

# Pardini HP 32 ACP Barrel

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I was approached by a friend that was dissatisfied with the accuracy of his factory Pardini HP in 32acp. We discussed making a new barrel and I looked into .312 diameter barrels. Some of the Forum Threads talked about using sections of 303 Enfield barrels, as buying a 28inch barrel blank from Douglas, Shilen, etc. would be expensive and wasteful for one job. I suggested we use a 308 diameter barrel and 308 bullets, as I had sections of match 308 barrels left over from rifle projects, and Hornady, Sierra, etc. offered essentially the same bullets in both .312 and .309. Ultimately, we did use the 308 barrel and fired factory .310 32acp Fiocchi ammunition at 50yds and cast .314 90gr bullets at 25 yds, both with excellent results and no signs of excessive pressure (i.e. bulged cases, flat primers, etc.). His completed pistol is shown below. We elected to make a new shorter shroud, that did not use the compensation weights and springs of the factory shroud. We also cut compensator slots in the barrel to reduce muzzle rise, in lieu of the weights and springs.



We did not take many photos during the work, as I did not anticipate being asked to make more barrels or prepare a tutorial for others.

- We found a Company in Serbia willing to custom grind a reamer for \$120 with \$25 Shipping. Delivery was about a week.

Jezdinsko polje 10,

32000 Cacak

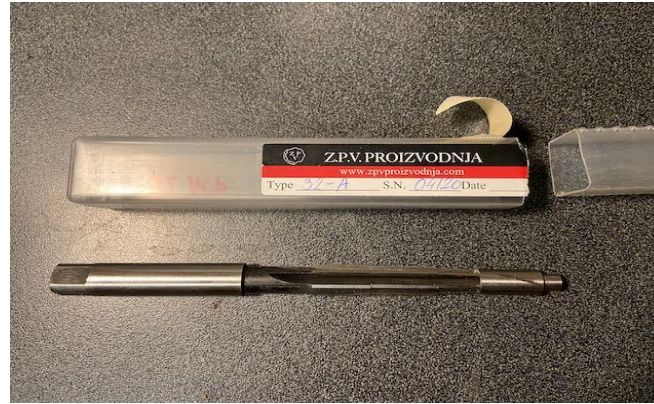
Srbija

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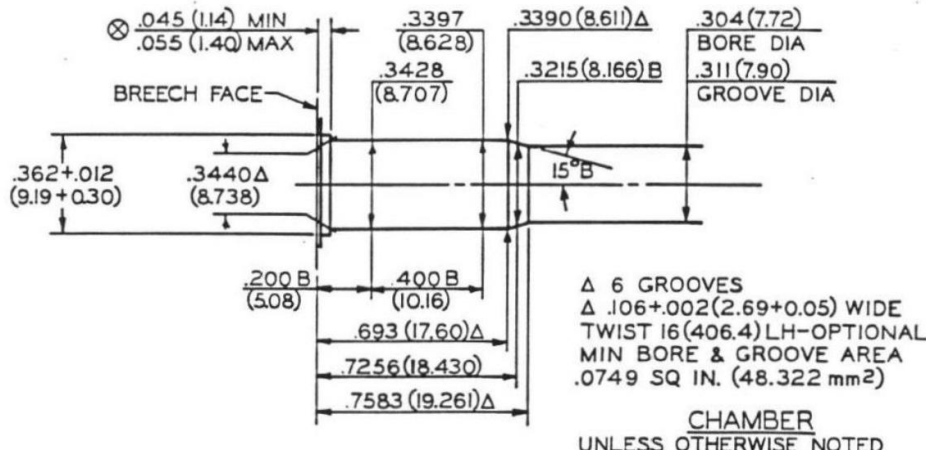
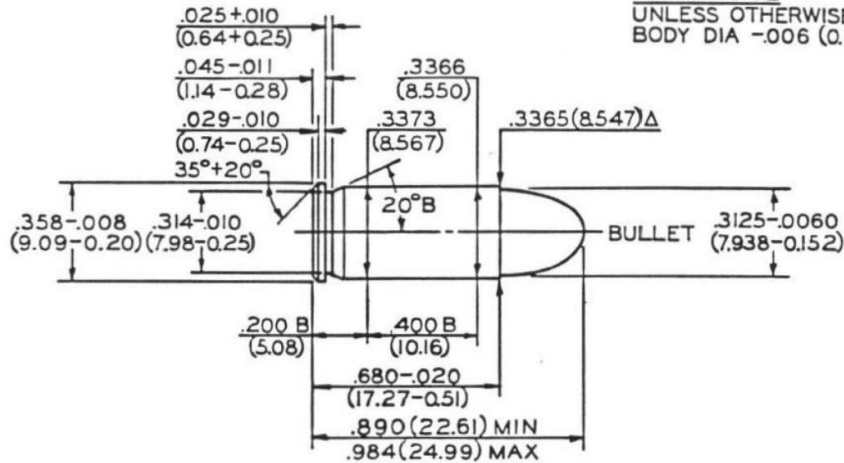
- Don't be intimidated by Serbian address, they both speak and write English.

