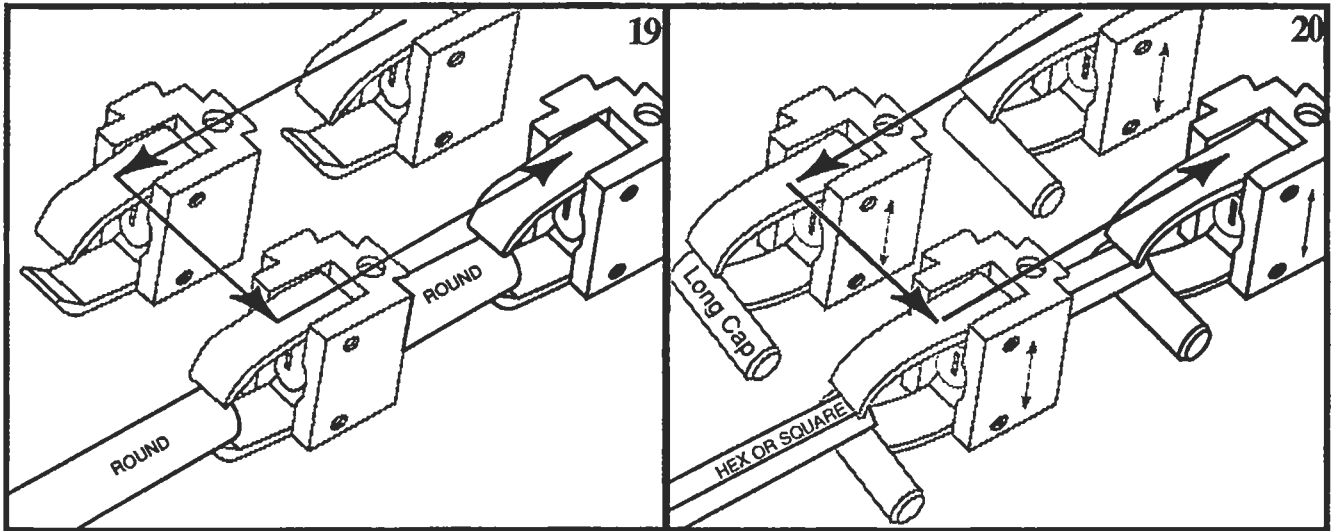
Draw Bar liners (Spindle Liners) must be used to help align the bar for easier pulling. Liners also reduce bar whip within the draw tube improving the surface finish and concentricity of the finished workpiece.

**Caution:** Under no circumstance should the bar stock extend beyond the rear end of the machine's draw tube or spindle. The stock may whip and bend when the spindle is running which may cause severe machine damage and may cause personal injury to the operator, other persons and the equipment in the machine shop.

# How To Approach and Pull The Bar Stock

## CONVENTIONAL METHOD

- This method is used for most round stock applications where a cross slide movement is available. See Figure 19.
- This method is the only one used for hex, square and octagonal bar stock applications.
  - A long jaw cap is used on the bottom jaw of the convertible style holder. The Head must be centered to the stock when using one long jaw cap. See Figure 20.
  - A short jaw cap is used on the top and a long jaw cap is used on the bottom jaw of the round shank bar puller. See Figure 21. The long and short caps are also used when the head of the convertible holder is set to the centerline of its shank.
- The jaw caps are used when pulling round stock out for tailstock work. The head is at a 90° position to the stock. See Figure 21.

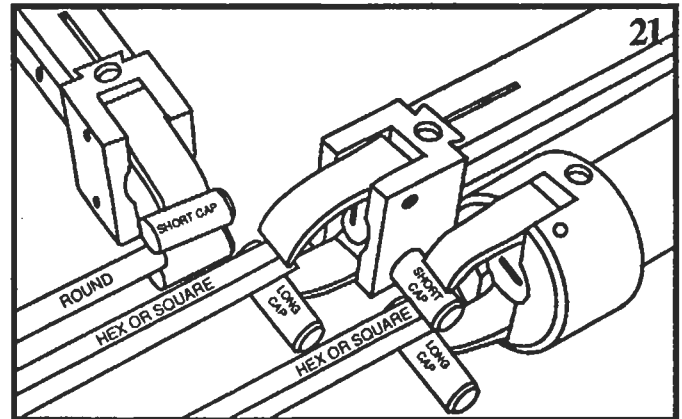


- The conventional method for programming a Bar Feed operation. See Figures 19 & 20.
- Place the machine in the free spindle condition before beginning the program for hex, & square bars.
- Approach the bar stock from the side as illustrated.
- Stop machine spindle (Program a spindle stop).
- Move the cross slide in until the center of the jaw and puller are on the centerline of the spindle. When doing hex or square stock the long bottom cap will orient the bar.

**NOTE:** If Spindle Orient is used anywhere in the

program (for live tooling, etc.) it also has to be used to orient the flats of the stock in relationship to the jaws of the bar puller. When Spindle Orient is used in a program it cancels out the Free Spindle condition set up on the control. (A synchronized collet is required when using the Spindle Orient feature).

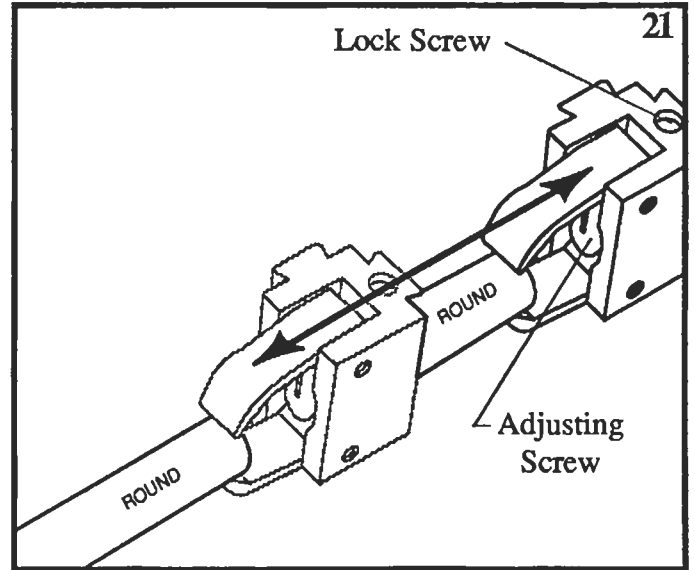
- Open the collet (Program enough dwell to make certain the collet has fully opened).
- Reverse carriage to the proper position for the part length desired. (Do not use rapid traverse feed).
- Close the collet (Program enough dwell to make certain the collet is fully closed).
- Pull back until jaws have completely cleared the bar stock.
- Continue with the program.



## STRAIGHT-ON METHOD

### Only For Round Bar Stock

- The Straight-on Method is used on machines that do not have cross slide movement available, or when the use of the cross slide is not practical due to tooling interferences.
- This method is not used for hex, square or octagonal work because the bar can not be oriented or when using a tailstock.
- Stop machine spindle (Program a Spindle Stop).
- Bring the bar puller forward with the centerline of the jaws on the centerline of the spindle.
- Go into feed rate mode a safe distance from the face of the bar stock.
- Continue forward until the jaws are on the part to at least 1/8" from the face of the bar stock. Stop the forward travel at this point.
- Open the collet (Program enough dwell to make certain the collet has fully opened).
- Reverse the carriage and stop at the proper position for the part length desired (Do not use rapid traverse feed rate).
- Close the collet (Program enough dwell to make certain the collet is fully closed).
- Pull back until the jaws have completely cleared the bar stock.
- Continue with the program.



