

C O P Y

E. I. du Pont de Nemours & Company
(Incorporated)

March 14, 1934

ADVICE OF ACTION

Mr. C. K. Davis, President,
Remington Arms Company, Inc.

Copy to Mr. W. U. Raising, Jr.,
Mr. G. Dare Hopkins,
Mr. W. A. Hart

SUBJECT USE OF DU PONT OVAL TRADE-MARK BY
REMINGTON ARMS COMPANY, INC.

ACTION TAKEN BY Executive Committee

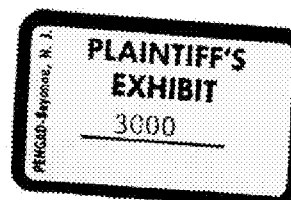
AT MEETING March 14, 1934

REMARKS

The following resolution was offered and unanimously adopted:

RESOLVED that, so long as this Company owns a controlling interest in Remington Arms Company, Inc., that Company be given the privilege of using the duPont oval in its trade-mark form on Remington products, stationery, advertising matter, cartons, packages, shipping cases, signs, etc.

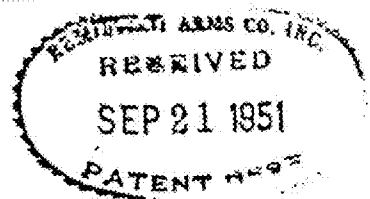
(Signed) M. D. Fisher
Sec'y Executive Committee



A L 0013517

1041

C O P Y



ADVICE OF ACTION

January 10, 1935

Mr. Wm. A. Hart, Director of Advertising

Copies to
Mr. C. K. Davis
Mr. W. U. Reisinger

SUBJECT

USE OF DU PONT OVAL TRADE-MARK BY
PETERS CARTRIDGE COMPANY

ACTION TAKEN BY

Executive Committee

AT MEETING HELD

January 9, 1935

REMARKS

Referring to your letter of December 21st in connection with the above subject:

It was moved and unanimously carried that the letter be received and ordered filed, and that the following resolution be adopted:-

RESOLVED that, so long as this Company owns a controlling interest in Remington Arms Company, Inc. and Remington owns a controlling interest in The Peters Cartridge Company, the latter company be given the privilege of using the duPont oval in its trade-mark form on Peters products, stationery, advertising matter, cartons, packages, shipping cases, signs, etc.

/s/ M. D. Fisher

Sec'y Executive Committee



A L 70013518

1061



E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

ADVICE OF ACTION

To: J. K. Jenney, Ass't Gen'l Mgr.
International Department

C. A. Rittenhouse, III-2
F.A.C. Wardenburg
M. R. Warden - 2

SUBJECT

USE OF DU PONT OVAL TRADE-MARK
BY REMINGTON ARMS OF CANADA LIMITED:

ACTION TAKEN BY

Executive Committee

AT MEETING HELD

October 29, 1958

REMARKS

Referring to your report on above subject, dated October 28, 1958:

After discussion, it was moved and unanimously carried that the report be filed, and that the following resolution on this subject be adopted, viz:

WHEREAS, the Executive Committee on March 14, 1954, unanimously adopted the following resolution:

"RESOLVED that, so long as this Company owns a controlling interest in Remington Arms Company, Inc., that Company be given the privilege of using the du Pont oval in its trade-mark form on Remington products, stationery, advertising matter, cartons, packages, shipping cases, signs, etc.";

RESOLVED, that, so long as E. I. du Pont de Nemours and Company owns directly or indirectly a majority of the voting stock of Remington Arms of Canada Limited (a subsidiary of Remington Arms Company, Inc.), the du Pont oval be registered in Canada as a trade-mark for products now or hereafter made by Remington Arms of Canada Limited, and that that Company be registered in Canada as a user of the du Pont oval trade-mark on its products.

A L 0013520

80-D

By telephone: 10/29/58
:Jmm

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WHEREAS the Executive Committee on March 14,
1934 unanimously adopted the following resolution: *etc.*

RESOLVED, that so long as E. I. du Pont de Nemours
& Co., Inc. owns directly or indirectly a majority of the voting
stock of Remington Arms of Canada Limited (a subsidiary of
Remington Arms Company, Inc.) the Du Pont oval be registered
in Canada as a trade mark for products now or hereafter made
by Remington Arms of Canada Limited and that that company be
registered in Canada as a user of the Du Pont oval trade mark
on its product.

ALL 0013521

3073

C O P Y

E. I. du Pont de Nemours & Company
Incorporated

ADVICE OF ACTION

To: J. K. Jenney, Asst't Gen'l Mgr.
International Department

C. A. Rittenhouse, III-2
F.A.C. Wardenburg
M. R. Warden - 2

Subject USE OF DU PONT OVAL TRADE-MARK
 BY REMINGTON ARMS OF CANADA LIMITED:

Action Taken By Executive Committee

At Meeting Held October 29, 1958

Remarks

Referring to your report on above subject, dated October 28, 1958:

After discussion, it was moved and unanimously carried that the report be filed, and that the following resolution on this subject be adopted, viz:

WHEREAS, the Executive Committee on March 14, 1934, unanimously adopted the following resolution:

"RESOLVED that, so long as this Company owns a controlling interest in Remington Arms Company, Inc., that Company be given the privilege of using the du Pont oval in its trade-mark form on Remington products, stationery, advertising matter, cartons, packages, shipping cases, signs, etc.";

RESOLVED, that, so long as E. I. du Pont de Nemours and Company owns directly or indirectly a majority of the voting stock of Remington Arms of Canada Limited (a subsidiary of Remington Arms Company, Inc.), the du Pont oval be registered in Canada as a trade-mark for products now or hereafter made by Remington Arms of Canada Limited, and that that Company be registered in Canada as a user of the du Pont oval trade-mark on its products.

(signed) F. G. Hess
Secretary, Executive Committee

PLAINTIFF'S
EXHIBIT

3002

A L 0013519

1 of 3

final
file
May 3, 1968

TO: BOARD OF DIRECTORS
REMINGTON ARMS COMPANY, INC.

FROM: PRESIDENT

USE OF THE DU PONT OVAL
BY REMINGTON ARMS COMPANY, INC.

Pursuant to resolutions of Du Pont's Executive Committee dated March 14, 1934 and October 29, 1958, copies attached, Remington and Remington Arms of Canada Limited were granted the privilege of using the Du Pont Oval in its trademark form on Remington products as long as the Du Pont Company continued to own a controlling interest in Remington. Since the adoption of these resolutions, Remington has used the Du Pont Oval in connection with its firearms and ammunition and, as its product line expanded, has extended the use of the Oval to other product areas. The Du Pont Oval is also used extensively in conjunction with the Remington name and trademarks in Remington advertising. To record Du Pont's ownership of the Oval as a trademark for products made and sold by Remington, Du Pont has applied for and obtained several trademark registrations for the Oval designating Remington as a "related company" as required by the Lanham Trademark Act. These registrations cover all of the important product lines manufactured by Remington. However, there has never been a written agreement defining Remington's rights and obligations.

Attached for approval is a proposed agreement which grants to Remington a non-exclusive and non-transferable privilege to use the Du Pont Oval for all products which are now or hereafter manufactured in the United States or sold or leased anywhere by Remington, provided that Remington will hold Du Pont harmless for any losses arising from the manufacture, sale, storage or use of products manufactured by it or Remington Arms of Canada Limited* and which

* An agreement appointing Remington Arms of Canada Limited as a registered user of the Du Pont Oval in Canada for ammunition will be filed in accordance with Canadian law.

PLAINTIFF'S
EXHIBIT

3003

A L 0013522

1 of 2

bear the Du Pont Oval. This hold-harmless provision is designed to protect Du Pont in product liability cases where Du Pont is sued, in addition to Remington, because of the presence of the Oval on our packaging. Remington acknowledges the validity of the Du Pont Oval and Du Pont's exclusive ownership thereof and agrees to exercise the privilege of using the Du Pont Oval only in compliance with good trademark practice. Remington shall employ the Oval only on such products as meet quality standards acceptable to Du Pont and, for the purpose of ascertaining the quality of Remington's products, Du Pont reserves the right to inspect Remington's manufacturing facilities. The agreement will be terminated immediately in the event Remington fails to conform to the terms of this agreement, or Du Pont ceases to own directly or indirectly a majority of the voting shares of Remington's common stock. The agreement may also be terminated by either party on sixty (60) days' prior written notice.

The proposed agreement has been approved by the Du Pont Executive Committee.

Approval is requested to execute this agreement in substantially the form presented. The following resolution is offered for consideration:

RESOLVED, that the President and General Manager, or the Vice-President and Assistant General Manager, each hereby is authorized to execute on behalf of Remington Arms Company, Inc., in a form satisfactory to counsel, an agreement with E. I. du Pont de Nemours and Company with respect to the use of the Du Pont Oval trademark on Remington products.

R. H. COLEMAN

MAY 15 1968

PATENT DEPT.

AGREEMENT

AGREEMENT made as of the 13th day of May, 1968, between E. I. DU PONT DE NEMOURS AND COMPANY, a Delaware Corporation, having an office and place of business at Wilmington, Delaware (hereinafter called "DU PONT"), and REMINGTON ARMS COMPANY, a Delaware corporation, having an office and place of business at Bridgeport, Connecticut, (hereinafter called "REMINGTON").

PLAINTIFF'S
EXHIBIT

3004

W I T N E S S E T H :

WHEREAS, DU PONT is engaged in the manufacture and sale of numerous products including explosives and chemicals under its trademark consisting of the name DU PONT within an oval (hereinafter called the "DU PONT Oval"), which is registered in the United States Patent Office; and

WHEREAS, REMINGTON is engaged in the manufacture and sale of numerous products including shot guns, rifles, cutting tools, and ammunition, and is controlled by DU PONT through the ownership by DU PONT of a majority of the common and preferred stock of REMINGTON; and

WHEREAS, REMINGTON has been using the DU PONT Oval in marketing its products for a number of years as a subsidiary of DU PONT; the privilege of using the DU PONT Oval having been originally extended to REMINGTON in accordance with the resolutions dated March 14, 1934 and January 9, 1935, of the Executive Committee of the Board of Directors of DU PONT; and

WHEREAS, DU PONT and REMINGTON are now desirous of superseding their prior understandings and of making a new agreement setting forth the terms and conditions under which REMINGTON enjoys the privilege of using the DU PONT Oval as a subsidiary

A. L. 0013524

NOW, THEREFORE, it is mutually agreed between the parties hereto that:

1. All prior understandings and agreements between the parties hereto as to the use of the DU PONT Oval by REMINGTON are hereby superseded by this agreement as of the day and year first above written.

2. REMINGTON hereby acknowledges the validity of the DU PONT Oval and DU PONT's exclusive ownership thereof, and further agrees that it will not make any use or take any action with respect thereto to the prejudice of DU PONT.

3. DU PONT hereby grants to REMINGTON and REMINGTON hereby accepts, subject to the provisions of this agreement all of which are conditions to such grant, a nonexclusive and non-transferable privilege of using the DU PONT Oval for all or any of the products which are now or hereafter manufactured in the United States, and sold or leased anywhere by REMINGTON; provided, however, that REMINGTON will always use the DU PONT Oval in conjunction with the name REMINGTON.

4. DU PONT hereby expressly reserves all right, title, and interest in the DU PONT Oval.

5. REMINGTON shall not sublicense the privilege granted herein and will exercise it on its own behalf only in compliance with good trademark practice so as to protect the DU PONT Oval and DU PONT's exclusive ownership thereof. DU PONT reserves the right to determine the adequacy of such compliance and the adequacy of the protection which REMINGTON's use affords to the DU PONT Oval and to DU PONT's ownership thereof.

6. The DU PONT Oval shall be employed by REMINGTON only on such products as meet such standards of quality as may be acceptable to DU PONT, and for the purpose of ascertaining

A L 0013525

the quality of said products, DU PONT shall have the right to inspect the manufacturing facilities of REMINGTON and to test such products from time to time through such agents and representatives as it may designate.

7. In order to maintain adequate trademark registrations covering the use of the DU PONT Oval by REMINGTON, REMINGTON shall keep DU PONT informed concerning the introduction of new products which bear the DU PONT Oval. DU PONT, at its sole discretion, may apply to the Commissioner of Patents, Washington, D. C., for registration of the DU PONT Oval for use in association with such products. REMINGTON shall assist DU PONT in obtaining and maintaining registrations for the DU PONT Oval in the product classifications utilized by REMINGTON.

8. In the event of any claim or litigation by a third party against REMINGTON alleging that the DU PONT Oval imitates or infringes a trademark of such third party, or alleging that the registration of the DU PONT Oval is invalid, REMINGTON shall promptly give notice of such claim or litigation to DU PONT which shall assume, at its expense, responsibility therefor and control all handling, defense or settlement thereof.

9. This agreement and the privilege hereby granted to REMINGTON shall terminate forthwith in the event that:

- a) REMINGTON shall fail or refuse to conform to the terms of this agreement as to use of the DU PONT Oval after thirty (30) days' written notice from DU PONT that REMINGTON's use thereof does not so conform, or

A L 0013526

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- b) DU PONT shall cease to own directly or indirectly a majority of the voting shares of REMINGTON's common stock.

10. Subject to the provisions of paragraph 9 hereof, this agreement and the privilege thereby granted to REMINGTON may be terminated by either party upon sixty (60) days' written notice. A registered letter written by either party and mailed to the principal office of the other shall be deemed to be sufficient notice.

11. Upon termination of this agreement, REMINGTON shall immediately discontinue all use of the DU PONT Oval in any manner whatsoever.

12. If this agreement shall be terminated by REMINGTON by notice given pursuant to paragraph 10 hereof, or by failure or refusal to conform to the terms of this agreement as provided for in paragraph 9 (a), REMINGTON shall, within sixty (60) days after the effective date of termination without payment therefor destroy or deliver to DU PONT all advertisements, displays, labels, signs, containers, dies, plates and stamps containing the DU PONT Oval. If this agreement shall be terminated by DU PONT pursuant to paragraph 10 hereof or by virtue of termination under paragraph 9 (b), REMINGTON shall be free to use up its stock on hand of such advertisements, displays, labels, signs, containers, dies, plates or stamps, but DU PONT shall have the option of purchasing any such advertisements, displays, labels, signs, containers, dies, plates or stamps at cost to REMINGTON or at prices to be mutually agreed upon by the parties hereto at that time, provided that DU PONT shall have given REMINGTON written notice of its election to purchase within sixty (60) days after the effective date of termination. Termination by either party for whatever reason shall not affect

ALL 0013527

the right of REMINGTON or its dealers and distributors to use and/or sell finished product packaged on or before the date of such termination in containers bearing the DU PONT Oval, but DU PONT shall have the option either to purchase such product at cost to REMINGTON or at prices to be mutually agreed upon by the parties hereto at that time or to require that such product be repackaged at DU PONT expense in containers which do not bear the DU PONT Oval provided that DU PONT shall have given REMINGTON written notice of its election to purchase or to have such product repackaged within sixty (60) days after the effective date of termination. As a condition of exercising such option, DU PONT shall assume the full responsibility for any loss or damage to REMINGTON, its distributors and/or dealers, resulting from any interruption in the supply of REMINGTON products in consequence of the exercise of such option.

13. REMINGTON shall hold DU PONT harmless for any losses, costs (including, without limitation, counsel fees) or liability from or for injury to any person, or damage to any property arising from the manufacture, sale, transportation, storage or use of products manufactured by it or REMINGTON ARMS OF CANADA LIMITED and which bear the DU PONT Oval; provided, however, that this obligation shall not apply where it is affirmatively established that such injury or damage was attributable solely to the negligence or misconduct of DU PONT or its employees. REMINGTON's obligation under this paragraph shall continue notwithstanding termination of the other provisions of this agreement.

14. This license shall not be assignable or otherwise transferable by REMINGTON either in whole or in part.

ALL 0013528

IN WITNESS WHEREOF the parties hereto have caused
this agreement to be executed by their duly authorized rep-
resentatives.

ATTEST:

C. C. McMillan
Assistant Secretary

E. I. DU PONT DE NEMOURS AND
COMPANY

By *R. R. Pittman* H-2
Vice President

ATTEST:

W. F. Larsen
Asst. Secretary

REMINGTON ARMS COMPANY
INCORPORATED

By *W. F. Larsen*
0

A L 0013529

6 of 7

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

RemingtonRECEIVED^{cc:}

AUG -8 1973

R. A. PARTNOY

J. G. Williams
G. M. Calhoun
E. J. Giner
E. Sparre
R. A. Partnoy ✓
E. F. Barrett

August 8, 1973

TO: J. H. LEWIS, JR.
FROM: N. L. OLDRIDGE
SUBJECT: USE OF DUPONT OVAL WITH PETERS AND MOHAWK LOGOS

The ammunition product section is in agreement with your letter to the Patents Committee of July 27, 1973 on the above subject. We would concur with "amending the agreement to remove any ambiguity by cancelling out the vague reference to the name "Remington" and instead requiring that Remington Arms Company, Inc. be definitely identified as the manufacturer of the products on which we use the DuPont oval".

NLO
NLO/gm

A L 0013530

7 of 7

cc: R. A. Partnoy ✓

RECEIVED

AUG 22 1973

R. A. PARTNOY

August 22, 1973

Mr. E. L. Grimm
Legal Department
DU PONT - Wilmington

Subject: DU PONT/REMINGTON AGREEMENT of MAY 13, 1968
re REMINGTON'S USE OF THE DU PONT OVAL TRADEMARK

Dear Mr. Grimm:

It is my understanding that you should now be our point of contact relative to Remington's use of the Du Pont Oval trademark. If this is not the case, will you please refer this letter to the proper individual in the Legal Department. When Mr. R. H. Rea, then Remington's General Counsel, was negotiating the Agreement of May 13, 1968, his contact was Mr. Howard J. Rudge.

To recapitulate, Remington was extended the privilege of using the Du Pont Oval trademark on its products in accordance with Resolutions of the Du Pont Executive Committee dated March 14, 1934, January 9, 1935, and October 29, 1958. There was no written agreement specifically defining the rights and obligations of the parties.

It is my understanding that in 1967 and 1968 sharp attention was focused on this relationship when, as a result of the appearance of the Du Pont Oval trademark on certain packages of Remington ammunition, an attempt was made by an injured user of a Remington ammunition product to involve Du Pont as a party defendant in a product liability suit brought against Remington. Although, I believe, that it had always been accepted that Du Pont had no liability in these circumstances, both Remington and Du Pont recognized that an agreement spelling out the rights and obligations of the parties was probably long overdue and the Agreement of May 13, 1968, was the result.

PLAINTIFF'S
EXHIBIT

3005

A L 70013531

1 of 8

Mr. E. L. Grimm
Page 2
August 22, 1973

However, in the intensity of the effort to provide for adequate quality control, product liability, etc. the question of Remington's privilege to use the Du Pont Oval with products not bearing the familiar Remington logotype does not appear to have been given adequate attention.

For example, from January 10, 1935, Remington had and exercised the privilege of using the Du Pont Oval trademark with its Peters brand ammunition. Although the Remington logotype did not appear on Peters products, such products were always identified in some such fashion as shown on the attached print of a current Peters package. Remington Arms Company, Inc., is always identified as the manufacturer of the product and thus the Du Pont Oval trademark has always been used "in conjunction with the name Remington".

Although Paragraph 1 of the May 13, 1968, Agreement, states that all prior agreements and understandings are superseded, it is my understanding that no question was ever raised as to the propriety of continuing to use the Du Pont Oval trademark in conjunction with the name Remington as set forth in the preceding paragraph. Such use continues today, has never been questioned by anyone on behalf of Du Pont and in my judgement is in conformity with the Agreement. I question that Paragraph 1 was intended to, or did, revoke the cited Resolution of the Executive Committee.

Remington also produces "Mohawk" brand ammunition and firearms. Although the practice varies somewhat between ammunition and firearms and the Du Pont Oval trademark does not appear on at least some packages of "Mohawk" firearms, the attached print of a "Mohawk" shotshell package typifies the usage we expect to continue. On these packages, Remington appears separately in the logotype form and the Du Pont Oval trademark is used in conjunction with the name Remington spelled out in full as Remington Arms Company, Inc. In my judgement, this usage is also in full compliance with the provisions of the Agreement.

Some Remington personnel have, however, interpreted the provision that "REMINGTON will always use the DU PONT Oval in conjunction with the name REMINGTON" as requiring that the Du Pont Oval trademark always be displayed in conjunction with the Remington logotype as shown on the back cover of the current Remington catalog or immediately beneath the Remington logotype as has been used on other Remington

A L 0013532

2 of 8

Mr. E. L. Grimm
Page 3
August 22, 1973

products and publications, for example, the cover of a booklet relative to our Pension and Retirement plan. Remembering some lengthy lectures delivered to me by Scotty Reynolds, I submit that it is not in the best interests of either Du Pont or Remington to establish or to maintain any rigid pattern of association between the Remington logotype and the Du Pont Oval, for to do so tends to establish the combination as a composite trademark and it imposes undue restrictions on the freedom of the designers of packaging and other copy to make best utilization of label space, etc.

In my view, the purpose of the requirement "that REMINGTON will always use the DU PONT Oval in conjunction with the name REMINGTON", is to insure that the Du Pont Oval is only used by Remington on products manufactured by or for Remington and sold by Remington so that the responsibility for the product is plainly imposed on Remington Arms Company, Inc. As established in the preamble to the Agreement, I believe the "name REMINGTON" is intended to be synonymous with Remington Arms Company, Inc.

Accordingly, and particularly since some Remington people tend to adopt a very strict construction of the quoted language, it has been suggested that an amendment of the May 13, 1968 Agreement be considered which would eliminate the somewhat vague reference to the "name REMINGTON" and more specifically identify Remington Arms Company, Inc.

Please consider the following suggestion:

Change "that REMINGTON will always use the DU PONT Oval in conjunction with the name REMINGTON" to --that REMINGTON will only use the DU PONT Oval on products manufactured by or for REMINGTON and adequately identified as products of Remington Arms Company, Inc.--.

Alternatively, if you agree that "hereinafter called REMINGTON" in the preamble of the Agreement adequately identifies Remington Arms Company, Inc., as the "name REMINGTON" which must be used in conjunction with the Du Pont Oval, perhaps we should not bother with the formality of an amendment to the Agreement. If the Agreement is amended, I note that it will be desirable to insert --Inc.-- after "REMINGTON ARMS COMPANY" to conform to our correct corporate identity.

A L 0013533

3048

Mr. E. L. Grimm
Page 4
August 22, 1973

Your recommendations will be appreciated.

Very truly yours,

JHL

JOHN H. LEWIS, Jr.,
Patent Attorney.

JHL:BH
Encls.

A L 0013534

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112 2 3/4 0 20.4 GR. EQ. P.W.D. 20.4 OZ. SHOT

Remington Long Range

Remington

Mohawk

LONG RANGE

25 PLASTIC SHOT SHELLS
WARNING: KEEP OUT
OF REACH OF CHILDREN

Remington

Remington Arms Company, Inc. disclaims any responsibility for any damages or injuries resulting from reloading and the use of reloaded shells.

CAUTION—These shells must not be used in guns having Damascus or twist steel barrels, or chambers shorter than 2 3/4 inches. Be sure your gun is in good condition and designed for ammunition of this gauge. It is dangerous to place 12 gauge shells in 8 gauge guns or to place 20 gauge shells in 12 gauge

REMINGTON ARMS COMPANY, INC.



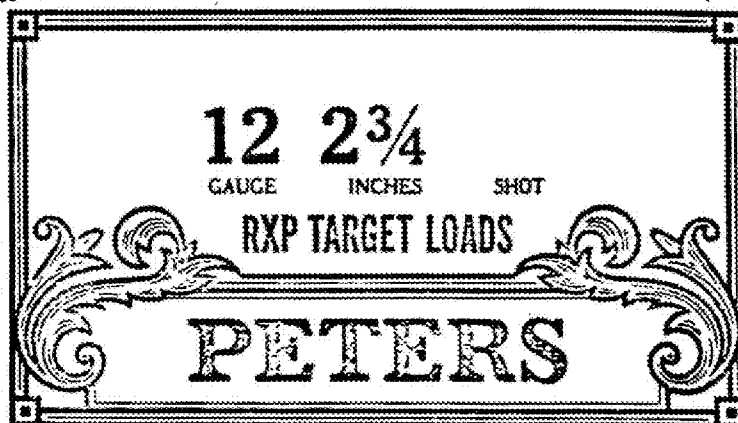
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Remington Arms Company, Inc./Bridgeport, Connecticut 06602

Made in U.S.A. / This company has 15 1/2 inch barrel and other features when they change design

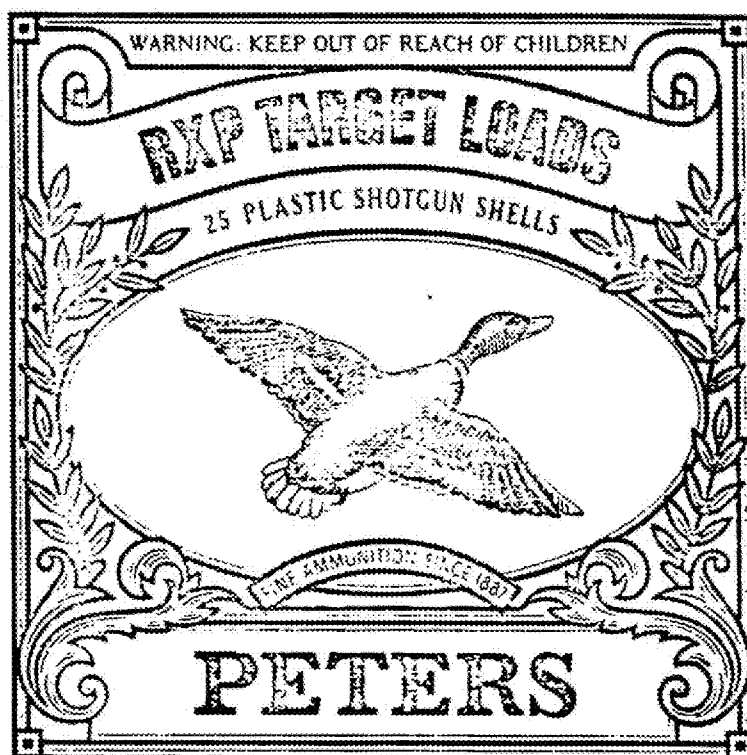
AL-0013535

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Remington Arms Company, Inc. disclaims any responsibility for any damages or injuries resulting from reloading and the use of reloaded shells.

CAUTION—These shells must not be used in guns having Damascus or twist steel barrels, or chambers shorter than 2 1/4 inches. Be sure your gun is in good condition and designed for ammunition of this gauge. It is dangerous to place 12 gauge shells in 8 gauge guns; or to place 20 gauge shells in 12 gauge



Caution

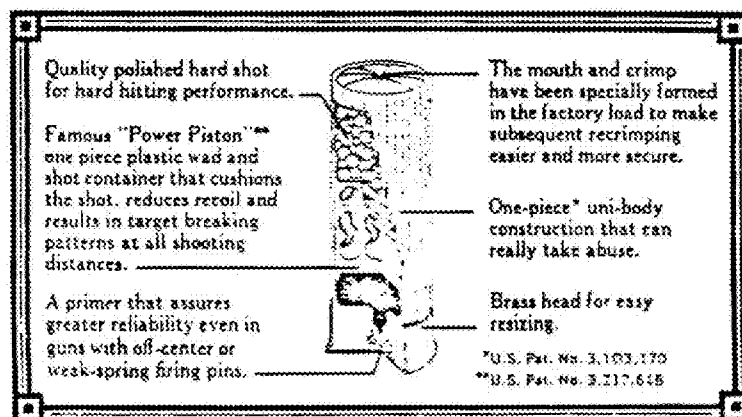
The data shown were obtained under controlled conditions. Pressures and velocities were measured in our Research & Development Ballistics Laboratory. To reproduce these results in your handloads, you must follow each and every condition listed. If there is any deviation, you will not achieve the stated ballistics. The velocity values shown may vary substantially if different component combinations and/or techniques are employed.

PETERS CARTRIDGE DIVISION

REMINGTON ARMS COMPANY, INC.
BRIDGEPORT, CONNECTICUT 06602



Made in U.S.A.
Trademarks Reg. U.S. Pat. Office and other Countries
Marca Reg. — Marque Deposée



PT12 RXP

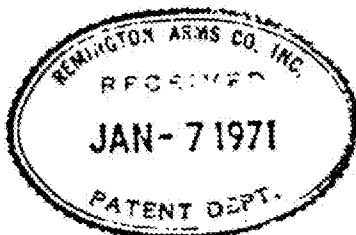
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Remington



**Remington
Pension
and
Retirement
Plan**



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E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED

WILMINGTON, DELAWARE 19898

LEGAL DEPARTMENT

*Copy to Mr. Partnoy
Hold others for next
Committee meeting.*
now
JHL

JOHN H. LEWIS, JR.
REMINGTON ARMS



October 17, 1973

cc: G. M. Calhoun
E. J. Giner
E. Sparre
R. A. Partnoy
E. F. Barrett
J. H. Lewis, Jr.

RECEIVED
OCT 23 1973
R. A. PARTNOY

Please forgive my delay in responding to your letter of August 22, 1973, regarding Remington's use of the Du Pont in Oval trademark. I have not yet reviewed Remington's agreement of May 13, 1968, regarding such usage. Accordingly, I have no particular position on the language which you quote at this time. I cannot believe, however, that there was any intent to deny Remington the privilege of using the Du Pont in Oval trademark in connection with Peters and Mohawk Ammunition or to require that the Oval always be used in connection with the Remington logo type.

I will communicate with you further in the future.

Eugene L. Grimm
EUGENE L. GRIMM

ELG:CA

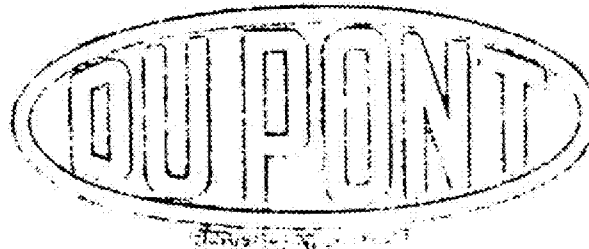
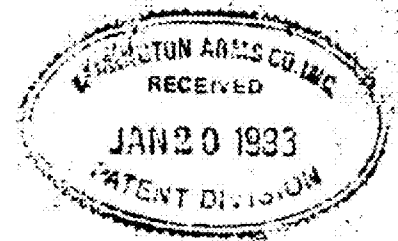
"BUDGET PACK"



A L 0013539

1071

How to use the Du Pont Oval



The Corporate Trademark

The Du Pont Oval, as illustrated here, is the corporate trademark of E. I. du Pont de Nemours and Company. It is registered in the United States

and virtually every other country in the world. The Oval has been in continuous use, in one way or another, since 1907.

Value of the Oval

The Oval is the single most valuable symbol of the Company. It identifies Du Pont as a responsible company with responsible people who develop, manufacture and market useful, quality products. The Oval is the one symbol that distinguishes the Du Pont Company and its products from those of all other companies in the world.

The value of the Oval, as well as the Company's ability to retain and protect it, derives from wide and proper use. All departments, licensed subsidiaries and affiliates, authorized distributors and retailers should use the Oval prominently and frequently.

The Oval should appear at least once on all printed matter produced for use by Du Pont and its licensed subsidiaries and affiliates. It should appear prominently and properly, not only on the Company's products, but also on its advertisements and commercials, product literature, promotional pieces, house organs, service bulletins, technical bulletins, signs, posters, billboards and trade exhibits.

The Marketing Communications Department is charged with the responsibility for stimulating prominent use of the Oval by the Du Pont departments and subsidiary companies licensed to use it.

**PLAINTIFF'S
EXHIBIT**

3907

A L 0013554

1 of 2

1. The Oval by Itself

The Oval may be used alone as the corporate signature for space advertising, television commercials and printed materials. The Oval should be positioned as a separate and final element, free of competition from other design elements and copy. Where possible, a space equal to the depth of the Oval should separate it from any other element.

RIGHT

Oval is used alone, well free of other elements.

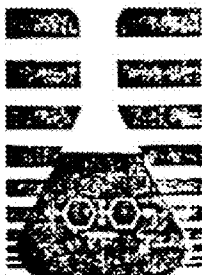
Adjustment: the abrasive resistance rubber that's easy to mold no matter how you shape it.



RIGHT

Oval by itself is the signature. Theme line is separate.

DuPont's cycloaliphatic diisocyanate offers improved resin properties in your R&D.



RIGHT

Oval final element. Product identification is separate.

For superior sulfur recovery control, monitor H₂S and SO₂ the DuPont way.



RIGHT

Oval is final element. Brand identification is separate.

"The dependable SM-2 relies on 27 flexible circuits of PYRALUX."



The Oval should *not* appear more than once on a page or panel (billboard, exhibit back wall, tent card, etc.), unless the second use is an illustration of a package or label containing the Oval. Repetitive designs or watermarks on bond paper, company checks, etc. are exceptions to this rule.

2. The Oval with Other Approved Organizational Unit Names and Symbols

Names, symbols and graphic devices other than the Oval should not be used for organizational units within the Company because they dilute the distinctiveness of the corporate trademark. It is recognized, however, that some operating units and subsidiaries, notably those recently acquired through purchase or merger, have identities of value in their own fields that were established and reinforced by corporate trademarks in distinctive graphic designs. To associate these units and subsidiaries with the parent company, their names, symbols and graphic devices may be used with the Oval as part of the signature. The Oval must be given equal visual weight and strength with the other identity, and presented distinctively.

The use of other corporate organizational names, symbols and graphic devices with the Oval should be recognized as a temporary measure. The objective during the period of combined use should be to increase the visual weight and strength of the Oval relative to the other identity until the other identity can be discontinued or until a suitable level of dominance for the Oval has been achieved.



ACCEPTABLE USAGE FOR ALL SUBSIDIARIES

As a temporary measure, the Oval may be used with the name or symbol of another unit of the company.

3. The Oval with Slogans and Theme Lines

The Oval may be used with the official corporate slogan, "Better Things for Better Living," as a signature for advertising, literature and elsewhere. When used with the official corporate slogan, the Oval need not be the final element.

The Oval may also be used with other slogans and theme lines. Appropriate institutional slogans and theme lines include "an electronics company," "a life sciences company," and "an energy company." The use of the Oval with any slogan or theme line other than the official corporate slogan should conform to the guidance in section 1 at left. The Oval must remain the final element.

When using the name symbol or graphic device of an operating unit or subsidiary with the Oval, it is permissible to include a slogan or theme line.

cc: N. Skovran

RD-55 REV. 8-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



Bridgeport, Connecticut
September 24, 1981

D. B. MAHONEY
LEGAL DEPARTMENT
E. I. DU PONT DE NEMOURS & COMPANY
WILMINGTON, DELAWARE

REMINGTON USE OF DU PONT OVAL

Per your request, I have enclosed copies of the following items involving Remington's use of the Du Pont oval:

1. My business card.
2. Remington's Office of the President stationery.
3. Remington's Executive Offices stationery.
4. Remington's standard stationery, Bridgeport location.
5. Remington's Inter-departmental correspondence stationery, yellow.
6. Remington's news release stationery.
7. Remington's 1981 catalog.
8. Remington's 1980 progress report.
9. Packaging for Remington center fire ammunition.
10. Packaging for Remington rim fire ammunition.
11. Packaging for Remington shotshell ammunition.

I have also enclosed a copy of the current agreement between Du Pont and Remington concerning Remington's use of the Du Pont oval.

R. A. Partnoy

R. A. Partnoy

RAP:CK
Enclosures

PLAINTIFF'S
EXHIBIT

3008

A. L. 0013540

1 of 14

Remington.



RONALD A. PARTNOY

GENERAL COUNSEL
REMINGTON ARMS COMPANY, INC.
P.O. BOX 1939
BRIDGEPORT, CONN. 06601

TELEPHONE
203-366-3151

A.L. 0013541

2 of 14

Remington.



NOTE OUR REVISED ADDRESS:

REMINGTON ARMS COMPANY INC.
729 BARNUM AVE.
P. O. BOX 1939
BRIDGEPORT, CT 06601

REMINGTON ARMS COMPANY, INC.

OFFICE OF
THE PRESIDENT

BRIDGEPORT, CONNECTICUT 06602

TELEPHONE 203-333-1112
TELEX 964 201 STRATFORD CT

A L 0013542

3 of 14

Remington.



REMINGTON ARMS COMPANY, Inc.

EXECUTIVE
OFFICES

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS
BRIDGEPORT, CONNECTICUT 06602

TELEPHONE 203-333-1112
TELEX 264 201 STRATFORD, CT

NOTE OUR REVISED ADDRESS:

REMINGTON ARMS COMPANY INC.
729 BARNUM AVE.
P. O. BOX 1939
BRIDGEPORT, CT 06601

A L 0013543

4 of 14



REMINGTON ARMS COMPANY, INC.

TELEX
904-201
STRATFORD, CT

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

939 BARNUM AVENUE
P.O. BOX 1939

BRIDGEPORT, CONNECTICUT 06601

TELEPHONE
203-333-1112

A L 0013544

5 of 14

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE


Remington



A L 0013545

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NEWS

Remington.  REMINGTON ARMS COMPANY, INC. • PUBLIC RELATIONS • BRIDGEPORT, CONNECTICUT 06602

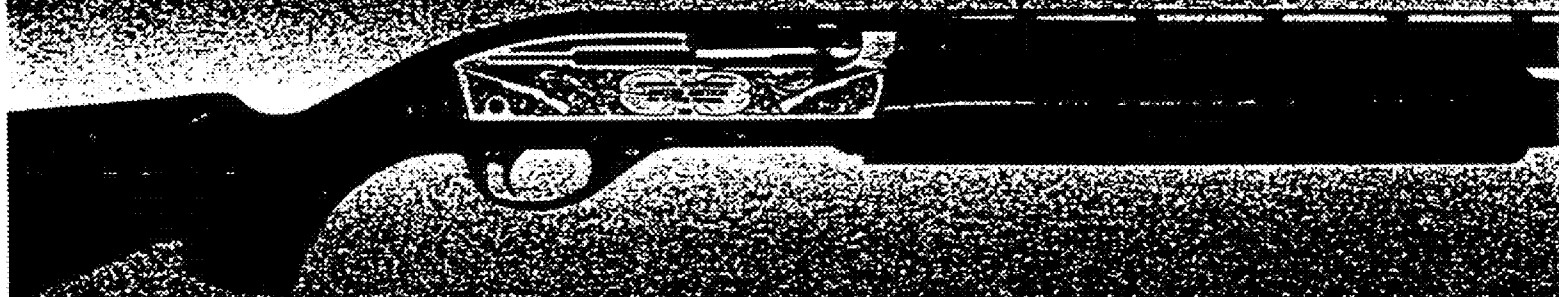
RELEASE

FOR RELEASE _____

A L 0013546

7 of 14

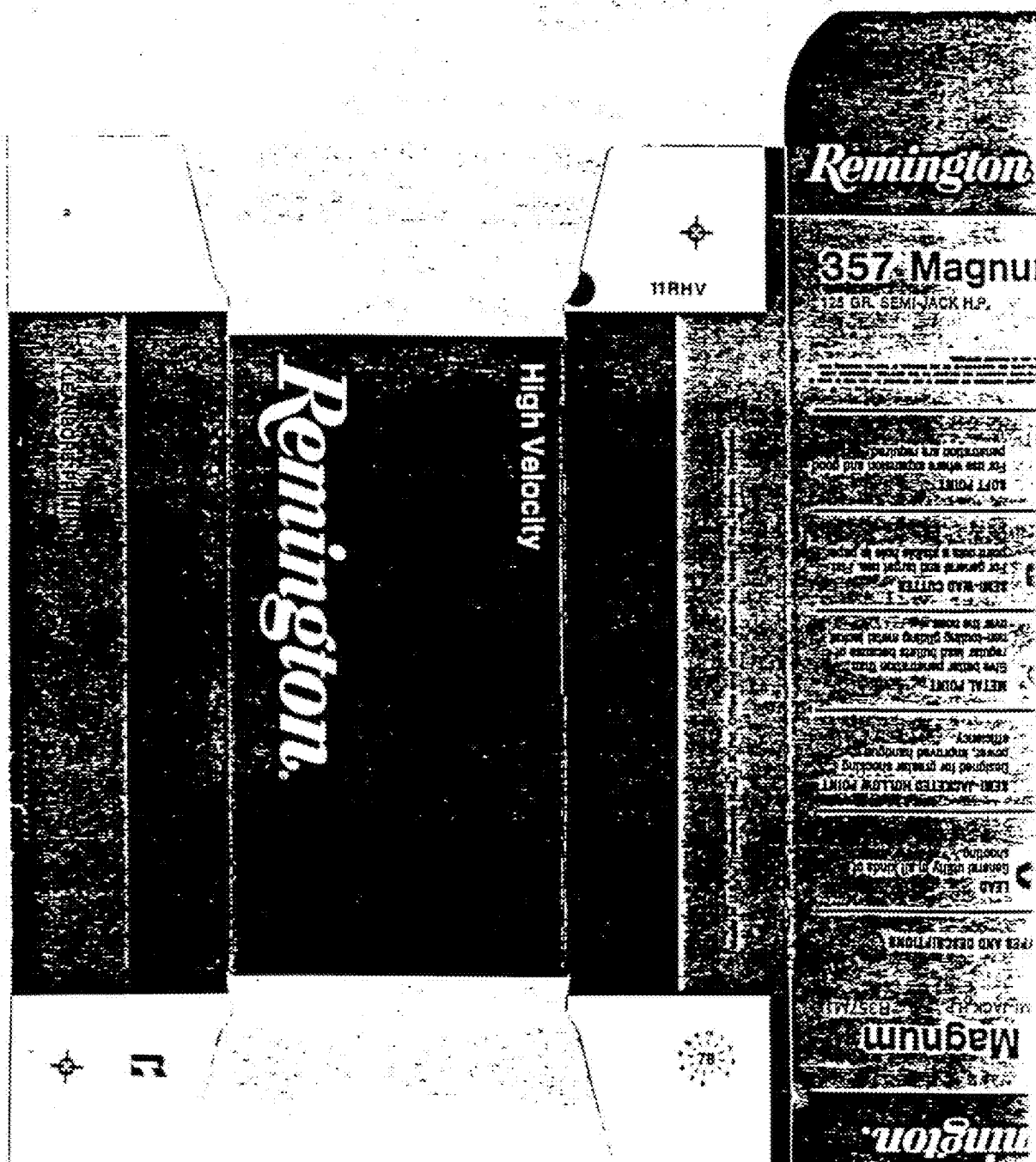
FIRST IN QUALITY



FIRST IN THE FIELD

A L 0013547

8 of 14



Remington

357 Magnum

125 GR. SEMI-JACK H.P.

118HV

Remington

High Velocity

Remington-Union Metallic Cartridge Co. has developed this new bullet for the 357 Magnum. It is a true semi-jacketed hollow point bullet, designed for greater accuracy and penetration. The bullet is made of a high speed steel, and is jacketed in a lead alloy. The hollow point design allows the bullet to expand upon impact, creating a larger wound channel. This bullet is ideal for hunting and target shooting. It is available in 125 grain weight.

LEAD
Remington-Union Metallic Cartridge Co. has developed this new bullet for the 357 Magnum. It is a true semi-jacketed hollow point bullet, designed for greater accuracy and penetration. The bullet is made of a high speed steel, and is jacketed in a lead alloy. The hollow point design allows the bullet to expand upon impact, creating a larger wound channel. This bullet is ideal for hunting and target shooting. It is available in 125 grain weight.

Magnum
Remington-Union Metallic Cartridge Co. has developed this new bullet for the 357 Magnum. It is a true semi-jacketed hollow point bullet, designed for greater accuracy and penetration. The bullet is made of a high speed steel, and is jacketed in a lead alloy. The hollow point design allows the bullet to expand upon impact, creating a larger wound channel. This bullet is ideal for hunting and target shooting. It is available in 125 grain weight.

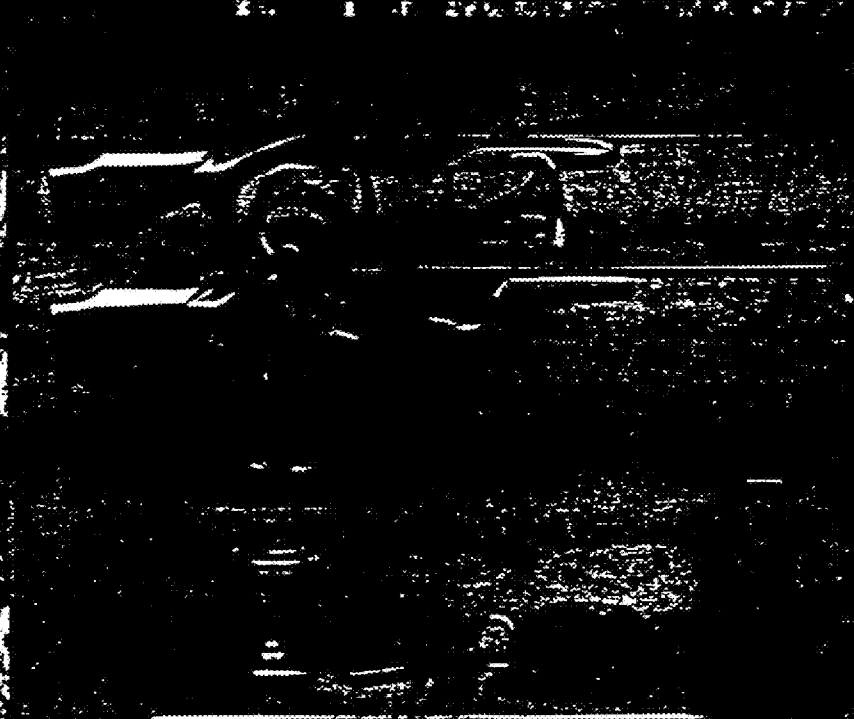
Remington

9 of 14

A L 700 3548

REMINGTON

SPORTING FIREARMS AND AMMUNITION FOR 1981



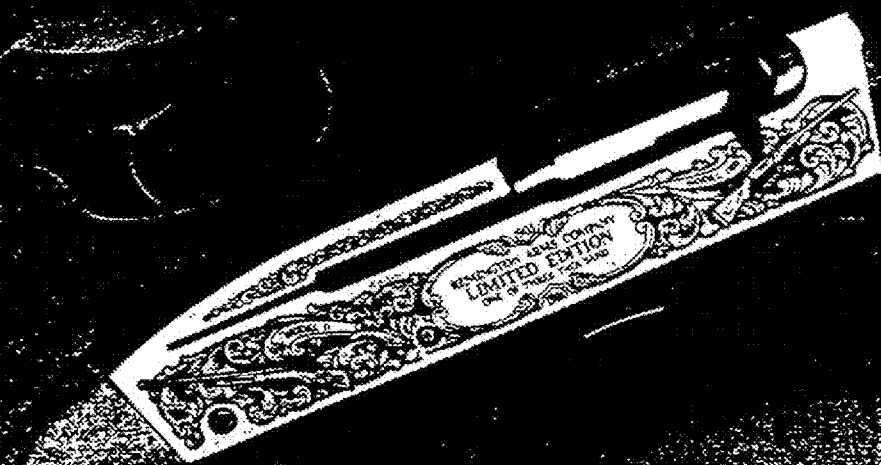
Remington. 

THE FIELD

L70013549

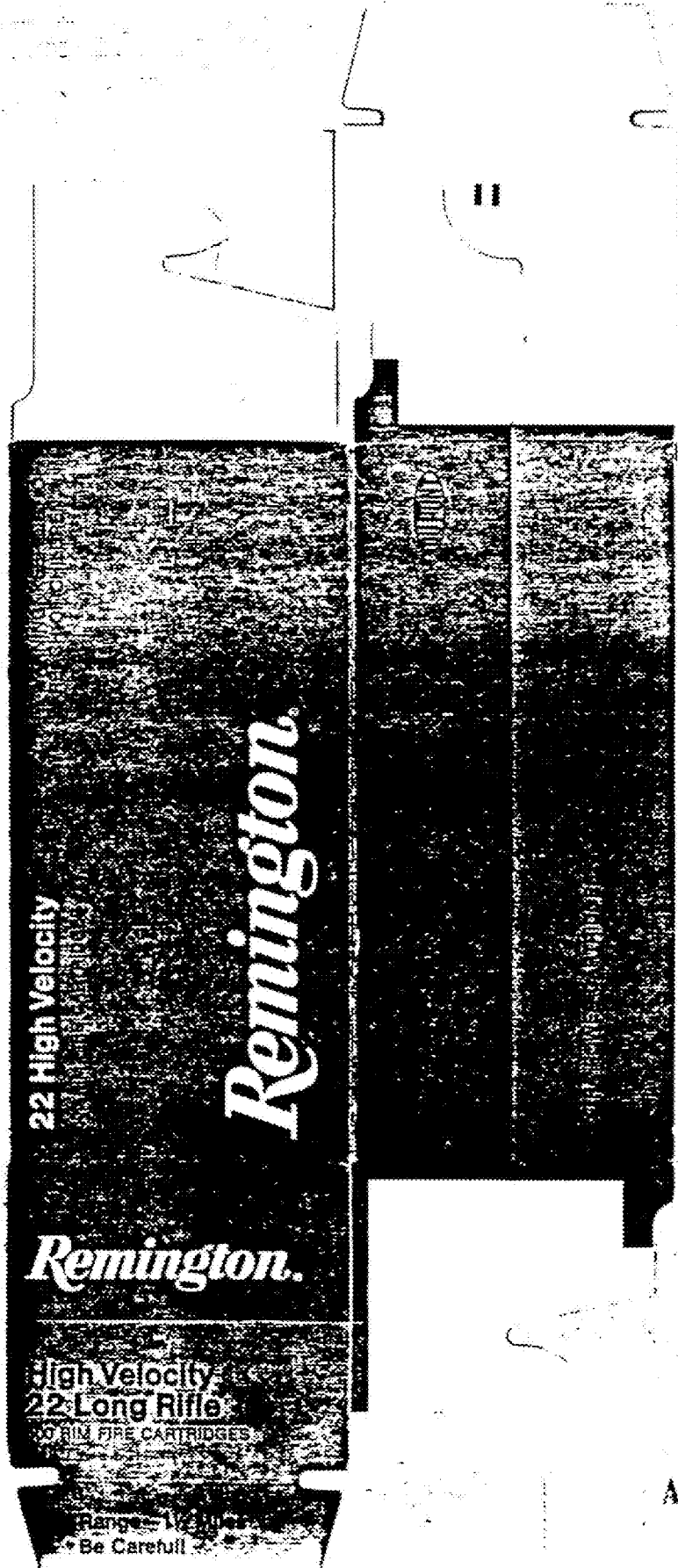
10 8 4 14

INTRODUCING THE FIRST MODEL 1100 IN THE COLLECTOR'S FIELD.



L.0013550

1100 14



22 High Velocity

Remington.

Remington.

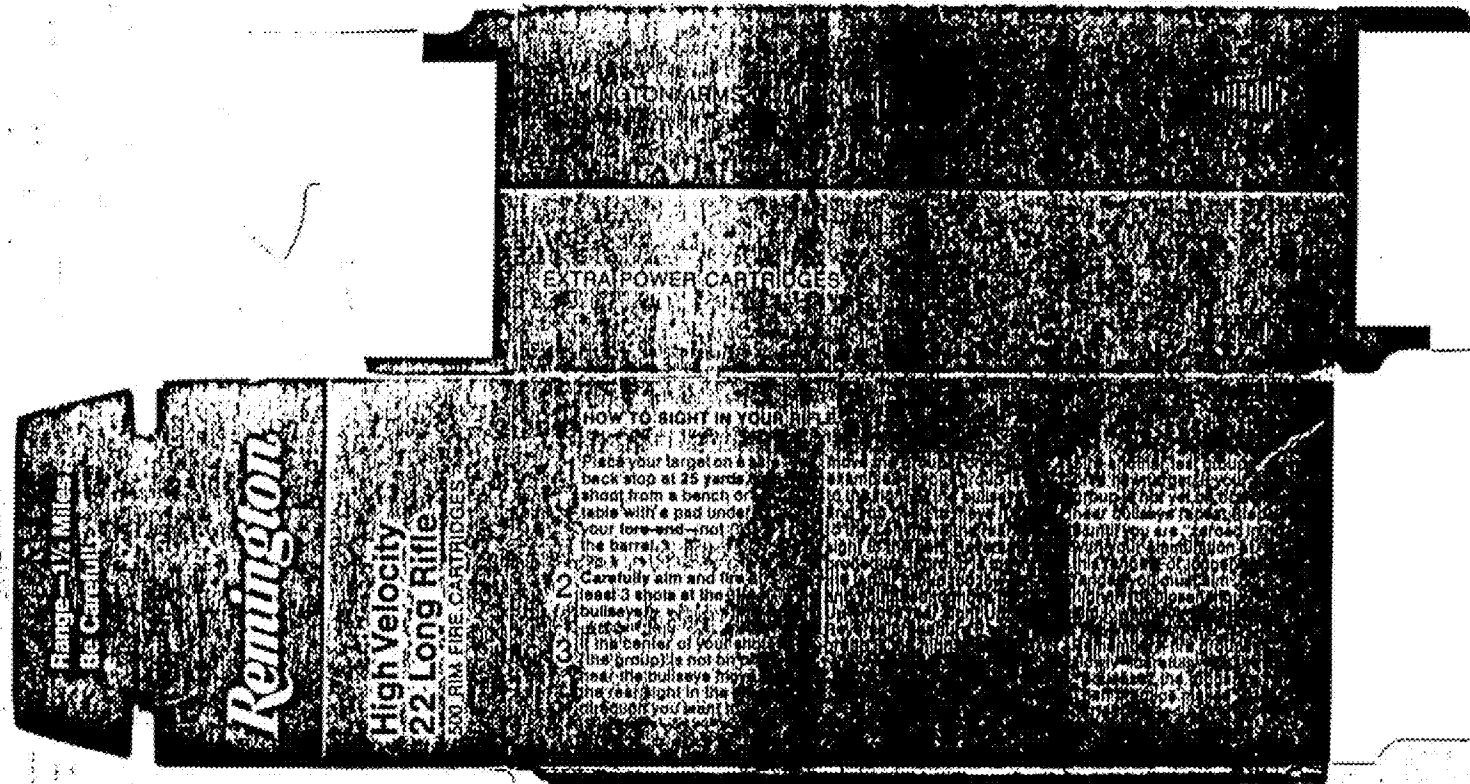
High Velocity
22 Long Rifle

100 RIM FIRE CARTRIDGES

Range 1000 Yards
Be Careful

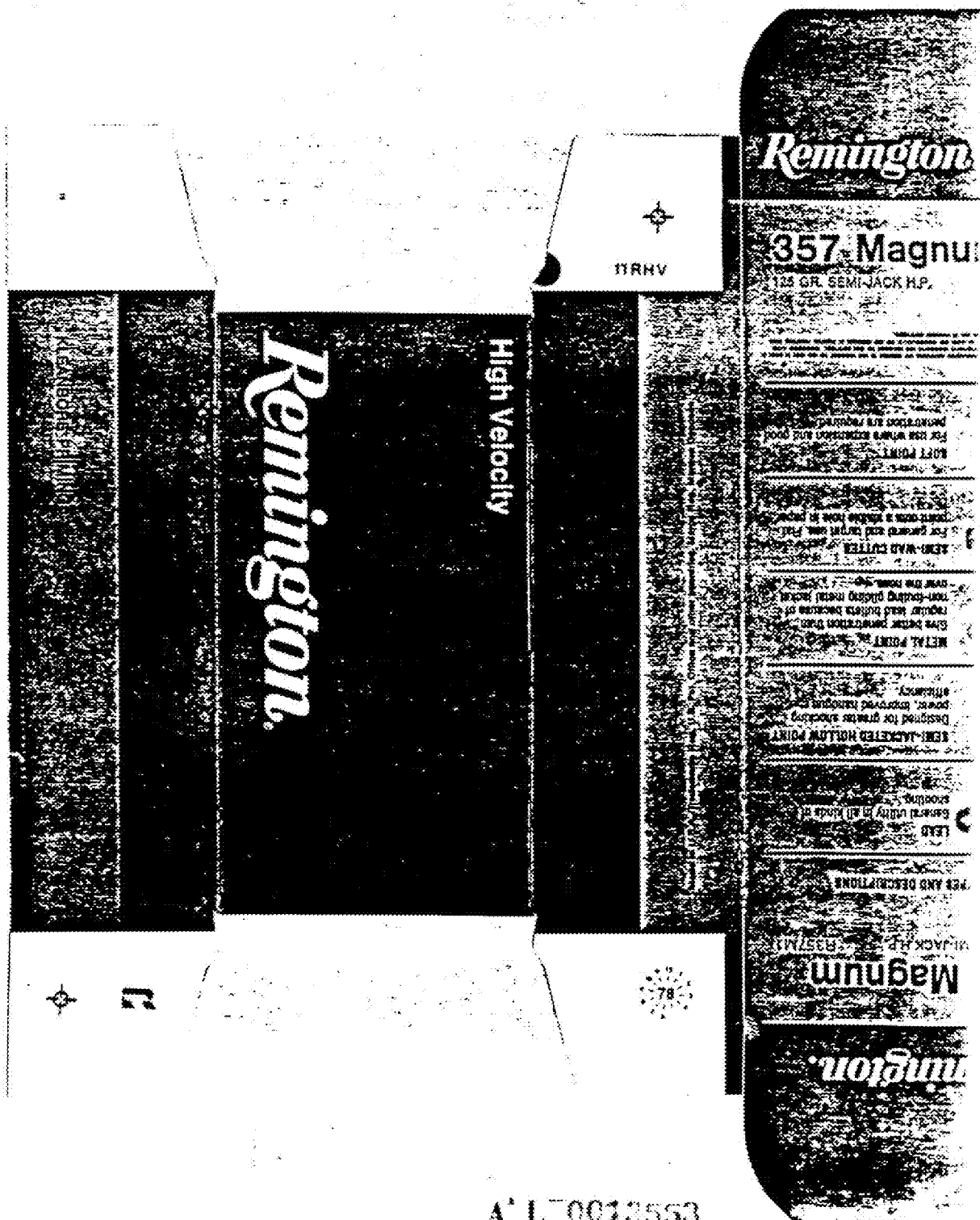
A L 0013551

12 of 14



ALF0013552

13 of 14



A L 0013553

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



cc: C. E. Crowley - MCD
R. E. Williams - "
R. J. Alfano -

RECEIVED

FEB -7 1983

R.A. PARTNOY

Bridgeport, Connecticut
February 1, 1983

cc: NS

ANNOUNCEMENT

NEW CORPORATE LOGO

A new standard has been established for the relative size and positioning of the Remington Logo and the Du Pont Oval. Both horizontal and vertical combination of the two corporate symbols are illustrated on the attached logo sheet.

This design is to be used in all graphic materials produced in the future. A program is underway to revise existing material such as stationery, packaging and advertising.

Copies of this logo sheet suitable for reproduction are available from Advertising. Contact Dick Baldwin (3033) or Bob May (3078).

J. G. Williams
J. G. Williams

Director -
Marketing Communications

JGW/y
attach.

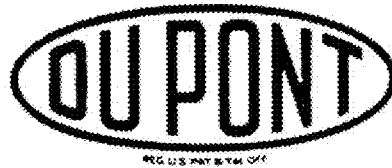
PLAINTIFF'S
EXHIBIT

3009

A L 0013556

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Remington.[®]



Remington.[®]

Remington.[®]



Remington.[®]



Remington.[®]



Remington.[®]



Remington.[®]



Remington.[®]



A* L 0013557

2 of 2

NOTE: Size relationship and relative position of Remington logo and DuPont oval *must* always remain as shown

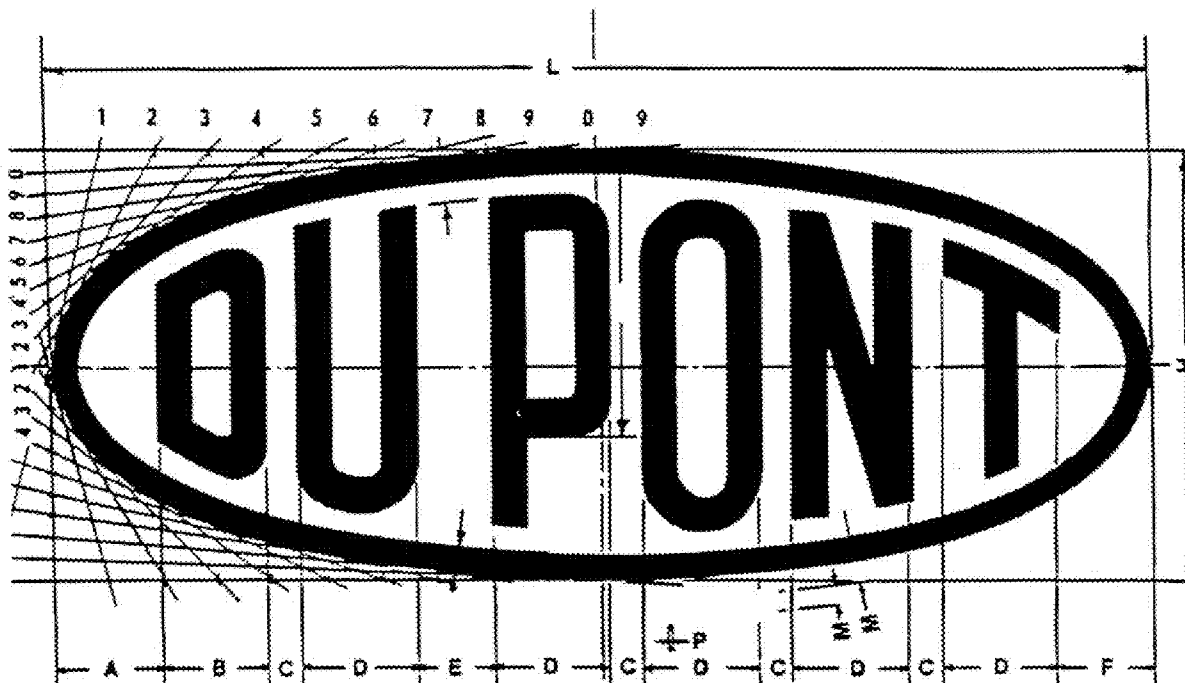
RECEIVED

W. L. Emerson

RECEIVED

CORPORATE IDENTITY

RECEIVED
AUG 9 1989
R.B. SPERLIN



PLAINTIFF'S
EXHIBIT

3010

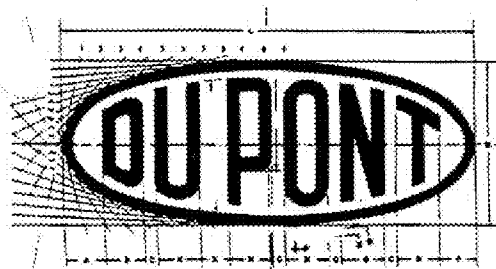
A* L 00012558

A Manual
for the Standard Use
of the Company Name,
Trademark, and Slogan

1 of 61

A' L 0013559

20f61



COVER: Engineering drawing of the Du Pont Oval logotype as it is registered with the United States Patent and Trademark Office.

NOTE: The new standards presented in this publication are effective with all newly produced materials. Previously produced materials will continue to be acceptable until their depletion.

For copies of this manual, write: Du Pont Stationery and Forms, Eden Park, Wilmington, DE 19898. Refer to H-07300.

To Du Pont Employees and Associates with Communications Responsibilities

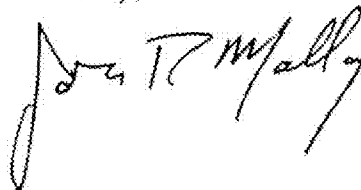
Du Pont is a recognized technological leader in today's competitive markets. With expanding product offerings and a continued commitment to excellence, we need to reflect a strong, consistent corporate identity. This requires a visual image that plays a key role in separating and distinguishing Du Pont from its competition.

Our communications material is an expression of the corporation's philosophy, abilities, and culture. It must be easily recognizable, impressive, organized, distinctive, and truly representative of our corporate attitudes and objectives.

A universal corporate identity requires consistent use of corporate and product nomenclature as well as the standardization of the corporate image. As a step in accomplishing this goal, we have developed this *Corporate Identity* manual, which provides standards and examples of proper usage for developing all visual communications for Du Pont.

The Du Pont global identification program depends on the commitment of every individual to follow these standards. Your cooperation in establishing and maintaining our image will guarantee the success of this worldwide effort.

Sincerely,



John R. Malloy
Senior Vice President
External Affairs

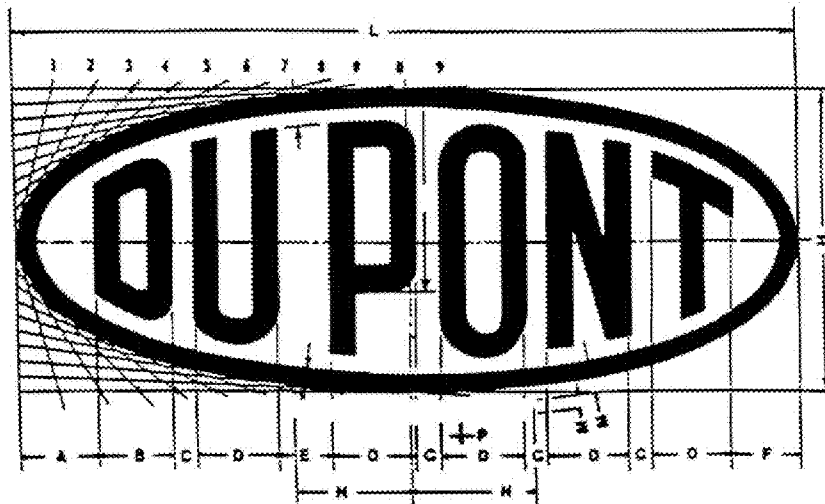
A¹ L⁷ 0013560

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Corporate Identity

A Manual
for the Standard Use
of the Company Name,
Trademark, and Slogan

Prepared by External Affairs



PREFACE

This *Corporate Identity* manual is offered to Du Pont employees and associates in their quest to understand and maintain the corporate identification of Du Pont throughout the world. Company standards and examples using the visual components of this program are provided. Our purpose is to help attain simplicity, clarity, and consistency in a uniform interpretation of the Du Pont identity.

These standards are to be applied to all **external** Du Pont communications. The same standards may also be used to help ensure the uniformity of internal communications.

This publication has been prepared by External Affairs, which has the responsibility to set standards for communications to the markets that Du Pont serves. It updates and supersedes previous instructions in the *Identification Manual for Advertising* and the pamphlet, "How to Use the Du Pont Oval."

The new standards presented in this publication are effective with all newly produced materials. Previously produced materials will continue to be acceptable until their depletion.

If there are any questions about the contents or the application of the *Corporate Identity* standards, please contact your External Affairs/Marketing Communications representative.

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QUICK REFERENCE GUIDE

The following highlights give a brief overview of communications guidelines to be followed when presenting the Du Pont corporate identity to the world.

LEGAL NAME

PAGE 8

The legal name, **E. I. du Pont de Nemours and Company**, is used on all legal documents, such as contracts, agreements, purchase orders, applications for copyrights, patents, and trademarks, as well as copyright notices.

TRADE NAME

PAGE 9

The trade name, **Du Pont**, identifies the business. It is used on all nonlegal communications to the outside world, such as advertisements, promotional communications, technical literature, sales aids, product labels, letterheads, signs, business cards, etc.

To the market, we want to be known as **Du Pont**.

OVAL TRADEMARK

PAGE 10

The Du Pont Oval identifies the Company's products and services.

OVAL ON COMMUNICATIONS MATERIALS

The Oval trademark **without** the legend "REG. U.S. PAT. & TM. OFF." should be used on **communications** materials, such as advertisements, promotional communications, sales aids, technical literature, letterheads, signs, business cards, etc.

OVAL ON PACKAGING AND LABELING

The Oval trademark **with** the legend "REG. U.S. PAT. & TM. OFF." must be used on **all packaging and labeling** materials that originate within the U.S. (for national or international distribution) to ensure commercial and trading protection.

For small labels and packages where the Oval is of a size that makes the legend "REG. U.S. PAT. & TM. OFF." illegible, a ® at the upper right-hand corner of the Oval is required (see reproduction sheets for Packaging and Labeling).

The Oval must be clear and distinct from all other elements.

QUICK REFERENCE GUIDE

COMPANY SLOGAN

PAGE 16

The Company slogan, **Better Things for Better Living**, should be used as frequently as possible.

BUSINESS UNITS

PAGE 18

When communicating to the world, it is important to maintain the image of Du Pont as a corporate entity that serves specific markets. To strengthen this emphasis on market focus, the words "department," "division," "section," "group," etc., should not be used as part of the business unit identification in external communications.

We must continually be market-focused and use terms that will be recognized and understood by the outside world.

PRODUCT TRADEMARKS

PAGE 19

We must preserve the distinctiveness and singularity of the meaning of Du Pont trademarks by properly identifying that they are unique and registered, where appropriate.

INTRODUCTION

This *Corporate Identity* manual provides specific information on elements involved in creating the Du Pont corporate identity and illustrates the various visual components of the program. These standards should be followed by anyone concerned with the identity of Du Pont and its associated businesses. Our aim is an image that looks professional, contemporary, and dynamic.

This guide is organized into three major sections:

- Part 1: CORPORATE ELEMENTS**
- Part 2: BUSINESS ELEMENTS**
- Part 3: APPLICATIONS**

The first section, "Corporate Elements," describes how our corporate identity is maintained with consistent use of the Company legal and trade name, the Oval trademark, and the Company slogan.

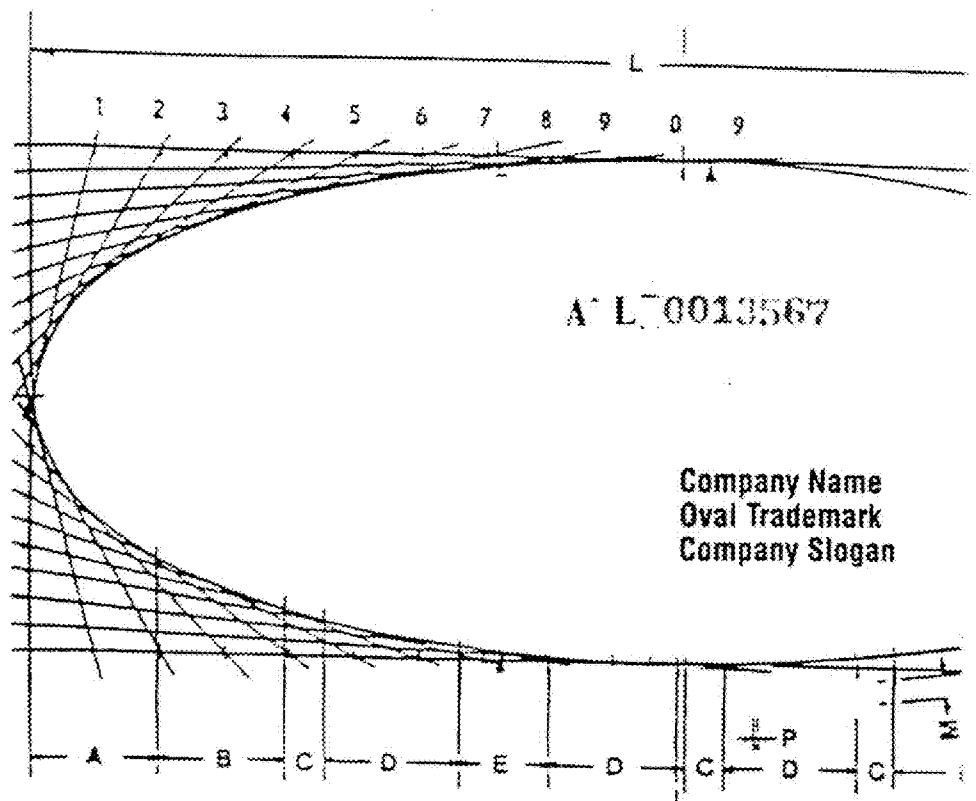
The second section, "Business Elements," presents guidelines in areas related to business units and product trademarks.

The third section discusses "Applications." Specific design considerations are presented for stationery, business cards, publications, product packaging, advertising, labeling, certification programs, electronic communications, equipment, rolling stock, and other items.

Reproduction sheets for both general communications and those specifically required for packaging and labeling are available. See Appendix B.

PART

CORPORATE ELEMENTS



10.461

CORPORATE ELEMENTS

Du Pont has both a legal name and a trade name. A sharp distinction should always be maintained in the proper choice of the appropriate nomenclature.

LEGAL NAME

The registered legal name of our corporation is:

E. I. du Pont de Nemours and Company

This name is derived from that of its original French owner, E. I. du Pont de Nemours, who established the Company in 1802.

APPROPRIATE USE

The legal name is used on all legal documents, such as contracts, agreements, purchase orders, applications for copyrights, patents, and trademarks, as well as copyright notices.

SPECIFICATIONS

- Always use the lower case "d" when using the legal name of E. I. du Pont de Nemours and Company (unless the entire name is in upper case, as in "E. I. DU PONT DE NEMOURS AND COMPANY").
- Always use a space between "du" and "Pont" and between "de" and "Nemours."
- The first letter of "Pont" and of "Nemours" is always capitalized.
- The word "du Pont" is a proper name and should never be divided at the end of a line.

⊗ Do Not Use

For legal purposes, **do not use:**

Du Pont

EXCEPTION

Du Pont may be used as an abbreviated name following the first occurrence of the legal name in a legal document.

For legal or trade purposes, **do not use:**

- E. I. du Pont de Nemours and Company (**Inc.**)
- E. I. du Pont de Nemours **&** Company
- E. I. du Pont de Nemours and **Co.**

CORPORATE ELEMENTS

Company Name

TRADE NAME

The official trade name or communications name is:

Du Pont

APPROPRIATE USE

The trade name, Du Pont, identifies the business. It is used on all nonlegal communications to the outside world, such as advertisements, promotional communications, technical literature, sales aids, product labels, letterheads, signs, business cards, etc.

SPECIFICATIONS

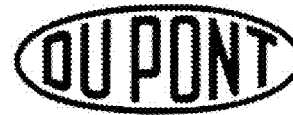
- Always use the upper case "D" in "Du" when using the trade name "Du Pont."
- Always use a space between "Du" and "Pont."
- Always capitalize the first letter of "Pont."
- The word "Du Pont" is a proper name and should never be divided at the end of a line.
- "DU PONT" may appear in all caps.

⊗ Do Not Use

For nonlegal purposes, **do not use:**

E. I. du Pont de Nemours and Company

CORPORATE ELEMENTS



VALUE OF THE OVAL

As Du Pont's corporate trademark, the Oval trademark is widely recognized throughout the U.S. and around the world and is **the single most valuable symbol of the Company**. It identifies Du Pont as a responsible company with responsible people who develop, manufacture, and market useful, quality products and services. The Oval is the one symbol that distinguishes Du Pont and its products from those of all other companies in the world. The principal significance of this well-known mark is the positive values and images it represents in the mind of the public.

To guarantee the all-important legal protection of the Oval, it is imperative that the corporate trademark always be produced distinctively, accurately, consistently, and in the manner described in this manual.

APPROVAL FOR USE

All departments, licensed subsidiaries and affiliates, authorized distributors, and retailers may use the Oval on specific materials authorized by External Affairs.

The Oval should appear at least once on all printed matter produced for use by Du Pont and its licensed subsidiaries and affiliates. It should appear proudly, prominently, and properly, not only on the Company's products, but also on its advertisements and commercials, product literature, promotional pieces, service bulletins, technical bulletins, signs, posters, billboards, trade show exhibits, correspondence, and business cards.

External Affairs is charged with the responsibility for stimulating prominent use of the Oval by any person intending to produce communications material for Du Pont and all subsidiary companies licensed to use it.

CORPORATE ELEMENTS

Oval Trademark

USE OF THE OVAL

The Du Pont Oval is the corporate trademark of Du Pont and identifies the Company's products and services. It is registered in the United States and in virtually every other country in the world. The Oval has been in continuous use since 1907. Based upon the specific use, the Oval may be shown with or without the legend "REG. U.S. PAT. & TM. OFF." underneath the Oval.

OVAL ON COMMUNICATIONS MATERIALS

The Oval trademark **without** the legend "REG. U.S. PAT. & TM. OFF." should be used on **communications** materials, such as advertisements, promotional communications, sales aids, letterheads, signs, technical literature, business cards, etc. (see reproduction sheets for Communications Materials).



OVAL ON PACKAGING AND LABELING MATERIALS

The Oval trademark **with** the legend "REG. U.S. PAT. & TM. OFF." must be used on **all packaging and labeling** materials that originate within the U.S. (for national and international distribution) to ensure commercial and trading protection.



For small labels and packages where the Oval is of a size 1/2" or smaller, making the legend "REG. U.S. PAT. & TM. OFF." illegible, a ® at the upper right-hand corner of the Oval is required (see reproduction sheets for Packaging and Labeling Materials).



For packaging and labeling of products that originate outside the U.S., refer to "Regions Other Than U.S." in Appendix A.

CORPORATE ELEMENTS

DESIGN ELEMENTS

The design elements of the Du Pont Oval are important and must be observed. This logotype must also be used in a way that preserves its official registration with the United States Patent and Trademark Office.

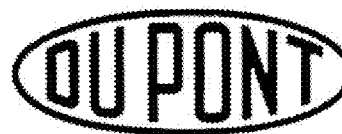
To maintain the integrity of this specific geometric design, corporate standards specify that only official Du Pont reproduction materials may be used when reproducing the Oval. See Appendix B for information on ordering Du Pont reproduction material.

SIX BASIC DESIGN STANDARDS

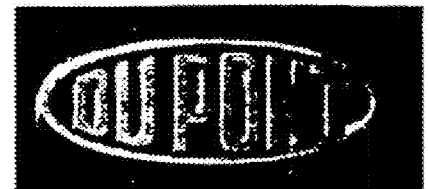
1. SHAPE

The Oval should always be used as a distinctive symbol that represents Du Pont. The Oval is to be used in its entirety and not distorted in any way, even if illustrated.

The Oval may also be produced three-dimensionally, either physically or simulated, as long as the top plane is an exact reproduction of our registered trademark.



or



Always use the official Du Pont Oval reproduction sheets specifically provided for either **communications** materials or **labeling** and **packaging** materials.

2. COLOR

The preferred company color is Pantone® Matching System (PMS) 185 Red. This color may also be reproduced in process colors using a solid magenta and a solid yellow.

CORPORATE ELEMENTS

Oval Trademark

SIX BASIC DESIGN STANDARDS (CONT'D.)

The entire Oval trademark (including the name DU PONT and the oval surrounding the words DU PONT) and the registration legend must be treated as a total entity and reproduced using the same color for each element.

If a business unit, product, or specific campaign has an associated color, the Oval may be produced in a color other than PMS 185 Red. In such cases, the Oval should appear in the same distinctive color.

3. SEPARATION

In order not to confuse or distort the registered elements of the Oval, at least one of the following three methods of separating the Oval from other text and/or graphics may be used:

A. SPACE

A space equal to at least 1/2 the depth of the Oval on all sides should separate the Oval from text and/or other graphics.



EXCEPTION

The Oval may be used with a visually subordinated* line of text below it in the same color when presenting either the Company slogan, a site name, a market segment, or a special Company activity, such as a certification program.



Polymer Products

*Less than 1/2 the depth of the Oval

CORPORATE ELEMENTS

SIX BASIC DESIGN STANDARDS (CONT'D.)

B. POSITION

The Oval may be offset from other text.



CHEMICALS & PIGMENTS
WILMINGTON, DE 19898

C. COLOR

The Oval may be presented in a contrasting color from other text and/or other graphics.



TEFLON®

or



TEFLON®

EXCEPTION

Color differentiation is not necessary when one-color printing is used for economical reasons.

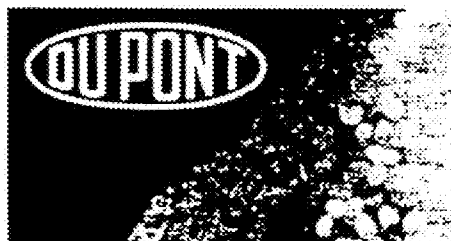
4. SIZE

The Oval should be presented in a distinctive size that reflects the distinct and recognizable image of Du Pont.

5. BACKGROUND

The Oval should appear on a uniform background that permits the Oval to be legible.

Right



Wrong



CORPORATE ELEMENTS

Oval Trademark

SIX BASIC DESIGN STANDARDS (CONT'D.)

6. FREQUENCY OF USE

The Oval is a symbol that represents the Company and its products and should not be used as a graphic device. Therefore, the Oval should **not** appear more than once on a page or panel, unless the second use is an illustration of a package or label containing the Oval, or the Oval is in its normal environment in a photograph or illustration.

EXCEPTION

The Du Pont Oval may be used repeatedly as a watermark on Du Pont watermark bond paper, on safety paper for financial conveyances, and with a product trademark to identify continuous rolls of product, such as TYVEK® housewrap.

Refer to the "Applications" section of this manual for detailed information and examples of how to use the Oval trademark in specific application areas. Exceptions to these design guidelines are also covered.

If you would like further clarification, please contact your External Affairs/Marketing Communications representative.

Use only official Du Pont Oval reproduction materials to ensure accuracy of rendition in all uses of the Oval. Appendix B includes information on Oval trademark film masters and information on how to order additional materials.

CORPORATE ELEMENTS

The Company slogan is widely recognized in the markets Du Pont serves, and emphasizes our continuous commitment to quality in the design and value of our products and services. To further strengthen this image, the slogan should be used as frequently as possible.

SLOGAN USED ALONE

The Company slogan may be used alone. When used without the Du Pont Oval, use the Company slogan with the words . . . **from Du Pont** to emphasize the Company name.

Better Things for Better Living . . . from Du Pont

SLOGAN USED WITH DU PONT OVAL

The slogan may be used with the Du Pont Oval. When presented with the Du Pont Oval in the same color, the slogan should appear subordinate to the Du Pont Oval.



or



Better Things for Better Living

**Better Things
for Better Living**

The Oval may be used with the Company slogan in equal weight on one line if they appear in contrasting colors.



Better Things for Better Living

Better Things for Better Living may also be used at the bottom of letterhead stationery that contains the Du Pont Oval.

The Company slogan should not be used when it conflicts with any theme that is being used by a business unit to address a specific market at a specific time.

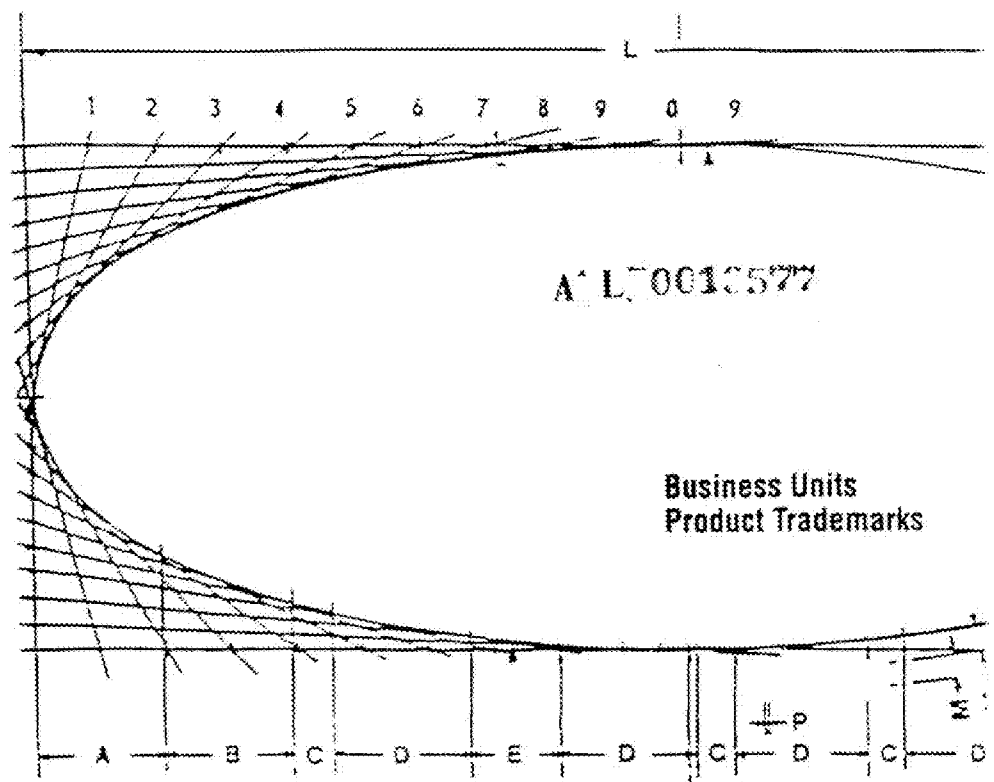
NOTE

The type style of the Company slogan may change to conform with the type style of the communications piece.

Reproduction sheets for the Company slogan are available. See Appendix B.

PART

BUSINESS ELEMENTS



2

Business Units

BUSINESS ELEMENTS

BUSINESS UNITS

When communicating to the world, it is important to maintain the image of Du Pont as a corporate entity that serves specific markets. To strengthen this emphasis on market focus, the words "department," "division," "section," "group," etc., should not be used as part of the business unit identification in external communications.

APPROPRIATE USE

Communicate business departments of the Company by only using market segments and not the word "department."

Agricultural Products	Imaging Systems
Automotive Products	Information Systems
Central Research and Development	International
Chemicals and Pigments	Legal
Corporate Plans	Marketing Communications
Electronics	Materials and Logistics
Employee Relations	Medical Products
External Affairs	Petrochemicals
Finance	Polymer Products
Fibers	

A market segment may be used with the Company name or the Du Pont Oval (see page 13).

Du Pont Electronics or



BUSINESS ELEMENTS

Product Trademarks

PRODUCT TRADEMARKS

Presently, a trademark is legally defined as:

"Any word, symbol, or device, or any combination thereof adopted and used by a manufacturer to identify goods and distinguish them from those manufactured or sold by others."

To reinforce the fact that our products are produced by Du Pont, it is important to use the word **Du Pont** frequently with trademark identification. This establishes ownership of the trademark and an association of the Company name with the product trademark. For well-known product trademarks, statements such as "Only Du Pont makes LYCRA® spandex" should be used frequently.

APPROPRIATE USE

To indicate that the product trademark is registered, the following registration symbol must be used—preferably at the first appearance of the product's name.

Registration status with ® **Mylar®**

Or registration status with footnote **Mylar***

*Du Pont registered trademark for (generic).

If the product trademark is in the process of being registered, use ™ to notify others that the word, symbol, or device is owned by Du Pont.

Subsequent appearances of the product trademark must be made distinctive by using one of the following:

All capitals: MYLAR

Quotation marks: "Mylar"

Italics: *Mylar*

Bold: **Mylar**

GENERIC NAME

The generic name is the common descriptive name for the class of product. The generic name **must** be used with the trademark at least once, preferably the first time the trademark is used. There may be more than one appropriate generic name for each class.

2

Product Trademarks

BUSINESS ELEMENTS

Trademarks may be used with a noun, other than the generic, when the noun is an item that contains the trademarked product, the Du Pont product relationship is explained, and the supplier of the item is identified. If the generic has not previously been identified, the ® and the generic name should also be included with the description of the noun.

EXAMPLES

When a product is made 100% with a Du Pont product, or nearly so, the product trademark may precede the noun.

Du Pont CORIAN® countertop fabricated by XYZ Company.

Du Pont "Kevlar" gloves from XYZ Company.

Du Pont *Cordura* luggage with leather trim made by XYZ Company.

When a product contains less than 100% of any one ingredient, but all ingredients are identified, the dominant ingredient should be first.

Du Pont ANTRON/LYCRA bathing suits designed and manufactured by XYZ Company.

Suits of Du Pont ANTRON/LYCRA.

Sweatsuits made of 50% Du Pont DACRON® polyester/50% cotton.

When a product contains less than 100% of the Du Pont product, the relationship should be identified.

XYZ Company cookware with Du Pont SILVERSTONE interiors.

XYZ Company umbrella treated with Du Pont **Teflon**® soil and stain repellent.

NOTE

The "Textile Fibers Products Identification Act" imposes special labeling and advertising requirements that must be observed. See your legal advisor for advice.

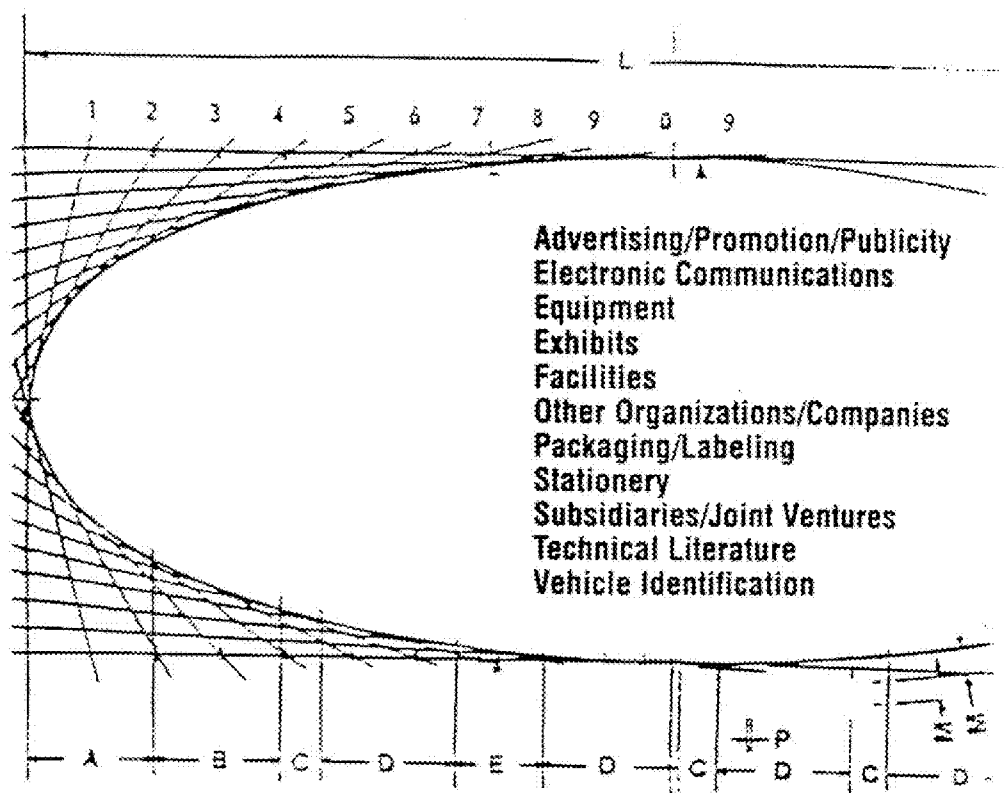
⊗ Do Not Use

Do **not** use a trademark in a possessive, plural, or hyphenated form.

PART

APPLICATIONS

A L 0023581



3

Advertising/ Promotion/ Publicity

APPLICATIONS

Advertising and promotion are the most visual forms of communication to the outside world. It is important to maintain consistency by using the guidelines in this manual.

ADVERTISEMENTS

The Oval is used as a corporate signature of the message.

The Oval as a signature should be the last element and at least 1/2 the depth of the Oval space clear from text copy.

Action steps, such as a response via a telephone number and/or an address, should be contained in the body text and should not follow the Oval signature.



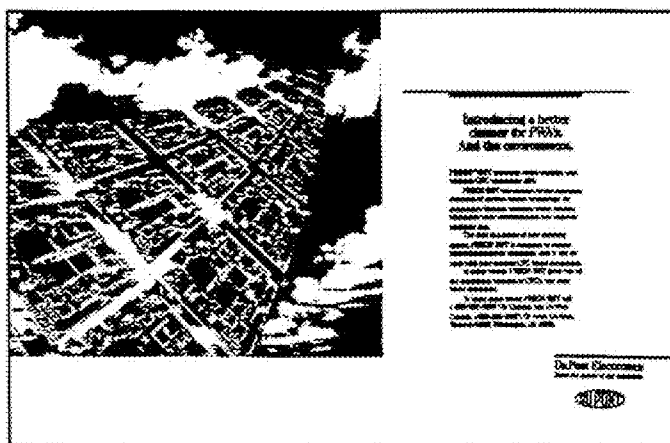
The Oval used with a market segment as a signature should have the market segment subordinated to the Oval.



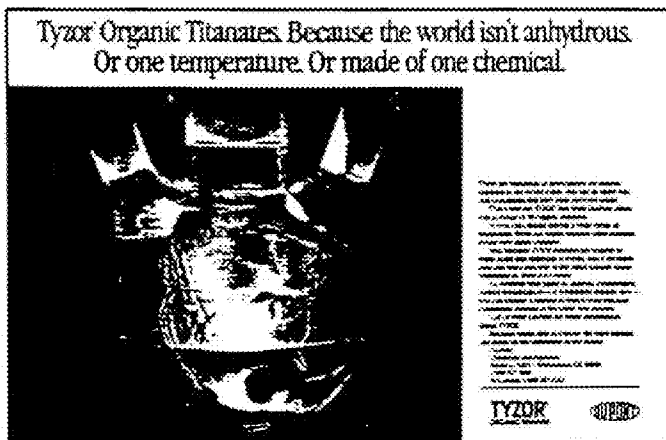
APPLICATIONS

Advertising/ Promotion/ Publicity

The Du Pont market identification and theme line are separate from the Oval signature. The Oval is the last element and should be separated by at least 1/2 the depth of the Oval space clear from the product theme line and other graphics and text.



The Oval used with product identification should have the Oval as the last element and should be separated by at least 1/2 the depth of the Oval space clear from product identification and other text and graphics.



Do Not Use

Do not use a product trademark below the Du Pont Oval when the Oval is used as a signature.

APPLICATIONS

OUTDOOR ADVERTISING

Both the message and a signature of that message must be short and legible since it must be captured by the audience within a few seconds. The Oval as a signature is the last element and is at least 1/2 the depth of the Oval space clear of all other elements.



AD SPECIALTIES

The Oval may be used on wearing apparel and ad specialties (such as pens, money clips, etc.) if the use is appropriate and in good taste.



APPLICATIONS

Advertising/ Promotion/ Publicity

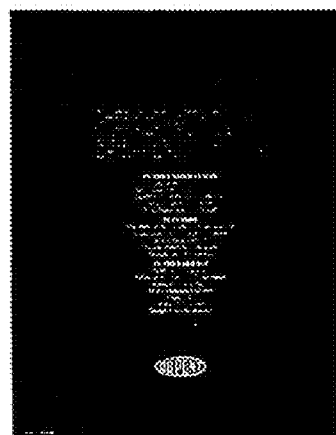
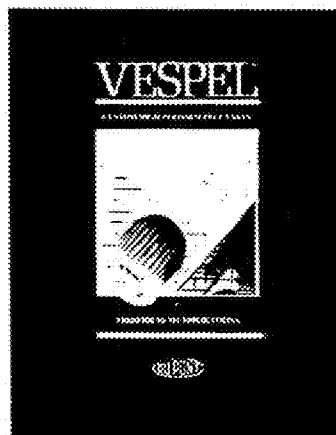
BROCHURES

BROCHURE FRONT COVER

The Oval is shown clear of all other elements by at least 1/2 the depth of the Oval. The communication should distinctively identify that the message is coming from Du Pont.

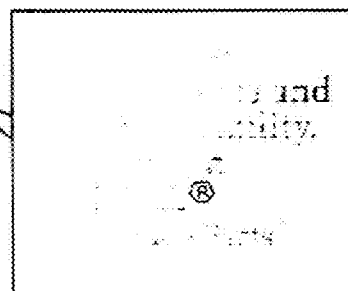
BROCHURE BACK COVER

The Oval, when used as a corporate signature, should be the last element. The Oval should **not** be used with an address when it is used as a signature.



FIRST TEXT PAGE

Even though a trademark is used on the cover with a ® and the generic, it should also be used in this form the first time it is used in the text portion of the brochure.



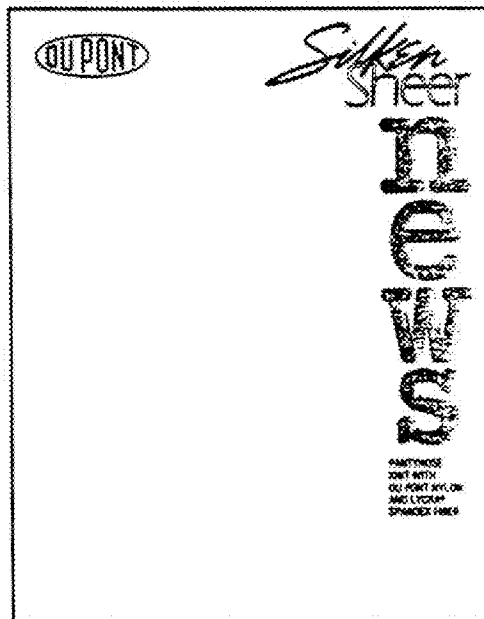
3

Advertising/ Promotion/ Publicity

APPLICATIONS

PROMOTIONAL NEWSLETTERS AND PUBLICATIONS

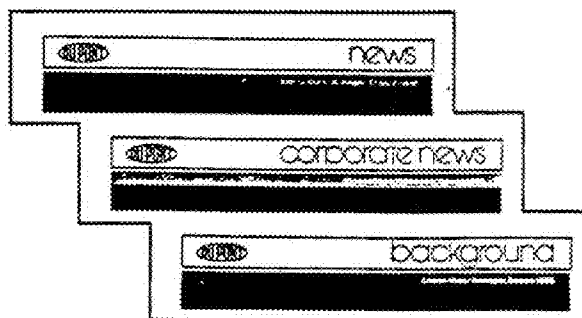
Newsletters and publications for distribution to customers should follow the same standards as promotional materials. The Du Pont Oval should have prominence with the use of color, space, or position.



NEWS RELEASES TO THE MEDIA

News releases to the media should have a consistency that automatically identifies that the information is coming from Du Pont.

The following examples illustrate the standard format for news releases.



APPLICATIONS

Electronic Communications

The use of two- and three-dimensional electronic communications offers the opportunity to expand the public image of the Company using a broader range of communication media than ever before possible. The emphasis on consistency and the correct application of the corporate standards are very important in supporting our products and enhancing our market position.

OVAL

ELECTRONIC DESIGN

⊗ Do Not Use

Do not use a computer graphics program to generate the Du Pont Oval for printed materials. If final copy is created on computer equipment and used for reproduction, the Oval must be stripped in at the printing stage, using reproduction sheets.

ELECTRONIC TRANSMISSION

⊗ Do Not Use

Materials that include the Oval sent by electronic transmission should not be used for reproduction unless the final product exactly matches our stock reproduction sheets.

BROADCAST MEDIA, FILM, AND VIDEOTAPE

⊗ Do Not Use

The Du Pont Oval used in motion should not have a distorted view frozen for more than a second in duration.

Do not have multiple Ovals on one screen.

PRODUCT TRADEMARKS

ELECTRONIC PUBLISHING

Always present the product trademark distinctively. Follow the trademark with the ® and the generic at least once on every document, preferably the first time the product trademark is used.

3

Equipment

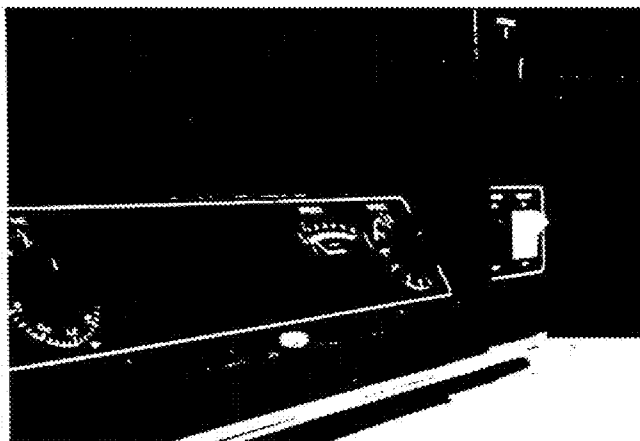
APPLICATIONS

The standards presented in this manual also apply to equipment. The Du Pont Oval should be distinctive and separated from other elements with the use of either color or space.