"We can make .32ACP caliber with throat of .309, angle 4°, pilot .299."

There are US reamer manufacturers that can certainly regrind a factory reamer to "32 acp National Match" dimensions.

FYI- Don't use a SAAMI reamer (see next slide).

**CARTRIDGE**  
UNLESS OTHERWISE NOTED  
BODY DIA  $-.006$  (0.15)



**CHAMBER**  
UNLESS OTHERWISE NOTED

Lets talk about cartridges and chambers;  
When the Chevy Truck Challenge was popular in the 90's, much effort was devoted to finding out how to get best accuracy from semi-automatic 22 rifles. It was determined that headspace should be no more than .002-.003 over .043 rim thickness, more headspace affected accuracy, less caused slamfire danger. Chamber should taper slightly to allow case to align as it moves in. Throat should lightly contact bullet for minimum distortion entering rifling.  
Here are the SAAMI dimensions for 32acp chambers and ammunition. SAAMI doesn't really care how well it shoots as long as it functions and is safe. You can see the case is .005-.006 smaller than the chamber (i.e. .3373 vs .3428) and no effort is made to headspace on the case mouth, only the rim. Looking at the reamer dimensions from the last slide shows a smaller pilot (for the .309 barrel) and a shorter throat with 4 degree single (8 degree included) taper. The pistol shoots very well with this chamber, but if I had it to do over, I would ask for smaller diameter and a different throat. I intend to cut the chamber in this presentation with a boring bar, so prospective gunsmiths can decide whether to purchase a reamer, or cut it themselves.



Time to check SAAMI against reality. The owner provided handloads he uses in the factory barrel, with new Hornady brass. I made a chamber gauge and measured the actual rim thickness, it was .045. Then I checked the factory rim cut in the slide (headspace) and found it was .054 (.009 over rim thickness). This means each time a round is chambered the firing pin has to drive it to the end of the chamber before it will fire. This would contribute to the owners accuracy issue.



The Inside diameter of the slide was close to  $9/16$  (.562). I had a  $9/16$  piloted counterbore. I set it up to grind to size, but it turned out to only need about .002 removed. Careful stoning of the flutes could have been done and saved grinder setup. I got a little lazy on the pilot and used a .098 drill. The counterbore has a  $3/16$  (.187) hole for the pilot and the bolt has a .098 firing pin hole. I drilled a .098 hole in a piece of stock and loctited the .098 drill in it. Being sure enough shank was exposed for the counterbore to guide into the breech face off the shank, rather than the flutes.



Here we are indicating the bore of the slide to ensure counterbore is correctly aligned.

Counterbore and pilot ready to cut slide.

Finished slide with .047 rim recess (.002 headspace)

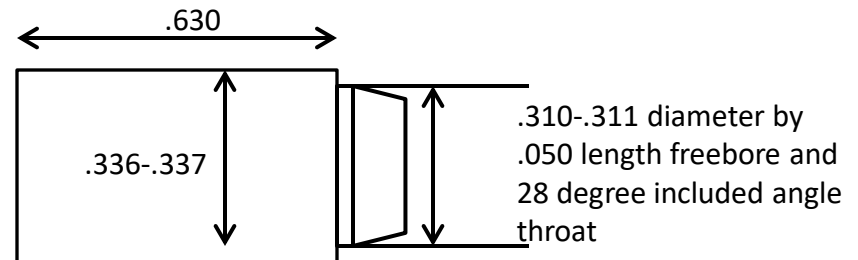


#### NOTE:

I talk about headspace of the rim only in reference to its thickness and the depth of the cut in the breech face. The barrel will be chambered to headspace on the case mouth.

