

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



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Ilion, New York
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FROM: J. P. LINDE

STATUS OF DESIGN WORK
MANUAL FIREARMS DESIGN

MODEL 3200

Cost Reduction and Product Improvement Items

1. Stock Breakage - Six stocks with a thicker grip section have been made.

These stocks have approximately .100 inches additional material on each side of the frame slots. Two of the stocks have a panel section which is 1/2 inch longer to give the grip section a better appearance. The panels have been smoothed into the stock, eliminating the hand shaping, to lower costs, in place of the sharp panel cuts which are presently on the stock. The grip section at the top and bottom tang have been rounded to eliminate sanding operations.

A stock with a cross bolt has been tried with little success. A stock with fiberglass netting in the epoxy seat and rear radius has also been tried with little success.

A plan will have to be formulated to meter the amount of epoxy in each stock to eliminate disassembling the stock and scraping out the excess epoxy. A stress diagram of the stock will be developed to determine exactly where the high stress areas are under slamming and shooting

1. loads. With this data perhaps an internal strengthening element can be fabricated to take the firing load of the wood in the weak wood areas.
2. Fore End Breakage - The assembly technique presently used will be checked. The fore end iron - fore end plate joint will be strengthened, a stamping formed into the fore end plate cavity, and/or heat treating will be tried first. The spring loaded ejector system which eliminates the ejector hammer will be tested and evaluated. This would allow a great strength increase in the joint.
3. Tang Block Shoulder Screw - A design which eliminates the slot in the bottom tang and which aligns the tang block with the bottom tang is being evaluated. This design will reduce stock splitting caused by reassembling the present tang block in a different position than what the epoxy has been cast for in the stock. The design will also eliminate any shifting of the tang block when the gun is fired. This design will eliminate a number of hand drilling operations.
4. Strut - The strut is being revaluated as an aluminum extrusion or as a formed bar stock piece. Drawings are out for quote and the aluminum strut is being evaluated.
5. Custom Repair Guns - Two guns were tested with screw attached bottom tang, strut, long slot nut and new sears. These guns were slammed to see if heat treat was necessary on the bottom and top tangs. The guns failed quicker than expected and this is not a viable alternative for returned guns at this time.

6. Top Lock Lever Load - Guns were measured for top lock lever unlocking loads at assembly, after assembly and after proof. From this data it has been determined that the gun can be assembled to a certain unlocking load at final assembly which will give good performance without excessive opening loads.
7. Trigger Gage - A device which gives the trigger force - displacement curve on a strip chart recorder is being made. This gage can be used on any Remington or competitive gun. This device will remove creep from a subjective determination and will allow a straightforward analysis.
8. Recoil Pad - The drawings have been changed and two .140 dia. holes have been added for access to the recoil pad screws. This will eliminate tearing of the pads from constant assembly and disassembly of the stock. A design is being investigated for permanently attaching the recoil pad to the stock. The stock bolt would be trapped in the assembly. This alteration would be made to lower costs of obtaining this fit.
9. A number of ejectors have been fabricated by electron beam welding the stem to the head. Several different joining configurations have been tried and tested. To date a welded ejector which will match the present production samples has not been achieved. The latest samples are being fabricated; soon will be ready for testing. The economics of the process are being costed by P.E. & C. and M. & S.
10. A final assembly test is being determined on the proper adjustment of the fore end iron assembly to give the correct barrel opening resistance.

11. A number of main hammer plunger rod failures was the only significant problem encountered in the skeet set endurance testing. Preliminary testing of a new design plunger rod indicates greatly improved endurance life. Additional samples will be made and tested to verify initial findings.
12. The trigger adjusting nuts are binding on the adjustment screws. A new nut design is needed which will lower the costs and improve ease of adjustment.
13. The excess epoxy is removed from the epoxy bearing surface in the back of the stock on every gun. A method is being developed to meter the correct amount of epoxy into every stock to give good bearing surface and eliminate the cleanup operation.
14. Operations in the process of being eliminated:
 - a. Top Lock Frame radius clearance cut. Shim eliminates need for cut.
 - b. Barrel Assembly Fore end iron assembly alignment cuts and ejector cam plate clearance cut being combined to eliminate one operation.
 - c. Monoblock Bottom radius to guide into frame slot being combined with squaring operation - eliminating one operation.
 - d. Bottom Tang Two roughing operations combined to eliminate one operation.
 - e. Proposed Changes
 1. Eliminate radius on top lock notch.
 2. Eliminate bearing radii on rear connector link.
 3. Make connector from formed bar stock.

