

Rifle Cartridge Bolt Action

By Les R. Elm © 2014

Revised 08/17/2018

I have been making Rifle Cartridge Pens using an actual cartridge casing and actual bullet for the nib with various top sections using antler, snake skin and various acrylic materials.

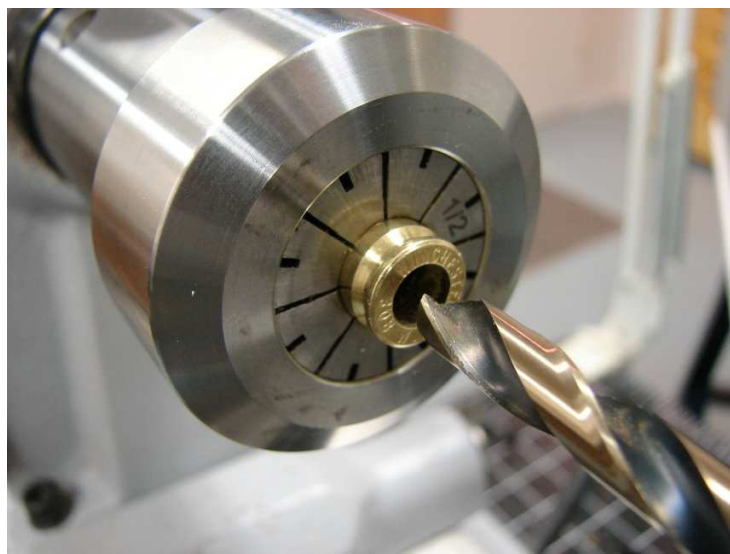
The following instructions are how I use a Bolt Action component top section. As you make your own pen you may find different ways to make this pen. These instructions can be used to make .270, .280, 25-06, 30-06 and other 30 calibers.

Required Materials:

- Midi Lathe
- Gold 30 Caliber Bolt Action pen kit
- Cross style refill
- One Parker Refill Spring
- One Bolt Action Refill Spring
- New 30 caliber brass rifle casing – 30 caliber Full Metal Jacket Bullet
- Beall Collet Chuck with a 1/2" Collet
- 3 Jaw Mini Chuck
- Rapid Tap Drilling Fluid
- 1/2" Drill Chuck
- Drill Bits: 15/64", 21/64", 27/64", #55, #46, 5/64", 9/64"
- 3/8"-24 HSS UNF Tap
- 3/8"-24 HSS UNF Die

A. Threading the Primer Pocket:

Step 1. Install Beall Collet Chuck with a 1/2" collet onto the head stock. Install a 30-06 casing into the collet and tighten. Install a drill chuck into the tail stock with a 21/64ths bit and enlarge the primer hole to 21/64ths. Ensure the collet is tightened enough to prevent the casing from turning and damaging the brass surface. Drill at 250 RPM using Rapid Tap drilling fluid.



Drilling Out Primer Pocket To 21/64^{ths}

Step 1.1: Countersink the Primer Pocket:

- Remove the 21/64ths drill bit from the 1/2" chuck and install a 27/64ths bit and countersink the 21/64ths hole to a depth of *5/64ths.

**This is important to allow the Bolt Action assembly face to sit flush on top of the casing head.*



Countersink 21/64ths Hole to a depth of 5/64ths

Step 1.2: Threading the Primer Pocket Hole:

- Remove the 27/64ths bit and install a 3/8"-24 NF HSS Tap into the 1/2" drill chuck and move the tap up to the primer hole and leave the tail stock unlocked.
- Apply some Rapid Tap cutting fluid to the Tap and rotate the head stock spindle clockwise by hand allowing the tail stock to move as the tap threads into the hole.
- Stop rotating and partially back out frequently to clean brass filings out of the cut threads and tap.
- Continue cutting threads to the full length of the tap. Back out the Tap by turning the spindle head counter clockwise and clean the casing head threads and Tap.
- Remove the 30-06 casing from the collet and remove the tap from the chuck.