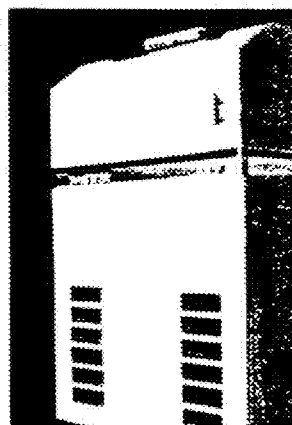
NOTE

The **packaging** of the equipment must contain the Du Pont Oval **with** the legend "REG. U.S. PAT. & TM. OFF." However, the **equipment** should contain the Du Pont Oval **without** the legend.

COLOR



SPACE

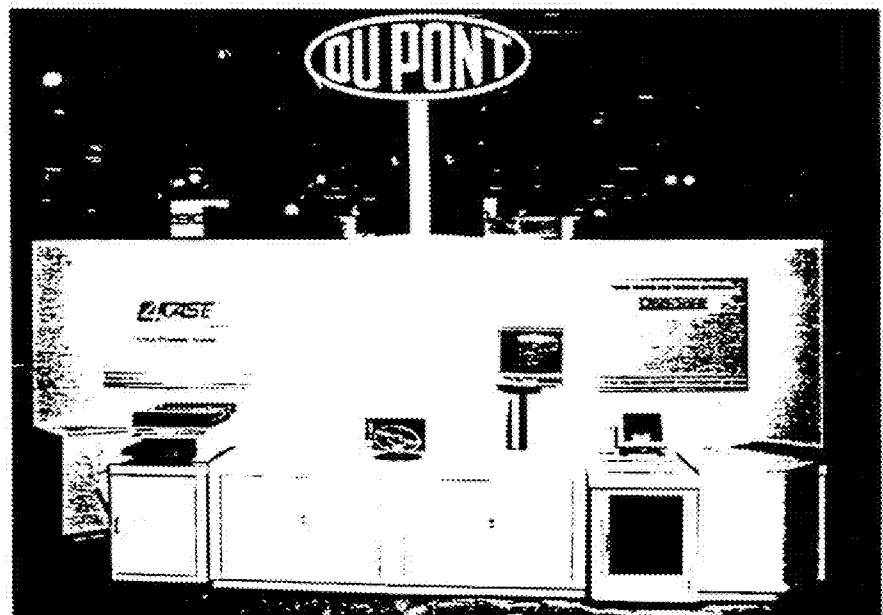


APPLICATIONS

Exhibits

The Oval should be high, large, legible, and visible from all sides for fast and easy access to the Du Pont booth. The position of the Oval should maximize the space available and be approved by show management.

The Oval may appear more than once on one side of an exhibit if each Oval is on a separate plane or if the side is long enough that you can see only one of the Ovals when standing in front of it and from a distance of six feet.



3

Facilities

APPLICATIONS

Facilities have a constant visual exposure to the public and can strongly influence our corporate image. It is very important that all signs be symbols of a proud Company.

OUTDOOR FACILITIES MARKING

These markings should be generic to emphasize the total offering of the Company, not just a company identified with a particular market segment.

Use the Oval by itself or with the site identified.

The site identification must be subservient to the Oval.



or



The address may be used, when necessary, in a contrasting color.

⊘ Do Not Use

The Oval and market segment should not be used on the outside of the facility.

Other symbols should not be used on the outside of the facility.

INDOOR FACILITIES MARKING

These markings should direct people with market segment interest, where appropriate, and may start with the front door.

Use the Oval by itself or with the market segment identified.

The market segment must be subservient to the Oval.



or



APPLICATIONS

Other Organizations/ Companies

The use of the Du Pont Oval by other organizations must be approved by External Affairs/Marketing Communications. The Oval may only be used when its use indisputably represents Du Pont. Approved uses include the following:

Non-Du Pont Advertising and Editorial

The Oval may be used when it represents Du Pont equally among the competition of other major corporations.

RANK
59

Wilmington, Del.
ADVERTISING: \$149.7 MILLION

Sales & Earnings
(\$ in millions)

	1987	1986	%chg
■ Worldwide			
Sales	\$0.468	\$7.148	12.2
Earnings	1.786	1.538	16.1
■ U.S.			
Sales	20.796	18.758	10.9
Operating income	1.418	1.147	23.5
■ Division sales			
Biomedical prods	1.266	1.150	10.1
Industr. cores, prods	3.284	2.279	43.7
Fibers	3.261	4.786	9.9
Polymer prods	3.611	3.657	4.2
Chemicals	3.979	5.396	17.2
Petro exploration	2.006	1.926	4.2

Spending on LYCRA® spends more than doubled to \$10 million in 1987, according to S&P/NA. LYCRA is promoted in ads for undergarments, hosiery and bathing suits from manufacturers such as Maidenform and No Nonsense. Spending on carpeting and apparel of ANTRON® nylon fibers dropped 50% to \$2.2 million. General fibers drew \$2.5 million - almost exclusively to magazines - down 20.9%.

Aside from fiber advertising, spending in several categories declined. These include TEFLON® soil and stain repellent down 19.3% to \$4.25 million; cookware made with SILVERSTONE® nonstick finish dropping 41% to \$2.6 million; and firearms and ammunition by Remington down 28% to \$473,000. However, general promotion of Du Pont accounted for \$11.6 million in spending, up 108%.

During 1987, Du Pont continued to move business from its core agencies into small, regional shops.

PROGRAMS WITH NONPROFIT AND EDUCATIONAL ORGANIZATIONS

The Oval may be used when it provides a positive, proud recognition for Du Pont being involved in grants or cooperative efforts with nonprofit and educational organizations.

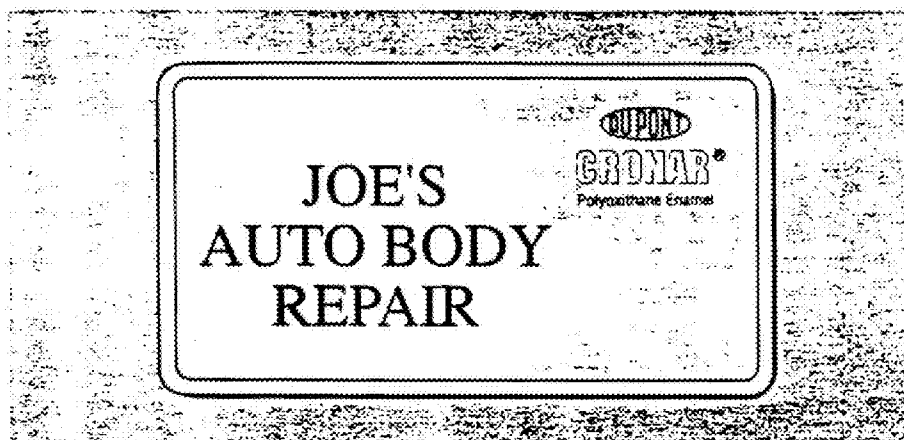


APPLICATIONS

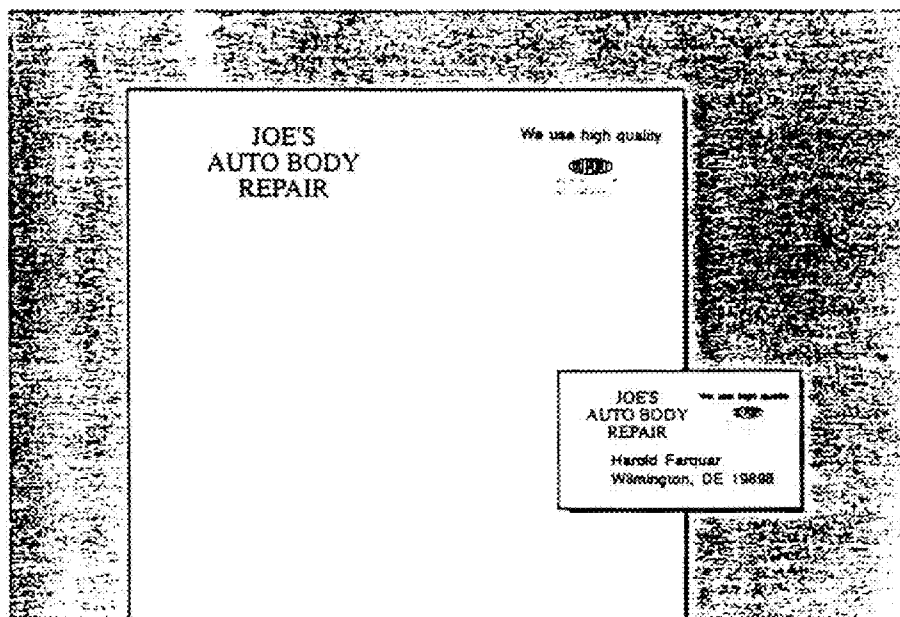
RETAILERS/DISTRIBUTORS

The Du Pont Oval may be used by retailers and distributors who have an established, contractual business relationship with Du Pont to sell Du Pont products in their original form and/or package when the use will provide an incentive for customers to buy. Retailer or distributor identification must be dominant.

SIGNAGE



LETTERHEAD/BUSINESS CARDS



APPLICATIONS

Other Organizations/ Companies

When retailers and distributors use the Oval, it is to be closely related to a Du Pont product. Therefore, the Oval should appear close to the Du Pont product trademark, but in a contrasting color to preserve its distinctiveness. The unit of the Oval and trademark may not be used as a signature for printed material. Also, the product trademark should be dominant to the Oval. Reproduction sheets should be provided to maintain consistency.

The product trademark must be used with an * and the statement, **Du Pont registered trademark for (generic)**, as shown below.

EXCEPTION

For hangtags or items printed in masses that determine two colors impractical because of cost considerations or registration of color in the printing process, the Oval may be the same color as the product trademark. Authorization by External Affairs/Marketing Communications should be obtained.

LABELS/HANGTAGS



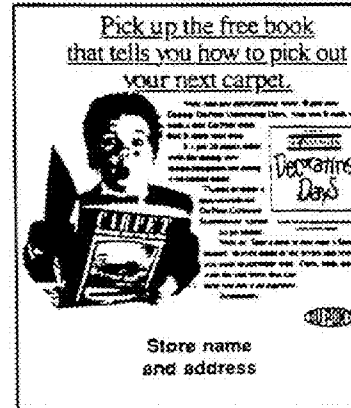
NOTE

Since this is not a Du Pont product label, but identifies the Du Pont ingredient product used in the manufactured product, the communications version of the Oval **without** the legend "REG. U.S. PAT. & TM. OFF." is used.

APPLICATIONS

IMPRINTED LITERATURE

The Du Pont Oval may be used on promotional literature dedicated to a Du Pont product that is produced or approved by External Affairs/Marketing Communications.



RETAIL ADVERTISEMENTS AND PROMOTION

Du Pont product labels or packages may be used to identify a product in an advertisement and in promotional literature.

Stren® \$2, \$3 and \$4
Bucks Rebate

When you order a fresh spool of premium STREN monofilament, you will receive a Cabela's Bucks Rebate Coupon, "good-as-cash" toward your next order from Cabela's catalogue. Use your Cabela's Bucks by Dec. 31 to take advantage of this fantastic offer.

Real FR spool	\$2 Cabela's Bucks
500 Yard spool	\$3 Cabela's Bucks
2400 Yard spool	\$4 Cabela's Bucks

DU PONT Stren® Monofilament

A technical breakthrough in monofilament research has created a new STREN with a durability and toughness which must be experienced to be believed. It still has the same high standards in casting, knot strength, stretch, tensile strength, shock resistance and visibility. But more durability and abrasion resistance than other leading monofilament lines, wet or dry. Gives high visibility to fishermen. Low visibility to fish through its exclusive fluorescent characteristics. Clear, blue and golden.

APPLICATIONS

Other Organizations/ Companies

YELLOW PAGES ADVERTISEMENTS

The Du Pont Oval may be used in a Yellow Pages advertisement as long as it is related to a Du Pont product trademark.

SHRINK PACKAGING

We use high quality



CLYSAR®

SHRINK FILM

ABC Packaging Corp.

123 Main Street, Anytown, USA

123-4567

CORIAN PRODUCTS BY DU PONT

"Solid Beauty That Lasts"
for

- Kitchen Countertops
& Sinks
- Bath Vanity Tops/Bowls
- Tub & Shower Walls
- Custom Applications



FOR MORE INFORMATION CALL:

LIVINGWELL CABINETS

101 Esplande Avenue, Newark, DE.....555-2110

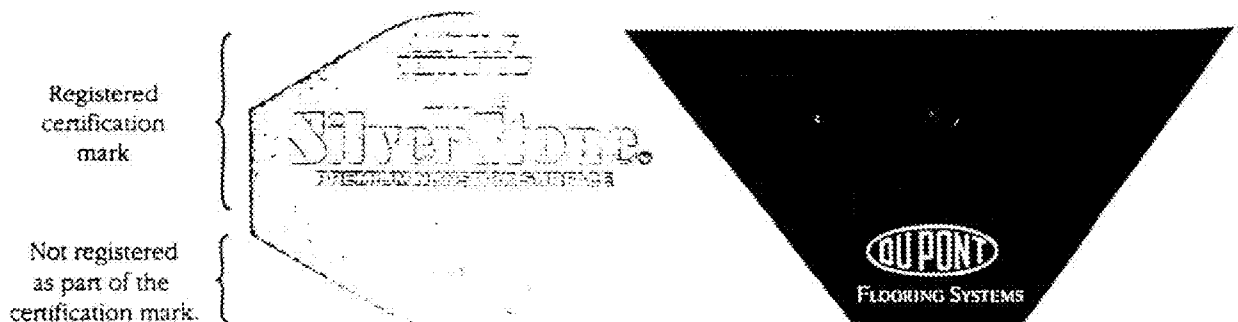
APPLICATIONS

CERTIFICATION MARK PROGRAMS

U.S. REGION LEGAL REQUIREMENTS

1. Do not use the Du Pont Oval as a part of the certification mark because the Du Pont Oval represents products made by Du Pont, not products made by others and certified by Du Pont.
2. Use a distinctive design or logotype for the certification mark. Use a distinctive color to the extent possible.
3. Use the words "Du Pont Approved," "Du Pont Certified," "Du Pont Tested," or other terms establishing Du Pont's role.
4. Identify the feature or construction that is approved or certified.
5. If a product trademark is used as part of a certification mark, maintain a difference recognizable by the purchasers of the certified goods between the goods sold by Du Pont and the Du Pont certification activity.
6. Adjacent appropriate use of the Du Pont Oval to identify ingredient products or the nature of the activity is not objectionable: i.e., the Oval used in conjunction with a certification mark may include the market segment or identification of the certification program. If a Du Pont product(s), e.g., carpet fibers, is identified with the Du Pont Oval, it should be preceded by the word "contains."
7. Adjacent uses of a certification mark and the Du Pont Oval should be approved in advance by External Affairs and departmental legal representatives servicing the business unit or activity. Also maintain the separate identity of the certification mark and the Du Pont Oval by following the Du Pont Oval design standards for both color and separation on pages 13 and 14 of this manual.

The following examples show the Du Pont Oval used with, nor within, a Du Pont certification mark. There should be no printed border enclosing the certification mark and the Du Pont Oval.



APPLICATIONS

Packaging/ Labeling

Package design is an important projection of the Du Pont corporate identity to customers around the world. Our corporate goal is to attain greater awareness and recognition. We want our packaging to help sell the product, and the Du Pont Oval used properly will contribute to this effort. This vision is best accomplished by applying the basic corporate identity standards to the design format for packaging and labeling.

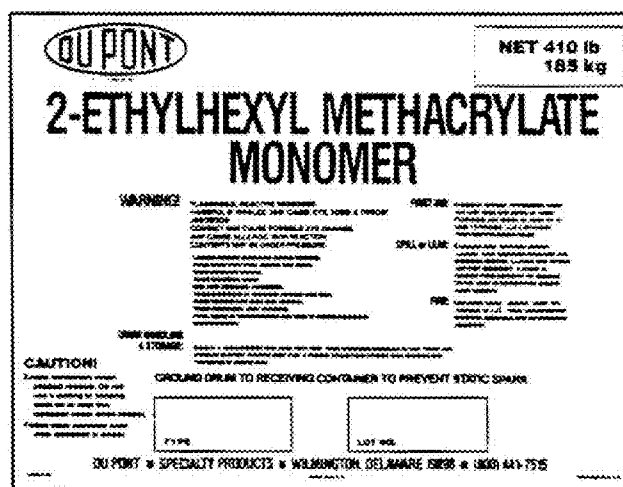
OVAL STANDARDS

The Oval trademark **with** the legend "REG. U.S. PAT. & TM. OFF." must be used on **all packaging** and **labeling** materials that originate within the U.S. (for national and international distribution) to ensure commercial and trading protection.

For small labels and packages where the Oval is of a size that makes the legend "REG. U.S. PAT. & TM. OFF." illegible, a ® at the upper right-hand corner of the Oval is required (see reproduction sheets for Packaging and Labeling).

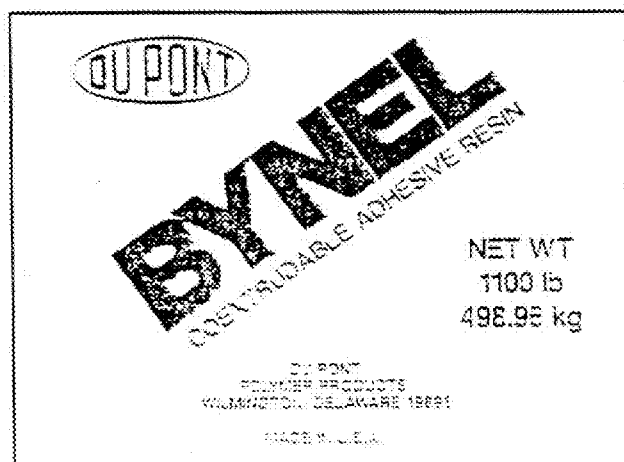
For packaging and labeling of products that originate outside the U.S., refer to Appendix A.

The Du Pont Oval is separated from text by using contrasting colors.

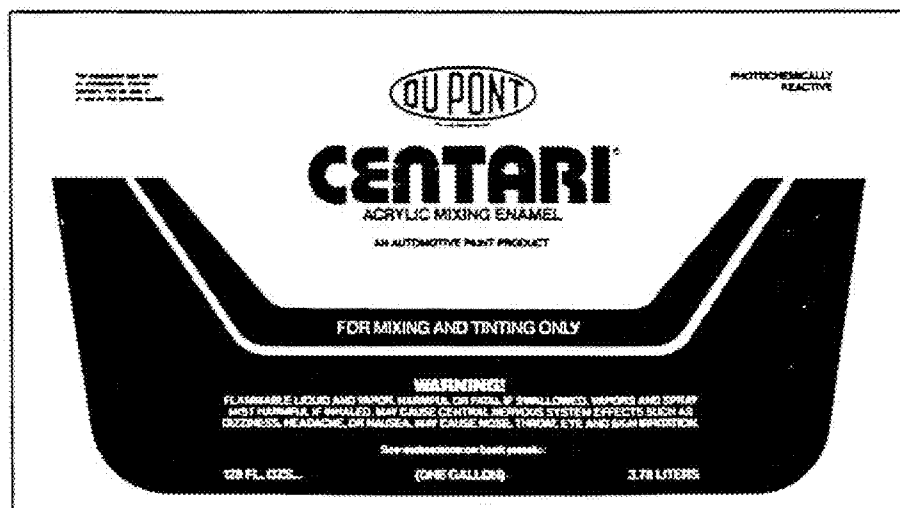


APPLICATIONS

The Du Pont Oval is separated from text by using space equal to 1/2 the depth of the Oval.



The Du Pont Oval is separated from text by using contrasting colors.

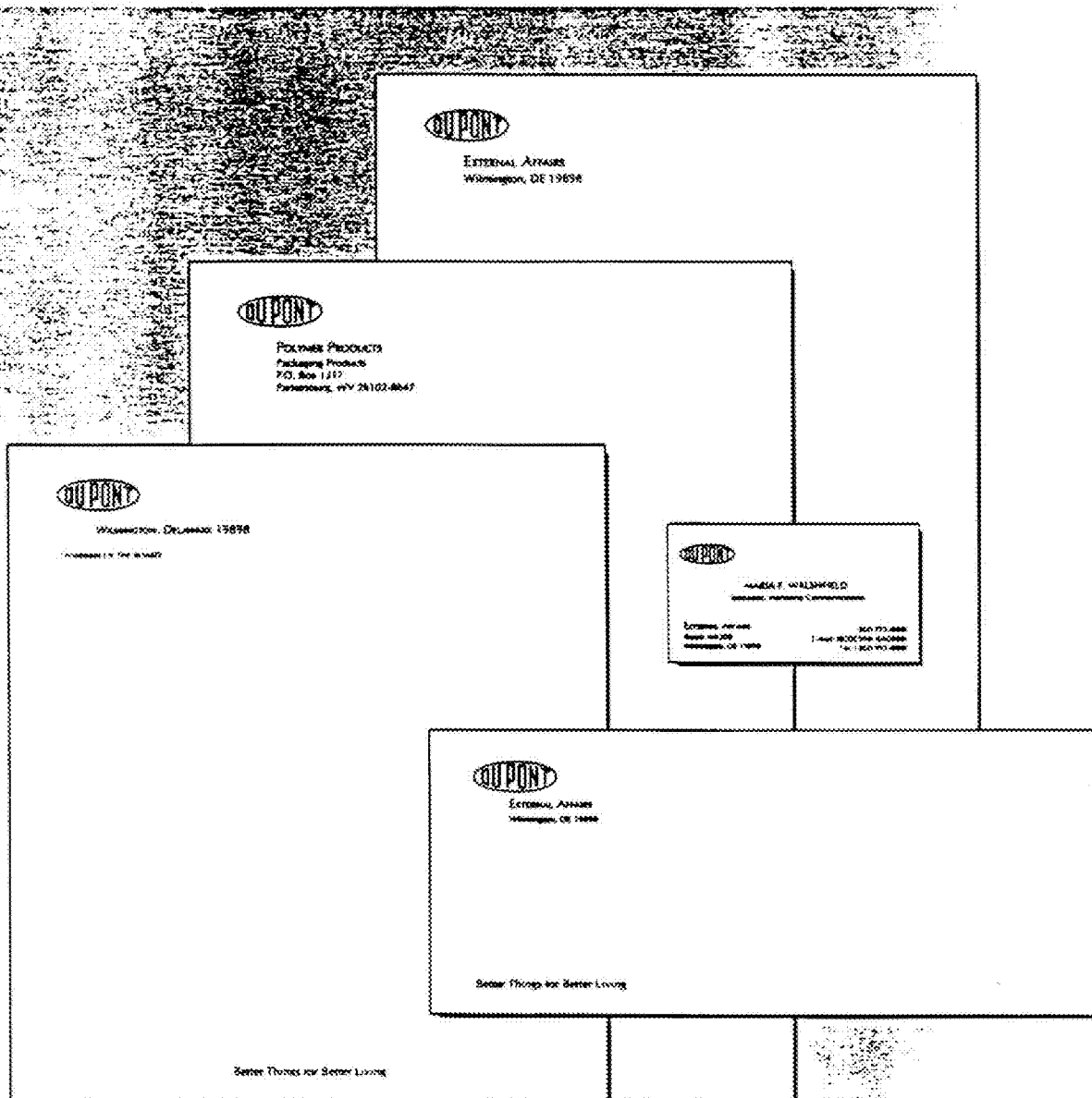


APPLICATIONS

Stationery

Stationery represents the Du Pont image to the thousands of people and organizations we do business with every day. Consistency in its design and printing standards will help our correspondence make an attractive, businesslike impression. "Optima" is the name of the type style in the following examples.

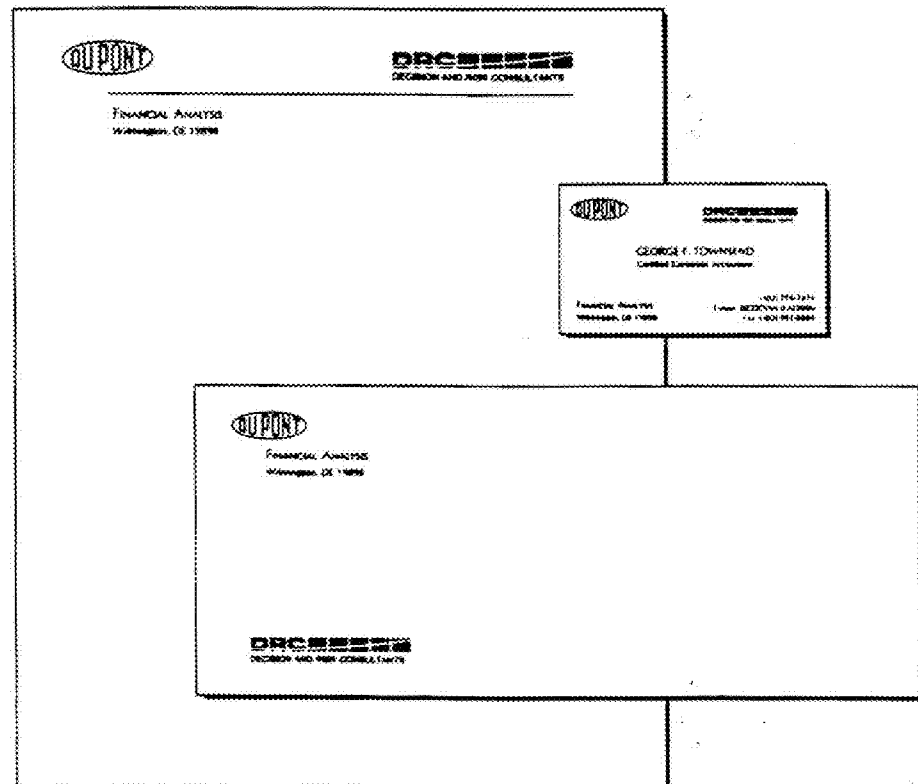
STANDARD FORMAT



APPLICATIONS

STANDARD FORMAT WITH PRODUCT IDENTIFICATION/THEME

When a business unit or product has a specific theme or product logo for a specific period of time, it may be used with the corporate identity in the following way. Be sure the design does not overpower the corporate identity. A prominent emphasis on the Du Pont Oval will provide a feeling of importance to this communication.



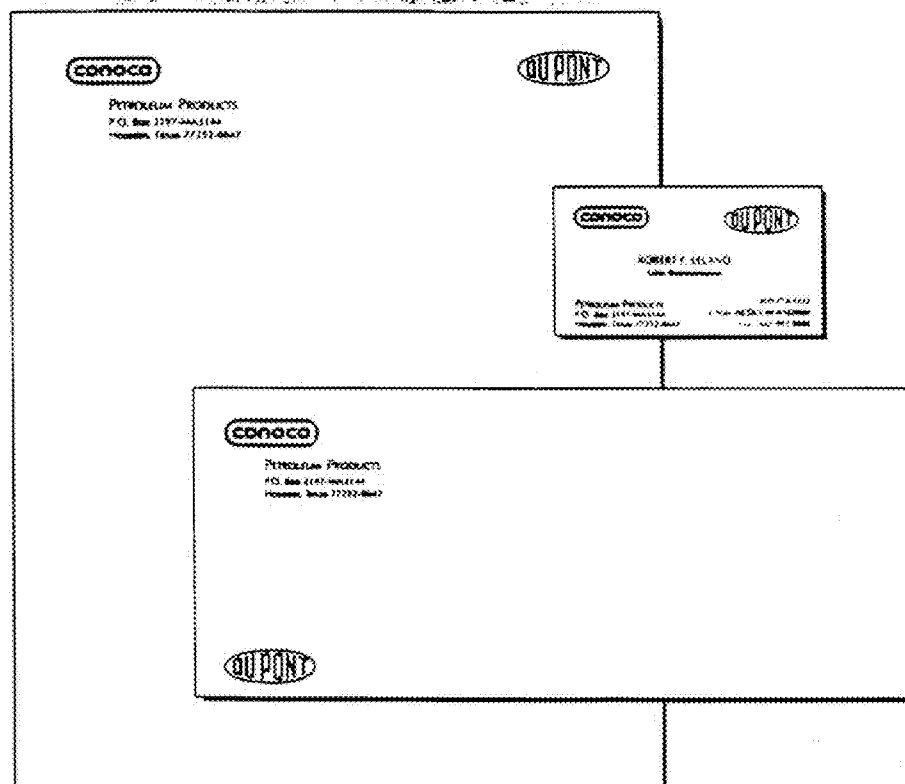
APPLICATIONS

Subsidiaries/ Joint Ventures

STANDARD FORMAT FOR SUBSIDIARIES

The logotypes of the subsidiaries are to be protected by following the same standards presented in this manual that cover the Du Pont Oval.

The Du Pont Oval should be of equal weight to the subsidiary's logotype and positioned in the upper right corner of the letterhead and business card.



3

Subsidiaries/ Joint Ventures

APPLICATIONS

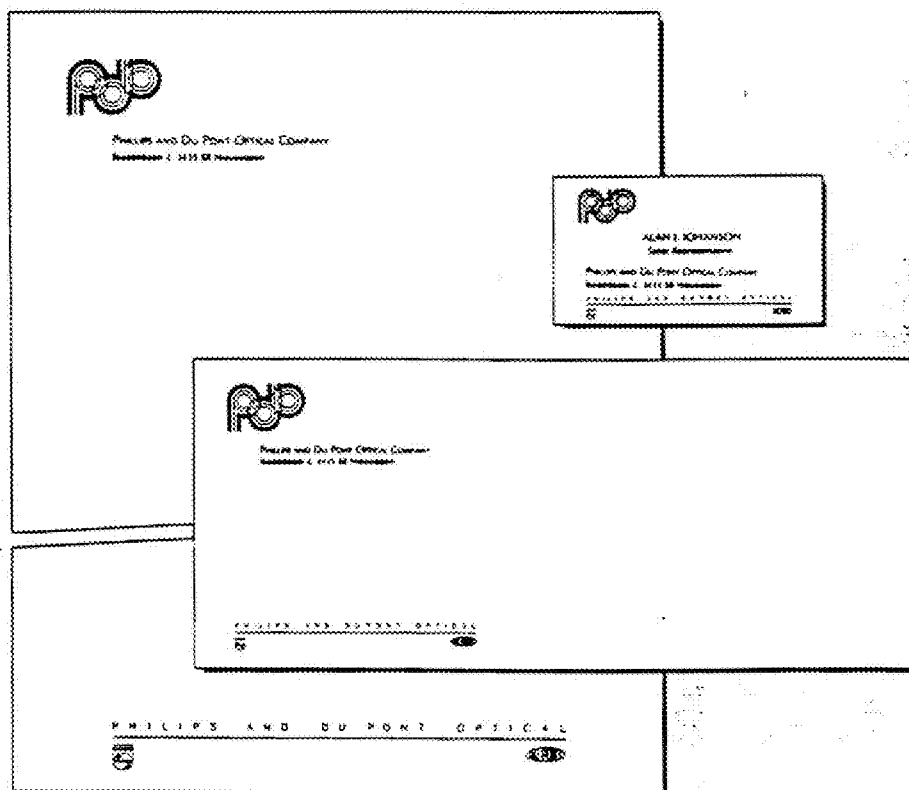
STANDARD FORMAT FOR JOINT VENTURES

Since Du Pont may not control the use of all trademarks involved in a joint venture, the following is a suggested use of the logotype of the joint venture, the other parent company, and Du Pont.

The name of a joint venture should include words that identify the product offering.

⊗ Do Not Use

The logo of the joint venture should never take the shape of an oval.



APPLICATIONS

Technical Literature

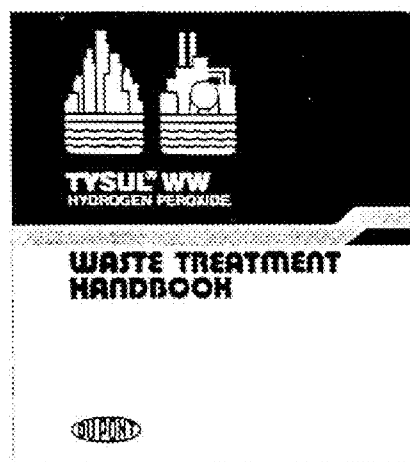
Technical publications share the common elements of the corporate identity program and should always communicate information with a simple, clear design.

Standards presented in this manual are demonstrated in the following examples.

TECHNICAL MANUALS

The Oval is shown clear of all other elements by at least 1/2 the depth of the Oval. The communication should distinctively identify that the message is coming from Du Pont.

BINDER



Cover



3" Spine



1" Spine

FIRST TEXT PAGE

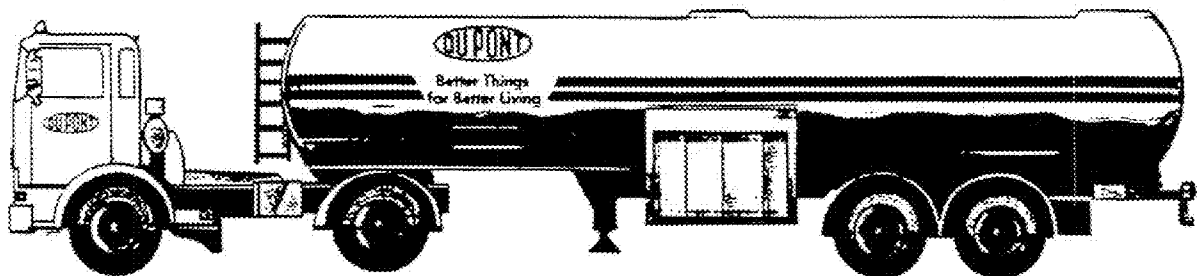
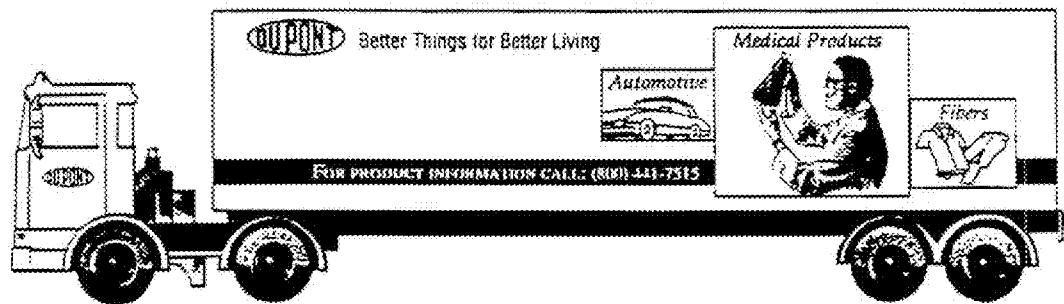
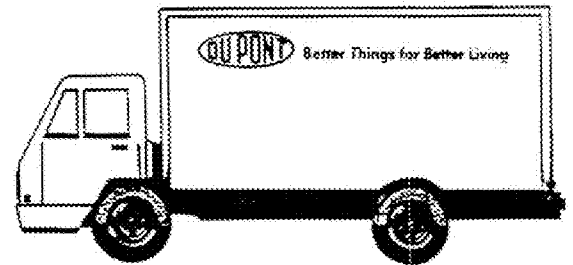
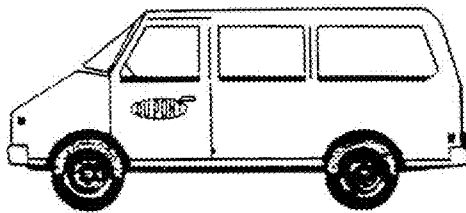
Even though a trademark is used on a cover with a ® and the generic, it should also be used in this form the first time it is used in the text portion of the manual.

APPLICATIONS

Vehicle Identification

Trucks, vans, and other company vehicles are an important form of advertising with major exposure to the public every day. The Du Pont corporate image is strengthened when the design elements already mentioned are presented advantageously on these large viewing surfaces in a consistent and well-maintained display.

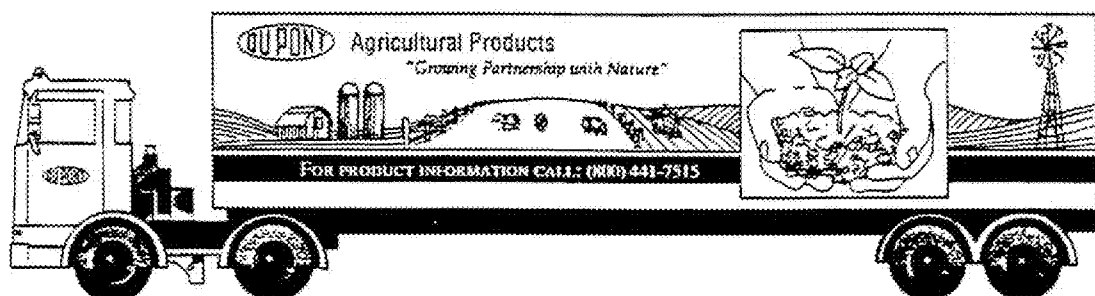
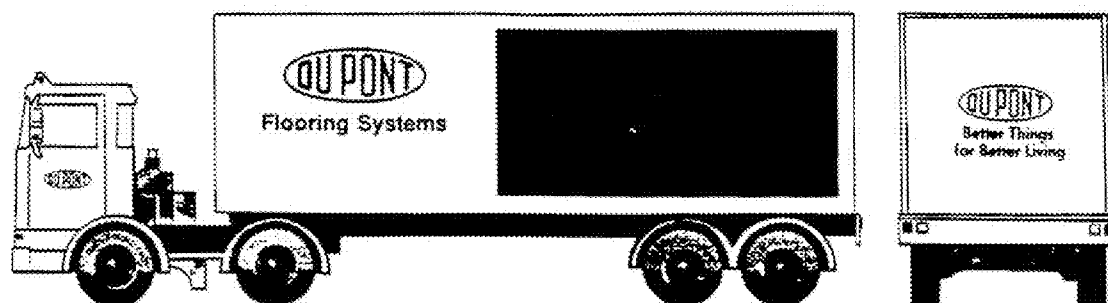
The Du Pont Oval, with or without the Company slogan, with or without market segments identified, and with or without the Du Pont product information telephone number, may be used on all multipurpose vehicles.



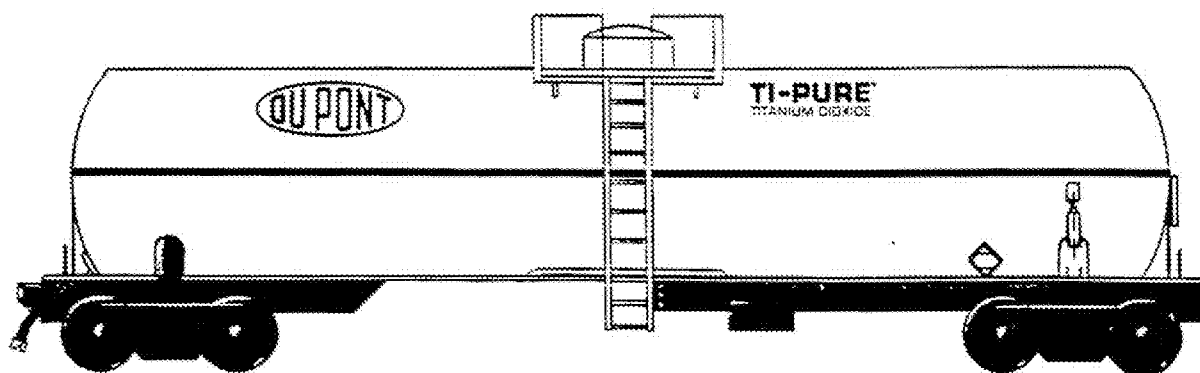
Vehicle Identification

APPLICATIONS

The Du Pont Oval, with or without market segment, and product trademarks, certification marks, or public affairs messages that are recognized by mass markets may be applied to multipurpose vehicles.

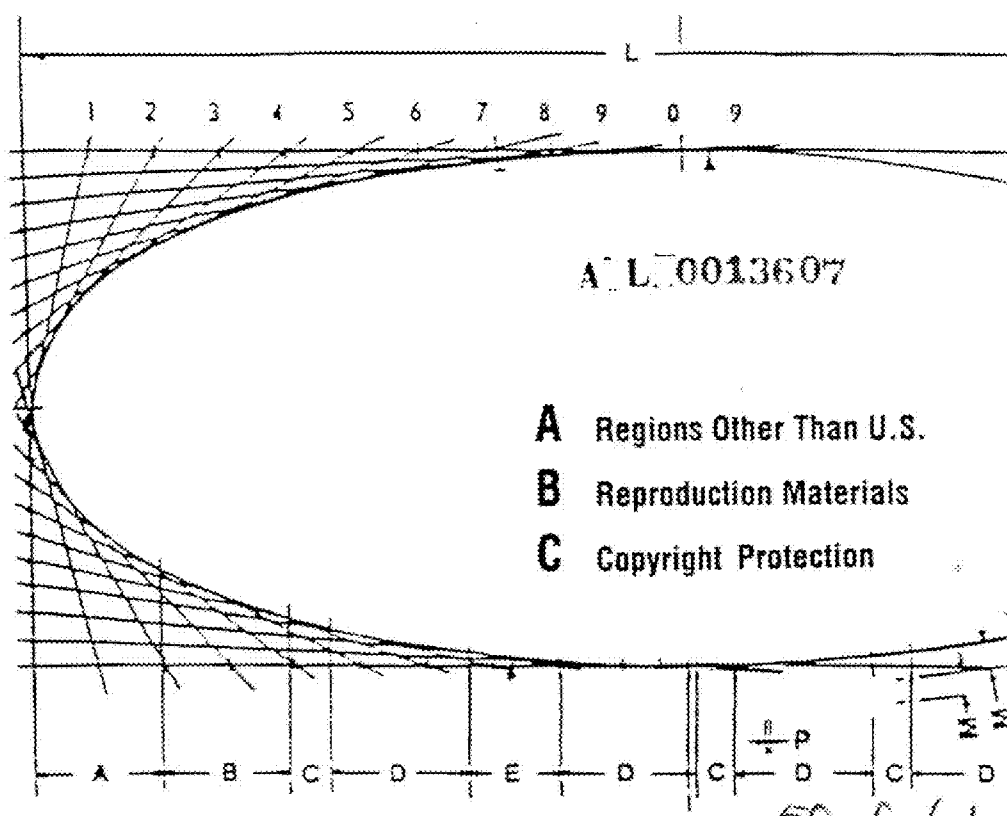


Industrial products may be identified if the vehicle is dedicated to that product and there is value in having our customer see the product name at the point of delivery.



All identification elements should be applied directly to the surface of the vehicle. Use only precisely reproduced materials for consistency. See Appendix B.

APPENDIX



APPENDIX A

REGIONS OTHER THAN U.S.

Various regions of the world have requirements for the Company name and the Du Pont Oval that differ from those presented in this manual. There should be a concerted effort to distinguish between the legal name and the communications or trade name. In order to be recognized as one worldwide company, the trade name in each region, if legally possible, should be **Du Pont**.

The Du Pont Oval should show appropriate registration status where it is legally necessary for either communications materials or packaging and labeling materials.

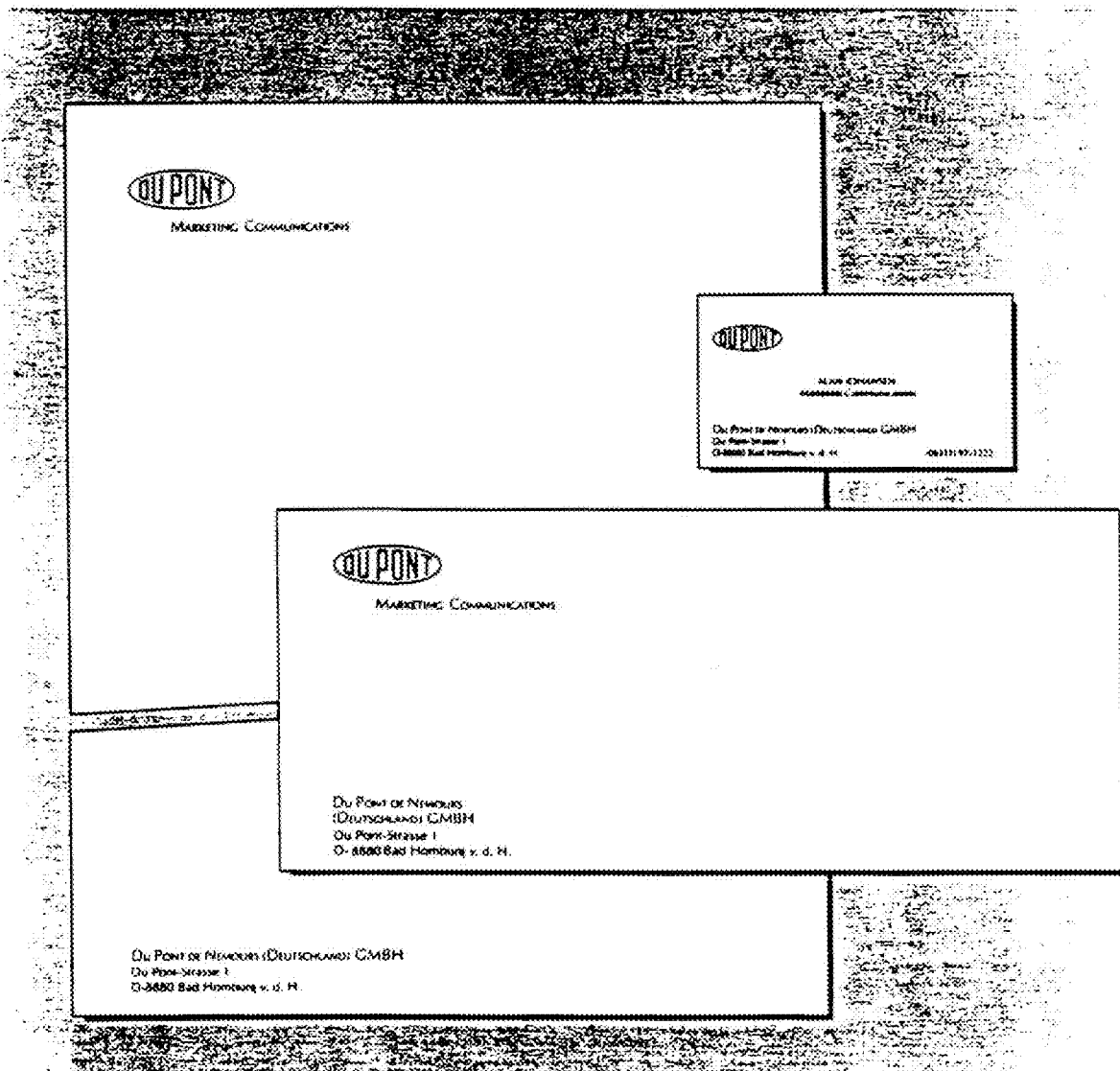
OVAL USED BY OTHER ORGANIZATIONS

The Oval may be used by sellers or resellers outside the United States if it is registered in the country or countries where the Oval will be used. If the Oval is not registered for the goods sold by the seller or reseller, the Oval may be used only if the seller or reseller enters into a license agreement recognizing Du Pont's ownership of the Oval, and agrees to use the Oval in a manner approved by Du Pont.

APPENDIX A

STATIONERY

The following example demonstrates a design for stationery in regions where the registered subsidiary name is legally required on all communications.



APPENDIX B

REPRODUCTION MATERIALS

To save time and to ensure accuracy of rendition in all uses of the Oval, reproduction material in the form of reproduction sheets is provided for artists, plate makers, printers, sign painters, etc.

Film masters are also provided at a nominal charge for the Du Pont Oval in various sizes from 1/2" to 18", as well as in metrics. The code numbers and sizes of reproduction sheets are listed below:

Code Number	Size	Usage
Stock reproduction sheets of Du Pont Oval		
H-19701	1/2" to 4" (1.25 cm to 10 cm)	For use on communications materials
H-19702	5", 6", 8" (12.5 cm, 15 cm, 20 cm)	For use on communications materials
H-19703	8" (20 cm)	For use on fabricated and painted signs
H-19704	1/2" to 4" (1.25 cm to 10 cm)	For use on packaging and labeling
H-19705	5", 6", 8" (12.5 cm, 15 cm, 20 cm)	For use on packaging and labeling
Stock reproduction sheets of Company Slogan		
H-19706	Assorted	For use on communications materials
Film masters of Du Pont Oval		
H-19707	1/2" to 4" (1.25 cm to 10 cm)	For use on communications materials
H-19708	5", 6", 8" (12.5 cm, 15 cm, 20 cm)	For use on communications materials
H-19709	12" (30 cm)	For use on communications materials
H-19710	18" (45 cm)	For use on communications materials
H-19711	1/2" to 4" (1.25 cm to 10 cm)	For use on packaging and labeling
H-19712	5", 6", 8" (12.5 cm, 15 cm, 20 cm)	For use on packaging and labeling
H-19713	12" (30 cm)	For use on packaging and labeling
H-19714	18" (45 cm)	For use on packaging and labeling

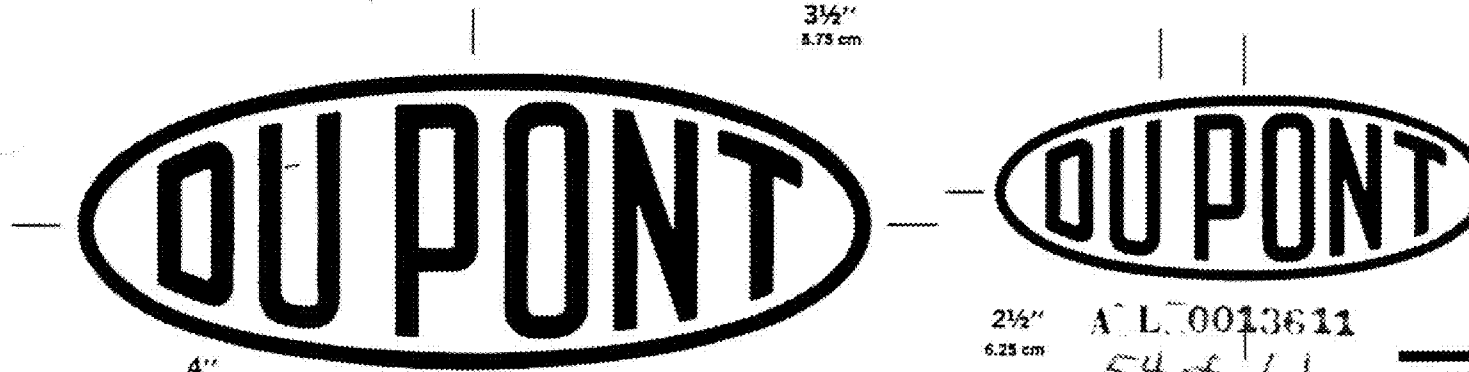
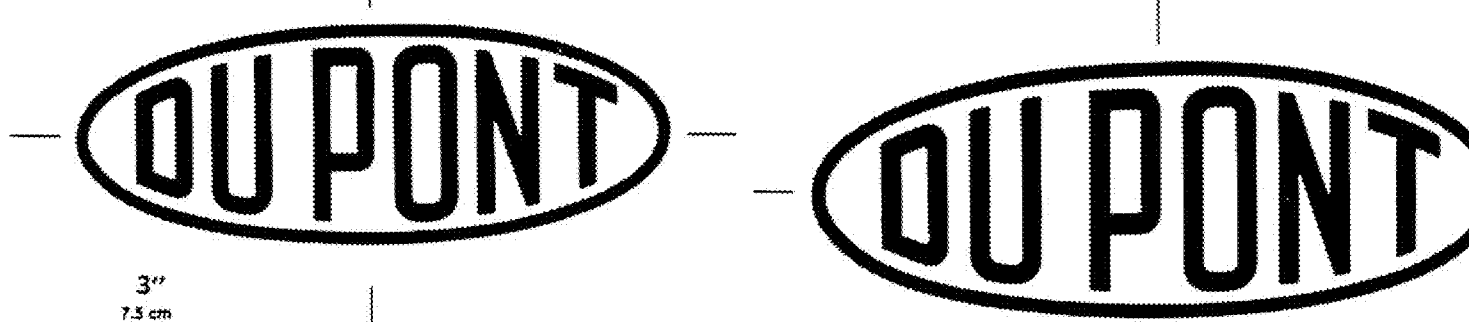
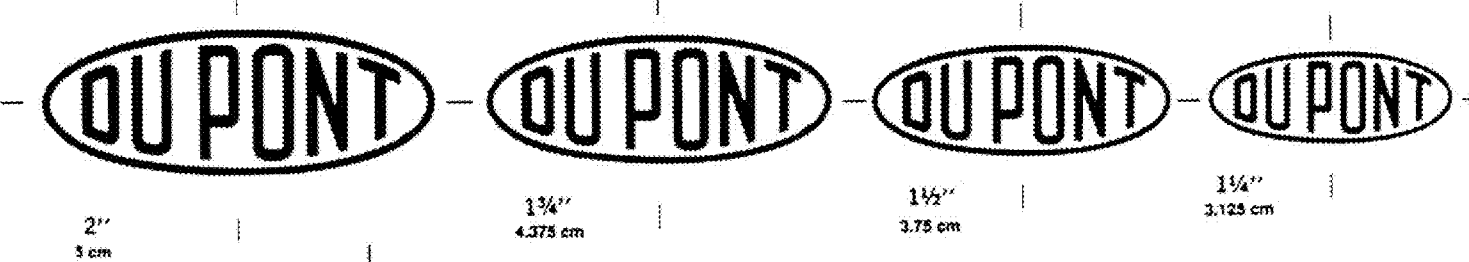
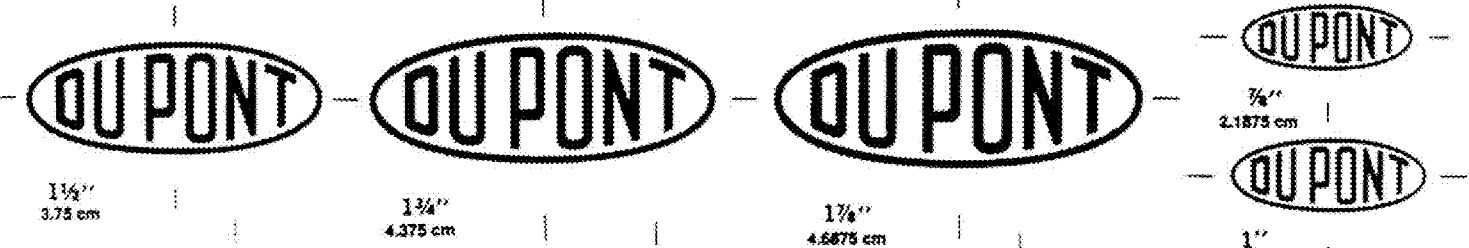
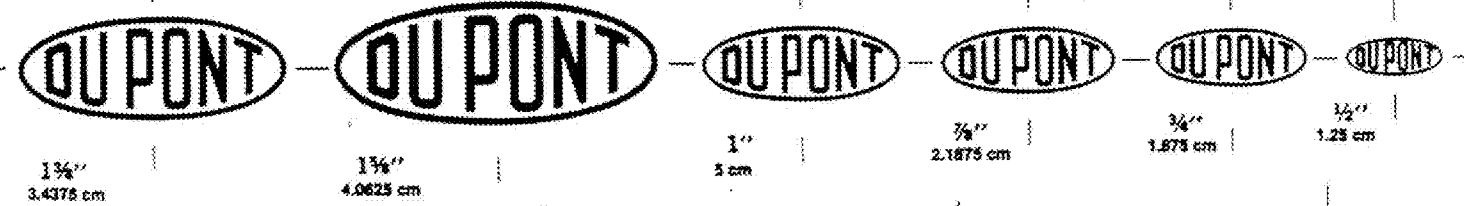
OPTIONS FOR ORDERING

- Complete a G-352 stationery and forms requisition form and send to Du Pont, Stationery and Forms, Eden Park, Wilmington, DE 19898.
- Call order desk: (302) 774-4444.
- Fax order: (302) 774-5643. The voice contact number is (302) 774-8004.

Do not enlarge for odd sizes • Reduce the next larger Oval • See page 50 for ordering information

Du Pont • Stationery and Forms • Eden Park • Wilmington, DE 19898 • (302) 774-4444

Refer to the *Corporate Identity* manual for correct usage of the Du Pont Oval.



A.L. 0013611

54 of 1.1

Do not enlarge for odd sizes • Reduce the next larger Oval • See page 50 for ordering information
Du Pont • Stationery and Forms • Eden Park • Wilmington, DE 19898 • (302) 774-4444

Refer to the *Corporate Identity* manual for correct usage of the Du Pont Oval.

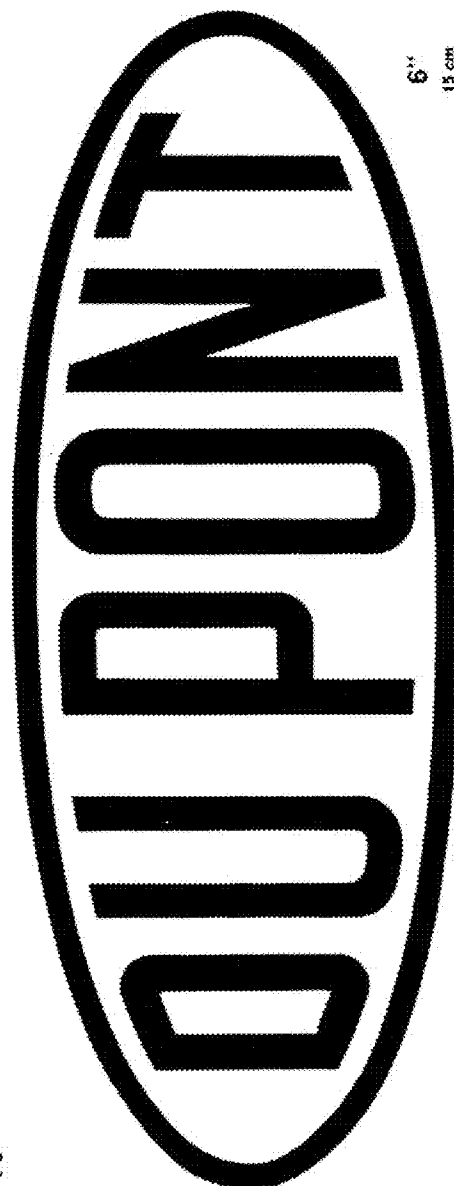


5"
12.5 cm



8"
20 cm

A L 0013612



6"
15 cm

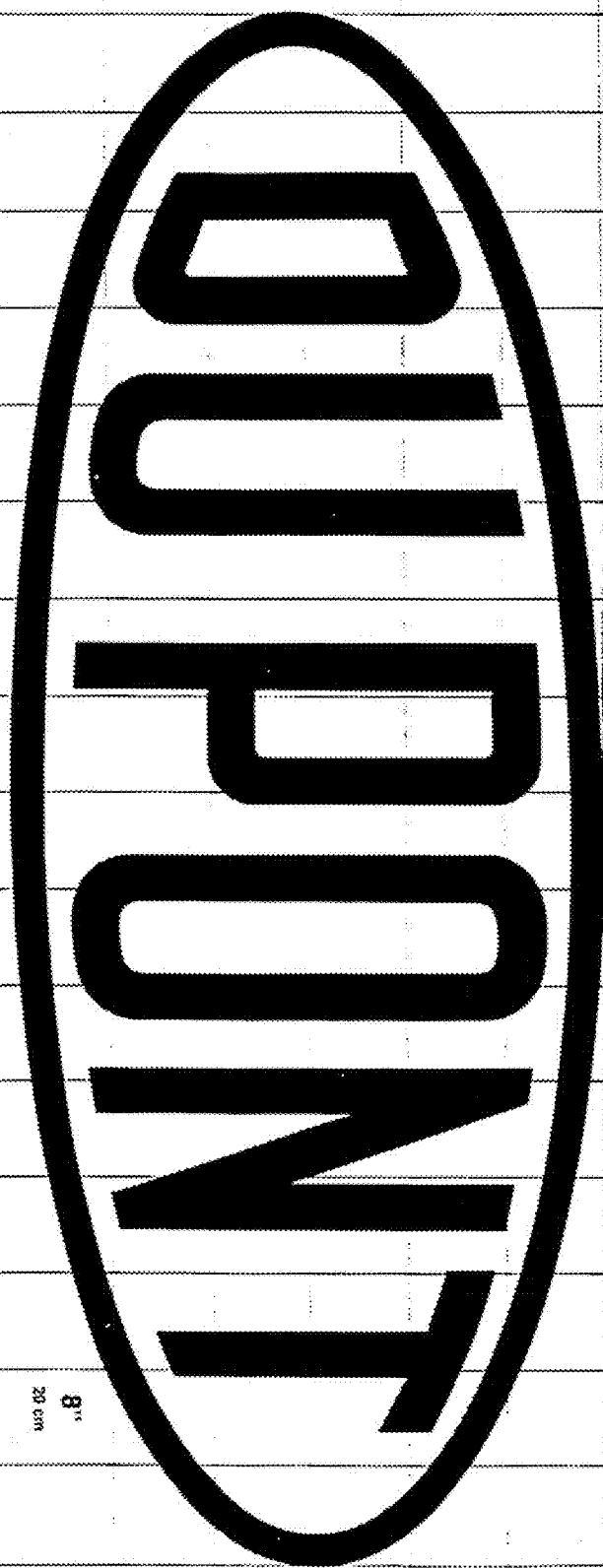
SAMPLE REPRO SHEET *for Fabricated and Painted Signs*

H-1970

See page 50 for ordering information

Du Pont • Stationery and Forms • Eden Park • Wilmington, DE 19898 • (302) 774-4444

Refer to the *Corporate Identity* manual for correct usage of the Du Pont Oval.



8"
20 cm

A L 0013613

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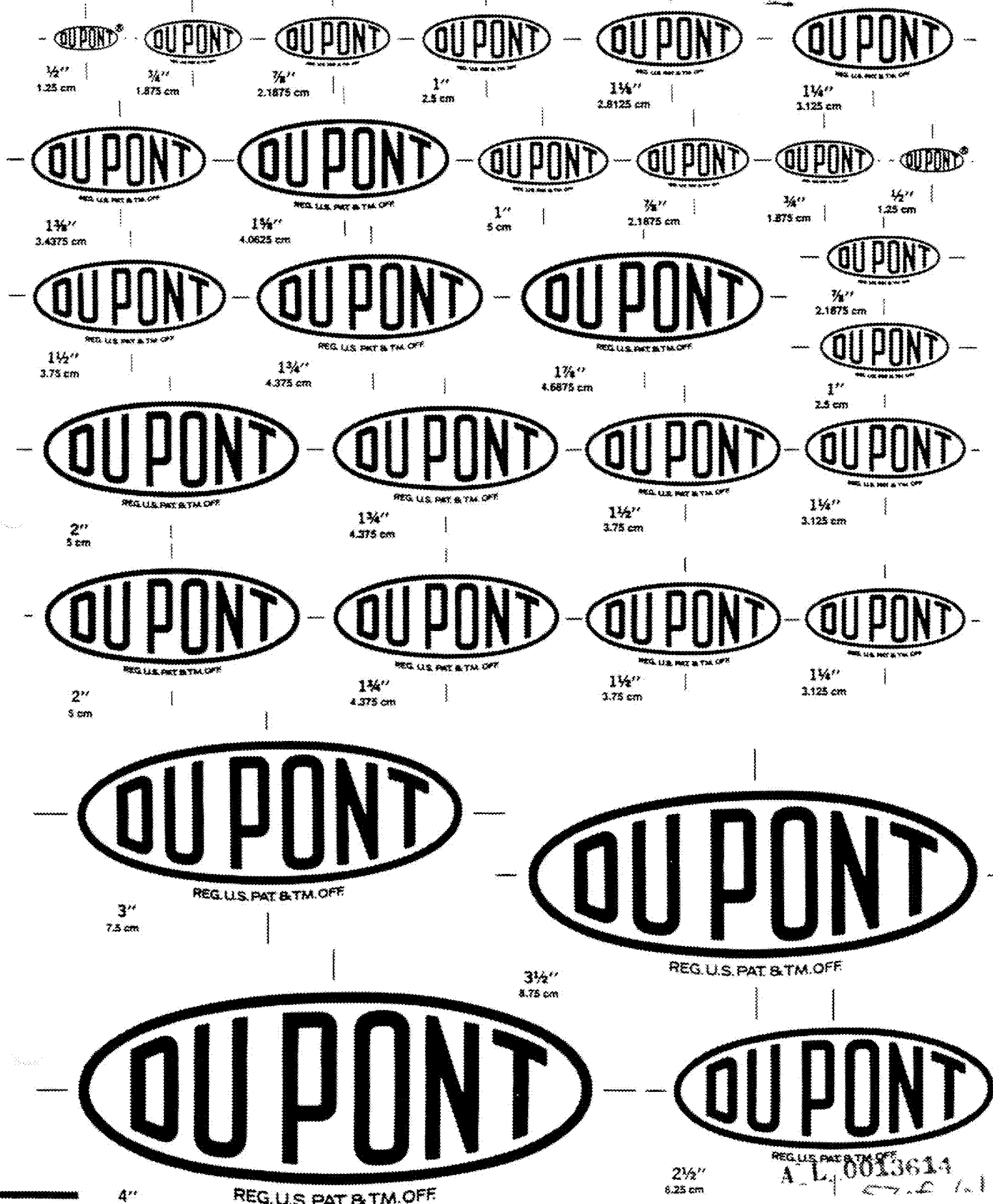
SAMPLE REPRO SHEET for Packaging/Labeling

H-19

Do not enlarge for odd sizes • Reduce the next larger Oval • See page 50 for ordering information

Du Pont • Stationery and Forms • Eden Park • Wilmington, DE 19898 • (302) 774-4444

Refer to the *Corporate Identity* manual for correct usage of the Du Pont Oval.





REG. U.S. PAT. & TM. OFF.

A-L 0013614

Do not enlarge for odd sizes • Reduce the next larger Oval • See page 50 for ordering information
Du Pont • Stationery and Forms • Eden Park • Wilmington, DE 19898 • (302) 774-4444

Refer to the *Corporate Identity* manual for correct usage of the Du Pont Oval.

 Better Things for Better Living  Better Things for Better Living

 Better Things for Better Living

 Better Things for Better Living


Better Things
for Better Living


Better Things
for Better Living


Better Things for Better Living


better Things
for Better Living


Better Things
for Better Living


Better Things for Better Living


Better Things
for Better Living


Better Things
for Better Living


Better Things for Better Living

Better Things for Better Living...from Du Pont

Better Things for Better Living...from Du Pont

Better Things for Better Living...from Du Pont

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Better Things for Better Living...from Du Pont

APPENDIX C

COPYRIGHT PROTECTION

Copyright is defined as the exclusive legal right to reproduce, publish, and sell the matter and form of a literary, musical, or artistic work, such as art, photography, computer software, videotapes, books, and other textual materials. The only requirement for material to be protectable under copyright law is that the work be an original expression of an idea that has been fixed in a "tangible form of expression." For example, choreographic works or improvisational speeches that have been notated or recorded are protectable, if a written, visual or audio record was made of the work.

In order to obtain full right and title to purchased art and photography, the creator must assign his/her rights to Du Pont by agreeing, in writing, to the following:

"E. I. du Pont de Nemours and Company (Du Pont) and Supplier hereby expressly agree, for good and sufficient consideration tendered and received, that should Du Pont not already own by operation of law or otherwise all copyrights in the work product to be produced pursuant to this agreement, Supplier hereby sells and/or assigns any and all rights, title and legal interests Supplier may have in such work product to Du Pont. Supplier warrants that it has full right to sell, transfer, and assign the material, work or service to Du Pont, and that same may be used or reproduced without violating any laws or the rights of any third parties."

Materials that are generally not eligible for copyright protection are titles, short phrases, slogans, familiar designs, symbols, ideas, procedures, methods, systems, processes, concepts, principles, and works consisting entirely of information that is common property and containing no original authorship. Famous titles, phrases, slogans, designs, and symbols may be protected as trademarks.

Copyright protection for all copyrightable works is to be obtained before that work is introduced to a customer and to the marketplace in general. The penalty for not doing so is the loss of a company's right of exclusive use.

APPENDIX C

The use of a copyright notice identifies copyrighted work. A proper Du Pont copyright notice consists of three elements:

1. The symbol "©";
2. the year of publication; and
3. the name of the owner of the copyright in the work.

© 1989 by E. I. du Pont de Nemours and Company

Position the copyright notice in such a manner and location as to give reasonable notice of the claim of copyright. On videotapes, the notice should be placed on labels affixed to the cassette container and should appear at the opening or closing credits. On books or other textual materials, the notice should appear either on the title page or on the page immediately following the title page. On computer software programs, it is recommended that the copyright notice appear on labels affixed to the disks, that it be displayed at the user's terminal at sign-on, and that it be embodied in the source code in such a manner that on visually perceptible printouts it appears either with or near the title, or at the end of the code.

REGIONS OTHER THAN U.S.

On March 1, 1989, the United States became a signatory to the Berne Convention, an international agreement created to strengthen the copyright protection of works in foreign countries. Beginning on this date, the U.S. authors of copyrighted works are protected automatically in all member nations of the Berne Union, and works of foreign authors who are nationals of a Berne Union country are protected automatically in the U.S. Although there is no such thing as an "international copyright" that automatically protects works globally, U.S. authors now have greater protection in more countries thanks to the U.S. entry into the Berne Union.

U.S. works must still be registered with the Copyright Office as a prerequisite to a copyright infringement suit, but foreign works need not be. However, U.S. registration of a foreign work is still highly recommended.

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LEASE

PLAINTIFF'S
EXHIBIT

3011

1. PARTIES. THIS AGREEMENT is made as of December 1, 1993, between Sporting Goods Properties, Inc., a Delaware corporation, of Wilmington, Delaware, herein called "SGPI", and E. I. du Pont de Nemours and Company, a Delaware corporation, herein called "Lessee".

2. LEASED PREMISES. SGPI does hereby let and lease unto Lessee and Lessee does hereby lease from SGPI for the rent hereinafter set forth, certain land and facilities located in Kent County, Maryland, to-wit:

<u>Location</u>	<u>Area</u>	<u>Yearly Rental</u>
Remington Farms	3,300 acres	\$525,000

Said space is more fully delineated on Exhibit A attached hereto and made a part hereof, together with the right to use, and sublease all facilities on the site, including the guest houses, the conference facilities, the six homes, and various other storage buildings, herein called "Premises".

3. TERM. The term of this Lease shall be for five (5) years beginning December 1, 1993 to November 30, 1998, and shall continue year to year thereafter. Either party may cancel this Lease at the end of the initial term, or at the end of any month thereafter, by giving at least sixty (60) days prior written notice to the other.

4. RENTAL. Rental shall be paid to SGPI at the office of its Agent in the Du Pont Building, Wilmington, Delaware, or at such other place or time as SGPI may at any time or from time to time request, on or before the first day of each month, in advance, during the term of this Lease. Rent for any fractional month shall be prorated.

SGPI shall be responsible for and shall pay directly all real estate taxes as they become due.

5. USE OF PREMISES. Lessee shall use Premises for any lawful purpose. Lessee shall not violate or permit any violation of statutes of the State of Maryland or the regulations of any other public authority, nor shall Lessee permit or suffer any nuisance thereon or commit waste thereon; and Lessee shall indemnify and save SGPI harmless from any loss, injury or damage resulting from the failure of Lessee fully to keep these covenants.

6. ASSIGNMENT AND SUBLETTING. Lessee may assign this Lease or sublet Premises or any part thereof or permit the use of Premises by any other party.

7. CONDITION OF PREMISES. Lessee's taking possession of Premises shall be conclusive evidence that Premises were in good order and satisfactory condition when Lessee took possession. Any alteration, remodeling, addition, or improvement of the Premises shall be made only as mutually agreed by SGPI and the Lessee.

8. MAINTENANCE. Lessee at its expense will during the term hereof keep and at the expiration thereof deliver up Premises in as good order and condition as the same now are, reasonable wear excepted. Further, Lessee shall be responsible for payments of all utilities.

9. ALTERATIONS. Lessee shall not make any alterations, additions or improvements upon Premises without SGPI's consent. If Lessee by written proposal requests alterations, additions, or improvements, SGPI will respond to said proposal within sixty (60) days. All alterations, additions or improvements made by either of the parties hereto upon Premises shall be the property of SGPI and shall remain upon and be surrendered with premises at the termination of this Lease without damage and in good order and condition.

10. DESTRUCTION. If during the term of this Lease, Premises or any part thereof are destroyed by fire or other casualty and shall become untenable in whole

or in part, then Lessee, at its option, may terminate this Lease forthwith by written notice to that effect to SGPI.

11. ACCESS TO PREMISES. Upon prior written notice, SGPI shall have the right to enter upon Premises at a time mutually agreeable by the parties hereto for the purpose of inspecting the same or for the purpose of making the repairs or for showing Premises to prospective tenants. In connection with the above purposes, however, this provision shall not obligate SGPI to make any repairs, alterations or improvements not provided for within this Lease.

12. HOLDING OVER. Any holding over after the expiration of this Lease without the written consent of SGPI shall be construed to be a tenancy from month to month at one and one-half (1-1/2) times the annual rent prorated on a monthly basis and shall otherwise be on the terms and conditions specified herein.

13. INDEMNIFICATION. Lessee shall indemnify and save SGPI harmless from and against any and all loss, costs, damages, claims, actions or liability on account of the death of or injury to any person or persons or the damage to or destruction of any property, arising from or growing out of Lessee's use or occupancy of Premises.

14. DEFAULT. In the event that either party shall default in the performance of any obligations specified herein, the non-defaulting party shall notify the party in default, in writing, of the specifics related to the alleged default, and if such default is not remedied within thirty (30) days from the date of notice the non-defaulting party shall have the right to terminate this lease unless within the thirty day period the defaulting party diligently undertakes those steps necessary to remedy the default, notifies the non-defaulting party accordingly, and continues with such diligence until the default is corrected.

15. RIGHTS CUMULATIVE. All rights and remedies of SGPI under this lease shall be cumulative and none shall exclude any other right of remedy allowed by law.

16. NOTICES. All notices to be given or delivered pursuant to any provision of this agreement or required by law shall be in writing and shall be effectively given or delivered if personally delivered or deposited in the United States Mail, postpaid, certified or registered, addressed in the case of SGPI to:

Attention: John McClintock
Comptroller, SGPI
1007 Market Street
Wilmington, DE 19898

and in the case of Lessee to:

E. I. du Pont de Nemours and Company
Corporate Real Estate
1007 Market Street
Wilmington, Delaware 19898

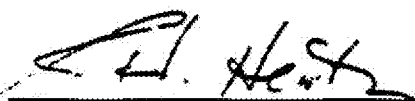
17. HEADINGS. The heading of the paragraphs of this Lease are intended only for convenience and are in no way to be construed as a part of this Lease or as a limitation on the scope of the particular paragraphs to which they refer.

18. SUCCESSION. This Lease shall be binding upon and inure to the benefit of the respective successors and permitted assigns of the parties hereto.

IN WITNESS WHEREOF, the parties have executed this instrument to be effective as of the day and year first above written.

WITNESS:

SPORTING GOODS PROPERTIES, INC.





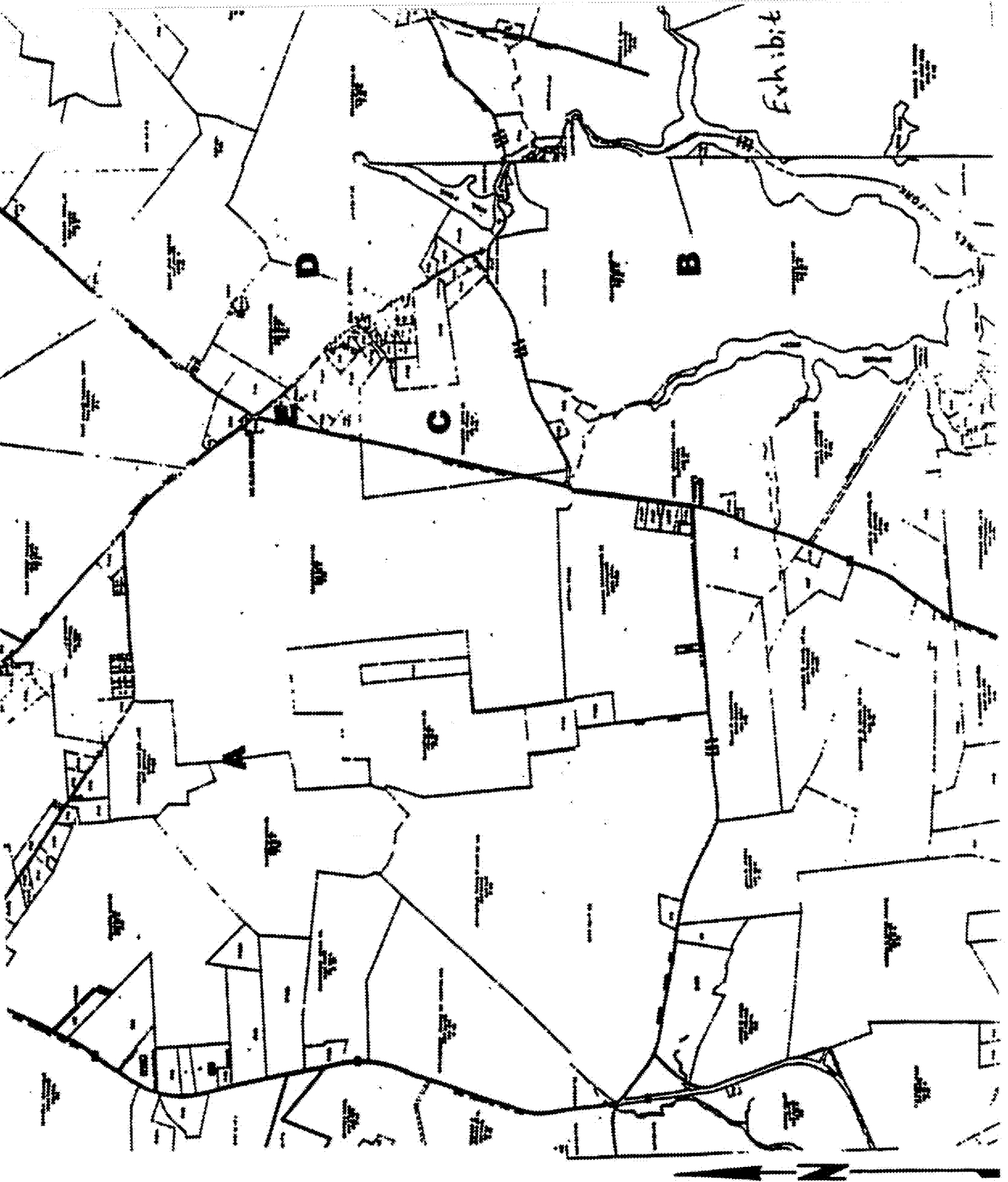
WITNESS:

E. I. DU PONT DE NEMOURS AND COMPANY

Joseph E. Loney III

Fredrick R. Ay

HH55



A L 0013624

6 of 6

SPORTING GOODS PROPERTIES, INC.
BALANCE SHEET
AS OF DECEMBER 31, 1994

Dollars in Thousands

Cash (incl time deposits) (Note 2)	83	
Accounts and Notes Receivable (Note 3)	96,450	
Miscellaneous Accounts Receivable	406	
Prepaid Expenses	52	
Total Current Assets	<u> </u>	96,991
Plants and Properties (Note 1 & 4)	3,445	
Less: Accum. Deprec., Depletion, and Amort.	(1,964)	
Total Plants and Properties	<u> </u>	1,481
Other Noncurrent Assets (Note 5)	11,077	
Total Other Assets	<u> </u>	11,077
TOTAL ASSETS		<u><u>109,549</u></u>

The accompanying notes are an integral part of these financial statements.

**PLAINTIFF'S
EXHIBIT**

3012

SPORTING GOODS PROPERTIES, INC.
BALANCE SHEET
AS OF DECEMBER 31, 1994

Dollars in Thousands

Accounts Payable	2	
Income Taxes Payable	2,633	
Deferred Current Incomes Taxes (Note 1)	(1,997)	
Other Accrued Liabilities	175	
Total Current Liabilities	<u> </u>	813
Deferred Noncurrent Income Taxes (Note 1)		
Federal	(15,459)	
State	76	
Total Deferred Noncurrent Income Taxes	<u> </u>	(15,383)
Other Noncurrent Liabilities (Note 6)		43,650
TOTAL LIABILITIES		<u>29,080</u>
TOTAL LIABILITIES & STOCKHOLDERS EQUITY		<u><u>109,549</u></u>

The accompanying notes are an integral part of these financial statements.

SPORTING GOODS PROPERTIES, INC.
STATEMENT OF STOCKHOLDER'S EQUITY
AS OF DECEMBER 31, 1994

Dollars in Thousands

Common Stock - Issued and Outstanding at Beginning of Year	1	
- Additions for Period		
Balance End of Year	<u>1</u>	1
Additional Paid-In Capital - Balance at Beginning of Year	22,762	
- Additions for Period	88,000	
Balance End of Year	<u>110,762</u>	110,762
Reinvested Earnings - Balance at Beginning of Year	(9,968)	
Net Income	(20,326)	
Balance End of Year	<u>(30,294)</u>	(30,294)
TOTAL STOCKHOLDERS' EQUITY	<u><u>80,469</u></u>	

The accompanying notes are an integral part of these financial statements.

SPORTING GOODS PROPERTIES, INC.
INCOME STATEMENT
FOR THE PERIOD ENDING DECEMBER 31, 1994

Dollars in Thousands

Interest Income	3,983	
Rental Income	525	
Miscellaneous Income	3,389	
Total Income	<u>7,897</u>	
Period Expense	33,030	
Selling Expense	4,445	
Administrative Expense	406	
Miscellaneous Expense	1,271	
Total Expenses	<u>39,152</u>	
Pretax Earnings		(31,255)
Provision for Income Taxes - Federal (Note 1)	(11,547)	
- State	618	
Total Provision for Income Taxes		(10,929)
NET INCOME		<u><u>(20,326)</u></u>

The accompanying notes are an integral part of these financial statements.

A_L_0013628

Sporting Goods Properties, Inc.
Notes to Financial Statements

1. Summary of Significant Accounting Policies

Sporting Goods Properties, Inc. (SGPI) observes the generally accepted accounting principles described below. These, together with the other notes that follow, are an integral part of financial statements. These statements are unaudited but reflect all adjustments that are necessary to provide a fair statement of the financial position.

Property, Plant and Equipment

Property, plant and equipment (PP&E) is carried at cost and is generally classified in depreciated groups and depreciated by accelerated methods that produce results similar to the sum-of-the-year' digits method. Depreciation rates range from 2 percent to 10 percent; in some instances appropriately higher or lower rates are used. Generally, for PP&E acquired prior to 1991, the gross carrying value of assets surrendered, retired, sold or otherwise disposed of is charged to accumulated depreciation and any salvage or other recovery therefrom is credited to accumulated depreciation. For disposals of PP&E acquired after 1993, the gross carrying value and related accumulated depreciation are removed from the accounts and included in determining gain or loss on such disposals.

Maintenance and repairs are charged to operations; replacements and betterments are capitalized.

Environmental Liabilities and Expenditures

Accruals for environmental matters are recorded in operating expenses when it is probable that a liability has been incurred and the amount of the liability can be reasonably estimated. Accrued liabilities are exclusive of claims against third parties and are not discounted.

In general, costs related to environmental remediation are charged to expense. Environmental costs are capitalized if the costs increase the value of the property and/or mitigate or prevent contamination from future operations.

Notes to the Financial Statements

Income Taxes

The provision for income taxes for 1994 has been determined under SFAS No. 109, which requires use of the asset and liability approach to accounting for income taxes. Under that approach, deferred taxes represent the future tax consequences expected to occur when the reported amounts of assets and liabilities are recovered or paid. The provision for income taxes represents income taxes paid or payable for the current year plus the change in deferred taxes during the year. Deferred taxes result from differences between the financial and tax bases of the company's assets and liabilities and are adjusted for changes in tax rates and tax laws when changes are enacted. Valuation allowances are recorded to reduce deferred tax assets when it is more likely than not that a tax benefit will not be realized.

2. Cash

SGPI maintains a credit line with DuPont up to \$20,000,000. The agreement terminates on December 1, 1996.

3. Accounts and Notes Receivable

Accounts and Notes Receivable represent a master note due from the parent company and accrued interest from the prior month. Such note is payable on demand by SGPI and accrues interest equal to a weighted 365-day effective interest rate for commercial paper adjusted monthly. The current rate at December 31 was 5.11%.

4. Plants and Properties

Capital expenditures totaled \$59,744 for 1994.

5. Other Noncurrent Assets

Other noncurrent assets represents the accrued value of future environmental expenses to be reimbursed to SGPI by a third party. (Note: Information subject to a confidentiality order.)

6. Other Noncurrent Liabilities

In 1994, SGPI accrued \$45,762,491 for environmental remediation activities. Estimated pre-tax environmental expenditures totalled \$2,948,635 in 1994 of which \$2,534,831 were charged against the accrual and \$413,804 were reimbursed by third parties. The balance at December 31 was \$43,227,660.

REMINGTON ARMS COMPANY, INC.
Bridgeport, CT

JULY 27, 1984

ORGANIZATION NOTICE

As a continuation of the consolidation of Remington's Finance Department functions begun last year, responsibility for Remington's tax accounting will transfer to Du Pont Finance Department effective September 1, 1984.

In connection with this change, R. H. Bartholomew, Supervisor-Taxes, has accepted transfer to Wilmington and is appointed Senior Tax Analyst, Reporting to C. W. Drury, Jr., Manager, State Income and Excise Taxes.

C. T. Wagner
C. T. WAGNER
COMPTROLLER

CTW:mu

PLAINTIFF'S
EXHIBIT

3013

AL 0014173

STATEMENT TO EMPLOYEES
FINANCE DEPARTMENT CONSOLIDATION

As previously announced, plans are being made to consolidate management and certain business support functions of Remington with those of Du Pont. As part of that consolidation, it is currently expected that portions of Remington's Finance Department corporate accounting organization will be moved to Wilmington by the end of this summer. Certain functions of the Accounts Payable, Salary Services and Corporate Information Systems units are expected to be moved at a later date. There are no plans to move any Plant Accounting sections. We are in the process of developing detailed plans and timetables for the Finance Department move. As these plans become firm, they will be communicated to all employees involved.

All benefits applicable to excess nonexempt employees will be available and every effort will be made to treat such employees fairly, including a review of job rights at the Bridgeport site, assisting in outplacement, or providing priority consideration for employment at other Remington sites, as new jobs become available. Remington management will work with other sites to support the job search activity wherever possible.

C. T. Wagner
C. T. WAGNER
COMPTROLLER

PLAINTIFF'S
EXHIBIT

3014

AL 0014175

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

I. RESTORE COMMONALITY.

A. PARTS. SEAR SAFETY CAMS

1. .005" DIFFERENCE IN TAIL HEIGHT
2. .029" " " PIN CLEARANCE

B. DIMENSIONS. ESTABLISH COMMON SAFETY CAM LIFT. MUST BE DERIVED FROM & CONSISTENT WITH MODEL DRAWINGS.

C. SPECIFICATIONS.

1. SEAR LIFT.

- a. REVISE ON M600 TRIGGER ASS'T DRAWING TO ELIMINATE THEORETICAL GEOMETRIC POSSIBILITY OF TRAPPING CONNECTOR FORWARD OF SEAR.

- b. ADD ABOVE TO M700 TRIGGER ASS'T DRAWING.

2. "SCREW DRIVER" TEST SIGNIFICANCE. THIS IS CURRENTLY PART OF M700 FINAL INSPECTION PROCESS. IT IS NOT BEING DONE.

- a. DIMENSIONAL IMPLICATIONS AND/OR
- b. FUNCTIONAL IMPLICATIONS



AL 0014709

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

II. ADJUSTMENTS. DEFINE PICTORIAL/GEOMETRICALLY, THE CORRECT AMOUNT (AND RANGE) OF TRIGGER OVERTRAVEL, M600 & 700, FOR COMPARATOR SETTING.

III. SAFETY ASSEMBLY

A. INCOMING PART INSPECTION OF SAFETY. ADD VIEWING HOLE TO M700. THIS WOULD ALLOW OPTICAL COMPARATOR PROJECTION INSPECTION OF SAFETY CAM GEOMETRY (SIMILAR TO M600).

B. SAFETY BUTTON CLEARANCE

1. MORE TO CLEAR BOLT PLUG

2. MORE TO CLEAR STOCK

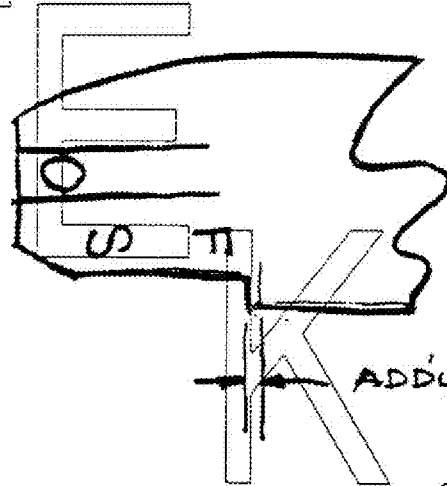
C. DEFINE: BEYOND-DETENT-POSITION STROKE REQUIREMENTS (IF ANY) IN ASSEMBLED GUN.

AL0014710

WOOD & TOOL TRIGGER ASSEMBLY IMPROVEMENTS

II. A.

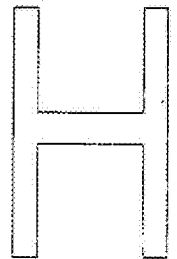
1. IF MOTION FORWARD OF "F" DETENT POSITION IS REQUIRED, THEN INVESTIGATE ADDITIONAL RECEIVER CLEARANCE. ASSEMBLERS ARE OFTEN NOW FILING RECEIVER TO PROVIDE THIS.



2. IF MOTION REARWARD OF "S" DETENT POSITION IS REQUIRED, THEN INVESTIGATE PRESENT INTERFERENCE(S). THIS IS NOW DIFFICULT TO ATTAIN.

IV. STOCK-RECEIVER RELATIONSHIP

- A. SEAR PIN. SHORTEN PIN TO ELIMINATE RIGHT END HITTING WOOD. LEFT END DRIVEN SLIGHTLY BELOW FLUSH WITH BOLT STOP SLOT TO ELIMINATE POSSIBILITY OF BINDING BOLT STOP.



M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

V. B. ELIMINATE LEFT REAR SIDE RECEIVER PLUG SCREW - WOOD INTERFERENCE.

VI. LUBRICATION. "MOLYKOTE TYPE GN" PASTE IS PROPOSED FOR BOLT PLUG THREAD AND COCKING CAM LUBRICATION ON PRODUCTION. IT WOULD REPLACE PRESENT MoS_2 POWDER. MOLYKOTE SPECIFICS LOWER TEMPERATURE LIMIT OF 0°F . R&D HAS BEEN USED TO TEST (AND SUPPLIED WITH MAT'L) FOR ANY ADVERSE EFFECTS @ -20°F (SAR BIND DOWN, ETC.)

VII AUSTRALIAN GUNS. THESE ARE SUBJECTED TO UNUSUAL "SAFETY TESTS" & CUSTOMS.

A. PROVIDE PARTS LISTS FOR ALL AUSTRALIAN MODEL VARIATIONS; RIMFIRE, CENTERFIRE; SPORTING & TARGET.

AND/OR

B. DEFINE ALL CUSTOMS TESTS SO WE MAY DUPLICATE @ ILION

AND/OR

C. PROVIDE MODIFIED SPECIFICATIONS TO MEET CUSTOMS REQUIREMENTS.

6-14-79

P 5 OF 5

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

VII MISCELLANEOUS

- A. SAFETY SNAP WASHER- SAFETY DETENT SPRING RADIAL RELATIONSHIP: S.S.W. HAS BEEN OBSERVED TO ROTATE IN USE WITHIN OPENING AS PERMITTED BY SINGLE DIMPLE ON S.D.S. IF CLOSER RELATIONSHIP IS NEEDED, S.D.S. SHOULD HAVE SECOND DIMPLE.

AL0014713

A

RD-48 REV. 4-54

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

cc: Doyle Long
R. G. Sherman

Remington
QUAD

File M 1600

RECEIVED

April 6, 1979

APR 10 1979

J. A. STEKL

To: J. A. Stekl

From: E. G. Larson

Jim:

Enclosed are two trigger assemblies that were recently sent to Doyle Long for use in replacement of triggers in recalled guns. These were part of 10 triggers he received.

On one, the detent ball is missing, and the safety just flops back and forth. Doyle found the fold on the upper section of the retainer was broken off. In looking at it with a low power glass, it appears to have been an old break.

The second trigger assembly, which has tape on it, when used as a replacement in the gun Doyle was repairing, would fire on closing whenever the bolt was opened and retracted, and then moved forward and closed.

The only way he could prevent it from firing on closing was to lift the bolt handle gently, and then close it gently without retracting it at all.

Doyle called me, and I asked that he return these two to me as received, so that we could determine the cause.

Please have these examined by plant and/or R. & D., and advise as to their findings.



E. G. Larson

E. G. Larson

EGL:lb
Encl.

C

H

PLAINTIFF'S
EXHIBIT

3016

AL 0014714

1 of 3

TO: G. J. HILL

5-17-79

FROM: BILL WARREN

2 RETURNED M600 TRIGGER ASSEMBLIES FROM DOYLE LONG

1ST

UPPER LOCATING TAB OF SAFETY DETENT SPRING IS BROKEN OFF. I EXAMINED IT UNDER 23 X STEREO MAGNIFICATION. THE BREAK IS BRIGHT - NO EVIDENCE OF HEAT TREAT COLORATION @ FRACTURE.

FOR A SHORT TIME, THIS SPRING WAS RESHAPED BY SUB-ASSEMBLERS TO IMPROVE BOLT LOCK ARM OPERATION.

THE TAB MAY HAVE BROKEN DURING THIS RESHAPING.

2ND

THERE IS NO OBVIOUS EXPLANATION HERE. SEAR ENGAGEMENT IS CORRECT.

REAR SEAR PIN HOLES ARE CORRECT DIAMETER. THEY ARE SLIGHTLY MIS-ALIGNED SIDE TO SIDE. LEFT SIDE HOLE PERIMETER IS SLIGHTLY DAMAGED THIS COULD BE CAUSED BY:

- RECEIVER HOLE SPACING INCORRECT OR/AND
- STARTING NON-CHAMFERED END OF SEAR PIN.

THESE CAN CAUSE THE LEFT SIDE OF THE HOUSING TO BOW-IN SLIGHTLY ADJACENT TO THE HOLE AND BIND THE SEAR

A IN THE DOWN (FIRED) POSITION, ANY SUCH BINDING WOULD TEND TO SELF-CORRECT AS THE PIN WAS DRIVEN THE OPPOSITE DIRECTION TO REMOVE TRIGGER ASSEMBLY FROM RECEIVER.

THE STAR FREEDOM CHECK IS A ROUTINE PART OF FINAL ASSEMBLY SAFETY CHECKS. THIS CHECK, AND THE CORRECTIVE ACTION, WERE COVERED VERBALLY BY REMINGTON PEOPLE DURING THEIR RECALL INSTRUCTION VISITS TO GUNSMITHS.

A

RD-44 REV. 6-54

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

cc: J. G. Williams
E. Rooton, Jr.
E. F. Barrett
E. J. Conroy
J. E. Preiser
R. B. Sperling
C. B. Workman
J. H. Brooks

Remington

C.C. To

J. J. BURN

S. J. HILL

P. JOHNSON

cc: J. H. Carter

J. P. Hinde

April 12, 1979

To:

B. L. Hall

HKB

D. J. Sanita

J. A. Stekl

From:

E. G. Larson

Subject: My Letter Dated March 16, 1979
Returned Gun Procedure

There is some confusion as to how repairs on certain models are to be handled when an alleged safety problem is reported, or a safety problem is found during our examination of a gun returned for general repair.

The procedures are as follows:

1. a. If a current cataloged gun is returned because of an alleged safety defect, we will examine, and if no defect is found, the customer will be so notified, and in that letter we should state that if the customer desires a new trigger assembly, such a change will be made at no charge as a gesture of good will. Copies of this correspondence are to be retained in our files.
- b. If, in our examination of a currently cataloged gun returned for general repairs, a safety problem is found, that repair will be made (replacement of trigger assembly) at no charge, and customer advised. The customer will be quoted on other repairs made at that time.
2. If a defect in workmanship or material is found in a gun returned for repair, regardless of age, a no charge repair should be made, if parts are available.
3. When an obsolete model of any type, other than those involved in the current recall, is returned for repair and found to have a safety problem, the handling procedure is as follows:
 - a. If the safety problem resulted from a defect in material or workmanship, and parts are available, the customer will be sent an estimate, as usual, and the repair or replacement required to eliminate the safety problem

PLAINTIFF'S
EXHIBIT

3017

AL 0014719

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will be noted on the estimate, and the customer advised that part of the total repair will be done at no charge.

- b. If the safety problem relates to use, misuse, or modification, the customer will be notified by letter of the problem and its ramifications, and, again, if parts are available, he is to be advised that that part of the repair is being made at no charge as a gesture of good will. Copies of correspondence relative to the above should be retained in our files, and be certain the serial number, model, and caliber or gauge is noted in the estimate or letter.

We feel that very few guns returned will fall into the above categories, but should any complications develop, please bring them to the writer's attention immediately, so that the matter can be rectified.

4. If we are unable to properly repair an obsolete gun due to lack of parts or ability to properly correct a safety problem, an offer can be made to the customer to exchange his old gun for a current model at a special price.

NOTE: When an obsolete model comes in under Item 3-a. or -b., or Item 4, in all cases where there is a safety problem and the customer is given an estimate for repair or a special price for replacement, the safety problem and its ramifications should be explained fully, and a copy of our letter retained.

If a customer turns down our offer, and demands the gun back, then a letter accompanying the gun should, again, specify the safety problem and its ramifications, and state that the customer is now responsible for any accident that might occur. A copy of this letter is to be retained.

E. G. Larson
E. G. Larson

EGL:lb

AL 0014720

A

FILE

March 12, 1979

~~To: J. G. Hall~~~~From: J. G. Linde~~~~Subject: M1600 - XP-100~~

XP-100

- X Check with vendors on safety lever delivery?
We should have parts in time to verify that they are to the drawing and to try before we run out of the modified parts. 25 samples due 3/16.
- X Has the trigger hole and trigger slope been corrected? Trigger hole - YES
Trigger slope - NO
- X Is there tooling and cutters available to mill the clearance on the sear safety cam
with an S* - TDR issued to make regulars.
Has the process record been updated? YES.
- X Status of the three new sear lift gages?
Have they been modified as the sight
due 6/29 from Pratt & Whitney?
screw does not have to be used?
- X Status of the comparator setup for customer repair? Blocks due 3/5 - Purchasing Center
- 6. Have J.G. Borne audit the guns being converted in customer repair, ^{YES} assembled in production, ^{YES} and the modified M1600 trigger assemblies (yes one of 2 was to be in it too)
- 7. Have the old style parts been scrapped?
Please ~~attach~~ forward scrap tickets (Copy),
YES - Ticket # 1 + 2

PLAINTIFF'S
EXHIBIT

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AL 0014723

1 of 2

PROBLEMS APPEAR TO BE LIMITED TO FEBRUARY SHIPMENTS.
TOTAL TRIGGER ASSEMBLIES SHIPPED TO DATE IN FEBRUARY - 1845

A RANDOM SAMPLING OF GUNSMITHS WERE CALLED (FIVE IN
JANUARY AND IN FEBRUARY) INCLUDING THOSE RECEIVING SHIPMENTS
THAT WERE SENT ON THE SAME DAY AS RUSK GUN SHOP, WHO
CONTACTED US WITH THE LIGHT TRIGGER PULL PROBLEM.

