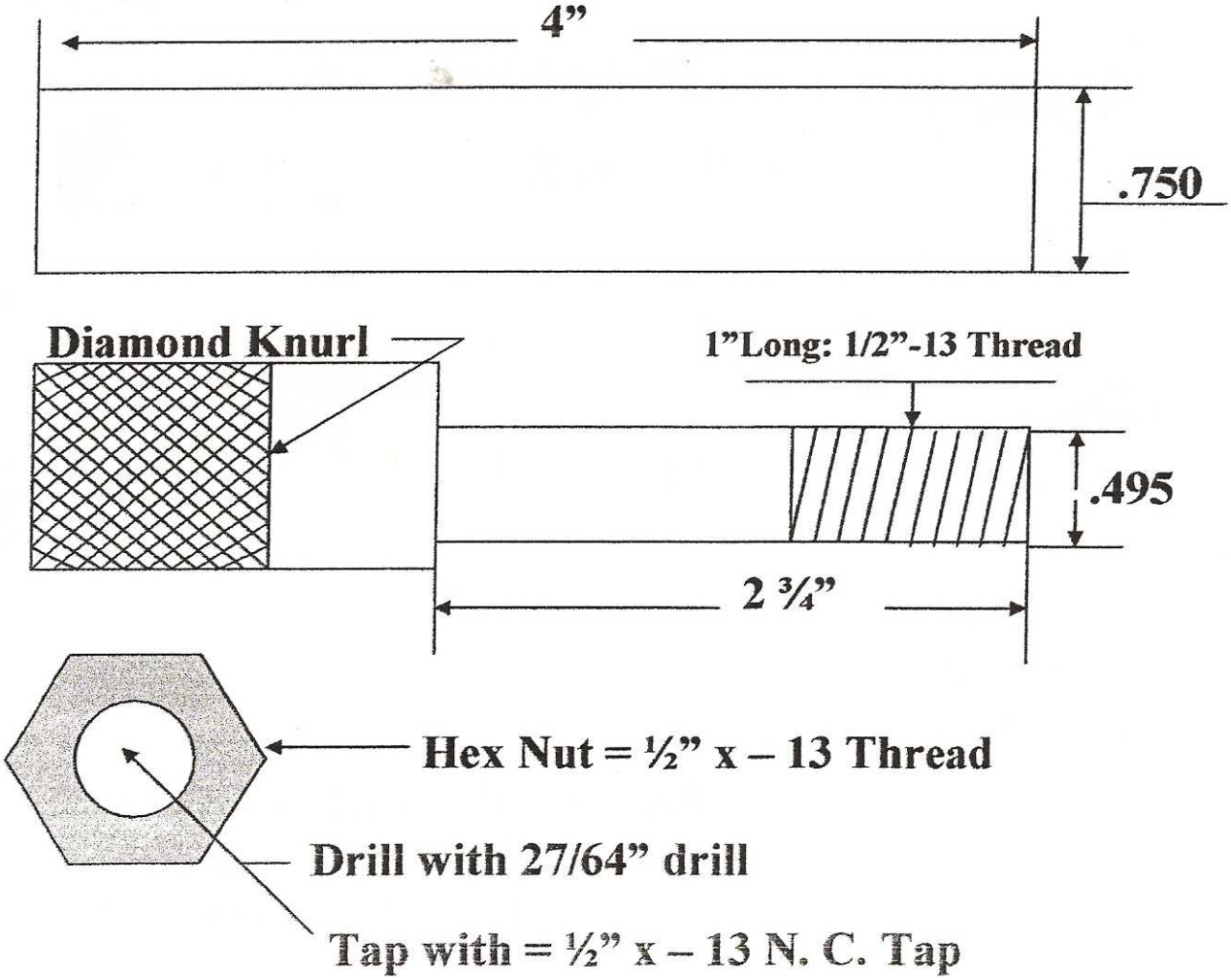
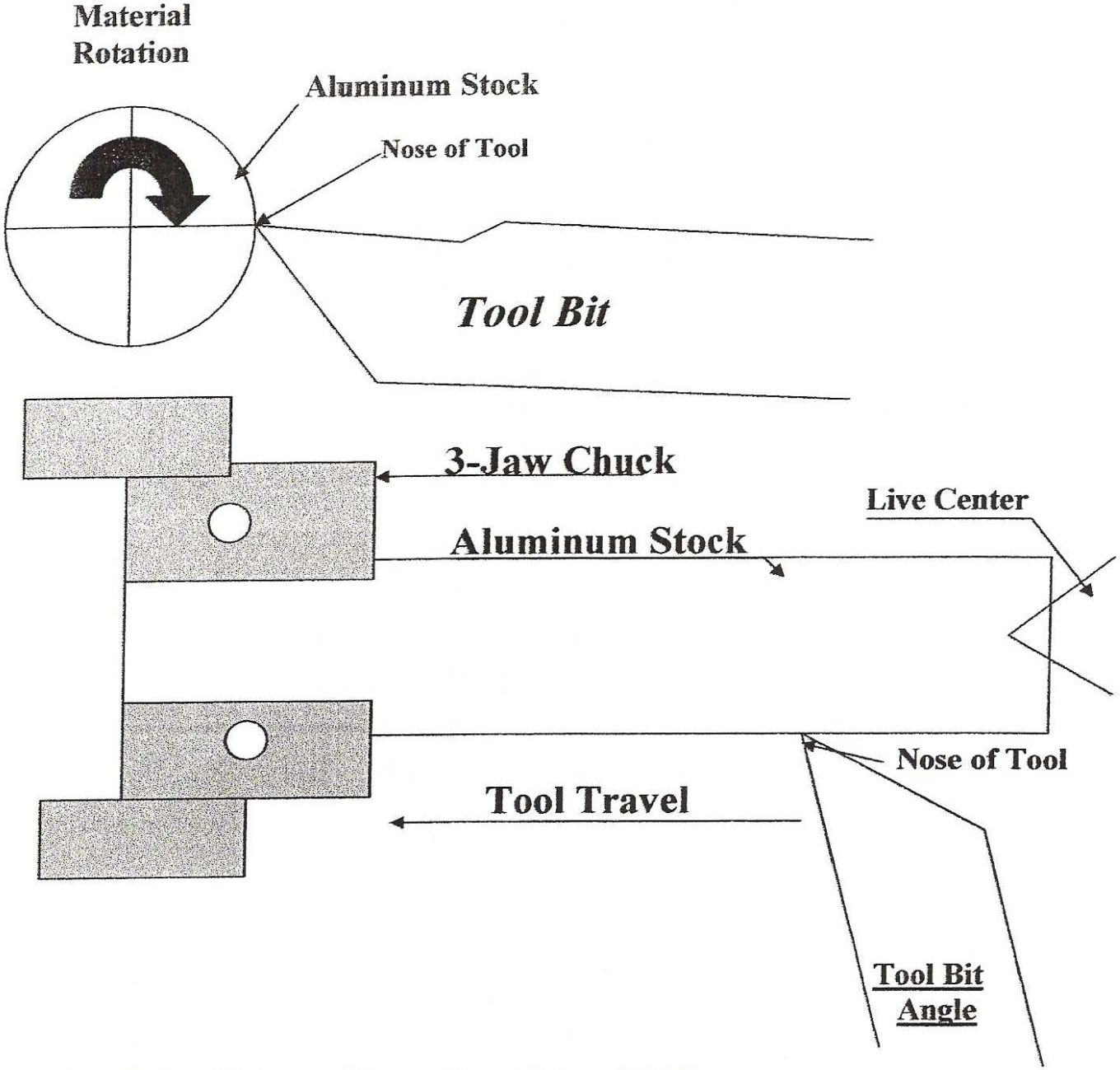
Lathe Project: Learn ***Safe*** and ***Basic Operations*** that can be performed using a **metal lathe:** Turning, Facing, Drilling, Threading, Tapping and Knurling. Use of a 1" micrometer will be demonstrated and used to produce this part.

