

FIREARMSModel 1100 Improvements

Production experienced problems with the lot of 50 spring retained feed latches. The latches came out when an air wrench was used to tighten stock nuts and when the action bars were cycled to check for fit. The Model Shop is making parts which have been redesigned to improve retention.

Model 1100 Weighted LT-20, 28 and 410 Skeet Guns

Design work is in progress to match weight and center of gravity to the large frame 20 gauge gun and also the 410 gauge as requested by Marketing.

Marketing is continuing their appraisal of the first design (12 gauge weight and c.g.).

Model 1100 Waterfowl Guns

Marketing is considering changes to the as-transmitted design. Drawing work is being held until decisions are made on the final configuration.

XSG

Due to out-of-tolerance conditions, gas system orifice holes had to be opened up to .110" to achieve proper bolt velocities. During the evaluation of the gas system a .093" diameter leading orifice hole was added to affect better sealing by using the high pressure gas itself to prevent blowby. Sealing was improved as evidenced by a 30 in./sec. increase in bolt velocity. New gas system components are in the Model Shop. We are also experimenting with a plastic piston which can be injection molded. Two pistons of Du Pont "Vespel" SP-1 are being made in the Model Shop and will be tested on a standard M/1100.

Shooting tests of the A3 with magnum loads resulted in cracks on the cam webs on both the slide block and locking block. This problem appears easily correctible by reducing the effect of stress raisers. These parts have been redesigned and will be sent to the Model Shop the week of 6/25/78.

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Model 870 All Gauge Wood Cosmetics

Layout work for the new checkering patterns is under way.

Model 3200 Skeet Set

No Research activity.

Models 7400 - 7600

Rebound bolt velocity has been demonstrated to be a factor in the malfunction rate of these guns. Bolt velocity testing has shown that deleting the buffer reduces rebound velocity and approximately doubles the total elapsed time between uncovering the feeding shell with the breech bolt and picking it up again to push it into the chamber. In a three-gun field function test the overall malfunction rate dropped from 14% with the buffer to 3.1% without. Tests to determine the possible decrease in endurance life of action bars and other components due to deletion of the buffer are in progress. Buffer material is now "Hytrel" 5555. Measurements with lower resilience "Hytrel" 6346 showed no appreciable improvement. Buffers of a low-resilience urethane compound have been ordered.

Two Model 7600 rifles were extensively dry-cycle tested. One was run to 52,000 cycles with no significant failures. The other was cycled to 23,000 at which time the small diameter rear shank of the breech bolt broke off. The gun was fitted with another bolt and cycled an additional 35,000 rounds. This bolt broke at the same location. Since the design life of this gun is 3,000 rounds and the breakage was fail safe (the gun cannot be fired) this performance is considered to be acceptable. These guns had the new design firing pin and hammer which performed satisfactorily.

Cracked barrel extensions have been seen in four endurance guns. Two guns were modified to include a radius in the high-stress area. One gun is at 3,000 rounds with no problems. This gun is also being used to check action bar life with the buffer removed.

Two guns are being shot and bolt velocities monitored every 500 rounds to determine the cause or causes of bolt velocity increase.

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New receiver inserts have been received from the vendor. They show no soft spots that caused receiver damage in two endurance guns. Dimensional control is also improved, resulting in easier assembly.

Action springs in endurance guns take a set of approximately 1" during the first 1,000 rounds and thereafter stabilize. A 1" set is typical of that seen on standard M/742's and is not considered to be a problem.

An intentional primer blanking test was run to determine the ability of the new hammer to sustain this type of abuse. The gun was subjected to 36 blanked primers with proof ammunition. Total bend of the hammer was approximately .010". Preplay was not seriously affected and no unsafe conditions resulted.

Parts are being prepared in the Model Shop to determine the effect of a maximum diameter firing pin and minimum diameter breech bolt hole on firing pin endurance life.

Redesigned magazine boxes and followers have been ordered.

High-speed movies are being analyzed in an effort to identify the causes of feed malfunctions.

#### Model 870 Competition Trap

Several parts have been changed to move the center of gravity away from the muzzle as requested by Marketing. These include an aluminum magazine cap, a shorter fore-end retaining nut, a shorter fore-end tube and thinner vent rib posts. Tests are to be run to determine what effect a slightly lighter piston will have on recoil.

#### Model 1100 - M/870 Target Trigger

Two prototypes for the M/870 have been completed, and two for the M/1100 will be completed by the end of June. They will then be put in test in the Test Lab. A patent search has been initiated.

#### Model 700 - 7mm-06 Rem. Caliber

Transmittal of drawings to the Plant has been completed per Operations Committee approval of June 13, 1978.

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Mechanical Trap

Operations Committee approval of the hand cocked trap was received on June 13, 1978. Transmittal of drawings should be complete by the end of June. The manual should be complete by August.

Model 600 Carbine

Marketing is setting up a focus panel to evaluate various designs.

Model 541 - 22 Hornet

A single-shot model was assembled and proofed. Because of assembly problems headspace was .073". SAAMI recommends .065" to .072". The headspace did not change during proofing. After 18 rounds a head separation was experienced. Headspace was still .073".

A new bolt was fitted, giving a headspace of .066". After two proof rounds it was .076". Test firing was commenced with hard bolt lift being experienced. After the 80th round the bolt had to be pried open. In checking the rifle a fire control stud was broken. This is being repaired so that further testing can be done. Because it is felt that receiver stretch is causing the tight bolt lift problem, a new receiver is being made with approximately 20% more material in the ejection port and magazine port area. This should be ready for assembly within two weeks.

The basic premise for this program was add using the M/541 for this cartridge. It now appears the magnitude of the product design changes will make the cost prohibitive. This program will be re-evaluated in July when high-spot costs will be available from the plant. If, as we suspect, the cartridge is not economically adaptable to the M/541 we will consider the M/788 providing Marketing believes there is sufficient incentive for an additional chambering in this gun.

Model 700 Fire Control

A fire control with a new sear safety cam assembly and trigger to eliminate the connector, and with fixed engagement and

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fixed overtravel, was assembled. Slight alterations were required. Parts are being made and will be ready for assembly and test the first week in July.

#### Bench Rest Bullets

Approximately 68,000, 6mm bench rest bullets have been shipped to the warehouse.

The cost reduction program on the 6mm bullet job is continuing. The second machine draw operation has been automated and resulted in reducing the direct labor by one. An estimated savings of approximately \$1300/month is expected to be realized.

#### Process Research

##### Center Fire Rivetless Extractors

A trial lot of 1,000 pieces can be produced, including 4-slide formed claws using temporary tooling at an estimated cost of \$10,000. However, work has been held up, pending a release from any possible contract violation between Remington and the H&P Die and Stamping Company who currently produces this part. H&P also has developed a proposal to reduce the cost of this part, however, our design and process still appear to have a significant cost advantage. Several alternative approaches to dealing with H&P are under consideration by Purchasing.

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