OF THE FIVE (5) GUNSMITHS CONTACTED CONCERNING JANUARY SHIPMENTS
RECEIVED BETWEEN JAN 15 - 31, ONLY ONE (1) GUNSMITH CLAIMED
TO HAVE ANY PROBLEM, HE HAD TWO (2) FOLLOW DOWNS. THESE
SHOPS RECEIVED A TOTAL OF 390 TRIGGER ASSEMBLIES WITH
85% WITH PROBLEMS.

GUNSMITHS CONTACTED THAT HAVE RECEIVED AND INSTALLED
TRIGGERS RECEIVED IN FEBRUARY EXPERIENCED PROBLEMS WITH
PULLS BEING UNDER 3# AND FOLLOW DOWNS. THEY RECEIVED A
TOTAL OF 370 TRIGGERS AND FOUND FOUR (4) FOLLOW DOWNS,
TWO (2) UNDER 3# (PULL WAS MEASURED HORIZONTAL WITH STOCK)
TWO @ 2 1/2# (METHOD OF ANGLE PULL IS UNKNOWN. BOUSA GUNSMITHING
IN WESTMINSTER, CA. CLAIMS MOST TRIGGER PULLS MEASURE
2 1/2# - 3#. HOWEVER, THESE MEASUREMENTS WERE TAKEN WITH A
SCHRADER TRIGGER PULL GAUGE WHICH HAS A FLEXIBLE BEAM.

A

BREDA GUNSMITHING

WESTMINSTER, CA

(714) 531-5570

FARM MURDERS

(20)

2 1/2 - 3 1/2 T

SCHADDER

HERALD'S CUSTOM GUN SERVICE

WAYNESBORO, PA.

(717) 762-4010

CEU. HERALD

(50) CHOSEN 1

FOLLOW DOWN

3 1/2 #

(2)

RCBS 2 UNDER 3 1/4 2 1/4 IDS

B. McDANIEL

SOUTH LYON, MI.

(313) 437-8989

NO PROBLEMS

3 1/2 # - 4 #

600-650

NATEL GUN SHOP LUGER

SAN ANTONIO, TX

(200)

(512) 342-5420 or 342-9893

WILL EOS.

3 - 3 1/2 #

not gaging full.

UNIQUE GUN STORE

ROSEBURG, ORE.

(50)

(503) 673-8415

AL PERRY

2. FOLLOW DOWN = RECENTLY

4-6 F

DAVE VON DRESAK

AL 0014729

H

A

G-88

DON'T SAY IT — WRITE IT

To J. P. LINDE

Date December 12, 1978

From R. L. HALL

Pull together for H. K. Boyle:

1. All dwgs. for M/700 Fire Control.
2. All Process Records referring to M/700 fire control mfg., assem., and testing, incl. operations where Trick Test is used.
3. Best information available on rejects for "Trick Test" at final inspection for current production - by questioning final inspectors if necessary. (M/700)

RLH:ah

SAFETY IS A WISE INVESTMENT

PLAINTIFF'S
EXHIBIT

3020

AL 0014745

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R. L. H.
12/12/78

1. M 1700

Ask final inspectors if in their memory if they have ever rejected any M 1700's for the trick test

If they rejected did they reject the first, second or third try.

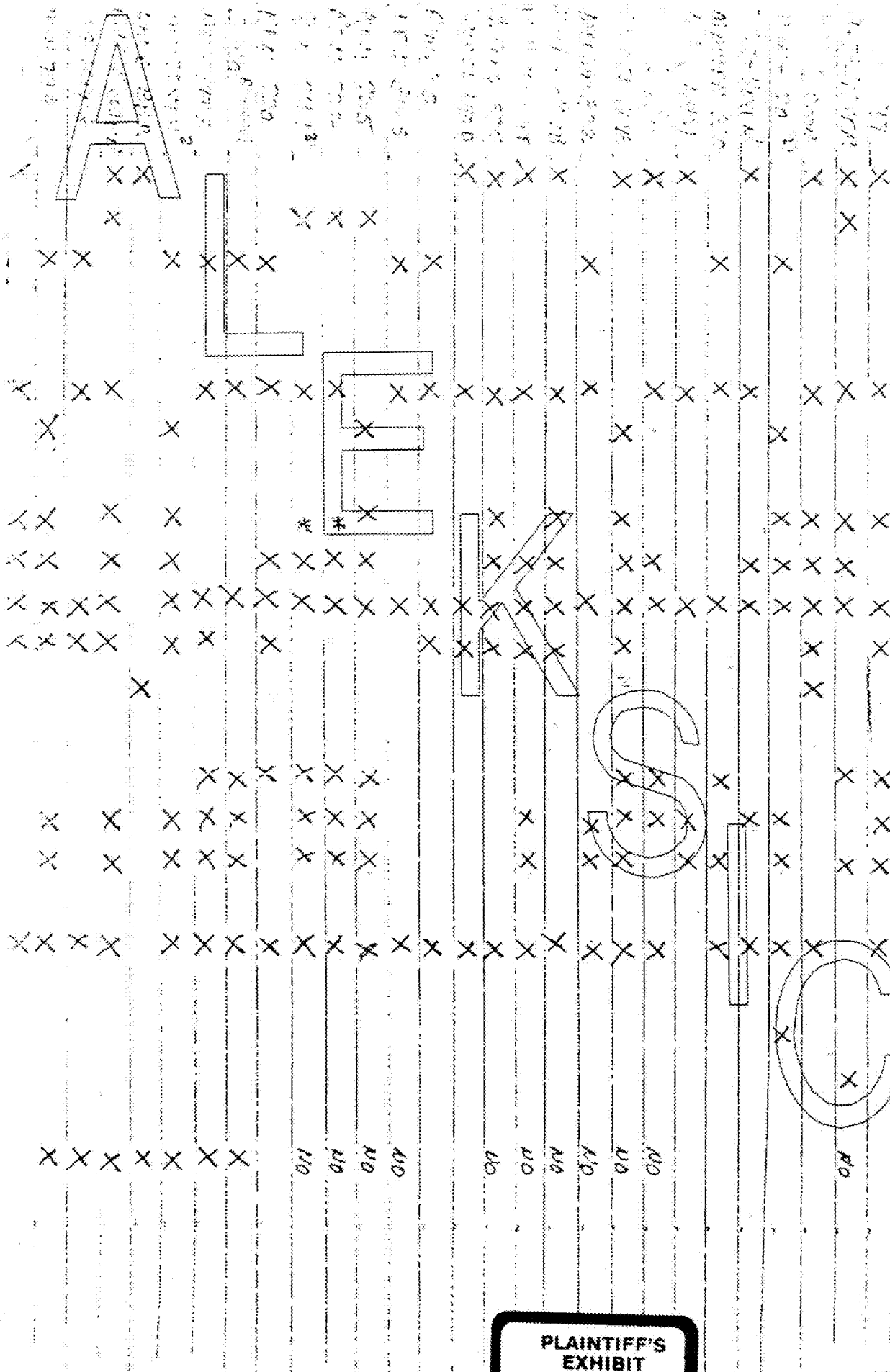
~~Answer~~

None

~~to be 8-90~~

Per. W. Doyle

AL 0014746



GROUP
TRIGGER

2-300
SEAR
GROUP
TRIGGER

DISCONNECT

2 POSITION

3 POSITION

UNLOAD-
SAFE ON

LOAD
SAFE ON

HAND OFF

FIRE-HAND UP

FIRE ON SAFE

ENGAGEMENT

PULL

COAR
TRAVEL

FIRE-TRIGGER
TRIGGER-DISC ON

ROCK LOCK
PART OF SAFE

ROCK LOCK
INDEPENDENT

TRICKER

PLAINTIFF'S
EXHIBIT

3021

AL 0014758

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

November 29, 1978

J. P. LINDE

REVIEW OF M/700 RIFLES RETURNED TO ARMS SERVICE

A total of six hundred and sixty nine M/700's were checked for firing pin falls when safety was released. Of the 176 that were manufactured prior to January 1, 1975, there were three firing pin falls when the safety lever was released, one of which was by tripping (null position). The causes of the three as follows: (1) Trigger adjusting screws tampered with so there was no tension on trigger (2) Trigger connector had excessive clearance with trigger and (3) Safety lever was binding on Stock.

Of the four hundred and ninety three that were manufactured after January 1, 1975, there were four firing pin falls when safety lever was released. The causes of the four are as follows: (1) trigger adjusting screw tampered with and connector broken at clearance hole (2) Trigger not retracting with safety lever on. Screws had been tampered with and trigger assembly dirty (3) Connector warped, excessive clearance between trigger and connector and (4) Trigger adjusting screws tampered with, trigger connector broken at clearance hole possibly caused by pierced primers.

by J. J. Burns
J. J. Burns, Supervisor
Quality Control and
Product Testing

JJB/bdm

PLAINTIFF'S
EXHIBIT

3022

AL 0014759

1 of 1

REMINGTON ARMS COMPANY, INC.
Research Department

c: J.P. McAndrews
E.G. Larson

Bridgeport, Connecticut
November 16, 1978

C.B. WORKMAN
M.H. WALKER
J.P. LINDE
H.D. ALBAUGH-W.H. FORSON

BOLT ACTION FIRE CONTROL - DESIGN REVIEW 11-14-78

- A gauge is being designed to check sear lift. The gauge is expected to be positive and simple enough to be used in the field. Completion of a prototype gauge is scheduled for mid-December.
- The following design requirements for a new fire control for bolt action rifles were tentatively established -
 1. Eliminate the "trick" condition. At this point the best solution appears to be adding a trigger block to the safety cam mechanism. This would prevent the trigger from moving in the "safe" position - eliminating the "fail to reset" possibility.
 2. The new fire control should be retrofittable.
 3. A bolt lock arrangement should be provided. At this point a locking device separate from the fire control appears most desirable.
 4. Adjustment for the trigger pull force should be provided for the user. Access to the adjustment should not require stock removal. Other adjustments - sear-connector engagement - should be eliminated.
- Program
 1. Marketing will conduct consumer tests of the fire control designs now in hand during December and January. These include a three position and a two position safety with an external bolt lock. A sample with the present fire control with the bolt lock removed will be included.

PLAINTIFF'S
EXHIBIT

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AL 0014774

2. Research will complete the design investigation and select a design approach by February 1, 1979.
3. Consideration will be given to introducing the new design in a limited quantity of restyled M/600s in 1980.

- M.H. Walker will prepare a letter with his views on renaming the "safety" mechanism.

E. F. Barrett

EFBarrett:jl

10/3/78

Ben model 700's were taken after final inspection and checked for clearance between the trigger connector and ~~sear~~ ~~safety~~ cam using the truck test. All rifles passed this test.

Technique used:

- 1) Safety lever pushed to "On Safe" position
- 2) Trigger pulled rearward and held
- 3) Pressure was applied upward on the trigger connector
- 4) Trigger connector must not catch on sear safety cam
- 5) Trigger was released
- 6) Safety lever pushed to "off safe" position
- 7) firing pin must not fall

PLAINTIFF'S
EXHIBIT

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AL 0014777

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
UNION

Bridgeport, Connecticut
February 7, 1980

J. P. McANDREWS
E. F. BARRETT

STATUS OF MODEL 700
PLANT AUDIT

From June 13, 1978 to January 15, 1980, 3,376 Model 700's returned to Ilion for service were tested for the "trick" condition (safety lever is put in mid position, trigger is pulled, and gun fires when lever is put in "fire" position), and for "firing off safe" (safety lever is moved to "fire" position and the gun fires without at any time having to pull the trigger).

Of this sample, 35 guns failed the "trick" test and 38 guns were found to fire off safe. However, of the 35 guns that could be tricked, only 13 were trickable because of causes due to manufacture (the other guns had been altered or damaged in the field). Similarly, of the 38 guns firing off safe, only 9 were due to causes attributable to manufacture. These figures indicate that only about .6% of the Model 700's presently out in the field are susceptible to the problems which prompted the Model 600 recall.

Refining these figures even further, we find that about .9% of the Model 700's manufactured before 1975 can be tricked or can fire off safe (in 1975 plant checks were instituted to prevent tricking), and about .55% of the post 1975 Model 700's can be induced to so malfunction.

When Remington made the determination in January of 1979, to institute a safe gun handling program rather than to recall pre-1975 Model 700's, the sample audit at that time indicated that about 1% of the 2 million pre-1975 Model 700's in the field were susceptible to being tricked.

R. B. Sperling

AL 0014947

RBS:hss

PLAINTIFF'S
EXHIBIT

3025

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



CC: I B GLAS

[Handwritten signature]

BRIDGEPORT, CONNECTICUT

FEBRUARY 8, 1982

REMINGTON ARMS CO.
RECEIVED

FEB 9 1982

TO: C. H. WILKINSON

FROM: W. L. ERICSON

RE: PATENT REVIEW MEETING OF JANUARY 28, 1982

FIREARMS RESEARCH DIVISION

I. Model 1100

Plastic Gas Seals - Several promising designs under current consideration were reviewed. We will follow up by securing further details for the preparation of a patent application.

II. Models XSG-XPG

Firing Pin Block - RA-0232 - U. S. Pat. Appln. No. 121,436. The PTO Examiner has agreed to grant a Patent with claims to a 100% firing pin block in a reciprocating-bolt action.

Magazine Spring Retainer and Cap Detent - RA-0233
U. S. Patent 4,310,982 issued on January 19, 1982.

Gas Regulating Systems. Progress with several alternative designs was reviewed with Jim Martin, Tom Powers and Jack Kast.

Locking System. Jack Kast's new alternative "rocker-locker" design with a vertically-sliding locking block was reviewed, and a preliminary patent search is planned.

Inertia-Operated Carrier Latch. Kevin Calkins is in an early stage of development work on this alternative carrier latch.

PLAINTIFF'S
EXHIBIT

3026

AL 0015562

10f2

TO: C. B. WORKMAN
RE: PATENT REVIEW MEETING OF JAN. 28, 1982

FEBRUARY 8, 1982
PAGE -2-

Redesigned Bolt Handle. We reviewed the possibility of conflict with Ithaca's Patent 4,052,926 - Tollinger, which was discussed in my preliminary opinion of January 26th to Jack Kast and Dave Findlay. You advised that the bolt handle design is in a fluid state; accordingly, we will temporarily postpone further study of this Patent.

Safety Lever. A preliminary patent search revealed no infringement problems, and showed potential patentability in an optional hammer safety. This was discussed in my letter of January 4th to Tom Powers.

III. Models 700 and 7

Bolt Latch - RA-0247. Status of pending Patent Appln. 290,693 is unchanged.

Fire Control with Sear and Trigger Block - A preliminary patent search, reported to Fred Martin January 4th, disclosed no conflicting patents, and suggested that patent protection is potentially available. We will follow up with a view to filing a patent application.

Magazine Box and Latch - Fred Martin demonstrated a removable magazine box purchased from Gene D. Trexler, who owns U. S. Patent 4,237,638 on this design. Fred plans to work out a modified design, and we will pursue this to insure that there will be no conflict with the Trexler patent.

Model 7 Design Specification - Jim and Fred Martin reviewed this with us. Potential features of particular interest to the Patent Division include, in addition to those options listed above; a possible relocation of a safety switch onto the bolt plug; improvements in the trigger adjustment means for increased assurance of safety; new provisions for gas flow from pierced primers; and a new extractor design which may incorporate a claw similar to that of the Model 1911 Colt pistol, but would locate this within the bolt face so that the shroud would continue to be free of weakening extractor cuts.

AL 0015563

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FIREARMS RESEARCH

SHOTGUN PRODUCT DEVELOPMENT

• Model 1100 Functional Improvements

Gas System development is continuing with several concepts. The elastomer seal/brake has reduced the spread of terminal bolt velocities from the 3" magnum to 1 oz. target loads to 270 in./sec. (one sample). This is close to the 225 in./sec. goal. The tossed action bar design has also demonstrated an ability to reduce the spread of velocities by 70-80 in./sec. (one sample). Both of these designs are in the Test Lab for additional evaluation.

Other designs currently being evaluated include:

- o Bolt shock absorber
- o Tandem orifices
- o Leaf spring pressure relief
- o Dual expansion volume
- o Expansion cut-off/pressure vent

A purchase requisition for a redesigned strengthened web carrier release has been sent to the vendor.

Endurance items in test include stainless steel magazine tubes, a new operating handle detent system, a square wire action spring, and an injection molded extractor.

• Choke Tube Development

Preliminary cost estimates indicate that it would be less expensive to source choke tubes for at least the first year. Specification packages are being forwarded to several potential vendors.

Briley Manufacturing and Trulock Tool Company were visited. A separate report on these companies has been issued.

Testing of the redesigned Remington choke tube is expected to be complete in September.

• Model 870 Restyle

Production's 12 gauge trial and pilot guns are in the Test Lab for evaluation. Marketing is reassessing the specifications.

AL 006119

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-2-

SHOTGUN PRODUCT DEVELOPMENT - Contd.

- New Generation Autoloading Shotgun

The product development team has been assigned:

- o K.C. Rowlands - Technical Leader
- o S.R. Franz
- o J.A. Lawrence
- o R.S. Murphy
- o E.W. Yetter

The program objective and potential goals were outlined on July 11. Team assignments have been made towards completing the basic data package by October.

RIFLE PRODUCT DEVELOPMENT

- Model 700 Mountain Rifle

The N/C Shop work on the stock has been stopped pending the receipt of a tool drawing. PE&C is preparing the drawing and is aware of a possible delay.

- New Bolt Action Rifle

A Marketing-Research meeting was held July 17 and a preferred design was selected. Questions remain regarding legal implications of the bolt lock, and customer preferences for the magazine box and bolt handle styling. Marketing will address these questions and supply estimated volumes and pricing.

A review with the business strategy team is expected in August.

- Model 7400 Functional Improvements

Research efforts to improve chambering, extraction, and feeding are continuing. The EDL work request to investigate chamber finish and friction has been approved and work has started. Prototype single lip stamped magazine boxes are in the Test Lab and work on the mold for a synthetic box is progressing.

Research Department

July 1984

AL 0016120

2 of 2

A

7/11/81
EM/7 DESIGN SPECIFICATION

This is a composite listing of features provided on the M/7 proto-type and those desired by Research:

- Octagonal Receiver
 - Investigate the use of octagonal stock
 - Heavier barrel lug
- Walnut Stock
 - True Classic
 - No Monte Carlo
 - Cheekpiece
 - Cut - functional checkering
 - Sling swivel studs
- Hammer Forged Barrel
 - No turn or polish
 - Program to determine possible benefits i.e., accuracy vs. finish
 - Lightweight - slimmer contour
 - Clean no sights
- Fire Control
 - Blocked trigger and sear
 - Bolt lock
 - New safety configuration or location
 - With safe adjustments
- Improved (Reduced) Locktime
 - Lightweight firing pin
 - Investigate pierced primer gas flow around firing pin and head
- Additional Desired Features
 - Scope mounts
 - New bolt handle
 - Jeweled
 - follower
 - bolt body
- New Extractor
- New Feeding System
 - To be smoother
 - To be functionally superior
 - To be detachable with integral magazine box

PLAINTIFF'S
EXHIBIT

3028

AL 0016246

1 of 2

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Classic Calibers

Limited Production 3,000 - 4,000 per year

F. E. Martin:ws
September 11, 1981

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AL 0016247

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- Bolt Action Fire Controls

PLAINTIFF'S
EXHIBIT
3026

DON'T SAY IT — WRITE IT

File Copy

To

Joe Glas

Date

5/22/50

From

Clark Workman

Attached are a series of memos, reports, letters etc that will give you a feel for our Bolt Action Rifle Fire Control Status. You will note that there is a wide variety of opinions and philosophies expressed. We will be prepared to discuss our present position with you in the near future.

SAFETY IS A WISE INVESTMENT

S
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AL 0016386

2 of 80

DON'T SAY IT-WRITE IT

To C.B. WORKMAN ✓ Location _____ Phone _____
From J.P. GLAS Location _____ No. _____
Subject _____ Date 5-16-80

There is no record of a policy statement re fire control design goals in the Product Safety file. I have requested a search of the Operations Committee minutes. If you have any records of documentation, please advise.

JPG:jl

REMINGTON ARMS CO.
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MAY 20 1980

ILION RESEARCH DIVISION

RD 778

STOP, LOOK, AND LIVE

AL 0016387

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26

REMINGTON ARMS COMPANY, INC.
Research Department

xc: R.A. Partnoy
J.E. Preiser
C.B. Workman

Bridgeport, Connecticut
May 16, 1980

E.F. BARRETT

POLICY DIRECTION FOR RESEARCH PROGRAMS
BOLT ACTION FIRE CONTROL IMPROVEMENT

The subject research programs are guided by the following policy guidelines.

1. Design the operation of the bolt lock to operate independently from that of the fire control.
2. Design the fire control so that the bolt can be operated, subject to (1), above, independently from the position of the safety mechanism.
3. Design the fire control mechanisms to be retro-fitable.

Point two would allow the user to unload the gun with the safety mechanism in the "ON SAFE" position. It would also allow the user to reload the gun with the safety mechanism in the "FIRE" position.

Please advise of your agreement, with, or suggestions for modifications to the policy.

Joseph P. Glas

JPGlas:jl

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RECEIVED

MAY 20 1980

ILION RESEARCH DIVISION

AL 0016388

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REMINGTON ARMS COMPANY, INC.
Research Department

cc: J.P. McAndrews
E. Sparre
R.A. Partnoy
E.G. Larson
T.J. Sharpe
J.G. Williams

TO: R.L. HALL J.P. LINDE
C.B. WORKMAN J.S. MARTIN
R.B. SPERLING A.A. HUGICK
W.E. LEEK

FROM:

E.P. BARRETT

SUBJECT: PRODUCT SAFETY MEETING - BOLT ACTION FIRE CONTROLS
APRIL 23, 1975

This meeting was held to develop plans to conduct a safety analysis of bolt action fire controls.

The following is a summary of the status reports given by each Department and their plans for further action.

RESEARCH

The investigation to date has been largely confined to the Model 600. An investigation has also been made of the M/788 and the M/580 series fire controls. Research has completed an analysis of the design of the M/600 fire control and has -

1. Changed part dimensioning to insure adequate lift of the sear by the safety cam.
2. Specified hardening the fire control housing to minimize wear between the detents.
3. Increased the length of the safety lever cam.

These modifications are being tested to evaluate their effectiveness and to insure there is no interaction with the other aspects of fire control performance.

Research has concluded that the present design for a 3-position safety is inadequate and plans to begin a study during the second half of 1975 to develop a new safety mechanism.

MARKETING

Approximately 600 Model 600 rifles are expected to be returned to the Plant as the result of the special quality audit.

AL 0016389

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Marketing will review the available information on all bolt action rifles as it relates to the safety performance of bolt action fire controls. This will include gunsmith reports, arms repair data, parts usage, etc.

PRODUCTION

Inspection of 147 Model 600 rifles returned for the safety audit show the following.

1. Safety cannot be "tricked" - 103
2. Safety can be "tricked" but movement of safety lever to full "safe" position clears trigger connector and sear and gun will not fire when moved to "off" position - 40
3. Safety can be "tricked"; trigger connector remains disengaged from sear when moved to "safe" position and gun will fire when the lever is moved to "off" position - 4
4. Trigger can be set in unsafe condition when safety lever is in "safe" position - 0

Production is rejecting guns which fall in the #2, #3 and #4 categories. Indications are that this provides an ample safety factor that wear will not lead to the category #4 situation during the life of the gun.

A gauge is being developed that will permit checking for sear lift at assembly.

Production is analyzing variations in purchased and internally manufactured parts and reviewing quality control procedures and limits. A list of recommendations for improving quality performance will be developed and reviewed by the Product Safety Committee.

A follow-up meeting is scheduled for the week of May 19.

EFB/ab
4/25/75

LIMITED DISTRIBUTION

RD-41-6

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
UNIONPETERS
UNIONTo: E. F. Barrett
A. A. Hugick

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Illion, New York
May 7, 1975

TO: W. E. LEEK

FROM: J. P. LINDE

SUBJECT: EVALUATION OF THE BOLT ACTION RIFLE SAFETY MECHANISMS
M/580s, 788, 600 and 700

This investigation was instituted when a Model 600 was returned from Texas by a customer who in the process of unloading his gun moved the safety lever from the on safe to off safe position (so the bolt could be actuated) and the gun discharged. Upon further investigation of the incident it was determined that he had pulled the trigger with the safe in the on position. It was also determined that some Model 600s could be tricked by putting the safety lever in an intermediate position half way between on safe and off safe, pulling the trigger, releasing the trigger, push the lever to the off safe position and the gun will fire.

Model 600

The M/600 safety is a blocked sear design. The safety lever rotates a cam under the sear, lifting the sear off its contact with the trigger-connector. The trigger then can be pulled with no effect to the sear or firing pin assembly. In the guns in question it was found that they had inadequate sear lift on both the on safe and intermediate positions. The sear lift is the amount of clearance generated between the trigger-connector and the sear. The lifting action of the cam on the safety lever takes place when the safety lever is rotated to the on safe position. On the guns in question there was very little clearance between the sear and trigger-connector. Thus when the trigger was pulled in a certain way when the gun was on safe, the connector would not return with the trigger. In this case the safety cam is preventing the gun from firing, thus when the safety is moved to the fire position the gun will discharge.

The initial production remedy was to swage the cam on the safety lever to provide greater lift on the sear. The greater lift provides a bigger clearance between the trigger connector and sear when the gun is in the on safe condition. The trigger can be pulled without any fear of the connector failing to return due to inadequate lift. The final inspectors, assemblers and customer repair people were reinstructed on what to look for. A test has been added at assembly to check for the sear lift from the safety actuation by use of a shim stock.

AL 0016391
70F 80

To: W.E. Leek
From: J. P. Linde

5-7-75

-2-

Evaluation of the Bolt Action Rifle Safety Mechanisms - M/500, 738, 600 & 700

The guns are being checked to give at least .008 inches min. lift between the trigger-connector surface and the sear.

The holes on the fire control housing on some of the samples tested were out of control. Corrective action is being taken.

Proposed Design and Process Changes

Design

1. The safety levers have been redimensioned to give better manufacturing control of critical dimensions.
2. The dimensions on the safety lever cam were changed to give greater lift on the sear and maintain the lift longer when the safety is moved from "on safe" to "off safe".
3. The fire control housing will be changed to be common with the Model 700. It has two separate side plates which are riveted together, while the 600 has a folded assembly. The M/700 housing has a heat treated side plate with the detent hole, which gives more positive safety. The folded assembly is not heat treated and the detent holes wear and become less positive.
4. The sear has to be altered to eliminate a potential interference with the rear housing assembly pin.

Process

1. A production gage has been designed and is being built which will measure the sear lift due to the safety lever operation before the fire controls are assembled to the gun.
2. An inspection hole has been added to the new design safety lever so the cam form and its position on the safety lever can be readily inspected in purchase parts inspection.

AL 0016392

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To: W. E. Leek

5-7-75

From: J. P. Linde

-3-

Evaluation of the Bolt Action Rifle Safety Mechanisms - M/580, 788, 600 & 700

Test Program - M/600

The current M/600 being manufactured with the swaged safety levers are being tested. They are shot with live ammunition at the start of the test to check their function. The amount of sear lift from the safety operation is measured before the start of the test as well as the force to put safe on and off. The guns are being dry cycled safe on-safe off and cock and dry fire to 50,000 cycles each. The sear lift is being measured every 5,000 cycles to determine how wear affects the sear lift over the life of the gun. The wear on the detent system, trigger connector and sear surfaces also will be checked. The test is being duplicated in a dry and oiled (WD40) condition on the trigger mechanism.

The testing will be duplicated for the redesigned fire control. From this and the original testing it is being determined the minimum safe sear lift for new guns. This report will be followed by the test report.

Status of Design Change

The design has been determined and all drawings have been completed. Design test confirmation is under way. The new drawings have been submitted to P.E. & C. for estimating purposes and the appropriate vendors contacted. As soon as the design test is satisfactorily completed the drawings will be transmitted.

Proposed Future Plans - M/600 & 700

A design investigation will be started to determine the feasibility of changing the safety design from a blocked sear system to a blocked firing pin system. The benefits of a three position safety also are being investigated.

The spring force on the detent system on the M/600 & 700 varies due to the leaf spring design, which can vary the safety operating force. The design will be reviewed to see if the system can be altered to give a more constant operating force.

Model 788 and 580 Series

The problem came to light in February when the design was changed from a blocked trigger system to a blocked sear system similar to the 600 and 700 design. This design change was instituted to standardize parts in these guns with the 540 Series, to eliminate a high scrap operation, and to obtain a more positive safety.

AL 0016393

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To: W.E. Leek
From: J. P. Linde

5-7-75

-4-

Evaluation of the Bolt Action Rifle Safety Mechanisms - M/580, 788, 600 & 700

Model 788 and 580 Series Continued

When the problem appeared all the parts involved in the safety mechanism were measured to determine why there was insufficient sear lift. The following items were found:

1. The powder metal trigger was out of tolerance. Powder Metal has been contacted.
2. The safety lever dimensioning did not tie the critical dimensions together.
3. The holes in the trigger housing were not to locational dimension.

Corrective Action Taken to Maintain Production

1. The triggers were ground to provide more clearance when the safety was operated.
2. The gaging technique was established to measure the sear lift with the safety operation when the gun is assembled.
3. All the assemblers were reinstructed on what to look for -- proper lift and can the gun be tricked.

Corrective Action Being Taken

1. Correct the parts out of gage and establish controls.
2. Redimension safety levers for both the 580 Series and 788 to tie the critical surfaces together. The vendor has been contacted on what surfaces are critical and how they can best be maintained.
3. The dimensions on the safety lever were altered to give greater lift to insure in all tolerance conditions there is adequate lift with an allowance for wear.
4. Process Engineering is designing a gage to measure the sear lift from the safety lever operation to insure that the fire control will have adequate lift before it is assembled to the gun.

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To: W. E. Leek

5-7-78

From: J. P. Linde

-3-

Evaluation of the Bolt Action Rifle Safety Mechanisms - M/580, 788, 500 & 700

Corrective Action Being Taken Continued

5. The assemblers will use a feeler gage to measure sear lift to make sure a minimum lift is maintained.
6. The safety lever hold down screw has been deleted. The pin with the retaining ring presently used in the pivot pin will be used instead of the screw. The alteration was made after it was determined under some conditions the screw could back out and bind the safety operation.
7. The cut in the bottom of the M/788 receiver for safety lever clearance has been altered in the proposed design to eliminate any potential interference with the safety lever which could block the safety operation.
8. An inspection hole will be added to the M/788 fire control housing so the sear lift can be visually checked.

Test Program - M/580 Series and 788

Production guns with ground triggers are being tested to make sure there will be no field problems with the powder metal surfaces wearing down with usage. These guns are being tested in the following way.

1. The 580 Series are being shot to 20,000 rounds and dry cycled safe on - safe off to 400 cycles.
2. Another gun will be dry cycled to 50,000 safe on - safe off cycles and 50,000 cock and fire cycles.

The new design is being tested by swaging out and recutting the safety lever to the new dimension. The gun test will include;

1. One gun will be shot 2,000 times, with 500 safe on - safe off cycles, the sear lift being measured every 500 rounds as well as the safe on - safe off actuation load.
2. One gun will be cycled to 50,000 safe on - safe off cycles, and 50,000 cock and dry fire cycles.

These tests will be repeated with the design changes as they become available.

AL 0016395

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To: W.E. Leek
From: J. P. Linde

5-7-75

-6-

Evaluation of the Bolt Action Rifle Safety Mechanisms - M/580, 738, 600 & 700

Future Program

1. The 540 Series fire controls will be altered to reflect the changes made in the M/580 and 788 fire controls.
2. ~~The sear pin will be~~ looked into as one backed out in testing. This is presently a substitute pin and will be changed to a spiral pin as soon as the testing can be completed on the new pin. When the solid pin backed out after about 20,000 cycles it resulted in a fire on safe condition. The pin slipped out of one side of the housing, letting the sear slip down. When the safety was positioned to the on safe position there was inadequate lift, so if the trigger is pulled it will become trapped ahead of the sear. When the safety is moved to the fire position the gun will discharge.

JPLinde:T
Ilion Research Division

AL0016396

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BOLT ACTION SAFETY SYSTEM ANALYSIS

This report is a summary of the information accumulated in a design analysis of the popular current bolt action safety systems. The systems are listed as to how they function, with a description of the design advantages and disadvantages.

Blocked Trigger Safety

This safety works on the principle of employing a mechanical means to block the rotation of the trigger. The trigger is the only element in the triggering mechanism which is blocked. This type of safety has been utilized extensively in hunting type rifles and shotguns. The M/1100, M/870, and M/742 utilize this type of safety.

The blocked trigger safety has the following advantages:

1. It is easy to determine how the mechanism operates even by a novice shooter.
2. The safety operation is not dependent on the position of the striker or some other integral part. The safety can be operated with the bolt open, bolt closed, or striker cocked or fired on all of our current models which use the common fire control such as the M/742. With all the bolt action rifles which use the blocked trigger safety, the safety can only be put in the "On Safe" position when the striker is cocked. The bolt can be either in the open or locked position. The bolt lock feature normally inhibits the operation of the safety if the bolt is in the open position.

*Not always true
i.e. 530-785*

A

Blocked Trigger Safety - Cont'd.

The blocked sear safety can normally not be moved to the "On Safe" position when the striker has fallen. The blocked striker type safety cannot be actuated unless the rifle is cocked and the bolt locked closed.

3. The blocked trigger safety locks the trigger in position; if the shooter fidgets with the rifle while he is waiting for a big trophy deer the trigger will remain locked unless the safety is repositioned. With a safety system where the trigger is free to move if the hunter fidgets with the rifle and pulls the trigger with the safety in the "On Safe" position, the trigger could possibly bind on the trigger guard, stock, or trigger housing. If this happened, the rifle would fire "off safe".
4. The designer has much greater freedom on where the physical position of the safety can be located with this type of safety. With the blocked striker or blocked trigger safety, the physical position of the safety mechanism is determined by where the force has to be applied to cam the striker or sear.

The blocked trigger safety has the following disadvantages:

1. In firearms where the trigger directly supports the sear (trigger surface engages sear surface to inhibit rotation), the tolerances and clearances in the trigger block (safety) allow movement when the trigger is pulled with the firearm in the "On Safe" position, decreasing the amount of sear trigger engagement.

Blocked Trigger Safety - Cont'd.

- 1.A. In the common fire control, as used on the M/1100 and M/870, and M/742, there is a connecting link between the trigger and sear. The design calls for a clearance between the link and sear engagement surface which, when the trigger is pulled with the firearm in the "On Safe" position, allows the trigger to move slightly taking up the tolerances and clearances in the safety block without moving the sear. The trigger is allowed to retract when released which allows the safety to be actuated regardless of the position of the sear.

2.

The blocked trigger design does not lend itself to target triggers as a target trigger demands a minimum preplay or initial clearance and a minimum engagement. If the trigger has a connecting link the trigger would normally have preplay. If the trigger connects directly to the sear the engagement cannot be decreased to target specifications as the safety tolerances and clearances are such as not to insure an adequate engagement if the trigger were pulled with the firearm in the "On Safe" position.

Blocked Sear Safety

This type of safety functions by having a mechanical means block the sear or cam the sear clear of the trigger. In this type of mechanism where the sear is disconnected from the trigger a mechanical cam is actuated against the sear, lifting the sear away from the trigger by actuation of the safety lever. The M/700 rifle uses a safety mechanism of this design. In the M/700 system when the sear is cammed free of the trigger the sear cams the striker assembly, retracting the firing pin slightly.

The blocked sear safety has the following advantages:

1. The system can be used successfully with either a hunting rifle or a target rifle. Because the system lifts the sear clear of the trigger, the system is not as sensitive to the amount of sear engagement as the blocked trigger safety.
2. The system blocks the striker, camming it rearward slightly.
3. The safety can be operated with the bolt in the open position or in the closed and cocked position.

A
4.
5.

The safety lever can be positioned in a convenient location.

The system is positive -- mechanical actuating means physically disconnecting sear from trigger. The trigger can be pulled with high force levels not affecting the safety operation.

6. The striker is blocked by the sear and will take a large amount of abuse without firing.

7. The sear, trigger and safety cam all are attached to the same housing making the system less tolerance sensitive.

8. Can be designed either as a two position or three position safety.

The blocked sear safety has the following disadvantages:

1. If the customer fidgets with the trigger when the gun is in the "On Safe" position and the trigger fails to return to position, the safety mechanism (can) will be holding the striker and when it is switched to the fire position the striker will fall. The trigger could be bound by the stock, trigger housing, trigger guard, or insufficient clearance between trigger and sear.

2. The rifle cannot be put in the "On Safe" position when the striker is forward.

Blocked Striker System

The system is actuated by camming the striker rearward with a mechanism located on the bolt plug. The M/70 Winchester utilizes this type of system.

Advantages of blocked striker system:

1. Can be designed as a two or three position safety system.
2. This type of safety holds or retains the last link in the firing mechanism. This could possibly be an advantage under drop test circumstances and for advertising or sales appeal.

Disadvantages of the blocked striker system:

1. Located in a position which interferes with scope mounted rifles.
2. The system is very tolerance sensitive as the mechanism parameters are determined by the sear position located in the receiver assembly and the camming mechanism located in the bolt assembly.
3. The mechanism can only be actuated when the bolt is closed and cocked. To load the rifle with the safe in the "On-Safe" position requires closing the rifle, putting the safe in the "On Safe" position, opening the bolt and loading the rifle. If one shot is fired and the following shot fed from the magazine, the bolt must be locked in the fire position before the safety can be actuated.
4. If the hunter fidgets with his rifle, squeezing the trigger while the rifle is in the "On Safe" condition, the trigger could possibly lock back from binding on the trigger housing, stock, trigger guard, or excessive dry lubrication and cause the rifle to fire when the safe is moved to the "On Safe" position.

SAFETY LEVER LOCATION

The safeties located on the bolt plug normally are difficult to actuate with scoped rifles.

The safety buttons located on the top center of the tang are very difficult to operate when the bolt is in the rear open position. If the hunter carries his rifle with his hand around the grip he could inadvertently reposition the safety without realizing it, with the safety positioned on the top tang.

A The safety buttons located on the trigger bow are easy to actuate but tend to be confusing as to which is the safe position.

L The safeties located along the side of the receiver are easy to actuate, do not interfere with the gun operation, but normally work in the same direction as the trigger. This could cause a problem if the customer previously operated a Winchester M/94 lever action where to put the gun on half cock he has to pull the trigger while retarding the fall of the hammer with his thumb. If the customer pulls the trigger while releasing the safety with a blocked sear safety the rifle will naturally fire.

Safety Design

K The safety should have two clearly defined positive positions; "ON SAFE" and "OFF SAFE". The safety should require 3 to 10⁸ pounds to move to the "Off Safe" position. The safety mechanism should not be overly sensitive to lubrication; that is, the actuation forces should not vary dramatically due to lubrication.

S The safety mechanism should have an endurance life such that it will not wear to create a dangerous condition. The safety clearances and checks performed at the plant should allow for wear.

C The operation of the safety mechanism should be easily understood by the customer without consulting the owner's manual.

The safety lever or button should not protrude in such a manner where it can be easily knocked out of position. The safety should not be positioned such that operation of the bolt or some other member is in line with the safety such that it could be repositioned by said mechanism operation. An example would be having the safety lever project up on the right rear tang such that operating the bolt handle back and forth by the customer could reposition the safety.

The safety operation should not be noisy such that its operation will scare off game animals.

If a clearance or interference is required in the mechanism it should be in a place where it can be readily inspected and understood by the people servicing the firearm.

With the safety in the "On Safe" position the rifle should tolerate a 30 pound pull on the trigger without firing.

The safety mechanism should be able to withstand a drop test without repositioning itself in all six planes.

The safety should allow the rifle to be loaded and unloaded with the safety in the "On Safe" position.

Three position safeties can be confusing to a new shooter. What does the center or middle position mean? 1/2 safe. The motion required on a three position safety to go from the fire to the middle position is the same as the total motion in a two position safety to obtain an equivalent mechanical advantage. The motion required on the three position safety from the second to third position must be substantial to allow for a positive central detent position. It is easier to develop and manufacture a two position detent system which goes from stop to stop than it is to develop a three position system where the mechanism is supposed to stop in an intermediate position.

People who own three position safeties leave them in the intermediate position so they can operate them quicker.

Bolt Locks

A bolt lock is important to insure proper function of a bolt action rifle. The bolt lock holds the bolt in the ready position to insure that the protruding bolt does not catch on some object and partially unlock the action. If the action becomes partially unlocked the rifle will not fire when the trigger is pulled as the firing pin head will bottom on the cam surface on the bolt before the tip can impinge on the shell primer. To insure the rifle is ready to fire, particularly when hunting dangerous game, it is important to incorporate a bolt lock into a bolt action rifle. If the bolt catches on an obstacle it can unlock the rifle, unloading the action.

January 19, 1977

FIRE CONTROL DESIGN CONSIDERATIONS

- BOLT ACTION RIFLES -

Tolerances

Fire Controls have many interacting parts. And their function requires minimum part movement. Because of this, tolerance buildup is the key problem in designing Fire Controls for mass production. This tolerance buildup problem can be solved in a variety of ways:

- Adjust tolerance buildup out by screw adjustment, bending, swaging, or filing.
- Have several parts sizes in inventory for a selective fit.
- Eliminate the tolerance buildup by performing a manufacturing operation during final assembly. For instance, a critical hole could be drilled during assembly using the assembly up to that point as a fixture.
- Design parts which can move a lot, to move even more to take up tolerance buildups.
- Parts whose function is not critical to safety can be tolerated statistically.

Safeties

Block Trigger Safety

This Safety blocks the movement of the Trigger. The Trigger, in turn, blocks the movement of the Sear which blocks the Firing Pin. When the Safety is disengaged the Trigger may be pulled to fire the rifle. In my opinion this is the ultimate Safety because it blocks all of the functions required to fire the rifle.

This type of Safety will not work on a target type Trigger because the Sear engagement might be adjusted too fine for the tolerances in the Safety. Then the rifle could be shot with the Safety on.

AL 0016406

Remington Arms Company, Inc.

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Safeties - Contd.

Lift Sear Safety

This Safety lifts the Sear clear of the Trigger and blocks it so that, when the Trigger is pulled, it can not release the Sear. This Safety is used on rifles where the Trigger movement is too small to effectively block. It is especially useful on target rifles.

Problems can occur with this Safety if the Trigger binds. Foreign material in the Fire Control, or a bad trigger fit, can cause the Trigger to stick in the "pulled" position. When the Safety is released, there is nothing to support the Sear, so the rifle fires off safe.

This Safety requires more throw than a block trigger safety. This is because it has to do considerable work to lift the Sear against the mainspring force.

A Lift Sear Safety must have constant force camming between the Safety and the Sear. So that the Safety "on" force will be consistent in all tolerance situations.

Bolt Safety or Block Firing Pin Safety

This Safety lifts the Firing Pin from the Sear and blocks it. A binding Trigger will also cause a rifle with this type of Safety to fire "off" safe.

Safety Detents

Safety detents provide the following functions:

- Controls Safety "on" and "off" forces
- Provides positive position stops for Safety "on" and "off"
- Insures no "dead" positions between "on" and "off" where the Safety might otherwise hang up.

The force required to initiate movement of the Safety depends upon the detent spring thrust and the "contact" angle of the detent head. These work together

Safety Detents - Contd.

to create the "feel" of the Safety. The "contact" angle is the angle of the surface that the Safety Lever has to work against to retract the detent. It is defined by 1/2 the included angle of a conical detent head. It can also be defined by the tangent angle where a ball detent contacts the hole it is sitting in.

I have successfully tested detents with conical heads whose included angle was 60° (contact angle of 30°). I found that these detents should be supported at both sides of the Fire Control Housing to eliminate binding.

The contact angle can be varied between the "on" and "off" positions. This is done by having two different size detent holes with a ball detent or a conical detent with a hemispherical tip.

Trigger

The Trigger should have the following characteristics:

- Balanced so that it cannot be jarred off
- Pull 3 - 5# or adjustable 1 - 5# for target Triggers
- Sear engagement adjustable for target rifles
- Over travel minimum or adjustable for target rifles
- An optional 3-bar system can be designed for target rifles to minimize Trigger movement.

Sear

- Engagement with Trigger - .015" Min. (except for target rifles)
- Engagement with Cocking Piece - .010" Min. (worst tolerance condition)

Bolt Release

The Bolt Release can sometimes be operated by the Safety.

On some rifles the Sear can also serve as a bolt stop.

Fire Control Mounting

The Fire Control must be strongly attached to the Receiver. This joint should not yield when Fire Control parts are being changed while the Fire Control is attached to the Receiver.

Critical Dimensions

After the Fire Control is designed the following dimensions have to be checked. They should be checked by drawing and/or calculation to ensure safe operation under all tolerance conditions:

- Sear-Cocking Piece engagement .010" minimum
- Sear Lift* (on sear lift type safety) - .008" minimum

* Be sure to include sear rotation allowed by sear pivot pin fit!
This happens if the Sear is lifted from the side so that it can become cocked.

E. J. YOUNG/nl
Illion Research Division
Manual Firearms Design

4/5/77

M/600 FIRE CONTROL

In January 1975 R&D was advised of a problem existing with the M/600 Fire Control. Initial investigation of the fire control and components showed several out of tolerance conditions existing. The parts found to be out of tolerance are:

SEAR SAFETY CAM - Safety cam surface.

.534 / .539 dim. and connector contact area

.341 / .346 dim. over max.

TRIGGER - Pivot hole in trigger

.991 / .973 dim. was found to be out of position over max.

TRIGGER CONNECTOR - This part was found to have a blow in the long leg of the part.

TRIGGER HOUSING - The following holes were found out of position -

Safety Pivot hole .649 / .651 & 1.305 / 1.307

Safety Detent Holes

Trigger Pivot holes .839 / .841 & 1.239 / 1.241

Holes were out of position also had variations from side to side.

Correction of these tolerance conditions was easily accomplished as two of the four parts are made here.

SEAR SAFETY CAM - Is manufactured by Hi-Dense. It was found that by exercising more care in pressing and sintering this part could be made to model drawing tolerance.

TRIGGER - Also made by Hi-Dense with final machining by Rem. This part was brought back into tolerance by minor alteration of fixturing and reinstruction of the operator.

TRIGGER CONNECTOR - Manufactured outside - this part was brought back into tolerance by having the vendor make alteration on die.

AL 0016410

26 of 80

TRIGGER HOUSING - This part was found to have the most out of tolerance conditions.

This part can be controlled but it is necessary for both Rem. and vendor to screen and check all parts. Doing this increases piece price. Parts are also checked at Sub-Assembly to insure proper sear connector separation with safe in "ON SAFE" position.

Reason for change to M/700 Style Fire Control Housing.

Hardened low wear housing

More Positive safety

Eliminate trigger housing rejects at safety clearance inspection.

Common Housing - (M/600, M/700 M/40X)

PARTS CHANGED OR REDESIGNED

Housing - Altered to fit M/600 and M/700 receivers.

Safety Lever and Sear Safety Cam - Altered to provide a longer duration of safety and more lift - sear and connector separation.

Future plans for this Fire Control, the XP-100 Fire Control and the M/700 Fire Control are:

Continue to upgrade and improve them, include a unload on safe feature, a three position safe or both. This will probably be dictated by Marketing.

FEMartin:bd

4/5/77

AL 0016411

27 of 80

m/700 BOLT LOCK (NEW DESIGN)

3/18/81

ERG

ESTIMATION OF ADDED OPERATIONAL COST.

NEW COMPONENTS:

	EQUIPMENT	COST/GUN
BOLT PLUG (ADDED COST TO PRESENT PROCESS) ———	\$118,120. ⁰⁰	.168
BOLT LATCH (P/M QUOTE) ———	4,400. ⁰⁰	1.540
PLUNGER ———		** .030
SPRING ———		** .010
PIN ———		** .005

ADDED OPERATIONS TO EXISTING COMPONENTS:

BOLT ASSEMBLY: ———	3920. ⁰⁰	.028
--------------------	---------------------	------

FIRING PIN ASSEMBLY

ASSEMBLE LATCH IN BOLT PLUG

785. ⁰⁰	.072
<u>\$127,225.⁰⁰</u>	<u>1.853</u>
*	
.467	

AL0016412

* INCLUDES TIE-IN EQUIPMENT COST ** BASED ON SIMILAR FACT COSTS

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10/790 BOLT LOCK (NEW DESIGN)

3/18/81

ERC

BOLT PLUG (NEW)

OPERATION-26 (ADDED TO PRESENT PROCESS)

8-STATION DIAL TYPE TRANSFER MACHINE

BASIC MACHINE WITH HYDRAULICS AND ALL CONTROLS 40,000.⁰⁰8- DRILLING HEADS @ \$5,000.⁰⁰ EACH * 40,000.⁰⁰2- MILLING HEADS @ \$7,500.⁰⁰ EACH * 15,000.⁰⁰8- FIXTURES AND TOOLING 17,000.⁰⁰
\$112,000.⁰⁰

GAGES

3- PLUG GAGES @ \$40.⁰⁰ EACH 120.⁰⁰1- PINNING GAGE (HOLE LOCATION) 2000.⁰⁰1- RISE GAGE (MILLED CUTS) 4000.⁰⁰
\$6120.⁰⁰TOTAL CAPITAL -- \$118,120.⁰⁰

MACHINE CYCLE TIME --- 20 SEC. **

PRODUCTION RATE @ 80% 144 PARTS/HR. CAPACITY

EMPLOYEE RATE /HR 7.90 + 45% (FRINGE) = 11.455

(OPERATOR REQUIRES PART WHILE WAITING) 11.455 / 144 = .0795 / PART

7 1/2% OF \$118,120.⁰⁰ = \$8859.⁰⁰\$8859.⁰⁰ / 100,000 = .0886 / PART

TOTAL -- .1681 / PART

NOTE: DESIGN COST INCLUDED

* INCLUDES INCHES ** INCLUDES LEAD TIME

AL 0016413

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m/300 BOLT LOCK (NEW DESIGN)

3/18/81

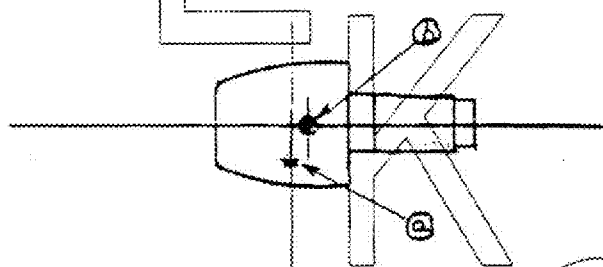
EEG

BOLT PLUG (NEW)

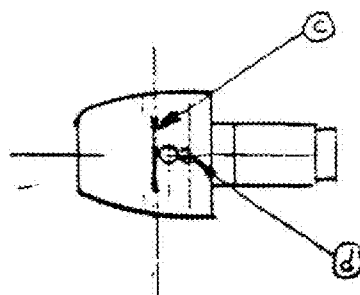
OPERATION - ZG - DESCRIPTION

8-STATION DIAL TYPE TRANSFER MACHINE. (LOAD AT STA. 1)

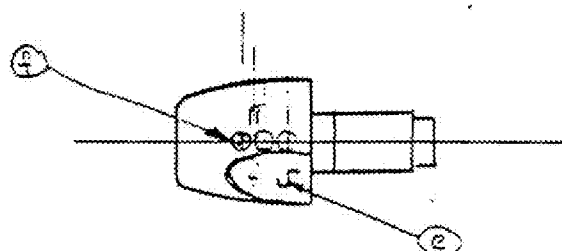
STA. 2 - (A) BUTT DRILL BOLT LATCH PIVOT HOLE & (B) ROUGH DRILL LATCH SLOT (CENTER)



STA. 3 - (C) DRILL B.L.P.H. & (D) ROUGH DRILL LATCH SLOT (FRONT)



STA 4 - (E) MILL RIGHT SIDE (m/60C D.A.R.) & (F) ROUGH DRILL LATCH SLOT (REAR)



3/18/81

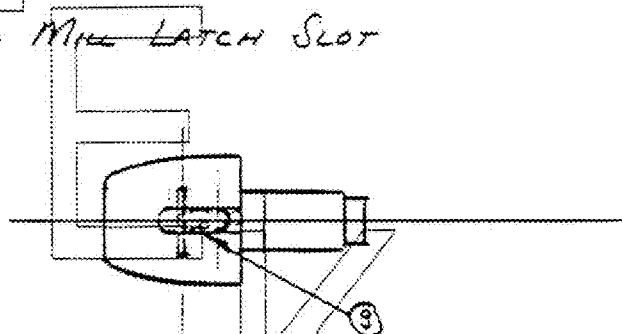
EEO

A
m/700 Bolt Lock (NEW DESIGN)

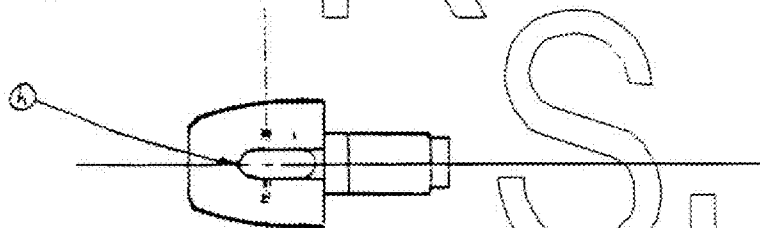
BOLT PLUG (NEW)

OPERATION 24 - DESCRIPTION CONT'D.

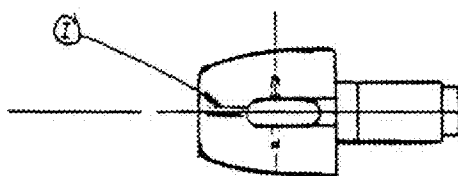
STA. 5 - ⑨ MILE LATCH SLOT



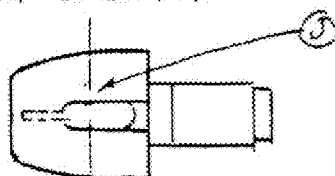
STA. 6 - ⑥ BUTT DRILL SPRING PLUNGER HOLE



STA. 7 - ① DRILL SPRING PLUNGER HOLE



STA. 8 ③ REAM B.L.P.H.



AL0016415

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1700 BOLT LOCK (NEW DESIGN)

BOLT ASS'Y. (ADDED OPERATION)

OPERATION - 238

3/18/81
EEO

MACHINE - O-12 CINN.

TOOLING - SPECIAL FL CUTTER

70.⁰⁰

FIXTURE - VERTICAL VEE-BLOCK

2500.⁰⁰

GAGES

1- POSITION GAGE (FUNCTIONAL GO-NOGO)

950.⁰⁰

1- DEPTH GAGE - FLUSH PIN TYPE

400.⁰⁰

TOTAL CAPITAL - \$ 3920.⁰⁰

MACHINE CYCLE TIME ---- 12 SEC.
LOAD TIME ---- 8 SEC. } 20 SEC.

PRODUCTION RATE @ 80% = 144 PARTS/HK CAPACITY

EMPLOYEE RATE /HK. 7.90 + 45% (FRINGE) = 11.455

BASED ON 8 SEC. EMPLOYEE TIME ADDED COST = .025/PART

$$3600 / 11.455 = 8 / 7 \quad 2 = 8 / 11.455$$

$$7\frac{1}{2}\% \text{ OF } 3920.00 = \$294.00$$

$$294.00 / 100,000 =$$

TOTAL - .0279

m/700 BOLT LOCK (NEW DESIGN)

3/19/81

ERO

FIRING PIN ASSEMBLY (ASSM. LATCH IN BOLT PLUG)
OPERATION - 100 (NEW)

FIXTURE - LOCATE ON FIRING PIN HEAD HOLE.

650.⁰⁰

PART HANDLING TOOLS - (MAGNETIC)

125.⁰⁰

HAND HELD DRILL - CLEAN OUT SPRING PLUNGER HOLE

10.⁰⁰

TOTAL CAPITAL - \$785.⁰⁰

CYCLE TIME - 18 SEC

PRODUCTION RATE @ 80% = 160 PARTS/HR.

EMPLOYEE RATE/HR. 7.90 + 45% (FRINGE) = 11.455

BASED ON 18 SEC. EMPLOYEE TIME ADDED COST = .0716 / PART

$$11.455 / 160 = .0716$$

7 1/2% OF \$785.⁰⁰ = 58.875

$$58.875 / 100,000 = .0006 / PART$$

TOTAL - .0722 / PART

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

SUPPORT

PETERS

SUPPORT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RESEARCH MEETING

November 1, 1978

SUBJECT: BOLT ACTION FIRE CONTROL

A meeting was held on the above subject with the following people in attendance:

C.B. Workman	E.J. Young	T.P. Powers
A.A. Hugick	D.E. Bullis	P. Nasypany
J. S. Martin	G.D. Bailey	J.W. Brooks

An explanation of the M/600 recall program was given by Clark Workman.

The present fire control was discussed using a diagram to explain its operation.

The various safeties, their positions on rifles and how they operated (what they blocked) were discussed. This included competitive models. The discussion then proceeded to what our future thinking should be on our fire controls. Is our present system satisfactory? Can we make a better system?

The outcome of the ensuing discussion produced the following criteria as a start for looking at future designs:

1. The mechanical lock type "ON SAFE" - "OFF SAFE" safety control should be retained.
2. Trigger must be pulled to fire rifle - pulling trigger is only way rifle will fire - rifle will fire immediately when trigger is pulled.

AL 0016418

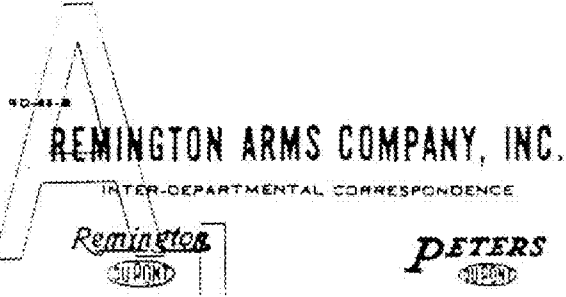
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3. Rifle (can - must) be unloaded with the mechanical safety (No. 1 above) in the "ON SAFE" position.
4. Bolt handle must be locked down with safety in "ON SAFE" position with round in chamber.

An example of No. 2 above that was discussed was to have a second trigger that had to be pulled before the primary trigger could be pulled. The secondary trigger would block the sear or other mechanism until pulled with a predetermined force through a specific distance and then continued movement would pull the primary trigger to fire the rifle.

In No. 3 above the discussion covered whether the rifle "can" or "must" be unloaded in the "ON SAFE" position. At the meeting of the Design Group on Nov. 7, opinions will be given for reaching a decision.

J. W. Brooks:T
Manual Firearms Design
Illon Research Division



Present: C. B. Workman
J. S. Martin
E. J. Young
D. E. Bullis
G. D. Bailey
F. E. Martin

T. P. Powers
P. Nasypany
J. W. Brooks
D. R. Lewis

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RESEARCH MEETING

November 7, 1978

SUBJECT: BOLT ACTION FIRE CONTROL

Observations

1. "Can" or "Must" condition on unloading a rifle in "ON SAFE" position. Majority feel a "Must".
2. Unload magazine box without cycling thru chamber?
3. Gun must be safe when unloaded!

Further Criteria

1. Bolt handle must be locked down with round chamber and safe on.
2. Rifle must be unloaded with safe on.
3. Trigger feel safely adjustable by customer.

JW Brooks:T
Manual Firearms Design
Illion Research Division

AL 0016420

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REMINGTON ARMS COMPANY, INC.
Research Department

c: J.P. McAndrews
E.G. Larson

Bridgeport, Connecticut
November 16, 1978

C.B. WORKMAN ✓
M.H. WALKER
J.P. LINDE
H.D. ALBAUGH-W.H. FORSON

BOLT ACTION FIRE CONTROL - DESIGN REVIEW 11-14-78

- A gauge is being designed to check sear lift. The gauge is expected to be positive and simple enough to be used in the field. Completion of a prototype gauge is scheduled for mid-December.
- The following design requirements for a new fire control for bolt action rifles were tentatively established -
 1. Eliminate the "trick" condition. At this point the best solution appears to be adding a trigger block to the safety cam mechanism. This would prevent the trigger from moving in the "safe" position - eliminating the "fail to reset" possibility.
 2. The new fire control should be retrofittable.
 3. A bolt lock arrangement should be provided. At this point a locking device separate from the fire control appears most desirable.
 4. Adjustment for the trigger pull force should be provided for the user. Access to the adjustment should not require stock removal. Other adjustments - sear-connector engagement - should be eliminated.
- Program
 1. Marketing will conduct consumer tests of the fire control designs now in hand during December and January. These include a three position and a two position safety with an external bolt lock. A sample with the present fire control with the bolt lock removed will be included.

AL 0016421

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2. Research will complete the design investigation and select a design approach by February 1, 1979.

3. Consideration will be given to introducing the new design in a limited quantity of restyled M/600s in 1980.

- M.H. Walker will prepare a letter with his views on renaming the "safety" mechanism.

E. F. Barrett

EFBarrett:jl

A

DON'T SAY IT-WRITE IT

700 BDL

	<u>w/o Butch</u>	<u>W Butch</u>	<u>A</u>
Std upper -	25.17	25.81	.64
Std with -	39.49	39.92	.43
			<u>1.07</u>

"SAFETY RULES ARE PERFECT TOOLS"

S
I
C
H

AL 0016423

39 of 80

Copies to: R. L. Hall
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H. K. Boyle
G. E. Fletcher
J. H. Sweeney

J. P. Linda
L. B. Bosquet
Z. J. Kowalski
Est. No. 4197

October 24, 1980

File

G. D. CAMPBELL

M/700 Bolt Latch Mechanism

Evaluation of the proposed Bolt Latch mechanism for M/700 rifles indicates it will result in a \$3.00 increase in unit factory cost (full allocation basis) in its first year (1982). For comparison purposes, a 1982 M/700 "Line Before" and three alternative "Line After" results were developed based on M/700 cost performance during the first six months of 1979. These alternatives were:

1. Adding of the Bolt Latch mechanism without adjusting prices.
2. Adding the Bolt Latch mechanism and adjusting prices to maintain the percent pretax margin.
3. Adding the Bolt Latch mechanism without adjusting prices, but deleting the sling and swivels from the BDL grade to compensate for the increased cost.

The results of these evaluations are summarized in the attached table which shows weighted average unit prices, costs, and pretax earnings and the project results. This data has been adjusted to anticipated 1982 price and cost levels.

As shown in this table, Alternative III is the most attractive in % margin, earnings, and net return on investment because it results in a net reduction in costs and working capital requirements. One disadvantage of this alternative is that ADL and Classic grade earnings are adversely affected, and the results shown depend on maintaining current product mix.

Alternative II also results in increased earnings, however, its net return on investment is substantially lower because of additional working capital requirements resulting from increased costs and sales.

All alternatives require project expenditures of \$249M construction and \$83M in operations charges. Detailed data for the line before and each alternative are attached.

J. C. Hutton
J. C. Hutton, Superintendent
INDUSTRIAL ENGINEERING SECTION

by T. R. Andrews
TRA/mc
Att.

AL 0016424

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1982 Line After

	1982 Line Before	Alternative I Without Price Adjustment	Alternative II With Price Adjustment	Alternative III With Sling Deleted From BDL
Retail Selling Price	\$ 411.28	\$ 411.28	\$ 419.09	\$ 411.28
Net Selling Price	220.55	220.55	224.74	220.55
Factory Cost	158.05	161.05	161.05	155.89
Total Cost	183.75	186.62	187.23	181.68
Pretax Earnings - Unit Line	36.80 \$ 5,123 M	33.93 \$ 4,723 M	37.51 \$ 5,221 M	38.87 \$ 5,410 M
% of Net Selling	16.7%	15.4%	16.7%	17.6%

Project ResultsPretax EarningsFull Allocation
Incremental(\$140M)
(\$310M)\$ 98M
\$223M\$ 287 M
\$ 275 MNet EarningsFull Allocation
Incremental(\$204M)
(\$158M)\$ 52M
\$117M\$ 150 M
\$ 144 MNet Return on InvestmentFull Allocation
Incremental-- Negative
-- Negative8.6%
19.7%202.7%
187.0%

AL 0016425

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M-22 Line Before - 1982

782
10/2/82

	M-700 ADL	M-700 BDL	M-700	Line Before (MS)		Weighted
			Classic	Book	Incremental	Ave
QUANTITY	44,535	99,398	4,176	139,210	139,210	139,210
RETAIL SELLING PRICE	\$353.14	\$239.72	\$402.35	57,254		\$411.28
NET SELLING PRICE	\$192.25	235.80	215.27	30,702	30,702	\$220.55
STANDARD MATERIAL	\$31.46	\$39.49	\$32.99	5,096	5,096	
MATERIAL VARIANCE	3.93	4.88	4.09	527	627	
STANDARD LABOR	22.35	25.17	23.53	3,366	3,366	
LABOR VARIANCE	13.27	15.12	13.21	2,011	2,011	
DIRECT EXPENSE	25.44	25.60	25.24			
GAS & POWER	2.34	2.52	2.34			
INDUSTRIAL RELATIONS	17.06	19.30	17.61			
GRATIS REPAIRS	.85	.91	.95			
TOTAL DIRECT CHGS.	\$421.59	\$481.23	\$446.06	6,451	6,451	
SUPERVISION	2.16	2.42	2.30			
INDUSTRIAL RELATIONS	1.03	1.15	1.09			
FACTORY CLERKS	.27	.30	.29			
INDUSTRIAL ENGINEERING	.30	.33	.32			
DEPRECIATION	3.16	3.58	3.33			
PE & C DIRECT	.20	.22	.21			
FLOOR SPACE	2.34	2.62	2.48			
PROJECT COST	.90	1.01	.95			
OTHER DIRECT	.28	.31	.29			
TOTAL MCG O/H	\$10.64	\$11.94	\$11.28	1,599	-	
SUB-TOTAL	\$124.14	\$144.93	\$131.17	19,150		
PLANT OVERHEAD	21.87	25.35	23.60	3,353	-	
UNADJUSTED FACTORY COST	\$146.01	170.28	\$154.77	22,503	17,351	
FACTORY COST (NOT FOR COST REP)	\$142.73	\$166.45	\$151.29	22,002	17,156	158.05
SELLING & ADMINISTRATIVE	14.60	17.92	16.41	2,324	921	16.76
TECHNICAL	2.69	3.30	3.02	430	154	3.09
DISTRIBUTION	3.65	4.48	4.10	583	7363	4.19
COST BEFORE ADMIN EXP	163.67	192.15	174.82		18,599	
TOTAL COST	\$164.89	\$194.03	\$176.59	25,579	19,119	\$183.75
EARNING BEFORE ADMIN EXP	29.35	43.65	41.05		12,103	
less: ADMIN EXP	1.22	1.83	1.77	230	520	1.66
PRE-TAX EARNINGS	\$27.16	\$41.77	\$39.28	5,123	11,583	36.80
less: TAX						
plus: AMORTIZED ITC						
NET EARNINGS						
PRE-TAX MARGIN	14.1%	17.7%	18.2%			16.7%

AL0016426

V-22 LINE AFTER WITH BOUT LATCH - 1982

PRICES ADJUSTED TO MAINTAIN % MARGIN

10/1/82

QUANTITY	M/700 ADL	M/700 BDL	M/700	LINE AFTER (M 53)	WEIGHTED
			CLASSIC	BOOK	AVG
RETAIL SELLING PRICE	46.432	80.388	4.176	139.210	179.210
NET SELLING PRICE	\$355.95	\$447.93	\$410.36	581.341	\$419.08
	\$196.24	239.99	230.06	311.285	\$224.74
STANDARD MATERIAL					
MATERIAL VARIANCE					
STANDARD LABOR					
LABOR VARIANCE					
DIRECT EXPENSE					
GAS & POWER					
INDUSTRIAL RELATIONS					
GRATIS REPAIRS					
TOTAL DIRECT CHGS					
SUPERVISION					
INDUSTRIAL RELATIONS					
FACTORY CLERKS					
INDUSTRIAL ENGINEERING					
DEPRECIATION					
PE & C DIRECT					
FLOOR SPACE					
PROJECT COST					
OTHER DIRECT					
TOTAL MFG O/H					
SUB-TOTAL					
PLANT OVERHEAD					
UNWASTED FACTORY COST					
FACTORY COST (COST PER)	\$45.73	\$169.45	\$154.29	221.428	\$161.05
SELLING & ADMINISTRATIVE	14.91	18.24	16.72	21.375	17.08
TECHNICAL	2.74	3.28	3.08	4.38	3.14
DISTRIBUTION	3.73	4.56	4.18	5.94	4.27
COST BEFORE ADMIN EXP	167.11	195.51	178.27	18.949	
TOTAL COST	\$168.36	\$197.52	\$180.07	26.064	\$187.23
EARNING BEFORE ADMIN EXP	29.13	44.38	41.79	12.336	
LESS: ADMIN EXP	1.25	1.91	1.80	2.34	1.69
PRETAX EARNINGS	\$27.88	\$42.47	\$39.99	5.221	\$27.51
LESS: TAX					
PLUS: AMORTIZED ITC					
NET EARNINGS					
PRETAX MARGIN	14.2%	17.7%	18.2%		16.7%
(% ON NET SELLING)					

AL0016428

M/100 LINE AFTER WITH BOUT -ATCH

WITHOUT PRICE ADJUSTMENT

SLING & SWIVELS DELETED FROM BDL GRADE

QUANTITY	M/100 ADL	M/100 BDL	M/100	Line After (M/S)	WEIGHTS	
			CLASSIC	BOOK	INCREMENTAL	Ave
RETAIL SELLING PRICE	556.14	499.72	500.55	57,354		511.29
NET SELLING PRICE	5192.03	5725.80	5215.87	30,702	30,702	5700.55
STANDARD MATERIAL	\$31.59	\$33.65	\$33.42	4,601	4,601	
MATERIAL VARIANCE	3.89	4.16	4.13	566	566	
STANDARD LABOR	23.00	23.81	24.20	3,456	3,456	
LABOR VARIANCE	13.52	15.37	13.46	2,042	2,042	
DIRECT EXPENSE	13.74	25.89	25.54			
GAS & POWER	5.30	2.58	2.42			
INDUSTRIAL RELATIONS	17.49	13.72	18.04			
GRATUITY REPAIRS	.87	.93	.87			
TOTAL DIRECT CHGS	43.40	49.12	46.87	6,562	6,562	
SUPERVISION	2.22	2.48	2.34			
INDUSTRIAL RELATIONS	1.06	1.16	1.12			
FACTORY CARES	.28	.31	.30			
INDUSTRIAL ENGINEERING	.31	.34	.33			
DEPRECIATION	3.29	3.71	3.48			
PE & C DIRECT	2.1	.23	.22			
FLOOR SPACE	2.41	2.69	2.55			
PROJECT COST	.93	1.04	.98			
OTHER DIRECT	.29	.32	.30			
TOTAL MES O/H	11.00	17.30	14.64	4,649	4,649	
SUB-TOTAL	126.69	140.41	133.42	18,880	17,249	
PLANT OVERHEAD	22.32	24.56	24.05	3,312	-	
UNWATERED FACTORY COST	149.01	164.97	157.47	22,192	17,249	
FACTORY COST (NOT FOR SALE)	145.73	161.33	154.29	21,702	16,868	155.89
SELLING & ADMINISTRATIVE	14.60	17.92	16.41	2,374	921	16.76
TECHNICAL	2.63	3.30	3.02	436	154	3.09
DISTRIBUTION	3.65	4.48	4.10	583	363	4.19
COST BEFORE ADMIN. EXP	166.67	187.03	177.82	16,311		
TOTAL COST	\$167.76	\$189.13	\$179.46	25,292	18,944	\$181.68
EARNING BEFORE ADMIN. EXP	25.38	48.77	38.05		12,391	
LESS: ADMIN. EXP	1.09	2.10	1.64	243	533	1.75
PRETAX EARNINGS	\$24.29	\$46.67	\$36.41	5,410	11,858	\$38.97
LESS: TAX						
PLUS: AMORTIZED ITC						
NET EARNINGS						
PRETAX MARGIN	12.6%	19.8%	16.9%			17.6%
(% OF NET SELLING)						

AL0016429

AL00016429

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October 24, 1980

G. B. CAMPBELL

M/700 Bolt Latch Mechanism

Evaluation of the proposed Bolt Latch mechanism for M/700 rifles indicates it will result in a \$3.00 increase in unit factory cost (full allocation basis) in its first year (1982). For comparison purposes, a 1982 M/700 "Line Before" and three alternative "Line After" results were developed based on M/700 cost performance during the first six months of 1979. These alternatives were:

1. Adding of the Bolt Latch mechanism without adjusting prices.
2. Adding the Bolt Latch mechanism and adjusting prices to maintain the percent pretax margin.
3. Adding the Bolt Latch mechanism without adjusting prices, but deleting the sling and swivels from the BBL grade to compensate for the increased cost.

The results of these evaluations are summarized in the attached table which shows weighted average unit prices, costs, and pretax earnings and the project results. This data has been adjusted to anticipated 1982 price and cost levels.

As shown in this table, Alternative III is the most attractive in % margin, earnings, and net return on investment because it results in a net reduction in costs and working capital requirements. One disadvantage of this alternative is that ADL and Classic grade earnings are adversely affected, and the results shown depend on maintaining current product mix.

Alternative II also results in increased earnings, however, its net return on investment is substantially lower because of additional working capital requirements resulting from increased costs and sales.

All alternatives require project expenditures of \$249M construction and \$83M in operations charges. Detailed data for the line before and each alternative are attached.

J. C. Hutton
J. C. Hutton, Superintendent
INDUSTRIAL ENGINEERING SECTION

by T. R. Andrews
TRA/mc
Att.

AL 0016430

46 of 80

	1982 Line Before	Alternative I Without Price Adjustment	Alternative II With Price Adjustment	Alternative III With Sling Deleted From BDL
Retail Selling Price	\$ 411.28	\$ 411.28	\$ 419.09	\$ 411.28
Net Selling Price	220.55	220.55	224.74	220.55
Factory Cost	158.05	161.05	161.05	155.89
Total Cost	183.75	186.62	187.23	181.68
Pretax Earnings - Unit Line	36.80 \$ 5,123 M	33.93 \$ 4,723 M	37.51 \$ 5,221 M	38.87 \$ 5,410 M
% of Net Selling	16.7%	15.4%	16.7%	17.6%

Project ResultsPretax Earnings

Full Allocation
Incremental

(\$400M)
(\$310M)

\$ 90M
\$223M

\$ 287 M
\$ 275 M

Net Earnings

Full Allocation
Incremental

(\$204M)
(\$150M)

\$ 52M
\$117M

\$ 150 M
\$ 144 M

Net Return on Investment

Full Allocation
Incremental

-- Negative
-- Negative

8.6%
19.7%

202.7%
187.0%

ALTERNATIVE II

W/200 LINE AFTER WITH-BOUT LATCH 1982

WITHOUT PRICE ADJUSTMENT

-20

1982

QUANTITY	NO. 200 ADL 7/200 BDL 7/200	CLASSIC	BOOK	LINE AFTER (M 86) W/200
	46,636	85,399	4,176	139,210
RETAIL SELLING PRICE	\$359,114	\$439,722	\$402,551	\$71,234
NET SELLING PRICE	\$192,005	\$233,801	\$215,871	\$30,702
				\$220,153
STANDARD MATERIAL	\$31.89	\$39.92	\$39.42	5,156
MATERIAL VARIANCE	3.88	4.93	4.13	634
STANDARD LABOR	23.88	28.82	24.28	3,456
LABOR VARIANCE	13.52	15.37	13.46	2,046
DIRECT EXPENSE	23.34	25.50	25.54	
GAS & POWER	2.78	2.58	2.42	
INDUSTRIAL RELATIONS	17.49	19.73	18.04	
GRATUITY REPAIRS	.87	.93	.87	
TOTAL DIRECT CHGS	43.40	49.14	46.87	6,564
SUPERVISION	2.22	2.48	2.30	
INDUSTRIAL RELATIONS	1.06	1.18	1.12	
FACILITY CHARGES	.28	.31	.30	
INDUSTRIAL ENGINEERING	.31	.34	.33	
DEPRECIATION	3.29	3.71	3.48	18
PE & C DIRECT	.21	.23	.22	
FLUOR SPACE	2.41	2.69	2.58	
PROJECT COST	.93	1.04	.98	
OTHER DIRECT	.24	.22	.30	
TOTAL MES O/H	11.00	12.30	11.64	18
SUB-TOTAL	126.69	147.48	133.72	19,505
PLANT OVERHEAD	22.32	25.80	24.05	3,422
UNWARRANTED FACILITY COST	149.01	173.28	157.77	22,927
FACILITY COST (CAP. EXP)	145.73	169.45	154.29	22,426
SELLING & ADMINISTRATIVE	14.40	17.92	16.41	2,334
TECHNICAL	2.69	3.30	3.02	420
DISTRIBUTION	3.65	4.48	4.10	583
COST BEFORE ADMIN. EXP	166.67	195.15	177.82	19,822
TOTAL COST	\$167.76	\$196.90	\$179.46	\$25,979
				\$196.62
EARNING BEFORE ADMIN. EXP	25.38	40.65	39.05	11,788
LESS: ADMIN. EXP	1.09	1.75	1.64	212
PRE-TAX EARNINGS	\$24.29	\$38.90	\$36.41	4,723
LESS: TAX				
PLANT AMORTIZED ITC				
NET EARNINGS				
				AL0016433
DEBTY MARGIN	12.6%	16.5%	16.9%	15.4%
(% OF NET SELLING)				

480f

ANALYTICAL STATEMENT

Wages After Wth Bottom - 1932
 Prices Adjusted to Maintain 70 Margin

		7/28 ADL W/100 BDL		M/200		LINE AFTER (M.B.)		Wages	
		CLASSIC		BOOK		CURRENT		4x3	
QUANTITY		46,030	30,300	4,176	139,210	139,210	179,210		
RETAIL SELLING PRICE		\$365.95	\$447.53	\$410.36	59,341		\$419.09		
NET SELLING PRICE		\$196.24	239.59	230.04	31,208	31,208	320,774		
STANDARD MATERIAL									
MATERIAL VARIANCE									
STANDARD LABOR									
LABOR VARIANCE									
DIRECT EXPENSE									
GAS & POWER									
INDUSTRIAL RELATIONS									
GRATUITY REPAIRS									
TOTAL DIRECT COST									
SUPERVISION									
INDUSTRIAL RELATIONS									
FACTORY CREDITS									
INDUSTRIAL ENGINEERING									
DEPRECIATION									
P.E. & C. DIRECT									
FLOOR SPACE									
PROJECT COST									
OTHER DIRECT									
TOTAL MFG. O/H									
SUB-TOTAL									
PLANT OVERHEAD									
UNWARRANTED FACTORY COST									
FACTORY COST (COST DEF)									
SELLING & ADMINISTRATIVE									
TECHNICAL									
DISTRIBUTION									
COST BEFORE ADMIN. EXP.									
TOTAL COST									
EARNING BEFORE ADMIN. EXP.									
LESS ADMIN. EXP.									
PROFIT EARNINGS									
LESS TAX									
PLAN AMORTIZED ITC									
NET EARNINGS									
PRETAX MARGIN									
70% OF NET SELLING									

AL 0016434

1/100 East-Latch Mechanism

Cost Breakdown

— 2 Answers

2/10/80

Standard Material	\$ 43	(Estimated)
Material Variance	.05	(@ 12.2% - historical ratio)
Standard Labor	.65	(Estimated)
Labor Variance	.22	(38.5% - calculated by department based on 1979 experience)
Direct Charges	.30	(Estimated)
Industrial Relations	.43	(@ 47.9% of Labor + Labor Variance)
Other Direct Expense	.08	(Calculated based on historical status repair and gas & power ratios)
Additional Depreciation	.13	(@ 14.5% of project estimate)
Other Manufacturing Overhead	.23	(Calculated based on historical ratios)
Sub. Total	2.55	
Plant Overhead	.45	(@ 14.5% of subtotal - historical ratio)
Total Cost	\$ 3.00	

AL 0016436

M/700 Bolt Latch Mechanism

COST BY COMPONENT

T.R. Andrews

12/1/80

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part 2 drill press operations heat treat & color)	\$.168	\$.115	\$.038
Bolt Plug (existing part + 3 special machine operations & deburr)	—	.377	.169
Bolt Assembly (existing part + 1 mill oper.)	—	.053	.101
Firing Pin Assembly (existing part + assem. oper.)	—	.092	.0001
Detent Plunger (new part, heat treat & color)	.234	.0004	.0004
Detent Plunger Spring (new part)	.013	—	—
Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	\$.426	\$.6514	\$.2995

AL 0016437

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

cc: C. B. Workman
J. S. Martin
F. E. Martin
E. R. Owens

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

April 8, 1981

To: T. L. Capeletti
From: I. W. Bower *job*
Re: M/700 Bolt Lock - Manufacturing Costs

In October, 1980, Industrial Engineering issued a report on the cost of the M/700 Bolt Lock based on a PE & C estimate. Because of the seemingly high cost to manufacture this feature, the Research Process Development Group was asked to review. Exhibit 1 shows a comparison of costs based on estimates prepared by PE & C, Research, and a hypothetical best case.

The major difference between the Research and PE & C estimate is the labor cost to make the extra cuts in the Bolt Plug. PE & C estimated two special machines, the Research estimate provides for 1 machine, and, therefore, less labor input. This \$.21 difference is multiplied when labor variance, industrial relations, and overhead are added to it.

The "best case" condition assumes that the pin hole in the Bolt Latch can be moved so that the powder metal blank can be made to include the hole. This \$.11 savings in the direct cost to drill the hole is again multiplied by the various overhead accounts.

Two other approaches are possible. If a high strength plastic could be substituted for powder metal in the Bolt Latch, it may be possible to reduce the total cost of the feature by an additional \$.20 below the "best case". Finally, the possibility of an investment cast Bolt Plug could be investigated. It would be necessary to eliminate all of the added cuts in the investment cast blank, however, to show any significant savings.

JWB:ws
Firearms Research Division
Attach.

AL 0016438

53 of 80

M/700 BOLT LOCKMANUFACTURING COSTS

	<u>PE&C</u>	<u>R&D</u>	<u>BEST CASE</u>
Standard Material			
Bolt Latch	.17	.15	.15
Detent Plunger	.02	.02	.02
Detent Plunger Spr.	.01	.01	.01
Detent Retaining Pin	.01	.01	.01
Total	.21	.19	.19
Material Variance (12.2%)	.03	.02	.02
Standard Labor			
Bolt Latch	.12	.12	.01
Bolt Plug	.38	.17	.17
Bolt Assembly	.05	.03	.03
Firing Pin Assembly	.09	.07	.07
Final Assembly	.01	.01	.01
Total	.65	.40	.29
Labor Variance (38.6%)	.25	.15	.11
Industrial Relations (47.9%)	.43	.26	.19
Misc. Direct Exp (3.8%)	.06	.04	.03
Depreciation (7.5% Capital)	.13	.07	.07
Manufacturing Overhead (10%)	.18	.12	.09
Plant Overhead (17.5%)	.34	.22	.17
Price/Gun	\$ 2.28	\$ 1.47	\$ 1.16

DON'T SAY IT-WRITE IT

To T.L. CAPELETTI

Date 12/22/80

From G.D. CAMPBELL *GC*

RE: M/700 BOLT LATCH MECHANISM - Costs

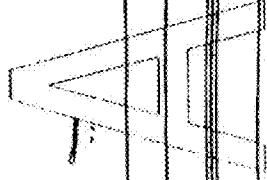
Attached are I.E. worksheets detailing the cost of adding this feature. If you have questions or wish to discuss this further, please contact me.

GDC:js
Attach.

"SAFETY RULES ARE PERFECT TOOLS"

AL0016440

55 of 80



41000 BOLT LATCH MECHANISM

Cost by Component

TR Address
1491150

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part & drill press operations, heat treat & color)	\$.168	\$.115	\$.038
Bolt Plug (existing part + 3 special machine operations & deburr)	—	.377	.169
Bolt Assembly (existing part + 1 mill open)	—	.053	.101
Firing Pin Assembly (existing part + assem. open)	A	.092	.001
Detent Plunger (new part, heat treat & color)	.234	.0004	.0004
Detent Plunger Spring (new part)	.013	—	—
Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	\$.426	\$.6514	\$.2985

AL 0016441

4/100 Bolt Latch Mechanism Cost Breakdown

T. R. Andrews
2/11/80

Standard Material	\$.43	(Estimated)
Material Variance	.05	(@ 12.3% - historical ratio)
Standard Labor	.65	(Estimated)
Labor Variance	.25	(38.6% - calculated by department based on 1979 experience)
Direct Charges	.30	(Estimated)
Industrial Relations	.43	(@ 47.9% of Labor + Labor Variance)
Other Direct Expense	.08	(Calculated based on historical grates repair and gas & power ratios)
Additional Depreciation	.13	(@ 7.5% of project estimate)
Other Manufacturing Overhead	.23	(Calculated based on historical ratios)
Sub-Total	2.55	
Plant Overhead	.45	(@ 17.5% of subtotal - historical ratio)
Total Cost	\$ 3.00	

AL 0016442

DON'T SAY IT—WRITE IT

To T.L. CAPELETTI

Date 12/22/80

From G.D. CAMPBELL *GC*

RE: M/700 BOLT LATCH MECHANISM - Costs

Attached are I.E. worksheets detailing the cost of adding this feature. If you have questions or wish to discuss this further, please contact me.

GDC:js.
Attach.

"SAFETY RULES ARE PERFECT TOOLS"

AL 0016443

58 of 80

W/200 Bolt Latch Mechanism

Cost by Component

12/11/80

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part 3 drill press operations heat treat & color)	\$.168	\$.115	\$.028
Bolt Plug (existing part + 3 special machine operations & deburr)	—	.377	.169
Bolt Assembly (existing part + 1 mill op.)	—	.053	.101
Firing Pin Assembly (existing part + assem. oper.)	—	.092	.001
Detent Plunger (new part heat treat & color)	.234	.004	.004
Detent Plunger - Spring (new part)	.013	—	—
Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	\$.236	\$.6514	\$.298

AL 0016444

4/100 Bolt Latch Mechanism Cost Breakdown

T.R. Andrews
12/1/80

Standard Material	\$.43	(Estimated)
Material Variance	.05	(@ 12.2% - historical ratio)
Standard Labor	.65	(Estimated)
Labor Variance	.35	(38.2% - calculated by department based on 1979 experience)
Direct Charges	.30	(Estimated)
Industrial Relations	.53	(@ 47.9% of Labor + Labor Variance)
Other Direct Expense	.08	(Calculated based on historical ratios repair and gas & power ratios)
Additional Depreciation	.13	(@ 7.5% of project estimate)
Other Manufacturing Overhead	.23	(Calculated based on historical ratios)
Sub-Total	2.55	
Plant Overhead	.45	(@ 17.5% of subtotal - historical ratio)
Total Cost	\$ 3.00	

AL 0016445

TITLE: BOAT LOCK
 DATE: 5-2-80
 DEVELOPED BY: Z. KONJALSKI

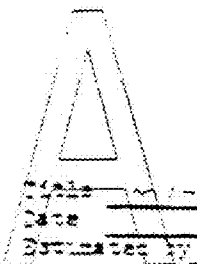
ESTIMATE

PREPARED BY: AL
 CHECKED BY: AL
 DATE: 5-2-80
 PROJECT NO: AL 0016446
 SHEET NO: 61 OF 80

ALL FIGURES IN \$		CAP.	OTHER.
1	INVESTIGATION		
	Investigation		
	Design		
	Model Making		
	Design Revision		
	Model, New Design		
	Manufacturing, Prototype Model		
	Manufacturing, Model		
2	PROCESSING		
	Process and, & Total Cost		
	Pilot Lot Costing		
3	TOOLING		
	Design	2000-	16000-
	Patterns & Molds	7000-	44000-
	Molds		
	Adjustable Tools		1000-
	Tool Revisions		18000-
	Process Costing		6000-
4	SPECIAL VENTURES		
	Construction	100000-	
	Design		
	Tooling		
	Manufacturing, Tooling		
	Revisions		
5	STRUCTURE VENTURES		
	Construction		
	Design		
	Tooling		
	Manufacturing, Tooling		
	Revisions		
6	SALES VENTURES & FINANCING		
	Manufacturing Time		
	Construction		
	Revisions		
	Cost Accounting		
	Machine Alterations		
	Pilot Lot Mfg		4000-
	Machine Maintenance		1000-
	Comm. Expenses		
	Design, New Alterations		
	Design & Material Costs		
	-- R&D		
	-- Plant	10900-	8700-
	TOTAL	119900-	95700-
	GRAND TOTAL	215600-	

AL 0016446

61 of 80



SECRET

Title: MITCHELL LOCK REVISION
Date: 2-13-80
Estimated by: G. CAMPBELL

GE FLETCHER
E. BURDICK
CO. HADCOCK
CO. WISE
B. BYANT
J. L. HUTTON
L. E. GOSWELL
J. T. A. L.
J. W. COOK
J. F. JOHNSON
A. L. HALL
R. F. COYLE

ALL FIGURES IN \$		CAP	OPER.
1	DEVELOPMENT		
	Investigation		
	Design		
	Model Making		
	Design testing		
	Models, for test		
	Development - Dryden Model		
	Development - Molds		
	Forming Molds, 1 of 1, 2nd		
2	PROCESS DEVELOPMENT		
	Process exp. & trial run		
	Pilot lot testing		
3	TOOLING		
	Design	1000-	2200-
	Patterns & Gages	1000-	
	Molds		
	Permanable tools		1000-
	Tool revisions		15000-
	Vendors tooling		3000-
4	SPECIAL MACHINES		
	Construction	212000-	
	Design	12000-	
	Tooling		
	Perishable tooling		
	Operations		
5	STANDARD MACHINES		
	Construction		
	Design		
	Tooling		
	Perishable tooling		
	Operations		
6	STANDARD MACHINES & EQUIP.		
	Construction		
	Operations		
7	MAINTENANCE		
	Machine alterations		
	Pilot lot exp.		3000-
	Machine reworkment		2000-
	Comp. obsolescence		3000-
	Design for advancing		
	Value & material costs		
	-- Mfg		
	-- Plant	23000-	8600-
	TOTAL	642000-	83000-
	GRAND TOTAL	725000-	

AL 0016447

A

John M.

5-24-80

W700 # Bolt Outer Cartridge Estimate

Bolt Assembly

Bolt Body

Patent Plugs

Pat. A.D.

Bolt Plug

For Gun

For Gun

SK-C-3550

SK-B-3549

SK-D-3551

SK

SK

Gang:

This is the estimate for the Bolt Body - other
assemblies, we will have for the 7/16". They are
now separated in. Can this be with the
Cartridge estimate.

John
10/10

John -
Work this up & issue to IE for estimate on its own.
They can add to BAC as separate item.

Trancho
JAC

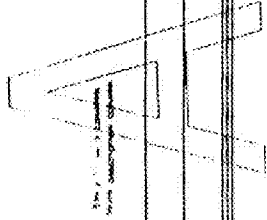
AL 0016448

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M1700 Bol-Latch Mechanism Cost Breakdown

T.R. Andrews
2/10/80

Standard Material	\$.63	35 (Estimated)
Material Variance	.05	01 (@ 12.2% - historical ratio)
Standard Labor	.65	40 (Estimated)
Labor Variance	.25	15 (30.6% - calculated by department based on 1979 experience)
Direct Charges	.30	30 (Estimated)
Industrial Relations	.43	40 (@ 47.9% of Labor + Labor Variance)
Other Direct Expense	.08	07 (Calculated based on historical status repair and gas & power ratios)
Additional Depreciation	.13	14 (@ 7.5% of project estimate)
Other Manufacturing Overhead	.23	23 (Calculated based on historical ratios)
Sub-Total	2.55	223
Plant Overhead	.45	40 (@ 17.5% of subtotal - historical ratio)
Total Cost	\$ 3.00	262
	1.62	
	1.38	



M/500 Bolt-Oper Mechanism

Cost by Component

12/1/80

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part, 3 drill press operations, heat treat & color)	\$.168	\$.115	\$.028
Bolt Plug (existing part + 3 special machine operations & deburr)	—	.377	.169
Bolt Assembly (existing part + 1 mill spec. case-strengthening)	—	.053	.101
Firing Pin Assembly (existing part + assem. oper.)	—	.092	.001
✓ Detent Plunger (new part, heat treat & color)	.034 1.032 1.176	.0004	.0004
✓ Detent Plunger Spring (new part)	.012	—	—
✓ Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	\$.426 - .179 .247	\$.6514	\$.2985

AL 0016450

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

MODEL 5-20-2

MODEL 44-3886 COMPONENT 11-11-11-11-11

DATE 5-29-82

COMPUTER ROYALSK

WASH DC

SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	NOTE: SAME AS PROPOSED ESTIMATE FOR BOLT ACTION CARBINE DATED 4-12-80 PLUS THE FOLLOWING OPERATION CHANGE				
77	ASSEMBLY ACTION				
16	TRY SAFETY -				
- ADD - CHECK ROFT LOCK - CLOSE BOLT - LOCK DOWN - MUST STAY IN LOCK POSITION - RELEASE RFT LATCH TO OPEN BOLT - CLOSE BOLT - LOCK DOWN FIRE - ROT LATCH MUST OPEN -					
TOTAL					

2025

3-3 8-8 3

AL 0016451

66 of 80

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL PERINE COMPONENT FILING P.J. ASSEMBLY PART NO.
 DATE 5-27-77 COMPUTER KOWALSKI SHEET 1 OF 1

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	NOTE				
	SAME AS PRESENT M1000 FILING P.J. ASSEMBLY # 28000 DECESS EXCEPT FOR THE ADDITIONAL OPERATION				
20	REMOVE DETENT PINNACLE	BENCH			
	SCREW DETENT PINNACLE WITH BOLT LATCH TO DETENT PIN (KOWALSKI)	REWORKING MACHINE	NEW	20	60
	ATTACH TEN BOLT LATCH FOR REWORK				
	TO DISCARD AREA				
S I C H					
TOTAL					

AL 0016452

(Sgt. Loh)

151-1000

CONFIDENTIAL

COMPETED KOWALSKI

Page 1 of 1

75742

3. 4. 4. 4. 4.

68 of 80

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

4-17-30 Actual

COMPONENT: DETECT PROPOSED KETAMINE

PART NO.

COMPUTER KONALSKI

SHEET 1 OF 1

[illegible][illegible]

1-10-53


AL 0016454

69 of 80

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL 00 COMPONENT Bolt Plug PART NO. SKD. 3002
 DATE 2-24-73 COMPUTER WUJALSKI SHEET 1 OF 2

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE SCREW MACHINE BLANK FROM VENDOR				
		EST REPECE - .584 EACH			
		TOOLING \$ 150.00			
	PURCHASE WIPERS	Gages	SM 20	—	—
		COND. SCREW	USU	8	—
12	MILL FILING PIN HEAD SLOT 2 FLATS ON BOTTOM	SAVE AS PRESENT M1700			
		PT# 17012			
15	MILL FILING PIN HEAD SLOT 2 FLATS ON BOTTOM AND SAFETY CLEARANCE	SAVE AS PRESENT M1600 FOR 15676			
		NOT REQUIRED IN M1700			
22	HAND REAM FILING PIN HEAD HOLE TO REMOVE BURR IN SLOT & BURR BOTH SIDES OF FILING PIN HEAD SLOT	SAVE AS PRESENT M1700 PT# 17012			
25	BUTT, SPOT-DRILL-REAM RETAINING PIN HOLE	6 STA. SPEC MACHINE INDEX TUBE			
	QTY'S: 100 PARTS/HOUR	MACHINE (CONE)	NEWLY 000	52.000	
	DELIVERY: 30-34 WKS	(FILING POWERS)			
		(CUTTING TOOLS ETC)			
		GAGES	USU	23	0.00
TOTAL					

AL 0016455

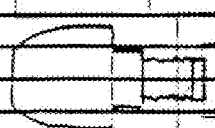
(Bolt Lock - Special Machines)
PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET
 * SEQUENCE OF OPERATIONS *

MODEL 100 COMPONENT BOLT PLUG PART NO. SK D.3604
 DATE 0-26-80 COMPUTER KOWALSKI SHEET 2 OF 2

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
(NEW) 25-8	LOAD & UNLOAD	USTA - SPEC. MACHINE			
	DEAL STAGNANT HOLE - 1/2 POS	INDEX TUBE			
	BUT DEAL - " - 1/2				
	DEAL " " 1/2	MACHINE	NEW	—	120,000
	ROUGH MILL SLOT (2 DEPTH)	(FIX - HOOPER - CUTTING TOOL)			
	FINISH MILL SLOT (2 DEPTH)	GAGES		70	200
	MACHINE CYCLE - 36 SEC (APPROX)				
	DELIVERY - 30-34 WKS				
(NEW) 26	BUT - DEAL TO DEPTH	REM. SPEC. LIVE MACHINE			
	DETENT PLUNGER HOLE	MACHINE		4000	20,000
	MACHINE CYCLE - 40 SEC (APPROX)				
	DELIVERY - 30-34 WKS	FIXTURE	NEW	50	1000
	(APPROX)	TOOLS	50 (NEW)	2	1500
		GAGES	NEW	40	110
	MAN DEBURR				
	BENCH				
29	SUPERSHARPEN	SAME AS 4/700			
31	DEGRASS	" " "			
32	NOTE BLACK & PLACE IN TRAYS	" " "			
33	100% POC COUNT				
	M. SUB. LOCKING				
	TOTAL				

(Bolt Lock)
PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

MODEL MISS 12 COMPONENT Bolt Plug PART NO. SK-D-2551
 DATE 5-17-84 COMPUTER KOWALSKI SHEET 1 OF 3

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE SCREW MACHINE BLANK FROM VENDOR				
	EST. PURCHASE - .58 PER INCH				
	EST. TOOLING - 150.00				
					
	PURCHASE INSPECTION	GAGES	STDAU	-	-
		COND SCREEN	WAL	9	-
12	MILL FILING PIN HEAD SLOT 2 FLATS OF BOTTOM	SAME AS PRESENT M1700 0.25" DIA. 0.125" DEEP 0.50" DIA. 0.25" DEEP			
(NEW) 15	MILL FLAT ON SIDE	0.25" DIA. MILLER	DE	EXTRA 75	
		FILTRICE CUTTER	NEW	25	135
		ARBOR	NEW	5	100.00
		GAGE	NEW	20	120
26	HAND REAM FILING PIN HEAD THIS TO REMOVE BURR IN SLOT 2 FLATS BOTH SIDES OF FILING PIN HEAD SLOT	SAME AS PRESENT M1700 ST # 17012			
TOTAL					

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL Bolt Plug COMPONENT Bolt Plug PART NO. 3551
 DATE 5/27/60 COMPUTER KOWALSKI SHEET 2 OF 3

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
(new) 15	LOAD & UNLOAD	7 STA SPEC MACHINE	1000 T-08		
	MIL FILING OF BAR LATH SWT				
	PERCUSS REBAR END	" " "	MACHINE COST	NEW	100,000
	DRILL 1/2" STARTING HOLE	FUTURE (7200)	"	70	27,000
	" 1/2" " "	PERCUSSIVE TOOLS	"	6	2500
	MIL SMALL SWT	TOOL HOLDERS	"	20	2750
	MIL FORM IN CENTER SECTION	GAGES	"	190	550
	CHECK TIME - 15 SEC (ASMT)				
(new) 16	BUTT & DRILL TO DENT DETENT PLUNGER HOLE	2-SPINDLE DRILL PRESS			
		DRILL DIA 1/4"	PAW WAD	60	120
		TOOLS 1/2"	"	2	8150
		GAGES 1/2"	"	40	110
(new) 17	BUTT SOUT DRILL - REM RETAINING DIA HOLE	4 SPINDLE DRILL PRESS			
		DRILL DIA 1/4"	JAW	60	120
		TOOLS 1/2"	SM 1/2"	6	2500
		GAGES 1/2"	"	35	95
(new) 18	DEBUR	BRUCH			
19	SHARPENING	(SAME AS 1700)			
TOTAL					

AL 0016458

(Foot Lock)
PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

417007
MODEL 3331 COMPONENT Bot Plug SK.D.
DATE 5/27-70 COMPUTER Kowalski PART NO. 3331
SHEET 2 OF 2

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
31	DR GRINDS	SAW AS 41700			
32	UPPER BLACK & PLACE IN TONGS	" " "			
33	INSPECT FOR WORK	" " "			
	TO SUB-ASSEMBLY				
<div>Handwritten notes and diagrams: - A large 'S' with 'IN' and 'OUT' arrows. - A large 'C' with 'IN' and 'OUT' arrows. - A large 'H' with 'IN' and 'OUT' arrows. - A large 'L' with 'IN' and 'OUT' arrows. - A large 'R' with 'IN' and 'OUT' arrows. - A large 'D' with 'IN' and 'OUT' arrows. - A large 'E' with 'IN' and 'OUT' arrows. - A large 'F' with 'IN' and 'OUT' arrows. - A large 'G' with 'IN' and 'OUT' arrows. - A large 'J' with 'IN' and 'OUT' arrows.</div>					
TOTAL					

AL 0016459

MODEL 100 COMPONENT BOAT LATCH PART NO. 10-2000
DATE 10-7-80 COMPUTER KOVALSKI SHEET 1 OF 1

RD-4268 1-18-63

AL 0016460

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

WCD = 12.5-15

COMPONENT Detent Flange Specs PART NO.