## Now lets discuss the chamber we want to cut.

We decided to do this one with a boring bar. So we need to decide the diameter and depth of the chamber, diameter and depth of freebore and angle of the throat. Measured diameter of the owners ammunition was .334. I wanted to hold chamber diameter to .002-.003 over the ammunition, so we are shooting for .336-.337. Length will be measured case length (not overall length with bullet) of owners ammunition (averaged over 10 samples), less the .045 rim. Which came out to .630. Measuring the bullet diameter and diameter of the mouth of the loaded round showed case wall thickness of .012. Freebore is the length of a full bullet diameter (+.001-.002) cut that closely matches the length of full bullet diameter that sticks out of the case. I also measured the angle of the bullet ogive (14 degrees), so the throat angle could match it. I don't have CAD, so I will insert a crude "Powerpoint Shapes and Objects" drawing of the planned chamber.



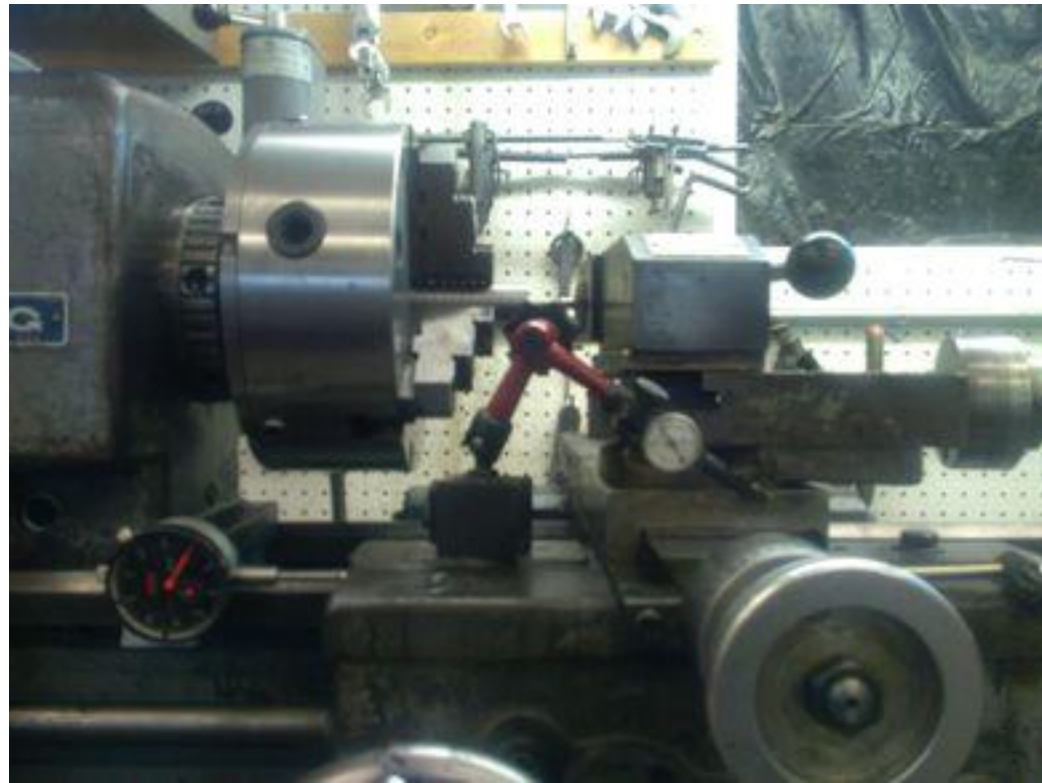
This is the freebore. We need to make a full bullet diameter cut (+.001-.002) that is about .005-.010 longer than this length. So the bullet does not wedge into the throat.





I had a 6 inch length of Krieger .308 1-10 twist barrel, left over from a rifle project. The barrel must be very carefully indicated for the least possible runout your lathe can provide. I read the groove, rather than the land, as my indicator gives better results that way. I was able to get it within .0002 total runout.

This is the setup I used to cut the chamber. The compound is set at 14 degrees. There are indicators to measure depth of cut and movement of the cross slide. I did not want to trust the dial, I wanted to know true movement of the cross slide. The procedure was to cut and measure until case body of .336 by .630 depth was completed. Then move cross slide .010 to leave .310 diameter freebore and cut .050 deeper than the chamber, then turn compound to cut throat angle .





This is the best photo I could get of the completed chamber. You can kinda see the freebore and throat.