Material: **Aluminum Rod = ¾"dia. x 4" long**
Aluminum Hex = 1" x ¾" long

Set-up: Work piece will be held in a 3-jaw chuck on one end and supported on the other by a live center.



Tool Set-Up (Height & Angle)



Tool Feed Rate (Travel) will be **.010"**
Depth of Cut will be **.040"**
Spindle Speed = 628 RPM

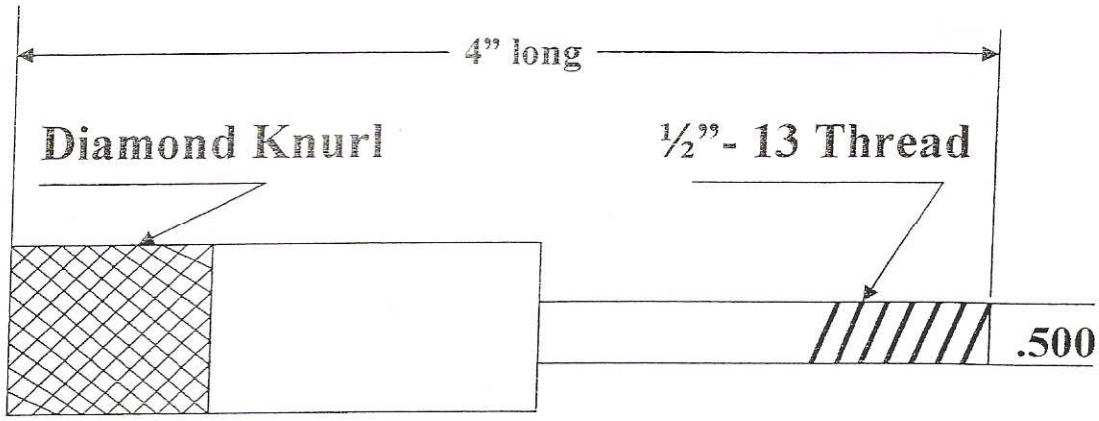
Steps to Produce
Bolt & Hex Nut

The Bolt

1. Set spindle speed = **628 RPM**
2. Set Feed speed (Gear Box) = .010
3. In 3-jaw chuck Face and Center Drill both ends.
4. Mount blank between 3-jaw chuck and live center.
5. Touch Off and set Cross Slide Dial to **0** (zero).
6. Take 6 cuts at .040 (Total = .240) **then measure.**
7. **Slow Feed Speed to .006** (Better Finish).
8. Final size = **.495 +/- .005**
9. Use hand file to chamfer end.
10. Set lathe in Back Gears at **60 RPM.**
11. Thread in lathe using ½ x 13 stock & die. Set
12. Apply **Diamond Knurl** (Reference knurling page)

The Hex Nut

1. Mount in 3-jaw chuck
2. Set spindle speed = **628 RPM**
3. Set Feed speed (Gear Box) = .010
4. Face both ends then **Center Drill one end only.**
5. Drill with a 27/64" Drill.
6. Set lathe in Back Gears at **60 RPM.**
7. Tap in lathe using a **½"X 13 N.C. Tap**



- **A knurl is a raised impression on the surface of the work piece.**
- ***Diamond knurling*:** is used to improve the appearance of a part and to provide a good gripping surface for levers and tool handles.
- **Knurls do not cut,** but displace the metal with high pressure. Knurling works best on work pieces mounted between centers.
- ***Lubrication is very important.***
- **Low speeds:** spindle speed (back gears: 60 rpm) and travel feeds of .015 to .020 are used for ***knurling.***