

Competition Mag Tuning Tutorial

Started by kgunz11 , Dec 16 2011 04:00 PM

I've had lots of questions from folks about DIY mag tuning since we are no longer offering this service. We still tune mags, but only on custom gun orders coming from our shop. With our backlog, we just can't do them all. Here is an effort to help guys that want to do it at home with some simple and inexpensive tools for their .40S&W STI magazine tubes. You'll need:

- Dial caliper with dept rod
- drill press (hand drill CAN be used here)
- 3/16" drill bit
- 3/4" wide flat file
- buffer
- 21 dummy rounds (no primer/powder)
- Dremel tool with sanding drum
- soft rubber mallet or dead blow hammer
- needle nose pliers

First, I start out by relieving the hump in the ribs that run down the left side of the magazine. The STI mags are built in a left 1/2 and a right 1/2 then welded up the front and back of the magazine. It would be wise to check that seam internally to make sure no crack is visible on the inside if you plan to re-dimension the tubes for additional capacity. If there is a crack there, it will only get worse in later steps. On the .40 mags, the ribs on the left side of the tube stop abruptly around the 19 round mark. Below where the rib stops the magazine is wider. This is the area that causes the most trouble for folks because it allows rounds to spread far enough apart in their side by side stagger to let the follower flip and a round will jam the follower in place or get under it. It's important to make that transition back onto the rib as smooth as possible for the round that encounters it. Take a Dremel tool with a sanding drum and make that hump a "ramp" by sanding it down. Try not to sand all the way through the rib but don't fret if you do, the mag will still work fine. Here is a photo to demonstrate what it should look like after you've completed this process.



If you'd like to re-dimension your mag tubes for a little extra capacity, you'll want to do this next step. If not, skip this step and go to the next one. For those of you that want 21 rounds in your magazine, you'll need to make a little more room inside the mag for the rounds. As you load your STI magazine, the rounds will begin to stack in a side by side staggered orientation. To get another round in the mag, you only need a fraction of a round throughout the entire mag. Out of the package the magazines should measure around 1.370" front to back. By placing the magazine in a vise you can squeeze them a little and bring that number to 1.360" or so. Go easy on the mags by applying a little pressure then measuring them. Start slow and work your way into it. After a little practice you'll know about how much pressure is needed to get the mags to that number. You can do this without a mandrel if you go slow and carefully. If you go too fast you can take the mags out of square and a mandrel will be needed to square them up in a timely manner. After you've gotten your mags to the desired measurement check

them to make sure they will drop free from your gun. Just a naked mag tube works for this, no need to assemble the mag.



Witness holes aren't a requirement and they don't add anything to the function of the mags, but they are a nice feature to give you a quick reference on how many rounds you have in the magazine. With Dawson base pads, you'll want to mark no more than the 18th round because of how high the pad rides up on the tube. With the Bolen followers you CAN do the 20th round, but what's the point? In order to measure for the location of the witness holes, install your spring and follower kit into the magazine and attach the base pad. I always use a DP base pad for this process because they can be easily removed without disrupting the arrangement of the rounds in the magazine. Next, I'll load 10 dummy rounds into the magazine and carefully remove the base pad and spring/follower while holding the mag upside down. From this position, I can use the drop arm from my dial caliper to measure to the rim of the 10th round.



Lock the caliper in place and empty the mag. Now turn your mag front side down on your work bench and lay the drop arm on top of the back of the mag and place a round at the end of the drop arm. The center of that round is where you want your hole.



Mark that location with a sharpie and then with a 3/16" drill bit, drill a hole in the tube where the primer will be when the mag is loaded. I use a drill press for this but you can hold the mag in your vise and manually drill it if you don't have one. Keep in mind, the mag tubes are heat treated 410 stainless steel and they are pretty hard.

