

Cartridge Pen using Sierra Transmission and 308

Contributed by:
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This tutorial was downloaded from

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The International Association of Penturners

30 Cal desk pen with Parker refill.

Prepare the bullet:

I started with 150 gr. FMJ bullets. I used these because I hadn't seen any 30 cal hollow point and didn't know how big the hole was and thought it might be too large for the refill tip.

1. Take bullet and hold it with a small pair of pliers. With a small handheld torch melt the lead out of the bullet. Do this in a well ventilated area as lead fumes are known to cause health problems. Once you are sure you have all the lead melted and out of the bullet set the bullet aside to cool to room temp.
2. Mount the bullet in a chuck on your lathe with the tip out. With the lathe off file the tip flat (with the bullets I'm using a small hole appears in the center, I use this as the starting point for my drill.) With a drill bit the same size or slightly larger than the refill tip drill the hole in the tip of the bullet. Go right through into the hollow section of the bullet.



3. Polish the bullet using brasso and then set it aside.

Bullet drilled and polished.



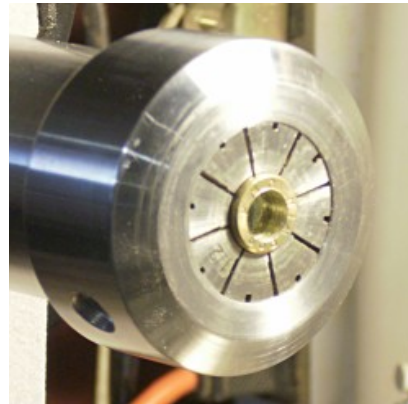
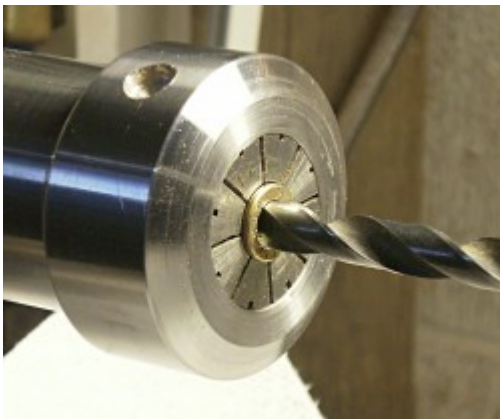
Prepare the cartridge:

1. Punch the **spent** primer out of the brass case. **Do not do this with a live primer.** Since I no longer have any reloading equipment I use a small dollar store jewelers screwdriver that is long enough and with a small enough tip to go through the primer hole.

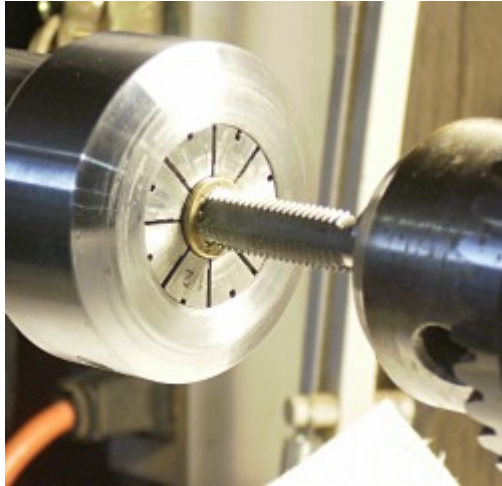
Brass ready to have the spent primer punched out. The hole in the maple block beside the cartridge is the one used later to resize the brass to fit the bullet if needed.



2. The primer hole gives a good center to drill out the end of the cartridge. I used a 19/64 drill bit.



3. Using a metric 9x1.25 tap, thread the hole in the cartridge end. I don't think this is the exact thread but since we are only using about 3 threads it works fine. I have since found out the correct thread is 8.4mm x 1 and have a tap ordered. Holding it in the drill chuck will get it started straight.



4. Mount the cartridge between centers on your lathe. Starting with 600 grit progressively sand up to about 25000 grit. (that's the finest I have) and then polish with brasso.

