M/700 POWDER METAL SEAR TEST

Summary of Comparative Dry Cycle Test Results

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The first test of M/700 powder metal sears was a 10,000 dry cycle feasibility study. The recorded maximum and minimum trigger pulls of this test indicated that the trigger pulls increased while no apparent wear was observed when the sears were inspected by Paul Gogol. The trigger pulls increased and decreased during the testing, giving inconclusive test results.

Test Number Two was organized for comparing the powder metal sears with the standard production M/700 sears. Test consisted of three samples of M/700 powder metal sears and three samples of M/700 standard production sears being dry cycled for 10,000 cycles each. The maximum and minimum trigger pull measurements taken during test number two varied like the results of test number one. Test number two results showed that the three powder metal sears and one standard production sear gave unsuitable trigger pulls. At the same time two of the standard production sears gave consistent maximum and minimum trigger pulls during the dry cycle test.

The dry cycled guns were returned for inspection of the sears. Observations made indicated the powder metal sears seemed smooth and the top corners were rounded off. The standard production M/700 sears had no detectable changes.

With completion of dry cycle test numbers one and two, decision was made to retest the M/700 powder metal sears. Test Number Three was to take into consideration factors as follows:

Lubrication	Cycle Rate
Individual Trigger Pulls	Manual Measured Trigger Pull
Firing Pin Indent	Fired Control Rotation with all Gun Assemblies

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The M/700 powder metal sear Test Number Three consisted of the dry cycling of the power metal, powder metal chromed, machined, and standard production samples. The cock and fire dry cycle test consisted of the following steps:

1. Wipe the sear and firing pin head surfaces with a "mask" oil dampened cloth.

2. M and record the firing pin fall time at the beginning of each 1,000 dry cycle set-up.

3. M and record the trigger pull and indent at the beginning of each 1,000 dry cycle set-up.

4. Cycle each gun assembly 1,000 dry cycles, recording each trigger pull with the Sanborn recorder.

5. M and record the firing pin fall time at the end of 1,000 cycles.

6. M and record the trigger pull and indent at the end of cycling.

7. Visually inspect the sear and firing pin surfaces.

8. Change the fire controls with the gun assemblies as given on the rotation schedule.

9. Repeat steps one thru eight until 10,000 cycles reached.

The cycle rate for this test was one cycle every three seconds, which is much slower than test number one and test number two of the M/700 powder metal sears. Cycle rate consideration was due to the build-up of a red-brown material, like surface rust, in past dry cycle work. In this test the cycle rate increased unnoticed up to approximately one cycle every two seconds at the 4,000 cycle level. At the 5,000 cycle level the cycle rate was adjusted back to the initial test cycle level, and held at one cycle every three seconds for the remainder of test.

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Apparently the presence of this surface rust alters the coefficient of friction and the resulting trigger pull. The individual trigger pulls recorded on the Sanborn recorder showed a variance and rise of trigger pull, but the electronic difficulty experienced during testing produced unreliable trigger pull readings.

The manual trigger pull measurements in test number three indicated the powder metal sears with a chrome plate gave the most consistent test results and lowest trigger pull during dry cycling.

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