The factory barrel was loctited into the shroud. It was heated to break the loctite and driven out to the rear. There is a fitted diameter of .569 about halfway up that corresponds to .570 recess in shroud. There is also a .551 surface at the muzzle that fits a .552 recess in the shroud. Other diameters are undersize for relief. I decided that the new barrel should be removable from the shroud, if more work was required, or the customer wanted to go back to his factory barrel. I decided to make a flange at the .569 location and leave the new barrel about half an inch longer for threading to receive a muzzle nut.

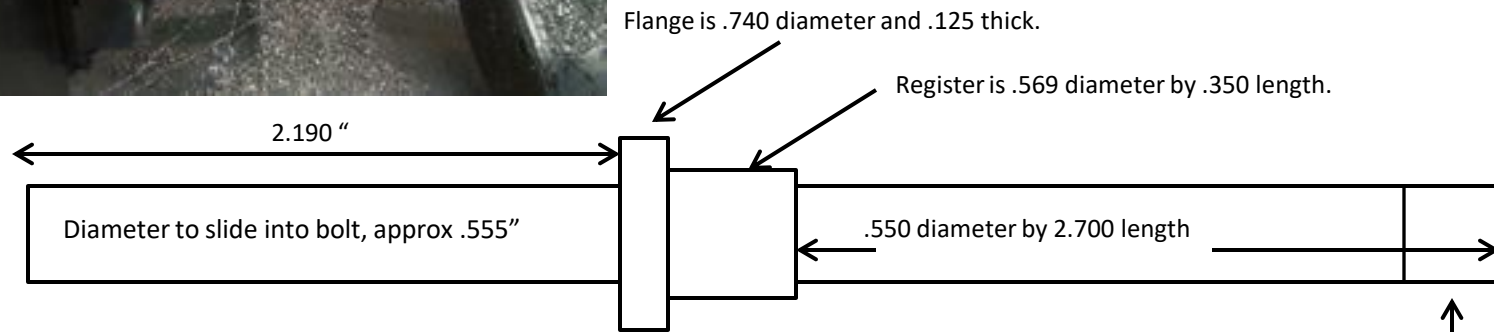


Here is the finished barrel ready for threading. I will get into details in the next few slides.

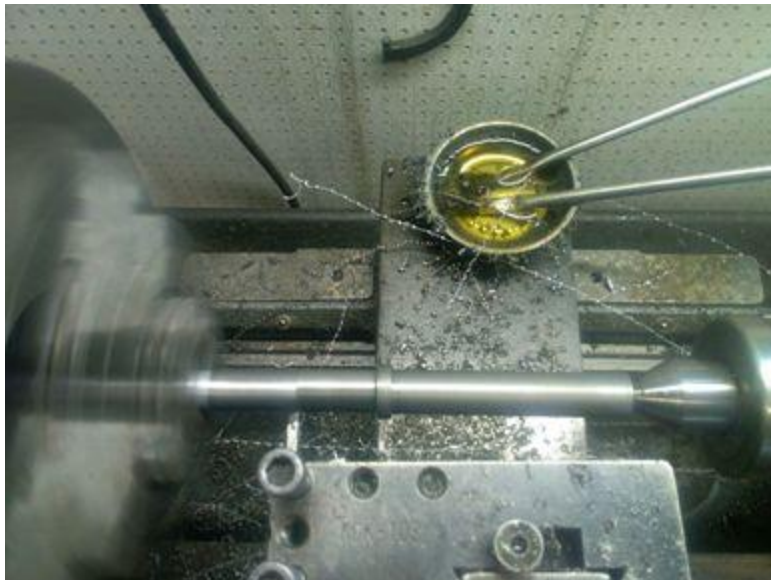


In the interest of concentricity and simplicity, I turned an aluminum rod to tightly fit the chamber. I could then drive it with friction on a live center and profile the entire barrel in one setup. Don't know if it's all that critical, but that's how I did it.

Here is another "Shapes and Objects" drawing of the barrel.