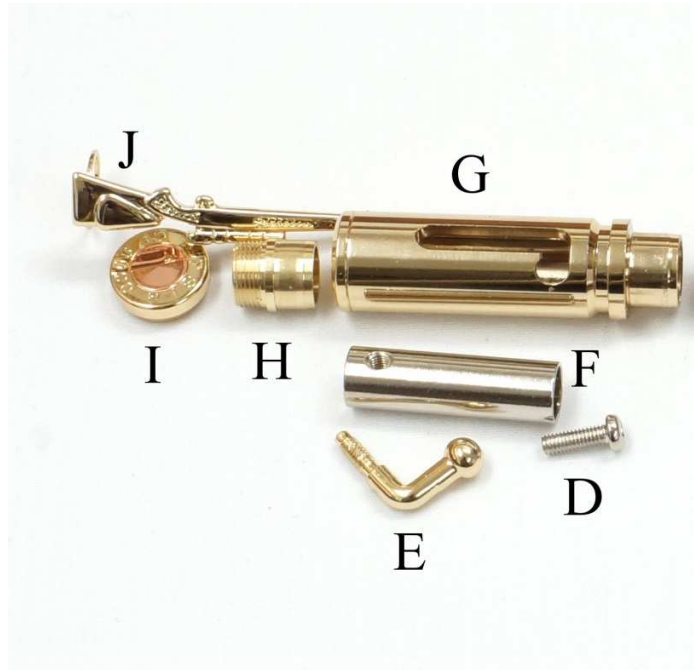


Threaded to 3/8" 24 NF Threads

B. Threading the Bolt Action Chamber:

Step 1. Disassemble the Bolt Action Assembly:

- Unscrew the Finial (I) and remove Rifle Clip (J). Using a Philips #0 screwdriver remove Set Screw (D), unscrew Bolt Handle (E) and slide out Bolt (F).

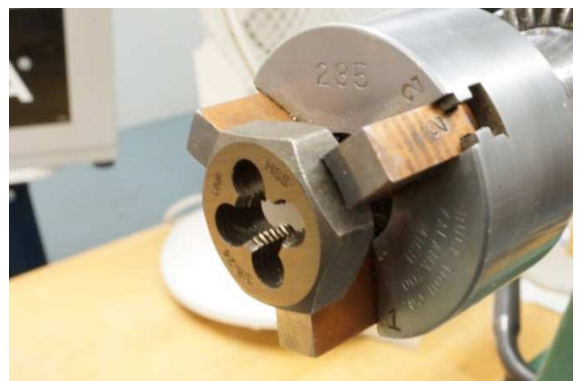


Step 1.1: Threading the Bolt Chamber:

- Check to ensure the 1/2" collet is clean so as not to damage the Bolt Chamber plating. Install the Bolt Chamber (G) with the Threaded Finial Bushing (H) inside the collet. Tighten the collet.
- Install a 3/8" – 24 NF Die in the jaws of a 3 jaw Mini Chuck installed into a 1/2" drill chuck and set into the tail stock.



Bolt Chamber Installed in Collet



3/8" – 24 UNF Die Installed In 3 Jaw Chuck

Step 1.2: Threading the Bolt Chamber:

- Move the die up to the bolt chamber and leave the tail stock unlocked.
- Apply some Rapid Tap cutting fluid to the die and rotate the head stock spindle clockwise by hand allowing the tail stock to move as the die threads on the end of the bolt chamber.
- Stop rotating and partially back out frequently to clean brass filings out of the cut threads and die.
- Continue cutting threads until the die stops. Back out the die by rotating the head stock spindle counter clockwise and clean the bolt chamber threads and Tap.



Bolt Chamber Threaded 3/8" – 24 UNF

- Remove the threaded bolt chamber from the collet and remove the collet chuck from the spindle head. Remove the die from the 3 jaw chuck and remove the 3 jaw chuck from the 1/2" drill chuck.
- Thread the casing onto the bolt chamber to check threads and to ensure the bolt chamber fits flush on top of the casing head.



Threaded Casing & Bolt Chamber



Bolt Chamber Sitting Flush on Casing Head

C. Making the Bullet Nib for a Cross Refill:

Step 1. Making the Bullet Nib:

- Install a drill chuck in the headstock and install the bullet with the point facing out. File $\frac{3}{32}$ nds of an inch from the point to get a square flat surface.
- *Always ensure the bullet is tightened on the surface that will not be seen when the bullet is seated into the cartridge neck.*



Bullet Installed In Drill Chuck



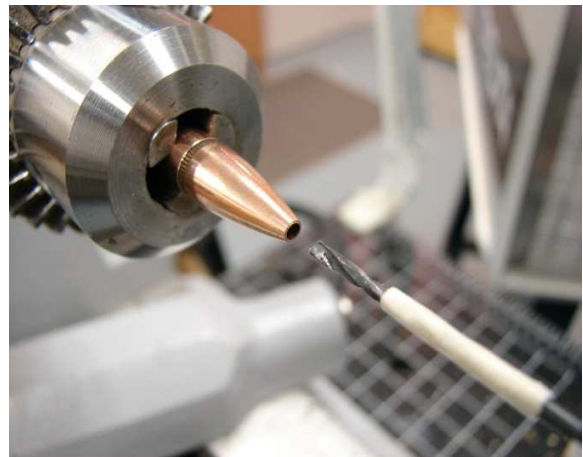
Bullet Tip Filed Square and Flat

Step 1.1. Making the Bullet Nib:

- Install a drill chuck in the tailstock and install a #55 drill bit to drill a pilot hole in the center of the flat bullet tip. Drill slowly using Rapid Tap Drilling Fluid and stop drilling once you hit lead.
- Remove the #55 bit and install a #46 bit and drill through the pilot hole using Rapid Tap drilling fluid to a depth of $\frac{1}{2}$ an inch. Place a piece of tape on the #46 bit to act as a depth gauge.