## – Trouble Shooting –

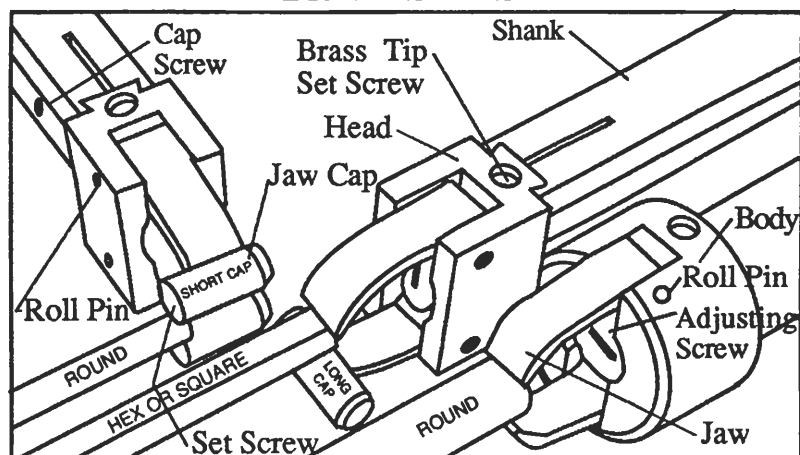
### Bar pulls out of jaws when carriage is reversed.

- The reverse feed rate is too fast and must be slowed down.
- Jaw adjustment not tight enough. Loosen lock screw. Turn adjusting screw clockwise 1/16 of a turn. Tighten lock screw. See Figure 14.
- The collet was not opened

### The feed-out length is not consistent.

- Not enough dwell time programmed to make certain the collet was fully closed before moving the bar puller off the stock.
- Jaw adjustment not tight enough. Loosen lock screw. Turn adjusting screw clockwise 1/16 of a turn. Tighten lock screw. See Figure 14.

# PARTS LIST



| ROUND SHANK Bar Puller Assembly | Model F125        | Model FM30        |
|---------------------------------|-------------------|-------------------|
| <b>Complete Assembly</b>        | 1817-00-00-000000 | 1819-00-00-000000 |
| — Body                          | 1817-00-00-000001 | 1819-00-00-000001 |
| — Adjusting Screw               | 1823-00-00-000006 | 1823-00-00-000006 |
| — Jaw (2 ea.)                   | 1823-00-00-000004 | 1823-00-00-000004 |
| — Brass Tip Set Screw           | 0670508           | 0670508           |
| — Roll Pin (2 ea.)              | RH-0011143        | RH-0011143        |
| *Jaw Cap-Short (1 Ea.)          | 1823-00-00-000007 | 1823-00-00-000007 |
| *Jaw Cap-Long (1 Ea.)           | 1823-00-00-000010 | 1823-00-00-000010 |
| — Jaw Cap Set Screw (1 Ea.)     | 0550504           | 0550504           |

| Convertible Bar Puller Assembly | Model C100        | Model C125        | Model CM30        |
|---------------------------------|-------------------|-------------------|-------------------|
| <b>Complete Assembly</b>        | 1821-00-00-000000 | 1823-00-00-000000 | 1825-00-00-000000 |
| — Shank                         | 1821-00-00-000003 | 1823-00-00-000003 | 1825-00-00-000003 |
| — Head                          | 1821-00-00-000002 | 1823-00-00-000002 | 1823-00-00-000002 |
| — Adjusting Screw               | 1821-00-00-000006 | 1823-00-00-000006 | 1823-00-00-000006 |
| — Cap Screw                     | 0100508           | 0100512           | 0100512           |
| — Jaw (2 Ea.)                   | 1821-00-00-000004 | 1823-00-00-000004 | 1823-00-00-000004 |
| — Brass Tip Set Screw           | 0670506           | 0670508           | 0670508           |
| — Roll Pin (2 ea.)              | RP-0009860        | PH-0011143        | RH-0011143        |
| *Jaw Cap-Short (2 Ea.)          | 1821-00-00-000007 | 1823-00-00-000007 | 1823-00-00-000007 |
| *Jaw Cap-Long (1 Ea.)           | 1821-00-00-000010 | 1823-00-00-000010 | 1823-00-00-000010 |
| — Cap Set Screw (1 Each)        | 0550504           | 0550504           | 0550504           |

\* Required for pulling hex, square and octagon bar stock



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