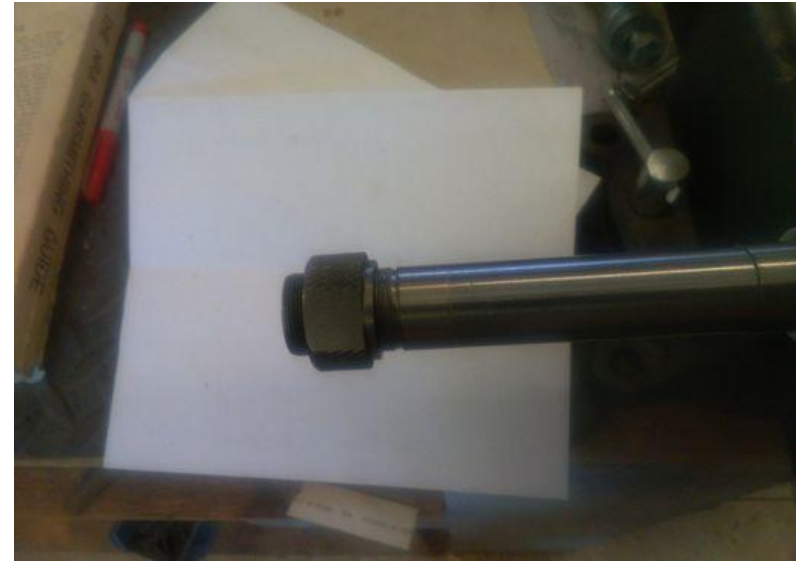


Muzzle is threaded .550 x 40 tpi, .750 long.





There is nothing significant about the .550 x 40 thread. I had a tap left over from when we made compensators for Springfield P9 Pistols. A suitable replacement could be 9/16 x 24, the small difference in diameter works out to about .005 per side, the single depth of 32 pitch thread is .020, so as long as you make the nut first and thread for close fit, it will be fine.



Here is the nut I made. Yours can be whatever you decide will work and looks good. If you decide to cut compensator slots into the barrel, be sure to leave it longer and slightly undersize (.005-.010 under root diameter) in front of the threads.



We now need to cut a recess in the shroud for the barrel flange. Indicate carefully and use a sharp  $\frac{3}{4}$  inch endmill. Depth is .125 to match flange.



The barrel must index in the shroud to ensure the extractor cut and feed ramp are aligned correctly. I decided to install two (2) .093 dowel pins, .180 from center on each side, and cut a flat on the barrel to register on them. Pins were installed tangent to inner face of the flange cut. Flat on barrel was made tangent to .555 diameter on rear of barrel.



Install barrel in shroud and align flat with top of shroud. Insert pins with Loctite #270 and push them against flat on barrel. Set aside to cure.

Here is a photo of the completed job after the pins were trimmed flush with the top.



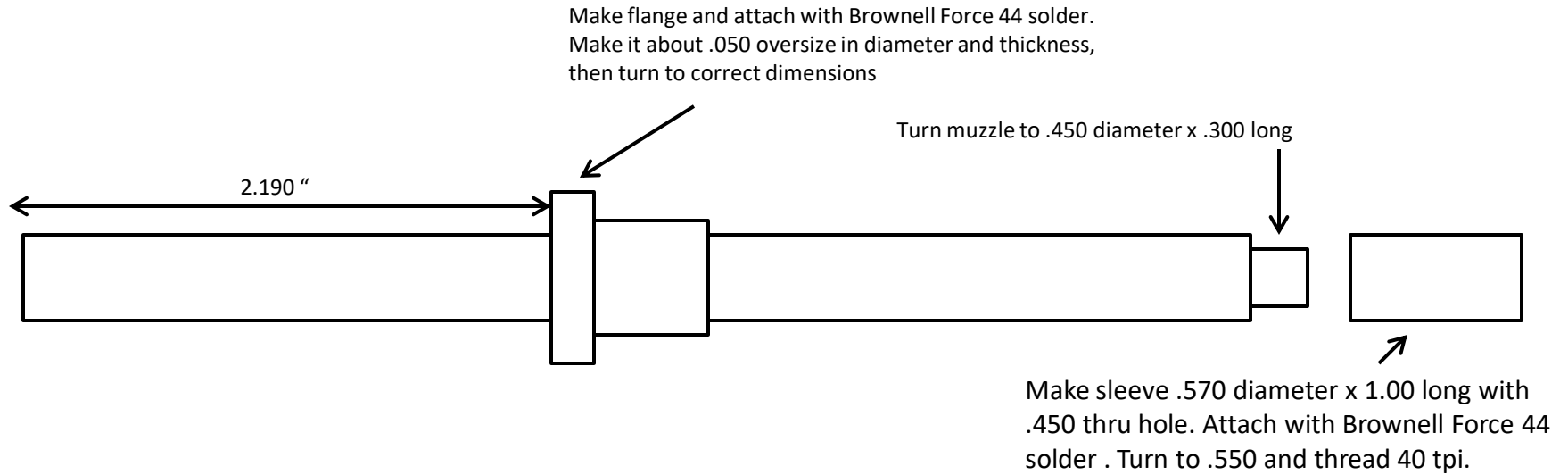
The extractor cut is centered vertically on the barrel.. Make the cut about twice as wide as your extractor, so it has plenty of clearance. You will cut into the rear of the chamber until you can see the extraction cannellure of a case thru the slot. Use the factory cut as a guide