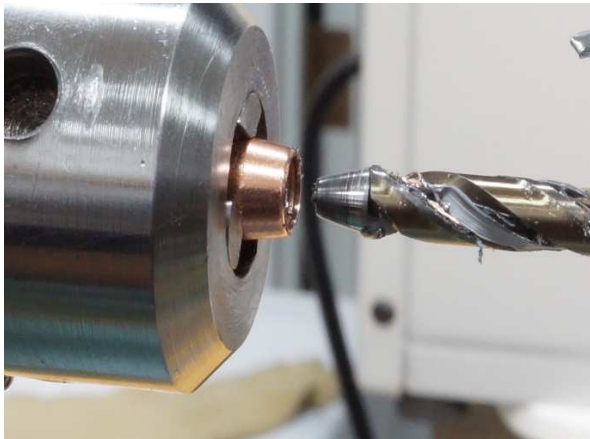
Drilling #55 Pilot Hole



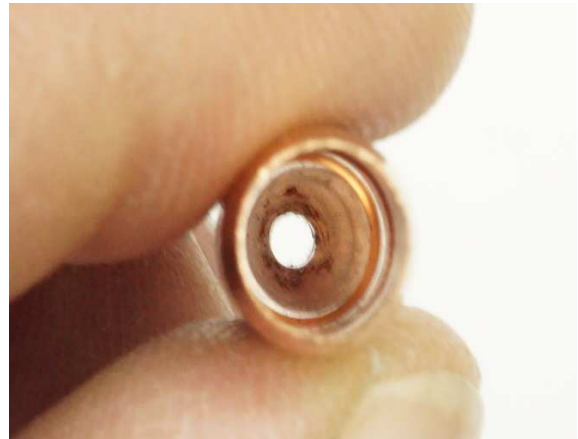
Drilling #46 Nib Hole

Step 1.2. Making the Bullet Nib:

- Reverse the bullet in the head stock drill chuck with the boat tail end facing out.
- Install a 1/2" drill chuck c/w a 15/64th bit into the tail stock and using Rapid Tap Drilling Fluid drill stopping frequently to clean the hole and bit.
- Drill to a depth of 3/4 of an inch to avoid drilling through the sides of the bullet.
- Retract the drill bit and the lead tip should be caught on the end of the drill bit.
- All the lead will have been removed from inside the metal jacket.
- The size of drill bit and depth will vary depending on the caliber of bullet being used.
- A piece of masking tape on the drill bit will act as a depth gauge.
- *Don't over tighten. Always ensure the bullet is tightened on the surface that will not be seen when the bullet is seated into the cartridge neck.*



Marking the Center of The Bullet Boat Tail



All Lead Removed from Metal Jacket

Step 1.3. Making the Bullet Nib:

- Remove the bullet from the drill chuck and check the #46 nib hole to ensure the refill slides in freely through the bullet nib hole.



Checking Nib Refill Hole for Reveal

D. Seating the Bullet Nib:

Step 1. Seating the Bullet:

- Press the bullet nib into brass cartridge neck to the normal seating position that you would see on a loaded bullet. A drill press works to do the seating.



E. Reassemble the Threaded Bolt Chamber:

Step 1. Reassemble the Threaded Bolt Chamber:

- Slide the Bolt (F) into the Bolt Chamber (B). Line up the bolt hole and screw in the Bolt Handle (E) Using the Philips #0 screwdriver tighten the Set Screw (D)



C. Modifying Cross Refill:

Step 1.

- Measure the total length of the casing with the projectile seated which in this case is 3-3/16".



Step 1.1:

- Remove the black threaded cap from the Cross refill and cut enough off the refill to get a total length of 3-1/4" with the black threaded refill cap back in place.
- The Cross refill should be a 1/16" longer than the total length of the casing with the bullet nib seated which will be the amount of refill reveal through the bullet nib.



Step 1.2:

- Slide a Parker refill spring onto the Cross refill first followed by the Bolt Action kit spring.



Parker and Bolt Action Springs



Springs Installed on 3-1/4" long Cross Refill

D: Completed Rifle Cartridge Bolt Action Pen

- Install the modified cross refill into the casing, lining up the refill tip into the top of the bullet nib and with the Bolt in to open position screw on the Bolt assembly.



Rifle Cartridge Bolt Action Assembly

- Check the operation by closing and opening the bolt to advance and retract the cross refill. There should be 1/16" reveal of the refill tip through the bullet nib.

Finished 30-06 Rifle Cartridge Bolt Action Pen



Completed 30-06 Rifle Cartridge Bolt Action Pen