U R A B I Z O

100-44361-10

COMPUTER Kowalski

1000

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE FROM SPRING VENDOR				
		EST PIPELINE - 11 TH	N		
	FURNISHING MATERIALS	BENCH			
	TO DISPOSE 4 CGA				
	TOTAL				

100-000000

• 334 •

AL 0016462

77 of 80

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4/15/81

17012 } 11.957 labor } 69.357
57.400 material }
129.885 full factory

AL 0016463

78 of 80

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
RUPON

PETERS
RUPON

Xc: C. B. Workman
T. L. Capeletti

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

February 8, 1982

TO: J. S. Martin
FROM: F. E. Martin
SUBJECT: M/700 Fire Control Program

The program to complete this project beginning now could be completed by 1 September 1982:

- The completion of the testing of fire controls already in the Test Lab. These fire controls contain:
 - hardened triggers
 - trigger block plunger of 8640 material
- Fabrication and testing of fire controls having:
 - skeletonized housing
 - relieved sear
 - relieved triggers - design permitting
 - no trigger connector
- Research-Marketing agreement on implementation of change
- Design acceptance and transmittal

FEM:ws

AL 0016464

79 of 80

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G-88

DON'T SAY IT-WRITE IT

cc Fred Martin

To Tim Martin

From Tami C ✓

Date 2/10/86

re: M/700 Fire Control Program

We should schedule an early review of our plans with workman, Marketing, and Legal (+ Production?) to make sure they are aware of our direction for this design. To be completed by Sept. 1, 1986 means that we must have a specific design concept in mind by March 1st with at least one contingency. Therefore, we should be prepared for revisions by Mid-March.

"SAFETY RULES ARE PERFECT TOOLS"

H

AL0016465

80 of 80

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copy to → T. Capelletti &
 DON'T SAY IT-WRITE IT R. Sassone

To Joe Glas - Location _____
 From Clark Workman Location _____ Phone No. _____
 Subject Hummed Triggers - Sassone's memo of Oct 3/80 Date 10/13/80

I have referred this to T Capelletti's group for action. To answer Sassone's questions,

- (1) We must investigate this more fully
- (2) We do not warn about improper cleaning or improper lubrication of the fire control in our manual.

RB 778

STOP, LOOK, AND LIVE

PLAINTIFF'S
EXHIBIT

3030

AL 0017502

1 of 5

RDW: KEY. 2-28

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: R. B. Sperling
C. B. Workman
J. H. Linde

October 3, 1980

To: J. P. Glas
From: E. G. Larson
Subject: Gummed Triggers

Please see the attached from John Linde and Jack Chisnall, relative to lubricants gumming up trigger mechanism, resulting in a safety problem.

One of these relates to WD40, but I have also heard that the protective coating we use (Steel Guard) will also gum up in time, and freeze trigger components.

My question is, should this be investigated more fully, and do we properly warn in our instruction manuals?

E. G. Larson

EGL:lb

AL 0017503

DON'T SAY IT-WRITE IT

To E. LARSON - BDPT.
From J.P. BINDE - ILION

Date 9-30-80

RECEIVED

OCT 1 1980

E. G. LARSON

In regard to our telephone conversation, September 29, this is an example of what happens when the Trigger Assembly is oiled too much.

JPL:js
Attach.

"SAFETY RULES ARE PERFECT TOOLS"

AL 0017504

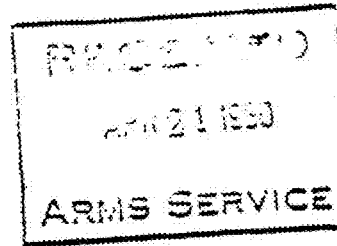
Sportsmen's Equipment Company

"DAN DWYER"

GUNS AND FISHING TACKLE

915 W. WASHINGTON STREET
SAN DIEGO, CALIFORNIA 92103

(714) 296-1501



John Dwyer
Remington Arms Company, Inc

1100, N.Y. 13357

ATT: Mr. Vic Rostokar

Dear Vic - While I'm working on it, and it is fresh in my mind: I had better write this. I have meant to before this but something else always interferes.

This is one of several Trigger difficulties of this same kind in recent months.

The customer brought this Mod 700 to me complaining that blamed thing fired when he released the safety. It only happened when the outside temperature was very cold. He had been hunting in Colorado at high altitude.

When I took it apart, I found it badly gummed up with WD-40 (confirmed by questioning him).

Nothing wrong with the Trigger except his own tampering. The gummy WD-40 and the cold weather.

AL 0017505

4 of 5

He had pulled the trigger when the safety was on, the gunny H'D-4s held it retracted and when the safety was switched off the inevitable happened.

We had several of these same cases in recent months.

All triggers were gummed up with rust preventative.

Please inform your engineering people.

Sincerely

Paul Wagner, Sr.

Daniel I. Dryden, Sr.

Recommendation recommended gunsm.

AL 0017506

REMINGTON ARMS COMPANY, INC. Trigger Assembly Special Replacement Program

(A)

GUNSMITH

GUN OWNER

Name Sportsmen's Equip
 Street 915 W. Washington St
 City, State, Zip San Diego, CA 92103
 Telephone _____
 (Area Code) _____
 Control No. 5914
 (For Rem. Use Only)

Name Robert Cole
 Street 2925 Pioneer Way
 City, State, Zip San Jose, CA 95135
 Telephone 784-461-1413
 (Area Code) _____
 Control No. _____
 (For Rem. Use Only)

(B) FIREARMS INFORMATION

Model (Check One)

- ☐ 1. Rem 600
☐ 2. Rem 660
☐ 3. Mohawk 600
☐ 4. XP-100

Caliber (Check One)

- ☐ 1. 222 Rem.
☐ 2. 6mm Rem.
☐ 3. 243 Win.
☐ 4. 308 Win.
☐ 5. 6.5mm Rem. Mag.

Caliber (Check One)

- ☒ 6. 350 Rem. Mag.
☐ 7. 35 Rem.
☐ 8. 223 Rem.
☐ 9. 221 Rem. "Fireball"
☐ 10. Rechambered

Serial No.

39783

(C) MODIFICATION INFORMATION

Method Gun Received From Owner:

(Check One)

- ☒ Hand Delivered
☐ UPS
☐ U.S. Mail
☐ Other _____
 (Specify)

Date Gun Received From Owner

Month Day Year
9 23 80

Estimated Completion Date

9 23 80

(D) INVOICE DATA

This gun was very badly gummed up through use of a gunny preservative. A warning should be put out against the use of such. There are several brands

Date Work Completed

9 23 80

I can't expect the gun to rise properly in such a condition.

Gunsmith Signature

Date

Charges: Modification Charge
 Transportation
 Other (Detail Below)

\$5.00

\$16.32

INVOICE COPY

(to be mailed for payment upon completion of work)

PLAINTIFF'S
EXHIBIT

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AL 0017508

1 of 1

REMINGTON ARMS COMPANY, INC.

W. C. Williams
J. P. Glass
J. E. Preiser
P. H. Holmberg
R. L. Hall
R. E. Linde
G. D. Campbell
R. B. Sperling

Bridgeport, Connecticut
April 30, 1981

TO: A. E. WORKMAN
FROM: W. B. FURSON, JR.
SUBJECT: MODEL REQUIREMENTS - MODEL 700 RESTYLE

Marketing has determined model requirements for the Model 700 restyle. They are as follows:

Model 700 ADL, 8 calibers: 22, 22-250, 243, 270, 30-06, 308, 7mm Mag

- New model designation - to be determined
- Model 700 action, without bolt lock
- New recessed magazine follower
- Floor plate
- No iron sights
- ADL stock with grip cap and high gloss finish
- Cut checkering, reduced pattern
- Sling swivel studs
- Remington scope mounts

Model 700 BDL, BDL L.E., Varmint Special

- Model 700 action, without bolt lock
- New recessed magazine follower
- Remington scope mounts

WBF:daf

REMINGTON ARMS CO.
RECEIVED

MAY 1 1981

ILLION RESEARCH DIVISION

PLAINTIFF'S
EXHIBIT

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AL0017551

1 of 1

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FIG #34

cc: R.L. Hall
 H.K. Boyle
 G.E. Fletcher
 J.C. Sutton
 J.H. Sweeney
 T.A. Capeletti
 J.P. Linda) In
 G.D. Campbell) Turn
 J.S. Martin) In
 F.E. Martin) Turn
 L.B. Bosquet) In
 G.J. Hill) Turn

Est. #4305

June 18, 1981

S.D. Bennett

M/700 Trigger AssemblyPresent Trigger Assembly vs. Proposed New Trigger Assembly

A high spot economic evaluation has been completed using the 1981 M/700 forecast comparing the present M/700 Trigger Assembly to a proposed new designed Trigger Assembly. The safety is revised in the proposed new Trigger Assembly, cutting off the locking arm and adding a countersink to actuate the new safety plunger when the "safe" is on. New designed side plates, trigger and a new stop screw and spring completes the proposed new Trigger Assembly.

The attached economic sheet indicates an annual cost increase of \$35,270 in operating cost. A cost increase of \$16,800 after amortization of operation charges of \$16,500 will be realized with total capital required of \$20,060.

Industrial Engineering Section
 R.W. Farrington, Jr., Supervisor

*\$0.15 per increase
 based on volume of 110,000*
 A.E. Desmond

By: A.E. Desmond

AED/kc
 Attached

H

PLAINTIFF'S
 EXHIBIT

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AL0017610

1 of 1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

SUPER

PETERS

SUPER

CC TCH

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

October 27, 1993

TO: BILL ERICSON

FROM: KEVIN CORNELL *KAC*

RE: RECENT REPAIR SURVEY

On a recent repair survey, a consumer commented on our "poor design of safety mechanism." It turns out the consumer had been hunting with the safety on and caught the gun on something and, of course, the bolt will open up.

When he sent the gun to repair, they installed a bolt lock safety switch. The consumer is now happy with the gun. I wrote back to him explaining that the feature allowing the bolt to be opened on safe was actually preferred by most consumers and so the guns are now produced so the bolt opens with the safe in any position.

Mr. Wiesner now understands our logic, no longer thinks this is a "poor design" and is happy to know he can have the bolt lock safety switch installed if he so desires.

Ken Green asked that I copy this material for you to show our consumer's confusion on this feature and how easily it can be interpreted as "poor design of safety mechanism."

KAC:tpg

xc: K.D. Green

PLAINTIFF'S
EXHIBIT

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AL 0017826
131

JONES, GILBREATH, JACKSON & MOLL

ATTORNEYS AT LAW

401 NORTH 7TH STREET

FORT OFFICE BOX 2023

FORT SMITH, ARKANSAS 72902-2023

ROBERT L. JONES JR.
C. C. GILBREATH
ROBERT L. JONES III
RANDOLPH C. JACKSON
KENDALL B. JONES
MARK A. MOLL
CHARLES R. GARNER JR.
DANIEL D. GILBREATH
CANDACE LYNN JONES

AREA CODE 501
FACSIMILE 782-9460
TELEPHONE 782-7203

ALSO LICENSED
IN OKLAHOMA

March 22, 1991



Jim Stickles
Remington Firearms
14 Hoefler Avenue
Ilion, NY 13357

Dear Mr. Stickles:

As I have advised you, Allen Cheek and I represent Evelyn Parks in a lawsuit against Darwin Lundeen.

There was an accidental discharge of a Remington Model 700 300 Winchester Magnum.

I told you the serial number on this rifle was 6871646.

You looked up this serial number and advised me that this rifle was sold to Sportsman Supply, Billings, Montana, and shipped on July 1, 1975.

In opposition to a motion for summary judgment that we filed on liability, the Defendant filed various documents including an affidavit of Robert J. Bauman and a copy of that affidavit with all attachments is attached hereto.

There was a videotape that came with the Robert J. Bauman affidavit and that videotape shows John T. Butters operating a Remington rifle.

I think what the videotape shows is Butters being able to cause the rifle to discharge on the release of the safety from the "safe" to the "fire" position.

The first part of the videotape is animated and shows the trigger mechanism.

What I would like to have, and I will have to hire an artist to make such a drawing if you do not already have such a drawing--I would like to demonstrate what it looks like when you put three rounds in the magazine and you have the rifle loaded with three rounds in the magazine and none in the chamber; and

PLAINTIFF'S
EXHIBIT

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then what it looks like when you operate the bolt and have two rounds in the magazine and one in the chamber. In other words, this would be a drawing that would show the magazine and show the spring that would keep the ammunition loaded in the magazine pushed up against the bolt.

In other words, this drawing would be to show the jury the meanings of the words: magazine, trigger mechanism, safety, and chamber so that when we are discussing the case it will mean something to the jury when we say that "three rounds were placed in the magazine and none in the chamber." Then with a cutaway drawing the jury would be able to quickly understand how the rifle was loaded.

Also, can you provide me with any information with reference to lawsuits that have been filed concerning alleged malfunction of the Remington 700 rifle? You will note that Bauman makes the statement that there have been many such lawsuits filed.

Also, a fact in our case is that Lundean, the Defendant, contends that the safety was always in the "on" position.

Have you ever been sued on an alleged malfunction of a Remington 700 rifle wherein the Remington 700 rifle malfunctioned while the safety was on and remained in the "on safe" position?

I have talked to two plaintiffs' attorneys who have pursued lawsuits against Remington and they have advised me, and based upon my own study, no one has ever contended that a Remington 700 rifle malfunctioned or discharged while the safety was on and remained on the "safe" position.

Yours very truly,

JONES, GILBREATH, JACKSON & MOLL

By

E. C. Gilbreath

E. C. Gilbreath

ECG/rh
cc: Allen Cheek

AL 0017828

2822

IN THE SUPERIOR COURT FOR THE STATE OF ALASKA

FOURTH JUDICIAL DISTRICT

EVELYN PARKS, individually and
the Natural Mother of and Next
Friend of JESSICA R. PARKS,
AND JESSICA R. PARKS,

Plaintiff,

vs.

DARWIN LUNDEEN, JOHN DOES I - V
and XYZ CORPORATIONS VI-XX,

Defendants.

Case No. 4FA-89-1452 Civil
(ABA No. 7410063)

AFFIDAVIT OF ROBERT J. BAUMAN

STATE OF ALASKA

FOURTH JUDICIAL DISTRICT

ss.

ROBERT J. BAUMAN, having been first duly sworn, does
hereby depose and state as follows:

1. That I over the age of 18 years of age and am in
every way competent to testify in the above entitled matter.

2. That I have personal knowledge of the facts
contained herein.

3. That if called to testify in open court, my
testimony would be the same as stated herein.

4. That I have been involved in the gunsmith trade for
over 35 years.

5. That I own and operate Fairbanks Gun and Repair,
located in the Regency Court Mall, 59 College Road, Suite 104,
Fairbanks, Alaska.

HUGHES THORNESS
DANTE POWELL & BRUNDIN
ATTORNEYS AT LAW
330 UNIVERSITY AVENUE
SUITE 200
FAIRBANKS, ALASKA 99701
TELEPHONE (907) 479-5181

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EXHIBIT E
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6. That I am familiar with all Remington bolt action rifles that have been manufactured in 300 Winchester magnum caliber, their operation, and their operational malfunctions.

7. A common malfunction associated with these firearms is a malfunction which is possible because of the design of their safety mechanism.

8. These rifles are manufactured with a sear-blocker type safety mechanism.

9. Because the firing pin/striker is not physically prevented from falling, this type of safety cannot prevent impact/jarring malfunctions which may result in the discharge of the firearm. This can occur without any actual defect in the mechanism. Additionally, this malfunction may occur to any of these firearms without any physical defect being present and without any identifiable change in the mechanism or operation of the firearm either prior to or subsequent to such a malfunction/discharge.

10. Specifically, this malfunction is possible because the safety mechanism, when engaged, merely prevents the sear from falling as opposed to mechanically preventing the firearm's striker/firing pin from falling.

11. The technical evaluation of the failure modes of the trigger mechanism of the Remington bolt action rifle is explained in detail in a failure mode Engineering Evaluation which was done by Engineering Consultants, Inc., signed by John T. Butter, P.E., and attached hereto. This failure mode

HUGHES THORNESS
SANTO PRAEL & BLANDIN
ATTORNEYS AT LAW
330 UNIVERSITY AVENUE
SUITE 200
PARKVILLE, ALABAMA 36867
TELEPHONE (205) 476-3141

SUBSCRIBED AND SWORN TO before me this 4th day of
March, 1991.

(SEAL)

LEL:SMO
206

Ernest E. Groan
Notary Public in and for Alaska
My Commission Expires: 3/1/91

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K
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HUGHES THORSNESS
DANTE ROGALL & BARNUM
ATTORNEYS AT LAW
580 UNIVERSITY AVENUE
SUITE 200
ANCHORAGE, ALASKA 99509
TELEPHONE 907.575.3170

Parks v. Lundeen
AFFIDAVIT OF ROBERT J. BAUMAN
Page 6 of 6

Case No. 4FA-89-1452 Civil

AL 0017834
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ENGINEERING EVALUATION

FAILURE MODES OF REMINGTON BOLT ACTION RIFLES

UTILIZING FIRE CONTROL SYSTEMS BUILT UNDER

U.S. PATENT NUMBER 2,914,981

ECI FILE NO. 6477

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Engineering Consultants

INC

1556 TOWNHURST DRIVE SUITE D • HOUSTON, TEXAS 77043 • (713) 466-7415

September 22, 1988

Re: Failure Modes of Remington Bolt Action Rifles
Utilizing Fire Control Systems Built Under
U.S. Patent Number 2,514,981
ECI File No. 6477

Abstract:

The Remington Model 700 and 600 type triggers built under the Remington/Walker patent have a basic design defect rooted in the susceptibility of their resiliently mounted connector pieces to either marginally engage the sear or to fail to engage it at all. Such a condition may result in inadvertent discharge of a loaded rifle upon closure or upon opening of its bolt or upon placement of its safety lever to the "fire" position. This often intermittent malfunction, especially when coupled with a safety design which forces the user to arm the rifle before unloading the chamber, presents an unreasonable hazard which outweighs the utility of the fire control mechanism in which it is employed. Due to its unusual susceptibility to intermittent and inadvertent release, the Remington

AL 0017836

A
ECF File No. 6477

2

M700 and 600 type trigger and fire control system is unsuitable for sale to and use by the general public in a hunting rifle.

Dear Mr. Miller:

In accordance with your request, the following report tabulates and comments upon the various modes of inadvertent discharge that are experienced by Remington bolt action rifles Model 721, 722, 725, 700, Sportsman 78, Seven, 40X, 600, 660, Mohawk 600 and the XP100 bolt action pistol.

All of these firearms utilize a common design of trigger mechanism and safety built under the U.S. patent number 2,514,981 issued to Phillip Haskell & Merle H. Walker on 11 July 1950 and assigned to the Remington Arms Co. The unique feature of this design which distinguishes it from all other commercially available bolt action trigger mechanisms is an independently acting resiliently mounted part called a trigger connector. This part is free to move with respect to the pivoted trigger body and is intended to be suddenly and precipitously moved forward by forces exerted by the main spring on the firing pin assembly and sear when the trigger is pulled to fire the gun. This motion of the connector releases the sear piece so that the sear no longer obstructs the forward motion of the firing pin which is then free to travel forward and forcefully strike and ignite the primer of a chambered cartridge. The connector is an intermediate part which

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provides a mechanical "avalanche" effect which in a properly regulated and adjusted Remington/Walker patent trigger yields an advantageously crisp trigger action.

The disadvantages of the Remington/Walker patent design are mechanical complexity and sensitivity to environmental influences and conditions of adjustment and maintenance. These conditions affect the moveable and resiliently mounted connector piece so that it may intermittently fail to properly support the sear. The design concept also forces adherence to rigorous standards of manufacturing dimensional quality control which are impossible to maintain with zero defects in actual practice. The necessity of enclosing the moving parts of the fire control mechanism in a structure with minimal clearances between moving and fixed parts likewise invites undesirable and critical interferences arising from the presence of minute amounts of debris and deteriorated lubricants and cleaning compounds.

All of the inadvertent discharge modes of the subject series of Remington bolt action rifles have their basis in the failure of the connector to securely capture the sear. The susceptibility of this small yet crucial member to critical displacement creates a condition which in my opinion renders trigger mechanisms using it unsuitable for use in hunting rifles sold for use by the general public. If, in addition, the safety mechanism forces the user to unload the rifle with

ECI File No. 6477

the safety in the "fire" mode, an additional measure of hazard by exposure to inadvertent discharge is created.

Adequate information concerning care, cleaning and adjustment of trigger mechanisms are vital to safe use of the firearms which employ them. Unless gunsmiths and firearms owners are in possession of sufficient data to enable them to fully understand the hazards presented by this particular design they are in no position to identify and avoid dangers contingent upon a mechanism malfunction.

With the foregoing provided as background data, the following modes of arriving at the failure of the connector to securely capture or engage the sear are offered:

Mode 1

Connector fails to engage the sear with adequate overlap creating a condition of marginal engagement between the sear and the trigger connector.

Cause(s)

1. Connector or trigger body held forward by field dirt, congealed lubricant, firing residues, or manufacturing debris.
2. Retarded trigger body return motion caused by interference between moving parts and fixed parts of the trigger assembly due to dimensional defects.
3. Inadequate trigger return action caused by improper preloading of trigger pull spring due to incorrect adjustment

ECY File No. 6477

5

of trigger pull adjustment screw or deterioration of trigger spring action.

4. Interference between the tip of the trigger over-travel screw and the hole in the front face of the connector resulting in the failure of the connector to return to a position of full engagement beneath the sear.

5. Improper adjustment of the sear engagement screw.

6. Displacement of trigger and connector with the safety in a mid position resulting in less sear lift than that necessary to allow the free return of the connector so that the connector fails to properly reengage the sear. This maneuver is called "tricking" by Remington.

Result(s)

The rifle fires upon bolt closure, initial bolt lift, impact, or rarely upon safety release. Firing on safety release is in Remington's terminology an "FSR". Firing upon bolt closure, or a "hard follow/down" is in Remington's terminology a "slam-fire". Firing upon mechanical impact is in Remington's terminology a "jar-off". All of these conditions result from marginal connector and sear engagement.

Mode 2

Connector fails to engage sear at all and is trapped or remains forward of sear engagement surface.

Cause(s)

1. Connector or trigger body held forward by field dirt, congealed lubricant, firing residues or manufacturing debris.

2. Retarded trigger body motion caused by interference between moving parts and fixed parts of the trigger assembly due to dimensional defects.

3. Inadequate trigger return action caused by improper preloading of trigger pull spring due to incorrect adjustment of trigger pull adjustment screw or deterioration of trigger spring action.

4. Interference between the tip of the trigger over-travel screw and the hole in the front face of the connector resulting in the failure of the connector to return to a position of full engagement beneath the sear.

5. Displacement of trigger and connector with the safety in a mid position resulting in less sear lift than that necessary to allow the free return of the connector so that the connector fails to properly reengage the sear. This maneuver is called "tricking" by Remington.

6. Dimensional mismatch caused by manufacturing defects allowing a vertical float on the trigger body of the connector in excess of the sear lift provided by the safety mechanism creating a condition enabling entrapment of the connector in the fire notch of sear. This condition is detectable without disassembly using the test Remington calls the "screwdriver test" in which the trigger is pulled with the safety in the

"safe" position and then released while maintaining an upward force on the lower limb of the connector which is visible through the trigger guard. The upward force is removed and if the firing pin then falls upon release of the safety to the "fire" position, a critical dimensional mismatch is shown to be present in the mechanism.

Result(s)

If the entrapment of the connector occurs with the safety in the "fire" position and the bolt open, a "soft" follow/down will occur as the bolt is closed and an inadvertent discharge is unlikely.

If the entrapment of the connector occurs with the rifle cocked and the bolt closed on a loaded chamber with the safety engaged, the only thing preventing release of the sear and the forward fall of the firing pin is the safety lug on the safety lever engaging the safety cam on the sear. When this support for the sear is removed by placing the safety to the "fire" position, as it must be to unload a rifle fitted with a bolt lock or to fire the rifle, the rifle will suffer an inadvertent discharge. This condition is called an "FSR" or a "trick" by Remington depending upon the events leading up to improper connector and sear engagement. All of these conditions result from the failure of the connector to engage the sear at all.

EC-File No. 6477

3

It is obvious that whatever name is given to the occurrence, the inadvertent discharge of the firearms involved results from an improper engagement of the trigger connector with the sear, a condition avoidable by the elimination of this design-induced susceptibility to malfunction.

Reference to the text of U.S. Patent number 2,514,981 indicates that the applicants for the patent were aware of the possibilities for malfunction of triggers built using those design features described in the patent. Column 1, lines 22 through 28 read:

"The value of any safety is proportional to the positiveness of its action. To this end we have found it to be essential that an inadvertent operation of the trigger while the safety is in "safe" will not condition the arm to fire upon release of the safety." Such a failure of the safety occurs during the maneuver called by Remington "tricking".

Lines 33 through 41 of Column 1 read:

"It is an object of our invention to provide a fire control having a safety which operates by positively moving the firing pin rearwardly out of contact with the sear and thereby releasably retaining it. In this way should the trigger be operated while the safety is engaged, the trigger and sear springs will immediately reposition the mechanism to catch the firing pin upon release of the safety." The failure

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ECI File No. 6477

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meet this claim occurs whenever and for whatever reason that the connector does not fully engage the sear.

In Column 4, the relationship of the trigger, connector and sear during the firing cycle are described and the results of their interaction are characterized in lines 50 through 52:

"This allows a clean crisp let-off closely approaching the target shooter's ideal without requiring any additional trigger movement after release is first instigated. These advantages of freedom from creep or slap with the short light trigger pull, crisp let-off and short lock time characteristic of negative angle sears have been achieved in a construction which is absolutely safe in the hands of the hunter or target shooter and rugged enough to remain so in spite of the abuse and neglect which are often heaped upon sporting arms."

Anticipation of adjustment and maintenance problems arising from conditions known to exist during field use of firearms is clearly enunciated.

These statements clearly show that the patent applicants appreciated not only the effect of care, maintenance and environmental influences upon the subject design of fire control but were aware that malfunction of critical members of the assembly could create a significant hazard. Subsequent data from the field in the form of gun examination reports, gunsmith interviews by Remington representatives and internal

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SUI File No. 5477

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data from final assembly and gallery proof testing provides strong indications that no matter what claims were made in the patent as issued, its realization was falling short of its intent and that Remington had hard data to support a rigorous and effective remedial program of action.

Remington through sworn statements of its corporate representatives denies the existence of a basic design defect involving the use of its unique trigger connector based design, although large amounts of engineering data clearly indicate that that feature is involved in virtually all inadvertent discharges of Remington firearms using triggers built under the Remington/Walker patent. Failure to identify and correct the basic defects of design resulting in inadvertent discharge of the subject Remington firearms are unexplainable from a technical standpoint and are failures of quality control at the engineering design level.

Very truly yours,

ENGINEERING CONSULTANTS, INC.

John T. Butters
John T. Butters, P.E.

JTB/jh

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16822

MINUTE #1 - 1979

LIMITED DISTRIBUTION

PRODUCT SAFETY SUBCOMMITTEE MEETING
JANUARY 2, 1979

PRESENT:

SUBCOMMITTEE

E. F. BARRETT, CHAIRMAN
J. G. WILLIAMS
E. HOOTON, JR.
R. A. PARTNOY

OTHER

R. B. SPERLING, ACTING SECRETARY

SAFE GUN HANDLING

It was reported to the Committee that in 1975, due to what we learned from a quality audit on the Mohawk 600, Remington instituted new inspection procedures for all center fire bolt action rifles which were designed to catch a gun capable of being "tricked" into firing when the safety lever is released from the "safe" position. "Tricked" in this context means, safety lever placed in between "safe" and "fire" positions, trigger is then pulled, and the safety lever is subsequently moved to the "fire" position and the gun discharges. The inspection procedures involve the following:

- (1) A visual check for adequate clearance between the sear and the connector.
- (2) Measurement of this clearance by use of a .005 shim.
- (3) Attempting to trick the gun--three times in assembly, three times in gallery and three times at final inspection.

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PRODUCT SAFETY
SUBCOMMITTEE MEETING

-2-

JANUARY 2, 1979

In addition to the above inspection procedures, Remington also changed the trigger assembly for the Model 600 family of guns by adopting Model 700 design features. Changes to the 600 included:

1. Going from a folded housing to an assembly consisting of side plates held together by rivets and spacer block.
2. Providing more lift to the sear.

No such changes were made in the design of the Model 700 because it already had those features.

Remington is confident because of the checks instituted in 1975, that bolt action rifles made during and after 1975 will not trick. Since June 1978, 500 post-1975 Model 700's have been returned to Ilion for repair for various reasons. Starting in June, Remington conducted a quality audit on these returned guns and none could be tricked.

During this same period (June 1978 to the present), two hundred pre-1975 Model 700's were returned to Ilion for repair, and it was found that two could be tricked (one because of insufficient clearance between sear and connector, and one because of a warped connector). Based on this sample, about 1% of the pre-1975 Model 700's in the field may be subject to tricking. There are about 2,000,000 pre-1975 Remington guns in the field with the Model 700 trigger assembly. (By comparison, it is noted that the 1975 quality audit indicated about 50% of the Model 600 family of guns in the field were susceptible to

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PRODUCT SAFETY
SUBCOMMITTEE MEETING

-3-

JANUARY 2, 1979

tricking.)

In addition to the above sample of 700's, 19 Model 700's have been returned to Ilion in response to the Model 600 recall with the complaint that the gun will fire when the safety lever is moved to the "fire" position. Remington found that only one of those guns could be tricked, the cause being insufficient clearance. Three other guns did fire with the safety being moved, but for reasons associated with owner alteration of the product. In one instance, an owner was about to return a gun for accidental discharge upon release of the safety; but just before sending the gun, the owner discovered that he was inadvertently pulling the trigger as he released the safety. It is suspected that this was also the case with the remaining 15 guns, since they were found to be in proper operating condition.

Remington has run quality audits on competitor bolt action rifles and has found that a large percentage of competitor models can be tricked. This includes some famous guns, such as the "Springfield" 30 caliber rifle, which was used in quantity in both World Wars.

The Subcommittee discussed the issue of tricking, as well as other causes of accidental discharge. It was decided that tricking, along with problems such as owner adjustment of the trigger engagement screw or the trigger adjustment screw, finger on the trigger when the safety is released, and trigger assembly alterations, are really problems more associated with abnormal use or misuse of the product rather than indication of a defective

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JANUARY 2, 1979

product. Consequently, a notice warning or a series of warnings against abnormal use or misuse, and highlighting safer gun handling procedures, is the most direct solution to the problem of accidental discharge.

The Subcommittee considered the possibility of recalling all pre-1975 Remington center fire bolt action rifles, many of which have been in the hands of the public well over several decades.

The Subcommittee decided against a recall for the following reasons:

1. Based on Remington's sample, only 1% of the pre-1975 Model 700 family of guns out in the field which number about 2,000,000 can be tricked. That would mean the recall would have to gather 20,000,000 guns just to find 20,000 that are susceptible to this condition.
2. An attempt to recall all bolt action rifles would undercut the message we plan to communicate to the public concerning proper gun handling. It would indicate that the answer to accidental discharge can be found entirely within the gun, when in reality only proper gun handling can eliminate injuries resulting from such occurrences.

The Subcommittee decided to recommend that an informational warning concerning accidental firing and safe gun handling be prepared and effectively communicated to the gun handling public. The Marketing, Legal and Public Relations Departments were to

PRODUCT SAFETY
SUBCOMMITTEE MEETING

-5-

(JANUARY 2, 1979)

coordinate their efforts, with possible help from outside consultants, in preparing such a notice.

Further meetings would be held to ensure that this informational program was launched effectively and expeditiously.

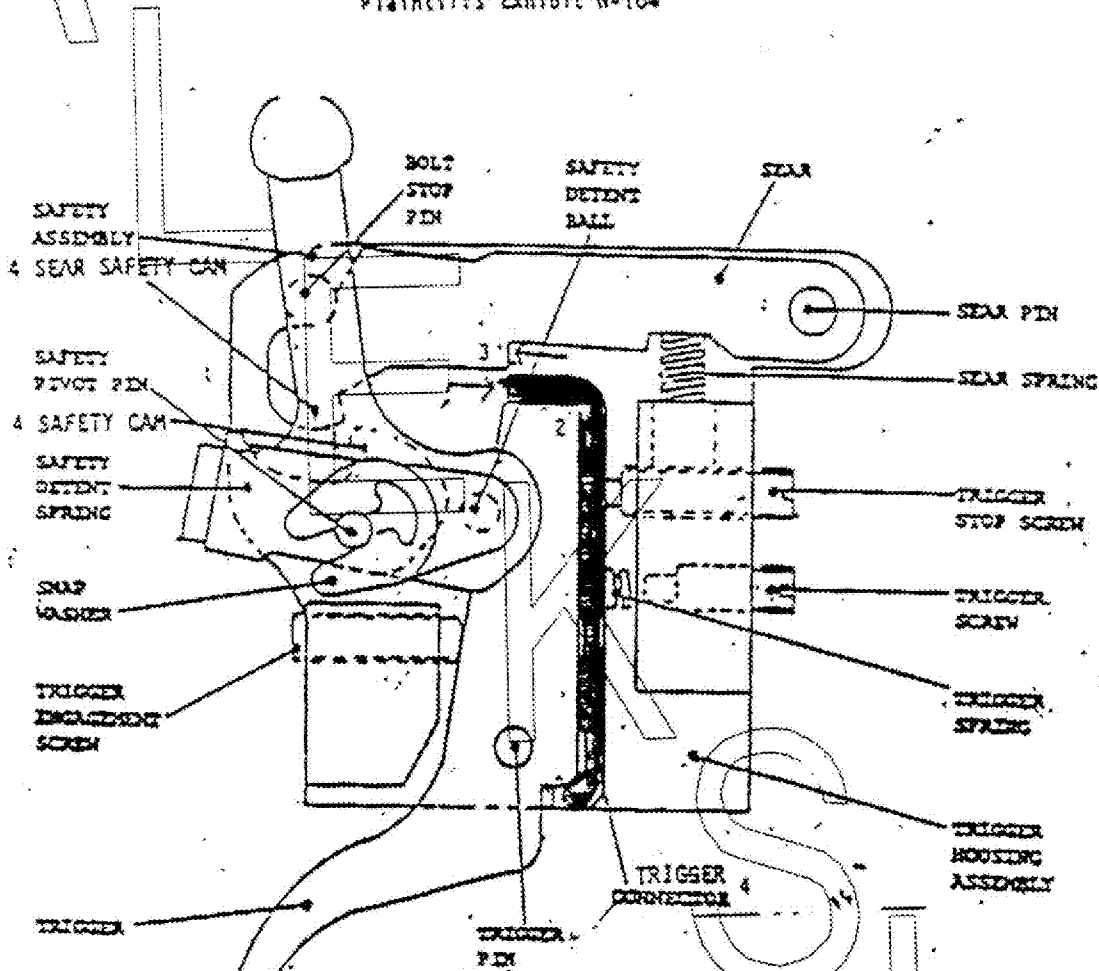
(Secretary's Note: The President approved these recommendations on January 2, 1979.)

R. B. Sperling
Acting Secretary

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21722

Appellees Addendum 6
Plaintiffs Exhibit G-104



Appellees Addendum 6
Plaintiffs Exhibit G-104

1. The safety cam rotates counterclockwise contacting the sear safety cam and lifting the sear from the trigger connector when the safety lever is moved forward to the on safe position. The sear lift in the Lewy rifle was .007 inches (T. 7/35).
2. This drawing does not show the vertical clearance between the trigger and trigger connector which was .010 inches in the Lewy rifle (T. 7/38).
3. The horizontal interference between the trigger connector and sear which was up to .003 (.010 -.007) inches in the Lewy rifle prevents the trigger connector from returning under the sear to provide support when the safety is moved to the off position (T. 8/52).
4. Appellees have added labels to G-104 in order to pictorially explain the function of the Walker fire control system and F3Rs to the Court.

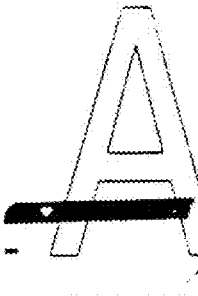
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2' PENDULUM DROP TEST
DATA SHEETS

PLAINTIFF'S
EXHIBIT
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HARD WOOD BACK STOP- 2' PENDULUM DROP TEST

MODEL 700

DATE 2-24-84

REPORT NUMBER 840321

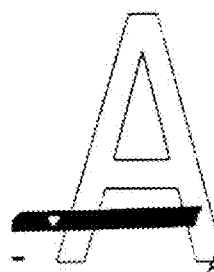
①

X - JAR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST	BUTT FIRST	TOP SIDE	BOTTOM SIDE	RIGHT SIDE	LEFT SIDE			
	SAFE POSITION →	S	F	S	F	S	F	S	F	
B6439317	1									1
B6439427	2					X				2
B6439303	3					X				3
B6440068	4					X				4
B6440047	5					X				5
B6440044	6					X				6
B6439446	7					X				7
B6439467	8					X				8
B6439976	9					X				9
B6439302	10					X				10

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HARD WOOD BACK STOP- 2' PENDULUM DROP TEST

MODEL 700

DATE 2-25-84

REPORT NUMBER 840321

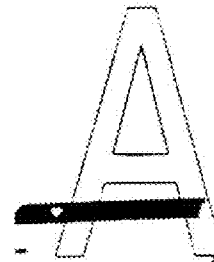
(2)

X = JTR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST		BUIT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE		
		SAFE POSITION →	S	F	S	F	S	F	S	F	S	F	S	
B 6439317	11									X				1
B 6439427	12									X				2
B 6439303	13													3
B 6440068	14													4
B 6440047	15									X				5
B 6440044	16									X				6
B 6439446	17									X				7
B 6439467	18													8
B 6439976	19									X				9
B 6439302	20													10

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HARD WOOD BACK STOP- 2' PENDULUM DROP TEST

MODEL 700

DATE 2-25-84

REPORT NUMBER 840321

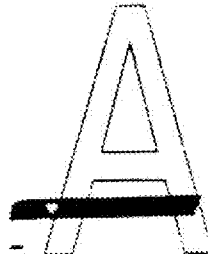
(3)

X-JAR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST		BUTT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE	
		SAFE POSITION →	S	F	S	F	S	F	S	F	S	F	
B6439317	21												1
B6439427	22								X				2
B6439303	23								X				3
B6440068	24								X				4
B6440047	25								X				5
B6440044	26												6
B6439446	27								X				7
B6439467	28												8
B6439976	29								X				9
B6439302	30												10

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HARD WOOD BACK STOP - 2' PENDULUM DROP TEST

MODEL 700

DATE 2-25-84

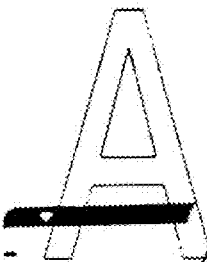
REPORT NUMBER 840321

(4)

X - JAR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST	BUTT FIRST	TOP SIDE	BOTTOM SIDE	RIGHT SIDE	LEFT SIDE			
	SAFE POSITION →	S	F	S	F	S	F	S	F	
B6439317	31									1
B6439427	32									2
B6439303	33					X	X			3
B6440068	34									4
B6440047	35					X				5
B6440044	36					X				6
B6439446	37					X				7
B6439467	38				X	X				8
B6439976	39					X				9
B6439302	40									10

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HARD WOOD BACK STOP- 2' PENDULUM DROP TEST

MODEL 700

DATE 2-27-84

REPORT NUMBER 840321

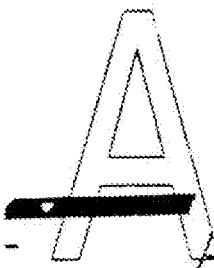
(5)

X = JAR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST		BUTT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE		
		SAFE POSITION →	S	F	S	F	S	F	S	F	S	F	S	
B6439317	41													1
B6439427	42									X				2
B6439303	43							X						3
B6440068	44													4
B6440047	45									X				5
B6440044	46													6
B6439446	47													7
B6439467	48									X				8
B6439976	49									X				9
B6439302	50							X		X				10

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HARD WOOD BACK STOP - 2' PENDULUM DROP TEST

MODEL 700

DATE 2-23-84

REPORT NUMBER 840321

(6)

X = JAR OFF

GUN SER #	UNIT NO.	MUZZLE FIRST		BOT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE		
		SAFE POSITION →	S	F	S	F	S	F	S	F	S	F		
B6439317	51									X				1
B6439427	52									X				2
B6439303	53									X				3
B6440068	54													4
B6440047	55									X				5
B6440044	56													6
B6139446	57													7
B6439467	58													8
B6439976	59													9
B6439302	60													10

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4' PENDULUM DROP TEST
DATA SHEETS

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-20-84

REPORT NUMBER 840321

X = JAR OFF

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GUN SER #	UNIT NO.	MUZZLE FIRST		BUTT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE	
		SAFE POSITION	S	F	S	F	S	F	S	F	S	F	
B 6439317	1								X				
B 6439427	2								X				
B 6439303	3								X				
B 6440068	4								X				
B 6440047	5								X			X	
B 6440014	6								X			X	
B 6439446	7								X				
B 6439467	8								X				
B 6439976	9								X				
B 6439302	10								X				

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-20-84

REPORT NUMBER 840321

X = JAR OFF

(2)

GUN SER #	UNIT NO.	MUZZLE FIRST	BUTT FIRST	TOP SIDE	BOTTOM SIDE	RIGHT SIDE	LEFT SIDE	
		SAFE POS. T. 101	S	F	S	F	S	F
B 6439317	11					X		1
B 6439427	12					X		2
B 6439303	13						X	3
B 6440068	14					X		4
B 6440047	15					X		5
B 6440044	16					X		6
B 6439446	17				X	X		7
B 6439467	18				X	X		8
B 6439976	19					X		9
B 6439302	20					X		10

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-21-84

REPORT NUMBER 840321

X = JNR OFF

(3)

GUN SER #	UNIT NO.	MUZZLE FIRST		BOT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE		
		SAFE POSITION →	S	F	S	F	S	F	S	F	S	F		
B 6439317	21									X				1
B 6439427	22									X				2
B 6439303	23									X				3
B 6440068	24									X				4
B 6440047	25									X				5
B 6440044	26									X		X		6
B 6439446	27									X				7
B 6439467	28							X		X				8
B 6439976	29									X				9
B 6439302	30									X				10

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL D00DATE 2-21-84REPORT NUMBER 840321

X - JAR OFF

(4)

GUN SER #	UNIT NO.	MUZZLE FIRST		BUTT FIRST		TOP SIDE		BOTTOM SIDE		RIGHT SIDE		LEFT SIDE		
		SAFE POSITION	S	F	S	F	S	F	S	F	S	F		
36439317	31			E						X				1
86439427	32					K				X				2
B6439303	33									X				3
B6440062	34									X				4
B6440047	35							S		X				5
B6440044	36									X			X	6
B6439446	37									X				7
B6439467	38								X	X				8
B6439976	39									X				9
86439302	40								X	X			H	10

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-21-84

REPORT NUMBER 840321

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(5)

GUN SER #	UNIT NO.	Muzzle		Butt		Top Side		Bottom Side		Right Side		Left Side		
		SAFE POSITION	FIRST	FIRST	FIRST	SIDE	SIDE	SIDE	SIDE	SIDE	SIDE	SIDE	SIDE	
B6439317	41								X					1
B6439427	42							X	X					2
B6439303	43							X	X					3
B6440068	44								X					4
B6440047	45							X	X					5
B6440044	46							X	X					6
B6439446	47								X					7
B6439467	48							X	X					8
B6439976	49								X					9
B6439302	50								X					10

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-22-84

REPORT NUMBER 840321

X = JAR OFF

(6)

GUN SER #	UNIT NO.	MUZZLE FIRST	BUTT FIRST	TOP SIDE	BOTTOM SIDE	RIGHT SIDE	LEFT SIDE			
	SAFE POSITION →	S	F	S	F	S	F	S	F	
B6439317	51						X		X	1
B6439427	52						X			2
B6439303	53						X			3
B6440068	54						X			4
B6440047	55						X			5
B6440044	56						X			6
B6439446	57						X			7
B6439467	58						X			8
B6439976	59						X			9
B6439302	(60)									10

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AL 0018485

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4' HARD WOOD BACK STOP PENDULUM DROP TEST

MODEL 700

DATE 2-22-84

REPORT NUMBER 840321

X = JAR-OFF

(7)

GUN SER #	UNIT NO.	MUZZLE FIRST	BUTT FIRST	TOP SIDE	BOTTOM SIDE	RIGHT SIDE	LEFT SIDE			
	SAFE POS. 7.00	S	F	S	F	S	F	S	F	
B6439317	61					X				1
B6439427	62					X				2
B6439303	63				X	X				3
B6440068	64					X				4
										5
										6
										7
										8
										9
										10

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AL 0018486

16817

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Report No. 840321

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING		
<input type="checkbox"/> Developmental	<input checked="" type="checkbox"/> Safety Related	<input type="checkbox"/> Litigation
<input type="checkbox"/> Design Acceptance	<input type="checkbox"/> Competitive Evaluation	<input type="checkbox"/> Warehouse Audit
<input type="checkbox"/> Pre-Pilot	<input type="checkbox"/> New Design	<input type="checkbox"/> Cost Reduction
<input type="checkbox"/> Pilot	<input type="checkbox"/> Design Change	State <input type="checkbox"/>
<input checked="" type="checkbox"/> Production Acceptance	<input checked="" type="checkbox"/> Plant Assistance	Other <input type="checkbox"/>

FIREARM STATS.	REPORT REQ'D.	DATE REQUESTED:
MODEL: <u>M/700</u>	<input type="checkbox"/> FORMAL	<u>2/1/83</u>
CAL. or GAGE: <input type="checkbox"/>	<input checked="" type="checkbox"/> TEST RESULTS ONLY	DATE NEEDED BY: <u>ASAP</u>
BARREL TYPE: <input type="checkbox"/>		REQUESTED BY: <u>JAL</u>
PROOFED: YES <input type="checkbox"/> NO <input type="checkbox"/>		WORK ORDER NO: <u>G-0460</u>

TEST TYPE		
<input type="checkbox"/> Strength Test	<input type="checkbox"/> Ammunition Test	<input type="checkbox"/> Dry Cycle Test
<input type="checkbox"/> Function Test	<input type="checkbox"/> Environmental Test	<input type="checkbox"/> Measurements
<input type="checkbox"/> Accuracy Test	<input type="checkbox"/> Customer Complaint	<input checked="" type="checkbox"/> Other <u>Drop Test</u>
	<input type="checkbox"/> Endurance Test	

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Determine if there is a functional difference in the vendor supplied connectors and connectors that are to model drawing.

Contact Jeff for test procedure

GUNS REQUIRED: 10 M/700 Guns/Actions
60 M/700 Fire Controls
approx 60 Scrap Stocks

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: ☐
TEST COMPLETED BY: ☐
REPORT DATE: ☐

AL 0018487

17817

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms M700 Cock and Fire SimulationABSTRACT

C.E. Ritchie requested that the Test Lab conduct a cock and fire evaluation on five spray lubricants.

1. Du Pont - Synthetic Diester
2. Krylon - Ten - 4
3. Sprayon - 711
4. CRC - 3-36
5. Houghton - HLP

These five lubricants were selected for evaluation from the results of a preliminary evaluation conducted by A.B. Hughes, Senior Consultant, ESD Maintenance Engineering Group, Du Pont. A copy of his evaluation for each of the five lubricants is located in Appendix "C".

SCOPE OF TEST

To compare the five lubricants in a Model 700 cock and fire simulation test.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant, the following results were obtained.

LUBRICANTAVERAGE CYCLE LIFE (5 Samples)

- | | |
|--------------------------------|-------------|
| 1. Du Pont - Synthetic Diester | 21,181 cys. |
| 2. Sprayon - 711 | 17,645 cys. |
| 3. CRC - 3-36 | 14,382 cys. |
| 4. Houghton - HLP | 8,333 cys. |
| 5. Krylon - Ten-4 | 2,830 cys. |

PLAINTIFF'S
EXHIBIT

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REPORT TEXT

A. Trigger pull, sear lift, sear engagement, safe on, safe off, and bolt lift measurements were taken on each test vehicle at the start of the test, and at 5000 cycle intervals. Remington specifications for the M700 components used are:

- | | |
|---------------------|-------------------|
| • Trigger Pull | 3½ lbs. - 6½ lbs. |
| • Sear Lift | .005" - .018" |
| • Sear Engagement | .015" - .020" |
| • Safe "On" - "Off" | None Established |
| • Bolt Lift | None Established |

Refer to Appendix "A", data sheets No. 1 through No. 5, for individual results.

The Rc hardness was measured, at the cocking cam area, on each M700 bolt.

Refer to Appendix "A", data sheet No. 6, for individual hardness, lubricant used, simulator used and cycles completed.

A graphical analysis comparing the lubricants tested to their cycle life, and their cycle life to the simulator used is found in Appendix "B".

TEST PROCEDURE

A. Measurements

1. Trigger Pull
Trigger Pull measurements were conducted using a Chatillon Model IN-10 pull scale.
2. Sear Lift and Sear Engagement
Sear lift and sear engagement measurements were conducted using a Model FC-14 optical comparator and measuring machine.
3. Safe "ON" and "OFF" Forces.
Safe On and Off forces were taken using a Chatillon Model DPP-25, push-pull scale.
4. Bolt Lift
Bolt lift forces, both cocked and fired, were taken utilizing a Chatillon Model 80D pull scale mounted on a machine designed to be used for bolt lift measurements.
5. Rc Hardness
The Rc hardness measurements were taken by George Catta, a production inspector, utilizing a Wilson Rockwell Hardness Tester.

B. Lubrication - (Pictorial presentation - Appendix "D")

1. Lubrication Points

- a. Receiver: Locking lug area.
Track on receiver tang.
- b. Bolt: Cocking cam
Locking lugs
- c. Firing Pin: Threads
Striker radius and track.
- d. Trigger Assembly: Sear safety cam face.
Interior of trigger assembly, through sear inspection hole.

2. Lubrication procedure

- a. Components to be lubricated were completely degreased, using the solvent degreasing tanks located in our Heat Treat Department.
- b. The interior of the trigger assembly was lubricated by holding the spray can to direct the spray into the sear inspection hole. Duration of spray approximately 1 second.

NOTE: The two position nozzle on Du Pont aerosol can was more difficult to control for pin point application, than the standard plastic tubes on the other samples. (Pictorial example included.)

2. Lubrication Procedure - continued

- c. All other lubrication points were lubricated by holding the aerosol can approximately six inches away from the area to be lubricated and covering the area until a thin layer of lubricant forms on the surface. Duration of spray; approximately 1 second.

C. Pictorial Presentation

1. Lubrication points and procedures.
2. Cocking cam, sear face, and striker radius and track areas were photographed at the start and completion of the test and are available on request.

A L E K S I C H

APPENDIX A
(Data Sheets)

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7-10 MARBLE 4 ONE LUBRICANT

DATA SHEET

		TRIGGER	SEAR	SEAR	SAFE	SAFE	SEAR	
		PULL	LIFT	ENGAGEMENT	ON	OFF	ON	OFF
REM. STRENGTH		34-64 lbs	.006"-.012"	.015"-.020"	(lbs)	(lbs)	(lbs)	(lbs)
1	DUPONT	(AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
2	711							
3	APC							
4	NLP							
5	TEN 4							
cycles	1	6.00	.009	.0125	6.00	4.50	4.00	8.00
	2	5.00	.006	.018	7.50	4.75	3.00	6.00
	3	6.00	.012	.012	7.00	4.50	3.00	7.00
	4	6.75	.0095	.016	7.50	6.75	2.50	7.00
	5	5.50	.008	.016	7.50	5.50	3.50	7.00
cycles	1	5.25	.0095	.0215	6.00	4.50	3.50	7.00
	2	5.00	.0065	.019	5.75	4.00	3.50	6.00
	3	5.75	.013	.020	5.00	4.00	3.00	8.00
	4	6.25	.0095	.020	6.75	6.25	2.50	8.00
	* 5	5.00	.009	.020	5.75	4.00	3.50	13.00
cycles	1	5.50	.011	.025	5.75	4.25	3.50	7.00
	2	4.75	.0065	.019	5.25	4.00	2.50	6.50
	* 3	6.00	.013	.023	6.25	3.75	3.00	15.00
	* 4	6.00	.0095	.021	6.50	5.75	3.00	25.00
	5	-	-	-	-	-	-	-
cycles	1	5.50	.011	.026	5.50	4.25	4.00	7.25
	2	4.75	.0075	.019	5.00	4.00	3.00	7.00
	3	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
cycles	1	5.50	.011	.0265	5.50	4.00	4.00	9.25
	2	4.75	.009	.019	5.25	4.50	3.00	6.50
	3	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
cycles	* 1	5.25	.011	.0285	5.50	3.75	4.00	14.00
	* 2	4.50	.0095	.021	5.25	4.00	2.50	7.00
	3	-	-	-	-	-	-	-
	4	-	-	-	-	-	-	-
	5	-	-	-	-	-	-	-
* 1		COMPLETED 25,000 cycles						
* 2		COMPLETED 25,000 cycles						
* 3		FAILED 8317 cycles						
* 4		FAILED 6115 cycles						
* 5		FAILED 2788 cycles						
DATA SHEET 2								

DATA SHEET 2

701-413-6145

SECRET

--- 1120 Sample of Cash Receipt

	PULL	SEAR	YEAR	SFES	JARE	BOLT - LIFT
	PULL	LIFT	DURAGEMENT	ON	OFF	COCKED FIRED
	74-64114	005-018	015-020	(lbs)	(lbs)	(lbs) (lbs)
1 DEPART	(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
2 711						
3 ORR						
4 HLP						
5 TEN 4						
1	5.75	.007	.015	7.25	4.50	2.50 6.50
2	6.00	.008	.015	7.50	7.50	2.50 8.25
3 cycles	6.25	.008	.017	6.75	5.50	3.00 7.00
4	5.75	.0125	.0195	8.00	5.50	3.00 7.00
5	5.50	.008	.015	8.00	5.00	2.50 6.00
10000	6.25	.009	.019	6.50	4.25	2.00 6.00
cycles	5.25	.009	.021	5.25	7.50	3.50 6.50
3	6.25	.0105	.0175	7.25	4.00	3.00 9.00
4	5.75	.0125	.021	7.00	5.00	3.00 10.00
* 5	5.50	.013	.021	6.00	3.75	2.50 18.00
10000	6.00	.0110	.020	6.00	3.75	2.00 5.50
cycles	5.25	.009	.021	7.00	6.00	3.50 7.00
3	6.00	.015	.0195	6.75	4.75	3.00 10.00
* 4	5.75	.0125	.0225	6.50	4.50	3.50 5.00
5	-	-	-	-	-	-
15000	5.25	.0115	.020	5.75	4.00	2.00 6.50
cycles	5.50	.0095	.022	6.50	5.50	4.00 14.00
* 3	6.50	.015	.0195	6.75	4.00	3.00 15.00
4	-	-	-	-	-	-
5	-	-	-	-	-	-
20000	5.75	.0115	.020	6.00	4.00	2.00 6.00
cycles	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
25000	6.00	.0115	.021	6.25	3.75	2.00 12.00
cycles	-	-	-	-	-	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
* 1	Completed 25,000 cycles					
* 2	Failed 15,140 cycles					
* 3	Failed 10,410 cycles					
* 4	Failed 6,788 cycles					
* 5	Failed 2,484 cycles					
						DATA SHEET 3

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A L E K S I C

APPENDIX B
(Graphic Presentation)

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APPENDIX C

(Previous Evaluation)

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A

Test # 20

Product: Du Pont - Synthetic Diaster - 20%

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Synthetic chemical oily smell, not lasting
2. Feel: Light oily feel
3. Drying Rate: Slow drying
4. Penetration: Rapid penetration and spreading, clear color
5. Surface Wetting: Local wetting, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, no dissolving, good cleanup
7. Type Container: 4 oz aerosol, nozzle with straw
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Wet look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Excellent
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
 - Test 1 - 7
 - Test 2 - 7
 - Avg - 7.0
17. Reason for Elimination: Continue testing

A

Test # 14

Product: Sprayon #111 Penetrant/Lube/Moisturize

Function: Multipurpose, prevents rust
displaces moisture and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Very oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Slow spreading, but continuous, clear color
5. Surface Wetting: Minimum spreading, removes oxidation, bright
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Very watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
 - Test 1 - 6
 - Test 2 - 5
 - Avg - 5.5
17. Reason for Elimination: Continue testing

A

Test # 15

Product: CRC - 3-35

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Pleasant peppermint smell, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Medium penetrating and spreading, tan color
5. Surface Wetting: Slow spread, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, some dissolving, easy cleanup
7. Type Container: 1 oz aerosol, nozzle
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 4

Test 2 - 5

Avg - 4.5

17. Reason for Elimination: Continue testing

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Test # 11

Product: E. F. Bouchon - ELP All Purpose

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Fly spray smell, not lasting
2. Feel: Oily feel
3. Drying Rate: Rapid drying
4. Penetration: Rapid spreading, med. spreading, tan stain
5. Surface Wetting: Slow spreading, rapid dry to oily film, hard to clean
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Waxy, dark tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oil look, no rust within 24 hours
11. Rust Removal: No rust removal
12. Displace Moisture: Poor
13. Displace Solids: Fair
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:
 - Test 1 - 8
 - Test 2 - 5
 - Avg - 6.5
17. Reason for Elimination: Continue testing

Test # 13

Product: Krylon - Tan 4

Function: Multipurpose, prevents rust
Displaces moisture, gums, dirt and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Rapid absorption and spreading, dark tan stain
5. Surface Wetting: Slow spreading, oily appearance, good cleanup
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 11 oz aerosol, nozzle with spray
8. Liquid Appearance: Dark tan, watery
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Damp look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Good
13. Displace Solids: Good
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:
 - Test 1 - 8
 - Test 2 - 5
 - Avg - 6.5
17. Reason for Elimination: Continuous testing

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APPENDIX D
(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test.
(Available upon request.)

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C

H

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Distribution: C.B. Workman
C.E. Ritchie
J.P. Linde
J.W. Brooks
R.J. Pohl
Petroleum Lab
Chambers Works
A.B. Hughes
ESD - Louviers

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331 - Supplement No. 2

Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M/700 and M/1100)

Prepared by: (F.L. Supry)

Date Prepared: 5/2/82

Proofread and Cleared By:

J.H. Hennings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

R.E. Nightingale 5.26.82
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Mech. & Mech. Analysis Lab

C.E. Ritchie 5/26/82
Signature Date

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TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331 - Supplement No. 2
REPORT TITLE: Evaluation of Lubricants on Firearms
MODEL(S): Environmental / Cold Tests (M700 and M1100)
GAUGE OR CALIBER: M/700 and M/1100

DATE: 5-2-82

WORK ORDER NO.:

PART NAME:

DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS _____ TARGET: _____

RIM FIRE _____ CENTER FIRE _____

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REMINGTON ARMS COMPANY, INC.
Firearms Research Division

May 25, 1982

TO: J.H. Hannings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms
Environmental/Cold Tests (M700 and M1100)

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct Environment/Cold Tests on three spray lubricants.

1. Du Pont - Synthetic Diester
2. Sprayon - 711
3. CRC - 3-36

NOTE: Krylon Ten-4 and Houghton HLP were eliminated from further testing due to their poor performance in the M700 cock and fire simulation test.

SCOPE OF TEST

To compare the three lubricants in an environmental/cold test.

TEST RESULTS

In their order of finish, from the best performing to the poorest performing lubricant, the following results were obtained: Du Pont - Synthetic Diester

CRC - 3-36

Sprayon - 711

The following is a brief synopsis of each phase of the environmental/cold test.

1. Firearm function as removed from freezer after 3 hours at -20° F.

Du Pont	No failures to function occurred.
CRC	1 failure to function occurred.
711	2 failures to function occurred.

2. Rust inspection at completion of test.

Du Pont and CRC	Very little rust.
711	Greater amount of rust

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TEST RESULTS - continued

3. Firearms function during firing of 100 rounds per day.
There were no malfunctions or failures during this phase of the test. All lubricants were equal.
4. Belt Velocity Measurements
Measurements indicate that the lubricants all performed equal during this phase of the test.
5. Firearm function as removed from roof after 3 hours exposure to environment.
Lubricants all performed equal during this phase of the test.
6. Firearm function as removed from roof after 64 consecutive hours of exposure to environment.
Du Pont and CRC - No failures to function occurred.
711 Actions frozen.

REPORT TEXT

- A. Bolt velocity measurements were taken at the start of the test and each morning during the test. Refer to Data Sheet No. 1 in Appendix A for individual results.
- B. Trigger pull, firing pin indent, sear engagement, sear lift, safe on, safe off, and bolt lift measurements were taken at the start and completion of the test. Refer to Data Sheet 2 in Appendix A for individual results.
- C. Trigger pull and firing pin indents were taken each day after the guns had remained in the freezer at 20°F . for three hours. Refer to Data Sheet 3, Appendix A, for individual results.

D. Weather conditions during test:

3/29	Sunny 45°F .	
3/30	Sunny 55°F .	
3/31	Rain 50°F .	
4/1	Flurries 30°F .	
4/2	Sunny, windy 35°F .	3 hours exposure each day.
4/3	Rain, freezing rain 38°F to 20°F .	} Week-end exposure
4/4	Snow 20°F to 15°F .	

TEST PROCEDURE

- A. All rifles and shotguns selected to be used in the test were disassembled and degreased, using the solvent degreasing tanks located in our Heat Treat Department.

Each gun was lubricated with the assigned lubricant and reassembled.

1. At 8:00 A.M. each day bolt velocity measurements were taken by the Measurements Lab, utilizing the photo-diode transducer system.
2. 100 rounds were fired through each gun.
3. All guns were exposed to the environment by being placed on the roof for 3 hours each day.
4. They were then placed in a freezer at -20°F . for 3 hours. Trigger pull and firing pin indents were taken as guns were removed from the freezer.
5. The guns were placed in a stress coat oven at 120°F . overnight (16 hours).

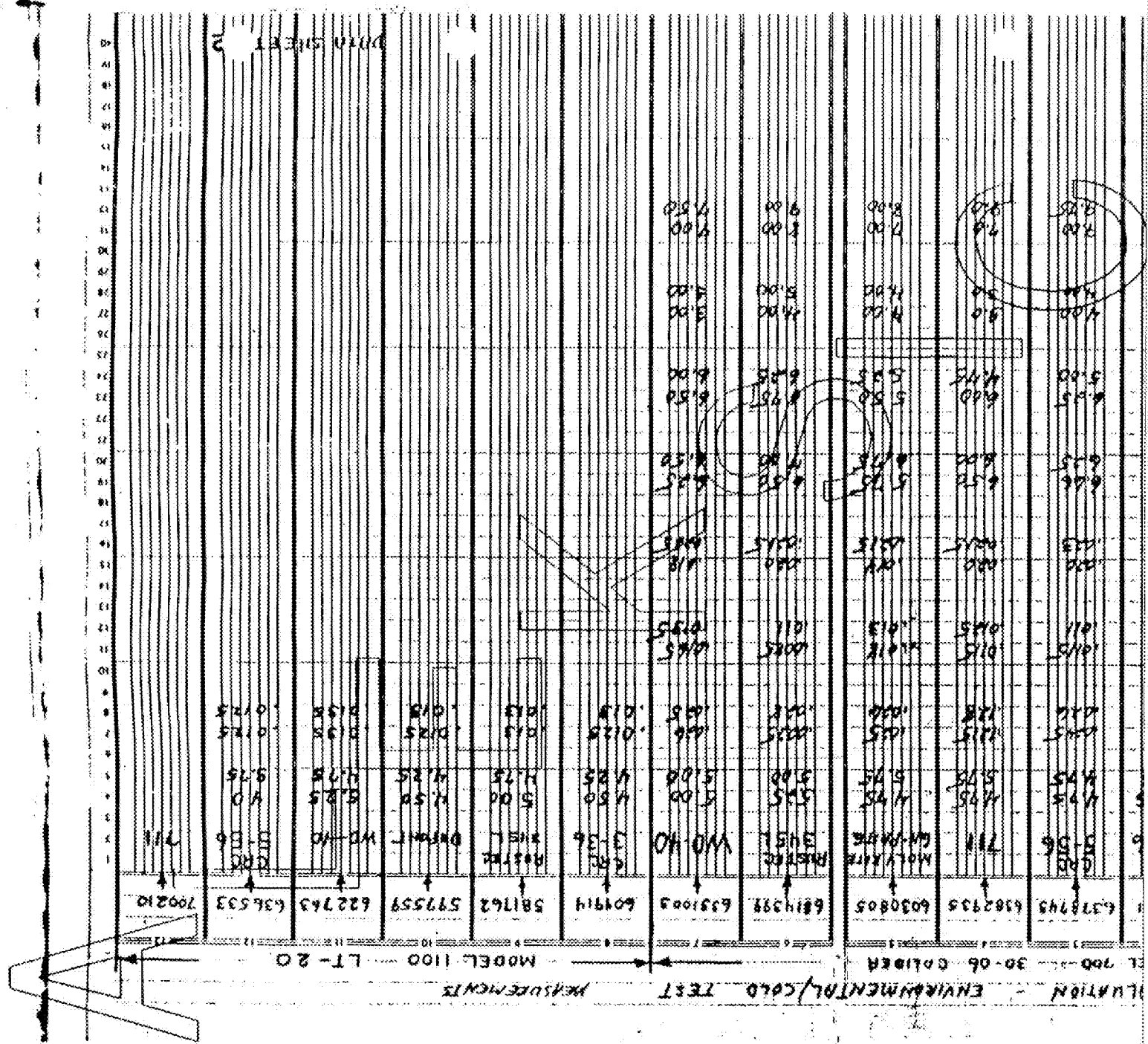
The procedure was repeated each day for 5 consecutive days.

The guns were then placed on the roof over the week-end. At 8:00 A.M. Monday they were removed and bolt velocity measurements were taken.


The guns were then placed in a dry cabinet for 24 hours.

The guns were removed from the dry cabinet and bolt velocity measurements were taken.

At the completion of the test all the guns were disassembled and examined for rust.



A technical drawing showing a cross-section of a structural member, likely a beam or column. The drawing includes several dimension lines and labels, such as "C-10", "C-8", "C-6", "C-4", "C-2", "C-1", "C-0", "C-1", "C-2", "C-4", "C-6", "C-8", "C-10".



4/1/82
F.P. THYSGAARD
INDENT PULL

4.25	4.00	3.25	2.50	1.75	1.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
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5-1-82

2 ND DAY		3 RD DAY		4 TH DAY		5 TH DAY		AFTER WEEK END	
INITIAL	TERMINAL	INITIAL	TERMINAL	INITIAL	TERMINAL	INITIAL	TERMINAL	INITIAL	TERMINAL
314 277	353 261	316 282	363 259	321 270	375 272	305 277	361 289	304 279	352 260
								*	
								319 290	360 272
295 259	330 238	298 265	329 245	299 267	336 245	303 266	343 247	279 248	321 233
								*	
								285 253	326 235
299 203	324 242	302 278	328 244	315 218	337 249	305 270	352 239	295 256	316 222
								*	
								291 263	311 236

PLACED IN A DRY CABINET IMMEDIATELY AFTER PREVIOUS BOLT VELOCITY
- GUNS WERE NOT WIPE DOWN AFTER BEING WET FROM WEER AND
HOURS LATER THE SHOTGUNS WERE RETAINED FROM CABINET
THE BOLT VELOCITY MEASUREMENTS WERE TAKEN.

TEST THAN THE 5TH DAY BOLT VELOCITY MEASUREMENTS
AT 8 CO AM EACH DAY. THE SHOTGUNS WERE PLACED IN
AT 1200F FOR 16 HOURS EACH NIGHT.

DATA SHEET 1.

A

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington



PETERS



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Distribution:

C. B. Workman

C. E. Ritchie

J. P. Linde

J. W. Brooks

R. J. Pohl

Petroleum Lab

Chambers Works

A. B. Hughes

ESD - LOUVIERS

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331

Supplement No. 4

LUBRICATION EVALUATION: ILION FISH AND GAME CLUB
CLEANING AND FIELD TESTING
EVALUATION

Prepared by: C. E. Ritchie

Date Prepared: 6-10-82

Proofread and Cleared By:

J.H. Hennings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature

Date

AL 0018702

26 of 38

A

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331 Supplement No. 4

REPORT TITLE: LUBRICATION EVALUATION: Lion Fish and Game Club
Cleaning & Field Testing
Evaluation

MODEL(S): 1100

GAUGE OR CALIBER:

DATE: 6-10-82

WORK ORDER NO.:

PART NAME:

DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. X ENDURANCE - NO. OF GUNS TESTED: 16

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS _____; TARGET: _____

RDM FIRE _____ CENTER FIRE _____

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TEST PROCEDURE

- A. On March 12, 1982, sixteen M/1100 shotguns were selected from the Lion Fish and Game Club to be used in this evaluation. These guns are:

<u>Labeled No.</u>	<u>Serial No.</u>	<u>Gauge</u>
1	N032715X	20
2	N098963H	410
3	N120547V	12
4	N122845V	12
5	N072571V	12
6	N098241H	410
7	N112195J	28
8	N120637V	12
9	N071849V	12
10	N067179V	12
11	N111015J	28
12	N032199X	20
13	N066916V	12
14	N120545V	12
15	N061062V	12
16	N067268V	12

The guns were delivered to the Lion Research Test Lab where they were individually disassembled to be cleaned. The shotguns were cleaned using only the lubricant as the cleaning agent. Results were based on the Test Lab personnel's opinion on how well each lubricant performed.

- B. For the next portion of the test, the entire firearm was dipped in Stoddard Solvent and thoroughly cleaned, degreased and allowed to dip dry. Each lubricant was assigned a firearm and then lubricated. The following firearm components were sprayed:

- o piston, piston seal, magazine tube - Spray, let stand for 5 minutes, lightly wipe off all excess.
- o receiver - Saturate, let stand for 5 minutes, lightly wipe off excess.
- o fire control - light spray.

The firearms were reassembled and then each were wiped down with a clean cloth dampened with the corresponding lubricant. The sixteen shotguns were returned to the Lion Fish and Game Club the week of 3/15/82 and placed in their metal storage cabinet. (Note: These storage cabinets are located in an unheated area on an earth floor. The room is also un-insulated. The room experiences temperature extremes and maintains a relatively high level of humidity).

TEST PROCEDURE - continued

The guns were used by the Remington Arms Employees at the Lion Fish & Game Club for a period of approximately 3 months.

On June 10, 1982, R. E. Nightingale (Measurement Lab Foreman) and C. E. Ritchie (Test & Measurement Lab Supervisor) made a visual inspection of the operation and appearance of those same sixteen shotguns. Items noted were:

- o any visible rusting
- o condition of lubricant (still wet, dry, sticky, etc.)
- o appraisal of rounds on gun

Results of the inspection can be found in Appendix A.

ALEXSICH

APPENDIX "A"
(Data Sheets)

AL 0018708
30738

Lubrication Evaluation: Ilion Fish & Game Club
Clearing and Field Testing Evaluation

Report No. 82 0331 Supplement No. 4
Page 5

Ilion Fish & Game Club Results:

DATA SHEET

Label No.	Gauge	Lubricant	Results
1	20	Du Pont	Still well lubricated - no rust evident.
2	410	"	Still well lubricated - no rust evident.
3	12	"	New rust spots on receiver (it appears someone wiped the outside of the receiver dry). Still well lubricated - light film on magazine tube by gas cylinder. High number of rounds on this gun.
4	12	"	Still well lubricated - no rust evident. High number of rounds on this gun.
5	12	"	Still well lubricated - no rust evident. High number of rounds on this gun.
6	410	711	Still well lubricated - no rust evident.
7	28	"	Lubricant is starting to dry out on magazine tube - gas cylinder and piston seal are lightly rusted (worst sample of rust - interior).
8	12	"	Rust on front area of magazine tube ahead of gas cylinder and on outside of gas cylinder - magazine tube has a very sticky film by gas cylinder area. High number of rounds on gun (worst sample of sticky film - interior).
9	12	"	Still well lubricated - no rust evident.
10	12	"	Still well lubricated - no rust evident. (A spot of rust on barrel at vent rib.)
11	28	CRC	Still well lubricated - no rust evident.
12	20	"	Still well lubricated but somewhat drier in appearance - no rust evident - gun is very dry but still functionable.
13	12	"	Still well lubricated - no rust evident. Moderate number of rounds on gun.
14	12	"	Lubrication starting to dry out on magazine tube at gas cylinder area. - some light rust inside gas cylinder. moderate number of rounds on gun.
15	12	"	Still well lubricated - no rust evident. High number of rounds on gun.
16	12	Du Pont	Still well lubricated - no rust evident. Starting to dry out a little - high number of rounds on gun (it appeared this gun had been shot the most).

AL 0018709

31238

A

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SPM

DETROS
SPM

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Distribution: C.B. Workman
C.E. Ritchie
J.P. Linde
J.W. Brooks
R.J. Pohl
Petroleum Lab
Chambers Works
A.B. Hughes
ESD - Louviers

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331 Supplement No. 3

Evaluation of Lubricants on Firearms
Rust Prevention Test

Prepared by: F.L. Supry

Date Prepared: 5-6-82

Proofread and Cleared By:

J.H. Hemmings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature

Date

AL 0018710

32738

A

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331 - Supplement No. 3
REPORT TITLE: Evaluation of Lubricants on Firearms
Rust Prevention Test
MODEL(S): M/1100
GAUGE OR CALIBER:
DATE: 5-6-82
WORK ORDER NO.:
PART NAME:
DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS. _____; TARGET: _____

RBM FIRE _____ CENTER FIRE _____

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A

Report No. 82 0331 Supplement No. 3

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

May 6, 1982

TO: J.H. Hennings
FROM: F.L. Supry
REPORT TITLE: Evaluation of Lubricants on Firearms
Rust Prevention Test

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct a rust prevention test on the three lubricants still under evaluation:

1. Du Pont - Synthetic Diester
2. Sprayon - 711
3. CRC - 3-36

SCOPE OF TEST

To observe the differences in rust prevention of the three lubricants.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant evaluating rust prevention, the following results were obtained:

1. CRC 3-36
2. Du Pont and 711

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REPORT TEXT

Eight M/1100 shotguns were selected for the test by J.H. Hennings (Test Lab).

For daily weather conditions during this test refer to Data Sheet No. 1.

ALASKA
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H

TEST PROCEDURE

The stocks and fore-ends were removed from the shotguns. The shotguns were then degreased, using the solvent degreasing tanks located in our Heat Treat Department.

All metal parts of the shotguns were then saturated with the assigned lubricant.

The guns were then placed horizontally in a rack on the roof of Bldg. 52.

The guns were left untouched in the environment for one month. They were then removed and inspected for rust.

Photographs were taken after two weeks on the roof and individual photographs were taken at the completion of the test.

The shotguns were disassembled and stored in boxes in the machine room at the completion of the test.

A L E K S I C H

APPENDIX "A"
(Data Sheets)

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WEATHER CONDITIONS DURING TEST

<u>Date</u>	<u>Condition</u>	<u>Degree</u>	
3/29	Sunny	45° F.	} 3 Hours Exposure Each Day.
3/30	Sunny	55° F.	
3/31	Rain	50° F.	
4/1	Flurries	30° F.	
4/2	Sunny, windy	35° F.	} Weak-end Exposure
4/3	Rain, freezing rain	32° F. to 20° F.	
4/4	Snow	20° F. to 15° F.	

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REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

RECEIVED

Distribution: C. B. Workman
C. E. Ritchie
J. W. Brooks

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RESEARCH TEST and MEASUREMENT REPORT - Report No. 830941

M/SEVEN LWT. PENDULUM DROP TEST TO EVALUATE NEW TRIGGER DESIGN.

Prepared by: R. Howe

Date Prepared: 4-6-83

Proofread and Cleared By:

J.H. Hearnings, R.E. Nightrich,
Foreman-Test Lab Foreman-Measurement Lab

C.E. Ritchie,
Sr. Supervisor - Testing,
Mech. & Mech. Analysis Lab

Signature

Date

Signature

Date

PLAINTIFF'S
EXHIBIT

3038

AL 0020199

1816

A

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 830941

REPORT TITLE: M/Seven LWT. Pendulum Drop Test To Evaluate New Trigger Design

MODEL(S): M/Seven LWT.

GAUGE OR CALIBER: .243

DATE: 4-6-83

WORK ORDER NO.: C-1809-000

PART NAME: Trigger

DESIGNER/ENGINEER: D. Bullis

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 4

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS. _____ TARGET: _____

RIM FIRE _____ CENTER FIRE _____

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April 6, 1983

TO: C. E. RITCHIE
FROM: R. W. HOWE
REPORT TITLE: M/SEVEN LWT PENDULUM DROPTEST TO EVALUATE NEW DESIGN TRIGGER

ABSTRACT

On April 4, 1983, a request was received to test three (3) M/Seven LWT rifles. Two with New Style Trigger, one with the Old Style Trigger, and also one M/700 with old style trigger. D. Bullis, Current Firearms Design, requested the Test Lab to do a Pendulum Drop Test on these four rifles. To evaluate the Jar-Off resistance of the Fire Control Assembly.

SCOPE OF TEST

To evaluate and compare the Jar-Off resistance of the Fire Control Assembly at a 3' drop height against a hardwood back stop.

TEST RESULTS

Some Jar-Offs did occur in the top and bottom side modes at various heights as described in Result Sheet Appendix "A".

REPORT TEXT

1. Trigger Pull and Sear Engagement was preset at minimum present Remington Specs.

Present Remington Specs. are:

Trigger Pull Lbs.	3.0 to 5.0 lbs.
Trigger Sear Eng.	.015 to .020

2. The four rifles were drop tested at the 3' drop height against a hardwood backstop in the following modes:

Muzzle First W/Safe in "On" & "Off" positions
Butt First W/Safe in "On" & "Off" positions
Right Side W/Safe in "On" & "Off" positions
Left Side W/Safe in "On" & "Off" positions
Top Side W/Safe in "On" & "Off" positions
Bottom Side W/Safe in "On" & "Off" positions

Results in Appendix "A".

Note: During drop test, some Jar-Off did occur in the top and bottom side modes so it was decided to drop these guns at various other levels to determine what height the Jar-Off would occur. Other drop levels and results are recorded in Appendix "A".

3. After the first drop test was completed, all four (4) rifles were set at the minimum (3.0lb.) trigger pull and re-dropped in all test modes.

Also, one M/700 rifle from Test Report No. 820391 was added to this test. This rifle contained a new design trigger spring and screw as per Drawing Nos.:

Trigger Spring Dwg. No. SK A-3687

Trigger Screw Dwg. No. SK B-3688

Results in Appendix "A".

TEST PROCEDURE

A. Measurements

Trigger Pull was taken at the start of each test.

Sear Engagement was taken at the start of each test.

Test Conditions

1. Trigger pull forces were taken on all test guns using a Chatillon Model IN-10 Spring Pull Scale (See Appendix "A".)
2. Sear Engagement was set on productions Optical Comparator in M/700 final assembly area. (See Appendix "A".)
3. The Pendulum Drop Test was conducted on all test rifles at the 3' and the various other drop levels against a hardwood backstop from the muzzle, butt, both sides, top and bottom. (See Appendix "A".)

Rifles Used in Test

M/Seven - Serial No. 7601285, Serial No. 7601292, Serial No. 7601289

M/700 - Serial No. A6351001, Serial No. B6341922

A L E K S I C H

APPENDIX "A"

M/7 NEW STYLE TRIGGER EVALUATION

TEST #1

DROPP/JAR-OFF TEST ON
HARDENED SURFACE FROM
3' DROP EVALUATION

Serial #	M/7 New Style Trigger	M/7 New Style Trigger	M/7 Old Style Trigger	M/700 Old Style Trigger	M/7	M/7	M/7	M/700
	#7601285	#7601292	#7601289	#A6351001	#7601285	#7601292	#7601289	#16351001
SAFE POSITION	On Off	On Off	On Off	On Off	On Off	On Off	On Off	On Off
TRIGGER PULL (lbs.) Avg.	3.5 lbs.	316.	4.75lb.	5.75lb.	3.01b.	3.01b.	3.01b.	3.01b.
SEAR ENGAGEMENT	.015"	.015"	.015"	.015"	.015"	.015"	.015"	.015"
MUZZLE FIRST	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
BUIT FIRST	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
RIGHT SIDE	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
LEFT SIDE	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
BOTTOM SIDE	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok
18"	- 3 J/04	- 1 J/04	- Ok	Ok Ok	Ok 1 J/04	Ok 3 J/04	Ok 2 J/04	Ok 4 J/04
24"	- 4 J/04	- 2 J/04	- 1 J/04	Ok Ok	Ok 2 J/04	Ok 4 J/04	Ok 4 J/04	Ok 4 J/04
36"	Ok 4 J/04	Ok 4 J/04	Ok 2 J/04	Ok Ok	Ok J/0	Ok J/0	Ok J/0	Ok J/0
TOP SIDE	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok	12" - Ok
18"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
24"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
36"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok J/0

NOTE: 300 means Jar Off (i.e. J J/0 4 means 3 Jar Off out of 4 tries.)

CER:chie/jb
4/10/83

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Report No. 830941

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

☐ Developmental
☒ Design Acceptance
☐ Pre-Pilot
☐ Pilot
☐ Production Acceptance

☐ Safety Related
☐ Competitive Evaluation
☒ New Design
☐ Design Change
☐ Plant Assistance
☐ Litigation
☐ Warehouse Audit
☐ Cost Reduction
Stake
☐ Other

FIREARM STATUS

MODEL: 7 LWT
CAL. or GAUGE: 243
BARREL TYPE:
PROOFED: YES ☒ NO ☐

REPORT REQ'D.

FORMAL ☒TEST
RESULTS
ONLY ☐

DATE REQUESTED: 4-4-83
DATE NEEDED BY: A.S.A.P.
REQUESTED BY: Bullis
WORK ORDER NO: C-1809-000

TEST TYPE

☐ Strength Test
☐ Function Test
☐ Accuracy Test

☐ Ammunition Test
☐ Environmental Test
☐ Customer Complaint

☐ Dry Cycle Test
☐ Measurements
☐ Endurance Test

☐ Photo/Video
☒ Other DROP

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

DROP TEST 2 M/7 LWT 243 CAL. RIFLES.

• DROP 3 FEET

• DROP BUTT, MUZZLE, BOTH SIDES.

NEW STYLE TRIGGER - RELIEVED BOTH SIDES.

GUNS REQUIRED:

#1 7601285 - Bull 3" Engagement .015"
#1 7601292 - " 3" " .015"

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED:
TEST COMPLETED BY:
REPORT DATE:

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~~1ST~~ SECOND TEST
(CONTROL GUNS) (4-5-83)

M/7 LWT DROP TEST SAFE "OFF" ONLY. (HARD WOOD STOP)

(FOUR DROPS AT EACH LEVEL)

M/7 LWT GUN #13 - JARRED OFF 2 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

1 " " 4 " " 18"
0 " " 4 " " 12"

M/7 LWT GUN #14 - JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

3 " " 4 " " 18"
0 " " 4 " " 12"

(CONTROL GUN)

M/7 LWT GUN #12 JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

2 " " 4 " " 18"
0 " " 4 " " 12"

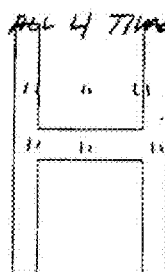
M/700 (CONTROL GUN) JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY)

4 " " 4 " " 18"
0 " " 4 " " 12"

NOTE:

M/700 CONTROL ALSO ~~ENJOYED~~ DROPPED ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK ALL 4 TIMES
18" OK
12" OK



M/7 LWT - NEW STYLE TRIGGER - 3' DROP TEST (HARD WOOD STOP ONLY)

	NEW STYLE TRIG.		NEW STYLE TRIG.		CONTROL GUN.		CONTROL GUN.		4-5-83
GUN + SER#	13 SER# 7601285		14 SER# 7601292		12 SER# 7601289		M/700 SER# A635 1001		
SAFE POSITION	ON	OFF	ON	OFF	ON	OFF	ON	OFF	
MUZZLE FIRST	OK	OK	OK	OK	OK	OK	OK	OK	
BUTT FIRST	OK	OK	OK	OK	OK	OK	OK	OK	
RIGHT SIDE	OK	OK	OK	OK	OK	OK	OK	OK	
LEFT SIDE	OK	OK	OK	OK	OK	OK	OK	OK	
TOP SIDE	OK	OK	OK	OK	OK	OK	OK	JARRED OFF	
BOTTOM SIDE	OK	JARRED OFF	OK	JARRED OFF	OK	JARRED OFF	OK	JARRED OFF	

NOTE: ALL FOUR GUNS HAVE BEEN SET AT 3LB. TRIG PULL AND .015" ENGAGEMENT (SER#)

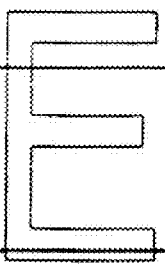
AL 0020208

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MP 114107 - NEW STYLE 120666R - 5' LKOP 1 EST (HARD LKOP STOP ONLY)

4-5-85

	NEW STYLE TRIG.	NEW STYLE TRIG.	CONTROL GUN.	CONTROL GUN.	
Gun #	13 ser # 7601285	14 ser # 7601292	12 ser # 7601289	MP 120 Ser # 7635 1001	
MP POSITION	ON	OFF	OFF	ON	OFF
Muzzle FIRST	OK	OK	OK	OK	OK
Butt FIRST	OK	OK	OK	OK	OK
RIGHT SIDE	OK	OK	OK	OK	OK
LEFT SIDE	OK	OK	OK	OK	OK
TOP SIDE	OK	OK	OK	OK	OK
Bottom SIDE	OK	JARRED OFF	JARRED OFF	OK	JARRED OFF



NOTE: All FOUR GUNS HAVE BEEN SET AT 3LB. TRIG Pull AND .015 ENGAGEMENT (SEAR)

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4-5-83

M/7 LWT DROP TEST SAFE "OFF" ONLY. (HARD WOOD STOP)
(FOUR DROPS AT EACH LEVEL)

M/7 LWT GUN #13 - JARRED OFF 2 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 1 " " 4 " " 18"
0 " " 4 " " 12"

M/7 LWT GUN #14 - JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 3 " " 4 " " 18"
0 " " 4 " " 12"

(CONTROL GUN)

M/7 LWT GUN #12 JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 2 " " 4 " " 18"
0 " " 4 " " 12"

M/700 (CONTROL GUN) JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 4 " " 4 " " 18"
0 " " 4 " " 12"

NOTE:

M/700 CONTROL ALSO ~~TESTED~~ ^{DROPPED} ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK ALL 4 TIMES
18" OK
12" OK

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(NEW STYLE TRIGGER)

FIRST TEST

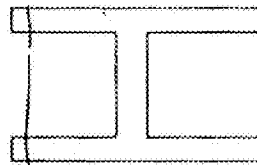
4/4/83

MFD LUT - 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER# 7601285 SAFE ON SAFE OFF	14 SER# 7601292 SAFE ON SAFE OFF
MUZZLE FIRST	OK OK	OK OK
BUTT FIRST	OK OK	OK OK
RIGHT SIDE	OK OK	OK OK
LEFT SIDE	OK OK	OK OK
TOP	OK OK	OK OK
BOTTOM	OK OK	OK OK

J.O. = TAPPED OFF (FIRING PIN FEEL)

#13 TRIG PULL	3.25 3.25 3.50 AUG	3.5 3.5 3.5 2.85
#14 " "	3-3-13 AUG. 3.40S	3-3-13
CONTRACT " "	4.50-4.75-5.00 AUG	4.75 4.05
MFD00 " "	5.00 6.00 5.75 AUG	5.25 4.85



4-4-83

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HARD WOOD STOP

A-SAFE OFF ONLY

M/7 LWT DROP TEST, B-BOTTOM ONLY
(4 DROPS AT EACH LEVEL BELOW)

#14 M/7 LWT GUN #14 JARRED OFF 2 TIMES IN 4 AT 24"
" " " " 1 " " 4 AT 18"
" " " " OK — 4 " " 4 AT 12"
#14 TRIG PULL AVG OF THREE = 3 LBS

#13 M/7 LWT GUN #13 JARRED OFF 4 TIMES IN 4 AT 24"
" " " " 3 " " 4 AT 18"
" " " " OK — 4 " " 4 AT 12"
#13 TRIG PULL AVG OF THREE 3.5 LBS

M/7 LWT CONTROL GUN JARRED OFF 2 TIMES IN 4 AT 36"
" " " " 1 " " 4 AT 24"
" " " " OK — 4 " " 4 AT 18"
" " " " OK — 4 " " 4 AT 12"
CONTROL TRIG PULL AVG OF THREE 4.75 LBS

#1700 REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
M/700 TRIG PULL AVG OF THREE 5.75 LBS.

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44-83

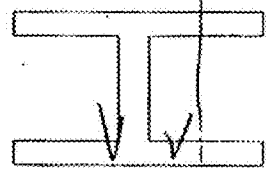
(NEW STYLE TRIGGER)

M/7 LUT 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER # 7601285 SAFE ON SAFE OFF	14 SER # 7601292 SAFE ON SAFE OFF
MUZZLE FIRST	OK	OK
BUTT FIRST	OK	OK
RIGHT SIDE	OK	OK
LEFT SIDE	OK	OK
TOP	OK	OK
BOTTOM	OK	OK

J.O. = TAPED OFF (FIRING PIN FALL)

#13 TRIG PULL	3.25-3.50 AUG	3.5-3.75
#14 " "	3-3-3 AUG.	3.25-3.50
* CONTRA " "	4.50-4.75-5.00 AUG	4.75-5.00
M/700 " "	5.50-6.00-5.75 AUG	5.25-5.50



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4-4-83

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HARD WOOD STOP

A-SAFE OFF ONLY

M/7 LWT DROP TEST, B-BOTTOM ONLY

(4 DROPS AT EACH LEVEL BELOW)

#14 M/7 LWT GUN #14 JARRED OFF 2 TIMES IN 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"

#14 TRIG PULL AVG OF THREE = 3 LBS

#13 M/7 LWT GUN #13 JARRED OFF 4 TIMES IN 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"

#13 TRIG PULL AVG OF THREE 3.5 LBS

#12 M/7 LWT CONTROL GUN JARRED OFF 2 TIMES IN 4 AT 36"
 " " " " " " " " " " 4 AT 24"
 " " " " " " " " " " 4 AT 18"
 " " " " " " " " " " 4 AT 12"

CONTROL TRIG PULL AVG OF THREE 4.75 LBS

#1200 REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
 M/700 TRIG PULL AVG OF THREE 5.75 LBS.

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168/16

EXPERIENCES
IN THE
DESIGN & MANUFACTURE
OF
SHOTGUNS & RIFLES

REMINGTON
DUPONT

Bridgeport, Connecticut, U.S.A.

October 1945

PLAINTIFF'S
EXHIBIT
3039

AL 0020729

1831

FOREWORD

The information compiled herein represents the contributions of many individuals of long service and varied experience in our organization. It comprises certain factual data based on analyses of our past experiences in the manufacture of shotguns and rifles and the performance of those weapons in the hands of our customers.

We believe that our employees are just as anxious as Management for maintenance of the quality, usefulness and economic value of our products. To develop and hold high quality standards we all recognize that we must practice constantly the habit of accuracy and thoroughness. Loose inspections and inattention to details are bound to lead to a minimum of good quality which in turn reduces our sales and affects the economic stability of the organization. The quality of our products must exceed that of our competitors at all times as our ultimate customers not only determine if our product is acceptable, but; of more importance, whether or not we stay in business. Therefore, in the manufacture and assembly of component parts for our shotguns and rifles we must maintain a quality consciousness which will ensure the contribution of good workmanship on the part of all members of the organization as they perform their daily tasks.

The recording of good accomplishments along with the focusing of attention upon existing weaknesses should serve as a guide or reference for those who assume the factory tasks as replacements in production during future years.

Now that war work is discontinued, if we can visualize our customers in place of Government inspectors awaiting our products for test and acceptance, we will go a long way toward building up an army of satisfied users of Remington Sporting Arms with attendant benefits toward our economic security.

Therefore, we are confident that all will unite in efforts to bring about new developments and improved designs combined with accurate fabrication and proper assembly so that Remington Quality may be maintained at a level unsurpassed in the industry.

W. L. Clay
W. L. Clay
Manager of Quality

COMMERCIAL ASPECTS OF DEFICIENCIES IN DESIGN

As a prelude to the discussions herein, we want to emphasize the decided effect on sales when firearms are placed on the market and develop deficiencies in functioning in the hands of the customer.

A few striking examples are listed herewith:

MODEL 14:

Just prior to 1912 Remington was selling the Model 8 which had been introduced in 1906 as the first American Autoloading Sporting Rifle and furnished in .25 Remington, .30 Remington, .32 Remington and .35 Remington calibers. A rifle of low cost was needed to meet the serious competition of competitors' lever action rifles which far out-sold the Remington Model 8. With this objective in mind, development was undertaken on a slide action centerfire rifle to be known as the Model 14. Considerable time was taken in its development and tooling, which during that period was an expensive undertaking. In 1912, the Model 14 Pump Action Hammerless Repeating Rifle was introduced in .25 Remington, .30 Remington, .32 Remington and .35 Remington calibers. It was enthusiastically received. During the first two years sales probably came up to expectations. However, a defect in the fire control mechanism was uncovered in the hands of customers with some unfortunate results. The rifle promptly got a "black eye" and failed to register customer acceptance. Sales dropped off seriously and the fire control mechanism had to be re-designed in order to overcome the defect. While sales were maintained at a moderate level for a few years, afterwards they dropped to a very unsatisfactory level and even after the gun was partially redesigned in the form of the present Model 141, the volume of sales was far below the level which had been expected with the result that competitors' lever action rifles continued to dominate the field. At the present time, over thirty years after the initial introduction of the rifle, it still lacks customer acceptance in certain sections of the country in spite of the fact that the principal faults in the mechanism were corrected many years ago.

This lack of customer acceptance is so serious that it is quite difficult to sell this rifle in certain sections of Canada and the Rocky Mountain territory in the United States and the unfavorable reputation of this one model reflects adversely on the sale of other Remington centerfire rifles and other Remington firearms in general in those markets and elsewhere where such reputation still persists.

This is an outstanding example of a heavy expenditure in the development and tooling of a new rifle which proved to be

liability to the company rather than an asset and resulted in the company's failure to attain a satisfactory competitive position in this field over a period of approximately thirty years.

- - - - -

Another example is set forth herewith:

MODEL 31:

The company's competitive position in the sale of slide action shotguns has never been satisfactory. A competitor's model commanded a very large portion of the market. In an effort to improve the company's position, the Model 29 was introduced in 1929 to replace the improved Model 10. Results were only mediocre. In 1931 the Model 29 was discontinued and replaced by the Model 31. Results again were quite mediocre and even in the early years of sale at which time any new model normally enjoys a large volume, the sales were very small and began to go downward.

A careful analysis of the situation a few years after the introduction of the Model 31 disclosed the fact that the weapon was developing an unfavorable reputation particularly among trap and short shooters who stated that the gun was slow in firing, thus causing flinching to an extent that many shooters refused to use it because they said it gave them bad shooting habits.

A check of the gun disclosed that the time required for the hammer to strike the firing pin was approximately .012 of a second which was longer in time than most of the similar types of this gun on the market. A redesign of the fire control mechanism corrected this difficulty and made the timing shorter than the majority of guns of this class on the market. However, the gun had received a "black eye" and sales did not improve appreciably. Other changes in the design were required, notably the repositioning of the trigger and strengthening of the action bar. Still the sales did not improve appreciably even though it was felt that the gun was probably the finest available for sale.

During the war the improved Model 31 has proven conclusively through its excellent services at training centers of the Army and Navy that it is an excellent gun and will probably now take its proper place in the competitive field so that the unfavorable reputation previously established may be overcome. However, if it had not been for the war, it is quite possible that the customer resistance to the gun might have continued and it would never have attained the reputation and position in its competitive class which it has now established.

- - - - -

Another example of a fault which reduces customer acceptance and in turn lowers the sales volume is the following:

MODEL 720 (Model 30):

Misfires attributable to gun design have appeared in this model. The original Model 30 was practically free of this fault. As the 720 was developed by remodeling the Remington Enfield Military Rifle, the firing mechanism was completely copied. It employed the full length of the cocking stroke of the bolt handle uplift plus the final closing resistance when the cocking piece met the sear. This resistance was objectionable to many customers and the bolt mechanism was redesigned along the lines of the Springfield Rifle having the cocking fully accomplished by the rotation of the bolt.

A faster lock time was desired by all shooters. Accordingly, the firing pin travel was shortened which resulted in less energy being delivered by the blow on the primer and misfires resulted. When a stronger main spring was used the arm was hard to cock. The firing pin which had a long heavy body was lightened by milling grooves lengthwise in it at the same time the strength of the main spring was reduced. The main spring tension, the firing pin weight and the length of the cocking stroke were all on a very narrow margin of balance and some misfires were still liable to occur. Here again, our sales have suffered in the centerfire rifle line through a reputation for misfires built up by this particular change in design.