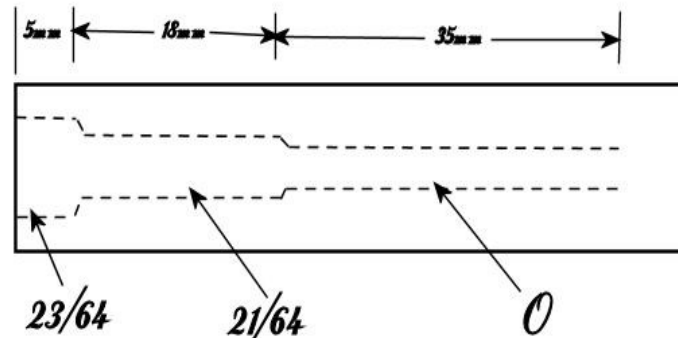


5. Set the cartridge aside.

Prepare the cap:

1. Determine what type of cap you want, closed end, hidden clip or what. This will determine the length you cut the blank to.
2. In this case I was planning on a clip but when I got to that point I realized I had cut the blank to short so I'll pretend the closed end was planned the way it turned out.
3. Cut the blank a little longer than the length of the transmission which is 56 mm in case of chipout when the drill bit exits the blank.

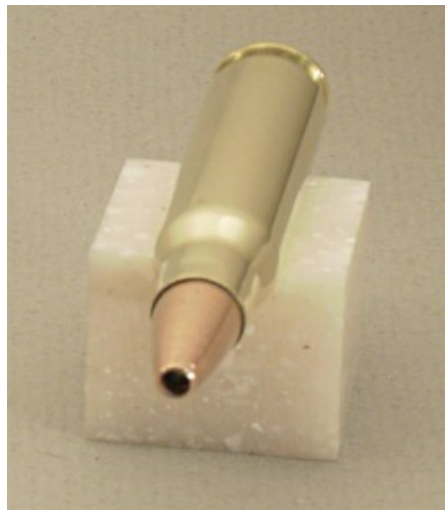
4. To provide the greatest support for the blank and the least play when finished I drilled it with 3 different sizes of drill bits. Starting with a $23/64$ drill I drilled 5mm deep. I then changed to a $21/64$ drill bit and drilled another 18 mm. The hole was then finished with a size O bit. The diagram below (exaggerated and not to scale) shows how the blank was drilled.



5. Cut a piece of 8mm brass tube 35mm long. This is the same tube that fits in the 8mm round top euro pen. Not having anything designed to cut tubing that small I just mounted it between centers on my lathe and used a small sharp parting tool.
6. Slide the cut piece of tubing over the end of the transmission and slide the transmission all the way into the blank. Trim the blank so one end is flush with the back end of the transmission and the other end is flush with the shoulder where the threads start. The length at the threaded end is critical. Too long and the transmission will not screw all the way into the cartridge and when the tip is retracted it will unscrew from the cartridge. Too short and there will be an unsightly gap between the cartridge and the cap. I did this by holding the whole assembly lightly between centers and trimming the ends with a small parting tool. Squaring them at the same time.
7. Glue the tubing into the tail end of the cap blank. Once the glue has hardened clean off any excess glue and glue a short piece of the leftover material to the end aligning the grain if necessary. (You did save that leftover piece I hope)
8. Mount the cap on a closed end mandrel and turn to size. Use your tailstock for support until it's time to finish the end. Finish with your desired finish. I like CA.

Assembly:

1. Gather your cartridge, bullet, refill and transmission.
2. Place the bullet into the cartridge to the desired depth. If you have a snug fit, great if not you will have to size the brass slightly. I did this by drilling a hole in a small block of hard maple that was just slightly smaller than the brass and chamfering the top edge slightly. Place the cartridge on to the hole and tap lightly with a rubber or wood mallet. Check the bullet fit. If still to large do it again.
3. Assemble the pieces and determine the depth you want to seat the bullet with the tip of the refill out.
4. Take everything apart and place a small amount of 5 minute epoxy inside the cartridge mouth. Slid the bullet in to the depth you want and let the epoxy harden.



5. Assemble the transmission and refill on the cartridge and check for proper operation.



6. Push your cap on over the transmission and your pen is finished.

The Completed Pen:

