Gun Project 7—A Fixture for Checking .22LR Match Rounds for Concentricity/ Bill Young

Bill Young came up with a way to mount a dial indicator and run it against a .22LR cartridge to check the projectile for concentricity. When firing for accuracy, it is important to assure each bullet is as perfect as possible. Rounds that do not fall within the accuracy requirements when checked are set aside to be fired during practice, and only the best rounds are used in competition. This simple fixture makes checking each round quick and easy.

We are not presenting dimensioned plans here because Bill just used what material he had on hand, much as you probably will. It should be pretty easy to come up with dimensions from once you see how it works and keeping in mind his basic requirements stated below in the letter from Bill that follows:

“As you can see from the photos, this was built primarily from scraps and other stuff lying around just crying to be put to use. The design is taken from pictures on-line of a commercial product. I kept some parts close to the original and others were seriously modified to cut down on machining time. The only items purchased for this task were the bearings, the grommets, and the shrink tube for the handle. Everything else was parts I had on hand including the gauge. Speaking of the latter, this was one of the major departures from the commercial version: they used a normal dial indicator instead of the test indicator that I used. I had a dial indicator available and could have used it, but I thought that it would involve more pressure against the bullet and decided against it.

I let the handle that holds and revolves the bullet under the indicator have a long angular motion so that it could lie back like it is shown in photos #2 and #3 and thus make it easier to handle the small .22 LR bullets when putting them into the device. (Experience with the device has shown me that all the rotation I built into it is a very good thing, as most times if you leave the device “open” and put the cartridge in, it will stay in the device until you swing it to the closed position. (See picture #4.) This facility is easily obtained by correctly adjusting the height of the test indicator so that its resting position is not so low that the cartridge will fall out of the intended testing position and not so high that it doesn’t properly make a measurement.)

I used the shrink tube to be the rubber on the turning rod and the grommets are carefully spaced as shown in both photos. The bearings (4mm x 8mm) are cheap ones costing $1.00 each at the local model car shop. I took a couple of gauges in with me to check them out and got four fairly good ones. When I put a length of ¼" brass rod in the device I get less than .0005" deviation on the test indicator. A good friend informed me that I could get a good bit less noise if I used class 9 bearings and he also told me where to get them. The price for them was about $5.00 per bearing, but I haven’t decided whether it’s worth it to me.

The white spacers shown are made of acetal trimmed to the correct OD and drilled to the proper ID. I also cut them off the original piece of round stock on the lathe carefully to the necessary thickness. There was an especially important OD on the one where the rim of the shell was against the brass; it didn’t want to be too large and contact the rim of the shell.

One of the lathe techniques of special interest was the fact that brass rods on which the bearings sit had to be 4mm in diameter to fit the 4mm ID of the bearings. This necessitated I go the extra mile in setting up the lathe headstock to be very accurately parallel to the bed of the lathe, a new process for me. I also jumped through a few more hoops to square up the mill when drilling the holes