Sometimes an arm may develop weaknesses or deficiencies through very heavy and constant use far beyond that normally expected in the hands of the customer. For example, we quote herewith certain experiences with our autoloading centerfire rifle:

MODEL 81:

As stated previously under the Model 141, the Model 8 was introduced in 1906 as the first American autoloading sporting rifle. The Model 81, an improved model containing changes in the stock and the addition of a semi-beaver tail fore-end, was produced in 1937. The Model 81 was also furnished for the .300 Savage Cartridge in 1940. This gun enjoys an excellent reputation in the field and is outstanding in its class. However, a review of the files of the Products Committee discloses that the one-piece firing pin with which this arm was originally supplied was given to excessive breakage. Prior to January 15, 1942, a survey was made which indicated that over a five-year period average sales for replacements of the firing pin were 957 pieces per year. This situation prompted the development and adoption of a two-piece firing pin. This two-piece firing pin when subjected to heavy duty and constant usage has not

proven satisfactory. It was possible by incorrect assembly after the weapon left the factory to fire the gun before the action was securely locked in place. Combined with these deficiencies of the two-piece firing pin were reports from the F.B.I. that complete separations were obtained in firing .30 Remington ammunition in the Model 81 as supplied. As a consequence, a comprehensive check had to be made not only pertaining to the functioning of the gun but also with respect to the processing of the ammunition. As a result, a newly developed one-piece firing pin has been supplied which has given satisfactory service to date while changes in the processing of the .30 Remington cartridge case has eliminated the cut-offs which previously developed.

In the main, however, the Model 81 is probably the leading autoloading centerfire rifle on the market and should give excellent performance when utilized under normal conditions. This case is set forth to illustrate not only the great care which must be taken in changing functioning parts of a gun but also the necessity for the proper functioning of all cartridges in any weapon designed to accomodate the same.

MOST PREVALENT MALFUNCTIONS

The things that can be wrong with a gun at the assembly operation and during testing are numerous. For instance, the breech may assemble loosely, shells fed from the magazine may "stem" on the chamber, that is the end of the shell or cartridge does not enter the chamber cavity but strikes on the edge of the barrel. Sometimes the safety mechanism will be finished so that the trigger can be pulled even though the safety is in the "safe" position. At other times, the safety will stay "on" or jar "on" so the gun cannot be fired when expected to fire. The mechanism occasionally will not unlock after the gun is fired. The ejecting mechanism may fail and the fired shell will not eject. Repeating or autoloading guns sometimes will drop a loaded shell or cartridge instead of feeding it into the chamber. Guns will sometimes fire on closing. They will occasionally "double" or "repeat", that is both barrels of a double barreled shotgun will fire simultaneously or two or more shells from an autoloading gun will fire when the trigger is pulled but once. Sometimes shells will catch in the feeding mechanism. The block may lock open with a shell on the carrier. The gun may not stay locked with a shell in the chamber caused by the breech block rebounding out of position. Misfires caused by a weak blow or other defect may be prevalent in a new arm from the assembly line. A new gun with all parts intact will occasionally "jar off" if it is struck a sharp blow or dropped a short distance and allowed to strike on the butt plate. The magazine follower may be stuck so that it does not release shells from the magazine to the feeding mechanism. Magazines may be too wide and allow wedging of the cartridges. The trigger pull may be too light so it is dangerous or too heavy and thus objectionable to the

shooter. The parts being new may not move as freely as they should, so the gun loads hard and functions stiffly. The firing pin may bind or may stick in any one of several positions and not retract. These defects and more must be the constant concern of operating personnel in an arms factory.

Some special defects inherent within arms of various kinds deserve special comment.

BREECH MECHANISM FAILURES:

All modern guns are the so-called breech loading type and they are all equipped with some kind of mechanism to hold the barrel and its breeching unit together. One of the most common designs makes use of a bolt or breech block for this purpose. The bolt or breech block may be locked in position by a barrel extension or held in place by a recoil shoulder in the receiver. Any failure in these parts during firing is serious. The breeching mechanism will be blown rearward violently while the shell or cartridge is at or near its maximum pressure. The projectile will leave the muzzle of the gun at approximately the same time the fired shell or cartridge case is blown out at the breech. Residual pressure usually ruptures the cartridge case releasing a considerable volume of hot gas and scattering burning grains of powder. The effect on the shooter is startling. In the case of a right-handed shooter it seldom causes a personal injury as the guns are designed with ejection ports on the right-hand side. Some left-handed shooters have been the victims of personal injury from this type of accident. Damage to the arm usually consists of a swollen receiver and broken feeding parts. It can be minimized in manufacture by using steels of appropriate structure and parts of correct design. There is no cure for the effect of this kind of accident upon the shooter.

SAFETY DEVICES:

Some mechanical safeties previously employed were so designed that the user of the gun would occasionally pull the trigger while attempting to "put on" or "take off" the safety. This was a former weakness in the Model 11 Shotgun, also in the Model 29 (Model 10). In both guns the former safety was located just in front of the trigger. It was a sliding unit which was pulled to the rear to lock the action or put the gun on safety, and was pushed forward to the firing position. Occasionally a shooter in attempting to put the safety "on" would allow his finger to slip off of the safety and strike the trigger, thus discharging the gun accidentally. It was also possible accidentally to discharge the gun while pushing the safety from "safe" to the firing position. Men with large fingers or wearing gloves could strike the trigger just to the rear of the safety with sufficient force to fire the arm. The effect of the accidental discharge of a high powered rifle or a shotgun is dangerous and annoying. It is sometimes accompanied by personal injury either to the shooter or

to adjacent bystanders. The shooter, of course, will invariably blame the arm.

In several instances this deficiency was overcome by changing the design of the safety to a cross bolt at the rear of the trigger guard.

ACCIDENTAL FIRING BY CLOSING THE ACTION:

Gun designs have been such that breakage or dirt could contribute to the accidental firing when the action is closed with no pressure of any kind placed on the trigger. This can happen if a firing pin breaks or if the firing pin becomes sufficiently fouled with dirt so that it is held in the forward position. Accidents of this type have occurred. In general, they have been caused partly by the use of carbon steel which was too brittle in quality and partly by the design of the firing pin. In the Model 11 Shotgun the former firing pin was a fairly heavy mass of steel at the rear end with a long slender forward portion. This design resulted in more or less frequent breakage, leaving the forward portion of the firing pin stuck fast in the breech block and protruding from the face sufficiently so that when the breech block was closed rapidly upon a loaded shell a premature firing could take place. The firing usually occurred before the breech was securely locked and resulted in a burst head on the shell, a considerable amount of noise at the chamber end of the barrel and a startled shooter. The damage of prematures was minimized by changing the design of the firing pin, using a tougher steel and adding a retractor spring.

FIRING BY "JAR OFF":

We have often noticed soldiers executing the command of "Order Arms". During such performance the butt plate strikes the ground at their feet and the barrel extends upward adjacent to the body. Hunters in the field frequently will rest a gun on the butt plate with the barrel pointed in any direction. Strangely enough the design of some guns has been such that this jar on the butt plate was sufficient to fire them. One model developed this defect. It was caused by the sear being out of balance to the point where an external jolt on the butt plate would cause it to slip out of the full cock notch. The difficulty was eliminated by changing the design of the parts and adding safety hooks to the firing pin and trigger which prevented the fall of the firing pin when the trigger has not been pulled. This type of accident gives the shooter a scare even though it is not accompanied by personal injury.

There have been enough gun accidents in the past to acquaint the American public with the constant danger accompanying the use of firearms. The more a shooter knows about arms and ammunition the greater is his pleasure in their use and his respect for their potential dangers. A gun which will fire by "jar off" will check the confidence of any shooter from the hardened and experienced lifetime hunter to the farmer boy who is out on his first hunting trip.

DEVELOPMENT AND MANUFACTURE OF A MODERN RIFLE OR SHOTGUN

With the foregoing difficulties in mind, what can we do to improve our products and avoid similar defects in new designs?

The preparation of a new model rifle or shotgun should be divided into the following stages: designing, preparing model, casting and perfecting model, production of samples for field tests, correcting designs as result of field tests, tooling up, and getting into quantity production.

Before starting the design work, a decision must be reached as to the cartridge the gun is to handle. A cartridge of new design and consequently of small distribution, adversely affects the sales volume of the gun. The greater the popularity of the cartridge, the better chance the gun has in a highly competitive field.

With this point settled, the general type of the gun is taken up, whether it is to be bolt action, slide operated, lever operated or autoloading. This is governed by a study of the competitive field unless an idea has been worked out which has enough original and novel features to make this unnecessary, or unless there is a definite need for a certain gun in our line. An example of this last was the development of the Model 31 Shotgun as we had only the Model 29 gun to compete with the Winchester Model 12.

In selecting the type of action we have several from which to choose:

THE BOLT ACTION:

This type is too well standardized to permit of much originality in design. It is one of the oldest actions made and is known for its strength, dependability, and accuracy when properly produced. Some trouble has been experienced when using rim shells due to a condition known as "rim lock" where the head of the shell sticks in the bolt recess. The Enfield, as made by Remington during World War I, is probably the best of the bolt actions, and with alterations has been used in bolt action sporting rifles. One of its outstanding features is the convenience of the safety and there is also a camming action of the bolt lugs in seating the shell.

THE SLIDE ACTION:

One of the earliest types of slide action was the Colt Lightning Rifle brought out in 1885. It met with considerable success, about 90,000 being made. Practically all the earlier slide actions were made for rimfire ammunition, Remington being the first to make a successful high power rifle of this type.

One of the points to be considered in designing a slide action gun is the danger of shells exploding in the magazine (tubular). There is little danger of this in shotguns but it is present in high power rifles particularly with pointed bullets. Remington overcame this by rolling spiral grooves in the magazine, throwing the nose of the bullet out of line with the primer in the cartridge ahead. In the rimfire rifles this condition can be caused by a jam in the action bar or the transferring mechanism.

Another danger is a hangfire condition. If the shooter is pulling rearwardly on the bore-end at the time the trigger is pulled, the action will open and the cartridge may explode just outside the ejection port endangering the shooter's eyes or hands.

All slide actions should have a means of preventing the gun from firing if the trigger is pulled back at the time the action is being closed. Remington guns all have a means to prevent such firing.

Rattle from loose fore-ends should be held to a minimum. It is objectionable from a sales angle but the fore-end must be loose enough to work freely. It is well to remember that in damp weather the fore-end, if fitted closely, will swell enough sometimes to bind the action.

AUTOLOADING ACTION:

Remington, in Caliber .22, uses the straight "blow back" type of action only. This has proven successful with us and is employed in the Model 241 and the Model 550. It was also used in the Model 16 now obsolete.

This action utilizes a fixed or stationary barrel, a rearwardly moving breech block operated by the recoil of the cartridge which ejects the fired shell, cocks the firing mechanism, compresses the action spring and, on its forward motion, takes the loaded shell from the magazine and feeds it into the chamber.

In designing an action of this type care must be exercised to have the breech block or bolt of sufficient weight so that the inertia will prevent a rearward movement of the fired cartridge in the chamber until the pressure has dropped to a point where it will not produce bulged or blown out rims. A cartridge case head blow-out is dangerous to the shooter or bystander and bulged rims make extraction and ejection difficult, as the best possible extraction and ejection are mandatory in autoloading guns.

The trigger mechanism must be such that the rifle cannot be fired until the breech block or bolt is in its fully locked position. This is to prevent firing in case the breech block or bolt has rebounded or failed to close fully.

The firing pin blow is important as a weak blow may give hangfires or imperfect ignition often resulting in the bolt being started back and full pressure not developing until the shell is partly out of the chamber.

The balance between springs and pressure is very important as an autoloading .22 Caliber rifle is called upon to handle a number of different kinds and makes of ammunition with widely differing pressures.

Proper heat treatment of the bolt face and breech end of the barrel is important as the continued impact of the bolt against the barrel requires a good depth of case hardening plus a stiff core to prevent deformation.

THE RECOILING BARREL TYPE OF AUTOLOADING GUN:

This is, so far, the most successful type of sporting "high power" autoloading arm and is the type used by Remington. It was developed by John Browning. In this gun the barrel and breech block recoil or move rearwardly as a locked unit in the meantime compressing a heavy recoil spring and the action spring. During this time and before the action becomes unlocked, the pressure of the gas has spent itself in propelling the charge. When the locking block is disengaged from the barrel extension, which is attached to the barrel, the recoil spring forces the barrel forward, extracting and ejecting the fired shell. Here, we must be sure that the ejected shells are not thrown backward so as to strike the face of the shooter or burn him in any way. When the barrel has reached its forward position, the breech block moves forward under pressure of the action spring, removes a shell from the magazine to the carrier and places it in the chamber and locks itself to the barrel extension. The gun is then ready to fire. While the preceding principle is the one on which a gun of this type works, the description is necessarily sketchy.

In the shotgun there are a number of movements which must take place in their proper sequence and all within a small fraction of a second or the weapon may fail or jam. In other words, proper timing is paramount in this type of gun.

With the type of action decided upon, layouts are made to determine the shape and size of the components required for the functioning of the mechanism. Special attention should be given to the weight of the completed arm and the outline or its finished appearance.

The weight is more or less established by convention. For instance, it is generally conceded that a 12 gauge shotgun using 3-3/4 dram loads should weigh around 7-1/2 pounds. In a gun much lighter than this, the recoil is objectionable. This is an instance where a good selling point should be weighed against satisfied users.

As appearance, lines, balance, weight, all affect the sale of the gun, a great deal of attention should be given them by the designer. The customer buys the gun if in his opinion it looks and feels better to him than a gun of the same class and price range made by one of our competitors. He takes for granted, if the gun is made by Remington or other reputable producers, that the parts inside will be properly made, that the gun will function and will shoot straight. One exception to this, of course, is the boy whose father and perhaps grandfather shoots a certain make of gun so that "What is good enough for his father and grandfather is good enough for him".

Proper attention having been given to the appearance, etc. of the new gun, careful consideration must be given to reliability of functioning, shape of the component parts in regard to strength and cost of machining, etc.

With the design completed, the manufacturing or processing engineers should come into the picture for their opinion on the practicability of the limits established, and for their advice as to the cost of the component operations. The Metallurgical Department should then establish steel specifications and heat treatments for the various components.

The model is then started and when completed it is given a thorough try-out and corrections or alterations made where necessary. The model is then given thorough shooting tests and when these are completed it is disassembled, all parts examined for evidence of undue wear or lack of endurance and corrections made where necessary. If it can be arranged, it is best to prepare about twenty of the new weapons so that comprehensive field tests can be made by different personnel. These tests often bring out deficiencies not uncovered in checking the model and give greater assurance that all deficiencies have been eliminated before the new design goes into production. It is always good practice to have thorough tests made on the new weapon by personnel other than the one or ones directly responsible for the design and development. Machinery layouts, operating sequences, and material specifications are then prepared.

At this point an estimate of the cost of manufacture is made and submitted to Management and if satisfactory, tooling is then started and when completed a "pilot" lot (perhaps 500) is started through the Plant. When the component parts reach the Assembly Department special attention is given to the assembly of parts with a minimum of hand fitting and also the difficulties or deficiencies encountered at the various inspection points and finally the appraisal of the shooting test. The purpose of putting through this pilot production lot is to discover any "bugs" missed in the model and to check for an accumulation of limits in any one direction causing an interference and also to find out whether our machining limits are too loose or too tight. When satisfied that

SPECIFIC RULES:

Control of Feeding.

Desirable way - A carrier having a transverse, horizontal pivot located in its rear portion and passing through the receiver (as in Model 31 having trunion pivots in each side wall of receiver) as far rearward as possible in the receiver; to allow for passage of the breech block between the carrier side arms. This arrangement provides a long easy slope for the cartridge moving rearward from the magazine, then when the carrier is lifted by cam action of breech block, the cartridge is presented in the rear of the barrel chamber in a nearly horizontal plane for easy entrance.

Undesirable way - Where the cartridge is lifted by a very short carrier to move the cartridge vertically through a T-slot in the action bar and into a similar T-slot in the face of the breech block. In this case the guidance and control of alignment of the cartridge depends upon the accuracy of fitting of the cartridge head within the T-slot. Too much freedom allows side sway of the front end of the cartridge which may not enter the barrel chamber properly and cause a jam in feeding.

Stationary Magazine for Tubular Magazine Guns.

Desirable way - Magazine tube screwed rigidly into the receiver, thereby furnishing a firm support for the action bar and detachable barrel.

Undesirable way - Magazine tube moveably mounted in the receiver to slide longitudinally in the receiver, the tube screwed rigidly into the action so as to move with the action bar. This motion of the tube causes the cartridges contained therein to shuttle back and forth, having a tendency to deform the soft points of the bullets.

Ease in Loading (Single Cartridge into Chamber).

Desirable way - Easy access through the side ejection port in receiver as in Models 11 and 31.

Undesirable way - Wherein a single cartridge must be carefully passed through a deep slot in the bottom of the receiver during which motion the cartridge is liable to tilt out of proper alignment and become jammed.

Safety of Fire Mechanism.

Desirable way - A simple arrangement of hammer, trigger and safety sear as in the Model 11 where the trigger holds the hammer at full cocked position until the breech block is fully closed and locked after which the trigger may then be pulled to

fire the gun. Also, as in the Model 31 where the trigger is prevented from being pulled by a trigger lock until after the breech block is fully closed and locked by the action bar lock.

Undesirable way - The hammer or the firing pin which has been brought to the fully cocked position by opening motion may be released by pulling the trigger during the closing motion and before the breech block is fully locked. Also, in weapons wherein it is necessary to release the trigger during the closing motion of the breech block. This requires very accurate workmanship to adjust the sear lock to prevent pulling the trigger before the breech block is fully closed and locked.

Mechanical Safety.

Desirable way - A device which will securely lock the trigger and the breech block in closed position. Also, a device which will securely lock the trigger or sear when breech block is fully closed and locked as in Model 11 and Model 31.

Undesirable way - A device which will lock the trigger but not lock the sear against "jar off".

Use of Springs.

Desirable way - Coiled springs are almost universally made of music wire which provides a most convenient source of material used in so many diversified products and is of a reliable quality. It can be fabricated conveniently at lowest cost without heating and tempering. It is also most reliable and durable and less liable to change or break during use.

Undesirable way - Flat or leaf springs are still used in some models simply because they were included in the original design of these models and a change by redesign to use of coiled wire springs would entail a great expense in equipment. Greater care is required in the manufacture of flat springs than in coiled springs because of proper shape and finish plus proper hardening and tempering. Also, the flat spring is more liable to weaken or break during use.

Another point of great importance and value is the greater convenience of coiled springs in designing the mechanism.

Breech Locking of High Power Rifles.

Desirable way - As in a military bolt action rifle where the bolt locking lugs are arranged as closely as possible behind the cartridge head and are of equally balanced strength to prevent tilting or swaying of the cartridge. It has been proven by accurate tests of rifles having locking lugs of uneven or unbalanced strength that bending or whipping of the barrel throughout its length may

result and cause inaccurate shooting. This type of front end of bolt locking is embodied in Models 81 and 720. Another model of this type having only one locking lug is not considered equal to the Models 81 or 720 for the reasons above mentioned.

Interchangeability of Design Changes.

Desirable way - Changes in design from the original plan as first produced, usually to obtain lower cost or to improve functioning of the mechanism. Such changes in design should make possible a substitution of the newly designed parts in place of the original parts without any alteration of the other existing parts of the gun. This is illustrated by single and double triggers - Model 32 and firing pin Model 32.

Undesirable way - Changes in design which require alterations in the other parts of the mechanism to make possible the inserting of the newly designed parts.

Fixed Trigger Pull.

Desirable way - A design employing a rotating hammer with a direct connected trigger having no intermediate part such as a sear. This is illustrated in Models 11, 31, 81 and 121.

Undesirable way - A design employing a rotating hammer, an intermediate sear and a trigger and/or a design having a firing pin with main spring attached, an intermediate sear and trigger. The objection to this is that when a sear is arranged intermediately between the hammer or firing pin and the trigger, the accumulated tolerances of manufacture cause too much lost motion or back lash when the trigger is pulled, thus resulting in a long drag or creepy pull. These conditions generally develop in manufacture and do not show up in the pilot model.

Trigger and/or Sear Movement and Lock Time.

Desirable way - A design of fire control which has the simplest and most direct correlation between hammer and trigger is considered the most desirable and least liable to change after proper assembly due to influence of wear and the accumulation of corrosive powder residue. Some devices are designed to adjust themselves automatically for accumulated looseness or back lash due to manufacturing tolerances. These usually consist of a simple spring arranged to take up looseness such as difference in diameters of a hole; and a pivot pin as illustrated in the Model 5134 trigger and sear, wherein the trigger spring urges the sear into full cock notch and a take-up spring moves the sear pivot, fixed stationary in the sear, to contact the pulling side of the hole in the trigger, thus eliminating all back lash and ensuring a crisp trigger pull.

Lock time is a term used to indicate the interval of time between release of the trigger or sear until the firing pin strikes the primer. Tests have proven that a slow heavy blow may have enough force or momentum to indent the primer, but due to slow speed will not fire the primer; but if a lighter weight firing pin is driven forward at a much higher speed, the primer will fire. Beyond the point of attaining enough speed surely to fire the primer, excess speed is preferred by only "Bug Target Shooters".

Undesirable way - A design of fire control which has more complication, using more parts and causing more points of connection which build up an accumulation of manufacturing tolerances causing more back lash resulting in a long drag in trigger pull which is more liable to change during use. Another point, is the fact that when the trigger is pressed during the closing motion of the breech block, the tail end of the sear is brought into contact with the trigger. This pressure on the trigger must be released before the breech block will fully close. This is very objectionable because the exact difference between sufficient release of the trigger and the final pull off is very close and may at times cause premature firing.

INSPECTION OF SHOTGUNS AND RIFLES

Inspection procedures should be examined carefully to insure that they include a check for each of the following:

Is the gun safe?
Do any of the parts show undue wear in firing?
Is the extractor properly made and does it function correctly?
Is the butt stock correctly attached to the receiver?
Is the breech tight?
Do shells or cartridges stem the chamber?
Can you pull the trigger with the safety "on"?
Will the safety "jar on"?
Does the gun unlock after the hammer falls?
Do fired shells eject properly?
Will the action drop a loaded shell?
Will the gun fire on closing?
If a double barreled gun, will it double?
If automatic, will it "repeat"?
Do shells catch in the feeding mechanism?
Does the bolt lock open with a shell on the carrier?
Does the breech block rebound?
Will the gun misfire?
Can it be made to "jar off"?
Do shells release properly from the magazine?
Do shells wedge in the magazine?
Is the trigger pull too light?
Is the trigger pull too heavy?
Does the gun load hard?
Does the gun function stiffly?
Does the firing pin bind or stick in any position?

In addition to the checks which may be prescribed by present inspection procedures, it is important that we take cognizance of complaints received during the past to insure that weapons leave the factory in a satisfactory condition.

SHOTGUNS

MODEL 11 AND SPORTSMAN - 12, 16 AND 20 GAUGE:

Is the guide ring loose?
Is the stock checked?
Is the fore-end checked?
Is the carrier latch out of adjustment?
Is the cartridge stop out of adjustment?
Does the carrier dog hold?
Does the extractor hold shells?
Are the receiver cushion and rivet loose?
Does the gun fail to lock back?
Does it fail to feed?
Are the guide grooves in receiver too thin?
Is the compensator out of line?
Are the carrier screw threads stripped?
Is the barrel properly aligned?
Is the carrier bent?
Is the sear out of adjustment?
Is the barrel extension loose?
Does the gun fail to eject?
Do the shells stem the chamber?
Does the tang screw hold?
Is the front sight base off center?
Is the magazine stop screw too long?
Is the sear too short?
Does the gun load hard?
Can you get doubles with the gun?
Does the block bind?
Are the cuts in safe out of position?
Does the barrel bind?
Is the compensator bushing loose?
Is the locking block latch too long?

MODEL 31 - 12, 16 AND 20 GAUGE:

Is the trigger lock out of adjustment?
Does the gun misfire?
Is the cartridge stop properly adjusted?
Is the main spring follower out of the housing?
Does the gun drop shells?
Does the action bar lock hold?
Is the barrel loose?
Is the barrel locking stud broken?
Is the trigger pull too heavy?
Is the barrel adjusting bushing loose?

H
Does the barrel adjusting bushing lock hold?
Does the hammer link jump out?
Is the nib loose on the action bar?
Is the extractor pin hole out of position?
Is the magazine loose?
Is the carrier out of adjustment?

MODEL 32 - OVER-UNDER:

Is the single trigger out of adjustment?
Does the gun fail to eject?
Does it cock properly?
Does the gun double?
Is there too much play on the safety?
Does the gun fire on closing?
Does the top lever plunger slip out?

PARKER:

Does the gun "jar off"?
Is the single trigger out of adjustment?
Does the action open hard?
Is the selector properly adjusted?
Does the gun fail to eject?
Does the safety hold properly?
Does the gun double?
Is the extension rib loose?
Do the fore-end and stock match?
Is the recoil pad properly fitted?

CENTERFIRE RIFLES

MODEL 81:

Does the indicator jump on?
Does the magazine retainer stay in adjustment?
Does the action lock back?
Does the barrel extension work loose?
Is the safety out of adjustment?
Is the front sight base out of line?
Does the action jam?
Does it fail to extract?
Does it fail to feed?
Is there a loose fit between barrel nut and jacket bushing?
Does the firing pin bind?
Does the bolt close hard?
Is the magazine side pin missing?
Is the front sight slot crooked?
Is the barrel lock spring broken?
Can the gun be fired without the action being locked?
Is the bolt carrier latch broken?

MODEL 141:

Is the magazine ring loose?
Is the guard loose in the receiver?
Does the gun fail to feed?
Are the sights out of line?
Are the cartridge stops out of adjustment?
Does the gun load hard?
Does the gun fail to eject or extract?
Does the sear lock hold?
Is the magazine tube pulled loose?
Does the gun "jar off"?

MODEL 720:

Does the gun misfire with any brand of ammunition?
Does the gun fire when the safety moves off?
Is the action properly bedded?
Is the front sight ramp machined properly?
Does the bolt strike the follower?
Does the gun fail to eject?

RIMFIRE RIFLES

MODEL 510:

Does the firing pin follow down?
Is the firing pin and sear adjustment functioning properly?
Does the gun fail to eject?
Is the bolt handle loose?
Is the rear sight set too low?
Is the barrel pulled away at receiver?
Does the gun pull off on safe?
Is the front sight loose?
Is the firing pin too long?
Does the gun fail to extract?
Does the bolt pull out?

MODEL 511:

Does the chamber permit shells to swell?
Does the gun fail to eject?
Does the bolt pull out?
Is the sear pivot screw loose?
Does the trigger pull properly (poor sear notch)?
Does the gun fail to extract?
Does the firing pin follow down?

MODEL 512:

Does the gun fail to feed properly?
Does the bolt pull out?

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H
Does the gun "jar off"?
Does the gun fail to eject?
Does the firing pin follow down?
Does the barrel pull out of the receiver?
Do the shells jump the cartridge stop?
Does the gun fail to extract?
Are the rear sight holes out of position?
Does the gun pull off on safety?
Do the shells jump past the retainer?

MODELS 513 S and T:

Is the ejector properly adjusted?
Does the bolt pull out?
Do the shells stem the chamber?
Is the bolt handle loose?
Does the firing pin follow down?
Is the trigger pull properly adjusted?

MODEL 550:

Does the gun fail to eject?
Does the magazine unlock?
Does the gun "jar off"?
Does the action jam?
Does the gun fail to feed?
Do the shells catch in the insert?
Does the extractor hold the shells?
Does the bolt fail to close?
Does the extractor bind?
Does the gun fail to cock?
Does the trigger bind?
Is the recoil chamber chamfered too much?
Does the firing pin strike side of chamber?
Is the rear sight out of line?
Is the carrier out of adjustment?
Is the rear sight loose?
Are the trigger and sear out of adjustment?
Is the magazine ring loose?

MODEL 37:

Is the trigger out of adjustment?
Is there too much play in the windage yoke?
Is the trigger pull too light?
Does the receiver sight work loose?

MODEL 121:

Does the gun feed properly?
Is the carrier dog spring broken?
Are the sights in line?

H
Is the guard cracked at the trigger bushing hole?
Does the gun fail to eject?
Is there a poor fit between guard and receiver?
Do the cartridges stem the chamber?
Does the gun misfire?
Does the action fail to lock?
Are the cartridge ways in block too wide?
Does the take-down screw pull out?
Is the guard loose in receiver?
Does the gun cock hard?
Is the sear lock out of adjustment?

MODEL 241:

S
K
E
V
Has the proper firing pin been assembled in the gun?
Is the guard loose (shells jump out)?
Does the gun fail to feed?
Does the gun fail to extract?
Does the gun fail to eject?
Are the trigger, disconnecter and sear adjusted properly?
Is the front sight slot out of position?
Is the sear pin loose?

APPENDIX

HISTORICAL BACKGROUND

RIFLES AND SHOTGUNS

GENERAL:

When the first breech loading guns were made, both shotguns and rifles, they were the result of inherent craftsmanship on the part of the maker. Little was known about metallurgy and precision equipment was almost non-existent. Parts were made and fitted by hand to any design which pleased that particular gun maker. Regardless of these shortcomings, many of the old arms were extremely accurate and showed fine workmanship. Too many of these old guns were handed down from father to son and used until they broke down. Fortunately for the shooting public, when these guns failed, only rarely were serious personal injuries involved.

In more recent years, the public demand for greater power, more speed and longer range resulted in the development of progressive burning smokeless powders. These powders do not necessarily develop higher maximum pressures than the first smokeless powders, but the pressure is sustained over a longer period of time and any combination of powder and projectile which imparts a greater energy to the projectile must of necessity place a greater strain upon the arm. Hence, if we increase the muzzle energy of our projectiles, the strength of the arm must be sufficient to hold the forces which do the propelling. Even with modern methods and metallurgical knowledge, the fabrication of a smooth functioning gun is a manufacturing problem of considerable magnitude. Typical gun mechanisms are not as simple as casual observation would lead us to believe. A parts list for the Model 510A Single Shot Rifle - shows something over 50 separate items. The Model 11 Autoloading Shotgun and the Model 31 Repeating Shotgun each have something over 80 individual parts. The Model 37 Target Rifle equipped with a magazine but with no sights of any kind, is composed of more than 90 individual parts. None of the parts in any of the guns is superfluous; each has a function to perform. Some of them are moving parts and while this movement may be small in extent, it is important. It is no wonder with this multiplicity of parts and their irregular shapes that an occasional gun will be produced which does not function smoothly when first assembled.

REMINGTON ACCOMPLISHMENTS

SHOTGUNS:

Prior to 1890 most breech loading double barrel shotguns were of a type known as hammer guns. A lever to open the gun was located forward of the trigger guard. Other means of opening were by a top lever lift or top lever of present design. The gun was

locked securely in the frame and in some designs an added locking was made by a rib extending rearward into the breech and locked by a horizontal cross bolt operated by the top lever.

In 1894 Remington built its first hammerless double weapon. In 1902 or thereabouts, Remington designed and built the #9 single barrel shotgun, unique in design and termed "semi-hammerless", with a cocking lever located on the left side of the frame and operated by the thumb of the right hand. The short top lever functioned to "break" the gun. Very few changes in design have been made in present-day single and double guns except improvement in materials and in minor substitutions of coil type for flat springs in top lever and main springs. Automatic ejectors and single trigger developments followed in 1910.

Well-known double guns of this period were Remington, Baker, Smith, LeFever, Ithaca, Colt and Parker. The foreign guns of top quality were Daly, Greener, Scott, Purdie, Wesley Richards, Francotte and Bone Hill. Many cheap foreign double guns were imported and sold up to 1908. Most of them went off the market with the general use of smokeless powder loads.

BROWNING TYPE - 12 GAUGE.

In 1905 Remington acquired the American rights to manufacture the Browning patented Autoloading gun and placed this first autoloader on the American market under the name "Model 11". Its design was identical with the Belgian product which was introduced later with the following minor changes: No magazine cut-off; slight increase in weight to withstand American heavy loads; barrel guide and guide ring of two pieces brazed to the barrel instead of integral with it; safety device within the trigger guard forward of the trigger instead of in the rearward end of the trigger guard.

The safety device was changed in 1922 to a cross bolt type located at the rear of the trigger guard. Subsequent changes improved functioning and durability of the arm. Redesign of the firing pin, a retractor spring adoption, and improvement of metal and heat treating have eliminated broken firing pins and the tendency to "fire on closing". The substitution of coil springs for flat springs in the cartridge stop and the carrier latch, the addition of check screws to carrier pivot screws, trigger plate pin and tang screw, were found to be much needed improvements. Stock and fore-end design and improved finish were made to enhance appearance and handling.

Barrels were furnished with solid and ventilated ribs made integral therewith. This feature increased sales volume. Checkering of the fore-end and grip was added to provide better handling and appearance.

MODEL 11.

The Model 11 was furnished in 20 gauge in 1930 and in 16 gauge in 1931. In anticipation of the law limiting the magazine capacity to 2-shots for the killing of migratory birds, the Model 11, after conversion to the "SPORTSMAN", was produced with a magazine capacity of two shells, a shortened magazine and fore-end, from which an improvement in appearance and balance was obtained.

The Model 11 and "SPORTSMAN" are now furnished in 12, 16 and 20 gauge and in a variety of finishes to suit the duck hunter and the field or skeet shooter. While the arm has limited acceptance by the trap shooter, it has been enthusiastically received by skeet shooters.

MODEL 10 AND MODEL 29.

In 1907 Remington produced the Model 10, a 6-shot slide action repeating shotgun under the Pederson patents. It was the first and only hammerless pump gun produced. Later competitive models were styled hammerless, however, all of them possessed hammers enclosed within the receiver.

The Model 10 was a bottom ejection pump gun, the first gun of this type. The firing mechanism was enclosed within the breech block and consisted of firing pin, firing pin spring, cocking head, sear and action bar. The firing mechanism is similar to the bolt action type used in rifles. Improvements and refinements were completed from time to time in appearance and functioning. Changes in design of extractors and elimination of the flat ejector spring were completed and as a result, the improved Model 10 became the Model 29 in 1929.

BROWNING PUMP GUNS.

In 1919 Remington procured manufacturing rights from John Browning to produce a 20 gauge pump gun (Model 17). This arm had a streamlined solid receiver with bottom ejection. It differed in takedown from the conventional pump gun as receiver, magazine, fore-end and operating slide were assembled as a unit. This was accomplished by a simple method of locking the barrel in the receiver and to the magazine by means of a locking magazine cap. This design permitted the sale of an extra barrel at less cost, as other type pump guns required the purchase of fore-end and magazine assembly mounted on the barrel. The breech block, carrier and other components were designed to permit the loaded shell to be fed into the chamber directly from the carrier, and the rim was held securely by the extractors so that "straight line feed" was accomplished. This feature was an improvement as it permitted ease of operation and overcame malfunctions that occurred after shell crimps became deformed. The prong type carrier functioned both as a carrier and ejector. The safety was the cross bolt type located at the rear of the trigger guard. This model was discontinued in 1937.

MODEL 31.

The Model 31 Shotgun was introduced in 1931 in 12 gauge only; 16 gauge and 20 gauge models were furnished in 1933. The basic design of the Model 31 is almost identical with the Model 17 with the exception that it is a side ejection type. Changes were made in the original design to accomplish this feature as follows: Changed extractor from a vertical position to a horizontal position and added an extractor on left side to aid in feeding and positioning for ejection; a tie bar was placed on the carrier at its forward end and a conventional ejector was placed in the receiver; some minor improvements were made in the firing mechanism such as a lighter main spring and a shortened hammer travel. These changes improved the trigger pull and the ease of operation.

Because of its ease of operation, balance and stability, the Model 31 holds a splendid reputation with all classes of shooters. A recent change in design and heat treating of the operating slide to overcome breakages has corrected its main weakness.

A most recent change of moving the trigger guard and trigger, rearward, has improved its handling and balance and will permit a better stock and grip design. The outstanding features are:

- Ease of operation
- Cross bolt safety
- Side ejection "straight line feed"
- Fast firing -- "speed lock"
- Interchangeability of barrels at a minimum cost.

OVER-UNDER SHOTGUN - MODEL 32.

In 1931 Remington procured patent rights to the Peiper Over-Under Shotgun. This arm was produced in 1931 and was known as the Model 32. The first model was a plain barrel, two-trigger gun. Other changes were incorporated to produce solid and ventilated rib barrels and an excellent single trigger was added. Some minor changes were made, such as changing the position of the scar springs to insure positive cocking. Trap and Skeet Models were produced.

The Model 32 is a rugged, well-designed shotgun and the best American Over-Under on the market. It compares favorably in design, balance and shooting performance with foreign-made Over-Under guns that sell at three times the price.

PARKER GUNS.

In 1934 Remington acquired the gun assets, designs and use of "Parker" name from the Parker owners located at Meriden, Conn. Remington continued manufacture at Meriden until 1936, when part of the Parker personnel and most of the machinery were moved to Ilion.

The Parker is a custom-built line of guns. Better Parker guns have been produced at Ilion because of more rigid inspection standards. The Parker gun is accepted as the finest double gun made in America.

CENTERFIRE RIFLES:

The Model 2 of 1888 was one of the first models supplied in .22, .25/20 Winchester, .32/20 Winchester, .38/40 Winchester and .44/40 Winchester calibers. It was discontinued in 1913.

Remington also supplied, in 1903, a Model 3 Rifle (Hopburn Patent) of .40/60, .40/65, .40/65 Remington Straight, .40/82, .45/70 and .45/90 calibers. It was fitted with a vertically sliding block action with a side lever for operating the breech block. This rifle was supplied in both sporting and target grades. It was later furnished for use of the high powered smokeless loads of this era, namely, .30/30, .30/06 Springfield, .32 Winchester Special, .32/40 High Power, .38/55 High Power and .38/72.

The #5 or Military Single Shot Rifle, a rolling block action, was produced in 1898 and discontinued in 1911. This rifle was sold to many foreign countries and was furnished in .303 British, .32/40, .32/20 Winchester, .38/55, .30/30, 7 m/m Mauser and .30/40 Krag calibers.

The Model 96, an improved Model 5, was produced from 1898 to 1912.

The Model 99 was produced from 1899 to 1921 and was furnished in World War #1 for the 8 m/m cartridge.

In 1898 Remington produced the Remington-Lee Bolt Action Box Magazine Military and Sporting Rifle, used by the United States, Great Britain, China and other countries. It was furnished in 30" barrels and in 20" barrel in Carbine. It was supplied in a variety of calibers - 6 m/m (.236 Navy), .30/30, .30/40 Krag, 7 m/m, 7.65 m/m, .32 Winchester Special, .35 Remington, .32/40, .38/55, .303 British, .38/72, .44/77, .43 Spanish, .45/70, .45/90, .45/85 and .45/84 Express. This model was discontinued in 1909.

MODEL 81.

The Model 8 (Browning Patent) produced in 1906, was the first American Autoloading Sporting Rifle in .25 Remington, .30 Remington, .32 Remington and .35 Remington calibers.

The Model 81, an improved model, containing changes in the stock and the addition of a semi-beaver tail fore-end was produced in 1937. The Model 81 was furnished for the .300 Savage cartridge in 1940.

MODEL 141.

In 1912 the Model 14 (covered by Pederson patent) Pump Action Hammerless Repeating Rifle was produced in .25 Remington, .30 Remington, .32 Remington and .35 Remington calibers. It was the first hammerless type sporting rifle offered the American sportsman. This model was obsoleted by the Model 141 in 1937. The Model 141 with redesigned shotgun stock and butt plate and large fore-end, was furnished in .30 Remington, .32 Remington and .35 Remington calibers.

MODEL 14½.

A Model 14½ in .38/40 Winchester and .44/40 Winchester was produced in 1913 and discontinued in 1931. The sales volume of this model did not warrant its continuation.

MODEL 30.

From components of the original British Enfield (Caliber .303) and later the U.S. Model 1917, the 30A was produced in 1920 in a sporting model. A change in cocking action was incorporated. It was furnished in .30/06 Springfield, .25 Remington, .30 Remington, .32 Remington, .35 Remington and 7 m/m. In 1930 the Model 30S was produced, an improved sporter in .30/06 Springfield, .257 Roberts, 7 m/m and .25 Remington calibers.

MODEL 720.

Both of these models (30A and 30S) were replaced in 1940 with the Model 720 in .30/06 Springfield, .270 Winchester and .257 Roberts calibers. The Model 720 was improved in appearance and trigger pull. Also, it had a short bolt travel and a modified bolt stop to improve streamlining.

MODEL 25.

In 1922 Remington produced the Model 25 slide action gun (Pederson patent) similar in design to the Models 12 and 14 in .25/20 Winchester and .32/20 Winchester calibers. It was discontinued in 1937.

RIMFIRE RIFLES:

Remington built the #4 Rolling Block Action Single Shot Rifle in 1890 and discontinued its manufacture in 1935. It was supplied in .22, .25/10 and .32 Rimfire calibers. The #4 was a duplicate of the original #5 Military Rifle but built smaller and lighter for Rimfire cartridges. It was a hammer type using flat main and trigger springs. Few changes were ever made with the exception of minor ones that reduced manufacturing costs.

Remington built the #6 Single Shot Rifle in 1901 and its manufacture was discontinued in 1933. It was furnished in .22 and .32 calibers. The model was similar in design to the Model 4 built with a shorter barrel, lighter in weight and cheaper to construct. It was supplied with a tang peep sight of simple design and low cost. This feature contributed to its large volume of sales.

Remington built the Model 7 in 1903 and discontinued its manufacture in 1911. It was supplied in .22 and .25/10 calibers. This rifle was Remington's first small bore target rifle and was built using the Navy Single Shot Pistol Frame fitted with 24", 26" or 28" half octagon barrel. Standard sight equipment consisted of a combination front sight and a "Lyman" Combination Peep Rear Sight. The weight was 5 to 6-1/2 pounds.

Remington also supplied, at about this period in 1903, a Model 3 Rimfire Rifle.

In 1933 Remington designed and produced its first .22 caliber Single Shot Bolt Action Rifle. The Model 33 was a low-cost rifle of simple design.

In 1934 the Model 34 - a tubular magazine, bolt action, .22 caliber Repeating Rifle - was produced which was similar in appearance to the Model 33. The Model 341 - a tubular magazine, repeating, .22 caliber - was produced in 1936. The Model 41 - a .22 caliber Bolt Action Rifle - that cocked on the upthrow of the bolt replaced the Model 33. Model 411 - similar to the Model 41 in construction - was produced for the .22 C.B. "Special" and supplied to the Steel Materials Corporation for "Bang-A-Deer" short range gallery.

MODEL 121.

Remington, in 1909, introduced a Model 12 - .22 caliber Side-ejection, Hammerless, Pump Action Repeating Rifle. It was built under the Pederson patents. It was the first Repeating Hammerless Rifle and the first Repeating Rifle with cross bolt safety. Also, it was the first Repeating Rifle that would handle .22 Short, .22 Long and .22 Long Rifle cartridges interchangeably without adjustment. It was supplied in 12A-22" Round Barrel Straight Grip, 12B-24" Octagon Barrel Pistol Grip for .22 Shorts only, and the 12C for Shorts, Longs and Long Rifles; also the 12CS was furnished in the .22 Remington Special (.22 W.R.F.) caliber. The Model 12 was replaced in 1936 by the present Model 121.

The 121 is furnished in only one model with a 24" Round Barrel, Beaver-tail Fore-end, Pistol Grip, increased capacity magazine, and shotgun butt. Its weight is 6 pounds. The firing and breech block mechanism is simple in design. The breech bolt contains the extractor and firing pin. The hammer is operated by a coil spring and few changes in design have been made in this model.

AUTOLOADING MODELS.

In 1914 Remington produced the Model 16 Autoloading .22 Caliber (Remington Auto) Rifle. This rifle was designed by C.R. Barnes. The rifle was similar in appearance to an autoloading shotgun, excellent in balance and weight. It was made to compete with

Winchester's 1903 - .22 Caliber Autoloading Rifle. It had a tendency to burn out the breech which was due to the use of the .22 Auto Cartridge which is inside lubricated. This rifle was discontinued in 1934.

In 1924 Remington acquired the patent rights to produce the Model 24, .22 Caliber Autoloading Rifle, from John Browning. Minor changes were made in the original Browning consisting of a longer barrel, a wider and deeper receiver and a change in the loading port from within the grip to the middle of the stock. This rifle was the conventional "blow back" type with a cross bolt safety, tubular magazine located in the butt stock and was built originally for the .22 Short. It was later supplied for .22 Long Rifle.

MODEL 241.

In 1935 the present Model 241 replaced the Model 24. The newer model has improvements such as larger fore-end and stock and a 24" barrel.

MODEL 37.

The Model 37 DeLuxe Match Rifle was produced in 1934. It is the last word in a match rifle and Remington's first modern .22 Caliber of the match type.

MODEL 500 SERIES.

In 1939 the production of the 500 Series of Bolt Action .22 Caliber Rifles was inaugurated. First, the Model 510, a Single Shot; the Model 511, a Clip Magazine Repeater; the Model 512, a Tubular Magazine Repeater, followed by the Models 513S and the 513T, Clip Magazine, medium priced, "Sporter" and "Match Rifles".

In 1940 the Model 550, a .22 Rimfire Autoloading, Tubular Magazine Gun of unique design was adapted to .22 Short, .22 Long and .22 Long Rifle with complete interchangeability.

PISTOLS AND REVOLVERS:

Remington produced Cap and Ball Revolvers near the close of the Civil War. The Remington Model 95, better known as the Remington Derringer, an over-under two-barreled Pistol of .41 Rimfire Caliber was first produced in 1867 and discontinued in 1937.

In 1903 Remington produced the Model 7, a Single Shot Pistol in .22 Caliber, .25 Rimfire and .44 S & W Russian Centerfire. This pistol was built on the Navy Single Shot Pistol Rolling Block frame with 10" barrel. It was discontinued in 1907.

The Model 51, supplied in .32 and .380 Automatic Pistol calibers, was designed and produced in 1918 but discontinued in 1927.

AIR RIFLE:

The Model 26 Air Rifle first produced in 1926, was discontinued in 1934.

W. L. Clay
W. L. Clay
Manager of Quality

WLC:VPD
10/1/45

Remington.

File Conn. Spring



REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ELIOT, NEW YORK 13357

TELEPHONE (315) 894-9961

October 12, 1988

Julius L. Galin, President
The Connecticut Spring
& Stamping Corporation
Number Five Spring Lane
Farmington, Connecticut 06034

Dear Mr. Galin:

Reference is made to your letter dated September 6, 1988, whereby you refuse to manufacture trigger connectors (Connector Blank 'B', Remington P/N 91937, Remington drawing C-91937, revision 5, dated April 26, 1984) for Remington Arms unless Remington supplies a letter providing to Connecticut Spring "...an unconditional release for product liability or damage".

Remington strongly disagrees with your assertion and any implications, either expressed or otherwise, that the trigger connector is poorly designed. Connecticut Spring has expressed a concern that providing the hole by stamping is not good stamping practice. Consequently, we have asked that you consider other methods of providing the hole, such as drilling. Our design does not require the hole to be stamped.

In order to ensure continuity of supply as we evaluate manufacturing alternatives, Remington elects to release Connecticut Spring unconditionally from product liability or damage associated with the manufacture of Remington P/N 91937 under purchase order LRI-47900-116, release order 89, for deliveries effective approximately December, 1988. Subject release applies only to trigger connectors supplied under release order 89 and is not to be construed as relief from product liability or damages resulting from previously supplied parts.



AL 0021176

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In witness whereof, please signify your acceptance of the above by signing in the space provided below and returning one original to P.R. Harper, Remington Arms Company, Inc., 14 Hoefler Ave., Ilion, NY 13357.

The Connecticut Spring
& Stamping Corporation

Remington Arms Co.,
Inc.

By: _____

By: _____

Title: _____

Title: _____

Date: _____

Date: _____

xc: J.F. Winske
R.S. Dobzelecki, Jr.
W.H. Coleman
H.C. Munson
J.M. Simpson
K.D. Green
R.J. Orf
L.B. Ferreira

cap

AL 0021177

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File: Conn Spring
Spring, Wire Form and Stamping Specialists
THE CONNECTICUT SPRING & STAMPING CORPORATION

NUMBER FIVE SPRING LANE · FARMINGTON, CONNECTICUT 06034
TWX 710-423-4229 FAX 203 677-7199 203 677-1341

September 6, 1988

Remington Arms Co., Inc.
Ilion, NY 13357

Attn: Phillip R. Harper

Dear Phil,

As per our phone conversation I am putting your order for 50,00 pieces of part #91937 Alt. E on hold. We will not manufacture the trigger connector with the punched hole. The design referring to the wall thickness between the edge of material and hole is way under minimum for stamping practice. If however you still want us to make the part per your design, then I am requesting a letter from Remington giving us an unconditional release for product liability or damages.

We are sorry that such a request is necessary, but future concern can be avoided.

Hope to hear from you soon.

Sincerely

THE CONNECTICUT SPRING & STAMPING CORPORATION

Jules Galin
Jules Galin
President

JG/cam

CC: *SIMPSON*
FERRERIA
DOBRELECKI
COLMAN
MUNSON

"... make a good spring ... make it better than the competition ...
be the best spring-maker in the industry ..."

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A

Remington.



REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

REMINGTON ARMS CO. ILION, NEW YORK 13357
RECEIVED TELEPHONE (315) 394-9961

October 12, 1986

FIREARMS RESEARCH DIVISION

Julius L. Galin, President
The Connecticut Spring &
Stamping Corporation
Number Five Spring Lane
Farmington, Connecticut 06034

Dear Mr. Galin:

Reference is made to your letter dated September 5, 1986, whereby you refuse to manufacture trigger connectors (Connector Blank "B", Remington P/N 91937, Remington Drawing C-91937, Revision 5, dated April 26, 1984) for Remington Arms unless Remington supplies a letter providing to Connecticut Spring "... an unconditional release for product liability or damages".

Remington strongly disagrees with your assertion and any implications, either expressed or otherwise, that the trigger connector is poorly designed. Connecticut Spring has expressed a concern that providing the hole by stamping is not good stamping practice. Consequently, we have asked that you consider other methods of providing the hole, such as drilling. Our design does not require the hole to be stamped.

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REMINGTON ARMS CO
RECEIVED

Remington.



cc: J.F. Winske
R.S. Dobzelecki
W.H. Coleman
H.C. Munson
J.M. Simpson
K.D. Green

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

RESEARCH DIVISION ILLION, NEW YORK 12357

TELEPHONE (315) 894-9961

August 1, 1988

The Connecticut Spring and Stamping Corporation
Julius L. Galin, President
Number Five Spring Lane
Farmington, CT 06032

Dear Mr. Galin:

Pursuant to our telephone conversation of August 1, 1988, this letter is formal notification of Remington Arms Company, Inc.'s claim against the Connecticut Spring and Stamping Corporation, which is presently estimated to be in the neighborhood of \$2,000,000.

Subject claim will be to recover costs incurred by Remington Arms resulting from the replacement of trigger assemblies in identified Model 700 Bolt Action Rifles. The targetted trigger assemblies are those which may include defective trigger connectors (Connector Blank "B", Remington P/N 91937, Remington drawing C-91937, Revision 5, dated 4/26/84) supplied to Remington Arms by Connecticut Spring during the approximate period of September-December, 1987.

Remington will follow this notification with documentation of the specifics of our claim and the breakdown of estimated costs which will result from the supply of defective connectors.


Phillip R. Harper
Supervisor, Purchasing
Remington, Illion

PRH:bb

AL 0021181

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File: Conn Spring

E. I. DuPont de Nemours & Company
Remington Arms Company, Inc.
Ilion, New York 13357

Xc: J. F. Winske

June 6, 1988

TO: W. H. COLEMAN

FROM: H. C. MUNSON

CONNECTICUT SPRING & STAMPING CO.

RISK ANALYSIS OF MAKING A CLAIM FOR TRIGGER CONNECTOR COMPENSATION

Background

- o Cracked trigger connectors manufactured by Connecticut Spring may have been assembled into some M700 rifles. This resulted in a trigger assembly replacement program with an estimated cost of \$1.81MM.
- o Connecticut Spring annual sales are about \$30MM.
 - Remington represents 1 1/2-2% of their sales.
 - Total firearms parts make up 8-10% of their sales.
 - DuPont's Electronics Department also represented about 1 1/2% of their sales in 1987, but this is decreasing rapidly due to offshore manufacturing.
- o Connecticut Spring has supplied millions of parts over many years to Remington.

Considerations in Determining What Action to Take

The main risk consideration is the potential loss of firearms sales if Connecticut Spring should decline to make parts beyond current commitments. This may be handled in advance by a white paper contract providing a "window of protection" for at least one year. Without assurance that the supplier is obligated to keep supplying parts against our releases, we would be foolish to risk a loss of supply. Connecticut Spring supplies parts that are used across our entire product line. Nearly all are single-sourced, including an 11-87 part for which no other potential sources have been found.

A "worst case" situation was analyzed, using gross approximations of time and expense required to find new suppliers for all these parts. As an order of magnitude, this effort would consume 7-8 man-months of engineering time, \$250,000 in tool costs, and 6-8 months elapsed time to account for initiation, tool build, development runs, approvals, and production time.

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Recommendations

- o Establish a white paper contract with Connecticut Spring, providing assurance of supply for a minimum of one year at all times (for example, a two-year contract renewed annually).
- o Continue increasing our activity with Connecticut Spring through Engineering work on new parts and resolution of problems on existing parts.
- o Consider a gradual build-up of inventory of a few very difficult parts
- o Assess our position monthly to determine the best time to make a claim.
- o Determine the best team to visit Connecticut Spring for the purpose of initiating discussions on T.A.R.P. compensation.

Summary

We need Connecticut Spring as a partnership supplier. By increasing our communication and activity with them over the next 6-12 months, and by establishing a firm contract as we have with other suppliers, we can be in a much stronger position to negotiate sharing costs incurred as a result of defective M/700 trigger connectors.

I will proceed on this basis unless you feel differently.

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CONNECTICUT SPRING - IMPACT OF CHANGING SUPPLIERS

Approximately 125 Remington parts are made by Connecticut Spring.

Approximately 3/4 (90) are active parts.

Of the 90, about 1/3 (27) are not coil springs.

Of the 27, 1/3 (9) would be very difficult to move, including the 11-87 gas cylinder spring which no one else will quote.

Assume the following costs and engineering time:

	<u>Coil Springs</u>	<u>Specials</u>
Tool Cost	\$500 - \$1000 (Use \$750)	\$3000 - 40,000 (Use \$8000)
Engineers Initial Time	1-2 Hrs.	1-2
Purchasing Time	1-2 Hrs.	1-2
Follow-Up	2-4 Hrs.	4-8
Scheduling Coord.	1 Hr.	1
Sample Approval (or not)	2-4 Hrs.	2-20
Purchase Order	1 Hr.	1 Hr.
	8-14 Ea. (Use 10 Hrs.)	10-34 (Use 20Hrs.)
	<u>Elapsed Time: Weeks</u>	<u>Elapsed Time: Months</u>
Total Cost 63 (\$750) =	\$47,250	27 (\$8000) = \$216,000
Total Time Invested:	630 Hrs.	540 Hrs.

Total
Our Engineering Time
Elapsed Time

\$250,000 in Tooling
1,200 Hrs. @ \$25/Hr. = \$30,000
6-8 Months

G.H.L.

REMINGTON ARMS COMPANY, INC.

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

- cc: E. Hooton, Jr.
J. G. Williams
J. P. Glas
C. A. Riley
P. H. Holmberg
W. H. Forson
C. B. Workman
K. D. Green
J. H. Chisnall
J. A. Stekl
R. L. St. John
J. H. Carter
J. P. Linde
R. B. Sperling

Bridgeport, Connecticut
February 11, 1982

H. K. BOYLE

SERVICE REQUIREMENT FOR MODEL 700
RELATIVE TO REMOVAL OF BOLT LOCK (REVISED 2/11/82)

With removal of the bolt lock feature from the Model 700, several questions have arisen with regard to repairs. This note sets forth Marketing's desires for handling repairs and/or replacements of Model 700's.

The various Arms Service repairs should be handled following these guidelines:

- o Receiver and trigger assembly not involved in repair.
 - | No change is to be made to the bolt lock. From a bolt lock standpoint, the gun is to be returned in the same condition it was received.
- o Receiver or trigger assembly involved in repair but bolt lock is not affected.
 - | If the repairs can be made without impacting the bolt lock, they should be done that way.
- o Receiver or trigger assembly must be replaced as part of the repair.

If possible, the same guidelines as above should be followed since it is desirable that the features of the firearm not be changed during a repair. However, if parts are not available to make such repairs, then a new receiver or trigger assembly, without the bolt lock, should be used. The customer does not need to be notified of this change.

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H
H. K. BOYLE

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February 11, 1982

Replacement of Model 40X, Model 600, and 660 parts should be handled the same way. If the bolt lock feature is changed as a result of a repair, we do not need to inform the customer.

Repairs made by our Recommended Gunsmiths should follow this same philosophy. This situation would arise only when the trigger assembly is replaced, since the receiver is a restricted part.

F. T. Millener
F. T. Millener

FTM:fms

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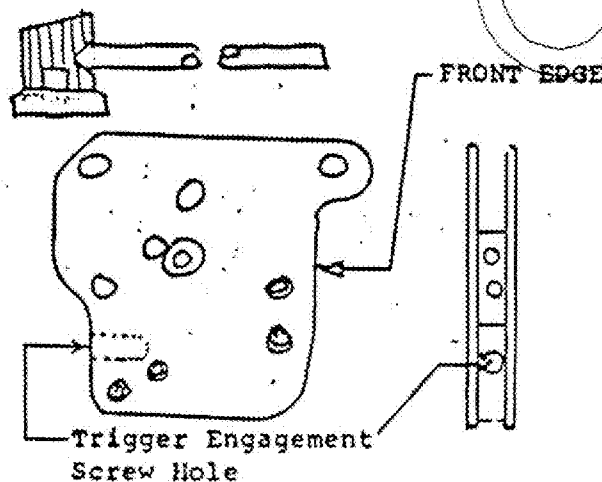
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ASSEMBLY AND INSPECTION PROCEDURE
MOHAWK 600 TRIGGER ASSEMBLY

1. Clean and prime Trigger Engagement Screw hole. (see figure 1)
 - a. Position Housing on its front edge.
 - b. Air clean Trigger Engagement Screw hole and Housing.
 - c. Spray Trigger Engagement Screw hole with "Locquic Primer T" (Aerosol can).—Housing must air dry (no hose) at least five minutes after spraying before they are used.
 - d. To Trigger Sub-Assembly -

NOTE: USE RED PLASTIC VALVE-FINGERPIECE
AND PLASTIC TUBE FROM CAN OF "INHIBISOL"
ON CAN OF "LOCQUIC".



(figure 1)

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2. Inspect Connectors 100% and smooth top. Scrap all defectives.

Note: Do all elements 100%.

- a. Inspect long inside connector surface and inside surface of long (top) leg for flatness. Hold connector against flatness block with light finger pressure.
- . If no light shows between back and long leg of connector and block surface, then connector is passed (see Figure 2).
 - . If light gap shows, measure gap with .004 shim. If gap accepts shim without moving connector, then reject connector (see Figure 3).
 - . Reject connector if it rocks on flatness block at all (see Figure 4).
 - . Front edge of long (top) leg must be square with shoulder on flatness block (see Figure 5).

Flatness Block: C-44520

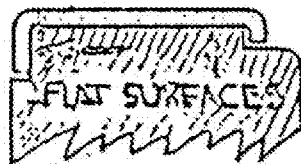


Fig. 2. GOOD



Fig. 3. TEST LIGHT GAP WITH SHIM

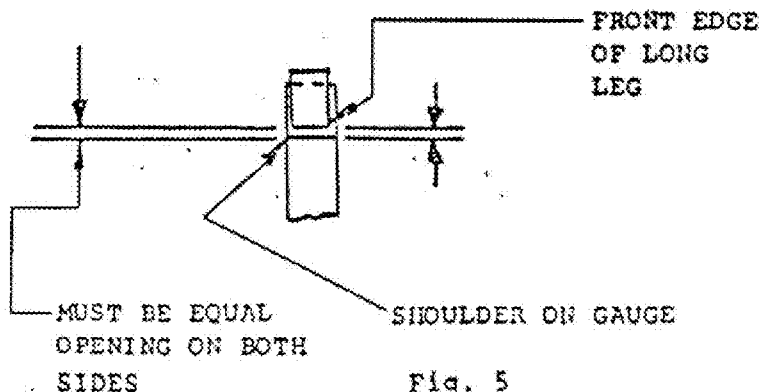


Fig. 5

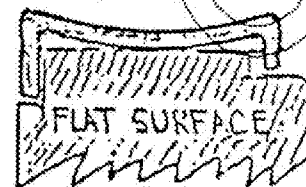
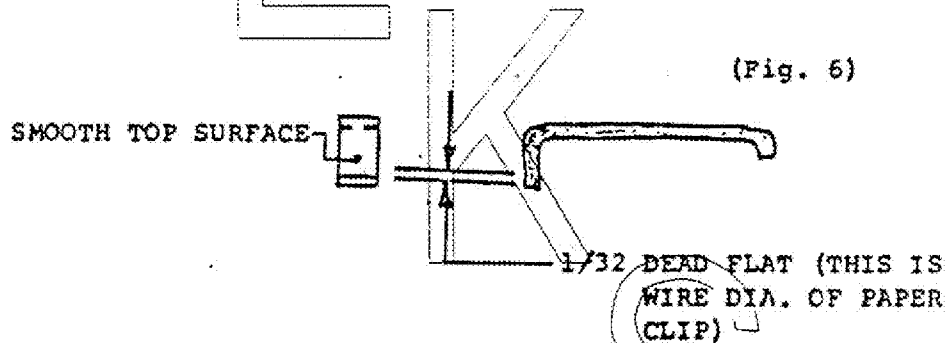


Fig. 4. REJECT

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TO REMINGTON ARMS COMPANY, INC.

- b. Check connector for maximum width over full length.
Reject parts over 0.172. Use receiving gauge C-44522.
- c. Smooth top surface of long leg of connector. Use crocus cloth. Surface must be: (see Figure 6)
 - . Smooth
 - . Burr-free
 - . Dead flat with 1/32" of end

Check for smoothness and burrs with tip of finger.



3. Inspect Trigger

- a. Inspect Trigger for: (See Figure 7)
 - . Good black color
 - . No bleed-out
 - . No burrs on sides

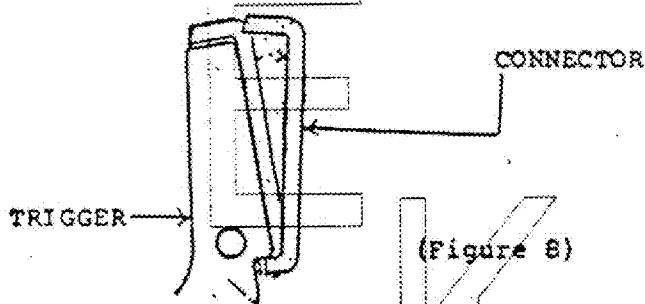


NO BURRS - BOTH SIDES

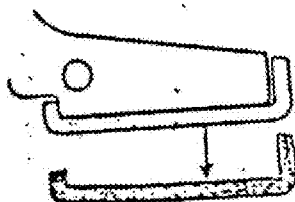
(Fig. 7)

4. Check Connector to Trigger Fit - 100%

- a. Fit passed connector to passed trigger and check for minimum working clearance (slipfit).
- . Connector must rotate freely around bottom (short) leg without binding on top of trigger (see Figure 8).

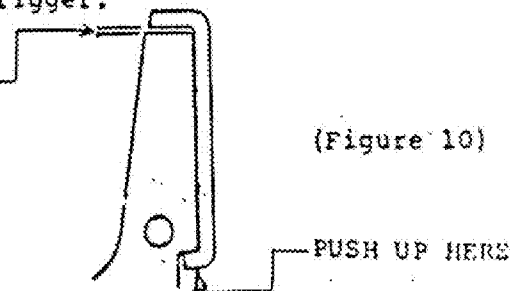


- . Connector must fall off trigger when trigger is held horizontally (see Figure 9).



- . File bottom notch on trigger only if required to remove bind. Filed surface must be flat and square with sides of trigger. Use filing fixture D-44521.
- b. With same trigger and connector, check for maximum working clearance (see Figure 10).
- . Push connector tight to trigger at bottom.
- . Insert shim stock in clearance from front to back. .006 shim must not go. If shim goes without moving connector, scrap trigger.

Insert shim from
this direction.



5. Assemble Trigger Sub-Assembly - Stage I

- a. Inspect Housing
 - . Good Black color.
 - . No bleedout.
 - . Check inside Housing for burrs at the Sear Pin Holes.
- b. Position Trigger in Housing and install Trigger Pin.
Use pin holder drive punch A-35645.
 - . Pin must be flush to Housing on right side.
 - . Trigger must rotate freely in Housing without bind.
Grip Trigger and rotate Housing around Pin.
- c. Install -
 - . Same Connector as fitted to above Trigger.
 - . Trigger stop screw - one turn (thread) above flush with hole.
 - . Trigger adjusting screw - flush with hole.
 - . Trigger Spring.
 - . Trigger Engagement Screw - flush with holes.
- d. Install -
 - . Sear Spring
 - . Correct Sear using two dummy Pins (A-51468).
Sear must be flat, not bowed (visually check).
Sear must have dimple (see Figure 11).



(Figure 11)

CORRECT SEAR - PART #91470
HAS A RECESSED DIMPLE ON
RIGHT SIDE. DO NOT
SUBSTITUTE.

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6. Adjust Trigger Sub-Assembly on Comparator 100%.

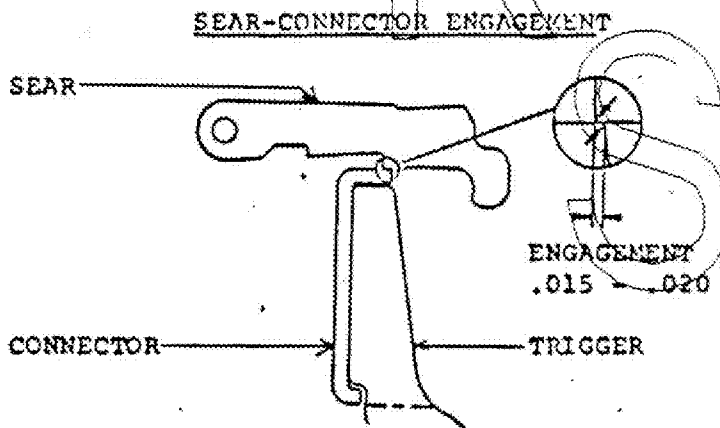
- a. Pick Trigger Sub-Assembly and position in comparator fixture and clamp.

(Comparator fixture E-42271)
(Comparator screen A-600-CL25)

- . Housing must properly contact all locators.
- . Top of Housing must be flat on fixture.

- b. Adjust fixture to locate Sear on "set" line of comparator screen.

- c. Adjust Sear-Connector engagement (.015 - .020) to correct comparator screen line by turning Trigger Engagement Screw slowly clockwise (to reduce engagement) (see Figure 12).



(Figure 12)

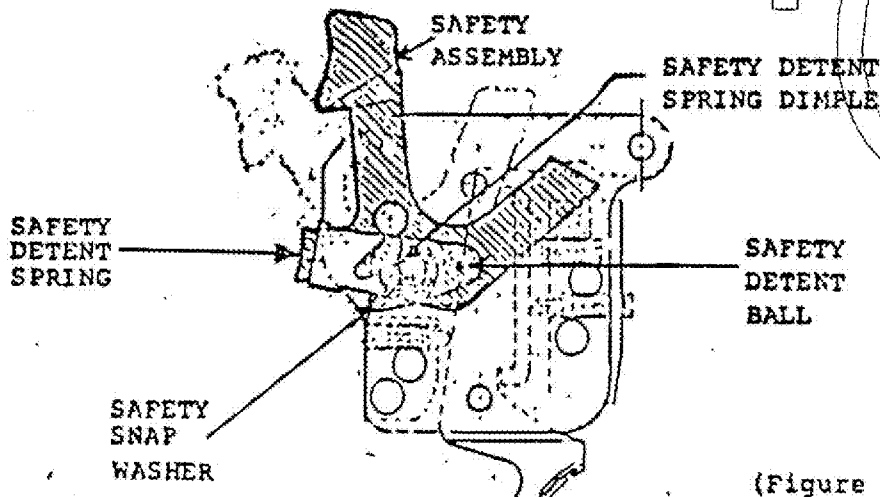
After correctly adjusting Sear-Connector engagement -

- d. Hang dead weight assembly to end of Trigger (Comparator fixture dead weight 2½ lbs. M600 only).
- e. Adjust Trigger pull by turning Trigger Adjusting Screw counter-clockwise slowly until Sear just disengages (fires).

- A
- f. Readjust fixture to locate Sear on "set" line of comparator screen.
 - g. Remove dead weight assembly from Trigger.
 - h. Hold Trigger in fired position firmly with finger.
 - . Set over-travel by turning Trigger stop screw clockwise until Trigger Connector touches correct line on comparator screen.
 - i. Remove Trigger Sub-Assembly from comparator fixture.
 - j. Seal all three screws with Duco cement.
7. Assemble Trigger Assembly - Stage Two.
- a. Pick correctly adjusted Trigger Sub-Assembly.
 - b. Assemble (see Figure 13).
 - . Safety Assembly.
 - . Safety Detent Ball.
 - . Safety Detent Spring.
 - . Safety Pivot Pin.
 - . Safety Snap Washer.

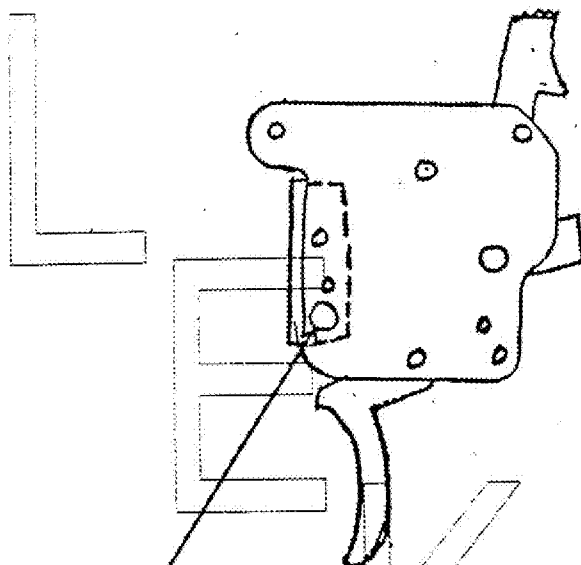
Make sure that:

- . Safety Snap Washer is completely contained within Safety Pivot Pin groove.
- . Raised dimple on Safety Detent Spring is at left end of opening at closed end of Safety Snap Washer.



(Figure 13)

8. Lubricate Connector and Sear with "Molykote" dry powder.
- Pick Trigger Assembly.
 - Apply small amount of "Molykote" powder to Sear-Connector engagement surfaces through engagement view hole. (Use dry type "Molykote" powder and squeeze container - eyedropper).
9. Function check completed Trigger Assembly 100%.
- Put safety in "off safe" position and check for:
 - Trigger Retraction - pull Trigger and release - Trigger and Connector must return freely to original position with spring force.
 - Sear freedom - pull Trigger and hold - depress Sear fully and release. Sear must move freely in Housing without binding. It must return fully upward under Sear Spring force.
 - Operation of Safe - push Safety thumb-piece fully forward beyond detent position. Safety must spring - return rearward to detent position.
 - Push Safety thumbpiece fully rearward beyond detent position. Safety must spring - return forward to detent position.
 - Move Safety from "on safe" to "off safe" position and back twice. Safety must spring forward into "off safe" detent when pushed slightly to rear of detent position. There must be no hangup or hesitation between detent positions. Bolt lock arm must work freely on Housing.
10. Mark correctly assembled and checked Trigger Assembly with Assembler's identification. (See Figure 14)
- Locate Trigger Assembly in stamping fixture.
 - Stamp lower left front corner, as shown in Figure 14, with correct assembler identification. Use 1/16" size character.



(Figure 14)

STAMP HERE. MARK MUST BE ON HOUSING WHERE
FULLY SUPPORTED BY SPACER BLOCK.

11. Check for Sear Lift 100%.

- a. Pick Trigger Assembly and position in gage and clamp (Gage #D-42614).
- b. With Safety in "off safe" position, move dial indicator into position and set dial to "0".
- c. Move Safety to "on safe" position.
 - . Dial indicator must read .008" or greater.
 - . Reject Trigger Assembly if less than .008".
- d. Move Safety to forward-most "null location."
 - . Dial indicator must read .008" or greater.
 - . Reject Trigger Assembly if less than .008".
- e. Move Safety to "on safe" position and remove Trigger Assembly from gage. Reposition Slave Pins in Sear Pin holes.

12. Check Sear-Connector Clearance 100%

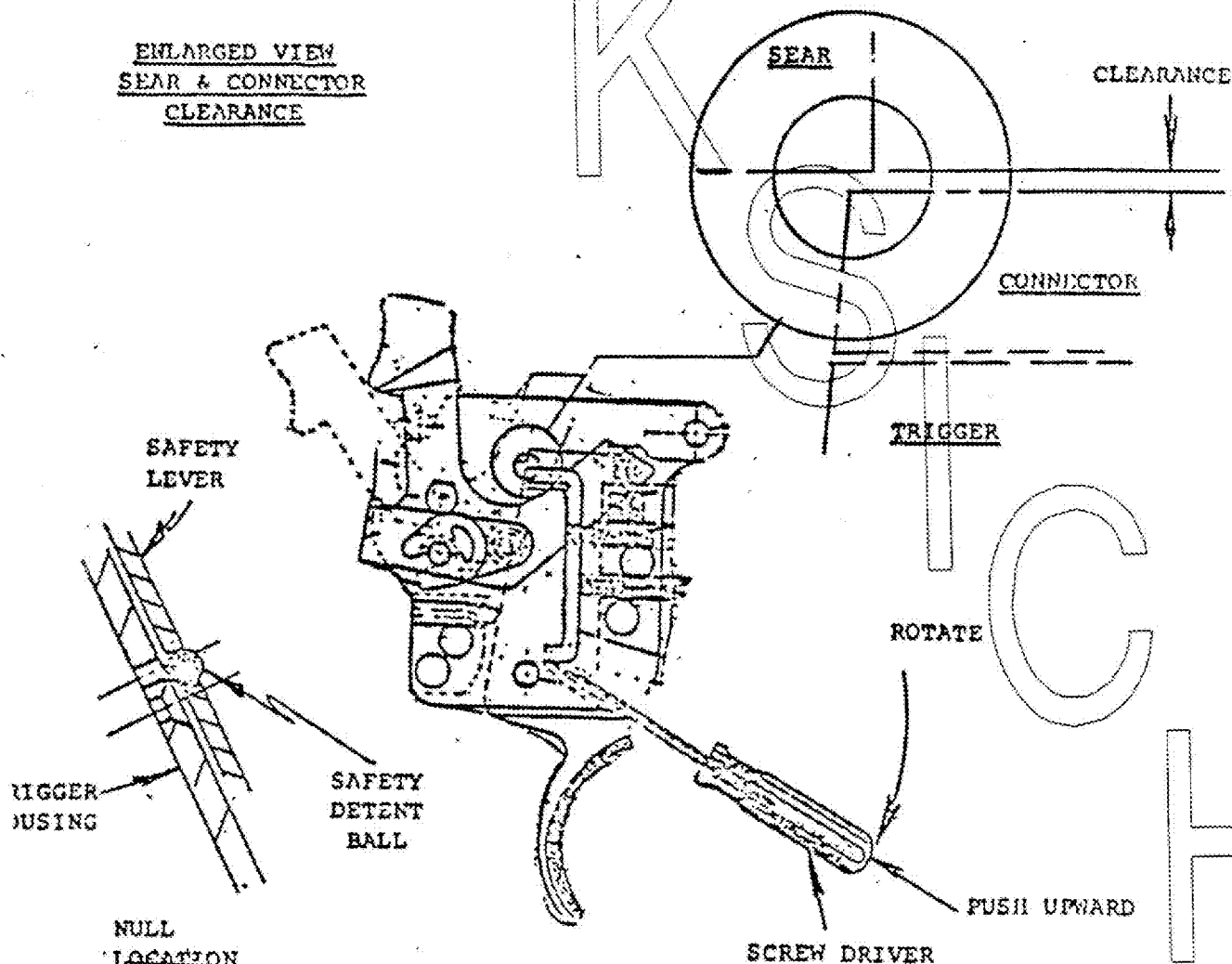
- a. Move Safety to "null location." Insert the blade of a small screwdriver in the Housing just ahead of the Trigger

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TO REMINGTON ARMS COMPANY, INC.,

and push the Connector upward toward the Sear. CAUTION:
Be sure to push on the Connector and not the Spacer Block.

- b. While pushing downward on the Sear and pushing upward on the Connector, use the screwdriver to rotate the Trigger front to rear (see Figure 15).
 - Through the inspection hole in the Housing, clearance must be observed between the Sear and Connector.
 - Connector must freely return under Sear when Trigger is released.
 - Reject for no clearance or if Connector catches on Sear.
- c. Stamp "V" on Trigger left side, just below Housing on Assemblies which have passed steps 11 and 12.

ENLARGED VIEW
SEAR & CONNECTOR
CLEARANCE



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→ R 5/11/1978
DON'T SAY IT—WRITE IT

TO C. B. WORKMAN

RECEIVED

DATE September 12, 1978

OCT 30 1978

FROM J. W. BROOKS

U. S. GOVERNMENT

BOB NAGEL's ARTICLE ON HUNTING RIFLE SAFETIES - In March-April 1978
Rifle Magazine

The part of the above mentioned article that covers the M/700 Safety is incorrect. He uses the word "lock" which Webster defines in the following way:

"To hold fast or inactive: Fix"

Using this terminology the M/700 firing pin (or striker) is locked when the safety is "ON".

He states that the safety does not lock the firing pin (or striker) but blocks the trigger.

The M/700 firing pin (or striker) is locked back by the sear safety cam assembly. The sear safety cam assembly is in turn locked up by the safety. The trigger can be moved and nothing will happen.

He states that if the safety device should malfunction, the firing pin (or striker) is free to fall with the safety in the "ON" position. This infers that the safety is a required part of the fire control (firing mechanism) to operate the firing pin. This is incorrect because if the safety is completely removed the firing pin can still be cocked and safely activated.

The M/700 safety operates as follows:

With the bolt closed and when the safety is moved to the "ON" position, the sear safety cam is moved or cammed up off the trigger connector by the safety. The sear safety cam is in contact with the firing pin head and moves it slightly to the rear. The firing pin cannot move forward. It is locked to the rear. The trigger is free to be moved within limits. In its normal position the trigger is spring loaded to the rear where it remains under the sear safety cam. Therefore, if the sear safety cam was suddenly allowed to drop down it would come in contact with the trigger connector and stop. This would prevent the firing pin from falling until the trigger was activated.

JWB:T

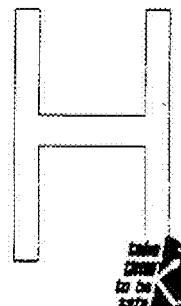


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Remington.

REMINGTON ARMS COMPANY, INC.

PETERS

MANUFACTURERS OF
SPORTING FIREARMS, AMMUNITION

SPORTING FIREARMS, TRAPS, BION, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT

TRAPS

TARGETS

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT

IONOKE, ARKANSAS

BRIDGEPORT, CONNECTICUT 06602

TARGETS, INDIAN, OHIO

CABLE—HARTLEY, BRIDGEPORT

ADA, OKLAHOMA

TELEX, 944-201 STRATFORD, CONN.

February 13, 1979

ATHENS, GEORGIA

Mr. Clem Morgello, Editor
Dun's Review
Editorial Office
666 Fifth Avenue
New York, New York 10019

Dear Mr. Morgello:

Thank you for your response to my letter of January 15 concerning DUN'S REVIEW's recent article on product recalls.

The facts of the situation are as stated in my letter. The rifles in question will not fire without someone at some point pulling the trigger. What makes the situation unusual is that by pulling the trigger while the safety selector is in a certain position that is neither "on" nor "off", these rifles can be made to fire when the safety selector is then released to the "off" position. That is what we meant by our reference to manipulation of the safety selector and trigger. Firing under such circumstances would constitute accidental discharge, but it is a far cry from the situation when the rifle fires without the trigger ever being pulled. The difference in the degree of hazard involved is significant. That is why I consider your statement to be "defective".

Very truly yours,

R. A. Partnoy

R. A. Partnoy
General Counsel

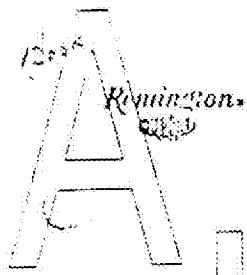
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PLAINTIFF'S
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REMINGTON ARMS COMPANY, INC.

PETERS
PETERS

MANUFACTURERS OF
SPORTING FIREARMS, AMMUNITION

SPORTING FIREARMS, TRAPS, ILLION, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT
IONOKE, ARKANSAS
CABLE—HARTLEY, BRIDGEPORT
TELEX, 964,201 STRATFORD, CONN.

TRAPS

TARGETS

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT
TARGETS, HINDIA, OHIO
ADA, OKLAHOMA
ATHENS, GEORGIA

BRIDGEPORT, CONNECTICUT 06602

January 15, 1979

Dun's Review
Editorial Office
666 Fifth Avenue
New York, New York 10019

bcc: P.H. Burdett
J.P. McAndrews
E.S. McCawley

Attention: Mr. Clem Morgello, Editor

Gentlemen:

I just read your article "A Record Year for Recalls" in the January 1979 issue of Dun's Review, and I wish to bring to your attention a defective statement contained therein which is unreasonably hazardous to Remington's business reputation.

I am referring to the reference on page 28 to "a rifle that may fire without anyone pulling the trigger". (The listing of "rifles" and "Remington Arms Co." under "product" and "manufacturer" under the "Recall Roll Call" on page 31 leaves little doubt that the manufacturer of the rifle referred to on page 28 is Remington.)

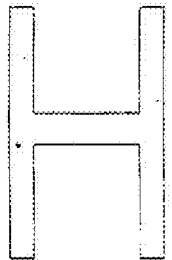
The fact is, the Remington rifles being recalled will not fire without pulling the trigger. As stated in our recall notice, under unusual circumstances the safety selector and trigger of certain of these rifles can be manipulated in such a way that subsequently moving the selector to the fire position could result in accidental discharge. However, at some point in this sequence the trigger must be pulled or the gun will not fire. It is a gross misrepresentation of the facts to say the rifle may fire without anyone pulling the trigger.

May I suggest a recall of your statement, with appropriate notice to assure that the message is adequately disseminated.

Very truly yours,

R. A. Partnoy
R. A. Partnoy
General Counsel

RAP:CK



AL 0021875
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A

NEW CENTER FIRE RIFLE

1. Endurance - 6,000 Min.
2. Function - 1/2 to 1%
3. New Locking System
4. Three Receiver Sizes
5. Interchangeable Between Calibers
6. New Styling
7. Weight - 5 1/2 lbs. - 6 1/2 lbs.
8. New Magazine Box
9. New Fire Control
10. New Safe Location
11. Type, Target, Verminor Hunter

JSMartin:sp
12-3-69
Illon Research Division

PLAINTIFF'S
EXHIBIT

3046

AL 0022835

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RECEIVED
NOV 24 1952
ARL
DEVELOPMENT DIVISION

CC: W. L. Clay - Capt.
G. E. Plimney -
G. R. Calhoun -
J. B. Neuphin
S. R. [unclear]
W. A. D. Jordan
W. A. Best
R. Snapp

Illness, New York
November 21, 1952

TO: W. A. Brown - Bridgeport
FROM: H. J. Hankman

We regret very much the delay in replying to your pencilled inquiry on copy of letter from G. E. Plimney to G. R. Calhoun dated October 29, 1952. This inquiry concerned the statement in the "1st Quarter Complaint Report" issued by W. L. Clay, October 25, 1952 to the effect that "the M/721 gun off occasionally", and calling our attention to the seriousness of this condition.

As you are no doubt aware, we are likewise concerned with incidents of this type and every effort is made to eliminate their occurrence. The following information is being presented and covers the period from 1950 to the present time. During 1950, there were twelve (12) per off complaints received on this model.

7 in the 1st Quarter
4 in the 2nd Quarter
1 in the 3rd Quarter
0 in the 4th Quarter

In 1951, there were no per off complaints received on this model. To date in 1952 there have been two (2) per off complaints received.

1 in the 1st Quarter
0 in the 2nd Quarter
1 in the 3rd Quarter

It has been determined that the complaint reported in the first quarter of 1952, occurred in a gun produced in January 1951. The complaint recorded for the third quarter of 1952, concerned a gun produced November 1948. As a result of the experience during the year 1950, as recorded herein, corrective action was taken at Plant Inspection by incorporating a special Action Test. This test requires that with the Bolt Handle raised halfway, the engagement of the Rear and Connector must be a minimum of ".020".

It appears that this test has been effective since no complaint has been received on guns produced since the introduction of this control in 1951. Also, to date no per off incidents have been found in final gun audit tests during the years 1951-52 to date.

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PLAINTIFF'S
EXHIBIT
3047

AL 0022407

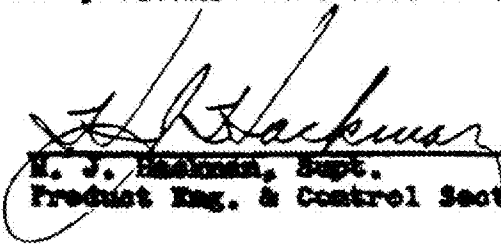
103

H. A. Brown

-2-

11/21/52

You can be certain that the importance of eliminating jer off incidents has been stressed in our contact with all personnel concerned at Ilicia.


H. J. Mackenna, Supt.
Product Eng. & Control Section

HJH:HK

AL 0022408

283

M-600, 660
M-700

GUNS RETURNED WITH CAUSES RELATED TO TRIGGER ASSEMBLY - CONNECTOR

CAUSE CODE	DESCRIPTION	1975		1974		1973		1972		1971		5 YR. TOTAL ↓
		'50	'70	'50	'70	'50	'70	'50	'70	'50	'70	
3200	- Mutilated	1		1								2
3201	- Broken, cracked	2		2	8	2		4	1	8		27
3202	- Rusty											
3203	- Bent			1	1							2
3204	- Sticky					1	1					2
3205	- Binds on trigger plate or in trigger, or in Rec.											
3206	- Corners rounded at engagement surfaces											
3207	- Soft											
3208	- Chips, etc., under connector							1				1
3209	- Out of pos.				1					1		2
3210	- Connector spring weak, buckled											
3211	- Missing, loose							1				1
3212	- Not adjusted properly (follow down)				1					3		4
3213	- Connector defective			2	2					1	2	7
3214	- Connector guide pin broken, missing, defective											
3215	- Connector spring missing											
3216	- Came loose from trigger											
3217	-											
3218	-											
3219	-											
3220	-											
YEARLY TOTALS		3	0	6	13	0	3	1	6	2	14	48

Rev F. MARTIN (R-O)
by G BULLIS
6/4/76

AL 6022409

383

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7-9-75 - 7-11-75

RESEARCH PRESENTATION

JULY 1975

PLAINTIFF'S
EXHIBIT

3048

3200 COST REDUCTION AND DESIGN IMPROVEMENTS

I. There will be a continuing effort over the next year to lower costs and improve the reliability of the 3200 Shotgun. The following cost items are presently being worked on:

- A. The present ejectors are machined out of solid bar stock. We propose to buy formed bar stock to match the head and stem profiles of the ejector. The formed bar stock would be cut to length and electron beam welded together. This change would save 9 milling operations per ejector.
- B. An ejection system design which would eliminate parts and lower costs has been developed. The design is being tested in the light weight series.
- C. We are working with Production on helping to reduce labor costs at the stock and fore end fitting operation while maintaining the quality objectives.
- D. The frame assembly complete is one of the most costly components on the 3200. We have investigated manufacturing it in a number of different ways. We have tried making both tangs integral with the frame, tried making the bottom tang integral with the frame. In each case the added cost due to complexity of the parts outweighed the savings in the reduced number of operations. We are now looking into the feasibility of taking the separate parts and welding them together. There should be a savings, as the parts would be easier to machine, and the mechanical joints would be eliminated.

AL 0022437

Remington Arms Company, Inc.

I. E. The modification added parts to the gun, which increased the cost. We are looking into ways of reducing the added part costs. Design work is being done to change the strut from a machined part to a stamping. The slot nut will be made from formed bar stock instead of being machined from bar stock.

II. There were a number of design changes made over the last year:

- A. The frame assembly was modified with the addition of the strut for added tang endurance, and the elimination of the following fire control problems: 1) deflection of the tangs causing fires on closing, 2) trigger adjustment affected by stock bolt torque, and 3) fails to fire malfunction.
- B. The ejector cam plates were redesigned to prevent cam plate breakage if the gun is excessively dry cycled and to reduce wear if the cam plate bearing surfaces are not properly lubricated.
- C. The ejector system was redesigned to allow the gun to rotate open further to give greater clearance between the shell ejecting from the bottom barrel and the top lock.
- D. The 3200 has a very good trigger pull, and to maintain this feature we have been isolating the factors which contribute to the trigger feel. From this study we have determined that the notch form and surface finish are the most critical. To maintain the 3200 trigger performance, the sears and hammer notches will be form ground. To monitor our firearms and compare our trigger pulls with the competition we have developed a gage which prints out a graph of the trigger characteristics. This takes trigger pulls out of the subjective case where

II. D. you are relying on individual feel, and puts it in a category where triggers can be rated.

E. We are continuing design work on reducing the number of cracks in the stocks and fore ends. We are working to decrease the deflection of the fore end iron - fore end plate joint to relieve the strain on the fore end wood. We are taking high speed movies of the stock under the various loading conditions to determine the best possible design solution.

3200 COMPETITION SKEET and TRAP GUNS

1. The competition grade guns will be announced in January 1976. The competition grade will allow the price restructuring of the whole 3200 line to increase revenues. The competition trap gun will replace the special trap, while the competition skeet gun will be a new item.

Competition Features

Presentation style recoil pad

"B" Grade wood

Low gloss oil type finish

New distinctive checkering patterns

Checkered side panels

Contoured pistol grip

New gold washed frame markings

Engraved trigger bow and fore end latch plate

Improved ejector finish

3200 ALL GAUGE SKEET SETS

With this set the customer can shoot all skeet events with the same gun, rather than having to adapt to a new gun for each event.

The gun has a common weight, balance point, sight line and point of impact for all barrel assemblies. When the shooter shoots any gauge it is practice for any other gauge because it is the same gun with the same feel with any of the barrel assemblies.

The barrels have a unique contour which lets us eliminate the need for spacers or separate fore ends for each barrel assembly.

Work has been done to optimize the chokes for each gauge. Three all gauge skeet sets have been fabricated. A total of 112,000 rounds have been put through the three sets. One gun was fired to 100,000 rounds - 25,000 per barrel assembly, with no significant problems. The barrel integrity has been tested with high pressure loads (3 times normal proof pressure levels). Over 12,000 rounds have been fired at skeet targets with excellent scores being recorded.

The drawings have been released to Production and a marketing plan is being developed.

AL 0022441

MODEL 3200 SINGLE BARREL TRAP GUN

The 3200 single barrel trap gun was designed to give the shooter the ultimate advantage at every trap shooting event. (16 yard singles and 17 to 27 yard handicap).

The gun features an adjustable rib which lets the shooter select his point of impact. No two shooters see the same thing or take aim on the target the same; thus, this gun lets the shooter adjust the gun to his needs; he does not have to adjust to the gun. The rib is such that the shooter will not be bothered with heat mirage.

The barrel assembly has a recoil reducer matched with the recoil pad to give the greatest possible recoil reduction. The recoil reduction should be about equal to the M/1100. This is a valuable asset in trap where all shooting is done with 12 Gauge guns.

The single barrel assembly will have two special Remington trap chokes so the shooter can choose the optimum pattern for his given yardage.

Because the bottom barrel is used, the gun has straight back recoil. The barrel is overbored to obtain the best possible pattern.

The single barrel gun can be offered with an extra set of barrels for trap doubles. This barrel assembly would have the bottom barrel shot high with a modified choke for the first bird, while the top barrel would be set to shoot right on with a full choke for the second bird.

MODEL 3200 SINGLE BARREL TRAP GUN Continued

Three prototype guns with the latest design features will be fabricated for a marketing field test in November. No firm announcement date has been established. The design is being approached from the standpoint of getting into production with a minimum of investment.

3200 LIGHTWEIGHT

The 3200 Light Weight has been developed in four different versions:

12 Gauge Field Light Weight	7 1/4
20 Gauge Field Light Weight	6 3/4
12 Gauge International Skeet Gun	7 1/2
12 Gauge Slug Gun	

The 3200 was designed for the skeet and trap markets. This gun is a variation of the standard gun which has been lightened to provide a better upland game gun. The 20 Gauge was developed to weigh under 7 pounds, while the 12 Gauge field weighs slightly over 7 pounds. The slug gun could be offered as a gun or a slug barrel assembly for the field gun.

These guns are being developed as a possible addition to the line, with no firm announcement date.

MODEL 870 SUPER TRAP

This model would be priced between the M/1100 Trap and the 3200 Trap gun. The gun will have a recoil reduction system, and an adjustable rib similar to the 3200 single barrel. It will be a two shot manually operated gun, so the shooter will have the reliability he wants with the option of saving his shells.

MODEL 700 PROGRAM

We are continuing design work on the bolt action line to maintain our market position.

For the short range we are going to bring out the M/700 BDL Varmint Rifle in the popular 308 Caliber. This rifle will be aimed at the following markets:

1. 30 Caliber Varmint Hunter
2. Silhouette Shooter
3. Hunter Class Bench Rest Shooter
4. Law Enforcement Officers

We are investigating the feasibility of putting the 8mm Remington magnum in the M/700 rifle.

MODEL 700 PROGRAM Continued

For the long range program we are looking at the following items:

1. Improved safety mechanism
2. Detachable box magazine
3. Decreasing the lock time
4. Going to an enclosed bolt plug with cocking indicator
5. Improved trigger mechanism
6. Improved accuracy

MODEL 600 MINI CARBINE

This rifle will satisfy the needs of the back packer, guide, and deer hunter for a light, short, and fast handling gun.

The gun is 34½ inches long and weighs only 5 7/8 pounds. There is no planned announcement date for this gun. The gun could be offered in one or two grades, with any of the popular short action cartridges.

The deluxe grade will feature:

- Laminated stock
- Sling and Swivels
- Recoil Pad
- Metal Trigger Guard
- RK-W Finish
- Press Checkering

The utility grade would be a plain gun with a straight pull birch stock.

REMINGTONS SHARE OF SPORTING ARMS MARKET

	1970	1972	1973	1974
AUTOLOADING SHOTGUNS	43	50	48	46
PUMP SHOTGUNS	29	32	28	29
RIM FIRE RIFLES	23	17	16	19
AUTOLOADING CF RIFLES	44	45	50	61
PUMP ACTION CF RIFLES	-	-	-	99
BOLT ACTION CF RIFLES	48	46	45	49

A *File Consumer Camp*

COPIES TO:

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F.K. CRAIG
G.O. CLIFFORD
M.R. WARDEN
G.E. PINCKNEY
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W.L. CLAY
W.F.H. MATTLAGE
BRIDGEPORT.

H.K. FAULKNER
W.H. DAVIS
H.A. BROWN
R.H. GRACE
H.J. HACKMAN (6)
D.S. FOOTE
D.E. MILLER
S.W. ROSE
R.A. WILLIAMSON
A.J. BROWN
R.E. WRIGHT

TOTAL JUSTIFIED COMPLAINTS

OCTOBER 1948	421
OCTOBER 1947	160
TO DATE 1948	2628
TO DATE 1947	1263

FOR 12 MONTHS ENDING OCTOBER 31, 1948	2863
FOR 12 MONTHS ENDING OCTOBER 31, 1947	1439

LAST 12 MONTHS RUNNING AVERAGE	238
LAST 12 MONTHS RUNNING AVERAGE (1 YEAR AGO)	119
LAST 12 MONTHS RUNNING AVERAGE (6 MONTHS AGO)	191

COMPLAINTS ON GUNS PRODUCED WITHIN ONE YEAR

CURRENT MONTH OCTOBER 1948	372
MAY 1948	268
OCTOBER 1947	128
OCTOBER 1946	0

FOR 12 MONTHS ENDING OCTOBER 31, 1948	2437
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LAST 12 MONTHS RUNNING AVERAGE ON GUNS
PRODUCED WITHIN ONE YEAR.

203

SHEET NO. 1.

PLAINTIFF'S
EXHIBIT

3049

L 0022477

1 of 8

COMPLAINTS ON FIREARMS FOR MONTH ENDED OCTOBER 31, 1948.

		PRODUCED WITHIN ONE YEAR	TOTAL
<u>MODEL 81</u>			
#	JACKET HEAD LOOSE	2	7
O	FAILS TO EXTRACT (EXTRACTOR OUT OF ADJ.)	1	1
O	FAILS TO EJECT	2	2
O	MAGAZINE SIDE SPRING OUT OF ADJUSTMENT	2	2
O	MAGAZINE SPRING BROKEN	1	1
O	MAGAZINE FOLLOWER BINDS	1	1
O	MAGAZINE BOX OUT OF SHAPE	1	1
O	RUST SPOT IN BARREL	1	1
O	JAMS (EXTRACTOR LOOSE)	1	1
	DEFECTIVE RECOIL SPRING (HAS SPLIT)	1	1
	DEFECTIVE RECETVER	1	1
	MAIN SPRING BROKEN	5	5
	TAKE DOWN SCREW THREADS STRIPPED	1	1
	INDICATOR BINDS	1	1
		<u>21</u>	<u>26</u>
<u>SPORTSMAN - 12 GA.</u>			
X	CARRIER LATCH OUT OF ADJUSTMENT	1	1
X	EXTRACTOR PLUNGER BINDS IN BLOCK	1	2
O	TRIGGER BINDS		1
	STOCK BROKEN	1	1
O	TAKE DOWN SCREW HOLES IN MAGAZINE PLUG		1
	COUNTER SUNK TOO DEEP.		
	TAKE DOWN SCREW THREADS DAMAGED	1	1
	BOLT CRACKED	1	1
	CARRIER DOG WORN	1	1
		<u>6</u>	<u>9</u>
<u>SPORTSMAN - 16 GA.</u>			
	BARREL LOOSE IN RECEIVER		1
<u>SPORTSMAN - 20 GA.</u>			
O	FAILS TO EJECT	1	1
	TRIGGER DOES NOT RELEASE ON REAR NOTCH	1	1
	THREADS STRIPPED ON TAKE DOWN SCREW	1	1
	TRIGGER SPRING BROKEN	2	2
		<u>5</u>	<u>5</u>
<u>MODEL 11 - 12 GA.</u>			
O	TRIGGER AND HAMMER OUT OF ADJUSTMENT	1	1
O	SHELLS STEM CHAMBER	2	2
O	FAILS TO EXTRACT	3	3
O	FAILS TO EJECT	1	1
	BARREL EXTENSION SPLIT	1	1
X	SEAMS IN BARREL	2	2
X	DEFECTIVE BARREL (TEAR IN CHOKE)	1	1

(CONTINUED(

SHEET NO. 2.

AL 0022478

PRODUCED WITHIN
ONE YEAR

TOTAL

MODEL 11 - 12 GA. (CONTINUED)

STOCK SPLIT
JAMS
X FAILS TO OPERATE
OUTSIDE RING LOOSE (POOR BRAZING)
SEAR SPRING PLUNGER BINDS IN TRIGGER GUARD
DEFECTIVE SAFETY
HAMMER FILED THIN
OPERATING SLIDE CAMS PAST LINK

1	2
1	1
1	1
1	2
1	1
1	1
1	1
1	1
<u>18</u>	<u>21</u>

MODEL 11 - 16 GA.

