

## Drawbar and Belleville Spring Replacement

### Drawbar Removal

- 1) Remove the Drawbar Cylinder Assembly.
- 2) Remove the Orientation Bridge Assembly.
- 3) Place a long 3/8 inch drive extension or similar item in the spindle and jog the head down until the extension is under slight tension between the drawbar and the table. Caution: Do not place high tension on the extension; it only needs to support the drawbar. Place a piece of wood between the extension and the table, if needed.
- 4) Remove the Knock out cap (on locking drawbars only).
- 5) Place pilot tool on spring pilot.
- 6) Use wheel puller to depress the spring pilot.
- 7) Remove spring retainers.
- 8) Remove wheel puller.
- 9) Jog head up and remove the extension and the drawbar. Be careful not to drop the ball bearing.
- 10) Now remove the belleville springs or the floater.
- 11) To reinstall, reverse the above steps.

### Replace Belleville Springs

- 1) Remove drawbar (See Section A).
- 2) Using a spring hook or a magnet remove the belleville springs (Be sure to remove any broken pieces).
- 3) Install replacement springs starting with first one cupped downward and reverse every other one. The quantity will vary depending on the spindle pocket size (See the spring quantity chart).
- 4) Reinstall drawbar.

### Remove Floater (This will rarely be necessary)

- 1) Remove the drawbar (See Section A).
- 2) The floater has two ball bearings that hold it in place. Using a floater removal tool or a magnet pull the ball bearing toward the center and the floater should come out. If badly damaged the floater can be difficult to remove.



## Spindle Belleville Springs Quality Chart

There have been many spindle and spring retainer combinations over the years. To determine the number of Belleville Springs in a spindle, three factors have to be considered: The depth of the spring pocket in the spindle, the depth of the spring retainer and the width of the Belleville springs. The following chart is a guide line for the number of springs and may vary slightly from spindle to spindle.

This chart covers the most common depths of spindles. In most cases the deeper spring retainers will use one less spring then number in the chart.

Spindle Type	Spindle Depth	Number of Springs	Remarks
10K Non-Locking	2.00	19	
10K Non-Locking	3.00	30	
10K Non-Locking	4.25	43	
7.5K & 15K Non-Locking	4.326	44	
7.5K & 15K Non-Locking	4.627	47	
10K Locking	2.00	18	
10K Locking	3.00	29	
10K Locking	4.25	42	
10K Locking	4.326	40	
10K Locking	4.627	44	