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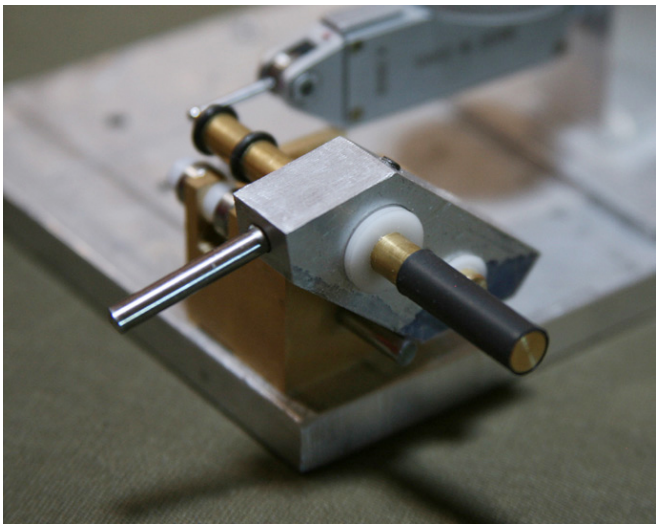
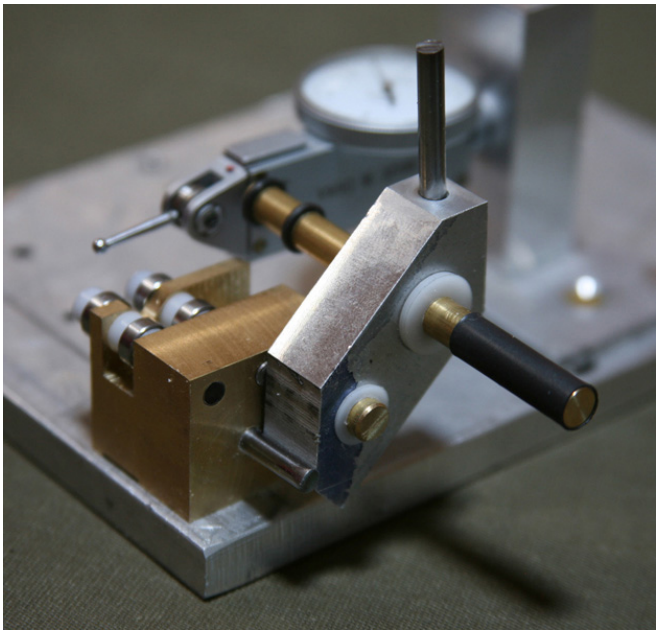
in the large hunk of brass to keep the rods parallel. These activities certainly cut down on the “noise” and they delivered a lot of precision. Actually, the commercial site where I found the design offered their device in two grades: one at $250 and the other at $365. Only the latter is guaranteed to deliver .0005" precision! So, if any of you builders are interested in constructing this device, you can build it cheaper and better if you take the time.”

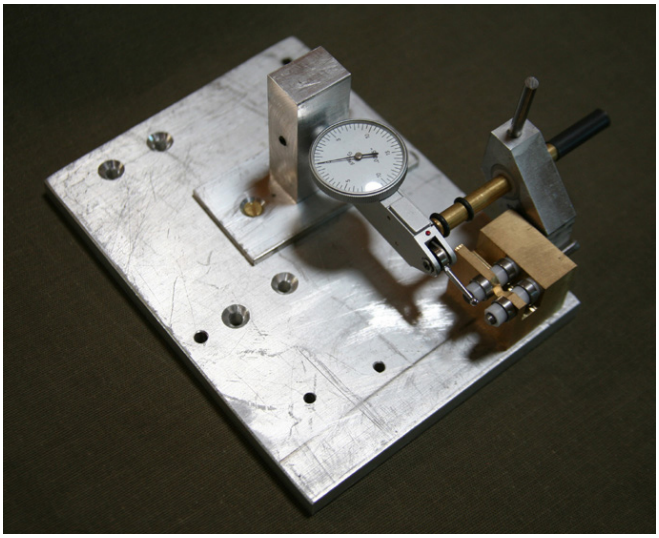
—Bill Young



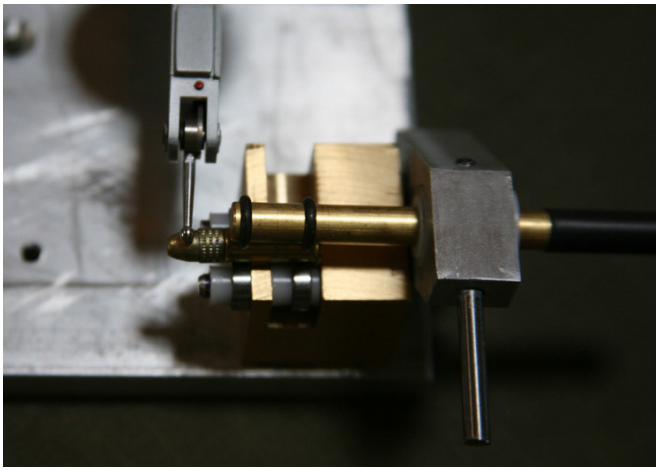
1. (Above) Concentricity checker in the “closed” position.



2. Checker in the “open” position, seen from the back side.



3. Concentricity checker in the “open” position with indicator feeler in place.



4. Checker in “closed” position with indicator tip on projectile surface.

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