X CARRIER DOG FILED TOO MUCH
O SHELLS STEM CHAMBER
EXTRACTOR BROKEN

1
1
<u>3</u>

MODEL 11 - 20 GA.

O SHELLS STEM CHAMBER
O FAILS TO FEED
BARREL DOES NOT FIT
BARREL EXTENSION LOOSE
TRIGGER SPRING BROKEN
EXTRACTOR SPRING AND PLUNGER STUCK IN BREECH

1	2
1	1
1	1
1	1
5	7
<u>8</u>	<u>13</u>

MODEL 121

FIRING PIN BROKEN
X FIRING PIN STRIKES INSIDE RIM
O STEM CHAMBER
O RETAINER LOOSE
O TAKES MAX. PLUG
O FAILS TO EJECT
X NOT ACCURATE
EXTRACTOR BROKEN
O FAILS TO FEED
O CARRIER OUT OF ADJUSTMENT
ACTION BAR BROKEN
X DEFECTIVE BARREL
O STEMS RETAINER
X JAMS (SHELLS CATCH BY CARTRIDGE STOP)
O BLOCK UNEVEN AT FACE
TRIGGER GUARD BROKEN
WEAK CARRIER DOG SPRING
O GUARD AND RECEIVER LOOSE
BURR IN CHAMBER
CARTRIDGE STOP FALLS OUT
RECEIVER THIN AT WELL SMALL HOLE
BROKEN RETAINER
FALL OF BREECH BLOCK NOT GOOD

1	1
6	6
6	6
1	1
4	4
1	1
1	1
1	1
1	1
1	1
1	1
1	1
2	2
1	1
1	1
1	1
2	2
1	1
1	1
1	1
<u>33</u>	<u>39</u>

SHEET NO. 3.

AL 0022479

MODEL 31 - 16 GA.
 STOCK CHECKED
 FAILS TO FEED

PRODUCED WITHIN
 ONE YEAR

TOTAL

1
 1
 2

1
 1
 2

MODEL 31 - 20 GA.
 MAGAZINE TUBE LAYS TO THE EXTRACTOR

1
 1

1
 1

MODEL 37

O REAR SIGHT ELEVATING SCREW NOT ADJUSTED PROPERLY
 X TRIGGER PULL NOT PROPERLY ADJUSTED
 O TAKES MAX. PLUG
 X PEEP DISC LOOSE
 X NOT ACCURATE
 SIGHT BLOCKS OFF CENTER
 POOR BOLT HANDLE

1
 5
 1
 1
 8

2
 1
 1
 1
 6
 1
 13

MODEL 510

N BARREL BENT
 TRIGGER SPRING PLUNGER BROKEN
 X BOLT DOES NOT CLOSE PROPERLY
 O SEAR DAMAGED
 TAKES MAX. PLUG
 X BOLT BROKEN

1
 1
 2
 1
 1
 6

1
 1
 2
 1
 1
 7

MODEL 511

N NOT ACCURATE
 O FAILS TO FEED
 X BARREL NOT STRAIGHT
 O BOLT PULLS OUT
 SMALL HOLE IN REAR SIGHT SCREW HOLE

2
 1
 7
 3
 13

2
 1
 7
 3
 14

MODEL 512

O CARTRIDGE RETAINER OUT OF ADJUSTMENT
 BOLT BROKEN
 BOLT HANDLE BROKEN
 O FIRING PIN FOLLOWS DOWN
 O FAILS TO EJECT
 SEAR BROKEN
 X BARREL BENT
 # BOLT PULLS OUT
 N NOT ACCURATE (SIGHTS OUT OF LINE)
 O DROP SHELLS
 X FIRING PIN CAM PIN OUT OF POSITION
 O OUTER MAGAZINE LOOSE
 O SEAR AND BOLT UPSET
 X BOLT BINDS
 O REAR SIGHT LOOSE
 SEAR STUD BROKEN

7
 1
 4
 9
 14
 2
 3
 1
 1
 1
 1
 46

7
 1
 2
 1
 4
 1
 9
 14
 2
 3
 1
 1
 1
 1
 50

SHEET NO. 5

AL 0022481

5 of 8

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MODEL 513

- ☐ FAILS TO EJECT
- ☒ KEY HOLES (POOR RIFLING)
- ☒ BOLT HANDLE HITS TOP OF RECEIVER
- ☒ BOLT HANDLE BROKEN
- ☐ BOLT PULLS OUT
- ☐ FIRING PIN CAM PIN SHORT

PRODUCED WITHIN
ONE YEAR

TOTAL

2	2
7	7
1	1
1	1
1	1
<u>11</u>	<u>13</u>

MODEL 514

- ☒ TRIGGER BENT
- ☒ SAFETY OUT OF ADJUSTMENT
- ☒ BOLT HANDLE BROKEN
- ☒ BARREL BENT
- ☐ NOT ACCURATE
- ☐ TAKE DOWN SCREW TIGHTENS TOO HARD
- ☐ FIRING PIN BINDS
- ☐ TRIGGER BROKEN AT PIN HOLE
- ☐ BOLT AND HANDLE CAME APART
- ☐ SIGHTS NOT ALIGNED PROPERLY

5	5
3	3
2	2
1	1
1	1
1	1
1	1
2	2
<u>1</u>	<u>1</u>
<u>22</u>	<u>22</u>

MODEL 521

- ☐ FAILS TO EJECT
- ☒ NOT ACCURATE
- ☒ STOCK DAMAGED
- ☒ BARREL BENT
- ☐ MAGAZINE OUT OF ADJUSTMENT
- ☐ BOLT BROKEN
- ☐ BOLT PULLS OUT
- ☐ RING IN BARREL
- ☐ TAKES MAX. PLUG

2	2
1	1
1	1
3	3
1	1
1	1
1	1
<u>1</u>	<u>1</u>
<u>12</u>	<u>12</u>

MODEL 550-1

- ☐ FAILS TO FEED
- ☒ NOT ACCURATE
- ☒ JAMS (INSERT ROUGH)
- ☐ FAILS TO EJECT
- ☐ BROKEN EXTRACTOR
- ☐ NO CHAMFER ON FRONT END OF RECOIL CHAMBER
- ☐ MISFIRES
- ☒ NO RIFLING IN BARREL
- ☒ CONNECTOR PIN LOOSE
- ☒ TOOL MARKS AROUND RIFLING
- ☐ SHELLS STEM CHAMBER
- ☐ DEFECTIVE BARREL
- ☐ FIRING PIN MISSING
- ☐ BROKEN CONNECTOR
- ☐ RECOIL CHAMBER BOTTOM SIDE UP
- ☐ CONNECTOR SPRING WEAK
- ☐ STOCK SPLIT AT TIP

2	2
1	1
6	6
6	6
1	1
1	1
1	1
2	2
1	1
2	2
1	1
1	1
1	1
3	3

(CONTINUED)

SHEET NO. 6.

AL 0022482

PRODUCED WITHIN
ONE YEAR

TOTAL

MODEL 550-1 (CONTINUED)

X THREADS IN MAGAZINE RING HOLE IN BARREL POOR
X DEFECTIVE BOLT
X SIGHTS NOT ALIGNED PROPERLY
O CARRIER AND CARTRIDGE STOP BINDS
X BARREL BENT
STOCK MARRED
X NO NOTCH ON REAR SIGHT
FRONT SIGHT MISSING (NEVER FITTED)
O SAFETY GRIND TOO MUCH
O DEFECTIVE RECOIL CHAMBER

2
1
1
1
3
1
1
1
1
1
19

2
1
1
1
3
1
1
1
1
1
19

MODEL 721

STOCK CRACKED AT GRIP
O FAILS TO EJECT
DEFECTIVE BOLT
O FAILS TO EXTRACT
FAULTY SAFETY
X SIGHTS NOT PROPERLY ALIGNED
BOLT HITS STOCK
EXTRACTOR STICKS OUT NEAR EJECTOR
FIRING PIN FOLLOWS THROUGH
BOLT STOP LOOSE
BOLT CRACKED NEAR LUGS

7
2
1
1
1
1
1
1
1
2
19

7
2
1
1
1
1
1
1
1
2
19

MODEL 722

O FAILS TO FIRE
X REAR SIGHT CROOKED
O POOR EXTRACTOR

1
1
3

1
1
3

- CORRECTED IN RECENT PRODUCTION.
X - OVERSIGHT IN INSPECTION
O - CLOSE ADJUSTMENT NOT SHOWING UP IN FACTORY TEST
RESULTING IN MALFUNCTION THRU USAGE.
N - NOT COVERED BY INSPECTION.

SHEET NO. 7

AL 0022483

COMPLAINTS RECEIVED DURING OCTOBER 1948 - ON GUNS PRODUCED IN THE FOLLOWING YEARS.

MODEL	1948	1947	1946	1945	MISC. & PARTS
MODEL 81	17	4	5		
SPORTSMAN - 12 GA.	4	2	3		
SPORTSMAN - 16 GA.			1		
SPORTSMAN - 20 GA.	3	2			
MODEL 11 - 12 GA.	15	3	3		
MODEL 11 - 16 GA.	8		3		
MODEL 11 - 20 GA.	30	3	6		
MODEL 121	11	2	6		
MODEL 141	60	9	5		
MODEL 241	6				
MODEL 31 - 12 GA.	2				
MODEL 31 - 16 GA.	1				
MODEL 31 - 20 GA.	3	5	5		
MODEL 37	6		1		
MODEL 510	11	3			
MODEL 511	40	6	4		
MODEL 512	7	4	2		
MODEL 513	22				
MODEL 514	10	2			
MODEL 521	36	13			
MODEL 550-1	19				
MODEL 721	3				
MODEL 722					

H.E. WEKS: FH
11/5/48.

AL 0023484

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M.R. WARDEN D.E.
G.E. PINCKNEY S.W.
A.L. FRENCH R.A.
W.L. CLAY A.J.
W.F.H. MATTLAGE R.E.
BRIDGEPORT.

TOTAL JUSTIFIED COMPLAINTS

SEPTEMBER 1948

SEPTEMBER 1947

TO DATE 1948

TO DATE 1947

FOR 12 MONTHS ENDING SEPTEMBER 30, 1948

FOR 12 MONTHS ENDING SEPTEMBER 30, 1947

LAST 12 MONTHS RUNNING AVERAGE

LAST 12 MONTHS RUNNING AVERAGE (1 YEAR AGO)

LAST 12 MONTHS RUNNING AVERAGE (SIX MONTHS AGO)

COMPLAINTS ON GUNS PRODUCED WITHIN ONE YEAR

CURRENT MONTH SEPTEMBER 1948

APRIL 1948

SEPTEMBER 1947

SEPTEMBER 1946

FOR 12 MONTHS ENDING SEPTEMBER 30, 1948

LAST 12 MONTHS RUNNING AVERAGE ON GUNS
PRODUCED WITHIN ONE YEAR.

SHEET NO. 1

PLAINTIFF'S
EXHIBIT

3050

1 of 6

ALC

TOTAL

Q	EXTRACTOR OUT OF ADJUSTMENT
X	OPERATING SLIDE FILED OUT OF SHAPE

$$\frac{1}{2}$$

0 SHELLS STEM CHAMBER

X FIRING PIN STRIKES INSIDE RIM
O STEMS CHAMBER
O TAKES MAX. PLUG
O FAILS TO EJECT
O FAILS TO EXTRACT
X ACTION BAR MACHINED WRONG
FIRING PIN NOT UP TO STANDARD
X FACE OF BLOCK ROUGH
O STEMS RETAINER
ACTION DOES NOT LOCK UP
X JAMS (SHELLS CATCH BY CARTRIDGE STOP)
O BLOCK UNEVEN AT FACE
O BOLT PULLS OUT
X BARREL PITTED
WEAK CARRIER DOG SPRING
HAMMER ROD GUIDE BENT

$$\begin{array}{r} 1 \\ 4 \\ 4 \\ 1 \\ 3 \\ 1 \\ 1 \\ 1 \\ 2 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ \hline 25 \end{array}$$

1
4
4
2
4
1
1
1
1
2
1
1
1
1
1
1

28

0 SEAR AND SEAR LOCK OUT OF ADJUSTMENT
0 JARS OFF
0 FAILS TO EXTRACT
0 FEEDING PLUG GOES BY CARTRIDGE STOP (JAMS)
X CARTRIDGE WAYS IN BAR NOT TO STANDARD
0 ACTION BINDS
FIRING PIN EXTENSION LOOSE FROM FIRING PIN
ACTION BAR LOCK WORN
TAKES MAX PLUG

$$\begin{array}{r} 2 \\ 1 \\ 2 \\ 1 \\ 1 \\ 1 \\ 1 \\ \hline 9 \end{array}$$
$$\begin{array}{r} 2 \\ 2 \\ 2 \\ 1 \\ 1 \\ 1 \\ 2 \\ 1 \\ 1 \\ \hline 13 \end{array}$$

```

O  FAILS TO DISCONNECT
X  POOR NOTCH ON FIRING PIN
O  FAILS TO EJECT
O  FAILS TO EXTRACT
X  SIGHTS OUT OF LINE
X  NOT ACCURATE (MUZZLE UPSET)
O  CARTRIDGE STOP OUT OF ADJUSTMENT
   STOCK CHECKED OR BROKEN
O  BARREL TAKE UP IS LOOSE
X  BARREL LOOSE

```

3671
32112

10-10-68

SHEET NO. 3

AL 0022487

2 of 6

A

MODEL 241 CONTINUED

O STEMS CHAMBER
O FAILS TO COCK
SAFETY OPERATES HARD

PRODUCED WITHIN
ONE YEAR

TOTAL

1	1
7	7
<u>1</u>	<u>1</u>
35	40

MODEL 31 - 12 GA.

O SHELLS STEM CHAMBER
O TRIGGER LOCK OUT OF ADJUSTMENT
O FAILS TO EJECT
FORE-END BROKEN
BARREL DAMAGED AT MUZZLE
BARREL ASSEMBLED HARD
BURST BARREL (THIN WALL)

1	1
1	1
1	1
1	2
1	1
1	1
<u>1</u>	<u>1</u>
5	8

MODEL 31 - 16 GA.

SEAM IN BARREL

1	1
<u>1</u>	<u>1</u>

MODEL 31 - 20 GA.

X TRIGGER BINDS

1	1
<u>1</u>	<u>1</u>

MODEL 37

X TRIGGER PULL NOT PROPERLY ADJUSTED
X FAILS TO COCK
ELEVATION PLATE DAMAGED
RECEIVER HAS SHARP EDGE NEAR BOLT HANDLE

1	1
1	1
1	1
<u>1</u>	<u>1</u>
3	4

MODEL 510

BOLT HANDLE BROKEN
O FAILS TO EJECT
N BARREL BENT
X EJECTOR TOO LOW
N SIGHTS NOT PROPERLY ALIGNED
DEFECTIVE BARREL
FAULTY ACTION
BROKEN EJECTOR
BOLT BINDS ON SEAR

1	1
2	2
1	1
1	1
1	1
1	1
1	1
1	1
<u>1</u>	<u>1</u>
8	10

MODEL 511

STOCK CHECKED
N NOT ACCURATE
N FAILS TO EJECT
X BARREL NOT STRAIGHT
X CARTRIDGE STEMS CHAMBER
O BOLTS PULL OUT
BOLT AND SEAR DAMAGED
O THREADS IN PEEP SIGHT HOLE IN RECEIVER STRIPPED
MAGAZINE FOLLOWER BROKEN

1	1
2	2
2	2
2	2
1	1
3	3
1	1
1	1
<u>1</u>	<u>1</u>
14	14

SHEET NO. 4

AL 0022488

3 of 6

A

MODEL 512

O CARTRIDGE RETAINER OUT OF ADJUSTMENT
 O FAILS TO FEED
 STOCK CHECKED
 BOLT HANDLE BROKEN
 O FAILS TO EJECT
 N NOT ACCURATE
 X CARTRIDGE STOP PLUNGER BINDS
 SEAR BROKEN
 X BARREL BENT
 # BOLT PULLS OUT
 N NOT ACCURATE (SIGHTS OUT OF LINE)
 O DROP SHELLS
 MAGAZINE RING THREAD BAD
 BOLT HANDLE LOOSE
 JAMS
 BOLT BINDS
 TAKE DOWN SCREW HOLE IN RECEIVER TOO LARGE
 CARRIER BINDS ON CARTRIDGE STOP PLUNGER

PRODUCED WITHIN
 ONE YEAR

TOTAL

8	9
3	3
2	2
2	2
5	5
1	1
3	3
2	2
12	13
2	2
3	3
2	2
1	1
1	1
1	1
1	1
1	1
49	53

MODEL 513

STOCK CHECKED
 O FAILS TO EJECT
 X POOR TRIGGER PULL
 X KEY HOLES
 DEFECTIVE BOLT HANDLE
 SIGHT SCREW BROKEN

1	1
1	2
1	1
1	1
1	1
1	1
5	7

MODEL 514

X TRIGGER BENT
 X SAFETY OUT OF ADJUSTMENT
 BOLT HANDLE BROKEN
 X POOR RIFLEING
 X BARREL BENT
 LOOSE BOLT HANDLE
 X POOR FINISH
 NOT ACCURATE
 BOLT COMPLETE MISSING

9	9
1	1
1	1
2	2
3	3
1	1
1	1
1	1
1	1
20	20

MODEL 521

STOCK CHECKED
 BOLT HANDLE BROKEN
 O THREADS STRIPPED ON REAR SIGHT ELEVATING SCREW
 O REAR SIGHT MOUNTING SCREW BROKEN IN RECEIVER
 REAR SIGHT MISSING
 SEAR AND BOLT DAMAGED
 TRIGGER AND SPRING PLUNGER MISSING
 X BARREL BENT

2	2
3	3
1	1
1	1
1	1
1	1
1	1
1	1
11	11

SHEET NO. 5

AL 0022489

4 of 6

A

MODEL 550-1

O EXTRACTOR OUT OF ADJUSTMENT
 O FAILS TO FEED
 X ROUGH ACTION
 X NOT ACCURATE
 X JAMS (INSERT ROUGH)
 O FAILS TO EJECT
 O FAILS TO CONNECT
 O FAILS TO EXTRACT
 O MISFIRES
 CONNECTOR SPRING WEAK
 X BOLT BINDS
 X CONNECTOR PIN OUT OF POSITION
 STOCK SPLIT AT TIP
 THREADS IN MAGAZINE RING HOLE IN BARREL POOR
 SHELLS SWELL
 DEFECTIVE BOLT
 FIRING PIN DAMAGED
 CARRIER AND CARTRIDGE STOP BINDS
 BROKEN SAFETY
 INNER MAGAZINE TUBE FAILS TO CLOSE FULL MAG.
 BARREL BENT

PRODUCED WITHIN
ONE YEAR

TOTAL

1	1
4	4
1	1
1	1
7	7
13	13
2	2
2	2
1	1
3	3
1	1
1	1
1	1
2	2
1	1
1	1
1	1
1	1
1	1
1	1
47	47

MODEL 721

STOCK CRACKED AT GRIP
 X BOLT CLOSURES HARD
 BOLT DAMAGED
 DEFECTIVE BOLT
 O FAILS TO EXTRACT
 BOLT HANDLE CRACKED
 FAULTY SAFETY
 TRIGGER BINDS
 MAGAZINE FOLLOWER BINDS
 MAGAZINE OUT OF ADJUSTMENT

11	11
3	3
4	4
1	1
1	1
1	1
1	1
1	1
1	1
1	1
25	25

MODEL 722

SAFETY AND TRIGGER OUT OF ADJUSTMENT

1	1
---	---

- # - CORRECTED IN RECENT PRODUCTION
- X - OVERSIGHT IN INSPECTION
- O - CLOSE ADJUSTMENT NOT SHOWING UP IN FACTORY TEST RESULTING IN MALFUNCTION THRU USAGE
- N - NOT COVERED BY INSPECTION

SHEET NO. 6

AL 0022490

50F6

COMPLAINTS RECEIVED DURING SEPTEMBER 1948 - ON GUNS PRODUCED IN THE FOLLOWING YEARS.

MODEL	1948	1947	1946	1945	MISC. & PARTS
MODEL 81	10	7	15		
SPORTSMAN - 12 GA.	3		2		
SPORTSMAN - 16 GA.			1		
SPORTSMAN - 20 GA.		2	1		
MODEL 11 - 12 GA.	7		1		
MODEL 11 - 16 GA.		1	1		
MODEL 11 - 20 GA.			1		
MODEL 121	18	7	3		
MODEL 141	5	4	4		
MODEL 241	32	3	5		
MODEL 31 - 12 GA.	5		3		
MODEL 31 - 16 GA.	1				
MODEL 31 - 20 GA.	1				
MODEL 37	1	2	1		
MODEL 510	6	2	2		
MODEL 511	9	5			
MODEL 512	35	14	4		
MODEL 513	4	1	2		
MODEL 514	19	1			
MODEL 521	6	2			
MODEL 550-1	42	5			
MODEL 721	24	1			
MODEL 722	1				

H.E. WEEKS: FH
10/6/48.

SHEET NO. 7

AL 0022491

6 of 6

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: R.L. Hall
C.B. Workman
W.E. Leek

March 26, 1975

RECEIVED
MAR 27 1975
E. G. LARSON

TO: E.G. LARSON

FROM: G.W. MARTIN

SUBJECT: MOHAWK 600'S AT CARTER'S IN HOUSTON, TEXAS

The safety was checked on a total of 354 rifles.

We used three (3) methods, as follows:

- Safety was placed in "mid" position, trigger was then pulled, and then the safety was released.
- Safety was placed in "mid" position, trigger was pulled, safety was then placed on safe, and the safety was next released.
- Safety was in fully on position, trigger pulled (very hard), and safety was released. *Note: This check was not made on first five (5) guns - reason, Bill Carter was checking these.

Results:

Total guns unable to "trick".....	39
Total guns "tricked" by A or B. (above).....	154
Total guns "tricked" by both A and B.....	152
Total guns "tricked" by C.....	4
	<u>349</u>
	<u>+ 5</u>
	354

Grand total-315 rifles out of 354 could be tricked.

Codes for 350 rifles.

CU Apr. 71.....	23
KU May 71.....	2
AW Mar. 72.....	7
PX June 73.....	3
OX July 73.....	23
RX Nov. 73.....	43
XX Dec. 73.....	175
BY Jan. 74.....	31
CY Apr. 74.....	2
DY Sept. 74.....	41
	<u>350</u>

(continued)

PLAINTIFF'S
EXHIBIT

3051

AL 0022637

1 of 2

CC: R.E. Hall
C.B. Workman
W.E. Leek

RD-47 REV. 5-54

A

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



-2-

SUBJECT: MOHAWK 600'S AT CARTER'S IN HOUSTON, TEXAS

Codes for the four (4) rifles that would fire by "C" method:

RX Nov. 73.....2
XX Dec. 73.....1
BY Jan. 74.....1
4

Les Freer, Houston Gunsmith, was contacted. He repairs the 600 in one or two ways. He said that sometimes it is just a matter of trigger adjustment and other times it needs a new safety. Les said that prior to 1973 repairs of this nature were rare.

Sincerely,

G.W. Martin
G.W. Martin, Supervisor
Firearms Product Service

GWM:tpg

AL 0022638

2 of 2

MINUTES OF
PRODUCT SAFETY SUBCOMMITTEE
HELD APRIL 2, 1975 -
MODEL 600

Present: E. F. Barrett, E. G. Larson, E. Sparre, E. Hooton,
F. E. Morgan and R. B. Sperling

E. F. Barrett reported to the Subcommittee that Remington's examination of approximately 300 Model 600s, drawn from the stock of a Texas dealer, revealed that about 80% of the sample could be "tricked" (easing the safety to the midway position, then pulling the trigger) so as to cause the gun to fire when the safety is moved to the off position. Four guns were found to fire under the following sequence of events: the trigger is pulled with the safety on and then the safety is taken off (hereinafter referred to as the "full safe condition"). These four guns have been returned to Ilion for further examination. After discussion the following action is recommended:

Request all Remington wholesalers to whom Model 600s were shipped in January, 1975, to return said inventory to Ilion for a quality audit.

It is estimated that approximately 1,000 Model 600s were shipped from Ilion in January. The return from this quantity should

PLAINTIFF'S
EXHIBIT

3052

AL 0022649

1 of 1

A provide an adequate sample to analyze the nature and magnitude of the problem, and to calculate the number of guns that may be out in the field in the "full safe condition". Every gun Remington examines, and every gun which is returned to Ilion for any reason, should be modified by substituting a longer safety lever if it is found to be necessary to prevent the "tricking" of the gun or to correct the "full safe condition".

RBS:CK

AL 0022650

2 of 2

A

L

E

Returned the file to
JOHN RALSTON *Tom Killebrew*

GUN COMPLT '75

10-19-78

Sandy

April 1, 1975

AIR MAIL

Mr. John Ralston
3026 Larknolls
Houston, Texas 77018

Dear Mr. Ralston:

Enclosed is our check to you for \$68.29 to cover the cost of repairs to your car.

On March 17 we entered an order for a new Model 700 ADL 25-06 caliber rifle, and have asked our Firearms Division to expedite shipment to you as soon as possible.

Thank you, Mr. Ralston, for giving us this opportunity to be of service, and we trust your new rifle will be satisfactory in every respect.

Sincerely,

REMINGTON ARMS COMPANY, INC.

J. H. Chisnall
Supervisor, Product Service

SENDER: Be sure to follow instructions on other side

PLEASE FURNISH SERVICE(S) INDICATED BY CHECKED BLOCK(S)
(Additional charges required for these services)

☐ Show address
where delivered

☐ Deliver ONLY
to addressee

RECEIPT

Received the numbered article described below

REGISTERED NO.

50 323

CERTIFIED NO.

INSURED NO.

DATE DELIVERED

APR 3 - 1975

SIGNATURE OR NAME OF ADDRESSEE (Must always be filled in)

SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

SHOW WHERE DELIVERED (Only if requested, and include ZIP Code)

PLAINTIFF'S
EXHIBIT

3053

AL 0022672

1 of 13

cc: Credit Department
Cashier - with chs
H. L. Hendrix
(For your info)
file

Date March 17, 1975

AM-86493

E/10/11

TO: SALES ORDER DEPARTMENT
ATTN: JOSEPHINE CRAW

FROM: PRODUCT SERVICE
J. H. CHISNALL

The following order is in connection with a personal injury ()
or product complaint (XX) and should go FORWARD IMMEDIATELY,
transportation prepaid, at no charge.

() Invoice at Special Price Indicated

(XX) Gratis Good Charge Account 80-57

<u>QUANTITY</u>	<u>ORDER #</u>	<u>DESCRIPTION</u>	<u>SPECIAL PRICE</u>
1 only	5768	M/700 ADL 25-06 caliber	N/C

SEE GEORGE MARTIN FOR PRODUCT

SHIP AT ONCE TO:

Mr. John Ralston
3026 Larknolle
Houston, Texas 77018

PLEASE NOTE:

MARK ORDER: ATTENTION OF H. L. HENDRIX - ILION FOR SPECIAL HANDLING
ORDER & BILLING: NO INVOICE TO CUSTOMER
CREDIT DEPARTMENT: NO STATEMENT OR LETTERS TO CUSTOMER
CASHIER: CREDIT ATTACHED REMITTANCE TO ACCTS. RECEIVABLE.

RECEIVED

MAR 18 1975

PRODUCT SERVICE

J. H. Chisnell
Supervisor, Product Service

AL 0022673

2 of 13

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L

Jack -

Attached is an
check to John Paleton,
Do you want to write
a letter to accompany
the check?

P

S

RECEIVED
75 MAR 17 PM 3:47
ORDER SALES

C

H

AL 0022674

3 of 13

JOHN RALSTON
Gus Comp
M 85473

REMINGTON ARMS COMPANY, INC. BRIDGEPORT, CONN. 06602

VENDOR'S DATE	VOUCHER NUMBER	VENDOR'S NUMBER	AMOUNT	DISCOUNT	FREIGHT	NET AMOUNT
---------------	----------------	-----------------	--------	----------	---------	------------

03/21/75	32538		68.29			68.29
----------	-------	--	-------	--	--	-------

68.29 *

ALWAYS REFER TO OUR CHECK NUMBER IN YOUR CORRESPONDENCE
PROPER ENDORSEMENT ON CHECK WILL BE SUFFICIENT ACKNOWLEDGMENT OF RECEIPT OF PAYMENT
DETACH BEFORE PRESENTING FOR PAYMENT

RD-1241

"IF IT'S REMINGTON - IT'S RIGHT"



REMINGTON ARMS COMPANY, INC. M 85473
SPORTING FIREARMS - AMMUNITION - TRAPS - TARGETS

BRIDGEPORT, CONN. 03/25/75

PAY REMINGTON ARMS CO. INC. 68 AND 29 CTS. 68.29

TO THE ORDER OF

MR. JOHN RALSTON
3026 LARKNOLLS
HOUSTON, TEXAS 77018

REMINGTON ARMS COMPANY, INC.

[Signature]

[Signature]

AUTHORIZED SIGNATURES

MORGAN GUARANTY TRUST
COMPANY OF NEW YORK

⑆0210⑉0023⑆ 051 57 508⑈

AL 0022675

4 of 13

JOHN RALSTON

GUN COMPLT '75

- 1.) C. W. Roney
- 2.) Accts. Pay.

3-17-75

Mr. John Ralston

3026 Larknolls

Houston, Texas 77018

Product Liability claim: To cover cost
of repairs to car which was damaged
while claimant was using a M/600 rifle.

OUR FILE: Mr. John Ralston
3026 Larknolls
Houston, Texas 77018

\$68.29

49-18346-001

(713) - 686-3400
Houston, Texas

AL 0022676

5 of 13

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After make-
up voucher for

68.28

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Payment for Car
repairs P.L. met
m/600-

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AL 0022677

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March 17, 1975

J. H. CHISNALL

E

XX

XXX

K

80-57

1 only

5768

M/700 ADL-25-06 caliber

N/C

SEE GEORGE MARTIN FOR PRODUCT

Mr. John Ralston
3026 Larknolls
Houston, Texas

77018

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AL 0022678

7 of 13

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These are
the for

1-M/700 ABL-2806

#5768

These are the
for product

099-80-57

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AL 0022679

February 10, 1975

Remington Arms Inc.
% Jack Chishell
939 Barnum Ave.

Dear Sir:

Subsequent to our conversation on Tuesday, Feb. 4, 1975, I have gone to Temple and picked up the 243 Mohawk. I also have pictures of the damage to the seat cover and an estimate to have the damage repaired. These are enclosed.

Two gunsmiths have checked the gun and they have confirmed that there is a default in the gun causing it to discharge as I explained in our conversation of last week. For the gun to discharge, the safety has to be put between safety and fire. Pull on the trigger and a small click can be heard. Pulling it all the way back to safety, the gun will then go off when it is put on fire. The gun is now on safety with no shells in the gun. After unpacking the gun, without pulling the trigger, the gun will fire if you push it to fire.

Subsequent to our conversation, I have discussed this with my nephew and he would rather have the 25/06.

Enclosed are the pictures, estimate, and a copy of the BankAmericard charge.

I'm very grateful for the co-operation shown me by you after I could get no co-operation from Carter's in Houston.

If anything else is needed, please contact me.

John W. Ralston
John W. Ralston
3026 Larknoills
Houston, Texas 77028
Area Code 713 686-3400

RECEIVED

FEB 18 1975

PRODUCT SERVICE

AL 0022680

9 of 13

5997564

JOHN W RALSTON

06360073 39364
CARTERS SHOOTING CENTER
SPRING TX 77373

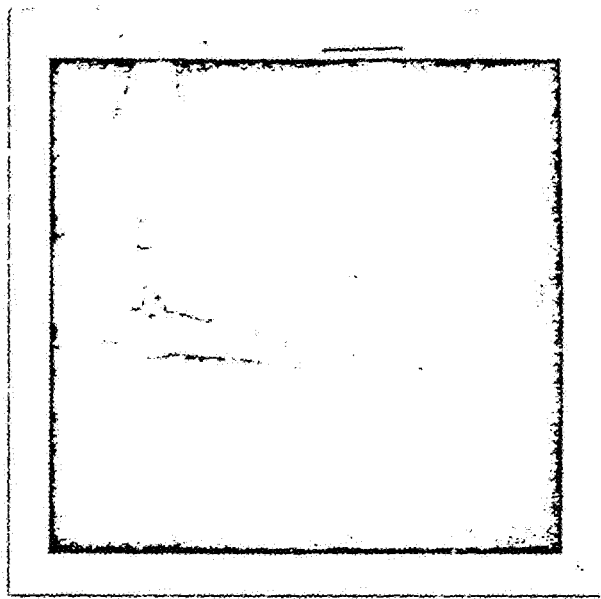
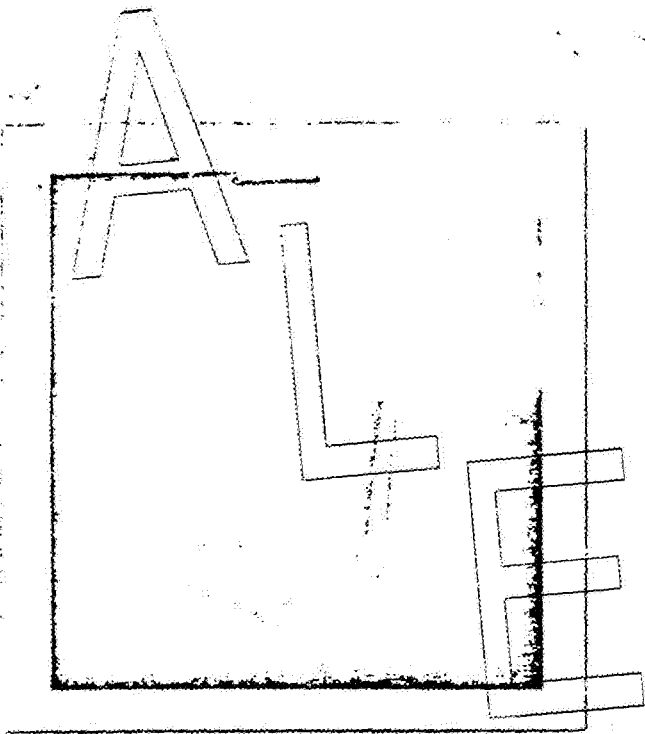
The foregoing information is being provided as identified
was it possible the information contained hereby. The
information is to be paid to the owner, or owner's agent,
should be in full together with all other data, if
any, in accordance with the Bank American Agreement.

[illegible]

BANK COPY

AL 0022681

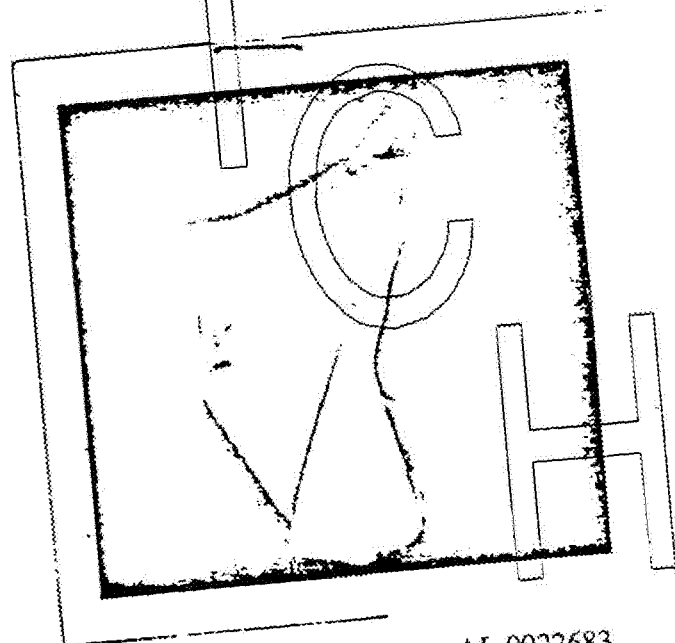
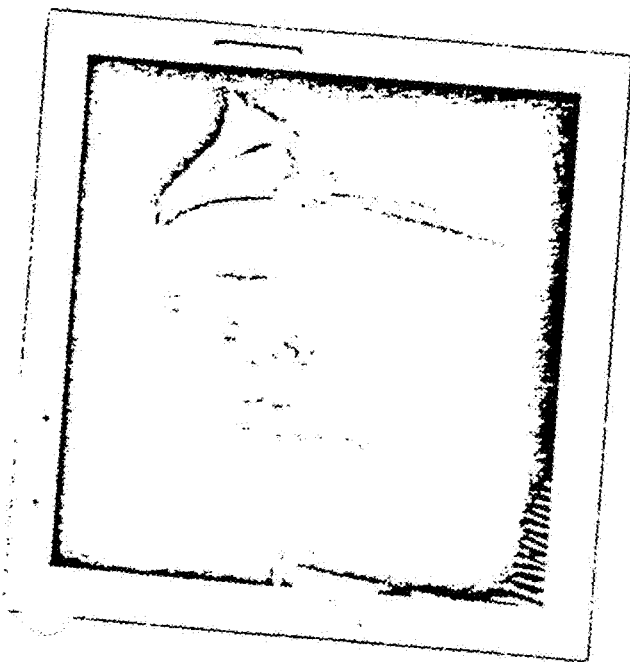
10 of 13



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AL 0022683

12 of 13

A

NO. 28 REV. 4-55

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: E. J. Garrity
G. A. Quinn

October 23, 1978

TO: E. S. MCCAWLEY
FROM: R. A. BALDWIN
SUBJECT: MODEL 600/660 RECALL AD

FILED

OCT 23 1978

E. S. MCCAWLEY, JR.

Based on our conversation this afternoon, I have asked our agency to supply us with information on government recall advertising regulations and how they have applied to other consumer product clients they have represented.

Compton Advertising, now parent company of Rumrill-Hoyt, will be contacted this afternoon. They have had experience in the past with recall advertising programs.

The following questions come to mind. Hopefully, Compton can help with the answers:

1. Size of call-back ad? Full page, 1/2 page, 1/4 page, etc. Are there any regulations on size?
2. Should the ad be black & white, two color, 4 color Any regulations here?
3. Circulation? To what extent are we obligated to spread the word. This year our gun and ammo ads appeared in approximately 62 different publications. Once we determine what books to go in we must know how many times we should run the ad.
4. Are there regulations on how soon the recall ad must begin appearing? The majority of the publications we advertise in require a minimum of two months lead time. We could be talking about January or February for initial insertions.

RABaldwin
RAB/ecc

PLAINTIFF'S
EXHIBIT

3054

AL 0022686

127

cc: R. B. Sperling ✓
R. G. Sherman

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

Bridgeport, Conn.
November 3, 1978

RECEIVED

NOV 3 1978

R. B. SPERLING

To: E. F. Sienkiewicz

From: E. G. Larson

Subject: Briefing of Personnel Visiting Gunsmiths

As previously discussed, you will be the instructor-moderator, and your briefing will follow the format used in Texas.

There are, however, a couple of additions.

It has been decided that we will show the gunsmith what the problem was, and how we corrected. Each person should have a trigger assembly with him to show lift.

It is imperative that each gunsmith be requested to return the green copy of the invoice form to Bridgeport as soon as the gun is logged in by the gunsmith.

Please coordinate the time of the meeting with R. B. Sperling, who will attend your briefing.

They are to advise all gunsmiths (and you should call the ones already visited in Texas) that XP-100's are to be returned to Ilion for repair. If they have accepted any XP-100's, they are to fill out the green copy of the invoice, noting on it that the gun is going to Ilion, and send the green copy to Bridgeport. The other copy should be sent along with the gun so that we can return it direct to the customer. The customer should be told by the gunsmith (in answer to inquiries) to send the gun directly to Arms Service.

Also, tell them that the old trigger assemblies must be returned to Arms Service, so that we can check our records on number out and guns repaired.

If there are other questions, R. B. Sperling will provide guidance.

E. G. Larson

EGL:lb

PLAINTIFF'S
EXHIBIT

3055

AL 0022689

1041

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

Bridgeport, Conn.
October 30, 1978

To: Field Service Reps Visiting Texas
From: E. G. Larson
Subject: Gun Recall

The serial numbers of guns involved are as follows:

Remington Model 600	From Serial #	0001 to #	131,552
Remington Model 660	From Serial #	0001 to #	131,552
Mohawk 600	From Serial #	6,200,000 to #	6,899,999
Remington Model 660	From Serial #	6,200,000 to #	6,899,999
Remington Model XP-100	From Serial #	0001 to #	7,507,983

No guns of above models that carry a letter prefix "A" or "B" in the serial numbers are involved. XP-100's with an "A" or a "B" prefix or numbered between 7,507,984 and 7,509,999 are not involved.

What to do during visits:

1. Do not release the procedure you brought with you from Ilion.
2. Talk each gunsmith through actual repair of 5-10 guns.
3. Tell them of the null position only if asked. Show them how the lift tolerance was increased.
4. Be sure they check the following clearances during repair:
 - a. Put screwdriver on top of sear, pull trigger, and push sear down; on release, sear should retract to upper position.
 - b. Receiver - bolt lock slot.
 - c. Stock reinforcing screws - through magazine well.
 - d. Stock - side clearance for safety arms, and on and off positions for full detent.
 - e. Trigger clearance on trigger guard.
 - f. Check safety several times after assembly in on and off positions, including pull of trigger each time.
 - g. Do not make any pull or engagement adjustments in this repair (lighter pull or change the engagement).

E. G. Larson

EGL:lb

PLAINTIFF'S
EXHIBIT

3056

AL 0022690

1021

REMINGTON ARMS COMPANY, INC.
Bridgeport, Connecticut

cc: E.B. Beattie
A.W. Bell
H.K. Boyle
E.G. Larson
N.S. Olenik
J.E. Preisler
R.B. Sperling

October 30, 1978

TO: J.P. McANDREWS
J.G. WILLIAMS
E. HOOTON
R.A. PARTNOY
FROM: E.F. BARRETT

MODEL 600 RECALL - STATUS REPORT

1. Owner Notification

- Toll free message center (National Data Corporation, Atlanta, Ga.) - about 2500 calls have been received through October 27. Approximately 50% of the calls have been from Texas. We are receiving magnetic tape information which will be computer processed to aid our planning for future action.

Owners and dealers have been confused by the serial number listing for the Mohawk 600 and XP-100. This is because the number series on some post 1975 guns is the same as on guns involved in the recall. Where this occurs, the letter A or B is used as a serial number prefix on post 1975 guns. This situation will be clarified in subsequent recall advertisements and customer mailing.

Some owners have expressed concern about the timing of the gun repair and the remoteness of approved gunsmiths. It was decided to handle these complaints by setting up WATS lines in Bridgeport and Ilion, rather than expanding the information now being given by the Atlanta operators.

- Advertisements - Ads are being prepared for Hawaii and Alaska which are not covered by the Atlanta information service. We have three gunsmiths in Alaska and one in Hawaii.

Ads are being prepared for the follow-on owner notification program. Media will be selected early this week.

PLAINTIFF'S
EXHIBIT

3057

AL 0022707

10f3

A dealer mailing which will include a counter poster announcing the recall and listing the guns involved is being prepared.

Internally Developed Owner Data -

A listing by wholesaler of serial numbers for the guns involved will be complete in mid-November. This listing will cover the period 1968 to 1975. Records exist for the period 1963 to 1967 but are in such a form that their utility is questionable.

Consideration is being given to paralleling this approach by beginning to search the records of major dealers now for owner information.

2. Gunsmiths

Essentially all of the gunsmiths on the recommended list have agreed to participate in the recall program. Initial phone contacts were confirmed by telegram. Cooperation has generally been excellent. Among the gunsmith comments have been concerns about future product liability claims arising from this program, their ability to provide adequate service at this point in the hunting season and the adequacy of the \$5.00 bench charge.

Forms to document the receipt of customer guns and serve as an invoice have been prepared and are being distributed.

An installation procedure for the replacement trigger assemblies is being prepared in Ilion. It appears this will be more complicated than anticipated because some fitting is required in older guns. We will review the proposed procedure and if necessary run a pilot evaluation with selected gunsmiths before making a general mailing.

Arrangement have been made to hand carry the available trigger assemblies to the 10 Texas gunsmiths today. Installation procedures will be discussed. We estimate each Texas gunsmith will receive a minimum of 50 trigger assemblies.

Ilion will be established as a repair station for customers requiring special handling. The gunsmith's reporting procedures will be used to maintain a common input to the record control system being developed by Business Services.

3. Replacement Parts- Mohawk rifle assembly has been suspended to increase trigger housing assembly availability. Production estimates they can start supplying at the rate of 75 per day and reach a rate of 325 per day by the end of November. It was decided to remove the trigger assemblies from approximately 3500 Mohawk 600s now in the warehouse in order to expedite initial shipments.

4. Export and Canada - Giner, Droge and Millhofer have been notified. Millhofer estimates there are 15,000 of the subject guns in Canada. He will visit Bridgeport Tuesday to review the program established for the domestic market.

NOTE: Attached are copies of press releases, gunsmith correspondence and other materials related to the recall.

EFB:jl
Attach.

DON'T SAY IT-WRITE IT

To E.G. LARSON Location BRIDGEPORT A/O BUILDING
From J.A. STEKL Location ILION Phone No. _____
Subject M/600 COMPLAINTS INVOLVING P.I. AND/OR PROPERTY DAMAGE Date 2/4/80

Per your request during our phone conversation earlier today, I am forwarding to you two (2) files involving the subject.

I will be pleased to handle these matters, however, it is felt that a policy should be established in this regard.

Basically, are we accepting liability for incidents involving recall rifles, when examination indicates no problems exists with the rifle, even though it contains the original fire-control?

Please advise.

JAS:
JAS:tp
attch.

RECEIVED

FEB 5 1980

E.G. LARSON

80 778

STOP, LOOK, AND LIVE

PLAINTIFF'S
EXHIBIT

3058

AL 0022714

1 of 1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

*Simms Hdwe.
(Geo. Mc Carthy)*

Ilion, New York
January 17, 1980

TO:

J. H. Ghisnall
J. H. GHISNALL
BRIDGEPORT, CONN.

FROM:

D. J. SANITA

Model 600 Remington Rifle 73633
Repair Order R 31610-600

Dear Jack:

We have completed our examination of the above subject Model 600, which was returned to us by Simms Hdwe. Co.

For completion of your files, we are attaching the gun examination report, customer's correspondence, and note from Marshall Hardy.

Due to reference to a product liability, we will hold the above and await your reply to its disposition.

Best Regards,

D. J. Sanita

D. J. Sanita:tc

attach.

RECEIVED

FEB - 1 1980

J. A. STEKL

Supervisor, Arms Service Division

RECEIVED

JAN 18 1980

PRODUCT SERVICE
BRIDGEPORT

PLAINTIFF'S
EXHIBIT

3059

AL 0022715

1 of 4

P.I. NFS GUN EXAMINATION REPORT NUMBER: 186 MODEL: 605
 GENERAL CONDITION: FAIR R #: 3160
 OUTSIDE WORK: 3" COIL O.D. + SLING STRAP DATE: 11-29-79
STOPS ADDED - stock refinished outside FROM: S/VHS HAWK H&B
 FIRED AMMO TYPE: NOT KNOWN Remington 2801-J-37 SA&P

& CONDITION: OK GUN #: 73633
 PROOF: REP INSP.: M TEST: 114 CODE: B P-1-67
 HEADING: OK GA./CAL.: 308
 BREACH OPENING: OK CHECKED BY: M-H-79
 RECOIL SHOULDERS: OK APPROVED: 9074 12/21/79
 CHAMBER: OK APPROVED: 12/21/79
 TEST: OK APPROVED: R.P.B. 12-21-79
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: 12/21/79

BRIGHT METAL ON REC. & BBL.
RE FINISHED TRIGGER COARD AND ALL
4 1/2 LB TRIG PULL

COMPLAINT: FIRE WHEN UNLOADING

INCIDENT:

COMMENTS: passed tick test, Trigger Pull 4 1/2 #

Gun involved in recall program.

AL 0022716

Replace fire control, under recall program



SIMMS HARDWARE CO.

2801 J STREET
19161 442-3894
SACRAMENTO, CALIF. 95816

RT: 2583
2244

TO Rem. Arms ATN: James Stekl DATE 11-19 19 79
ADDRESS Service Dept WHEN SHIP ASAP
CITY Iliou New York 13357 HOW SHIP B/W

QUANTITY	PLEASE SUPPLY ITEMS LISTED BELOW	PRICE	UNIT
1	Subject: 600 308 Win.		
2	SN# 73633		
3	Safety check.		
4			
5			
6	MR. Stekl.		
7	This is the Rifle I Talked		
8	With you about, the same date.		
9	The customer brought this one		
10	in and asked if this gun was on		
11	a Recall. I checked the SN and told		
12	him it was. He then told me that the		
13	Rifle had gone off when his son		
14	was unloading it in the car port. He		
15	claims that when it it went off the		
16	bullet went through a laundry room		
17	causing about \$2500 worth of damages.		
18	Customer is:		
19	MR. George McCauley		
20	4554 Amberley Way		
21	Sac. Calif. 95821		
22			
23	THANK YOU		
24	Rich		
25			

PLEASE SEND COPIES OF YOUR INVOICE WITH ORIGINAL BILL OF LADING

AL0022717

PURCHASING AGENT

PLEASE PUT PURCHASE ORDER NUMBER ON ALL PACKAGES

To _____

Date _____

From _____

MODEL	CALB.	R-NO.	PICK UP NO.	SER. NO	DATE
600	308	31610	186	73633	12-6-79

RIFLE PASSED ON TRICK TEST AND SCREW DRIVER TEST. 41 LB TRIG POLL, TRIG CLEAR OF TRIG GUARD WHEN RECEIVED.

RIFLE APPEARS TO BE UP TO REM SPEC. OLD STYLE FIRE CONTROL

NO. PI MARKED ON WORK ORDER. LETTER STATES THAT IT IS.

Marshall Hall

SAFETY IS A WISE INVESTMENT

AL 0022718

4 of 4

D-44.2

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RECEIVED

FEB 7 1980

Ilion, New York
January 17, 1980

J. A. STEKL
TO:

J. H. CHISHALL
BRIDGEPORT, CONN.

FROM: D. J. SANITA

Model 600 Remington Rifle 71789
Repair Order R 31624-600

Dear Jack:

We have completed our examination of the above Model 600, which was returned to us by Snapply ServiSenter.

For completion of your files, we are attaching the gun examination report and customer's correspondence.

There were no pictures taken of the gun.

Due to the customer's reference to a personal injury, we will hold the above and await your reply as to its disposition.

Best Regards,

D. J. Sanita

D. J. Sanita:tc
attach.

Supervisor, Arms Service Division

PLAINTIFF'S
EXHIBIT

3060

AL 0022719

1 of 4

*Snapply ServiSenter
(Michael Harvey)*

A

Kalispell, Mont.

Nov. 3, 1979.

Remington Arms Co.

Dear Sir:

The gun discharged accidentally
in the process of unloading.
The bolt was open and the shell
showing when it discharged, the
butt coming back and hitting
me in the face, also powder burns
on the face. Haven't felt safe
with this gun since.

Sincerely

Michael Farney

3005 East Hills Rd.

Kalispell, Mont. 59901

AL 0022720

- 2 of 4

SPEED MESSAGE

TO REMINGTON ARMS COMPANY
Arms Service Division
Ilion
New York 13357

FROM **Snappy ServiSenter**

1400 HIWAY 2 EAST — PHONE 406-257-7525

KALISPELL, MONTANA 59901

Attn: Jim Stekl

SUBJECT Warranty Repair of Remington Model 600, serial # 71789

DATE November 19, 1979

Dear Mr. Stekl:

Please find enclosed subject firearm which I am returning for my customer, Mr. Michael Harvey of Kalispell, Montana. Mr. Harvey returned this firearm to me recently, and asked that I return the firearm to you for inspection and repair of the hammer, sear, and safety assembly. Mr. Harvey feels that this firearm is one of those to which the Model 600 recall applies. I have confirmed this.

Mr. Harvey had a bad experience with this firearm, when it accidentally discharged as he was unloading the rifle. I have enclosed a note from Mr. Harvey.

Please repair this firearm under warranty, thoroughly function check and test fire, and return at your very earliest convenience to us at the above address.

Thankyou for your attention to this matter.

Sincerely,

W. J. LUPTON

SIGNED

P.I. FEJ GUN EXAMINATION REPORT NUMBER: 175 MODEL: 600
 GENERAL CONDITION: POOR R #: 31524
 OUTSIDE WORK: SCOPE SCREW + REAR SCREW DATE: 11-29-79
REMOVED FROM: SHAW-WALKER
 FIRED AMMO TYPE: NOT KNOWN KALISPELL MONT. 500
 & CONDITION: OK GUN #: 71789
 PROOF: REP INSP.: N TEST: 32 CODE: OK=9-63
 HEADING: OK GA./CAL.: 243
 BRESCH OPENING: OK CHECKED BY: M-HARDY
 RECOIL SHOULDERS: OK APPROVED: JDH 12/21/79
 CHAMBER: DIRTY APPROVED: FEJ 12/21/79
 TEST: OK APPROVED: FEJ 12-21-79
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: FEJ 12-21-79

STOCK BEAT UP. BRIGHT METAL ON BBL.
ROLT RUSTY RIFLE DIRTY CHAMBER RUSTY

COMPLAINT: DISCHARGED ACCIDENTALLY IN PROCESS
OF UNLOADING - "When bolt open & shell showing"

INCIDENT: for customer

COMMENTS: Gun passed triac test. No evidence of gun damage,
in area of mag box. Incident described by customer is
mechanically impossible in this gun.

AL 0022722

Gun involved in recall program - Repair at no charge

LES FREER GUN SHOP

SERVICE REPRESENTATIVE FOR LEADING MANUFACTURERS

FIELD SERVICE

JUN 17 1979

July 12, 1979

Remington Arms Co.
Att: E. L. St. John
Arms Service Div.
Ilion, N.Y. 13357

Dear Dick:

Regarding your recent bulletins on safety related problems in Remington guns, we share your concern in this matter and pass on the following notes for whatever they may be worth.

Our somewhat extensive experience with these problems has been confined, almost 100%, to the bolt actions, 600, 660 & 700. From the very first of these, going back a few years, we have always been confronted with more complaints than gun problems. In other words, the so called safety problems in many cases were people problems rather than gun problems, perfectly normal rifles returned with accounts of accidental discharge. What bothered us most were the reasons why only these models were involved, while we very rarely encountered the same complaint with any other make or model rifle. These reasons are what we have tried to analyze.

The models involved (700 etc.) were cleverly designed to locate trigger and safety in the most convenient and comfortable positions for the shooter - no question that this feature has been appreciated by everyone who ever used one of these rifles. But at the same time, this very convenience naturally places the index finger on the trigger and the thumb on the safety simultaneously and any effort to push the safety forward induces some support by the index finger resting on the trigger. A very desirable, yet safe, trigger pull then becomes a liability as the sear is released unintentionally.

Of course, we all know that the trigger should not be contacted while moving the safety, and no experienced shooter commits this error, but more often than not these rifles are in the hands of inexperienced shooters. Furthermore, with very few exceptions the complaint has been: "Fired when the safety was moved".

PLAINTIFF'S
EXHIBIT

3061

AL 0022736

10 of 2

A
R. L. St. John

(2)

July 12, 1979

While it is true that many other types and models of rifles have thumb operated safeties their location in relation to the location of the trigger differs enough to reduce the problem.

The few exceptions mentioned have been cases where the trigger/sear engagement was just too short, sometimes having been adjusted after leaving the factory, sometimes not. In these cases the complaint has been firing on closing the bolt.

Now a few words about the 600 recall program. We find the new trigger assemblies that we are installing a great improvement - an excellent assembly in every way; we can't find any problem with these at all.

It should be worth mentioning that we have processed about 425 of these recalled rifles so far, and we are appalled by the condition of some of these guns as they come to us. Lack of maintenance is hardly the word for it; many of them come in with the old trigger assembly so fouled with dirt and dried up, sticky, gummy lubricant it is a miracle that it functions at all. Putting in that nice new trigger assembly is truly "casting pearls to the swine".

That's all I have to bug you with today. Kindest regards.

Very truly yours,

Les

Les Freer

cc: Dennis Sanita

AL 0022737

2072

... (supplemental back up materials)
Cross Ref: Recall 600 (See PR file)

D R A F T

LETTERS TO THE EDITOR

This is in response to Blake C. Erskine's letter in the February 23, 1979, issue. On behalf of Remington, I would like to set the record straight on several points. First of all, the 6.8 million dollar product liability settlement was negotiated by Remington's insurance companies, who have full authority to settle cases without Remington's approval, and who consider many factors in addition to the merits of the case when making their decision on settlement. Remington never believed, nor does it believe now, that the accident paralyzing the Austin, Texas, claimant was caused by a defective product. Remington believes the accident was the result of unsafe gun handling; the act of attempting to unload a gun in a vehicle, with the safety off and the muzzle pointed in the direction of someone or something the gun handler did not intend to shoot.

It is not true that a Remington official handled the accident rifle in the same manner as the plaintiff's son said he handled it, and the gun discharged. In fact, if the son's deposition is correct on how he handled the rifle on the day of the accident, the gun could not have fired without the trigger having been pulled immediately before discharge. Remington has recalled the model rifle under discussion, primarily because the publicity given the Texas case has undercut the public's confidence in the

PLAINTIFF'S
EXHIBIT

3062

AL 0022747

1 of 1

A

Remington.



REMINGTON ARMS COMPANY, INC.

TELEX
904-00
BRIDGEPORT, CTSPORTING ARMS-AMMUNITION-TARGETS-TRAPS
BRIDGEPORT, CONNECTICUT 06602TELEPHONE
203-333-1112

February 8, 1979

RECEIVED

FEB 9 1979

TO OUR FIREARMS DISTRIBUTORS

SUBJECT: BULLETIN - RIFLE RECALL R. B. SPERLING

Gentlemen:

In our letter of November 8, 1978 on this subject, we mentioned that we would be sending you information on shipments we have made to you of models covered by our recall (certain Model 600, 660 and Mohawk 600 rifles and XP-100 pistols).

As an expediency, we have, instead, elected to take a more direct approach ... furnishing full information on the recall to firearms dealers.

Enclosed is a copy of a letter now being mailed to our dealer list, together with a laminated message for use as a display in bringing information on the recall to the attention of retail customers. Also enclosed is a copy of a form for dealers to use in sending customer data back to us. In addition, we plan a similar mailing to the full list of Federal Firearms License holders in the near future.

We appreciate your cooperation in working with us on this recall, and while it may be necessary to request your assistance from time to time, every attempt will be made to spare you as much inconvenience as possible.

Sincerely,

E. J. Conroy
Director of SalesEJC/ecc
AttachmentsPLAINTIFF'S
EXHIBIT

3063

AL 0022748

1 of 3

A

Remington



REMINGTON ARMS COMPANY, INC.

TELETYPE
904-201
BRIDGEPORT, CT

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS
BRIDGEPORT, CONNECTICUT 06602

TELEPHONE
203-333-1112

February 8, 1979

TO REMINGTON FIREARMS DEALERS:

BULLETIN: PRODUCT RECALL

As you are undoubtedly aware, we are recalling certain of our Model 600 series of center fire rifles and our XP-100 target pistol. We are trying to reach all of the owners who may have these recalled models and you can be of invaluable assistance to us in this effort. To date, we have alerted the public to our recall through radio and television coverage as well as by newspaper and magazine articles and advertisements. In order to help us reach the individual shooter directly, we ask that you look through your files to determine the customers to whom the following recalled guns were sold.

MODELS BEING RECALLED

All Remington Model 600 and 660 rifles, and all Mohawk Model 600 rifles EXCEPT THOSE WITH A SERIAL NUMBER STARTING WITH AN "A".

Any XP-100 pistol with a serial number below 7587984, EXCEPT THOSE WITH THE PREFIX "A" OR "B" BEFORE THE NUMBER.

DATES OF MANUFACTURE

Prior to February, 1975

* * *

Please send the customers' names and addresses to us at

Remington Arms Company, Inc.
Box AWB
Bridgeport, CT 06602

and we will contact them.

AL 0022749

2 of 3

A

- 2 -

Enclosed for your convenience is a form to be used in sending us the above information.

We also urge you to check your own firearms inventories to be absolutely sure none of these recalled guns remain in your stock. If you find that you do have either a new or used gun covered by the recall, call the appropriate toll-free number listed below to find the name of the nearest participating gunsmith who will, at no charge, inspect and modify the gun as required.

All states except Georgia - 1-800-241-8444 (Operator 61)

Georgia only - 1-800-282-1333 (Operator 61)

Inquiring customers who may have guns covered by the recall should be told that Remington recommends that prior to any further usage of their guns that they be inspected and modified as required. This will be done at no charge by participating gunsmiths around the country. Customers may call one of the above toll-free phone numbers for the name of the nearest participating gunsmith. If the location is not convenient to personally deliver the gun, the customer may send the gun collect to the gunsmith and have it returned prepaid.

For convenient in-store use and display purposes we are also attaching a laminated message form that shows information pertaining to the recall.

We thank you for your cooperation in assisting us in this recall and regret any inconvenience caused you or your customers.

Sincerely,

E. J. Conroy
E. J. Conroy
Director of Sales

EJC/ecc
Attachments

AL 0022750

3 of 3

Remington

REMINGTON ARMS COMPANY, INC.

MANUFACTURERS OF
SPORTING FIREARMS, AMMUNITION

SPORTING FIREARMS, TRAPS, RIFLES, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT
IONOKE, ARKANSAS
CABLE—HARTLEY, BRIDGEPORT

TRAPS

TARGETS

BRIDGEPORT, CONNECTICUT 06602

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT
TARGETS, RINDLAY, OHIO
ADA, OKLAHOMA
ATHENS, GEORGIA

TELE: 944-201 STRATFORD, CONN.

PETERS
RECEIVED

DEC 15 1978

R. A. PARTNOY

December 14, 1978

Mr. Charles Murray
312 S. Colorado
Gunnison, CO 81230

Dear Mr. Murray:

We are in receipt of your letter dated 11/13/78. I would like to offer our sincere apologies for not replying sooner, but we have been completely inundated due to the recall response. Just now we are approaching a catch-up stage.

You indicated that you were rather upset with our watts-line operator in Atlanta when she requested the serial number for the gun in question. I should inform you that this was done at our request in order that, if in the future, we had a question concerning your particular gun that we could pinpoint the owner for verification that we had offered to make the necessary trigger replacement. This, of course, would absolve us from the legal responsibility in case the owner decided not to have the authorized work in repair performed.

On the question of making the installation yourself, there is a legal reason for not being able to ship you the trigger assembly for self installation. Only our new gun repair stations are authorized to make this repair, and we cannot deviate from that policy.

1

PLAINTIFF'S
EXHIBIT

3084

RECEIVED

DEC 15 1978

PHILIP H. BURDETT

H

AL 0022760

1 of 4

In view of your apprehension concerning the possibility of your gun's serial number falling into the wrong hands, we would like you to return your gun to the attention of Mr. Ed Sienkiewicz, transportation collect, to the following address.

Remington Arms Company, Inc.
Arms Service Division
Ilion, NY 13357

I am enclosing information that will allow you to determine by the serial number whether your Remington 660 falls into the recall category.

If we can be of any further service to you, please call us on our toll-free Bridgeport number, 1-800-243-9275.

Best regards.

R. G. Sherman
Product Service Coordinator

RGS/lb
Enclosure
cc: P.H. Burdett



Orig. - J. Chisnall -- To handle N.G. Williams 13 November 13th 1978
cc: P.H. Burdett R.A. Partnoy
J.P. McAndrews

Remington Arms Company Inc.

Office of the President
Bridgport, Conn 06602

Mr. President.

RECEIVED

NOV 16 1978

PHILIP H BURDETT

RECEIVED

NOV 17 1978

PRODUCT SERVICE
BRIDGEPORT

I own one of the 660 Remington Rifles which are being recalled. I called the water line number that you have and to my dismay and disliking, the operator asked me for my serial number so that she might enter it in a computer. I fail to see why she must have my number in a computer just to refer me to a gunsmith to have it installed. All that must be done for the gunsmith to look at the rifle, see if it falls within the recall range and install the trigger. For that matter I can install the trigger myself or good as any gunsmith around - probably better than most.

AL 0022762

3 of 4

I am opposed to having any of my rifle
serial numbers entered into a computer
for any reason on the negative tapes
can fall into the wrong hands. What
refugees does Raimington have against
the minutes of their computer tapes? For
all we know the terminal may be hooked
up to the BATH.

I know this side a personal
gun "frank", but if one looks back at our
freedom erosion in the last 20 years, it
is readily justifiable.

I am a competitive Rifle and pistol
shooter and I own two Raimington Match
Rifles of which I have had no trouble with
In fact I have nothing but high praise for
them. I would appreciate your giving me
the address of where I might get my trigger
replaced or send me one to replace myself.
I will send you a sum, intended instead
that my rifle is in the small range of
your machine proof. Thank you for your time.
I remain

Very truly yours

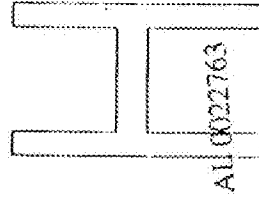
Charles H. Hines

312 S. Colo

P.S. Maybe this could be
handled through the N.R.A.

Gunnison, Colo 81230

4 of 4



REMINGTON ARMS COMPANY, INC.
Ilion Research Division

May 19, 1964

cc: R. A. Williamson
H. J. Hackman
L. J. Boyle
M. J. ~~Boyle~~ *Boyle*
C/B. Workman
W.E. Leek - File

G. M. CALHOUN

GUN SAFETY - SPECIAL "JAR-OFF" TESTS
Model 700 - Model 600

As result of the report from Foreign Sales (re Australia), the Firearms Test Unit withdrew ten (10) each of Models 700 and 600 from Ilion production. Each was subjected to the standard "jar-off" test of 10 inches (3/4" wood on concrete floor) with the actions cocked and safeties "off". First drop was with butts "down". Second drop with muzzles down. All passed. One of each model (M/700 - Serial No. 102894, and M/600 - Serial No. 11158) was retained for "torture test". The balance was returned to production, since needed for assembly schedules.

Each of the two selected rifles was next dropped progressively higher from 12" to 36" at two (2) inch increments, first with butt stocks down, next with muzzle down. The safety was set in "off" position. Results all "OK". For the M/700 the safety would jar "ON" when dropped with butt stock "down" at heights above 32 inches. In the M/600 the safety would jar "ON" when dropped from heights above 22 inches with butt stock "down".

The rifles were next subjected to drops from a horizontal position, actions cocked and safeties "off". The M/700 was OK up through the 36 inch with "normal" or bottom side "down". However, the action "fired" at 28, 30 and 36" heights when dropped "top side down".

The M/600 did not pass this test from above 18 inches; however, both rifles were OK with safety "ON".

We can only conclude that this sample of rifles passed the standard jar-off tests and that the single samples of each model seemed to be significantly "better" than the previously accepted jar-off requirements.

SMART

Small
G. M. Alvie
Ilion Research Division

PLAINTIFF'S
EXHIBIT

3065

AL 0022785

1 of 1

MODEL 700 CUSTOMER GUNS RETURNED
BY COMPLAINT-MONTH RECEIVED AND YEARLY TOTAL

1963

1962

	Tot.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot.
Total Guns Returned:	355	81	26											
Total Complaints:	397	83	29											
Total Functional Complaints	130	29	28											
Ejection	6	1	1											
Firing	8	1												
Extraction	10	1	7											
Feeding	31	4	6											
Closing	12	5	5											
Bolt Binds	8	1	1											
Trigger Pull	5	2	3											
Safe	6	2												
Damaged or Blown Cases or Primers	18	3	2											
Ejector Binds or Stuck in Bolt	6	1	1											
Jams, Repair Etc.	5	2												
Up to Standard (Functional)	4	6	2											
Total Intermediate Complaints	206	47	42											
Stock Broken, Cracked	70	21	16											
Stock Finish or Checkering	83	12	14											
Stock Cracked at Barrel Groove														
Accuracy (Point of Impact)	2		2											
Accuracy (Group Size)	11	4	5											
Bolt Handle Broken-Loose	13	2	1											
Sights Crooked-Tipped Etc.	5	1												
Sights Out of Line			1											
Scope Mounting Trouble	6	1												
Sights Broken		1	3											
Bolt Pulls Out	1													
Up to Standard (Intermediate)	15	3	1											
Broken Steel Parts	11	2	5											
Total Visual Etc.-Complaints	61	7	13											
Misc. Visual Complaints	52	7	11											
Misc. Non-Functional	8													
Up to Standard (Non Functional)	1		2											

PLAINTIFF'S
EXHIBIT

3066

AL 0022787

1 of 19

Model 700 Total Complaints (except up to 'Std.)

[illegible]

AL 0022788

10 X 10 TO THE WINERY 359.11G
KUDOFF & SNERCO.

Model 700 - Functional

Month Produced	Month Returned												Month Produced
	J	F	M	A	M	J	J	A	S	O	N	D	
Jan. 1961						2	1	2					Jan. 1962
Feb.													Feb.
Mar.						2			3	1			Mar.
Apr.					1		2	3	2	2	1	1	Apr.
May					4	4	3	4	10	2	5	3	May
June						2	1	3	5	4	3	4	June
July							4	3	5	3	1	4	July
Aug.									2	2	5	1	Aug.
Sept.									2	8	4	4	Sept.
Oct.									4	2	3	6	Oct.
Nov.											1	2	Nov.
Dec.											1	1	Dec.
Jan.													Jan.
Feb.													Feb.
Mar.													Mar.
Apr.													Apr.
May													May
June													June
July													July
Aug.													Aug.
Sept.													Sept.
Oct.													Oct.
Nov.													Nov.
Dec.													Dec.

Model 700 Feeding 222-222 M. Cal.

Month Produced 1962												Month Returned											
J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
a	e	a	p	a	u	u	u	e	c	c	e	a	e	a	p	a	u	u	e	c	c	e	a
b	b	r	r	y	n	l	s	p	t	v	c	b	b	r	r	y	n	l	s	p	t	v	c
M. Code																							
1961																							
Jan.																							
Feb.																							
Mar.																							
Apr.																							
May																							
June																							
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Nov.																							
Dec.																							
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Dec.																							

10 X 10 TO THE 5 INCH
 349-110
 100%
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Model 700 - Feeding 7mm-264 Cal.

Month Produced 1962												Month Returned 1963											
J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
a	e	a	p	a	u	u	o	e	c	o	e	a	a	a	p	a	u	u	e	c	o	e	e
n	b	r	r	y	n	i	g	y	t	v	c	n	b	r	r	y	n	i	g	y	t	v	c
No. Gobs																							
1961																							
1	Jan.																						
2	Feb.																						
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2	Apr.																						
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	Aug.																						
	Sept.																						
	Oct.																						
	Nov.																						
	Dec.																						

10 X 10 TO THE 15 INCH 339-116
RECEIVED
RECEIVED

Model 700 Ejector Binds or Stuck in the Bolt

Month Produced	1962												Month Returned												1963											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
No. Code																																				
1961																																				
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2007																																				
2008																																				
2009																																				
2010																																				

10 X 10 TO THE 1/4 INCH 359-116
MULTIPLESSER CO. AUG 1962

AL 0022793



Model 700 Stock Broken/Stock Finish & Checkering

Month Produced	1962	Month Returned	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	331
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300 000 000

NOTE

MODEL 700 CUSTOMER GUNS RETURNED
BY COMPLAINT-MONTH RECEIVED AND YEARLY TOTAL

1963

1962

	Tot.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot.
Total Guns Returned:	355	81												
Total Complaints:	397	83												
Total Functional Complaints	130	29												
Ejection	6	1												
Firing	8	1												
Extraction	10	1												
Feeding	31	7												
Closing	12	5												
Bolt Binds	8	1												
Trigger Pull	5	2												
Safe	6	2												
Damaged or Blown Cases or Primers	18	3												
Ejector Binds or Stock in Bolt	6	1												
Jams, Repair Etc.	5	2												
Up to Standard (Functional)	4	6												
Total Intermediate Complaints	206	47												
Stock Broken, Cracked	70	21												
Stock Finish or Checkering	83	12												
Stock Cracked at Barrel Groove														
Accuracy (Point of Impact)	2													
Accuracy (Group Size)	11	4												
Bolt Handle Broken-Loose	13	2												
Sights Crooked-Tipped Etc.	5	1												
Sights Out of Line														
Scope Mounting Trouble	6	1												
Sights Broken		1												
Bolt Pulls Out	1													
Up to Standard (Intermediate)	15	3												
Broken Steel Parts	11	2												
Total Visual Etc.-Complaints	61	7												
Misc. Visual Complaints	52	7												
Misc. Non-Functional	8													
Up to Standard (Non-Functional)	1													

AL 0022797

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Model 700 Total Complaints (except up to Std.)

Month Produced	1962												1963											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Month Returned	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
No. Date																								
1961																								
1 Jan.										1	2	1												
9 Feb.																								
6 Mar.				2	4		2	2		5	2	1												
2 Apr.				2	2	6	4	11	7	4	6	3	5											
May						6	8	5	10	17	6	6	7											
June							12	13	15	20	14	8	6											
July								10	10	12	12	7	7											
Aug.									2	6	17	11	5											
Sept.										8	17	12	11											
Oct.										3	7	16	18											
Nov.												2	8											
Dec.													1	8										
1 Jan.																								
6 Feb.																								
3 Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

10 X 10 TO THE INCH 359-110
K&E SCOTT & ESSEN CO.

Model 700 - Functional

Month Produced	1962	1963
Month Returned	1962	1963
Jan.		
Feb.		
Mar.		
Apr.		
May		
June		
July		
Aug.		
Sept.		
Oct.		
Nov.		
Dec.		
Jan.		
Feb.		
Mar.		
Apr.		
May		
June		
July		
Aug.		
Sept.		
Oct.		
Nov.		
Dec.		

SECRET

Model 700 Feeding 222-222 M. Cal.

Month Produced	Month Returned												Month Produced	Month Returned											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J
	a	e	a	p	a	u	u	u	e	c	c	e	a	e	a	p	a	u	u	u	e	c	c	e	a
	n	b	r	r	y	n	i	s	p	t	v	e	n	b	r	r	y	n	i	s	p	t	v	e	n
Code																									
1961																									
1 Jan.																									
2 Feb.																									
6 Mar.																									
2 Apr.																									
May																									
June																									
July																									
Aug.																									
Sept.																									
Oct.																									
Nov.																									
Dec.																									
1 Jan.																									
2 Feb.																									
6 Mar.																									
2 Apr.																									
May																									
June																									
July																									
Aug.																									
Sept.																									
Oct.																									
Nov.																									
Dec.																									

10 X 10 TO THE INCH 350-110
 10 X 10 TO THE INCH 350-110

Model 700 - Feeding 7mm-264 Cal.

Month Produced	1962	Month Returned	1963
Jan.			
Feb.			
Mar.			
Apr.			
May	3		
June			
July			
Aug.			
Sept.			
Oct.			
Nov.			
Dec.			
Jan.			
Feb.			
Mar.			
Apr.			
May.			
June			
July			
Aug.			
Sept.			
Oct.			
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Dec.			

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AL 0022801

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Model 700 Feeding/All Others

Model	Produced 1962												Model Returned 1963											
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. Code																								
1961																								
Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
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1962																								
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Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

10 X 10 TO THE VINCH 339-110
4 CUPILL & SINK CO. MOBILE, AL

Model 700 Ejector Binds or Stuck in the Bolt

Month Produced		Month Returned	
1962	1963		
Jan.	Jan.		
Feb.	Feb.		
Mar.	Mar.		
Apr.	Apr.		
May	May		
June	June		
July	July		
Aug.	Aug.		
Sept.	Sept.		
Oct.	Oct.		
Nov.	Nov.		
Dec.	Dec.		
1961	1962		
Jan.	Jan.		
Feb.	Feb.		
Mar.	Mar.		
Apr.	Apr.		
May	May		
June	June		
July	July		
Aug.	Aug.		
Sept.	Sept.		
Oct.	Oct.		
Nov.	Nov.		
Dec.	Dec.		

AL 0022803

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MODEL 700 - BROKEN STEEL PARTS

With
Approved: L.S.

636364

40-42

H U V G M

10 X 10 TO THE 4 INCH 359-116

AL 0022815

545

COPIES TO:

C.K. DAVIS
D.E. CARPENTER
W.O. REISINGER
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F.K. CRAIG
G.O. CLIFFORD
M.R. WARDEN
G.E. PINCKNEY
A.L. FRENCH
W.L. CLAY
W.F.H. MATTLAGE
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H.K. FAULKNER
W.H. DAVIS
H.A. BROWN
R.H. GRACE
H.J. HACKMAN (6)
D.S. FOOTE
D.E. MILLER
S.W. ROSE
R.A. WILLIAMSON
A.J. BROWN
R.E. WRIGHT

TOTAL JUSTIFIED COMPLAINTS

AUGUST 1948	96
AUGUST 1947	81
TO DATE 1948	1872
TO DATE 1947	990
FOR 12 MONTHS ENDING AUGUST 31, 1948	2380
FOR 12 MONTHS ENDING AUGUST 31, 1947	1366
LAST 12 MONTHS RUNNING AVERAGE	198
LAST 12 MONTHS RUNNING AVERAGE (1 YEAR AGO)	113
LAST 12 MONTHS RUNNING AVERAGE (6 MONTHS AGO)	169

COMPLAINTS ON GUNS PRODUCED WITHIN ONE YEAR

CURRENT MONTH AUGUST 1948	86
MARCH 1948	171
AUGUST 1947	66
AUGUST 1946	0

FOR 12 MONTHS ENDING AUGUST 31, 1948	2003
--------------------------------------	------

LAST 12 MONTHS RUNNING AVERAGE ON GUNS PRODUCED WITHIN ONE YEAR.	166
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SHEET NO. 1

PLAINTIFF'S
EXHIBIT

3067

AL 0022492

1 of 5

A

COMPLAINTS ON FIREARMS FOR MONTH ENDED AUGUST 31, 1948.

	PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 81		
* JACKET HEAD LOOSE	1	2
O FAILS TO EJECT	1	1
O MAGAZINE SIDE SPRING OUT OF ADJUSTMENT	2	2
X NOT ACCURATE	1	1
TAKE DOWN SCREW BINDS	1	1
	<u>6</u>	<u>7</u>
SPORTSMAN - 12 GA.		
MAIN SPRING BROKEN	1	1
O TRIGGER BINDS	1	1
FORE-END SPLIT	1	1
O FAILS TO EJECT	1	1
	<u>4</u>	<u>4</u>
SPORTSMAN - 16 GA.		
O TRIGGER BINDS	—	1
	—	<u>1</u>
MODEL 11 - 12 GA.		
O SHELLS STEM CHAMBER	1	2
O FAILS TO EJECT	1	1
	<u>1</u>	<u>3</u>
MODEL 11 - 20 GA.		
O SHELLS STEM CHAMBER	—	1
X FRONT SIGHT BASE OUT OF POSITION	1	1
	<u>1</u>	<u>2</u>
MODEL 121		
FIRING PIN BROKEN	—	1
O SHELLS STEM CHAMBER	1	2
O TAKES MAX. PLUG	—	1
O FAILS TO EJECT	—	1
O FAILS TO FEED	1	1
	<u>2</u>	<u>6</u>
MODEL 141		
O SHELLS STEM CHAMBER	1	1
CARTRIDGE STOP BROKEN	2	2
X FIRING PIN HOLE OUT OF POSITION	2	2
	<u>5</u>	<u>5</u>

SHEET NO. 2

AL 0022493

A

MODEL 241

O FAILS TO DISCONNECT
 X POOR NOTCH ON FIRING PIN
 O FAILS TO EJECT
 X SIGHTS OUT OF LINE
 X NOT ACCURATE (MUZZLE UPSET)
 O CARTRIDGE STOP OUT OF ADJUSTMENT
 X POOR BLUEING
 X JAMS (POOR CLAW ON EXTRACTOR)
 O SHELLS STEM CHAMBER
 DEFECTIVE BARREL
 O DISCONNECTOR DAMAGED
 O FAILS TO COCK
 RECEIVER CRACKED

PRODUCED WITHIN
ONE YEAR

TOTAL

1	1
2	2
2	2
1	1
1	1
1	1
1	1
1	1
1	1
1	1
2	2
1	1
<u>16</u>	<u>16</u>

MODEL 31 -12 GA.

DEFECTIVE BARREL

1
<u>1</u>

MODEL 510

O FAILS TO EXTRACT
 TAKE DOWN SCREW THREADS BAD IN RECEIVER

1	1
<u>1</u>	<u>1</u>
2	2

MODEL 512

O CARTRIDGE RETAINER OUT OF ADJUSTMENT
 O FAILS TO EJECT
 # BOLT PULLS OUT
 N NOT ACCURATE (SIGHTS OUT OF LINE)

1	1
1	1
3	3
<u>5</u>	<u>5</u>

MODEL 513

X KEY HOLES (POOR RIFLEING)

6	6
<u>6</u>	<u>6</u>

MODEL 514

X DEFECTIVE BOLT
 BOLT HANDLE BROKEN

1	1
<u>1</u>	<u>1</u>
2	2

MODEL 521

X BOLT HANDLE LOOSE

1	1
<u>1</u>	<u>1</u>

SHEET NO. 3

AL 0022494

3 of 5

A

	PRODUCED WITHIN ONE YEAR	TOTAL
--	-----------------------------	-------

MODEL 550-1

X	NOT ACCURATE	1	1
X	JAMS (INSERT ROUGH)	2	2
O	FAILS TO EJECT	2	2
O	FAILS TO CONNECT	1	1
	BROKEN EXTRACTOR	1	1
	FAILS TO OPERATE PROPERLY	1	1
	SHELLS STEM CHAMBER	2	2
	CONNECTOR SPRING WEAK	2	2
X	BOLT BINDS	1	1
	SHELLS SWELL	1	1
	DEFECTIVE BOLT	1	1
	POOR THREADS IN RECEIVER	1	1
		<u>16</u>	<u>16</u>

MODEL 721

#	STOCK CRACKED AT GRIP	7	7
O	FAILS TO EJECT	2	2
	DEFECTIVE BOLT	2	2
X	BAD SPOT IN BARREL	1	1
	EXTRACTOR LOOSE	1	1
	SEAR BINDS	1	1
O	TRIGGER PIN OUT OF POSITION	1	1
		<u>15</u>	<u>15</u>

MODEL 722

	BOLT HANDLE CRACKED	1	1
	BOLT CRACKED	1	1
X	BARREL LOOSE IN RECEIVER	1	1
		<u>3</u>	<u>3</u>

- # - CORRECTED IN RECENT PRODUCTION
 X - OVERSIGHT IN INSPECTION
 O - CLOSE ADJUSTMENT NOT SHOWING UP IN
 FACTORY TEST RESULTING IN MALFUNCTION
 THROUGH USAGE
 N - NOT COVERED BY INSPECTION

SHEET NO. 4

AL 0022495

COMPLAINTS RECEIVED DURING AUGUST 1948 - ON GUNS PRODUCED IN THE FOLLOWING YEARS.

MODEL	1948	1947	1946	1945	MISC. & PARTS
MODEL 81	1	5	1		
SPORTSMAN - 12 GA.	1	3			
SPORTSMAN - 16 GA.			1		
SPORTSMAN - 20 GA.					
MODEL 11 - 12 GA.	1		2		
MODEL 11 - 16 GA.					
MODEL 11 - 20 GA.	1		1		
MODEL 121	1	1	4		
MODEL 141	3	2			
MODEL 241	10	6			
MODEL 31 - 12 GA.			1		
MODEL 31 - 16 GA.					
MODEL 31 - 20 GA.					
MODEL 37					
MODEL 510		2			
MODEL 511					
MODEL 512	1	5			
MODEL 513		6			
MODEL 514	2				
MODEL 521	1				
MODEL 550-1	16				
MODEL 721	14	1			
MODEL 722	3				

H.E. WEEKS: FH
9/8/48

SHEET NO. 5

AL 0022496

A

cc: G.M. Calhoun
M.H. Walker
L. Fox

Ilion, New York
April 18, 1968

W. E. LEEK

MODEL 700 EDI QUALITY - COMPUTER AIDED DESIGN

Here is the memorandum from P.H. Burdett we discussed and in which we are being asked to consider what improvement if any might be accomplished through use of the computer as regards to established tolerances in detecting interferences beyond accepted levels, etc.. This has grown out of the recent incident of a trigger interference which was published in "Consumer Reports" magazine.

From Mr. Burdett's memo one might conclude that there is need for further information from Management regarding expected levels of quality from our standards of sampling, and how all of this including the economics of established tolerances relates to cost of manufacture. Messrs. Fox and Pregnell might go further in this area, and in the meantime we have answer regarding the specific computer applications. For example, I believe we reported earlier that with this system in combination with N/C model making it would be possible to build sample guns from design that would more nearly represent expected range of dimensional variations for the purpose of more reliable test results. However, we may not be thinking specifically of computer application for establishing tolerances or making interference checks. I believe that you plan to discuss this with Ed Yetter.

Perhaps the questions which have subsequently arisen may have come about by fact that Ilion reported four things to do to further safeguard specific trigger interference item in the M/700.

First, the design was described as being changed to increase clearance between trigger and trigger guard. This clearance may have been set up originally to give a desired appearance which is now being compromised.

Second, it was reported that the tools and gages for the stock inletting were being changed to reduce probability of a tolerance buildup among the receiver, magazine and floor plate cuts and the guard screw holes.

Third, it was planned to transfer the M/700 stock inletting to another machine which would provide better dimensional control.

PLAINTIFF'S
EXHIBIT

3068

AL 0023806

10 of 2

W.E. Look

-2-

April 19, 1968

Finally, it was reported that all of the M/700 rifles were being gaged to assure clearance between trigger and trigger guard at inspection.

I have the impression that this latest request to analyze our tolerance checks for interferences should be aimed at the first item above as relates to the trigger clearance limited by the model drawings.

Please be prepared to discuss further with Dr. Calhoun during his visit this coming week.

Sam
S. M. Alvis
Rifles Research Division

SMA:T

AL 0022807

2 of 2

AL
COPY to SNA

DON'T SAY IT—WRITE IT

To G. M. CALHOUN ✓

DATE 4/17/68

From PHILIP H. BURDETT

MODEL 700 BDL QUALITY

Letter Lloyd Fox to R. A. Williamson of March 21 explains what was found on the Consumer's Union gun and what steps have been taken to avoid this trouble in the future. Letter Fox to Williamson of April 2 explains the extent to which Quality Audit can be expected to pick up such defects.

Neither letter is very comforting. The second seems to say our designers are giving us parts which are interchangeable---most of the time. It explains that on a typical gun there are approximately 3,000 measurable characteristics. Of course, tolerance build-ups on many---perhaps most---of these will not lead to interferences.

If it is impractical for the designers to analyze in detail potential interferences, would it be practical to program the GE computer to do this? Such an analysis might permit redesign in a few critical spots or, at least, flag a few critical areas for inspection.

You have reminded me of the famous words of our mutual friend, Col. W. L. Clay, that "You can't inspect quality into a product." Let's see if we can't figure a way to build a little more into our guns in this area.

PHB:jm

cc R. H. Coleman
R. A. Williamson-L. Fox
E. Sapp
J. P. McAndrews
E. Sparre
L. L. Presnell

RECEIVED

APR 17 1968

G. M. CALHOUN

PLAINTIFF'S
EXHIBIT

3069

THERE IS A SAFE WAY; DO IT THAT WAY

AL 0022808

1021

CC: S. M. Alvis
M. H. Walker
V. G. DeRous
E. R. Carr
B. W. Menard

Ilion, New York
March 21, 1968

R. A. WILLIAMSON
WORKS MANAGER

CONSUMERS' UNION - MODEL 700 BDL VARMINT SPECIAL, CAL. 22-250

Following the visit of Carl Larsen and Mike Walker to Consumers' Union on March 9, 1968 to inspect a malfunctioning Model 700 Varmint rifle (letter March 11, 1968), the Ilion Plant has audited Model 700 rifle assemblies, receivers, stocks and fire controls. We have found tolerance build-up in components which could lead to trigger binding as reported by Consumers' Union. The following corrective action has solved this problem and will lead to long range product improvement:

- Trigger Clearance - The design of the Model 700 trigger has been modified to increase the clearance between the trigger and trigger guard. This new design is in production.
- Stock Inletting - The tooling and gaging for the Model 700 stock inletter is being changed to reduce the probability of tolerance buildup among the receiver, magazine and floor plate cuts and the guard screw holes. These changes require several weeks for completion.
- Richardson Inletter - It is planned to transfer the Model 700 inletting from the Pratt and Whitney machine to a new Richardson long stock inletter. This process change will provide inherent tolerance improvements and will be completed in 1969.
- Product Inspection - At final inspection, all Model 700 rifles are being gaged to assure clearance between the trigger and trigger guard.

L. Fox, Supt.
P & C Section

LF:I

PLAINTIFF'S
EXHIBIT

3070

AL 0022811

1 of 1

cc: J. E. Dickey
F. E. Morgan
H. D. Albaugh
✓ M. A. Walker - Ilion

Bridgeport, Connecticut
March 11, 1968

TO: J. G. WILLIAMS

FROM: E. G. LARSON

SUBJECT: VISIT REPORT - CONSUMERS' UNION - MODEL 700 BDL 22/250

On March 8, Mike Walker and the writer met with Mr. Bert Strauss, of Consumers' Union, to examine the Remington Model 700 BDL caliber 22/250 Varmint Special rifle #262315. This rifle was involved in their test and report as published in the March 1968 issue of "Consumer Reports."

Mr. Strauss explained that when the rifle was received they fortunately noted prior to any firing tests, that when the trigger was depressed with the safety on, it would remain back, and the gun would fire when the safety was released. It was explained that after approximately 100 dry firings the condition disappeared.

In our examination we found that there was some stickiness in the trigger release, although not enough to have the trigger remain back when pulled with the safety on.

Mike disassembled the rifle and examined all parts within the fire control and trigger guard to determine the cause. There was a bright spot on the side of the trigger cut in the trigger guard, indicating the possibility of the trigger rubbing at this spot. In further disassembly of the trigger housing, we found slight burrs in the trigger pin hole of the trigger and an extremely tight fit of the trigger pin in the housing, and a slight cramping on the various parts due to tightness in the housing.

Mike then re-assembled the trigger assembly and, when he replaced the action in the stock and tightened the front guard screw first, there was a distinct twisting motion of the action

- 1 -

PLAINTIFF'S
EXHIBIT

3071

AL 002812

10 of 2

A
J. G. WILLIAMS

March 11, 1968

Re: Visit Report - Consumers' Union - Model 700 BDL 22/250

- 2 -

in the stock and the condition noted in the "Consumer Reports" test was prevalent once again.

We then found that if the rear trigger guard screw was inserted first, the trigger assembly would operate normally; but, of course, due to the condition noted previously, once the front screw was tightened, the stresses remained.

We asked if we could replace or purchase the gun in question, and were advised that this was impossible due to policy. Their normal procedure is to sell all items tested to employees sometime after the tests are completed and the reports are issued.

It was agreed, however, that when this rifle was sold to an employee, it would be returned to the writer for repair prior to useage.

It was imperative that we make this offer because, if the gun were disassembled and the front guard screw replaced first, a dangerous condition could result.

Mike Walker will discuss the matter with Ilion production personnel and, if necessary, institute a new inspection procedure.

EGL:k

AL 0022813

2 of 2

A



Varmint Rifles

THE FIVE CHECK-RATED MODELS WERE ACCURATE ENOUGH TO HIT SMALL VARMINTS AT LONG RANGES

The varmint hunter is in some ways more fortunate than his fellow Nimrods who go out for big game. He can usually hunt near home in any season and without limit on his bag; and some farmers, bedeviled by crows, woodchucks and such, will allow the varmint hunter to shoot in their fields.

But while an old .30-30 may still bring home the venison, the varmint hunter needs a long-range precision rifle. It will normally be a rifle chambered for a cartridge with a rather heavy powder charge and a comparatively light bullet of small diameter. That combination results in a flat trajectory and long effective range (up to about 400 yards for some calibers), and in a bullet that tends to disintegrate when it hits an obstacle, rather than ricochet dangerously.

Varmint hunters have used many calibers, from the little .22 Long Rifle to the .30-06. At the lower extreme, you have a short-range cartridge with a slow-moving, high-trajectory bullet that ricochets easily—not suitable or safe for most varminting. At the other extreme, you have a big-game cartridge, that has a large-diameter bullet with too high a trajectory for accuracy over long range, plus a lot of recoil and a report loud enough to make your ears ring and to startle someone taken unawares. In between is anyone's land. The venerable .22 Hornet is on the small side by today's standards and seems to have lost much of its popularity. And the famed .220 Swift, which delivered higher velocity and flatter trajectory than any commercial cartridge before or since, proved to have drawbacks. (It was extremely loud, some claimed it tended to wear out barrels rapidly, and its relatively light bullet was too easily deflected by the wind, among other things.)

Among the most popular varmint-hunting cartridges today are the .222 Remington and the .22-250 Remington. The .222 has an effective range of up to about 300 yards and a relatively mild report; the .22-250 has a maximum effective range of about 400 yards, but a considerably bigger bang. On the advice of our consultants, we decided to limit our report largely to rifles of those two calibers. Two other calibers, the .243 Winchester and the .244 Remington, have been widely used for varmint shooting in the West. But they're a bit heavy for varmints smaller than the coyote or fox, and a bit loud for use away from the wide open spaces.

We purchased 13 models in 11 major brands. Eight rifles were .22-250s and four were .222s (models available in both calibers were tested in .22-250). The other 10-bolt rifle, the popular Winchester 70, was not available in either cali-

ber at the time we purchased our test models, although it's now being made in .22-250. Our Winchester fired a .225 caliber bullet, slightly shorter in range than the .22-250.

All the models we tested are repeaters, except for the top-rated Ruger. That unique rifle has a dropping-block, single-shot action. You operate it by pushing down a hinged lever extending beneath the trigger guard.

The rifle versus the varmint

Above all, the varmint rifle must be accurate. A bullet that hits the target a couple of inches off your aiming point can still bring down a deer, but it may completely miss a prairie dog, crow or woodchuck. To meet our consultants' standard of accuracy for a rifle often called upon to hit small targets at long distances, a rifle must be capable of grouping all its shots within a circle of about one inch diameter at 100 yards (one minute of angle, or MOA). We fitted each rifle with a high-quality, high-powered telescopic sight and, after a 50-shot "break-in," fired groups of five shots from a rest.

We tested all the rifles with commercial ammunition and checked most of them with carefully hand-loaded ammunition as well. As would be expected, the rifles fired with both types of ammo proved more consistently accurate with the hand-loaded type than with the commercial product. The check-rated Trademarks, for example, shot slightly outside the MOA with commercial ammo, within the MOA with hand-loaded ammo.

Nine models were judged consistently capable of MOA accuracy with either type of ammunition. The H&R was only slightly outside the MOA limit; the Savage 340 and the similar Western Field were significantly further out.

We checked the fired cases for excessive expansion. All checked out satisfactorily, indicating that cases fired in these rifles could probably be reloaded up to about 20 or 30 times.

While firing for accuracy, we judged the quality of the trigger pull and the smoothness and ease of operation of the bolt and the repeating mechanism. As a group, our varmint rifles exhibited better trigger performance than most guns of other types CL has tested in the past. That is as it should be, since a good trigger pull—light and without noticeable creep—contributes greatly to the accuracy a varmint hunter must have. A pull of four or five pounds is about right. A heavier pull may cost you in shot; a lighter pull risks accidental discharge.

A You may have to adjust the trigger pull—or have a gunsmith do it—once you get the rifle home. We judged the trigger pulls on most of the tested rifles a little heavy as received, but the pull was adjustable on all but the three lowest-ranked models. Where a trigger showed noticeable creep, it's mentioned in the Ratings.

The lightest trigger pull was on the *Tradewinds*, which has a double-set trigger. To set the front trigger, the one that fires the rifle, you must first pull the rear trigger rather hard (about seven pounds on our sample). Then the front trigger responds to a pull that can safely be set very light indeed. Ours was adjusted for less than a one-pound pull.

The five check-rated models were judged very good in both trigger pull and mechanical operation (see table, page 158) and, of course, they were judged consistently capable of meeting the minimum MDA criterion, at least with hand-loaded ammunition.

The sixth-ranked rifle, the *Remington 700*, exhibited a potentially dangerous flaw at first tested. There was so little clearance between the trigger and the trigger guard that when the trigger was pulled with the safety on (something you or a friend might do when sighting down the rifle or trying it for feel), the trigger sometimes failed to return to its forward position. And with the trigger in the back position, the rifle would fire without warning the next time the safety was moved to the fire position. The malfunction persisted for more than 100 firings before the trigger wore in and performed normally. An unwary buyer might have caused a serious accident by then.

Although we judged the deficiency more a sample defect than a design shortcoming, we nevertheless downgraded the *Remington 700* because of it. We would warn anyone buy-

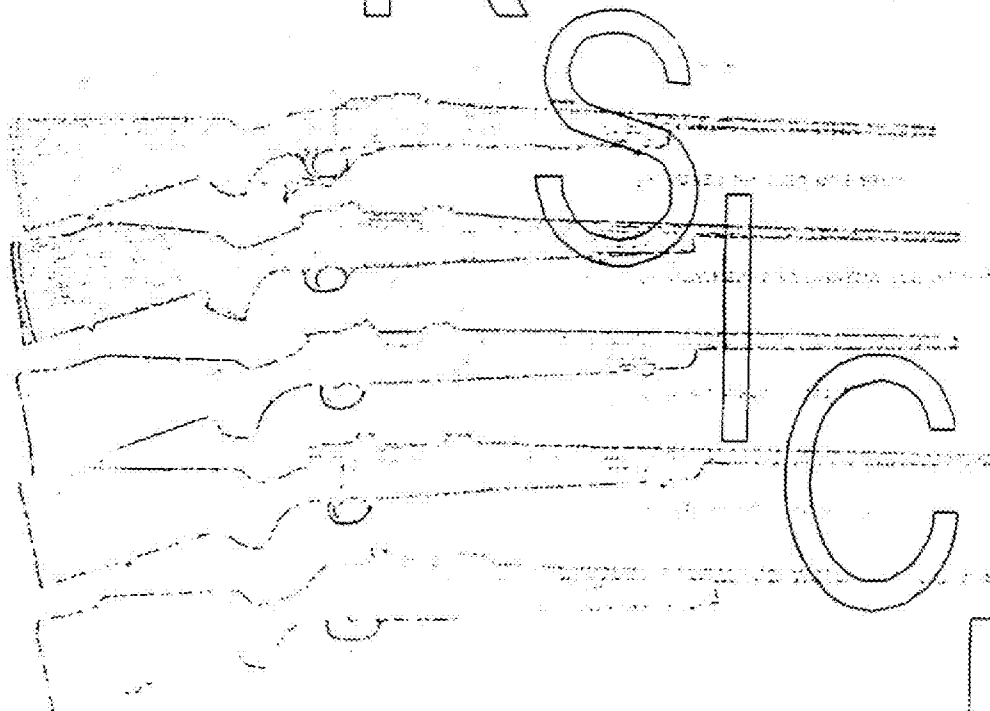
ing a rifle to test the safety in the store. If the trigger can be moved with the safety on, make sure it returns to its full forward position after you pull it.