14. f. The filing operation on the barrel assembly when fitting with the frame is being eliminated.
- g. The ejector cam plate is being altered to eliminate excessive brass on the front frame radius, which has to be filed clean.
15. A cost analysis is being run on making the bottom tang, strut, and tang block a one piece investment casting. The cocking rod would be changed to formed bar stock, and the tang lip projection would be shortened. All of the external surfaces which are critical would be recut.
16. All inspection sheets have been reviewed and updated. The assembly sheets will be updated next.
17. The fore end fit to the gun is being checked to see if it is being properly fitted to the bottom barrel at the front of the fore end. Improper fit can load the fore end latch and cause it to work with great difficulty. The tabs on the loop will also be strengthened to stop deformation when abused.

Safety Items

The 3200 was fired with the 12-20 cartridge combination (results in report).

The proof mark will be moved forward to eliminate a potential area for the failure to start.

High Grades

Our Trap high grade for the NSGA and NRA shows has been completed. The Skeet high grade is presently being engraved.

Skeet Sets and Lightweights

No further design work will be done on these models during the cost reduction program. If the Model Shop requests work, the redesigned 20 Ga. barrels will be fabricated.

Single Barrel Trap Guns

Three model guns have been fabricated and are ready to be assembled. A test procedure for these guns will be formulated and the guns will be put into design test. These guns will be shot at trap against all the leading competitive guns. The guns have the new super trap choke which will be tested. They also have the latest recoil reduction system which is presently giving recoil reduction levels equal to the M/1100 autoloaders. The adjustable rib has been designed to give a point of impact range from 0-10 inches high at 40 yds.

Models 600 - 700 - 788 - 580 Safeties

The design of the safety mechanism for the M/788, 580 and Mohawk 600 has been completed and being instituted by production. The 540X and 541S safety designs will be transmitted with the successful completion of the 788 and 580. Work still remains to be done on updating the field service manual to reflect the known safety checks. The M/700 safety alterations are in test and have to be completed and transmitted to production.

Design work has to be done on making the safeties more positive, making the trigger and connector one piece, and checking on misalignment effects.

The stock interference with the safety on the M/788 is being checked with layouts and assemblies are being made to verify the layout conclusions.

Model 600 - Mini-Carbine

The gun has been presented to management a number of times with no positive response. The only activity is fitting the present guns with aluminum trigger guards.

Model 700 - New Calibers

The M/700 BDL Varmint Rifle in 308 Win. will be announced in January 1976. Five guns (three of which will be shown to the gun writers) have been fabricated and tested. The accuracy of all five guns was well within our specifications.

Two M/700 rifles and two pressure barrels are being made for the 8mm Rem. Magnum cartridge. The guns are being held up awaiting chamber tooling.

Three M/700 rifles are being made for the 7x64 cartridge. This is a popular caliber in Europe and the 700 is being tested with this cartridge for foreign sales.

M/700 Silhouette Rifles

The latest silhouette rifle being made has the following specifications:

- 280 Rem. cartridge
- 27 $\frac{1}{4}$ inch barrel
- Enlarged muzzle approximately 1/2 pound added
- Fiberglass stock
- Possibly an aluminum-steel firing pin for faster lock time.

A fire control will be made with formground sear, connector and firing pin head, to give a better trigger pull.

M/700 Scope Mount Problems

The scope blocks will not line up properly (i.e. one block is lower or higher than the other). The problem appears to stem from heat treating deformation of the receiver. A Quality Control study has been run on production receivers and a course of action is being determined.

M/700 Future Program

The future 700 calls for a safety which will allow the shooter to unload the gun with the safety on. A box magazine option will be investigated.

Model 788

The material in the firing pin head and 580 cocking piece will be changed from powder metal to formed bar stock. Powder metal will be running out of HVA powder, the only one which has been successful to date for these parts. New parts will be made and tested, followed by the design change.

Model 581 Single Shot

A design is being developed to alter the 581 clip fed gun to a single shot. This design has a plastic loading ramp with a metal ejector. The clip slot would be covered with a plastic cover. The gun could be converted back to a repeater at some later date.

Model 540X

The bolt stop on the 540X is very fragile and will be redesigned for added strength.

Model 40XC

The 40XC does not feed properly with the new stock, and will require modifications to the magazine spring.

The M/40X RF Sporter also is experiencing feeding problems.

Trap Program - 4100 Series

Work is being done to eliminate the chatter, follow through, and mice problems in the 4100 traps. High speed movies are being taken of the linkage to determine the main source of the chatter.

Trap Program - 4100 Series Continued

The parts lists, part usage, and drawings of both the skeet and tournament traps are being reviewed and corrected.

Mechanical Trap

A new design proposal has been formulated using a piece of steel tubing for the frame in place of the costly casting. This design should meet the standards of cost, quality and endurance strength. Part drawings are being made as time permits.

JPL:T
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