Borden Rifles

Instructions for Bushing Firing Pin Hole

Background:

Remington bolts and some custom bolts as they come from the manufacturer have at least 1 or 2 issues with the firing pin that need to be corrected to ensure accuracy and reliability. From my experience, the prime issue effecting accuracy is the firing pin travel and the guidance of the firing pin during travel. The second issue is the diameter of the firing pin hole to help prevent primer cup blanking.

There are two common ways for the front of the firing pin to be guided in a bolt. The primary consideration for either method is to have the tip of the firing pin controlled and guided so that once the firing pin has been released that it has smooth and uninterrupted travel to primer impact. One of the methods used by some manufacturers to guide the firing pin at the front is to have the firing pin boss/spring stop be large enough to closely follow the internal hole in the bolt to keep the firing pin tip lined up with the firing pin hole. The second methods is to have a long firing pin tip that travels in a firing pin hole that is long enough to keep it "trapped" for the entire length of the firing pin travel. Remington and Model 70 Bolts use method 1-the firing pin boss. However, over the years, the manufacturers departed from understanding why some dimensions were held tightly and let the firing pin spring clearance holes in the bolts get bigger and the firing pin bosses get smaller. The result was that the firing pin was no longer guided to have the tip remain lined up with the firing pin hole and accuracy suffered.

Careful study of a number of bolts from a number of manufacturers in the 1980's resulted in the procedure described here. Some bolts (factory and custom) were machined as cross sections to more readily be able to study the internal design concepts used and what problems were being experienced. The procedure described here is to address the issue of firing pin tip guidance to optimize accuracy and firing pin hole diameter to prevent primer cup blanking.

Tools and Equipment:

1. Labounty bolt fixture or other reliable method to hold bolt body concentric to lathe centerline
2. Small carbide boring bar
3. ¼ x 28 Bottom tap (I used carbide)
4. Custom made 1/4x28 screw to use as plug for bolt face (see Drawing 1)
    a. This screw needs to be made of 4140 or 4340 hardened to 36 to 40 Rc
5. Dial indicator or test indicator in 0.0001" sensitivity
6. Carbide endmill (size depends on size of boltface)
    a. use 7/16 for .480 boltface
    b. ½ inch for magnum boltface

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7. Red Loctite
8. #0 center drill
9. #52 carbide drill
10. .065 reamer

Procedure:

1. Setup bolt in lathe to be concentric to the axis of the lathe and in a sturdy setup that will not move while you are machining the bolt. I use a LaBounty style fixture and indicate the bolt behind the bolt head in to .0002 TIR or less. Make sure you mic the bolt diameter in two places 90 degrees from each other so that you can allow for diameter differences in your alignment.
2. Measure boltface counterbore and record.
3. Using the boring bar, establish Z0 as the current boltface.
4. Bore a hole in the bolt .217 in diameter by .575 deep from the boltface surface. (see drawing 2 and figure 1 as reference for this machining)
5. Bore a concentric hole .260 in diameter by .180 deep from the boltface surface.
6. Spotface bore .480 diameter by .100 deep from the boltface surface and face to the .260 diameter hole to make a good seat for the screw
7. Use the ¼ x 28 tap to thread the .217 hole
8. Screw the custom made screw into the threaded hole until it stops and make sure the plug fits tightly and has minimal clearance around edges for neat looking job.
9. Remove the screw, degrease the hole and threads and apply loctite and re-install the screw making sure it is seated tightly against the machined shoulder.
10. Measure counterbore depth to face of custom screw.
11. Use Carbide endmill in tailstock to machine face of custom screw to .05 in front of boltface.
12. Use #0 centerdrill to spot center hole for firing pin hole. Just make deep enough to start drill-if too deep it will flare the front of the firing pin hole.
13. Use #52 carbide drill to drill the firing pin hole
14. Ream firing pin hole with .065 reamer.
15. Use boring bar to machine face of the custom screw to old boltface -.001 or until it completely cleans up to give smooth, square boltface.

Figure 1-Remington Boltface with holes and counterbores machined

Figure 2—Custom made screw in place and ready to machine

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16. Bolt can now be removed from fixture.
17. The firing pin tip will need to be modified to result in a cylindrical tip that is .062 +/- .0005 in diameter by .4 long. This can best be done in cylindrical grinder or with whirly jig on surface grinder or any other option that you have available to cylindrically grind.

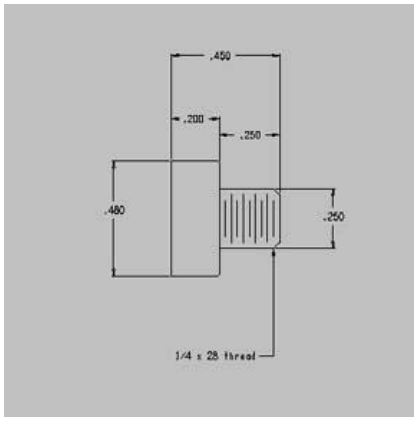

Figure 3 drawing for custom screw

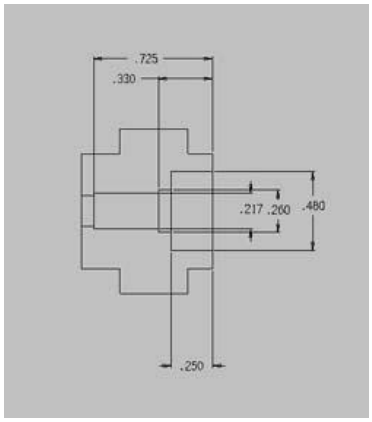

Figure 4 Drawing for machining

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