You can tell it is finished when the extractor will clip over a case and pull it out of the chamber.



I modified the factory barrel to work with the modified shroud.





Reference Point- This is the Extractor Slot

**FEED RAMP-** If you look closely you will see the feed ramp on the magazine is hooked under the barrel and will not allow the magazine to seat and lock. The factory addressed this with a large undercut on the barrel feed ramp.



I cut a notch in the bottom of the barrel to clear the feed ramp on the magazine. It was .035 deep and .225 wide with .062 radius in the corners (.125 endmill)



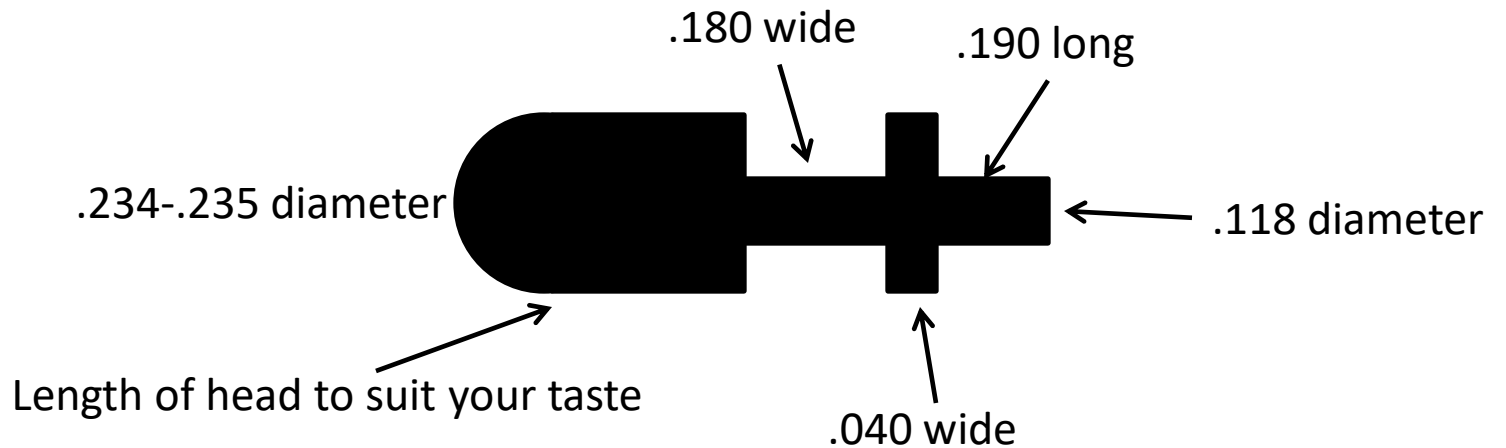
I then used 1/8 burr in MotoTool and cut small angles up the sides of the barrel and polished with cratex . Radius and polish the edges of the chamber to aid feeding. Next slide will give details on ammunition feeding.



The pistol really doesn't need much of a feed ramp in the barrel. You can see the round actually uses the feed ramp on the magazine and has a very straight line into the chamber. The small bevel on the sides and radiused edges on the barrel (from the last slide) are really all that is required. If you experience feed issues with different shaped bullets, use the factory barrel feed ramp as a guide. I ended up with visible radius on bottom edge of chamber, to prevent cases "catching" halfway in. Chamber diameter was not the issue, it was radius to allow case to transition into chamber.



The owner also asked for a longer Bolt Hold Open Pin.  
You can copy yours or use these dimensions.





Here is the completed project with some test targets. Owner has much smaller hands than I do, so proper grip was a problem. The smallest group (center target) was the last fired, so I guess I got it figured out. Firing was done from sandbagged rest at 25yds. Please feel free to contact me with questions or comments, [ask\\_derrick@aol.com](mailto:ask_derrick@aol.com).