We also gave weight in the Ratings to checkering and other grip-improving devices. Those qualities affect not only the appearance of the rifle (an important matter to many purchasers) but also the ease of holding and firing. Good, sharp checkering helps you keep a firm grip; a raised checkpiece helps you position your head for a good sighting picture. The stocks of all but five models (*Ruger*, *Savage 110C*, *Remington 788*, *Savage 340* and *Western Field*) had raised checkpieces, and all but the *Remington 788* had checkered grips and fore-ends. Cut checkering (formed by actual removal of wood) generally provides a better grip than impressed checkering. The *Ruger*, *Weatherby*, *Sako*, *Browning*, *Tradewinds*, *BSA* and *H&R* models had cut checkering. The *Winchester*, *Savage 110C*, *Savage 340* and *Western Field* had impressed checkering that we judged not sharp enough to help your grip much. The checkering on the *Remington 700*, though impressed, did provide enough friction to improve the grip.

Special needs, special features

The varmint hunter may drive around a good deal between shots, looking for his game. So he should be able to unload his rifle quickly, without working each cartridge through the action (it's dangerous to carry a loaded gun in a car, and usually illegal). With eight of the tested repeaters you could remove cartridges easily through a hinged floor plate at the bottom of the magazine. Five models had a removable box magazine, also judged satisfactory.

Rather than load and unload a magazine, many varmint



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VARMINT RIFLES continued

hunters prefer to load a single cartridge into the chamber, since a missed varmint seldom stays put for a second shot anyway. The single-shot *Ruger*, judged the smoothest-operating model tested, was also judged the most convenient for loading a single cartridge.

The *Savage 340* and similar *Western Field* were the only tested rifles that were sometimes difficult to load singly. The tip of the cartridge occasionally jammed against the rear edge of the firing chamber.

The varmint hunter generally prefers a bolt action to other repeater actions. Its strength, rigidity and corresponding potential for accuracy recommend it. Except for the single-shot *Ruger*, all the tested models have bolt actions. And they are all drilled so that they can be fitted easily for telescope sights, which are essential for small targets at long ranges. The Ratings also note five models that are equipped with open iron sights. But open sights are next to useless for varmints at ranges beyond about 75 yards.

In the past, rifles made specifically for varmint shooting typically had heavier barrels than other rifles; heavy barrels presumably contributed to the accuracy varmint shooting demands. Among the tested models, only the *Winchester 70*, *Remington 700* and *Sako* were available with heavy barrels, an extra-cost option on each of them. The heavier barrels of those three did help in holding the rifle steady. But most varmint hunters shoot prone or from a rest, and our regular-barrel rifles shot about as accurately from a rest as did the heavy-barrel guns.

The sportsman who displays his guns in a rack or on a wall will want a rifle that is as good in looks as in performance. Some models are offered in several "grades," or price lines that differ from each other chiefly in finish and



To operate the double-set trigger on the Tradewinds, you first pull the rear trigger hard. That sets the front trigger for a light pull. As on most models, trigger pull is adjustable.

workmanship. Where a choice was offered, we bought the lowest grade. Some models, as the Table shows, were nevertheless judged high in quality of finish and workmanship.

Choosing your varmintier

The five check-rated models are rated about equal in those factors that may spell the difference between a hit and a miss. We rated the *Ruger* and the *Weatherby* above the other check-rated models because of their excellent finish and workmanship. However, those models are priced considerably higher than the *Sako Vixen* and *Browning Safari* (whose finish and workmanship were judged nearly as good) and more than \$100 higher than the *Tradewinds*, the other check-rated model. Keep in mind, too, that you can cut about \$15 from the price of the *Sako* by buying it with a standard barrel. For a utility or knockabout gun with good accuracy, the *Remington 700*, listed at \$349.95, or the *Savage 110C*, at \$127.50, would be good buys.

CHARACTERISTICS AND SPECIFICATIONS OF VARMINT RIFLES

KEY: E, Excellent; VG, Very Good; G, Good; F, Fair

ACCEPTABLE—Very Good

✓ <i>RUGER</i> NUMBER ONE S26M	VG	VG	E	B	—
✓ <i>WEATHERBY</i> VARMINTMASTER DELUXE	VG	VG	E	6 1/4	3
✓ <i>SAKO</i> VIXEN B 341 F	VG	VG	VG	7 1/4	6
✓ <i>BROWNING</i> SAFARI 160703	VG	VG	VG	6 1/2	3
✓ <i>TRADEWINDS</i> 607K	VG	VG	G-to-VG	6 1/2	3

ACCEPTABLE—Good

<i>REMINGTON</i> 700 BOL #3920	G-to-VG	VG	G	6 1/2	3
<i>BSA</i> MONARCH DELUXE	VG	G	G-to-VG	6 1/2	3
<i>WINCHESTER</i> 70 VARMINT	G	VG	F-to-G	9	4
<i>SAVAGE</i> 110 C	G	G	F-to-G	8 1/2	4
<i>H & R</i> 300 ULTRA	F	VG	G-to-VG	7 1/2	5
<i>REMINGTON</i> 785 #29725	G	G	F-to-G	7 1/2	3

ACCEPTABLE—Fair

<i>SAVAGE</i> 340	G	F	F	7 1/2	4
<i>WYDOS</i> WESTERN FIELD CAL. No. 714	G	F	F	7	4

W Figures give capacity of magazine only; they do not include cartridge in chamber.

A

The slender, tapered barrel of the Weatherby is in considerable contrast to the extra-cost heavyweight varmint barrel of the Remington 700. A heavier barrel may sometimes help you hold a rifle steadier, but the standard barrels were as accurate when fired from a rest.

RATINGS OF VARMINT RIFLES

Listed in order of estimated overall quality based on field tests and engineering judgments. Closely ranked models within groups differed little in overall quality. All models provide for mounting a telescopic sight. Except as noted, each has a bolt-action repeating mechanism, trigger-pull adjustment, hinged floor plate, 24-in. barrel of standard weight, sling attachments, single trigger with no appreciable creep and a stock with raised cheekpiece and checkering judged of adequate sharpness to provide a good grip. Unless otherwise indicated, each was tested in .22-250 caliber and was judged capable of MOA accuracy, that is, of placing 5-shot groups within a 1-in. circle at 100 yd. Except as noted, none has sights. Prices are list; discounts may be available on some models.

ACCEPTABLE—Very Good

¶ Except for finish and workmanship the following five models were judged approximately equal in overall quality (see table on facing page).

✓ **RUGER NUMBER ONE 324M** (Sears, Roebuck & Co., Inc., Southport, Conn.), \$280. Dropping-block, lever-action, single-shot. Barrel length, 26 in. No raised cheekpiece. According to the manufacturer, model available with 22-in. barrel, medium-weight or lightweight, at same price (not tested), and in .222 caliber (not tested), at same price.

✓ **WEATHERBY VARMINTMASTER DELUXE** (Weatherby, Inc., South Gate, Calif.), \$295.

✓ **S&W VIXEN B 141 F** (Firearms International Corp., Washington, D.C.), \$206. .222 caliber. Tested with heavyweight barrel; similar model with standard barrel available at \$192.55 (not tested).

✓ **BROWNING SAFARI 140709** (Browning Arms Co., Morgan, Utah), \$207.50. Also available in .222 caliber (not tested).

✓ **TRADWINDS 407X** (Tradewinds, Inc., Tacoma, Wash.), \$169.50. Barrel length, 23½ in. Fired with MOA accuracy with hand-loaded ammunition, but not with commercial ammunition. Removable box magazine. Only model tested with double set trigger, judged an aid to accuracy (see story). Also available in .222 caliber (not tested).

ACCEPTABLE—Good

✓ **REMINGTON 700 EOL #5918** (Remington Arms Co., Inc., Bridgeport, Conn.), \$169.95. Tested with heavyweight barrel; similar model with standard barrel available at \$154.95 (not tested). Under certain circumstances, it was possible to fire one round accidentally when releasing the safety (see story).

✓ **ISA HATCHER DRUM** (J. L. Galt & Son, Inc., NYC), \$149.95. .222

caliber. Barrel length, 22 in. Slight trigger creep. Has iron sights.

✓ **WINCHESTER 70 VARMINT** (Winchester-Western, New Haven, Conn.), \$149.95. Tested in .225 caliber because not available in .222 or .22-250 in time for testing. According to the manufacturer, model now available in .22-250. Tested with heavyweight barrel; similar model with standard barrel available at \$149.95 (not tested). Checkering judged of inadequate sharpness for good grip.

✓ **SAVAGE 110 C** (Savage Arms Div., Enhart Corp., Westfield, Mass.), \$124.50. Removable box magazine. Slight trigger creep. No sling attachments or raised cheekpiece. Checkering judged of inadequate sharpness for good grip.

✓ **MAR 320 ULTRA** (Harrington & Richardson, Inc., Worcester, Mass.), \$205. Fired with slightly less than MOA accuracy. Barrel length, 22 in. Has iron sights.

✓ **REMINGTON 700, #9734** (Remington Arms Co., Inc.), \$84.95. Removable box magazine. No trigger-pull adjustment. Sling attachments, checkering or raised cheekpiece. Has iron sights.

ACCEPTABLE—Fair

¶ The following two models were considerably less accurate than those preceding.

✓ **SAVAGE 340** (Savage Arms Div., Enhart Corp.), \$22.50. .222 caliber. Removable box magazine. Slight trigger creep. No trigger-pull adjustment, sling attachments, or raised cheekpiece. Has iron sights. Checkering judged of inadequate sharpness for good grip. Sometimes jammed when loaded singly.

✓ **WARD'S WESTERN FIELD** (Ward's, 114 Montgomery Ward, \$59.94 plus shipping). Appears similar to Savage 340, preceding. Made of softer wood. All other comments apply.

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June 14, 1974

MODEL 700

Sear

Porosity in our powder metal sear is causing large excursions in coefficient of friction. The result of trigger pulls as high as 7 to 10 pounds is that shooters will attempt to adjust the trigger and get themselves in trouble with firing pin follow down. Some so-called competent gunsmiths produce the same results. We are seriously considering changing back to wrought material and sealing the trigger adjustments permanently.

3-Position Safety

With three lawsuits pending chargeable to poor gun handling on a 788, a 721 and a 700, we are, and have been, working on a 3-position safety lever for the 700. This will allow loading and unloading with the safety lever in the "on" position at all times. Many 3-position safety levers such as the Winchester 70, the '03 Springfield, and the 98 Mauser, will not allow moving the safety lever to the "on" position with the bolt open.

Enclosed Bolt Head

There is still some doubt that we can develop a system which will improve the safety of the 700. Nevertheless efforts in this direction are being exerted. Some testing of designs, which in addition improve the lock time, has been done. The same proposal applies to the 40XB and 40XR.

New Calibers

Since there are no calibers, at least currently, that could improve the volume on the 700, our recommendation would be to consider the 6x47 bench rest cartridge or an African cartridge such as the .458 - .416. Either of these would have some prestige value and would get Remington's name before the shooting public.

Appearance

Appearance changes just introduced should be sufficient for some time.

PLAINTIFF'S
EXHIBIT

3073

AL 0022822

1071

✓ M. H. Walker - Ilion
R. A. Baldwin
R. P. Kelly - Ilion
Lloyd Fox - Ilion
Field Service File

Bridgeport, Connecticut
April 9, 1973

TO: P. K. MORGAN
FROM: E. G. LARSON

BOLT GUN SAFETIES

You will recall in our last Field Service meeting at Ilion, the subject of the safety on our bolt guns was brought up because some customers complained that it was unsafe to take the safety off to unload the gun.

At the N.R.A. Convention, Dick Baldwin and I checked all the bolt guns of our major competitors, and all worked similarly to the 700.

We would like to point out, however, the Model 70 has an indexed stop on it and does not require the precision positioning pointed out by Mike Walker.

Would suggest Mike investigate possibility of including an index notch, if at all possible, and that the instruction folder be updated, clearly advising how the operation should be performed.

E. G. Larson

EGL:tk

PLAINTIFF'S
EXHIBIT

3074

AL 0022827

1 of 1

DON'T SAY IT—WRITE IT

TO S.M. ALVIS

DATE February 21, 1973

FROM F.G. HART

SUBJECT MODEL 700 GUN OWNER'S GUIDES

M. H. Walker has suggested that present copy instructing adjustment of trigger be substituted with following:

TRIGGER (Fig.4) — No adjustment of trigger by ~~the owner is recommended.~~ Trigger pull has been factory adjusted. Should any adjustment be necessary return rifle to factory or see a Remington approved gunsmith."

The question arises as to whether the illustration (Fig. 4) should also be deleted.

As of this date, there are 6,725 copies in stores, representing approx. \$2,000. Reorder date is next month.

F. G. Hart

F.G.Hart:B

Ilion Research Division

CC: R. P. Kelly

M. H. Walker

F. E. Morgan — Bdpt.

PLAINTIFF'S
EXHIBIT

3075

TO BE SAFE, FIRST THINK YOU MIGHT NOT BE

AL 0022828

1041

DON'T SAY IT—WRITE IT

To R. P. KELLY
From S. M. ADVIS

DATE February 21, 1973

MODEL 700 - INSTRUCTION FOLDER

M. H. Walker has requested change to the folder to indicate "No Trigger Adjustments Are Recommended".

This is in accordance with his consultation with F. E. Morgan. It is understood that the need arises as result of significant increase in customer complaints of problem growing out of attempts to adjust trigger by shooters. The designers believe this condition arises as result of differences in parts as compared to earlier production, with the sear being a contributor.

M. H. Walker advises that F. E. Morgan desires to see proof copy of the folder change before printing, and advice as to inventory in terms of usage requirements and inventory cost in order to determine whether this should be made without obsolescence.

SMA:T

cc: M. H. Walker
F. E. Morgan

PLAINTIFF'S
EXHIBIT

3076

AL 0022829

10f1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
PUMPPETERS
PUMPRoute: J.P. McAndrews
F.E. Morgan
J. E. Dickey

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
April 24, 1968TO: G. M. CALHOUN
S. M. ALVIS

FROM: W. E. LEEK

PROPOSED NEW DEVELOPMENT
AUTOMATIC, PUMP AND LEVER CENTER FIRE RIFLESThe attached report is for the purpose of guiding investigation to provide
information for the basis of a new line of center fire rifles.W. E. Leek,
Manager - Firearms Research & Design
Ilion Research DivisionWEL:T
Attach.PLAINTIFF'S
EXHIBIT

3077

AL 0022858

1 of 15

RD 44-2
REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

REPORT

PETERS

REPORT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
April 22, 1968

NEW DEVELOPMENT

AUTOMATIC, PUMP AND LEVER CENTER FIRE RIFLES

A new line of automatic, pump and lever center fire rifles must be superior to the presently new BAR. This superiority can and must be achieved in several areas, i.e. (in importance)

(1)	(2)	(3)	(4)
strength,	appearance,	functional performance,	endurance,
(5)	(6)	(7)	(8)
weight reduction,	handling,	trigger excellence,	recoil reduction,
(9)	elegance in magazine design, insertion and removal from the		
(10)	receiver, and accuracy.		

Of these items, strength is the most important factor because this requirement determines to a great extent safety, weight, and appearance limitations.

It is believed that the future of consumable or the so-called caseless cartridge is beset with enough development problems that a new rifle to accommodate this ammunition would seriously delay development of a new center fire auto rifle utilizing standard ammunition. Based on this premise, it is proposed to proceed in

AL 0022859

2 of 15

A the development of a new design utilizing the standard cased ammunition.

It is most desirable and mandatory, I believe, that all auto system designs of the future should be designed first to withstand endurance-wise the rigors of full automatic fire. Using this technique of testing provides the design the ultimate exposure to functional and endurance weaknesses. Therefore, the designs should be aimed in this direction. In using this approach, although secondary in nature, adaptability to military use could be considered.

Strength of the locked cased system must nearly approach or equal that of the M/700 bolt action system. Evaluation of investigations of numerous other design developments reveals that added strength can be obtained by improvement in extractor design. We have explored this area many times and have in a sense set a policy of arms design; i.e. the center fire actions must support the cartridge case without rupture under any conceivable pressure load.

The multiple lug rotary lock system it appears must be used to keep the rifle within weight and size limitations.

The M/742-760 bolt lock is ideally suited for a strong light weight rifle, but has a built in weakness in the extractor design and the imbalance of the bolt support in the barrel extension. Lack of support of the bottom of the bolt by the

A extension prevents the multiple lugs being utilized to their fullest in shear and bearing. Full support of all lugs is mandatory. However, this presents problems, too, as it places the feed system further rearwardly from the chamber, aggravating feeding. A longer receiver may be needed to accommodate the needed change. Styling changes will be required to camouflage this extended length. One possibility might be to extend the receiver into the grip section of the stock providing more receiver length and bolt travel without apparent long receiver length.

This area is critical from two points--lacks strength, and if overcome with more lugs creates feeding problem. Even in the M/700 with its superior strength the bottom lug in the receiver fails under load because a portion of the lug in shear was removed to provide a feeding ramp. Extractor design for full support of the cartridge case under load and full support around the periphery of the bolt should be one of the first areas of research investigation.

A rotary bolt has its weaknesses also, especially when rotated at high speed necessary in autoloading mechanisms. The bolt lock (an added device in the M/742 system) nullified the over rotation of the bolt and reduced some of the damage to the receiver, but still is not adequate and needs redesign and evaluation.

A Heat transfer from the fired cartridge case to the chamber during obturation has always made the extraction time critical in center fire autoloaders. Recoil operated systems provide added delay during this cycle but they have the added disadvantage

(4)
of a moving barrel. If a recoil system; i.e. bolt and chamber, could be devised and devoid of a fixed barrel the much needed delay in extraction could be improved. In autoloaders the variation in extraction time during obturation is most critical and I fear one of the important items in the failures of the Armalite rifles used by our military. As the heating and dissipation time cycle changes, varied power requirements aggravate function and limit the usable power time available.

(5)
Overpowering is generally the designer's approach to a solution.

A constant thermal system in the chamber area is most desirable and would eliminate the variables in obturation and improve

(6)
function. One approach we used in our machine gun development was to use stainless steel in the chamber section. I believe this approach has merit as stainless does not transfer heat readily and, therefore, possibly could be used to maintain a

(7)
more uniform obturation cycle. During the war, I worked with Mr. Garand on an idea of his to retard the heat flow in a barrel from the 10" point down the barrel from flowing back into the chamber. His idea involved three grooves turned in the barrel

approximately over the neck section in the chamber. His objective was to retard cook-off, and it did this quite effectively. However, it did present accuracy and point of impact problems due to lack of barrel rigidity. This retardation of heat flow would have a tendency to equalize the obturation cycle. Our idea during the machine gun development to provide a joint for a detachable barrel might have some merit in providing a heat barrier at a joint just ahead of the chamber or joint section. Plating of external barrel surfaces plus a finned design might help dissipation of heat, although the finned idea has been seen on numerous designs of machine guns, etc. The question arises here as to whether dissipation is fast enough.

There is no doubt that during automatic or full automatic fire the obturation cycle will vary regardless of how many devices we install to retard this variation. Some over powering of the gun is necessary and extra loading of the extractor is expected. Browning's idea of a "T" slot on the machine gun provided the extra grip needed to cope with this problem. Perhaps we could devise a double extractor system where the left extractor is cammed out of its gripping position just prior to the ejecting cycle. This would allow added assurance of proper extraction without undue loading of the extractor or damage to the cartridge, but mainly allowing better uniform function during adverse obturation conditions.

A If we maintain the multiple lug system and seal it securely I am sure we can approach or equal the desired strength specification and, at the same time, not increase weight of the gun. We have had experience with recoil effects on the M/600 in 308 Caliber without benefit of recoil reducing devices which resulted in severe recoil in this rifle. If we are to achieve light weight and maintain strength, lighter materials must be used. The 5-1/2# to 6# weight for 308 caliber seems most desirable but some recoil reduction must be used. Although aluminum die casting has been used for light weight rifles in small calibers, it appears this would be undesirable in the heavier ones. We have discussed the use of titanium many times, and one model was fabricated in the M/760, and we have always allowed three problems to prevent further development using this material; namely, high material cost, high machining cost, and no known method of coloring except by coating. This material would provide us the ultimate in strength to weight ratio, however. Advances in techniques of alloying, machining, brazing, casting, forming, etc. have been made in this material, and I suggest that titanium be given serious consideration for the manufacture of the receiver. Due consideration as to the size of the receiver should be made here. I suggest four sizes to accommodate ranges of shell lengths and diameters in sizes 223, 30-06, 350 short mag. and 300 H&H mag.

AL0022864

(12)

In the development of feeding systems for the center fire rifles, detachable boxes are most desirable as they are quicker to load into the receiver, provide additional package loadings for the hunter during fast shooting, and the gun can be unloaded readily and carried in a car without infringing on safety regulations. Yet the hunter can readily get into shooting position with a loaded magazine box at hand.

Assembly of a box magazine into and out of a receiver in any but a vertical manner, prevents appearance problems. Experience in military designs demonstrate that a hinged type box is more reliable. The best magazine latching system seems to be a hinge located at the front section of the box providing a latch in the rear section. However, this requires a little more magazine space in the receiver and sometimes leaves an objectionable opening in the front section of the magazine box in the receiver. But I think this design is most desirable and effort should be made to camouflage the gap left in front of the receiver.

There is one reasonably good box magazine on the market utilized commercially in autoloading rifles and is to be found in the Model 100 Winchester. The only difficulty here is that it can be loaded backwards into the receiver. This particular box is the only one I have ever seen that can be inserted into the receiver vertically with reasonable assurance of proper

insertion and not utilizing a hinge system. These boxes should be of the flush type, relatively easy to grasp. There is no objection to disposable type magazine and perhaps some desirability in their design, but they should be substantial enough that reloading of the individual box could be made.

Low cost of disposable boxes would be most desirable and a combination of molded plastic body with reinforced or substantial metal lips might be considered for such a low cost box.

The basic power systems that have been successfully used in the past for center fire cartridges have mainly been in the area of recoil and gas, and some combinations of both. To my knowledge, all blowback and primer setback power devices for center fire have not been too successful. The desirability of each type has several setbacks but I believe the gas mechanism is the most desirable, with exception of the delay in obturation mentioned previously that can be better accommodated by the recoil method. The M/742 gas principle is probably the most inefficient of those utilized in any of the military or commercially made guns today. However, it is virtually free of interference from adverse buildup of corrosion, powder residue, and the like.

At the time the gas system now utilized in the M/742 was selected it was considered by Rene Studler of the Ordnance Department

to be the most trouble free of the group. However, it must be remembered that he had approved two other means of gas operating mechanisms for rifles used in the military at that time; namely, the ~~White gas~~ expansion system for the M1 rifle and the Williams tappet system on the M1 carbine. I believe that the expansion mechanism is ~~most desirable~~ from standpoint of a cushioned energy force transmitted to the unlocking mechanism. A time delay during the obturation cycle can also be achieved. However, corrosion of the piston elements is ever present. The tappet method has corrosive problems also and depends a great deal upon an inertia block transmitting energy from the gas in the barrel to the operating mechanism through this member. The tappet system was utilized in a 30-06 type rifle developed by Williams of Winchester in hopes of replacing the BAR. This rifle withstood a continuous test of 6,000 rounds of full automatic type firing with no difficulty. A heavy inertia block and a good size tappet system were used by him to achieve this result. It certainly has merit and would outperform the Browning automatic rifle. I don't ever recall need for cleaning or maintenance of the gas system itself.

In tapping off gas earlier ahead of the chamber versus later at the muzzle I believe one would expect cleaner, hotter gases with more efficient impingement through a tappet system to the inertia

AL 0022867

block than the expansion type. If the barrel is designed of laminates or of two pieces where the forward section could be disassembled from the rear section it might be desirable to consider a tappet type mechanism, which is ideally suited for gas takeoff just ahead of the chamber.

It is mandatory that the rate of firing not exceed 300 rounds per minute in full automatic type of firing, and I believe would be more successful around 200 rounds per minute. We have experienced problems in keeping rifles and shotguns pointed on target in full automatic fire regardless of recoil at rates exceeding 300 rounds per minute. I feel certain that the M14 would be a more successful military weapon if the rate of fire was at this level. Because of the timing involved in unlocking, storing energy, action springs, etc., a reasonably low rate is difficult to achieve. Delays such as late gas takeoff, gas expansion, absorbing energy by inertia blocks, and cam unlocks seem to be the general area for designers to work in, but to date the low rate of fire has not been achieved. To utilize recoil and blowback as additional forces to extract and eject, and accomplish these during the time allowed, one can see that delays in unlocking cannot be achieved in that area. Therefore,
(13)
I suggest that we concentrate on a delay mechanism integrated into the fire control.

The fire control in the M/742 is not adequate for the job at hand. First of all, the trigger pull is poor for either shotgun or rifle. However, we have had some experience with this fire control in full automatic work on the 7188 shotgun. But long extensive endurance firing has not been conducted with these mechanisms. I feel that a hammer type system is possible the better mechanism, such as we use in the M/742, and a good, close look at the M1, Armalite and Fabrique Nationale fire controls would be desirable. The M1 fire control has several advantages. Only one spring is utilized to perform functions with the sear, the hammer and the safety. A double sear type mechanism is provided which, I believe, is safer in full automatic fire than the conventional one notch sear type used in the M/742. Although a disconnect system in the fire control is not provided in the Armalite, I believe it should be, and would consider it an essential element in all gun design to fully guarantee that the mechanisms must be fully locked before the fire control can be actuated.

The M1 has one of the best safety systems for the manual operation of this part I have ever seen. One movement of the safety on the ON position does three things; cams the hammer out of engagement with the sear, locks the hammer back, and blocks the trigger. It is much superior to any other system I have observed and should attract our interest.

Fluted barrels are going to be necessary to meet our general weight requirements and possibly have some advantage in heat dissipation, and should remain rigid during firing, with less weight, providing adequate accuracy. These features, however, (15) have never been investigated and I suggest that we initiate a research program to investigate these features as well as possibility of process development on GPM or Torrington equipment as the machining of such a barrel would be very expensive indeed.

Recoil reduction achieved only by the transfer of recoil energy from the barrel to the operating mechanism and then transferred back into the gun itself at a later period will not (16) be enough to make for comfortable shooting. A study should be initiated to determine further if an Adiprene type butt plate would be adequate or if some other mechanical means would be necessary. Devices eliminating or reducing the jet effect at the muzzle should be reinvestigated.

A review again of muzzle devices should be made and due regard given to the effect of the noise level. The following specifications for the individual rifle should be set as a goal at least for the first investigation:

- Overall weight with box magazine empty and no attachments ---
5-1/2 to 6 lbs. in 308 Caliber.
- Barrel length --- 24" max. --- convenient for attachment of
scopes and sights.

A NEW DEVELOPMENT
AUTOMATIC, PUMP AND LEVER CENTER FIRE RIFLES

Page 13
4-22-68

- Stocks and fore ends to be made of walnut and/or laminated wood with possibility of further reinforcement.
- Fore end area insulated from heat.
 - Trigger pull to be in the neighborhood of 5 lbs. with no creep.
 - Barrel fluted.
 - Receiver size similar to M/742.
 - Trigger guard similar to the new BAR.
 - Hinged type detachable box magazine.
 - Sights rigid and readily adjustable open type for both windage and elevation.
 - Recoil reducing mechanism.
 - Strength equal to the M/700.
 - Functional performance under 1 per cent
 - Accuracy - comparable with M/700.
 - Balance and handling - better than BAR or 742.
 - Appearance - superior to BAR and 742.
 - Manual operation equal or exceeding BAR. Must be superior to 742.

WEL:c
4/22/68

AL (002287)

14 of 15

cc: S.M. Alvis
R.J. Service

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
February 6, 1968

MEMORANDUM

TO: W. E. LEEK
FROM: C. W. STEPHAN *cd*

RECORD OF MEETING - 5MM AUTOLOADER

A meeting was held on January 24, 1968 to discuss the current status of the 5mm Autoloader and to schedule the future program.

The following were present:

W.E. Leek
R.J. Service
C.W. Stephan

1. The design was reported as 85% complete.
2. The cost estimate is to be brought up to date by March.
3. Drawings are to be released to the Plant by January 1, 1969.
4. Announcement date is January 1, 1970.
5. A schedule of necessary model guns is to be developed with the first "Look See" model in March of 1968.
6. Cost of above models is to be estimated.
7. Experimental model numbers to be:
 - XRA - Autoloader
 - XRP - Pump

CWS:w

AL 0022872

CC: D. S. Foote
S. M. Alvis
H. W. Young

August 16, 1948

TO: H. A. Brown
FROM: E. H. Walker
SUBJECT: M/721 MODIFICATION OF SAFETY DESIGN

One modification of the M/721 Safety uses a trigger block in addition to the present design. This is accomplished by providing a boss on the rear of the trigger to hold an adjusting screw with a lock nut. When the Safety is "on", the end of this screw is contacted by a projection on the Safety effectively blocking the trigger.

Tooling-wise the parts affected are these:

1. Trigger

A boss with a drilled and tapped hole must be provided. As now tooling this would mean a change in the blanking die and a change in the cold forming die, with tooling provided for drilling, counterboring and tapping.

2. Safety

A projection must be added with a surface which is a radius about the pivot hole. Changes to the blanking die would be necessary plus possibly a means provided for finishing the radius after the hole is drilled. Changes to the bending die may be necessary.

3. Trigger Guide Plate

It is necessary to lengthen the slot in the Trigger Guide Plate to provide clearance for the new Trigger.

4. Safety Adjusting Screw and Lock Nut

These are added parts.

PLAINTIFF'S
EXHIBIT

3078

AL 0022932

10f2

H. A. Brown

- 2 -

August 16, 1948

A second modification would eliminate the Safety Cam and provide a near the full width of the opening in the housing. This would eliminate the necessity for a projection on the Safety to contact the Safety Cam. The other parts would be the same as modification number one above.

M. E.
M. E. Walker
Design Unit
Arms Technical Division

HW:EL

AL 0022933

11-21-78

Dennis Dibert
P. O. Box 60
Claysburg, Penn 16625
Model 600
(did not have S# handy-calling
from work)

Will take to Grice Gun Shop
Clearfield, PA.

PLAINTIFF'S
EXHIBIT

3079

AL0023149

1 of 43

November 13, 1978

Richard Singleton
High Haws. Co.
121 Main St.
Bawson, Georgia 31742
Tel. # (912) 995-2533

Said he has sold Model 600s and
wanted the guns involved in the
recall.

Also the gunsmith, which, the
closest was in Augusta.

Bryan Hibell
Box 194
Hawthorne, Pennsylvania
16230
Tel #814.365-6302

Model 600 6mm

AL 0023150

2 of 43

11-13-75

A

Gus Marchewski
Box 221 - RDA
Factoryville, Pa 18419
217-0945-5840
M/600 tel 222 - #83,044

Send list of businesses doing work in Pa

E

K

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AL 0023151

①

Amman

Amman is a city in Jordan, the capital and largest city. It is located in the center of the country, on the eastern bank of the Jordan River. The city is known for its rich history and culture, and is a major center of commerce and industry. It is also a popular tourist destination, with many historical sites and museums. The city is surrounded by mountains and is known for its beautiful views. The climate is generally hot and dry, with some rain in the winter. The population is around 4 million people.

STC

H

bcc: R.B. Sperling
E.G. Larson
J.H. Chisnall
H.L. Hendrix

November 10, 1978

Mr. Albert R. Moon
Clover Valley
Wells, Nevada

89835

Dear Mr. Moon:

Your letter in regards to your Model 700 BDL 300 Win. Mag. caliber rifle, serial number A6578703, allegedly firing when the safety was pushed to the fire position has been forwarded to this office for reply.

We were indeed sorry to learn of your incident and trust that you have fully recovered.

The Model 700 is not involved in our recall; however, we certainly want to examine your rifle. Please, at your convenience, return your rifle via insured and collect transportation to:

Remington Arms Company, Inc.
Attn: Mr. E.F. Sienkiewicz
Ilion, New York 13357

Enclosed for your convenience please find a self-addressed label. Upon receipt of your rifle we will have our experts examine it and you will be contacted as to our findings.

Thank you for bringing this matter to our attention and for having afforded us this opportunity to be of service.

Sincerely,

E.F. Sienkiewicz, Supervisor
Firearms Product Service

EPS:tpg
encl.

RECEIVED

NOV 14 1978

AL 0023153

5 of 43

RECEIVED

NOV 9 1978

E. F. SIENKIEWICZ

11-5-78

CLOVER VALLEY
WELLS, NEVADA 89735

DEAR SIR,

IN AUG. OF THIS YEAR I PURCHASED A NEW
REM. 300 MAG. MODEL 700 BDL SERIAL NO. A6578703.
I INSTALLED A NEW ACCTRAC REDFIELD SCOPE.

I SHOT TWO BOXES OF SHELLS AND WAS VERY
HAPPY WITH THE ACCURACY & WORKMANSHIP OF THE
RIFLE & SCOPE.

A FEW WEEKS AGO I WAS STANDING ON AN
OUTCROPPING OF ROCKS, I PUSHED THE SAFETY FROM
SAFE TO FIRE AND THE GUN WENT OFF, BEING
CAUGHT OFF BALANCE I WAS KNOCKED OFF OF
THIS ROCKS INTO SOME BARBED WIRE. I PULLED
THE MUSCLES IN MY BACK & LOST A WEEKS
WORK BECAUSE OF IT BUT THANK GOD NO ONE
WAS KILLED.

MY RIFLE & SCOPE WERE BADLY SCRATCHED.
THERE IS SOMETHING DANGEROUSLY WRONG WITH THIS
GUN. I FEEL IT SHOULD BE REPLACED ALONG WITH
THE SCOPE. I ALSO SHOULD BE REIMBURSED FOR
LOST WAGES.

I DON'T WANT TO START A LAW SUIT OVER
THIS, BUT I WILL IF THIS IS NOT TAKEN CARE
OF IMMEDIATELY.

I HAVE BEEN HUNTING & HANDLING GUNS FOR
30 YRS. I WAS AN EXPERT MARKSMAN IN THE ARMY,
AND I KNOW WHAT I'M DOING. THIS IS THE FIRST
TIME ANYTHING LIKE THIS HAS HAPPENED TO
ME AND IT'S VERY FRIGHTENING.

AL 0023154

6 of 43

I HAVE had 2 REM. 870 WINGMASTER shotgun
AND HAVE BEEN VERY happy with them. I was going
TO BUY MY WIFE & SON REMINGTON RIFLES & shotgun
BUT NOW I DON'T KNOW.

PLEASE RESPONDED AS TO HOW YOU INTEND TO
TAKE CARE OF THIS PROBLEM. MY PAY IS \$660.⁰⁰/₁₀₀
WEEKLY.

Thank you
Albert R. Moon

P.S.

PACKARD NO. 15 2107 AC
ORDER NO. 15 5807

THE GUN WAS PURCHASED FROM WILD SPORTS
ORANGEVALE, CALIF.

AL 0023155

7 of 43

A Call 11/9/75

L 11/700

Fired when sat. pulsed off
Boat V in 1971

Boat 3 Rabbits to Thor

K

S

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AL 0023157

A

111
111
111

Bull Conolly - 15712
700-210 6760038
Dinh
W26
651532

Ref. ~~Free~~ Port to Kosh

2102-330-0726

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A

R Dent. 1955 Hope Rd SW
Roanoke Va.

600 - 38603

L

1/2

X 1-100 -

Luna H-26

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AL 0023159

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PRIN SH2153
2153 BK.

BK
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Larry Gordon
645 6th Ave
New York

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645

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AL 0023160

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STL 12
AP 2645

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AD 812

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777/900 - LRL - A6353790

K

Robert O'Neil

S

Boys NC.

27505

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S Zeb Bercher

25,48 ft.

Rec. Cl

30519

C

600 - A-6429768

A-6429744

H

AL 0023161

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E

To 11-3-78

Robert Rayburn
713-824-2380

OK/601-6870281

OK will talk to
him at home
until 2:00

Just had. Hope sighted
in - used 4 boxes of
shell - Claret G.S.
is in Shrewport. ^{From} J. H. Chisnall
Wanted to call his lawyer.

C

H

A

L

E

Explained our position &
he asked if Rem. would
exchange gun.

11/04 Sent F-12
40-243 HP
R 24342

S

C

H

AL 0023763

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W.R. COCK RILL

E

4231 SOUTH PADRE
ISLAND DR

Cape Charles Island 75415

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100-923161

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4759

Cell Bell
Make some 2000000

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AL 0023164

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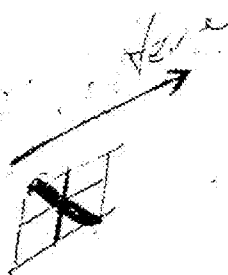
C

H

B.H. Robinson
713-694-5505
~~8~~ 4479 ticket =
6569808

600
Must be referred
by TUES

Sfty Online
Does not allow
enaps prints



AL 0023165

A

4/9/75

1- m/700 - 7th in line.
Russ Manning
Washington N.C.

919-346-4988

Went off when softly released
dome & truck.

S

C

H

AL 0023166

11/10

A Alt. Gen. Spec 0
1
25

AL
E
K
S
I
C

H

AL 0023167

1-2-78

Records / call J.C. Self (617) 338-2251. No other info. [817 in Texas - Call Back mid morning]

9:02 Guatemala R. A. Landis, Gwynedd Pa 19434
(215) 609-5388

Don't know S.W. advised re letter prefix He will work with Paul Jeger at Kenton town.

10/15 E. L. Gendall - 10/15 - 10/15

I don't need an idea why into brown w. that gives
small ones (which I don't know). In meantime
he has already fixed an A-# too. He
does it while customer waits, so will wait
green & white ones together.

10:25 Ball's Lost Shop

known was (German). Take German literature
according to him, etc. And ES with it.

[illegible]

J.C. Self (817) 295-9121 (Rox) ADL: 700 W. O. 2-43 SN 93-73375 Law Williams
22 Roaring Spring Drive Joshua, TX. 76058

030917Z JAN 68
FM JCRC
TO RUEADHJ
INFO RUEADHJ

1. Paper in Carman II 1464

1000

Vol. 11, No. 1, 1914

Handwritten: 1000 / 1000

11-9-78
4:00 P.M.
TO DO *MD*

A F. E. Davis Gun Repair Inc. DONE
Louisville, Ky. 3 2

Received 5 trigger ass.
Could use same more.

E
K
S
I
C
H

AL 0023169

11-8-78

Anthony Tardibueno
66 Church St.
New Rochelle, N. Y.
Tel. No. 914-NE2-3856

Will take to gunsmith in either
N.Y. N. Y. or Parish, N. Y.

M/660 243 caliber S#107232

Mrs. William Droge
R.D. #2 Welsh Road
Honey Brook, PA 19340
Tel. #215-286-6311

Will ship to the gunsmith in
~~AVONDALE,~~
~~PA.~~

Mohawk M/600 (didn't know cal.)
S#6431809

K

S

C

H

AL 0023170

22 of 43

A

11-7-78

Cpl. James Ross
Vermont State Police
Montpelier, Vermont
Tel No. 802-828-2171
M/660 Did not have S# on hand

He is going to send his gun
to Sportsmen Den in Bpt. Ct.

Tom Lycko
1927 Oaklawn
Sugarland, Texas 77478
Tel #713-493 6690 work
713-494-9613 home
M/Mohawk 600 S#6849467

Okay, will bring the gun to
one of the three gunsmiths in
Houston, Texas.

E

K

S

I

C

H

AL 0023171

10/30/31

10/30/31 Rect Hewald - Lynn Mass
#600 - 308 - #29221 - Ketchikan Station

10/30 11:15 660-308 -
10/30

10/30 11:20 1110 Overcast br. Danden 5-10.

10/30 11:20 1110 Overcast br. Danden 5-10.

10/31 - 1 Cal

10/31 11:20 1110 Overcast br. Danden 5-10.

10/31

10/31 11:20 1110 Overcast br. Danden 5-10.

Andrew Wise - 982-1050
Port Haven.

10/31

10/31 11:20 1110 Overcast br. Danden 5-10.

10/31

10/31 11:20 1110 Overcast br. Danden 5-10.

A

HOLD HARMLESS AND INDEMNIFICATION
AGREEMENT

Remington Arms Company, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Bridgeport, Connecticut, does hereby agree to assume full and complete responsibility for, and to hold _____ harmless from, any and all claims that may arise out of the design or manufacture of the trigger assembly provided to _____ by Remington for the repair of Remington Model 600 and 660 rifles, Mohawk Model 600 rifles and XP-100 pistols.

REMINGTON ARMS COMPANY, INC.

By J. G. Williams
J. G. Williams,
Vice President & Director of Marketing

Dated _____

H

AL 0023173

A

HOLD HARMLESS AND INDEMNIFICATION
AGREEMENT

Remington Arms Company, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Bridgeport, Connecticut, does hereby agree to assume full and complete responsibility for, and to hold _____ harmless from, any and all claims that may arise out of the design or manufacture of the trigger assembly provided to _____ by Remington for the repair of Remington Model 600 and 660 rifles, Mohawk Model 600 rifles and XP-100 pistols.

REMINGTON ARMS COMPANY, INC.

By _____

J. G. Williams

Vice President & Director of Marketing

Dated _____

H

AL 0023174

A

HOLD HARMLESS AND INDEMNIFICATION
AGREEMENT

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REMINGTON ARMS COMPANY, INC.

By _____

J. G. Williams,
Vice President & Director of Marketing

Dated _____

H

AL 0023175

27 of 43

A

HOLD HARMLESS AND INDEMNIFICATION
AGREEMENT

Remington Arms Company, Inc., a corporation organized and existing under the laws of the State of Delaware, with its principal place of business in Bridgeport, Connecticut, does hereby agree to ~~assume~~ full and complete responsibility for, and to hold _____ harmless from, any and all claims that may arise out of the design or manufacture of the trigger assembly provided to _____ by Remington for the repair of Remington Model 600 and 660 rifles, Mohawk Model 600 rifles and XP-100 pistols.

REMINGTON ARMS COMPANY, INC.

By

J. G. Williams
J. G. Williams
Vice President & Director of Marketing

Dated _____

H

AL 0023176

28 of 43

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



cc: E. F. Barrett
J. E. Preiser
J. H. Chisnall ✓
E. F. Sienkiewicz
R. G. Sherman ✓

November 1, 1978

To: E. J. Conroy
From: E. G. Larson
Subject: Recall

I met with my people in Product Service - Bridgeport, on personnel requirements during the recall.

At present, we are spending 100% of our time on recall, and regular Product Service functions are suffering.

To take care of our immediate needs (handling of 800 Enterprise phone, recording, and typing), I will need one male and two stenographic people, preferably Kelly Girl types. In addition to the male requested, we will continue to use the Trainees to handle phone calls, etc.

Ed Sienkiewicz, at Ilion, advises that with the assistance of Fred Woodrick and Larry Goodstal, he is holding his own. However, when Atlanta is closed and transferred to Ilion and Bridgeport 800 numbers, we will require additional telephone and clerical help.

I would like approval to add the people in Bridgeport.

You will be kept advised of our position and needs.

E. G. Larson

EGL:lb

RECEIVED

NOV - 2 1978

PRODUCT SERVICE
BRIDGEPORT

AL 0023177

OK.

A

Kelly Girls
Mampan Girls

FGL

petition

Herb

and

Heel

2 girls

Market Research
Girls

S

I

C

Scott
Kut

H

AL 0023178

Recall Call

Custom

10/30

Greg Brown - who repairs in Alaska
M/660
907-353-5467

Albert Fischer
San Antonio
512-434-5853
512-222-3735

Mrs. Frank Pizzewick
Bpt.
929-488
Nude box

Tooley
336-1235
Bpt

Alden Atwater
Wallingford
269-3007

Ernest Ballister
Denver
303-427-6334

- R A

Dear Gun Owner:

This letter will confirm receipt of your telephone call to our toll-free number regarding the recall of certain Remington bolt action rifles and pistols. We would appreciate your checking the following list to verify that your gun is involved:

RECALLED GUNS

All Remington Model 600's

All Remington Model 660's

All Mohawk 600's - except those with a serial number starting with an "A".

All XP-100's, with a serial number below 7507984, except those with the prefix "A" or "B" before the numbers.

Remington recommends that prior to any further usage of guns included in the recall, they be inspected - and modified if necessary. If you do not already have the name and address of the nearest Remington Recommended Gunsmith (who will perform the inspection and modification service free of charge), phone one of the following numbers:

In all states except Connecticut (toll free):

1-800-243-2870

In Connecticut (toll free):

1-800-972-9379

The operator will need the model and serial numbers of your gun and your telephone number, so please have them ready when you call.

If it is necessary for you to ship your gun to the nearest repair station rather than deliver it in person, do so "collect".

If you have an XP-100 that is being recalled, please send it "collect" to Remington instead of to one of the gunsmiths:

- R A

Dear Gun Owner:

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In all states except Connecticut (toll free):

1-800-243-2870

In Connecticut (toll free):

1-800-972-9079

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Remington Arms Company, Inc.
Arms Service Division

- R A

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If it is necessary for you to ship your gun to the nearest repair station rather than deliver it in person, do so "collect".

If you have an XP-100 that is being recalled, please send it "collect" to Remington instead of to one of the gunsmiths:

Remington Arms Company, Inc.

Personal History

11/78.

Nov. 1969. gun discharged

✓
JIMMY JONES

741 Wash. Ave.

Greenville Miss.

S/N. 21636

CAI-243

332-3181 (Gensmill)

C. A. Tate

Box 117.

Customer shot him self.

Elisebeth Miss

Shot himself in leg. had bone graft.
\$12,000 medical bills. Ins. paid 80% of
medical.

Mr. Tate is not asking for any damages

AL
Guns to be mailed in
to att. R. O. Sherman

Model 660 - Cal 308

S/N 6209877

Mr. Frank Folkes

P.O. Box 169

Princeton, La. 70769

Phone 504-673-3932

Guns fire on closing or
when safe is pushed off.
Shot puts up Truck.

Second Hand Guns

over 8

A
11/30/58

Wayland Thubbs
113A Mountain Lake Rd.
Lynchburg, Va 24505

804-236-0138

Wed 700 BDL 30/06

Father's Name

Chris purchased at 11/30/58.
Chris purchased at 11/30/58.

Chris lived on clearing floor and man
shielded & down. No personal injury
injured. Will ship gun to B post with
Darius if he can find for

Chris
Chris

H

3:30 PM

11/20/78

Personal Injury Rem-660 Cal 308
S/N 90076

Gun owner R.A. Sansburn
11639 South East 52th
Bellevue, Wash. 98006
Home phone 206-747-1787
office 206-237-9253

Man injured - Mr. Jack Riden
7040 122nd Ave S.E.
Renton, Wash. 98055
Home phone 206-255-8783
office " 206-593-1069

Truck owned by Dick Haynes
206-392-2328

Mr. Sansburn's son was unloading gun in
truck (4 wheel dr.) pick up. Gun fired
when the boy claimed he pushed the
safe forward - Mr. Sansburn claimed he had
not seen any ads in paper or TV or the
news prior to accident.

38 of 43

A

11-14-78

P.I.

Dewey Godfrey called re:

Howell Baker

810 E. Bonnie

Falmer, Tex 78355

512-325-~~2571~~ 5279

all 4x being
called - ~~2571~~ 5279

Dealer:

Mc Intyre Lumber Co. (Rear)

Falmer, Tex

512-325-2571

has answered
will return
my call

M/700 17 cal - H034 D4689 (10/77)

Wholesaler Perry Shankle asked Dewey what
he should do with the ammo he has in
stock.

Called Baker 4 times - line busy - wanted
him to return gun & ammo.

H

AL 0023188

A

Lower N° Cell

300 Win May 1509 - CL PSP

L

Stk

Ran 222 Re. 700

E

Deke Pict / A.K. on 1400

Name
Pos

K

Meat. cost 1750

S

I

C

H

A

11/13 Detroit Buller Truck B1
Dog Destroy
312-397-4070

Vegetation

E

11/13 Geo Lander - 500 Grotes - EGH

2 - Box ~~Q~~ 2 MAF
First 2nd time

Core

2 Box 1 - MAF

3 Box 0 MAF

S

11/13 LBC Alexander - Replaced gun at.
Sfty Bt Trig
Went off.

Had D. Thompson take it to LA Free & Refuse
Kuba Trigger - ready to BCL

11-14-78

Mr. Frank Catterton of
Clayton Holmes Law firm
Hickory, NC

Their client, R. R. Walker called here Nov. 1
re his 80/700 cal. 270 which had extra safety
on & blew back and exploded. Took it to Tongs,
who said he could not fix it.

Needs gun for hunting; end of this month.

Arrived here & call E. F. H. at Walker's make
arrangements & have gun repaired.

SLIC

CH

A

(Pg 1)

P.J.

11-14-78

Call received from:

Paul Gustafson

Lauri Sport Shop

117 10th Ave

Menomonie, Mich. 49858

Sold his customer

David Beal

Rt. 1 - Box 260 A

Porterfield, Wis.

a used M/760 Carbine, cal 30-06 (He fired 4 shots in it the day before he sold it & it was O.K.)

Mr. Beal changed the scope on it, took one of our shells (that is all he had) & fired it in woods & they went - gun blew up - head of shell is still in gun - gun is gutted & receiver spread. Shooter was cut on arm - several stitches. He sold gun to Lauri, who sold him a new gun for \$40 more.

Gustafson will return gun to us - no other shells available.

Hot Line

11-14-78

AL 0023192

43 of 43

CLASSIFIED-CONFIDENTIAL

CC: R. E. Davis in
W. L. Brown/Turn
V. G. Delella
S. H. Grace
D. J. Hoote
H. J. Macman
W. E. Ooss
P. D. Wetherford
W. H. Fisher

September 12th, 1947

TO:

G. C. Pincney
Bridgeport

FROM:

E. J. Lusk

SUBJECT:

W/70 PERFORMANCE AT EXTREME LOW TEMPERATURE CONDITIONS

In answer to your letter of August 28th, 1947, previous testing has shown the following:

1. The ice will not adhere to the parts in question if they are well lubricated with Grease or Petroleum Oil. However it is not likely that the shooter would lubricate his gun in that section as it is not a functioning part of the gun.
2. The Trigger Guide Plate is used as a spacer only between the Trigger Guard and the Stock. If it is made of a plastic material, I am sure that its use would not introduce difficulties under normal or adverse conditions, and the nature of the material prevents a bonding of ice to its surface.
3. I would not guarantee that the gun would not freeze under 32°F.
4. A W/70 Winchester under similar conditions (-60°F.) will fire the first round. The bolt will not close because ice jams between the top ring lug on the bolt and the recess for this bearing lug in the receiver.
5. When comparing the trigger and the space between the Guard and Guide Plate in the W/70 and W/71 respectively, it will be noticed that there is approximately 1/8" more clearance between the Trigger and the Trigger slot in the Guard of the W/70 than there is in the W/71. It may also be noted that the Trigger Pin in the W/70 is located much higher than the W/71, allowing the Trigger to clear ice in that section around the trigger slot in the Guard, while in the W/71 the Trigger and Trigger Guide Plate under the ice is in compression. In the former case the ice breaks and allows the shooter to fire, while in the latter case (W/71) the ice is in compression and prevents firing.
6. I would like to stress the fact that this ice is not a uniform layer in that it forms a rapid transition into the section in question.

If there is any further information needed, please do not hesitate to contact me.

E. J. Lusk
Engineering Section
Federal Government

PLAINTIFF'S
EXHIBIT

3080

AL 0023221

104/

cc: S. M. Alvin
H. A. Brown
V. G. DeRous
R. H. Grace
P. B. Rutherford
M. H. Walker

Bridgeport, Connecticut
August 29, 1947

TO: W. E. LEEK
FROM: G. E. PLUCKEY
SUBJECT: M/721 - PERFORMANCE AT EXTREME LOW TEMPERATURE CONDITIONS

Thanks very much for your letter of August 26. Everything considered, I think that the rifle stood your test very well.

You recommend that the trigger guide plate be made of plastic material to prevent freezing of the trigger. Is not this material affected by varying climatic conditions and isn't its use likely to introduce other troubles?

Have you tried using powdered graphite or even Remington oil on the safety and trigger guide plate in these extremely low temperatures. If so, do these parts still freeze?

Another question I would like to ask is this - what is the absolute minimum temperature at which these parts will work without freezing?

Arms Sales Manager

GEP:ha

P. S. It would be interesting to know how the Winchester Model 70 rifle functions under similar conditions, that is, at 60° below zero.

PLAINTIFF'S
EXHIBIT

3081

AL 0023222

1 of 1

APPENDIX
Item B

CC: S. M. Alvis } In
H. A. Brown } Turn
V. G. DeReus
R. H. Grace
P. B. Rutherford
M. H. Walker

CLASSIFIED CONFIDENTIAL

Ilion, New York
August 26th, 1947

TO: G. E. Pinckney
Bridgeport

FROM: W. E. Lock

SUBJECT: M/721 - PERFORMANCE AT EXTREME LOW TEMPERATURE CONDITIONS

This letter is in answer to your recent inquiry concerning the above subject. We have previously tested pilot and production line M/721 rifles under both ice and cold conditions at -60°F. The objectives of the tests at this temperature were as follows:

1. To determine the gun's functional performance at -60°F. under cold and ice conditions.
2. To determine the gun's strength* characteristics at -60°F. under cold and ice conditions.

Results of the tests show:

1. a. That the Safety will freeze to the Receiver under extreme ice conditions but can be broken loose by hitting the Safety and surrounding area with an object the size of a pocket knife.
b. That under extreme freezing conditions it is possible for the Trigger to freeze to the Trigger Guide Plate, which prevents firing of the gun.
c. That the functional performance of the gun is excellent with the exception of (a) and (b) above.
2. That the strength of the M/721 under these conditions is more than adequate.

We are recommending in our report which will follow the testing of production guns, that the Trigger Guide Plate be made of a plastic material, preventing freezing of the Trigger.

PLAINTIFF'S
EXHIBIT

3082

AL 0023234

1 of 2

G. E. Pinckney

-2-

August 26th, 1941

Your inquiry mentioned that the natives in the interior of Alaska were concerned with the functional performance of the Ejector and Extractor of this gun during extreme cold conditions. We have found that the Ejector and Extractor as now used in the M/721 are far superior in performance to those of other manufacture because they are enclosed in the bolt head, which allows less surface to be subjected to the elements. We have encountered no functional difficulties with these component parts.

/s/
W. E. Leek
Engineering Section
Technical Department

VEL:MC

*The strength of steel decreases at -60°F. The chamber pressure developed by 30-06 ammunition at -60°F. sometimes approximates proof pressures.

AL 0023235

2 of 2

DAILY PROGRESS REPORT

SUBJECT M/721 Pilot Line Inspection

Date 4/9/47

There is evidence from the functioning of the above mentioned guns that the Connector, Safety Cam and Sear are not within design limits. This situation can be very dangerous from a safety and functional point of view and the existing condition has caused the following listed malfunctions to occur in several guns that were inspected:

1. Firing Pin moves forward during the bolt locking cycle.
2. Possible to fire the gun by pushing the Safety to the "off" position.
3. Occasionally the firing pin moves forward during the bolt locking cycle.

From the inspection standpoint, situation #3 should be considered the most dangerous in that the malfunction might not occur during the relatively few cycles that the gun would be functioned during inspection.

W. E. Leek
Test Engineer

PLAINTIFF'S
EXHIBIT

3083

AL 0023239

1 of 1

J.P. Linde
A.A. Hugick

Ilion, New York
January 15, 1970

To: J.S. Martin
From: R.C. Ecker
Date: January 12, 1970

Objective:

To establish a value or dimension of "trigger creep" (trigger movement that is felt by shooter between the end of slack travel, if any, and the release of the firing pin).

Conclusion:

From the graph of rifles and shotguns, it is quite evident that the border between no creep () and slight creep (x) is an .030 line. However, there is a trace of slight creep below the .030. This is caused by burr or seer edge, but by the same token we have a trace of no creep up in .060 movement area. This amount of movement was not noticeable to sense of feel because of the polished surfaces.

From the over and under graph, a group of no creep piled about the .060 line represents a long movement with no feel because of the polished surfaces. A good percentage of the creep is represented below .060 and is caused by rough surfaces.

Test Details:

The study of the trigger movement was made from a group of fire controls with various design mechanisms, both in rifles and shotguns, to try and relate the amount of trigger movement (creep) with sense of feel.

Each fire control was dry fired in a completely assembled gun several times to get the feel for that particular gun. An opinion was passed and recorded by the tester as to whether creep was present or not.

PLAINTIFF'S
EXHIBIT

3984

AL 0023332

1 of 4

A
J.S. Martin

- 2 -

January 15, 1970

Test Details (Continued):

The gun was then placed in a set up as shown by Sketch No. 1. The gun was placed endways, barrel up against an angle iron and held with "C" clamps. Measurements were made with height gage of the height of the trigger from the surface plates with the free motion removed. Then the height gage was anchored to the surface plate and turned down until the firing pin released. The reading was taken and subtracted from the first measurement, and the difference was recorded as trigger displacement. Results are shown on the following pages.

Trigger pull was measured with scales for each gun and recorded in pounds. Each fire control was typed as being one of three types..

1. Sear Hammer Type (as in Remington M/760) where the sear notch of the hammer is the farthest away from the hammer pivot point.
2. Hammer Sear (as in Winchester M/55) where the sear notch is close to the pivot point of hammer.
3. Striker - Blocked Sear (as in Remington M/700) where the striker is blocked and has to be released through a mechanism before the gun can fire.

ECE:sp
Attach.

AL 0023333

2 of 4

MODEL	GA. OR CALIBER	SERIAL NO.	COMPUTER OPINION	DISPLACEMENT HI & LO OF THREE ADINGS	TRIGGER PULL (LBS.)	TYPE
Rem. 1100	410	L002261H	Creep	.036 - .043		Sear Hammer
Rem. 11-48	28	4043407	Creep	.061 - .068	4.5	Sear Hammer
Rem. 742	243 Wfn.	315580	Creep	.058 - .063	3.8	Sear Hammer
Rem. 760	223 Rem.	485602	Creep	.052 - .057	3.75	Sear Hammer
Rem. 870 Trap		Fire Control	Slight Creep	.035 - .037		Sear Hammer
Rem. 870 Trap		Fire Control	Slight Creep	.034 - .035		Sear Hammer
Rem. 870	12 Ga.	Test #6	Creep	.059 - .062	4.3	Sear Hammer
Rem. 788	222 Rem.	067133	No Creep	.026 - .030	4.3	Striker-Blocked Sear
Rem. 660	6.5mm	105750	No Creep	.020 - .024	3.1	Striker-Blocked Sear
Rem. 660	6.5mm	105750	Slight Creep	.033 - .037		Striker-Blocked Sear
Rem. 660		6226090	No Creep	.019 - .023	3.25	Striker-Blocked Sear
Rem. 660		6226090	Slight Creep	.042 - .045 *		Striker-Blocked Sear
Rem. 1100	12 Ga.	No. Fire Control	Creep	.059 - .062		Sear Hammer
Rem. 1100	12 Ga.	Ground Hammer Notch Down	No Creep	.027 - .031	4.0	Sear Hammer

Distance was more, and feel was less (believed because the surfaces rubbing are smoother).
 Sear hammer describes sear notch as being on top of farthest away from pivot of hammer.
 Hammer seal means sear notch under or close to pivot of hammer.

R.C. Ecker:sp
 Illion Research Div.
 1-15-70

AL 0023334

W
 0
 4
 7

MODEL	SERIAL NO.	COMPUTER OPINION	DISPLACEMENT III & IV OF THREE READINGS		TRIGGER PULL (LBS.)	TYPE
Ithaca 37 1. Ga.	371082780	Slight Creep	.033	- .038	8.0	Hammer Sear
Ithaca 37 12 Ga.	371082540	Creep	.040	-	7.0	Hammer Sear
Browning 7 Rem. Mag.	69046M9	No Creep	.024	- .031	2.8	Sear Hammer
Ruger M77 243 Win.	2603	Slight Creep	.024	- .027	5.75	Striker-Blocked Sear
Win. 94 25-35 WFC	939430	No Creep	.058	- .059	4.2	Hammer Sear
Weatherby Mark V 300 Mag.	P2358	No Creep	.027	- .035	4.4	Striker-Blocked Sear
Franchi Breshcia	Top -	No Creep	.044	- .054	7.50	Sear Hammer
	Bottom -	Creep	.056	- .058	8.25	
Charles Daly	380811	No Creep	.030	- .040	3.85	Sear Hammer
		Creep	.035	- .043	3.50	
Savage Mod. 440	34782	Creep	.051	- .058	5.4	Sear Hammer
		Creep	.040	- .052	5.0	
Winchester 101	109821	No Creep	.046	- .048	5.3	Sear Hammer
		Creep	.044	- .047	5.4	
Remington Mod. 32	4380	Creep	.051	- .055	3.55	Sear Hammer
		No Creep	.023	- .054	5.35	
Browning	7071157	No Creep	.062	- .065	5.15	Sear Hammer
		No Creep	.062	- .065		
Ithaca Mod. 600		No Creep	.062	- .067	3.6	Hammer Sear
		No Creep	.083	- .092	3.5	
Brono ZH 202	2-280 697	Creep	.118		8.25	
		Creep	.093		7.33	
Savage 330	V25647	Creep	.073		4.65	Hammer Sear
		Green	.088		4.41	

AL 0023335

Ilion, New York
July 7, 1970

To: W.E. Laek
From: C.B. Workman
Subject: Statistical Method of Evaluating Firearms Design
and
Manufacture

In March 1968, the attached article involving the M/700 rifle appeared in "Consumers' Reports". As you remember, the reaction by our Management was one of extreme displeasure. Accordingly, Mr. Burdett requested that we find a way to evaluate our future designs in order to eliminate similar incidents from further embarrassing our Company.

We pursued a method of statistical evaluation of components and assemblies that would tell us whether or not tolerance combinations and distributions, theoretical and actual, could cause trouble in our product. Meetings were held between Ilion Plant Quality Control, Bridgeport Quality Control and Ilion Research. It was decided that the pursuit of this technique was very expensive (DuPont verbally quoted \$50,000 just to study the problem) and that the facilities and/or personnel at any one location were not available to produce such a program. For these and other reasons, the programs degenerated into a "keep watch" for someone else to develop what we were looking for.

In May 1970, Lloyd Fox referred Connecticut Scientific Center to me to discuss a tolerance evaluation program they had developed. These discussions revealed that a program of the type for which we had been searching had now been developed and was in use.

PLAINTIFF'S
EXHIBIT

3085

AL 0023383

1 of 1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONTINUE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
December 1, 1975

TO: J. P. LINDE
FROM: D. F. BULLIS
SUBJECT: PROGRESS REPORT

ELECTRON BEAM WELDED EJECTORS:

The latest design ejectors have been machined, heat treated, blasted and put in test for endurance.

M/700 TRIGGER (One Piece):

For test purpose only, a trigger was made by screwing a connector to a M/700 trigger making in effect, a solid one piece trigger. Preliminary tests indicate a one piece trigger may be acceptable.

A new design was drawn up and put in the shop of a trigger which has a back angle on the break away portion of the trigger, sear surface. A formed bar stock blank was also drawn up for cost estimate.

COMPETITION STOCK FINISH:

All stock assembly drawings were altered to contain both a shiny(RKW) and dull (VINYL) finish. A new drawing was required for the fore-end.

3200 RECOIL PADS:

Drawings were altered to show a .140 dia. hole for each screw position of the recoil pads, to eliminate the ragged look which develops from using a screw driver through the pad with no hole.

3200 TRIGGER GUARD REAR PIN HOLE:

A number of trigger guards were made up with the rear pin hole moved forward .010 & .015. They were put on guns at assembly and checked for appearance. It was decided that .015 better covered the gap we were getting behind the bottom tang and the stock. The guard drawing was changed to this effect.

PLAINTIFF'S
EXHIBIT

3086

AL 0023392

1 of 2

To: J. P. Linde
From: D. E. Bullis
Subject: Progress Report

Dec. 1, 1975
Page 2

BRIGHT SCREWS ON GRIP CAPS:

An investigation was conducted as to why we are getting bright marks or marks on the grip caps. Following the process from the final assembly back to the wood job, where they are assembled, it looks to me like the screws are not put in far enough originally and the sanding process is buffing off the finish. Perhaps we should move the C'Bore for the screw heads in another .010 or .015.

BRAZED BARREL BAND (Lower) 3200:

A new design was made of the lower barrel band on the 3200 which consists of a cut off regular band and brazed to the lower barrel. Some were made, one model was assembled and tested with attached results.

D E BULLIS

DEB/bd
Ilion Research Division.

Attached

AL 0023393

2 of 2

A

CC: D. J. Anderson	C. A. Korba
L. B. Bosquet	J. P. Linde
J. W. Bower	R. J. Long
H. K. Boyle	F. E. Martin
J. J. Burns	N. W. Menard
R. J. Chesebrough	C. O. Pardee
W. W. Cook	C. F. Prosser
<u>A. A. Hugick</u>	File

January 6, 1976

A. D. KERR

C. B. WORKMAN

CENTER FIRE - FIRE CONTROL - SAFETY PROBLEMS

Center Fire - Design Process Problems

A program has been set up to review weekly with R & D and P E & C personnel, relating to Fire Control and Safety problems on M/700, 600, 788 and 580 Series.

Next meeting will be held in H. K. Boyle's office - Bldg. 52-4 on 1/13/76 at 8:15 A. M.

Program

1. Model 600 - 250 guns to be assembled with the following altered parts; this will allow M/700 trigger housings to be used in M/600.

- A. Alter trigger housing side plates - 250 - ready 1/7/76. Ready for sub-assembly - 1/6/76.
- B. Alter sear-safety cam - 20 complete 1/6/76.
- C. Alter M/700 safety levers. 20 complete - 1/6/76. 250 ready 1/7/76.
- D. Transmit drawings for model drawing changes.
- E. First 20 guns to be ready for test 1/6/76.

D. Anderson

F. Martin

F. Martin

J. Linde

J. Bower

C. Prosser



AL 0023414

10f3

Program (cont.)

1. (cont.)

F. Guns to be regular gallery tested, then turned over to R & D for test.

A. Hugick

G. When change in safety occurs, what is status of XP100?

J. Linde

2. M/788 - Safety and related problems.

A. Fit of Receiver to Stock - drawings transmitted to tie up dimensions of Barrel bracket slot and front take down screw hole in Stock to front take down screw hole in Receiver. Complete 12/30/75.

J. Linde

1. Process Engineering to correct process to new drawings.

B. Bosquet
J. Bower

B. Double click safe - present process.

1. Chamfer on safety to new sample - complete 12/18/75.

C. Prosser

2. Stone c'sink on safety detent hole on safety.

C. Prosser

3. Triggers being used - not ground.

J. Bower

4. H. T. study on safety warpage.

G. Hill

C. Double click safe - future process.

1. Housing - sample of 27 available to model drawing dimensions.
- Mill thickness of safety .349-.346

G. Hill
D. Anderson

2. New type safeties - available.

3. Triggers - H. T. Study to be completed by 1/5/76. From these results M/D dimension to be determined. Ready 1/13/76.

J. Linde
J. Bower

4. Receivers with new safety clearance cut - available approximately 1/15/76.

W. Cook

CENTER FIRE - FIRE CONTROL - SAFETY PROBLEMS (cont.)

- 3 -

Program (cont.)

2. (cont.)

- C. 5. Assemblies to be made with these parts -
1/15/76. J. Bower
6. New pin with shoulder - 250 samples to be
made by R & D. J. Linde
3. M/700 Assembly - bolt closes hard.
- A. Vendor was contacted on bolt plug problems
on concentricity - threads to firing pin
hole. B. Bosquet
- B. New gaging to be investigated. B. Bosquet
4. M/700 Assembly - hard under rail
- A. Supersheen operation to be reinstated on
follower. J. Bower
- B. Review radius on undersize of Receiver
rails. Correct M/D to dimension needed. J. Bower
J. Linde
- C. Temp. operation in on Receivers to file
bottom of right rail in magazine opening. J. Bower
- D. Investigate polishing of follower - contact
vendor for equipment. D. Anderson
- E. Magazine spring retainer - should it be
used in gun. J. Linde
- F. Study needed on Stock for position of
Barrel radius. This may contribute to
HUR malfunction. G. Hill

by

G. J. Hill
G. J. Hill, Supervisor
for the Committee

GJH/bdm

AL 0023416

3 of 3

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

xc: W. E. Leek
G. W. Martin
C. F. Prosser

Ilion, New York
March 25, 1976

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/700 Serial #623088 Cal. 243 Win.
CUSTOMER COMPLAINT
FIRES WHEN SAFE IS RELEASED

Gun was received from Arms Service approximately March 15, 1976, for examination by Research personnel. People involved in the examination were C. F. Prosser, J. P. Linde and F. E. Martin.

It was noted at the beginning of the examination that the fire control has been readjusted. As evidence, the removal of sealant from the front of the Fire Control Housing, Trigger Adjusting Screw and Trigger Stop Screw and the improper reassembly of the Safety Snap Washer. The examination of the Fire Control continued with complete disassembly. It was then noted that a "sticky" brown residue was present on all internal parts. There were a number of small metal chips removed from ins the housing. In addition to the above parts, examination of the following was made:

Trigger Pull - 3 - 3 1/4# (3 - 5 Fac. Spec.)

Fire Control Housing Damaged - No

Alignment of Firing Pin Cock Notch - Acceptable

Bolt Alteration - Cock notch area shows some alteration

Binding of Firing Pin Head in Receiver or Fire Control Housing - No

Free Movement of Trigger - Trigger shows some signs of rubbing.

Trigger Connector - Moves freely on trigger - Some alterations made to sear surface by stoning or grinding.

PLAINTIFF'S
EXHIBIT

3088

AL 0023418

1 of 2

To: J. P. Linde
From: F. E. Martin
M/700 #623088 Cal. 243 Win.
Customer Complaint - Fired When Safe is Released

3/25/76
Page 2

It is felt by C. F. Prosser and F. E. Martin that a fire on safe release condition did exist. It is also felt that the combination of connector alteration, chips and residue were directly responsible for the malfunction. The fire control has been replaced and the faulty one retained for case reference.

FEMartin:bd
Illion Research Division

AL 0023419

2 of 2

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

SUPPORT

PETERS

DEFEND

xc: W. E. Leek
G. W. Martin
C. F. Prosser

Chino file

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Illon, New York
March 4, 1976

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/700-25-06 Ser. #6495814
Customer Complaint Accidental Discharge

This rifle was received from G. W. Martin for examination by R&D. This inspection was made March 2, 1976 by J. P. Linde, C. F. Prosser and F. E. Martin.

It was found during examination that this gun could be made to "Follow-Down". It was decided at this time to replace the fire control. This was done by C. F. Prosser and examination of the fire control assembly continued. During this examination the following items were noted. The sear safety cam showed a radius at the sear area. The trigger connector also showed the same radius at the mating point. It is known that this damage is indicative of being caused by a pierced primer. The fire control itself showed less trigger-sear engagement than is presently accepted. It was noted that the fire control had not been tampered with and was one that was set entirely by the assembler. Present practice is to set sear engagement and trigger pull by use of a comparator. There was no damage to the fire control assembly noted.

To determine if pierced primers had been experienced, G. W. Martin contacted the former owner of this rifle. It was determined through this conversation that the former owner was not a handloader and had not used handloads. It was also determined that he did not know what a pierced primer was. Further examination of this rifle is to be done. This will include a chamber cast and shooting.

It is felt by all persons that examined this rifle that through some misuse the fire control of this rifle was made defective.

FEM:bd
Illon Research Division

PLAINTIFF'S
EXHIBIT

3089

AL 0023422

1 of 3

DRAFT

3/4/76

cc: W. E. Leek
G. W. Martin
C. F. Prosser

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/700 25/06 Ser. #6496814
CUSTOMER COMPLAINT ACCIDENTAL DISCHARGE

This rifle was received from G. W. Martin for examination by R. & D. This inspection was made March 2, 1976 by J. P. Linde, C. F. Prosser and F. E. Martin.

It was found during examination that this gun could be made to "Follow -Down". It was decided at this time to replace the fire control. This was done by C. F. Prosser and examination of the fire control assembly continued. During this examination the following items were noted. The sear safety cam showed a radius at the sear area. The trigger connector also showed the same radius at the mating point. This damage as noted is indicative of being caused by a pierced primer. The fire control itself showed less trigger-sear engagement than is presently accepted. It was noted that the rifle was not tampered with and the fire control was of the type that was set entirely by the assembler. Present practice is to set sear engagement by use of a comparator. There was no damage to the fire control assembly noted.

To determine if pierced primers had been experienced, G. W. Martin contacted the former owner of this rifle. It was determined thru this conversation that the former owner was not a handloader and had not used handloads. It was also determined that he did not know what a pierced primer was. Further examination of this rifle is to be done. This will include a chamber cast and shooting.

AL 0023423

2 of 3

DRAFT

3/4/76

M700 25/06 Ser. #6496814

Customer Complaint Accidental Discharge

Pg. 2

It is felt by all persons that examined this rifle that thru some misuse the
fire control of this rifle was made defective.

FEM:bd

Illion Research Division

AL 0023424

3 of 3

cc: W.E. Leek
G. Martin

RD-41-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
March 3, 1976

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/700 L.H. 30/06 Ser. #5858856
Customer Complaint-Accidental Discharge

This rifle was received from Arms Service the afternoon of Feb. 27, 1976, for examination by R & D people. Initial examination was made March 1, 1976 using the proposed changes to the Field Service Manual as a guide. Involved in the examination were, J. P. Linde, C. F. Prosser and F. E. Martin. All three people involved tested this gun and were unable to duplicate the customer described accidental discharge. In addition to this, C. F. Prosser and F. E. Martin continued the examination for the following items:

Trigger Pull - 6 1/4#

Fire Control Housing bent or misshapen - No

Alignment of Firing Pin cock notch - Acceptable

Bolt Alteration - None

Binding of firing pin head in receiver or fire control housing - No sign.

Freedom of movement of both sear safety cam and trigger connector - OK

Fit of trigger connector to trigger - Acceptable

To accomplish the above examination it was necessary to partially disassemble the fire control and as a result it was noted that the Fire Control housing contained many small metal particles and oil, also a large chip was found in the sear spring hole along side of the sear spring. It is not Remington's procedure to oil the fire control of this gun, it is supplied with a dry lubricant.

It is felt by C. F. Prosser and F. E. Martin that the fire control in the condition it was found at time of disassembly, with the oil and chips present, could have caused an accidental discharge. All parts inspected were found to be to manufacturing tolerances.

FEM:bd

PLAINTIFF'S
EXHIBIT

3090

AL 0023425

1 of 3

DRAFT

3/2/76

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/700 L.H. 30/06 Ser. #6858856
Customer Complaint - Accidental Discharge

This rifle was received from Arms Service the afternoon of Feb. 27, 1976, for examination by R & D people. Involved in the examination were J. P. Linde, C. F. Prosser and F. E. Martin. Initial examination was made using the proposed changes to the Field Service Manual as a guide. All three people involved tested this gun and were unable to duplicate the customer described accidental discharge. In addition to this, C. F. Prosser and F. E. Martin continued the examination for the following items:

Trigger Pull - 6 1/4"

Fire Control Housing bent or misshapen - No

Alignment of Firing Pin cock notch bolt alteration - None

Binding of firing pin head in receiver or fire control housing - No sign

Freedom of movement of both sear safety cam and trigger connector - OK

Fit of trigger connector to trigger - Acceptable

To accomplish the above examination it was necessary to partially disassemble the fire control and as a result it was noted that the Fire Control housing contained many small metal particles and oil, also a large chip was found in the sear spring hole along side of the sear spring. It is not Remingtons procedure to oil the fire control of this gun, it is supplied with a dry lubricant.

AL 0023426

20f3

DRAFT

To: J. P. Linde
From: F. E. Martin
Subject: M/700 L.H. 30/06 #6858856
Customer Complaint - Accidental Discharge

3/2/76
Pg. 2

It is felt by C. F. Prosser and F. E. Martin that the fire control in the condition it was found at time of disassembly, with oil and chips present could have caused an accidental discharge.

FEM:bd

AL 0023427

3 of 3

REMININGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
January 14, 1976

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: Monthly Progress Report

M-788 & M-580 SAFETY

New safety levers are in production and have shown adequate lift in all conditions. The double click problem as reported by production has been eliminated by the use of a new safety retaining pin designed by P. Nasypany. Alterations to the housing are also being made and evaluated.

NEW BOLT PLUG

I am unable to report on the status of this change at this time.

M-600 FIRE CONTROL

The evaluation of a proposed change on this model's fire control from the stamped folded type to one of the M-700 type is being evaluated by production. This change would give us a common fire control housing for M-600 M-700. All drawings are completed.

TRIGGER GUARD

An investment cast aluminum trigger guard has been completed and is ready for evaluation.

M/700 FIRE CONTROL

All testing is completed and changes will be dictated by results of present M-600 production testing.

PLAINTIFF'S
EXHIBIT

3091

AL0023428

1 of 2

To: J. P. Linde
From: F. E. Martin
Monthly Progress Report

January 14, 1976
Page 2

FIRING PIN

Testing has been completed on all lightweight samples. The all aluminum pin had the best endurance.

8m/m REM. MAG

Tooling has not yet been received and is believed to be enroute.

.280 REM

Rifles having the new barrel configuration have been completed and are being tested.

7 x 64mm

No change in status of this caliber.

.308 VARMINT

No change other than preparation of guns for W.S.G.A. show.

FEM:bd
Illon Research Division

F. E. MARTIN

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
September 2, 1975

TO: J. P. LINDE
FROM: E. E. MARTIN
SUBJECT: MONTHLY PROGRESS REPORT

M/580 Series & M/788 Series

Fire Control - All alterations that had been planned for these rifles have been tested, evaluated and transmitted. Changes are, the use of a roll pin for sear pivot pin, more clearance for sear safety cam leg, removal of safety retaining screw.

Safety - Model 580's & M/788 safety changes have been released to production incorporating all anticipated alterations. Attention is to be given the detent system particularly the spring, plunger angle and detent counter sink angle.

Bolt Assembly - Testing on the bolt handle improvement for M/788 has been completed and all changes and test specifications have been transmitted.

Stock - The interference of stock and safety has been looked into and the problem has been defined as one of an "out of tolerance" condition. More investigation is necessary to find the reason for this condition and eliminate it.

M/600

Safety - The new design of the safety has been completed. The drawings are ready to be transmitted. Quotes have been obtained and final evaluation to be made based on M/700 testing.

Fire Control - Drawings have been completed and final testing is to be done. This will decide if the housing is going to be compatible for the two models involved i.e. M/600 & M/700.

PLAINTIFF'S
EXHIBIT

3092

AL 0023438

1 of 2

To: J. P. Linde
From: F. E. Martin
Subject: Monthly Progress Report

9/2/75

-2-

M/700

Safety - Having more positive detents have been assembled and are to be tested. Work in this area is to continue looking at the detent spring, detent ball and the method of assembly, ie. the tru-arc clip.

Fire Control - Housing of the new type have been assembled and are to be tested. These consist of the new housing that will be common to the M/600, M/700 and also have a more positive detent. Several variations to be tested.

8mm Rem. Mag. - M/700 8mm Rem. Mag. 2 P.V. barrels are to be made and 2 proto type rifles - W. O. to be issued by R. Sassone.

Silhouette Rifle - Match shot 3, Aug. 75 using a M/700 .308 "Varm". proto-type and factory ammunition results were acceptable. Work still continues in this area.

.280 - 7mm - Two (2) rifles have been assembled and some accuracy testing has been done; to date the results have not been satisfactory. It is planned that more guns, using Hart barrels, will be assembled and accuracy testing continued.

.308 Varmint - M/700 .308 Varmint has been released to production. It has been recently decided that rate of twist originally released is not satisfactory. It has been decided that the twist should be changed from 1 - 10" to 1 - 12". Drawings have been completed and transmittal to be made.

FEMartin/bd
Illion Research Division

AL 0023439

2 of 2

Shirley

RD-47-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

OUTPOST

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Illon, New York
June 16, 1975

TO: J. P. LINDE
FROM: F. E. MARTIN
SUBJECT: M/600 FIRE CONTROL

M/600 Fire Control problem has been defined and the necessary parts have been altered and redesigned. During the course of investigation and definition of the problem it was decided that a permanent solution should be reached. This has been done. The changes that have been made are as follows:

A new design safety lever to provide greater lift and a longer cam duration and an easier method of inspection of purchased parts.

A new housing; this will use parts (side plates, spacers etc.) that are common to the M/700. The assembly will be riveted and side plates hardened. This will give us better dimensional control of the assembly and the heat treated plate will give us a better wearing surface in the detent area. A more positive detent has been developed in conjunction with the longer duration cam found on the safety lever.

The last area of concern is the sear safety cam; this is a powder metal part. It was found during the investigation that this part, among others was out of tolerance. This part has also been redimensioned and redrawn.

Prints of all revised and redesigned parts have been sent to our vendors and most have been returned. There are presently 10 model guns in the test lab and testing is presently under way to determine total cam life and lift available.

FEM:bd
Illon Research Division

PLAINTIFF'S
EXHIBIT

3093

AL 0023440

1 of 1

REMINGTON ARMS COMPANY, INC.
Research Department

file
cc: J. P. McAndrews
E. G. Larson

Ilion, New York
November 20, 1978

E. F. BARRETT
C. B. WORKMAN
J. P. LINDE
H. D. ALBAUGH - W. H. FORSON

BOLT ACTION FIRE CONTROL - DESIGN REVIEW 11-14-78

- One of the items discussed at this meeting was the use of the word "safety" to describe the mechanism used to block the trigger or the sear or the firing pin.
- Since the firearm is only as safe as the person handling it, the term "safety" is being misused. It was the consensus that the word "safety" should not be used and that other terms should be substituted. Some were suggested such as, trigger block, lock, stop, interrupter snubber, disconnecter, intersector, switch arrester, latch, etc.

MHW
MHWalker:bd

PLAINTIFF'S
EXHIBIT

3094

AL 0023503

10P1

M/600 FIRE CONTROL

In January 1975 R&D was advised of a problem existing with the M/600 Fire Control. Initial investigation of the fire control and components showed several out of tolerance conditions existing. The parts found to be out of tolerance are:

SEAR SAFETY CAM - Safety cam surface.

.5347 / .539 dim. and connector contact area

.341 / .346 dim. over max.

TRIGGER - Pivot hole in trigger

.991 / .975 dim. was found to be out of position over max.

TRIGGER CONNECTOR - This part was found to have a blow in the long leg of the part.

TRIGGER HOUSING - The following holes were found out of position -

Safety Pivot hole .649 / .651 & 1.306 / 1.307

Safety Detent Holes

Trigger Pivot holes .839 / .841 & 1.239 / 1.241

Holes were out of position also had variations from side to side.

Correction of these tolerance conditions was easily accomplished, as two of the four parts are made here.

SEAR SAFETY CAM - Is manufactured by Hi-Dense. It was found that by exercising more care in pressing and sintering this part could be made to model drawing tolerance.

TRIGGER - Also made by Hi-Dense with final machining by Rem. This part was brought back into tolerance by minor alteration of fixturing and reinstruction of the operator.

TRIGGER CONNECTOR - Manufactured outside - this part was brought back into tolerance by having the vendor make alteration on die.

PLAINTIFF'S
EXHIBIT

3095

AL 0023528

1 of 3

TRIGGER HOUSING — This part was found to have the most out of tolerance conditions.

This part can be controlled but it is necessary for both Rem. and vendor to screen and check all parts. Doing this increases piece price. Parts are also checked at Sub-Assembly to insure proper sear connector separation with safe in "ON SAFE" position.

Reason for change to M/700 Style Fire Control Housing.

Hardened low wear housing

More Positive safety

Eliminate trigger housing rejects at safety clearance inspection.

Common Housing — (M/600, M/700, M/40X)

PARTS CHANGED OR REDESIGNED

Housing — Altered to fit M/600 and M/700 receivers.

Safety Lever and Sear Safety Cam — Altered to provide a longer duration of safety and more lift — sear and connector separation.

Future plans for this Fire Control, the XP-100 Fire Control and the M/700 Fire Control are:

Continue to upgrade and improve them, include a unload on safe feature, a three position safe or both. This will probably be dictated by Marketing.

FEMartin:bd

4 / 5 / 77

AL 0023529

BEAD					RAMP		
CALIBER	25751 LOW	25750 MED.	14659 HIGH	REAR SIGHT SET	28512 LOW	28511 MED.	28510 HIGH
.17 REM		x		4th Index Mark from rear			x
.222		x		"			x
.22-250		x		"			x
.25-06		x		"			x
.6mm		x		"			x
.243		x		"			x
.270		x		"			x
.30-06		x		"			x
.308		x		"			x
.7mm			x	"			x
.264			x	"			x
.300			x	"			x
.8mm			x	"			x
.375	x	Alt.		Middle 5th space		x	
.458	x	Alt.		"		x	

AL 0023530

3 of 3

FEM:bd
2-4-77

Remington Arms Company, Inc.
Ilion Research Division

Telex to E. F. Barrett

Ilion, New York
March 4, 1977

TO: W. E. LEEK
FROM: J. P. LINDE
SUBJECT: MOHAWK 600 RIFLES FOR EXPORT TO AUSTRALIA

I recommend that no alterations be made to the Mohawk 600 rifles being exported to Australia based on the following information.

The trigger adjustment mechanism on the Mohawk 600 has been investigated from a reliability standpoint. The basic question raised is will the rifle trigger mechanism stay in adjustment over an extended period of time. The answer to this question is yes based on the experience we have with the Mohawk 600 and Models 721 and 722. Both the Model 721 and 722 have the same type of fire control with a folded housing and staked adjustment screws. The Mohawk 600 has an added degree of security as the adjusting screws are also sealed with DuPont Duco cement. In conclusion, it has been our experience that these rifles will not change adjustment with continued usage.

The next question raised on the Mohawk 600: is it adjustable in the field by the customer? The answer is no. The Gun Owner's Instruction Folder supplied with each rifle states that the trigger assembly is factory sealed to the correct adjustment.

In the Field Service Manual supplied to gunsmiths we give clear concise details how to adjust the trigger assembly with proper instructions on resealing the screws.

In reviewing the Model 700 rifles being exported to Australia I have determined why their trigger assemblies are different from the assemblies sold in the United States.

The alteration was made to the trigger assemblies in Australia due to an accident involving a Model 700. The customer had improperly adjusted his fire control, applied no locking cement, and after some usage, the rifle discharged unexpectedly. At the time of this incident the Gun Owner's Manual described how to make the adjustment

PLAINTIFF'S
EXHIBIT

3096

AL 0023534

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A
To: W. E. Leek
From: J. P. Linde
Subject: Mohawk 600 Rifles for Export to Australia

Page 2

March 4, 1977

to lighten the trigger pull. The Australian position was that, if it is adjustable, the adjusting screws should be able to be locked after adjustment. Our experience on the M/700 indicated that it would stay in adjustment without the jam screws, which we supplied, but the government prohibited the sale of these rifles until the alterations were completed. Since this time the gun owner's guide for all M/700s has been altered to read, "No adjustment of trigger by the owner is recommended. Trigger pull has been factory adjusted. Should any adjustment be necessary return rifle or see a Remington approved gunsmith".

The M/700 trigger assemblies are presently being sealed in place with DuPont Ducc cement. The sear engagement screw, the most important, is also sealed with a Loctite type of adhesive. The Ducc cement not only seals the screws but also indicates whether the screws have been tampered with.

So in conclusion the situation which existed in 1973 on the M/700 does not exist today. That is, we recommend that the customer does not make any alterations to his trigger assembly. We are also secure in the position that the screws will stay in position once adjusted.

J. P. Linde/nl
Manual Firearms Design
Lion Research Division

AL 0023535

2 of 2

BOUSTEAD WOOD PTY. LTD.

CNR. DAY & EGERTON STREETS, SILVERWATER • PHONE 648 3922
ADDRESS ALL MAIL TO: P.O. BOX 148, ERMINGTON 2115
CABLE AND TELEGRAPHIC ADDRESS: "WINWOODED" SYDNEY

BRANCH OFFICES: BRISBANE, MELBOURNE, ADELAIDE, PERTH
AND AT: WELLINGTON, AUCKLAND, CHRISTCHURCH, LONDON
REGISTERED OFFICE: 487 CITY ROAD, SOUTH MELBOURNE

GW:LM
750

9th February, 1973.

Mr. W.J. Boettner,
Manager Far East & Latin American Sales,
Remington Arms Co. Inc.,
939 Barnum Ave.,
Bridgeport,
CONNECTICUT. U.S.A.

Dear Bill,

SUBJECT: MODEL 700 TRIGGER SAFETY.

We have been advised of a fault in the Model 700 which potentially could be very serious.

The fault is the trigger adjusting screw working loose after several cockings. This results in the discharge of the rifle without using the trigger when the safety is released from "safe" to "fire". This recently resulted in a person being shot by a 700 ADL .243W (Serial 6463258).

It is obvious the owner of the rifle had removed the glue applied in the factory over the trigger adjusting screw and the trigger stop screw on the trigger housing assembly. We must accept the fact that people will remove this glue to adjust the screw and will not replace the glue.

Discussions with the N.S.W. Police and the Commonwealth Police lead to a probable solution - this is to either fit a lock nut or limit the amount of adjustment possible with this screw.

The N.S.W. Police have advised us that their report will state only the cause of the accident and not make any recommendations or place the blame directly on the rifle. There will be no publicity.

ALSO AT BRISBANE, MELBOURNE, ADELAIDE, PERTH AND LONDON

PLAINTIFF'S
EXHIBIT

5097

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AL 0023540

BOUSTEAD WOOD PTY. LTD.

Mr. W.J. Boettner,
SUBJECT: MODEL 700 TRIGGER SAFETY

2.

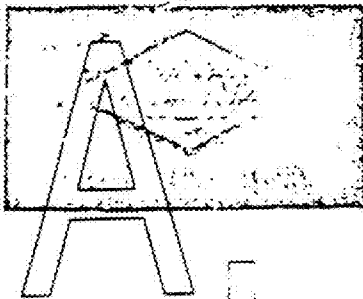
9th February, 1973.

The Commonwealth Police, through Bill Grist (whom you have met), will take no action in Sydney unless Canberra advise them to. Bill has advised Canberra of the circumstances and is awaiting a reply. He is quietly confident no action will eventuate.

We would appreciate your people looking into this matter and would appreciate an early reply to pass onto the two Police Departments.

Yours sincerely,
BOUSTEAD WOOD PTY. LTD.

Geoff Willits
G. WILKICK,
SALES REPRESENTATIVE.



BOUSTEAD WOOD PTY. LTD.

CHR. DAY & ECERTON STREETS, SILVERWATER • PHONE 648 3822
ADDRESS ALL MAIL TO: P.O. BOX 148, ERMINGTON 2115
CABLE AND TELEGRAPHIC ADDRESS: "WINWOODED" SYDNEY

BRANCH OFFICES: BRISBANE, MELBOURNE, ADELAIDE, PERTH
AND AT: WELLINGTON, AUCKLAND, CHRISTCHURCH, LONDON
REGISTERED OFFICE: 407 CITY ROAD, SOUTH MELBOURNE

DFT:LM
765

22nd March, 1973.

RECEIVED

MAR 27 1973

OFFICE - P. L. M. L.

Attention Mr. Cipcar.

Remington Arms Co. Inc.,
939 Barnum Ave.,
Bridgeport,
CONNECTICUT, U.S.A.

RECEIVED

MAR 27 1973

INTERNATIONAL SALES

Gentlemen,

SUBJECT: PROHIBITIVE FIREARM IMPORTS
MODELS 700 & 541S

The Australian Commonwealth Police in conjunction with the Department of Customs and Excise have siezed all 700 and 541S firearms offour recent shipments and will not release them until we undertake to correct what they declare is an unsafe trigger mechanism.

This current problem is the result of a situation described in our letter 9th February, 1973 to which you subsequently replied 8th March, 1973.

The adhesive that you apply to the various adjusting screws is inadequate according to our authorities and we have to provide a locking nut to both-the trigger adjusting screw and the trigger engagement screw (both part no. 17053 on model 700). We are not required to install a lock nut on the trigger stop screw.

Are you able to help us immediately with a quantity of 200 trigger screws similar to 17053 but about 1/8" to 3/16" longer complete with a locking nut?

We have not yet received a 541S into Australia prior to this problem, nor do we have a parts break down sheet to confirm the type and size of the various trigger screws. If the 541S trigger is different to the 700 we will require a quantity of 12 only longer screws and lock nuts to fit the 541S also.

...2/

ALSO AT BRISBANE, MELBOURNE, ADELAIDE, PERTH AND LONDON

PLAINTIFF'S
EXHIBIT

3098

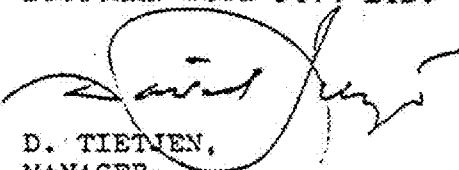
10f2
AL 0023542

A Please attend to this request immediately as we are involved in bond storage charges and also have no stock to sell of these items until this problem is resolved.

We must resolve this problem quickly and then consider orders outstanding for shipment as these too must be rectified.

The writer has been involved in personal discussions with the authorities and there is no likelihood of any other solution being acceptable. We trust you will help us promptly.

Yours sincerely,
BOUSTEAD WOOD PTY. LTD.


D. TIETJEN,
MANAGER.

2 of 2

AL 0023543

cc: E. J. Giner
E. S. Cipcer
E. G. Larson

Bridgeport, Connecticut
February 22, 1973

TO: S. M. ALVIS
FROM: F. E. MORGAN
SUBJECT: BOUSTEAD WOOD PTY. LTD.
THEIR LETTER OF 2/9/73

A prompt reply to the attached letter from the subject concern should be made by someone from Ilion via the International Department.

The Model 700 instruction folder on page 2 and captioned in bold print **TO ADJUST TRIGGER** -- tells the shooter in detail how to make some very technical adjustments to his Model 700 trigger. In fact, the copy actually invites him to make these changes.

Earl Larson points out that we should be more cautious and perhaps rewrite this portion of the folder. I certainly concur and suggest that we also delete the figure 4 drawing.

FEM/bc
att.

P.S.

Since dictating this letter suggested copy changes have been received as the result of a telephone call to Mike Walker earlier this week. The composition in Frank Hart's letter of February 21 is satisfactory and should be incorporated in the next printing of the folder.

PLAINTIFF'S
EXHIBIT

3099

AL 0023545

1 of 1

cc: C. B. Workman
E. F. Sienkiewicz
File *in file*

Ilion, New York
September 21, 1977

J. H. CHISNALL
Bridgeport

LETTER FROM MR. C. V. TOMPKINS
MODEL 700 COMPLAINT

Jack:

In the enclosed letter (dated September 14, 1977) Mr. Tompkins has included a list of people who supposedly own M/700 rifles which discharged when the safe was released. I requested their names on my trip to visit him concerning his rifle.

Would you please contact these individuals and ask for the return of their rifles so we can inspect them? Please have them mark the box for the attention of Mr. Sienkiewicz so Ed can coordinate our Ilion activities on these rifles.

J. P. Linde
Ilion Research Division

JPL/nl
Enc.

10f2
PLAINTIFF'S
EXHIBIT

3100

AL 0023559

cc: C. B. Workman
E. F. Sienkiewicz
File - *Hand* *filed*

also, Customer Complaints

September 21, 1977

Mr. C. V. Tompkins
803 Avenue J
South Houston, Texas 77587

Dear Mr. Tompkins:

I appreciate your efforts in supplying us the names of other Model 700 rifle owners who have experienced problems. Thank you for your cooperation in this matter.

We will contact these people on the return of their rifles for our inspection.

Sincerely,

John P. Linde, Manager
Manual Firearms Design
I&D Research Division

JPL/nl

AL 0023560

2 of 2

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July 11, 1977

RESEARCH PRESENTATION

I will describe the research product development programs for which I am responsible in the following product areas: Bolt Action Centerfire Rifles, Target Shotguns, Rim-fire Rifles, and Mechanical Traps.

CENTERFIRE BOLT ACTION RIFLES

Present Status

Remington is the leading producer of bolt action centerfire rifles with 46% of the market in 1976. Our production rate is presently limited by our manufacturing capacity, but we have project approval to increase our manufacturing capacity by % in the next years. Our bolt action line is very vulnerable to competition because of the limited product differentiation between models and the vast number of competitors. Presently our biggest competitors are Ruger with their M/77 and Winchester with the M/70.

The M/700 has gained wide acceptance for its appearance, performance, and accuracy characteristics, but we must continue to update and improve this model with design improvements and new model variations to maintain our market position.

New Bolt Action Model Variations

M/700 Classic

- A. Chart
- B. Show rifle

The M/700 Classic is a rifle with uncluttered elegance. It features a traditional stock void of cheek piece, Monte Carlo styled comb, and white line spacers. The grip radius has been swung back to compliment the style of the stock. The tough satin finish will be used on the stock in keeping with the classic theme. The stock will be cut checkered with the same pattern as presently used on the M/700 BDL rifle. The BDL floor plate is included on the Classic Rifle to give the customer a rifle with improved appearance and also make the rifle easier to unload. The rifle will be offered with sling studs and swivels so any carrying strap can be readily adapted to the rifle.

Ilion Research Division

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PLAINTIFF'S
EXHIBIT

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RESEARCH PRESENTATION

- 2 -

July 11, 1977

New Bolt Action Model Variations - Cont'd.

M/700 BDL Rifle with Skip Line Checkering

A. Show Rifle

The M/700 BDL with skip line checkering dresses up the model while at the same time gives a definite model distinction between the Classic and BDL checkering patterns.

M/600 Carbine

The objective of this development effort is to satisfy the needs of the back packer, guide, and deer hunter for a hard hitting, light, short, and fast handling rifle.

Design Objectives:

- Chamber for modern high performance cartridges
- Weight - 6 pounds
- Length - 35 inches

Rifle equipped with:

- Sling and Swivels
- Recoil Pad
- Metal Trigger Guard

Design options to be investigated:

1. Styling of Stock
2. Bolt Handle design
3. Checkering
4. Wood Finish
5. Sights

20F 11

AL 0023566

CLASSIC

H

RESEARCH PRESENTATION

- 3 -

July 11, 1977

New Bolt Action Model Variations - Cont'd.

M/600 Carbine - Cont'd.

Development Program:

Fabricate models with design objectives and options by November 1977.

Evaluation of Options with completion in January 1978:

Research Testing
Marketing Analysis
Economics

Proposed Market Announcement:

January 1979.

Bolt Action Product Improvements

Model 700 Extractor

We have received a number of complaints critical of our cartridge extraction from the marketing focus panels and customer contacts. We feel we have a reliable system but we are going to investigate these soundings and if they are justified find a solution. If not justified we will generate marketing information to demonstrate the performance advantages of our extractor. We will present our findings at the January meeting.

Model 700-600 Fire Control Improvements

We presently offer these two rifles with a fully adjustable fire control which we tell the customer not to adjust because the typical customer does not understand the system well enough to adjust it properly. The adjustment feature increases the cost of the fire controls. These rifles cannot be unloaded with the safety in the "On Safe" position which we believe would be a desirable feature. To overcome these

3 of 11

AL 0023567

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RESEARCH PRESENTATION

- 4 -

July 11, 1977

Bolt Action Product Improvements - Cont'd.

M/700-600 Fire Control Improvements - Cont'd.

deficiencies we are presently doing a design analysis of the M/700-600 fire controls. We are trying to develop a new fire control with the following features:

1. Trigger externally adjustable for pounds pull within safe limits.
2. Sear engagement and trigger overtravel determined by design (not adjustable by customer).
3. Rifles can be unloaded with the safety in the "On Safe" position.
4. Improved trigger pull characteristics.
5. Reduction of trigger assembly costs.

Development Schedule:

- . Prototypes with different design options available for inspection and testing - March 1978.
- . Preferred model ready for extensive testing - July 1978
- . Design complete - March 1979

TARGET SHOTGUNS

The 3200 All Gauge Skeet Sets

The skeet sets will satisfy a market need for a good quality skeet system for the competitive skeet shooter. This program should also help to improve the financial position of the M3200 line.