After you drill your hole use your flat file to remove any bur that the drill bit might have caused inside the magazine. Now you can load up for the next hole at 18 rounds and repeat the process. This will need to be done individually for each magazine. When you're done, they should look like this:



Repeat that process for each magazine and don't forget to debur. The last stop before the polishing procedure is to check the feed lip dimension. I like to run 40 mags at .388" +/- .004. If they are wider than that you can use your rubber faced hammer to close them in or a pair of needle nose pliers to open them. Use the nnp inside the tube and open them up to open the feed lips, don't grab them and try to open them by bending them. After you've done that you can take the mags to the buffer and put whatever level of polish you desire on them. For a satin brushed finish I use a fine grit 3M wheel. They'll look like this:



I hope that helps some of you DIY guys out there and if you have any questions I'll do what I can to help.

[Freedom Gunworks](#)

FAQ:

1. **Can you elaborate on what type of polishing wheel for the satin finish (fine grit 3M)?**

"It's a scotchbrite 3M wheel on the buffer. I have coarse, medium, and fine grit. Originally I was sanding the tubes with an orbital and used 320, 400, 500, 600, 800, 1000, and 1500 grit paper. You can imagine how long that process took on a set of 4 mag tubes! It did leave a great finish but I soon learned the prettier they

started the quicker they scuff in use. The brushed finish stays looking better longer.”

2. **What feedlip dimensions do you use for 9mm and does this tutorial essentially apply to new style SVI mags as well?**

“The SVI mags require no tuning for fit and function in the SVI guns they were designed to work with. They can be a real bear to make them compatible with an STI gun though.”

1. **Is the front to back dimension to 1.360 inside measurement or outside of the mag?**

“Outside”

2. **Where does one get a mandrel that you talk about to resquare mags?**

“You'd have to make one”

3. **What are you using in between the mag and vice as a buffer (leather)?**

“I use leather soft jaws but it works the same without them”

4. **How do you polish the inside of the mags?**

“Paintball gun cleaning mop chucked up in the drill covered in an abrasive polishing compound”

5. **Are the feedlips .388 all the way from front to back in 40 cal?**

“Yes. Over time the fwd side will open up so it is something to watch”

6. **What polish do you use with the 3m wheel**

“I don't put anything on the 3M wheel”

7. **What do you debur and polish the feedlips with**

“A muslin wheel on the buffer”

8. **What are the feedlip dimensions for 9mm mags...Any separate tricks needed for them?**

“9mm mags are totally different. The information shared here is for 40S&W mags”

9. **Curious, is there similar info in the DP Mag tuning kit, like taking down the ribs inside the mag?**

“No, the Dawson kit only talks about restoring mags to original spec. If the tubes get out of square though Dawson doesn't tell you how to correct that...”

10. **For guns where you want the slide to lock back, what follower have you found most reliable? I have tried Grams, and have ground through the slide stop tab to try and stop lock back with one round in the mag, stock STI followers work, but some stick out through the feed lips even though I have tuned the lips and the dimensions are the same.**

“I use STI followers when I want the slide to lock back.”

11. **If I were to use a Dawson SNL basepad, would I need to re-dimension the mag, or would that for sure put it over 140mm? Or, would I just use a regular Dawson basepad?**

“SNL stands for SOMETIMES Not Legal. On STI tubes they almost always are legal, on SVI tubes they rarely are legal. The only way to know for sure is to use a mag gauge. At the recent Alabama Sectional a lot of folks failed the mag gauge at the chrono station. I saw a lot of mags I tuned come through there and they all passed the gauge. To knowingly use a mag that isn't legal is akin to cheating in my book.”

12. **I got the whole vise deal with opening up the inner width of the mags, but what is the limit of the inner bearing width? I plan on fixing mine to hold 20 or more reloadable. Going to make a male plug to open up the inner surfaces, but there has to be some limiting factor.**

“Interior dimensions vary as do the exterior. It depends on how deeply the ribs were stamped in the magazine. The exterior dimensions are critical because of the mag doesn't drop free, what good is it anyway?”

13. **I just finished sizing all of my 9/38 140 & 170 mags this weekend, both front to back and feed lips. I used your advice on loading up all mags and letting them sit over night to set the memory of the grams springs. In my DP mag kit, Dave "apparently" sets the spring memory by holding them down in his tool for about 20 seconds...this doesn't seem like it'd do anything at all. Is that just based on the fact that he's showing people how to tune STI springs?**

“I don't believe 20 seconds is going to do much. I'd load them up to capacity and leave them that way for a few days.”