The design and Research testing of the 3200 Skeet Sets was completed in July of 1975. The Research testing was followed by a Marketing field test which verified the superior bird-breaking ability of our skeet system. With this skeet shooting system the customer can shoot all four skeet events with the same gun rather than having to adapt to a new gun for each event.

The gun has a common weight, balance point, sight line and point of impact, for all 4 barrel assemblies. When the shooter shoots any gauge it is practice for any other gauge because he is shooting the same gun with the same feel with any of the 4 different barrel assemblies. The barrels have a unique contour which eliminates the need for spacers or separate fore-ends for each barrel assembly, but also has a very pleasing side and top appearance.

The design is completed, tested, and transmitted to Production. The Skeet Sets have a planned January 1979 market introduction.

M/870 Competition Trap Gun

We have a less than 10% of the Trap Gun market with all three of our model types. The leading competitive trap guns are the Browning BT99, Rem-um Single Barrel, and Winchester M12.

With the limited volume of the Trap Gun market we cannot afford to develop and manufacture a new model designed specifically for trap shooting. What we need to meet our company's objectives of profit and market share is a Trap Gun with superior features based on one of the existing high volume shotguns.

M/870 Competition Trap Gun - Cont'd.

The objective of the M/870 Competition Trap Gun program is to develop a superior shooting trap gun with proprietary features which will give us a competitive advantage in the marketplace.

The M/870 Competition Trap Gun could be offered with all or any combination of the following features:

. Recoil Reduction System:

This system is placed in the magazine tube. The system is capable of shoulder force reduction equal to the M1100.

. Adjustable Point of Impact:

The vent rib can be altered to give the shooter a 10-inch adjustment at 40 yards.

. Pattern Control:

The gun could be offered with a choke-tube system which would give the shooter a choice of two chokes for optimum pattern control.

Development Schedule:

Three prototype shotguns with combinations of the above listed features have been fabricated and are ready for Research testing.

The selection of design options, testing, Marketing evaluation, and economics should be completed by September 1978.

The M/870 Competition will be announced January 1980.

M/3200 Single Barrel Trap Gun

The objective of this development program is to offer the customer a superior bird breaking shotgun with proprietary features.

This gun could be offered with recoil reduction, adjustable point of impact, and pattern control devices utilizing either the top or bottom barrel.

M/3200 Single Barrel Trap Gun - Cont'd.

The simplest design is fabricated by cutting the bottom barrel off at the end of the fore-end and plugging both ends. This gives a moderately good looking gun without any of the above features. If it is desired, any of the features could be added, but this would require additional development effort.

E
RIMFIRE RIFLES

Of all the product lines the ones which are the most threatened by competition are our rimfire rifles. Our market share has dropped to 13% of the total rimfire market. We have short-term development programs on the Nylon 66, M/552, and 581 rifles. We are presently analyzing our long term options on the rimfire autoloading rifles.

M/581 Single Shot Conversion

The objective of this design is to give the customer the option of converting his M/581 clip fed repeater to a single shot rifle which can be used to train new shooters. The rifle at some later date can be converted back to a repeater. This design is accomplished by supplying the customer with two molded plastic parts which readily convert the rifle to a single shot.

New Autoloading Rimfire Rifle

Research is presently initiating a program to determine the long term options available to us in the .22 autoloading market. Because of the complexity and magnitude of the development program it is being initiated with clearly defined check points and goals. To be competitive in the rimfire autoloading market will require a major commitment from the company in the areas of product design and advanced process development.

New Autoloading Rimfire Rifle - Cont'd.

We are in the initial investigative stage of this study. We are approaching the problem from five different vantage points to nail down the autoloading rimfire rifle parameters which will guide our future course of action.

I. Marketing Input

Before the rimfire autoloading proposal can be formulated a number of market related questions have to be answered which directly determine the design options available:

1. To what degree can new innovations be incorporated into the new design which differ from the accepted norm of rimfire rifle characteristics.
2. The type or types of appearance characteristics desired by the potential customers: military, sporting, classic, etc.
3. Functional and operating characteristics desired which would affect its marketability.
4. Definition of market area and types of customer new rifle is being designed for.
5. Potential volumes and proposed pricing structure.
6. Will a promotional gun be a variation of the product mix?
7. The principal competition, their market share and pricing structure.

An interim report has been supplied by Marketing which we are using to guide our thinking until their final report is completed in a couple of months. While the answers to these marketing questions which apply to the design effort are being formulated, Research will be involved in the following activities.

New Autoloading Rimfire Rifle - Cont'd.

II. Analysis of Competitive Rifles

All of the existing autoloading rimfire rifles in the market are being analyzed from an appearance, function, design and process cost viewpoint.

III. Firearms Cost Data

All of the existing .22 rimfire rifles manufactured by Remington are being cost analyzed to determine what the various elements of manufacturing contribute to the total gun cost. This cost data is pointing out where effort should be concentrated on a new design to reduce overall gun costs. The leading competitive models will be cost analyzed to determine if they have a cost advantage, and if they do, where it exists.

IV. Processing Data

To gain the proprietary position in design and manufacturing costs which we desire, the process development effort on this model will have to be greatly accelerated in the area of rimfire production. All new processes and process innovations will have to be investigated in the proposal stage of development so the parts can be designed to be fabricated by the most economical method.

V. Rifle Design

The design will have to be fully integrated with the process and market requirements to meet the cost and customer acceptance requirements.

A proposal will be made in the January meeting detailing the new development program on the .22 Rimfire Autoloading Rifle. This proposal will include the proposed development schedule, development activity requirements, estimate of development costs, design objectives and proposed product characteristics.

MECHANICAL TRAPS

The objective of this development program was to design two new traps to replace the outdated Blue Rock and Wonder Traps. The new traps are portable, easy to operate and throw targets to tournament standards. These traps will fill the gap between the Trius type traps and the electric traps.

The new traps are constructed of welded steel tubing which is very strong, giving the needed endurance strength to ensure reliability. The new traps have clean lines with a modern appearance. The new traps are much easier to cock than the Blue Rock. They have a smooth throwing action with no throwing arm flailing at the end of the throwing cycle.

The development work on the Blue Rock 78 trap is complete. Drawings will be transmitted after the Marketing field test is completed.

The design of the Blue Rock Tournament Trap with cocking handle and solenoid release will be finished in September of this year.

Research has met its objectives of developing a new mechanical trap family to replace the Blue Rock and Wonder Traps. The new traps are an innovative design safe, reliable, and well within the cost structure specified. The traps are fabricated completely from purchased parts and will require a minimum of plant effort to produce.

With the addition of these two traps to our product line Research is stopping any further development work on either mechanical or electrical traps.

A

RESEARCH PRESENTATION

- 11 -

July 11, 1977

L

M/12 Winchester \$575.00

BT 99 Browning Single Barrel \$432.50

Grade 1 Comp. \$462.50

1976 Bolt Action market share 46%

Winchester 70 14%

Ruger 16%

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K

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C

H

John P. Linde/nl
Ilion Research Division

Xc: J. H. Chisnall Bpt.
R. B. Sperling "
E. F. Sienkiewica Ilion

Ilion, New York
June 20, 1977

TO: C. B. WORKMAN

FROM: J. P. LINDE

MEMORANDUM OF VISIT
with
LT. C. V. TOMPKINS, HOUSTON, TEXAS
MODEL 700 FIRING "OFF SAFE"

Mr. Ken Walte and myself visited with Police Lt. C. V. Tompkins at his office in the police station in Houston, Texas, on June 16, 1977. We spent approximately three hours with Lt. Tompkins.

We described the engineering effort expended on trying to find the problem with his Model 700 BDL rifle, serial number 6581402, by both the Process Engineering Section and the Research Division. The results of all the tests and measurements were discussed. A M/700 action was brought along for demonstration purposes so the operation of the safety mechanism could be demonstrated. All of our investigation at the plant indicated that there was nothing wrong with the rifle.

An explanation of how Mr. C. V. Tompkins could have held the trigger back with his knuckle while he flipped the rifle from the safe to fire position was present, and, demonstrated a number of times. He did not accept the explanation (I did not expect him to, with us there; he is a police lieutenant), as he said he did not position his lower hand in contact with the trigger. He did consider the explanation and it was apparent from his actions he was thinking about it.

We had him completely describe the incident and the following are key points of the discussion.

PLAINTIFF'S
EXHIBIT

3102

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AL 0023578

A
To: C. B. Workman
From: J. P. Linde
Subject: Visit with Lt. C. V. Tompkins
M/700 Firing "Off Safe"

- 2 -

June 20, 1977

-
1. Time of day - 7:00 A.M.
 2. Location of accident - Ranch road, maintained gravel, not rough where accident happened.
 3. Two people were in the pickup cab.
 4. He was familiar with the operation of the M/700 rifle.
 5. He had no physical conditions at the time which would bear on the accident.
 6. He was not wearing gloves.
 7. The temperature was mild; he was not wearing a coat.
 8. There was nothing he was wearing which he thought could have caught on the trigger.
 9. He uses a Buck pocket knife for hunting.
 10. He always unloads the rifle in this manner. He was not in his opinion doing anything different in the truck.
 11. He was not crowded in the truck.
 12. He had fired the rifle a number of times in the weeks preceding the accident - approximately 10.

We offered him a new Model 700 in place of his old one. We had his rifle there also. We made it clear that we had not altered his rifle in any way. He wanted to keep his original rifle. Then we offered to let him keep both rifles and let him take the rifle which was involved in the accident to a gunsmith to satisfy himself that they could not find anything wrong with the rifle.

He accepted this offer and will keep both rifles and then, when he is satisfied, he will return the original rifle to us. We assured him that nothing would happen to the rifle when in our possession until the problem is resolved. We also requested a copy of the gunsmith's report.

We tried to impress on him that we were also concerned about the other six rifles he described in his letter which would also "fire off safe". He agreed to contact the people involved and supply us with their names if they complied. We will then contact the people involved for the return of their rifles. He cited one case where the rifle would malfunction on a frequency rate of one in ten times.

2 of 3
AL 0023579

H

A

To: C. B. Workman
From: J. P. Linde
Subject: Visit with Lt. C. V. Tompkins
M/700 Firing "Off Safe"

- 3 -

June 20, 1977

No mention of any kind of deal or settlement was discussed; only the technical points were covered. He did mention the letter which said we had a problem with the M/700 Safety from Mr. R. B. Sperling. We informed him that we had had a problem with the Mohawk 600 Safety with a limited number of production rifles but had traced down and corrected all rifles involved.

He had tried to duplicate the condition with his rifle after the accident but could not; that is, he could not make the rifle in question malfunction.

Mr. Tompkins answered all of our questions in a very straightforward manner. He makes a good impression and is a very avid hunter. Last year he won a trophy for shooting a deer with one of the biggest racks taken in Texas. He was not convinced that there is nothing wrong with the rifle but he is not as sure of himself as he was.

J. P. Linde, Manager
Manual Firearms Design
Illion Research Division

JPL/nl

3 of 3
AL 0023580

H

May 20, 1977

MODEL 700 SAFETY EVALUATION

SERIAL NO. 6338370 - 25-06 E. Sliwa

As received, all functions work correctly. The rifle shows moderate usage. The rifle is a pre-1974.

1. Cocking notch on bolt roughed up.
2. Slight wear mark on left edge of Firing Pin Head.
3. Much large unburned powder particles found throughout action. Six particles found on Floor Plate. Sample .042" Dia. - .082" long.
4. Parts have a generally oily appearance - not excessive, but, could affect cold weather operation.
5. Fire control of welded design not riveted.
6. Adjustment screws have not been tampered with - sealant is still intact.
7. No trigger scrubbing on trigger guard.
8. No interference marks in stock at either trigger or safety position.
- 9/ Sear works free in housing .
10. Trigger Assembly fits tightly in Receiver.
11. Excessive oil on Bolt Stop.
12. Excessive oil on sides of Sear Safety Cam.
13. Sear shows 70% bearing with Connector.
14. Line on Connector shows satisfactory engagement.
15. Satisfactory clearance between Trigger Connector and Sear.
16. Engagement ok. - Sear Connector
17. Edge of Bolt Stop tore off.
18. Powder particles back in action along Bolt Stop.

F. E. Martin/nl

PLAINTIFF'S
EXHIBIT

3103

AL 0023586

Illion Research Division

May 20, 1977

MODEL 700 SAFETY EVALUATION

Serial No. 6859218

.270 Win.

J. Schiro

1. Safety lever is hitting bolt plug and top of stock.
2. Bright spot on bolt plug.
3. Slight galling on cocking cam on bolt body.
4. Trigger pull taken across comb cuts - 5#.
5. Firing pin head lines up with detent on bolt body.
6. Adjustment screws still glued.
7. Free oil on metal parts.
8. Lots of free oil on bolt stop.
9. Fire control housing full of free oil.
10. Sear surface sharp.

P. E. Martin/nl

1 of 1
PLAINTIFF'S
EXHIBIT

3104

AL 0023587

May 20, 1977

MODEL 700 SAFETY EVALUATION

SERIAL NO, 6718369 - 30-06

E. Sliwa

As received all functions work correctly. The rifle shows moderate usage.

1. No signs of rubbing in Trigger Guard.
2. No signs of interference in Stock.
3. Visible signs of wet oil throughout assembly.
4. Seals on adjustment screws unaltered from the factory.
5. Slight mis-shape on the rear of Sear Safety Cam.
6. Trigger Assembly has axially (sideways) play on Receiver Assembly Pins. Play perpendicular to bore of rifle.
7. Sear not oily - inside of Housing has thin coat of oil - not excessive.
8. Definite burrs on Sear Safety Cam where part was densified on the Firing Pin contact surface.
9. Engagement of Sear Connector - good.
10. Top of Connector looks good.
11. Corner of Sear Safety Cam ok.
12. Housing shows slight deformation directly above assembly pin hole. Could have been done by assembler spreading housing.
13. Detent ball working in correct position.
14. Wear marks in Trigger Housing where Sear (burr on Sear) was scrubbing. Could see where this could cause follow down but not fire off safe condition.

F. E. Martin/nl

PLAINTIFF'S
EXHIBIT

3105

10f1
AL 0023588

May 17, 1977

FIVE YEAR DEVELOPMENT PROJECTION
MANUAL FIREARMS DESIGN GROUP

CENTERFIRE RIFLES

1. Develop new fire control assembly for Mohawk 600 and M/700. Improved trigger pull, reduced assembly procedures, and more features.
2. Design a short lightweight mini carbine based on the Mohawk 600. Rifle would be available in high velocity cartridges and would be lighter and shorter than M/94 Winchester.
3. Complete development and determine process requirements to manufacture integral scope rings for Mohawk 600 and M/700 rifles.
4. Develop detachable magazine box for M/700 rifle.
5. Add two new cartridges to XP-100 pistol.
6. Design new single shot centerfire rifle.
7. Develop new bolt action centerfire rifle scaled between the M/788 and 580s to handle the cartridges with the .22 Rem. head size.
8. Implement the super accurate bench rest cartridges (.22 BR and 6mm BR) into the M/700 Varmint rifles.
9. Finish development of the 7mm/08 cartridge and implement in the M/700 short action, Mohawk 600, and M/788.

1 of 1

PLAINTIFF'S
EXHIBIT

3106

AL 0023590

Alton, New York
May 2, 1977

TO: C. B. WORKMAN

FROM: J. P. LINDE

SUBJECT: M/700 FIRE CONTROL
RETURNED BY FIELD SERVICE REPRESENTATIVES

The Fire Control was returned from Mac's Gun Shop by F. W. Woodrick. Fred tried to duplicate the condition with the customer's rifle and could not duplicate the fire off safe condition. He replaced the Fire Control returning the questionable Fire Control to Alton.

The Fire Control was inspected by the writer and P. E. Martin. The Fire Control was assembled to a M/700 action. The Fire Control performed perfectly in all testing. All different sequences of operation and methods of operation were tried. In every case the Fire Control could not be made to malfunction.

We have inspected the questionable Fire Control and made the following observations:

1. Trigger pull - 5 3/4 pounds; trigger returns to initial position when partially pulled and released.
2. Adequate clearance between connector and sear in "on safe" position.
3. Adjusting screws not tampered with - all three sealed.
4. Connector- Sear engagement ok.

1 of 3
PLAINTIFF'S
EXHIBIT

3107

AL 0023594

A
To: C. B. Workman
From: J. P. Linde
Subject: M/700 Fire Control
Returned by Field Service Representatives

- 2 -

May 2, 1977

5. No deformation on top of side plates which could hang up sear.
6. The safety detents very positive.
7. Trigger Assembly clean.
8. Trigger housing cross pins tight to receiver.
9. Sear engagement surface sharp.
10. No wear or binding marks on sear.
11. The engagement surface on sear has been polished by customer (note No. 9).
12. The firing pin head was bearing at the top of the sear surface. This would have no effect on given problem.
13. There were two tiny burrs around the trigger pin holes.
14. The connector is tight to trigger; pulls away hard.
15. Rust on trigger and connector. No rust on trigger pin.
16. Burr on trigger pull weight spring hole. Seems to have no effect on fire control operation.
17. Rust in housing.

The only abnormal condition noted in this Fire Control was the pronounced rust on the connector, trigger and inside housing surface. The only feasible explanation of malfunction as described would require the following conditions: If the customer stored the rifle in the fired condition (firing pin forward, sear rotated down, and connector forward) for a period of time and rust formed between the connector and trigger and connector and fire control housing, this would tend to hold the connector forward. If the customer loaded the rifle, and closed the bolt with the safety in the

2 of 3

AL 0023595

A

To: C. B. Workman
From: J. P. Linde
Subject: M/700 Fire Control
Returned by Field Service Representatives

- 3 -

May 2, 1977

"on safe" position, the cam on the safety lever would hold the sear, disconnecting the trigger from the firing pin assembly. When the customer released the safety, the firing pin would fall as the cam on the safety lever was retaining the sear.

This is a possible explanation and not necessarily what happened. The explanation would only apply if the shooter loaded his rifle without functioning it first to make sure everything worked. It would also only apply if the shooter put the rifle in the "on safe" position before closing the bolt; if he closed the bolt with the safety in the fire position he would get a follow down malfunction.

The rust explanation has one attribute; once the connector breaks loose the fire control will work perfectly and the condition will not be able to be duplicated.

J. P. Linde/nl
Illion Research Division

30f3 AL 0028596

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April 25, 1977

NOTES FOR OPERATIONS COMMITTEE

MOHAWK 600, MODEL 700 FIRE CONTROL REVIEW

Mohawk 600 Rifles

Drawings have been transmitted to the plant to alter the Mohawk 600 Fire Control. The Fire Control Housing presently used on the M/700 has been modified so that it will fit the Mohawk 600. This change will yield a common Fire Control Housing for the Mohawk 600 and M/700 rifles. It will reduce cost, as the factory cost of the M/700 Fire Control Housing is less than the factory cost of the Mohawk 600 Fire Control Housing. This change should also improve the detent action of the Mohawk 600 Fire Control. The side plate on the M/700 Housing is heat treated. This is the surface the hardened steel detent ball is spring loaded against to obtain the two Safety positions.

The Safety functions by camming the Sear away from the Trigger; thus the Trigger is disconnected from the firing mechanism. The cam on the Safety Lever was altered to increase the disconnecting clearance. The Sear also had to be altered slightly to allow for the increased clearance. It was felt that the clearance should be increased somewhat to allow for manufacturing tolerances and lower costs by eliminating guns which would be rejected for insufficient clearance. The Safety mechanism operation is checked by the assembler, gallery personnel, and final inspector.

1 of 3

PLAINTIFF'S
EXHIBIT

3108

AL 0023597

April 25, 1977

Mohawk 600 and Model 700 Rifles for Export to Australia

One thousand (1000) Mohawk 600 rifles were shipped to Australia and stopped by the customs officials as being unacceptable for importation. This action was taken because the customs officials claimed the trigger adjusting screws should have a mechanical locking means.

It has been our experience with the Mohawk 600, M/721, M/722 and M/700 rifles that the trigger adjusting screws stay in adjustment. The screws on the Mohawk 600, M/722, M/721 were staked and sealed with Du Pont Duco cement. The M/700 trigger engagement screw is Loc-Tited and sealed with Du Pont Duco cement. All of these trigger adjustment screws will stay in adjustment if they are not tampered with by the customer. The Owner's Manual instructs the customer not to adjust the trigger engagement on the Mohawk 600 and Model 700 rifles.

All Mohawk 600 rifles and Model 700 rifles to be shipped to Australia will be assembled with lock screws in the trigger assembly. These modifications are being made so the rifles will pass their customs requirements and has nothing to do with the safety, function, or performance of the rifles.

2 of 3

AL 0023598

Future Program

Research will do a complete design analysis on all the bolt action rifles and present a proposal to the Operations Committee. The areas of investigation will include:

1. Trigger Assembly adjustability
2. Increase commonality of parts in bolt action line
3. Allow M/700 to be unloaded with Safety in the "on safe" position
4. Improve the trigger pull characteristics
5. Reduce the cost of the Trigger Assembly

J.P. Linde/nl

3 of 3

AL 0023599

January 19, 1977

FIRE CONTROL DESIGN CONSIDERATIONS
- BOLT ACTION RIFLES -

Tolerances

Fire Controls have many interacting parts. And their function requires minimum part movement. Because of this, tolerance buildup is the key problem in designing Fire Controls for mass production. This tolerance buildup problem can be solved in a variety of ways:

- Adjust tolerance buildup out by screw adjustment, bending, swaging, or filing.
- Have several parts sizes in inventory for a selective fit.
- Eliminate the tolerance buildup by performing a manufacturing operation during final assembly. For instance, a critical hole could be drilled during assembly using the assembly up to that point as a fixture.
- Design parts which can move a lot, to move even more to take up tolerance buildups.
- Parts whose function is not critical to safety can be toleranced statistically.

Safeties

Block Trigger Safety

This Safety blocks the movement of the Trigger. The Trigger, in turn, blocks the movement of the Sear which blocks the Firing Pin. When the Safety is disengaged the Trigger may be pulled to fire the rifle. In my opinion this is the ultimate Safety because it blocks all of the functions required to fire the rifle.

This type of Safety will not work on a target type Trigger because the Sear engagement might be adjusted too fine for the tolerances in the Safety. Then the rifle could be shot with the Safety on.

1 of 2
**PLAINTIFF'S
EXHIBIT**

3109

AL 0023605

Safeties - Contd.

Lift Sear Safety

This Safety lifts the Sear clear of the Trigger and blocks it so that, when the Trigger is pulled, it can not release the Sear. This Safety is used on rifles where the Trigger movement is too small to effectively block. It is especially useful on target rifles.

Problems can occur with this Safety if the Trigger binds. Foreign material in the Fire Control, or a bad trigger fit, can cause the Trigger to stick in the "pulled" position. When the Safety is released, there is nothing to support the Sear, so the rifle fires off safe.

This Safety requires more throw than a block trigger safety. This is because it has to do considerable work to lift the Sear against the mainspring force.

A Lift Sear Safety must have constant force camming between the Safety and the Sear. So that the Safety "on" force will be consistent in all tolerance situations.

Bolt Safety or Block Firing Pin Safety

This Safety lifts the Firing Pin from the Sear and blocks it. A binding Trigger will also cause a rifle with this type of Safety to fire "off" safe.

Safety Detents

Safety detents provide the following functions:

- Controls Safety "on" and "off" forces
- Provides positive position stops for Safety "on" and "off"
- Insures no "dead" positions between "on" and "off" where the Safety might otherwise hang up.

The force required to initiate movement of the Safety depends upon the detent spring thrust and the "contact" angle of the detent head. These work together

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January 22, 1975

Creighton & Warren
P. O. Box 15723
2120 Crestmoor Road
Nashville, Tennessee 37215

Attention: Mr. Harry Creighton:

Dear Mr. Creighton:

Thank you for sending us the .308 case that was fired in the Model 700 .25-06. I believe this is the first report we have ever received of this combination! It is amazing, however, the number of similar incidents that do occur especially considering that the caliber designation is clearly stamped on the cartridge head as well as on the barrel of our rifles.

We are glad to hear that there was no damage to speak of and especially that the shooter apparently wasn't hurt. We consider this a testimonial as to the strength of our M/700 rifles. I might add that we make every attempt to design our firearms to be fool-proof, but we will admit that we can't make them idiot proof.

Sincerely,

J. A. Stekl
Elion Research Division

JAS/nl

1 of 2

PLAINTIFF'S
EXHIBIT

3110

AL 0023608

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cc: P.L. Gebrian

July 22, 1973

J. L. Teal

J. S. Martin

We do not intend to change the design of the Trigger Assembly. The one-piece Connector has too many problems in retrofitting, safety and testing. We are planning a process change to the Trigger which will not affect the assembly but will correct our endurance life on the Trigger Assembly.

JSM/al

2 of 2

AL 0023609

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Ilion, New York
May 4, 1976

TO: E. F. BARRETT

FROM: J. F. LINDE

SUBJECT: RELEASE TRIGGER ON REPAIR GUNS

I think the problem should be divided into two parts: (1) guns for conversion or major repair to fire control area, (2) guns with problems which do not affect the fire control.

- (1) It would be impracticable for us to try and put a Release Trigger into a gun which is being converted. The conversion requires major changes to the fire control area which would require a lot of individual effort, both in repair and engineering, to make the customer's Release Trigger work. We would also be jointly responsible for the performance of the Trigger. We want no part of this.
- (2) On guns with problems which do not affect the fire control I would not take out the Release; I would leave it as the customer has it set up and fix the problem area, such as cracked stock. Special labels should be made to affix to the gun so that in its in plant handling everyone knows that it is a Release Trigger. A special tester should be educated in their function and used to test the limited number which are received.

It is unfair to the shooter who has a breakdown of some part with nothing to do with the fire control to have to pay additional to have his Release Trigger reinstalled. In any case all guns must be test fired before they leave the factory.

H

1 of 1

PLAINTIFF'S
EXHIBIT

3111

AL 0023644

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September 29, 1976

Mr. C. V. Tompkins
803 Ave. J
South Houston, Texas 77587

E

Dear Mr. Tompkins:

We have reviewed your M/700 BDL rifle, serial number 6581402, and we cannot duplicate the conditions you describe in your letter. Our preliminary examination does not show any conditions which would cause the condition you describe. In matters such as this we do not want to leave any stone unturned so could you give us a better description of the events and motions you went through when you loaded, repositioned, and moved the safety from the "safe" to the "fire" position.

We are also concerned about the other M/700 rifles you describe in your letter and would like the names and addresses of the owners of these rifles so we can contact them and subsequently inspect their rifles.

We would be glad to check over your two sons' M/600 rifles. Return them when it is convenient for you and we will check them for proper functioning. Please return these 600 rifles to the Ilion Plant, marked to the attention of Mr. George Martin, insured and collect.

Thank you for your consideration.

Sincerely,

John P. Linde, Manager
Manual Firearms Design
Ilion Research Division

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JPL/nl

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1 of 1

AL 0023653

PLAINTIFF'S
EXHIBIT

3112

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October 18, 1976

TO: J. P. LINDE
FROM: F. B. MARTIN
SUBJECT: PROGRESS REPORT JULY - SEPTEMBER

M/600 & XP-100

All drawings for the new style Fire Control have been transmitted and it is expected to be in production in January 1977.

The cost estimate for XP-100 new style Safety has been received from I. E. and a decision as to transmittal date has to be made at R&D level.

Several samples of the new M/600 Trigger Guard have been made and assembled to rifles for review. No decision has been made.

Model 700

The 8mm Rem. Magnum development is continuing with both ammunition development and rifle assembly and testing. A lot of 12 rifles has been put up by Production and are being tested in the gallery.

A second group of three rifles was assembled by the writer and turned over to the Test Lab for testing. Subjects for this testing are accuracy, barrel bracket bending, function, and stock strength. To date the following tests have been completed and results are listed below:

Accuracy: Shoulder	- 3 Gun Ave. -	220 Gr. Factory	3.23"
		185 Gr. Factory	3.14"
		220 Gr. Handload	2.66"
Accuracy Device	- 3 Gun Ave.	220 Gr. Factory	4.17"
		185 Gr. Factory	2.87"
		220 Gr. Handload	3.70"

1 of 2

PLAINTIFF'S
EXHIBIT

3113

AL 0023654

A

To: J. P. Linde
From: F. E. Martin
Subject: Progress Report July - September

Page 2

October 18, 1976

Model 700 - Contd.

Barrel Bracket Bending: has been measured before and after Proof. The Bracket was found to deform .001 with no progressive movement with successive shooting.

Functioning: functioning of these rifles has been checked with both dummies and live ammunition of both bullet weights. Some difficulties were encountered using the dummies. It has been generally accepted by those involved that the finish on the dummies was causing the problem.

Some alterations to the Receiver feed rails and release point have been made and found to cause more problems. This alteration has been dropped. Also the ejection clearance cut was altered. This has been found to help ejection but the appearance was found to be objectionable. No decision has been made as yet.

Stock Strength: the Stocks were examined by the writer and Test Lab personnel for cracking or breakage before and after Proof, and also after the subsequent limited shooting. To date no breakage has been observed.

For the present, accuracy continues to be our chief concern. It is hoped that with the latest loadings from Lonoke our accuracy, both from the shoulder and jack, will improve. It was learned late last week that 25,000 rounds of each bullet weight had been loaded in Lonoke and that a quantity was being prepared for shipment to Ilion.

Fire Control Lubricant

Complaints from the field of hard or heavy trigger pull, creep, and extremely stiff triggers have prompted us to start investigation into cause and solution for these problems. Trigger pulls of twenty rifles were taken on Assembly ranging from 4 1/4# to 6 1/2#. Two guns have been prepared by Assembly and delivered to the Test Lab for dry cycle testing. It is felt that by measuring trigger pulls every 250 cycles for 25,000 cycles that a pattern can be established. A second sample will be tested using a new lubricant to help us evaluate both lubricant and assembly methods.

2 of 2

AL 0023655

CC: W.E. Leek-M.H. Walker
C.J. Theriault
H.J. Hackman-V.G. DeRosa
E. Sapp
J.W. Miller

January 9, 1953

TO: W. A. Best
FROM: E. M. Alvis
SUBJECT: MODEL 721 QUALITY & ENDURANCE TESTING

Under date of January 5th, C. J. Theriault, of the Testing Unit, issued report of results covering the quality and endurance test for the Model 721 which was conducted by Research during 1952. In this connection, a conclusion was made with respect to adequacy of functioning. This conclusion was based on assumptions with respect to the original trial and pilot test as made for this model many years ago.

We have since discussed the matter with C. J. Theriault and believe have reached an agreement as to the fallacy of such a policy. In other words, we often assume certain calculated risks in connection with new models but only on basis of confidence that required standards of quality will be attained as production improvements are made. Then too, we must all agree that the complaints from customers is one of our principal yardsticks, especially as to "what will be acceptable", and we believe that everyone will agree that a 2% malfunction rate in a bolt action gun of this type is too high and that the results of any such tests should be carefully analysed in an effort to use the information to the best possible advantage towards improving our quality.

We have, therefore, suggested to C. J. Theriault that in future reports of this type, they will simply record and report on the factual results and, where practical, to give comparisons of previous testing. No attempt should be made to judge adequacy.

E. M. Alvis
E. M. Alvis

Arms Research & Development Division

SM:LF

1081
PLAINTIFF'S
EXHIBIT

3114

AL 0023676

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M/721 ENDURANCE
TEST - 1952

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PLAINTIFF'S
EXHIBIT
3115

AL 0023677

10 of 22

10021 721 30-06

DATE 10-2-58

[illegible]

AL 0023679

2072

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AL 0023680

3048

A

 MODEL 725-366

 DATE 8-15-52

R.T. No.	Rounds Fired	Malfunctions											Remarks		
		Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	
	4040														END TEST # 199805 END GUN
Rem 110 M	4080				1										Ext Drops Shell
	4120				1										" " " "
Rem 220 SP	4160														OK
	4200				1										Ext Drop shell
	4240				1										" " " "
Bolt Release Binds															
8-25-52															
Rem 150 MC	4280				111										Ext Drop shell
	4320				111										" " " "
Win 220 ST	4360														OK
	4400														OK
	4440														OK
Win 150 ST	4480														OK
	4520														OK
	4560														OK
Win 150 SP	4600														OK
	4640														OK
8-29-52															
Win 150 Exp	4640														OK
"	4680														OK
Peters 150 MC	4720				14	12									Ext drop shell + ejection
Rem 110 MUSH	4760				1										Ext. dropped shell
Win 180 ST	4800				1										" " " "
Rem 180 SP	4840				1										Ext. dropped shell
Rem 110 MUSH	4880				1										" " " "
Win 180 ST	4920				1										" " " "
Rem 150 M.C	4960				3	8									" " " "
49															

AL 0023681

40 of 20

MODEL 721 30-06DATE 6-6-52

R.T. No.	Rounds Fired	Malfunctions								Remarks
		Feeding	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	
	3240									Quality and Endurance Test #19805-
Win 110 S.P.	3241-3250									Endurance Gun OK
	3320									OK
30.180 MC	3321-									6-20-52
	3360									First to extend
	3400									6 " " " "
	3520									" " " "
										" " " "
Win 120 B.P.	3401-									" " " "
	3440									" " " "
	3520									" " " "
										" " " "
Win 180 ST	3560									" " " "
	3600									" " " "
	3640									" " " "
										" " " "
REM 180 RP	3680									OK
	3720									OK
	3760									OK
Peter 180 SP	3800									OK
	3840									OK
	3880									EXT. DROP SHELLS
REM 220 S2	3920									EXT. DROP SHELLS
	3960									" " " "
REM 150 MC	4000									" " " "
										OK
REM										EXT. DROP SHELLS
150 MC	4040									Failed to EXT
										(47)

AL 0023682

5 of 22

MODEL 721-20000

DATE 5-26-52

R.T. No.	Rounds Fired	Malfunctions										Adjustments	Remarks
		Firing	Unloading	Primary Ejection	Secondary Ejection	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	
	2440 Run												Quality 2400 Excessive near Endurance Gun 199903
Run 220	2450												OK
S.P.	2520												OK
"	2560												OK
"	2600												OK
West 180 S.P.	2601- 2640												OK
	2680												fail to eject
	2720												" " " "
	2760												" " " "
	2800												" " " "
Win 180													
S.P.	2801- 2840												OK
	2880												OK
	2920												action chamber
	2960												OK
	3000												OK
Pat. 180 S.P.	3001- 3040												OK
	3080												1 bolt stop pin works in chamber. bolt stop to fail to hold bolt
West 150 S.P.	3081- 3120												OK
	3160												OK
Run 150 AP.	3200												1 bolt stop pin worked out easily. bolt stop to fail to hold bolt
													OK
	3240												OK

AL 0023683

6 of 22

Capital built assembly with
1000 ad on it. (Spoke other where
#1 0.1

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STANDARD ENDURANCE TEST CENTER FIRE RIFLES

MODEL 721 30-06

GUN NO. 199805

To Be Performed Every 1000 Rnds.

Clean and Oil

Head Space (Min-Max)

Trigger Pull

Firing Pin Indentation

Bolt Opening-Cocked

Bolt Opening-Cocking

Safety Mech. Test

Jer Off Test

	0	100	1000	2000	3000	4000	5000
		✓	✓	✓	✓	✓	✓
		OK	OK	OK	OK	OK	OK
		4 3/8"	4 3/4"	5 1/4"	4 3/4"	4 3/4"	4 1/2"
		.020"	.020"	.025"	.020"	.0215	.020
		4"	4"	2 1/2"	3 1/2"	3 1/2"	3 1/2"
		10"	10"	10"	12"	11 1/2"	11 1/2"
		OK	OK	OK	OK	OK	OK
		OK	OK	OK	OK	OK	OK

To Be Performed Every 2000 Rnds.

Main Spring

~~EJECTOR~~
~~Sear Lock Plunger Spring~~

~~SEAR~~
~~Action Bar Lock Spring~~

~~Loading Bar Spring~~

~~Magazine Spring~~

~~Extractor Spring~~

~~Trigger Spring~~

	6.2"	6.2"	6.2"	6.2"	6.2"	6.2"
	1.2"	1.2"	1.2"	1.2"	1.2"	1.2"
	.55"	.55"	.55"	.55"	.55"	.55"

RL 10/29/51

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AL 0023688

9 of 22

STANDARD ENDURANCE TEST CENTER FIRE RIFLES

MODEL 721 30-06

GUN NO. 238483

To Be Performed Every 1000 Rads.

Clean and Old

Road Space (Min-Max)

Trigger Pull

Firing Pin Indentation

Bolt Opening-Cocked

Bolt Opening-Cocking

Safety Mach. Test

Jer Off Test

To Be Performed Every 2000 Rnds.

Main Spring

EJECTOR
~~Door Lock Plunger~~ Spring

SEAR
~~Motion Bar Lock~~ Spring

~~Landing Door Spring~~

~~Magazine Spring~~

~~Detention Service~~

~~Training Society~~

NL 10/29/51

	0	720	1,000	2,000	3,000	4,000	5,000
X	OK						
	5.75"						
	.620"						
K	2.5#						
	10"						
	C +						
	6"						
S	6.25"						
	1.18"						
	.53"						
I							
c							

DATE 5-9-52

11 of 22

A

MODEL 751 39-46

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions											Remarks
		Spring	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	
													QUALITY AND ENDURANCE TEST
													237412
Win 220 S&W	20							7					
Rem 800 P	40												6/c
Win 150 S&W	60												OK
Rem 110 M	80												OK
Win 120	100												OK
Win 120	120												Don - full to 1000
Rem 220 S&W	160												OK
Win 180 P	200												OK
Win 150 S&W	220												1st time
Win 150 S&W	240												OK
Win 120	260												chamber loaded up
Win 220 S&W	280												OK
Win 150 S&W	300												OK
Rem 110 M	320												OK
<p>Leading up of brush causing head opening of bolt picked for continued test</p>													
<p>17</p>													

AL 0023691

12 of 22

1000 721 20-00

DATE 5-9-52

[illegible]

AL 0023697

1304

A

MODEL 721 21-55

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions										Remarks		
		Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakers		Replacements	Gun Failures
011220500	20													237412
011220500	40													OK
011220500	60													OK
011220500	80													OK
011220500	100													OK
011220500	120													OK
011220500	140													OK
011220500	160													OK
011220500	180													OK
011220500	200													OK
011220500	220													OK
011220500	240													OK
011220500	260													OK
011220500	280													OK
011220500	300													OK
011220500	320													OK
011220500	340													OK
011220500	360													OK
011220500	380													OK
011220500	400													OK
011220500	420													OK
011220500	440													OK
011220500	460													OK
011220500	480													OK
011220500	500													OK
011220500	520													OK
011220500	540													OK
011220500	560													OK
011220500	580													OK
011220500	600													OK
011220500	620													OK
011220500	640													OK
011220500	660													OK
011220500	680													OK
011220500	700													OK
011220500	720													OK
011220500	740													OK
011220500	760													OK
011220500	780													OK
011220500	800													OK
011220500	820													OK
011220500	840													OK
011220500	860													OK
011220500	880													OK
011220500	900													OK
011220500	920													OK
011220500	940													OK
011220500	960													OK
011220500	980													OK
011220500	1000													OK

177 Locking up of brush causing
 head opening of 177
 picked for continued test

177

AL 0023693

14 of 22

A

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Pounds Fired	Malfunctions								Replacements	Gun Failures	Adjustments	Remarks
		Feeding	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages		
Win 130 SP	20												OK
REM 170 SP	40												OK
Win 150 M.P.	60												OK
Rem 110 M.	80												OK
Win 140	100												OK
SP	120												OK
Rem 220 S.P.	160												OK
GA 140 PEX	200												OK
Win 180 SP	240												OK
Win 160 ST	280												OK
Rem 110 M	260												OK
Win 220 SX	320												OK
Win 150 M.P.	300												OK
Win 140	320												OK
<div> <div>① Loading up of truck missing head</div> <div>opening of bolt</div> </div>													
<div> <div>Win 130 SP</div> <div>Win 150 M.P.</div> <div>Win 140</div> <div>Win 160 ST</div> <div>Win 180 SP</div> <div>Win 220 SX</div> <div>Win 110 M</div> <div>Win 140</div> <div>Win 160 ST</div> <div>Win 180 SP</div> <div>Win 220 SX</div> <div>Win 110 M</div> <div>Win 140</div> <div>Win 160 ST</div> </div>													

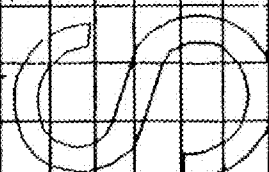

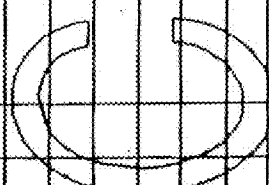
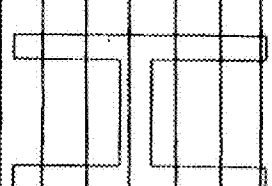
DATE 5-7-52

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A

MODEL 721 30-46

DATE 5-7-58

R.T. No.	Rounds Fired	Malfunctions										Adjustments	Remarks		
		Feeding	Unloading	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages			Replacements	Gun Failures
Win 220 ST.	120													OK	QUALITY AND ENDURANCE TEST # 2055P7
Run 100 g.p.	40													OK	
Win 150 ST.	60													OK	
Run 110 M.	70													OK	
Win 150 ST.	120													OK	
Run 220	140													OK	
SD	160													OK	
Get PPE	200													OK	
Win 150 ST.	220													OK	
Run 150 ST.	240													OK	
Win 220 ST.	220													OK	   
Win 150 ST.	300													OK	
Run 110 M.	220													OK	
<p>Handing up of brush causing hard opening of M.H.</p> <p>Tank</p>															

AL 0023697

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A

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions											Remarks
		Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	
		0											QUALITY AND ENDURANCE TEST
Win 220ST	1-24				Jack			1					237007 stem chamber
Win 100BP	40												OK
Win 150HP	50												OK
Win 110Mush	80												OK
Win 180SP	120												OK
Win 220	140												OK
Win SP	160												OK
Win 400PAX	200												OK
													Field Test (Shoulder)
Win 100ST	240												OK
Win 110M	260												OK
Win 220Ex	280												stem chamber
Win 150HP	300												OK
Win 100BP	320												OK
													⑥ leading up of brush causing hard opening of bolt

AL 0023701

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cc: G.M. Calhoun
J.E. Maupin
H.J. Hackman
E. Sapp
W.E. Leek
M.H. Walker

MEMORANDUM OF DISCUSSION

March 23, 1954

PLAINTIFF'S
EXHIBIT

3116

SUBJECT: MODEL 721-722 QUALITY
Notes on Discussion Held in Gun Room 3-23-54
Between Messrs. Hackman, Sapp, Leek, Walker & Alvis

The purpose of this discussion was an effort to correlate a number of items which R&D personnel feel to be adverse to quality. Also, it is felt that some of these items may be directly or indirectly contributing to reductions in sales on these models.

It was not expected that the results of this discussion would be conclusive since in most cases there is not sufficient information. It was also confirmed that in most cases the Plant is fully aware of the conditions reported but question the justification of expense that would be involved to meet the requirements considered necessary by Research personnel. However, it was agreed desirable that this information be reviewed so that there would be no question regarding the opinions of each group, and where indicated, additional data is to be obtained for consultation with Management and Sales regarding action to be taken.

Lapping of Barrels

The lapping operation was discontinued quite some time ago and on basis of test results through the Plant Gallery. Research personnel are of opinion that elimination of the lapping is not necessarily reflected in normal Gallery testing but that it does cause excessive fouling of the barrel after additional firing. It was also brought out that the use of double base powders such as in the 222 Remington caliber further aggravates this situation and also is contributing to the pitting of barrels such as observed in many of our production guns.

This question as to whether or not we should consider going back to the lapping can be resolved only after making further test and it was tentatively agreed that such a test would be run using approximately 60 rifles in 222 Cal. as now being run. One half of these would be lapped in a manner considered satisfactory to P.E. & C. and Research, and each gun would be fired a total of six 5-shot groups through accuracy testing device. (The above test may well be subject to review by the Plant Testing Committee).

Chamber Diameter

This item has come up more recently because of guns returned, in 300 HAM Mag. caliber and involves "high spots" in the chambers

AL 0023714

1083

thought to be caused by our chambering tools and not easily picked up by the air gage. It was brought out that the condition would probably not cause trouble with factory ammunition but since it does not conform with SAAMI "max. cartridge" dimensions we should take steps to correct same.

Caliber 222 - Groove Diameter

It was reported that the present lot of 222 caliber barrels are being produced with a groove diameter from .002" to .005" under size. It is understood that production feels that these barrels should be satisfactory in finished guns and that they will "shoot" to meet accuracy specifications. R&D personnel are of opinion that this variation in groove diameter may very well affect ballistics, especially that of pressures, and that the barrels should be "lapped in" to proper dimensions. It is understood that this condition was probably caused by fact that we have not revised our tools to accommodate the new stress release furnace. In the past we have "pickled out" a certain amount of scale from the barrels after heat treating. With the new atmosphere control furnace there is no loss of metal in scale.

Alignment of Threads - Receiver to Barrel

M.H. Walker pointed out that the misalignment in this assembly does not conform to drawing requirements. E. Sapp reported that he is having this investigated further and will advise just what is involved. Again, this may be a question as to justification for making a change.

Extractors

M.H. Walker pointed out that some time ago we accepted a lot of extractors which had "missed" an operation. It seems that this came to the attention of Research while investigating complaint guns involving extraction difficulties. Apparently there is no further question on this item, only that of concern with respect to the quantity of guns produced with these extractors that may cause future complaints.

M/721-722 Quality - General

H.J. Hackman pointed out that complaints on these two models during 1953 totaled approximately 500 guns in all categories and "were just and unjust complaints", out of a total production of approximately 50,000. This is considered to be a very good level. However, opinion was expressed that because of the number of rifles which are being repaired on the outside there is some doubt as to whether or not our complaint report records show a true picture. It was agreed that we have no other means of accurately measuring our quality.

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-3-

Future Program

Copies of notes on this discussion are being distributed to interested personnel and arrangements will be made to again review the situation within approximately one month.

S. H. Alvis, Manager
Arms Research & Development Division

SMA:T
3-24-54

AL 0023716

3 of 3

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L

E

Quality

May 18, 1954.

TO: H.J. BACKMAN (6)
FROM: QUALITY CONTROL DEPARTMENT
SUBJECT: M/72-722 TRIGGER FULL

Referring to S. M. Alvis' letter of 3/22/54 to H. J. Backman on the above subject -

The attached distribution indicates that the subject characteristic is not very well controlled in our finished guns.

If feasible, from the time and cost point-of-view, the picture could be improved by instructing the Assemblers making the Trigger Pull adjustment to work to the mean of the specs. It is suggested that the distribution would be a helpful part of any such instructions.

A corollary problem of variable Trigger Pull was evidenced on four to six of the Fifty-eight (58) guns.

QUALITY CONTROL DEPARTMENT
A. D. Gordon, Supervisor

BY *W. S. Bryant*
W. S. Bryant

WMB/HAB

H

PLAINTIFF'S
EXHIBIT

3117

AL 0023720

1 of 1

A

L

Illion, New York
May 2, 1977

TO: C. B. WORKMAN

FROM: J. P. LINDE

SUBJECT: M/700 FIRE CONTROL
RETURNED BY FIELD SERVICE REPRESENTATIVES

The Fire Control was returned from Mac's Gun Shop by F. W. Woodrick. Fred tried to duplicate the condition with the customer's rifle and could not duplicate the fire off safe condition. He replaced the Fire Control returning the questionable Fire Control to Illion.

The Fire Control was inspected by the writer and F. B. Martin. The Fire Control was assembled to a M/700 action. The Fire Control performed perfectly in all testing. All different sequences of operation and methods of operation were tried. In every case the Fire Control could not be made to malfunction.

We have inspected the questionable Fire Control and made the following observations:

1. Trigger pull - 5 3/4 pounds; trigger returns to initial position when partially pulled and released.
2. Adequate clearance between connector and sear in "on safe" position.
3. Adjusting screws not tampered with - all three sealed.
4. Connector - Sear engagement ok.

H

PLAINTIFF'S
EXHIBIT

3118

AL 0023757

1 of 3

A

To: C. B. Workman
From: J. P. Linde
Subject: M/700 Fire Control
Returned by Field Service Representatives

- 2 -

May 2, 1977

- L
5. No deformation on top of side plates which could hang up sear.
 6. The safety detents very positive.
 7. Trigger Assembly clean.
 8. Trigger housing cross pins tight to receiver.
 9. Sear engagement surface sharp.
 10. No wear or binding marks on sear.
 11. The engagement surface on sear has been polished by customer (note No. 9).
 12. The firing pin head was bearing at the top of the sear surface. This would have no effect on given problem.
 13. There were two tiny burrs around the trigger pin holes.
 14. The connector is tight to trigger; pulls away hard.
 15. Rust on trigger and connector. No rust on trigger pin.
 16. Burr on trigger pull weight spring hole. Seems to have no effect on fire control operation.
 17. Rust in housing.
- K S C

The only abnormal condition noted in this Fire Control was the pronounced rust on the connector, trigger and inside housing surface. The only feasible explanation of malfunction as described would require the following conditions. If the customer stored the rifle in the fired condition (firing pin forward, sear rotated down, and connector forward) for a period of time and rust formed between the connector and trigger and connector and fire control housing, this would tend to hold the connector forward. If the customer loaded the rifle, and closed the bolt with the safety in the

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AL 0023758

2 of 3

A
To: C. B. Workman
From: J. P. Linde
Subject: M/700 Fire Control
Returned by Field Service Representatives

- 3 -

May 2, 1977

L
"on safe" position, the cam on the safety lever would hold the sear, disconnecting the trigger from the firing pin assembly. When the customer released the safety, the firing pin would fall as the cam on the safety lever was retaining the sear.

This is a possible explanation and not necessarily what happened. The explanation would only apply if the shooter loaded his rifle without functioning it first to make sure everything worked. It would also only apply if the shooter put the rifle in the "on safe" position before closing the bolt; if he closed the bolt with the safety in the fire position he would get a follow down malfunction.

The rust explanation has one attribute; once the connector breaks loose the fire control will work perfectly and the condition will not be able to be duplicated.

J. P. Linde/nl
Ilion Research Division

S I C H
AL 0023759

3 of 3

April 19, 1977

FIRE CONTROL ALTERATIONS
MOHAWK 600

HISTORY OF PROBLEM

1. Malfunction Description:

When the rifle Safety is put in the "on safe" position, the trigger pulled, and the Safety repositioned to the "off safe" position, the rifle fires. The rifle fires when the Safety Lever is positioned to "off safe" when the previous conditions are established.

2. Where Discovered:

The first complaint of this malfunction came from a customer in Houston, Texas, in the first quarter of 1975. Representatives were sent to this area where a warehouse audit was performed on the wholesaler's inventory and four rifles which would fire as described were found.

IMMEDIATE CORRECTIVE ACTION TAKEN

The cause of the malfunction was determined and a procedure was established to check the rifles without disassembly. This procedure consisted of the following elements.

1. Cock rifle
2. Put Safety in "on safe" position
3. Pull Trigger; no click, Trigger should retract
4. Position Safety in "fire" position - rifle should not fire
5. Repeat test 3 times

1 of 1
PLAINTIFF'S
EXHIBIT

3119

AL 0023763

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GUN TESTING MANUAL

Ilion Research Division
Remington Arms Company, Inc.
Ilion, New York

PLAINTIFF'S
EXHIBIT

3120

AL 0023826

1 of 54

Prepared by: C. J. Kirchen
Compiled: 5/1/45 - 1 Page
Revised: 11/1/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #1
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

PROOF FIRING TEST

INTRODUCTION:

~~With the exception of .22 Cal. rifles, every gun~~
should be proof tested before any other ammunition is fired.
This is to insure the safety of the arm. As the name implies,
a "proof" load is purposely higher pressure than any standard
load of the same caliber. (See S.A.A.M.I. manual for specifi-
cations.) If the gun and case withstands this higher pressure,
the gun is assumed to be safe for normal shooting.

Test Range
(In the Ilion plant all proof firing is done in
the plant gallery where proper safeguards are taken to avoid
injury should the arm fail.) Take the gun to the foreman of
~~Commercial Gallery~~ and verbally request the number of proof
rounds to be fired. If desired, this proof firing will be done
in the presence of the person making the request provided the
requestor is equipped with suitable ear plugs. Ammunition will
be supplied by the foreman or from the Technical Division supply
maintained in the gallery for that purpose. After proof firing,
the gun will be stamped with a proof mark by gallery personnel.
The mark used on a particular gun should be recorded in the
test notebook.

CONDITIONS OF TEST:

The steps by which a proof test is made are:

1. Check barrel of each gun for possible obstruction.
2. Check caliber or gage of each gun.
3. Place gun in proof fixture with muzzle in port
hole, weight on the muzzle and stock in jack.
4. Put safe "on".
5. Load gun with proof shell.
6. Close action with loading port away from the face
when gun is in fixture with safe still on.
7. Attach hook to trigger.
8. Throw "safe" off.
9. Pull down boiler plate cover.
10. Move to outside of proof booth, pulling safety
door outward.
11. Pull lanyard to fire.
12. Empty case must be out of gun before gun is
removed from fixture.
13. Check for live ammunition - Chamber must be
empty and follower visible.
14. Check barrel for possible obstructions.
15. Stamp barrel with proof stamp and mark bolt
indicating proofing.

STANDARD TEST QUANTITY: One.

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For Special .001" Increment Head Space Gages (continued)

3. Place smallest head space gage in chamber with clearance flats in proper position.
4. Close bolt carefully.
5. Continue testing with larger head space gages until one is found which will permit the bolt to close but which will cause a slight feel. NOTE: Do not force bolt closed.
6. Record dimension of gage found in Step 5.

For S.A.A.M.I. "Go" - "No Go" Head space Gages:

1. CAUTION: Handle all head space gages with care.
2. Clean and wipe dry: chamber, bolt face, and breeching system surfaces.
3. Place "Go" head space gage in chamber with clearance flats in proper position.
4. Close bolt carefully. NOTE: The bolt must close on the "Go" head space gage.
5. Remove "Go" head space gage from gun.
6. Place "No Go" head space gage in chamber with clearance flats in proper position.
7. Close bolt carefully. NOTE: The bolt must not close on the "No Go" head space gage.

Accuracy may be affected by the following items:

1. Ammunition
2. Shooter
3. Gun
4. Range Conditions

A quantitative test of accuracy should consider each one of these variables and steps should be taken to evaluate the effect of each. This test is qualitative only, hence only a few of the above variables are considered.

CONDITIONS OF TEST

1. Use a 10 power telescope equipped with fine cross hairs.
2. Fire all shots from a bench rest.
3. Clean barrel.
4. Fire three fouling shots.
5. Fire five ten-shot groups.
6. Rate of fire should approximate one per minute.
7. Fire Mann barrel accuracy in same manner except for 1 and 2. In order to reduce the effect of ammunition variables, Mann barrel accuracy is obtained on each lot of ammunition used for accuracy testing.
8. Record bullet weight, type and lot number of ammunition.
9. Measure and record extreme vertical spread.
10. Measure and record extreme horizontal spread.
11. Determine mean radius for each target.
12. Calculate:

$$\frac{\text{Mean Radius (Mann)}}{\text{Mean Radius (Test)}} \times 100 = \% \text{ Mann Barrel Accuracy}$$

13. The following ammunition is to be used in the calibers noted:

(a) .300 Savage	180 grain Soft Point
(b) .30 Remington	170 grain Soft Point
(c) .270 Winchester	150 grain Soft Point
(d) .35 Remington	200 grain Soft Point
(e) .30/40	180 grain Soft Point
(f) .300 H&H Magnum	220 grain Soft Point
(g) .32/20	100 grain Soft Point
(h) .22 Hornet	45 grain Soft Point
(i) .32 Winchester Spec.	170 grain Soft Point
(j) .257 Remington Roberts	117 grain Soft Point
(k) .30/06	220 grain Soft Point
(l) .243	100 grain Soft Point
(m) 7mm Remington	175 grain Pointed Soft Point
(n) .222 Remington	50 grain Soft Point
(o) 6mm Remington	100 grain Pointed Soft Point
(p) 22-250 Remington	55 grain Pointed Soft Point
(q) 30-30 Winchester	170 grain Soft Point
(r) .308 Winchester	180 grain Pointed Soft Point
(s) 44 Remington Mag.	240 grain Soft Point
(t) .223 Remington	55 grain Soft Point

Accuracy Test(Qualitative) Continued

Page 4

(u) .350 Remington Mag. 200 grain Pointed Soft Point
(v) 6.5 Remington Mag. 120 grain Pointed Soft Point
(w) .300 Winchester Mag. 180 grain Soft Point
(x) .264 Winchester Mag. 140 grain Soft Point
(y) 7.62 NATO 168 grain Soft Point
(z) .280 Remington 165 grain Soft Point
(aa) .221 Remington Fireball 50 grain Soft Point
(bb) .22 L. Rifle 40 grain Soft Point

AL 0023834

6 of 54

Prepared by: H.C. Moss
Compiled: 5/1/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #5
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

STABILITY OF CENTER OF IMPACT

Stability of center of impact is important in a sporting arm because it is extremely desirable to have a gun which will place different weight bullets in approximately the same location on a target. This test is designed to determine the difference in center of impact between the ammunition selected for accuracy shooting and ammunition of a different bullet weight.

CONDITIONS OF TEST

All firing is done according to Accuracy Test (Qualitative) except as noted below:

1. Fire 5 shots without sighting on target to warm gun.
2. Fire 5 shots at one target with ammunition noted in Accuracy Test.
3. Mark holes in target to designate bullet weight.
4. Fire 5 shots at same target with different weight of bullet.
5. Mark holes.
6. Locate center of impact of each group.
7. Determine distance between the two centers of impact and record.

STANDARD TEST QUANTITY

15 Rounds	5 warm up
	5 accuracy cartridges
	5 cartridges of different bullet weight

This test may be repeated as many times as necessary to cover each bullet weight normally manufactured in the caliber being tested.

Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 5/21/45 - 2 Page
Revised: 1/9/69 - 2 Pages

Gun Test #6
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

TRIGGER PULL TEST

INTRODUCTION

Trigger pull is important because of the part it plays in firing the gun and the effect this may have on accuracy. The trigger mechanism should be of such design and construction that the trigger pull will remain substantially constant.

To perform the test it is necessary to place gun in a holder to keep the gun stationary in a horizontal position. The reading is measured with a special trigger pull scale. The maximum reading is marked on the trigger pull scale with a slider device. The trigger pull scale should be in such a position as to have line or pull pass the comb of the stock. See original sketch. Trigger pull is defined as the average of ten (10) tests.

CONDITIONS OF TEST

1. Clear and check for ammunition.
2. Place gun in holder.
3. Close and cock gun.
4. Release safety device.
5. Move slider to zero position on trigger pull scale.
6. Insert trigger pull scale on trigger and pull on scale slowly till firing pin is released.
7. Read scale value as marked by slider device.
8. Perform this test a total of ten (10) times.
9. Calculate and record average.

STANDARD TEST QUANTITY

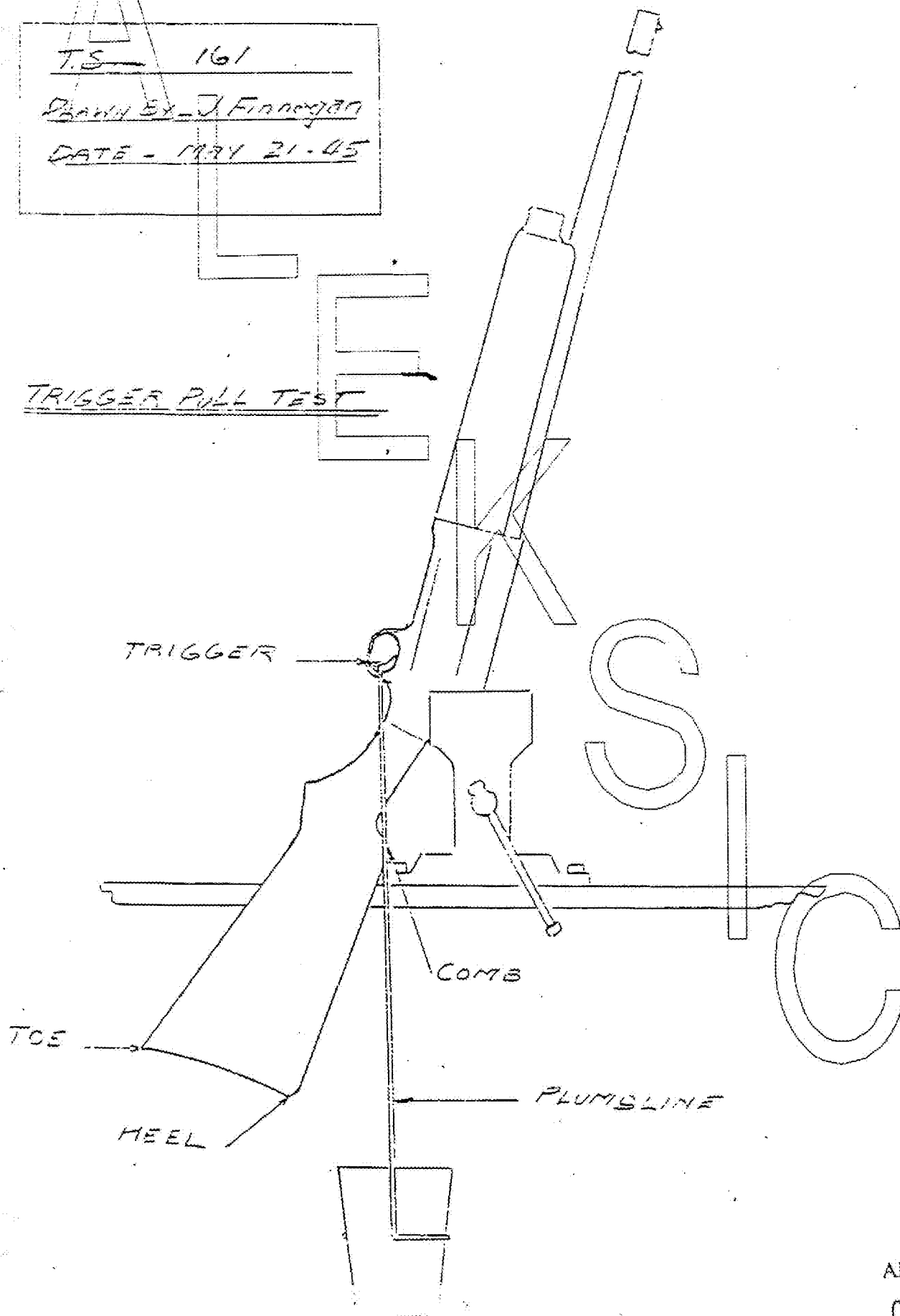
One determination.

AL 0023836

8 of 54

T.S. 161
DRAWN BY - J. Finnegan
DATE - MAY 21-45

TRIGGER PULL TEST



AL 0023837

9 of 54

Prepared by: C.J. Kirchen
Compiled: 10/10/44 - 2 Pages
Revised: 2/15/45 - 1 Page
Revised: 11/13/45 - 2 Pages

Gun Test #7
Uses: 1. Bolt Action High
Power Rifle
2. .22 Cal. Autoloading
Rifle

INTERCHANGEABILITY TEST

INTRODUCTION:

Interchangeability of parts is important and desirable for a number of reasons:

- a. Reduction of assembly costs.
- b. Simplification of service.

The optimum condition is that all parts of each model be interchangeable with a corresponding part of the same model.

For .22 Cal. Autoloading Rifles, only certain parts are subject to interchangeability, and the criterion of success or failure is the Standard Live Fire Test only.

CONDITIONS OF TEST:

For high power rifle:

1. Perform following tests on all guns selected for interchange.
 - a. Headspace
 - b. Trigger Pull
 - c. Bolt Lift
 - d. Firing Pin Protrusion and Indentation
 - e. Safety Mechanism
 - f. Accuracy
 - g. Standard Live Firing
2. Disassemble each gun with the exception of barrel-receiver assembly. Serial numbers on the receiver will be used for reference.
3. Place all like components in one container.
4. Mix thoroughly.
5. Reassemble by random selection of parts.

6. Record any difficulty encountered in assembling the guns. Since the object of this test is to accumulate data having considerable relation to the fundamental design and manufacture of guns, it is imperative that each minute detail as to why a component is not interchangeable be recorded.
7. After the guns are reassembled, repeat tests made in 1.

For .22 Cal. Autoloading Rifles

1. This test involves parts to be specified by the Design Unit.
2. Subject each gun to Standard Live Fire Test.
3. Disassemble guns insofar as is necessary to obtain parts to be used in the test. Serial numbers on the receiver will be used for reference.
4. For each single gun, keep all components not used in the interchange in a single container numbered to correspond with receiver serial number.
5. Place all like components to be interchanged in one container.
6. Mix thoroughly.
7. Reassemble guns by random selection of parts.
8. Record any difficulty encountered in assembling the guns. Since the object of this test is to accumulate data having considerable relation to the fundamental design and manufacture of guns, it is imperative that each minute detail as to why a component is not interchangeable be recorded.
9. After the guns are reassembled, subject each gun to Standard Live Fire Test.
10. Compare results of Standard Live Fire Test before and after interchange.

STANDARD TEST QUANTITY: Ten guns.

Prepared by: C.J. Kirchen
Compiled: 4/14/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #7A

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

INTERCHANGEABILITY TEST

INTRODUCTION

This test is performed for the same reasons as Gun Test #7. It differs from #7 in that only certain parts are subject to interchangeability and the criterion of success or failure is Standard Live Fire Test only.

CONDITIONS OF TEST

1. This test involves parts to be specified by the Design Unit.
2. Subject each gun to Standard Live Fire Test.
3. Disassemble guns insofar as is necessary to obtain parts to be used in the test. Serial numbers on the receiver will be used for reference.
4. For each single gun, keep all components not used in the interchange in a single container numbered to correspond with receiver serial number.
5. Place all like components to be interchanged in one container.
6. Mix thoroughly.
7. Reassemble guns by random selection of parts.
8. Record any difficulty encountered in assembling the guns. Since the object of this test is to accumulate data having considerable relation to the fundamental design and manufacture of guns, it is imperative that each minute detail as to why a component is not interchanged be recorded.
9. After the guns are reassembled, subject each gun to Standard Live Fire Test.
10. Compare results of Standard Live Fire Test before and after interchange.

STANDARD TEST QUANTITY: Ten guns.

AL 0023840

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Prepared by: C.J. Kirchen
Compiled: 10/10/44 - 1 Page
Revised: 8/30/45 - 1 Page
Revised: 1/9/69 - 2 Pages

Gun Test #8
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

FIRING PIN PROTRUSION & INDENTATION TEST

INTRODUCTION

Firing pin protrusion and indentation are important in attaining and maintaining accuracy in center fire rifles. This is due primarily to the manner in which ignition of the primer is produced.

Protrusion is the distance the firing pin protrudes beyond the face of the bolt when the firing pin is in the forward position.

Indentation is the depth of an impression made by the firing pin in a standard copper crusher cylinder when the pin is released normally. Indentation is a measure of the work performed on the primer by the firing pin. To perform the test, an adapter is required to hold the crusher cylinder in the particular caliber being tested. The head of the crusher cylinder is somewhat deformed by the test as it tends to become basin-like when done with the M/121. Care must be taken in establishing a reference point on the head for comparison with the indentation.

CONDITIONS OF TEST

1. Protrusion

- a. Remove bolt from gun.
- b. Release or push firing pin to forward position.
- c. Measure distance from face of bolt to tip of firing pin with depth calipers reading to .001".
- d. Perform this test five times and record average.

2. Indentation

- a. Place standard copper crusher cylinder (see SAAMI for Specifications) in adapter for particular caliber being tested; .22 cal. cylinders need no adapter.
- b. Place adapter in chamber.
- c. Hold muzzle of gun down.
- d. Close bolt (breech block in M/121, taking care action is completely closed by holding muzzle against a clean, solid surface and pushing the slide action forward).

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2. Indentation (Continued)

- e. Pull trigger.
- f. Remove crusher.
- g. Measure depth of impression with dial gage equipped with pointer and reading to .001". Reference point is the center of the flanged head of the crusher cylinder.
- h. Perform this test five times and record average.

STANDARD TEST QUANTITY

One determination; i.e., average of five tests.

Prepared by: C.J. Kirchen
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 7/10/45 - 1 Page
Revised: 11/12/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #9

Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

SAFETY MECHANISM SHOCK TEST

INTRODUCTION

A common source of accidents with firearms is accidental discharge. A safety mechanism is provided to insure against accidental discharge. This test is intended to determine how much shock, if any, will cause the safety mechanism to fail to function properly and allow the gun to be discharged.

CONDITIONS OF TEST:

This test is made by allowing the gun to fall freely a distance of 10 inches upon a solid wood surface with the safety "on". The following positions are used:

1. Butt down
2. Muzzle down
3. Top side down
4. Bottom side down

The trigger shall be tried after each of the above tests to determine whether the safety has released any mechanism which may allow firing.

This test is always made using dummy cartridges and should be conducted very carefully.

STANDARD TEST QUANTITY:

One determination.

Prepared by: C.J. Kirchen
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 2/22/46 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #10

Uses: 1. Bolt Action Center
Fire Rifles
2. Bolt Action Shotguns
3. Bolt Action Rim Fire
Rifles

BOLT OPENING TEST

INTRODUCTION

This test is made at intervals during live fire testing to determine the force required to open the bolt. The force is applied at center of the bolt handle knob. The average of fifty tests at any stage of testing is defined as bolt lift.

CONDITIONS OF TEST

- a. Place gun in spring actuated recoil fixture.
- b. Place one cartridge in chamber.
- c. Fire.
- d. Support the right hand as it pulls on the spring scale to lift the bolt, with the left fore-arm, the left elbow resting near the comb of the stock.
- e. Perform this test 50 times; record average and standard deviation of the 50 trials.

DEVELOPMENT

Fixture, Spring Scale with special attachment to fit the handle ball.

STANDARD TEST QUANTITY

One determination.

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Prepared by: C.J. Kirchen
Compiled: 5/21/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #10A

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

BOLT OPENING TEST

INTRODUCTION

It is the purpose of this test to determine the force necessary to open the bolt. Bolt opening force is significant because it is necessary to open manually the bolt of each gun at least once in clearing the gun of ammunition. This force must be sufficiently large to avoid accidental opening of the bolt, but not so large as to make this a competitive disadvantage of the gun. Bolt opening is defined as the average of ten (10) tests made in manner described below.

CONDITIONS OF TEST

1. Check and clear gun of all ammunition.
2. Place the gun in the fixture designed for this test.
3. Cock the gun and close the bolt.
4. Measure force required to open bolt of the gun.
5. Perform this test ten (10) times.
6. Calculate and record the average.
7. Repeat the test ten (10) times with the firing pin in a released position; calculate and record average.

STANDARD TEST QUANTITY

One determination.

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Prepared by: H.C. Moss
Compiled: 2/15/45 - 1 Page
Revised: 12/29/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #11
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

TAKEDOWN INSPECTION TEST

INTRODUCTION

There occur at times throughout a test, defects in the mechanism which may or may not be serious and are not readily detected from operation or firing but are of considerable importance in making a logical evaluation of the arm.

Some defects of this type may be:

1. Loosening of action in stock unnoticeable by feel but quite obvious from a measurement of guard screw tightness.
2. Improper bedding in stock.
3. Movement or binding in magazine.
4. Loose pins and screws.
5. Broken parts.
6. Excessively worn parts.

CONDITIONS OF TEST

1. Test pins, screws, and fasteners during disassembly for tightness.
2. Test guard screws with a scale screw driver.
3. Clean, inspect and record any and all details no matter how trivial.

Prepared by: H.C. Mose
Compiled: 10/10/44 - 3 Pages
Revised: 2/15/45 - 1 Page
Revised: 1/9/69 - 2 Pages

Gun Test #12

- Uses: 1. Manual Action Center
Fire Rifles
2. Manual Action Shotguns
3. Manual Action Rim Fire
Rifles

STANDARD LIVE FIRING TEST

INTRODUCTION:

Live ammunition is fired in guns under test to observe the function of both the gun and ammunition and to evaluate certain characteristics of the gun. The characteristics of components, new or unused in design, material, method of production, heat treatment and assembly procedures are obviously pertinent.

CONDITIONS OF TEST:

1. Normal lubrication. All parts shall be thoroughly oiled with Remington Oil, the excess removed by wiping with a clean soft cloth.
2. Only a single type of ammunition, by one manufacturer and as uniform as commercially practicable, shall be used.
3. The shooting to be done by or under close observation of a single individual.
4. Shooting shall be done with gun in a horizontal position, muzzle in shooting port, stock in spring-loaded rest.
5. Rate of firing - one shot each ten seconds until magazine is empty. After thirty consecutive shots at this rate, the barrel shall be cooled before further firing.
6. Method of cooling - remove gun from shooting port and pour water, or air cool, using hose provided for this purpose until barrel is cool.
7. The magazine shall be filled and all shots fired after being fed from the magazine. Before beginning each magazineful, the safety shall be placed in "on" position, trigger tried, safety released and gun fired.
8. The function of both gun and ammunition shall be recorded with particular attention being given to such malfunctions as:
 - a. Failure to extract

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- b. Failure to eject
 - c. Failure to fire
 - d. Extraction difficulties apparent in stiff bolt opening.
 - e. Failure to feed from magazine
 - f. Difficult loading of magazine
 - g. Changes in trigger pull
 - h. Changes in bolt operation
 - i. Changes in feel in closing bolt
 - j. Changes in safety operation
 - k. Blown primers
 - l. Sticking or sluggish firing pin
 - m. Any function which may be specified or particularly important

The occurrence of any malfunction, that is, at the round it was noticed shall be recorded, since this test is performed to determine the number of rounds which may be fired without malfunction. Any unusual occurrence is of interest and must be recorded or the person conducting the test notified verbally. The cause of a malfunction shall be ascertained and recorded.

STANDARD TEST QUANTITY: 200

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Prepared by: C.J. Kirchen
Compiled: 4/1/45 - 6 Pages
Revised: 1/9/69 - 7 Pages

Gun Test #12A

- Uses: 1. Autoloading Center
Fire Rifles
2. Autoloading Shotguns
3. Autoloading Rim Fire
Rifles

STANDARD LIVE FIRING TEST

INTRODUCTION:

This test is performed for the same reasons as Test #12. It differs from Test #12 in that it covers autoloading firearms. The functional characteristics of which differ considerably from manual action firearms.

CONDITIONS OF TEST:

1. Light lubrication. In assembling gun, wash parts in a mixture of one part Rem Oil and one part Varnolene or equivalent.
2. Only a single type of ammunition, by one manufacturer, and as uniform as commercially practicable, shall be used.
3. The shooting to be done by, or under close observation of a single individual.
4. Shooting shall be done with gun in a horizontal position, muzzle in shooting port, stock in spring-loaded rest.
5. If the gun is equipped with a deflector and unless otherwise specified, all shooting is to be done with deflector in place.
6. The magazine shall be filled, and all shots fired after being fed from magazine. The gun shall be cocked at the start of each magazineful by pulling the bolt handle back with the grooved composition bar available for this purpose in the shooting pit. Before beginning each magazineful, the safety shall be placed in "on" position, trigger tried, safety released and gun fired.
7. The function of both gun and ammunition shall be recorded, with particular attention being given to such malfunctions as:
 - a. Failure to feed up
 - b. Failure of the bolt to close
 - c. Gun misfire
 - d. Cartridge misfire

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- e. Hangfire
- f. Failure to cock
- g. Failure of the trigger to disengage the sear
- h. Failure to feed back
- i. Failure to feed into the chamber
- j. Failure to eject
- k. Split cartridge heads
- l. Difficult loading of magazine
- m. Changes in trigger pull
- n. Changes in bolt operation
- o. Changes in safety operation
- p. Sticking or sluggish firing pin
- q. Any function which may be specified or particularly important

Any unusual occurrence is of interest and must be recored or the person conducting the test notified verbally. The cause of a malfunction shall be ascertained and recorded.

Eleven malfunctions are described in detail below in order that consistency in identifying malfunctions will result when shooting is done by various individuals. Seven of these malfunctions occur under identical conditions. Hence, extreme care should be exercised in order that correct identification of the malfunctions which exist can be made. The seven are as follows.

1. Failure to feed up
2. Failure of bolt to close
3. Gun misfire
4. Cartridge misfire
5. Cartridge hangfire
6. Failure to cock
7. Failure of trigger to disengage sear

Caution: When one of these malfunctions occurs, it is necessary to wait two minutes before opening the bolt. This will insure against injury in case the malfunction is a cartridge hangfire.

1. Failure to feed up

Definition - No cartridge gets into the chamber during a normal sequence of trigger and firing pin actions.

Failure to feed up (continued)

Description - On pulling the trigger, the firing pin is released but the gun does not fire. The bolt is seated against the chamber. When the bolt is open, no cartridge is ejected nor is there one in the chamber. Later examination shows at least one cartridge in the magazine.

Procedure - Push the bolt forward; if no motion is felt, open the bolt. If no cartridge is in the chamber and at least one is in the magazine, the malfunction is failure to feed up. If none feeds, remove the deflector and see if the magazine follower can be seen. A cartridge must come from the magazine to resume shooting. Attach the deflector before resuming shooting.

2. Failure of the bolt to close

Definition - The bolt does not seat against the chamber.

Description - On pulling the trigger, the gun does not fire even if the firing pin is released. The bolt may be apparently seated against the chamber but actually is not.

Procedure - Push the bolt forward; if the bolt moves, the malfunction is failure of the bolt to close. To continue firing, pull the trigger.

3. Gun Misfire

Definition - The indentation in the cartridge head is not sufficient to fire a cartridge of normal primer sensitivity.

Description - On pulling the trigger, the gun does not fire even though the firing pin is released. The bolt is seated against the chamber.

Procedure - Push the bolt forward; if it does not move, open the bolt. If a cartridge is ejected, measure the depth of the indentation on the rim relative to the center of the head. If the indentation is .010" or less, the malfunction is a gun misfire. To continue firing, pull back the bolt and release it.

4. Cartridge Misfire

Definition - The indentation in the cartridge head is sufficient to fire a cartridge of normal primer sensitivity.

Description - On pulling the trigger, the gun does not fire even though the firing pin is released. The bolt is seated against the chamber.

Procedure - Push the bolt forward; if it does not move, open the bolt. If a cartridge is ejected, measure the depth of indentation on the rim relative to the center of the head. If it is more than .010", the malfunction is a cartridge misfire.

5. Cartridge Hangfire

Definition - Firing occurs only after a lapse of time from pulling the trigger.

Description - On pulling the trigger, the gun does not fire even though the firing pin is released. The bolt is seated against the chamber.

Procedure - If the gun fires without pulling the trigger again (and before the bolt is opened), the malfunction is a hangfire. To continue firing, pull the trigger.

6. Failure to Cock

Definition - The bolt does not go back far enough to cock the trigger.

Description - Full movement of the trigger does not fire the gun.

Procedure - Push the bolt forward; if it does not move and full trigger action does not fire the gun, open the bolt manually and close it to resume firing. If the gun fails to cock because of a weak cartridge explosion, the malfunction is not chargeable to the gun.

7. Failure of trigger to disengage sear

Definition - The trigger does not slip off the sear so that the firing pin is released.

Description - The trigger can be pulled slightly but it does not result in complete action as it does not slip off the sear.

Procedure - Push the bolt forward; if it does not move, and the trigger does not have complete action, attempt to fire the gun by repeatedly pulling the trigger to cause it to slip off the sear. If the malfunction persists, carefully open the bolt and remove the cartridge from the chamber. The gun is a safety hazard and should be carefully checked.

8. Failure to Feed Back

Definition - The cartridge from the magazine fails to travel back as far as is necessary to be lifted into the loading position.

Description - The nose of the carrier is held down by the cartridge and the bolt is jammed in a rearward position. A spent cartridge may or may not be in front of the bolt. The bolt will not move forward or backward. A live cartridge is jammed against the insert by pressure of the carrier.

Procedure - If a live cartridge is jammed against the insert, it is necessary to force the live cartridge rearward with a screwdriver until the bolt releases. If another malfunction occurs with this same cartridge, do not charge it against the gun.

9. Failure to Feed into Chamber

Definition - The cartridge head does not seat against the chamber.

Description - The bolt jams in its forward movement, but can be moved rearward. The cartridge is tilted so that it is not aligned with the chamber, preventing its feeding completely into the chamber.

Failure to Feed into Chamber (continued)

Procedure - If a live cartridge has not seated properly in the chamber, move the bolt rearward. With a screwdriver, adjust the cartridge so that it is in alignment with the chamber. To continue firing, close the bolt. If the cartridge can't be aligned, remove it and feed another cartridge into the chamber.

10. Failure to Eject

Definition - The bolt is partially open and a spent cartridge is between the bolt and the chamber.

Description - The gun is cocked but fails to function on pulling the trigger. The bolt is free to move rearward. A new cartridge may be part way into the chamber. The spent cartridge may be jammed between the bolt and the chamber for one of the following reasons:

- a. Failure to eject - gun malfunction
- b. Weak cartridge explosion not driving the bolt far back enough - cartridge malfunction.
- c. Very loud cartridge explosion causing a blown cartridge head - cartridge malfunction.

Procedure - If a cartridge case has not been ejected, move the bolt rearward about 1/4", tilt to allow the fired case to fall out, then close the bolt.

11. Split Cartridge Head

Definition - A crack in the metal occurs as a consequence of firing.

Description - Noticeably louder cartridge explosions are heard. Examination of the spent cartridge reveals a split in the head. If several of these show splits at different points relative to the firing pin indentation, the malfunction is chargeable to the ammunition. If the splits do not vary in their position relative to the firing pin indentation, careful examination of the bolt should be made to determine whether the malfunction is chargeable to the gun.

Standard Live Firing Test (Continued)

Page 7

Split Cartridge Head (continued)

Procedure -

Continue firing, bearing in mind that variations in the strength of explosions are indications of variation in cartridge quality and hence are valuable clues in the identification of malfunctions. Excessively loud explosions may result in failure to eject, as covered in (10) above, chargeable to the ammunition.

STANDARD TEST QUANTITY: 200

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 2 Pages
Revised: 5/22/45 - 1 Page
Revised: 1/9/59 - 2 Pages

Gun Test #13
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

STANDARD DRY FIRING TEST WITH DUMMY AMMUNITION

INTRODUCTION:

Dry firing is done to determine the useful life of some component parts of the gun, without incurring the cost of firing live ammunition. The results, if viewed with caution, may permit satisfactory evaluation of certain characteristics peculiar to the gun.

Dry firing should produce wear on all parts except the barrel comparable with live firing and is primarily useful in determining the durability of the gun mechanism.

CONDITIONS OF TEST:

1. Lubrication is normal.
2. Place gun in fixture to support gun during testing.
3. Load magazine to capacity with dummy rounds.
4. Move bolt through a normal cycle to load chamber, pull trigger, open bolt to extract and eject round.
5. Place safety on, try trigger, move safety to off position and reload magazine for another cycle.

It is desirable to have this test run by as many individuals as practicable in that each has a different technique, thereby offering greater possibility for disclosing a peculiarity of the gun, since one person operating the gun is likely to acquire a certain "know how" and fail to notice some defects.

In time, dummy ammunition wears and is unfit for further service. Care should be exercised in reporting malfunctions without first determining definitely whether the gun or dummies are at fault.

The rate of operation is relatively unimportant and may be done as fast as desirable, however, a complete cycle in 1.5 seconds is suggested.

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 2 Pages
Revised: 2/15/45 - 1 Page
Revised: 11/19/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #15

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

WET AND DUST TEST

INTRODUCTION:

This test, with live ammunition and with dummies, is for the purpose of determining the action of the gun under severe field usage.

The dusting and wetting appear extreme, but since the test must, of necessity, be accelerated it seems desirable to approach the most extreme condition conceivable.

CONDITIONS OF TEST:

With the exception noted below, this test is conducted in a manner identical with that described under Standard Live Firing Test and Standard Dry Firing Test with Dummies.

1. Fill magazine only with ammunition.
Caution: Do not load chamber.
2. Spray water over gun. Wet all parts.
3. Place gun in dust chamber immediately.
4. Dust for 15 minutes with bolt closed. Use two pounds of mixture of 50% "Silocel" powder and 50% of 100 mesh fire clay each time gun is tested.
5. Remove gun and clean inside of barrel thoroughly.
6. Rub off excess dust with hand.
7. Gun is ready for testing.

STANDARD TEST QUANTITY: 50

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #16

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

NO LUBRICATION TEST

INTRODUCTION:

This test is performed with (1) live ammunition (2) dummy ammunition (3) no ammunition, for the purpose of properly evaluating the operating characteristics of a gun which is improperly lubricated.

A large number of guns used are improperly lubricated, either through negligence or ignorance of the operator, and it is desirable to have information concerning the amount of abuse the gun may take and still function satisfactory.

Rougher or stiffer operation than that of a properly lubrication arm is anticipated; but on the other hand the gun is expected to function properly. It is possible, but not probable, excessive wear will occur on some areas of the mechanism. Therefore, areas of wear or binding should be located and reported. It is conceivable that the gun may fail entirely and not function at all, in which case the purpose of this test has been fulfilled.

With the previously mentioned points in view the test shall be conducted in a manner identical to that prescribed under the following tests, with the exceptions noted below: (1) Standard Live Firing (2) Standard Dry Firing with Dummies (3) Standard Dry Firing without Dummies.

CONDITIONS OF TEST:

1. Disassemble arm.
2. Wash parts thoroughly in clean Varnolene
3. Reassemble the arm

STANDARD TEST QUANTITY:

1. Live Fire - 200
2. Dry Fire with Dummies - 1,000
3. Dry Fire without Dummies - 3,000

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 2 Pages
Revised: 2/14/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #17
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

COLD TEST

INTRODUCTION:

This test is performed with live ammunition for the purpose of determining the gun's functional characteristics at low temperatures. A temperature of -20°F is possible with existing equipment and this temperature appears satisfactory for this test. It is felt that this temperature approaches conditions encountered in actual service.

At times, failures to fire will be observed and in this case, close scrutiny is necessary to determine whether the failure may be attributed to the ammunition or to a defect inherent in the gun. It is very desirable to make this determination accurately. No cooling will be necessary in this test as the rate of fire is reduced to approximately one per minute with longer intervals for reloading.

CONDITIONS OF TEST:

With the exception of lubrication, this test will be conducted in a manner identical with that prescribed in Standard Live Firing Tests and the same observations made and recorded.

1. The gun mechanism is lubricated with Hoppes in the following manner:
 - a. Disassemble gun
 - b. Clean all parts with Varmolene or equivalent
 - c. Oil very lightly with Hoppes Oil
 - d. Reassemble after lubricating gun
2. Cool gun and ammunition to -20°F
3. Fire from cooling chamber to avoid condensation accumulating and freezing or temperature changes

STANDARD TEST QUANTITY: 200

Prepared by: A.A. Hugick
Compiled: 1/9/69 - 1 Page

Gun Test #17A
Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

COLD TEST

INTRODUCTION:

This test is performed with live ammunition for the purpose of determining the gun's functional characteristics at low temperature with the gun in an iced condition. A temperature of -20°F is possible with existing equipment and this temperature appears satisfactory for this test. It is felt that this temperature approaches conditions encountered in actual service.

At times, failures to fire will be observed and in this case, close scrutiny is necessary to determine whether the failure may be attributed to the ammunition or to a defect inherent in the gun. It is very desirable to make this determination accurately. No cooling will be necessary in this test as the rate of fire is reduced to approximately one per minute with longer intervals for reloading.

CONDITIONS OF TEST:

With the exception of lubrication, this test will be conducted in a manner identical with that prescribed in Standard Live Firing Tests and the same observations made and recorded.

1. The gun mechanism is lubricated with Hoppes in the following manner:
 - a. Disassemble gun.
 - b. Clean all parts with Varmolene or equivalent.
 - c. Oil very lightly with Hoppes Oil.
 - d. Reassemble after lubricating gun.
2. Cool gun and ammunition to -20°F .
3. Spray gun with hose to produce the gun to become covered with ice.
4. Fire in iced condition.

STANDARD TEST QUANTITY: 200

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #18

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

FIELD TEST

INTRODUCTION:

This test is conducted with live ammunition to determine to what extent the arm will function under conditions encountered in the field. Sawdust is used to contaminate the gun, it being a fair substitute for weed seeds and miscellaneous debris which accumulate within a gun's mechanism over a period of time.

CONDITIONS OF TEST:

1. The sawdust shall be graded to pass 60 mesh and be retained on 150 mesh standard screen size.
2. Spray the gun thoroughly with water.
3. Place the assembled gun, magazine only loaded, action closed, in the dust chamber.

Caution: Do not move the cartridge from magazine to chamber until muzzle of gun is through shooting port.

4. Dust with the graded sawdust for 15 minutes using approximately 1 lb. of sawdust.
5. Allow the gun in this condition to stand for 30 minutes.
6. Clean inside of barrel thoroughly.
7. Firing shall be done in the manner specified under Standard Live Firing Test.

Any and all malfunctions or unusual functional characteristics shall be recorded.

STANDARD TEST QUANTITY: 200

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 5/1/45 - 1 Page
Revised: 12/29/45 - 1 Page

Gun Test #19

Uses: 1. Bolt Action High
Power Rifles
2. Shotguns

OILED CASE TEST

INTRODUCTION:

This test is to determine the effect of excessive oil in the chamber. When a round is fired with oil on the case, the pressure on the bolt face is increased because sidewall friction is reduced.

CONDITIONS OF TEST:

Consider all rounds fired as though they were proof charges and conduct the firing in manner described under Proof Firing Test.

1. Dip standard or proof ammunition in Rem Oil to within one-half inch of rim. For shotguns, Nitro Express is standard.
2. Wipe off excess oil with bare hand.
3. Round is ready to fire.
4. On firing, note effect as indicated by excessive pressures, blown primers, etc.

STANDARD TEST QUANTITY:

Standard ammunition - 10 rounds.

Proof ammunition - 1 round.

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Prepared by: C.J. Kirchen
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 1/2/46 - 2 Pages
Revised: 1/9/69 - 2 Pages

Gun Test #20

Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

DEFECTIVE AMMUNITION TEST

INTRODUCTION:

This test is designed to determine the effect on the gun of defective ammunition such as burst heads, punctured primers, and split cases or bodies. Although the test described for defective primers makes use of a defective firing pin, this test is meant to show the effect of defective primers or excessive pressure. It is desirable to have some indication of the path, or direction escaping gases may take in the event of case or body, or primer casualties.

Defective ammunition is prepared as follows:

A. Center Fire Rifles

1. Burst Head
 - (a) Select factory primed case
 - (b) Saw, with fine tooth saw through a section of the head in a direction parallel to the long axis of the case, being careful not to saw into the primer.
 - (c) Hand load to factory specification
2. Split Case
 - (a) Select factory primed case
 - (b) Saw a slot through the case shoulder about 1/2" long in a direction of approximately 30° with the longitudinal axis, being careful not to saw through the neck.
 - (c) Hand load to factory specification
3. A punctured primer is accomplished by using a firing pin, .010" smaller in diameter than specified and .020" longer on the end which strikes the primer.

B. Shotguns

1. Burst Head: File, with fine triangular file, through the cylindrical section of the head in a direction parallel to the long axis of the shell so that the underlying paper is exposed.

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B. Shotgun (Continued)

2. Split body: Split the body on one side with a knife for distance of 1/2" from the mouth of the shell.

3. Punctured primer: Same procedure as for the rifles.

C. Rim Fire Rifles

1. Burst Head

(a) Select factory primed case.

(b) File the case rim O.D. of head sufficiently to weaken the base head at the rim.

(c) Hand load to factory specifications.

2. Split Body

(a) Select a factory loaded round.

(b) File the case body O.D. on one side of case sufficiently to produce splitting on firing.

CONDITIONS OF TEST:

1. Consider all firing as proof testing. See Proof Firing Test for details.
2. Place defective ammunition in chamber and carefully close bolt.
3. Completely surround the action with white paper in order that the port from which gas escapes may be located and the intensity of gas escape may be determined.
4. Fire the gun.
5. Remove the paper carefully. Be sure to note location of paper on gun.
6. Record the place and intensity of gas escape.
7. Record any signs of erosion on bolt or receiver.
8. Inspect extractor after recording extraction and ejection action.
9. There will, in all probability, be some peculiar circumstance which is not mentioned here. Therefore, it is necessary to examine the arm thoroughly both before opening the bolt and afterward:

STANDARD TEST QUANTITY: 10 rounds for each type of defect.

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Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 2/15/45 - 1 Page
Revised: 12/19/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #21

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

COMPETITIVE AMMUNITION TEST

This test with live ammunition is to determine the functional characteristics of competitive ammunition in the test gun. As many different makes should be tested as possible. To yield the most information, accuracy and endurance should be tested. The tests are performed in the manner described under:

1. Accuracy Test (Qualitative); for rifles only
2. Standard Live Firing Test

STANDARD TEST QUANTITY:

Accuracy - 53
Standard Live Fire - 200

Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 5/22/45 - 1 Page

Gun Test #22
Uses: 1. Bolt Action High
Power Rifle
2. Shotguns

SAFETY MECHANISM FUNCTION TEST

INTRODUCTION:

This test is to determine if the gun will fire when the trigger is held back with the safety "on" when the bolt is closed sharply.

CONDITIONS OF TEST:

1. Insert primed round in chamber.
2. Move Safety to "on" position.
3. Hold trigger down.
4. Close bolt sharply.

STANDARD TEST QUANTITY: 10 determinations.

Prepared by: H.C. Moss
Compiled: 10/10/44 - 1 Page
Revised: 5/1/45 - 1 Page

Gun Test #23
Uses: 1. Bolt Action High
Power Rifles

BOLT LUG SHEAR TEST

INTRODUCTION:

This test is to determine what will happen to the gun and to the shooter if for any reason the bolt locking lugs shear in service. Most bolt action rifles are designed so that if lug failure occurs, a second locking area absorbs the pressure and protects the shooter. This test is meant to measure the effectiveness of this secondary locking means.

CONDITIONS OF TEST:

Consider all rounds fired as though they were proof charges and conduct firing in manner described under Proof Firing Test.

1. Soft, low strength lugs.
 - A. Make bolt head of X-1112 steel and do not heat treat.
 - B. Fire proof ammunition.
 - C. Fire service ammunition.
 - D. Note effect of secondary locking area in stopping or diverting bolt.
2. Hard, brittle lugs.
 - A. Make bolt head of 4140 steel and heat treat as follows:
 - a. Cyanide Harden, 1600°F, 30 minutes.
 - b. Oil Quench
 - c. Do not temper
 - d. Record Rockwell C
 - B. Fire proof ammunition.
 - C. Fire service ammunition.
 - D. Note effect of secondary locking area in stopping or diverting bolt.

STANDARD TEST QUANTITY: Three bolt heads of each material.
Proof ammunition - 1 round.
Service ammunition - 1 to 10 rounds.

AL 0023869

390F54

Prepared by: C.J. Kirchen
Compiled: 4/30/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #24
Uses: 1. Shotguns Only

OUTDOORS LIVE FIRING TEST

INTRODUCTION:

This test is performed for the same reasons as Test #12 and #12A. It differs in that firing is done other than horizontally, the only permissible way with plant facilities. It is apparent that consumers will find frequent reasons to fire below and above horizontal position.

CONDITIONS OF TEST:

These are the same as those for Test #12A except for Condition 4. Replace it by the following:

Shooting shall be done 20° - 30° below horizontal and 60° - 80° above horizontal, the standard test quantity specified in Test #12 to be used in each case.

Caution: As the shooting is out-of-doors, every safety precaution should be taken.

Note: No rifle slug ammunition will be fired in this test.

AL 0023870

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Prepared by: C.J. Kirchen
Compiled: 6/12/45 - 1 Page
Revised: 7/19/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #25

Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

SAFETY SEAR MECHANISM TEST

INTRODUCTION:

The safety sear mechanism is designed to prevent the gun from being discharged by pulling the trigger if the bolt is displaced from the normal firing position. A gun which will discharge under this condition is a safety hazard.

It is the purpose of this test to determine how much displacement of the bolt from the normal firing position is necessary before the safety sear mechanism will prevent the trigger from being pulled. The test is performed with an adjustable head space gage, a two-inch micrometer, and a screwdriver for "setting" the gage.

CONDITIONS OF TEST:

1. With the screwdriver, adjust the head space gage so that the movable portion is flush with, or recessed from the head of the gage.
2. Measure the length of the head space with a micrometer.
3. Adjust the movable section of the gage so that it protrudes beyond the head of the gage.
4. Measure the overall length of the gage to the end of the movable section.
5. Determine the amount of protrusion from: (4) - (2).
6. Insert the gage in the chamber of the gun.
7. Close the bolt. Caution: Release the bolt carefully to avoid chipping the hardened surface of the work gage.
8. Pull the trigger. If it releases, take the gage out of the chamber and increase the protrusion of the center section. Repeat steps 5 - 8 until the trigger does not release. Record (1) the protrusion which prevents the trigger from releasing, and (2) the protrusion .001" less than that of (1) such that the trigger does release.

STANDARD TEST QUANTITY: One determination.

AL 0023871

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Prepared by: R.H. Grace
Compiled: 8/29/45 - 1 Page

Gun Test #26
Uses: 1. M/500 Series
.22 Cal. Rifles

TAKE DOWN SCREW SHOCK TEST

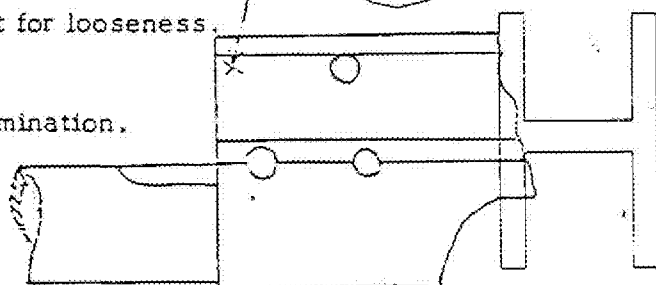
INTRODUCTION:

This test is meant to simulate the conditions in which a gun is temporarily leaning against a chair, table, or in a corner and accidentally falls, striking against some other object. It applies particularly to guns having a single take down screw. It was developed for the 500 series open bottom receiver to test the reliability of the construction to maintain a tight joint between barrel and receiver.

CONDITIONS OF TEST:

1. Measure and record width of receiver at area adjacent to take down screw hole. Micrometers. See sketch.
2. Check barrel and receiver joint for looseness.
3. Pivoting the gun on the toe of the stock, raise the muzzle one foot above a solid wood block. Allow the gun to fall freely so that the muzzle strikes the wood block. Perform a total of five times.
4. Measure and record width of receiver.
5. Check barrel and receiver joint for looseness.
6. Pivoting the gun on the heel of the stock, raise the front end of the receiver one foot above a solid wood block. Allow the gun to fall freely so that the receiver strikes the wood block. Perform a total of five times.
7. Measure and record width of receiver.
8. Check barrel and receiver joint for looseness.

STANDARD TEST QUANTITY: One determination.



Prepared by: C.J. Kirchen
Compiled: 11/12/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #27

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

JAR OFF TEST

INTRODUCTION:

A common source of accidents with firearms is accidental discharge. A safety mechanism is provided to insure against accidental discharge. This test is designed to determine how much shock, if any, will cause the gun to be discharged when the safety mechanism is "off".

CONDITIONS OF TEST:

This test is made by allowing the gun to fall freely a distance of 10 inches upon a solid wood surface with the safety "off". The following positions are used:

1. Butt down
2. Muzzle down
3. Top side down
4. Bottom side down

The trigger shall be tried after each of the above tests to determine whether the safety has released any mechanism which may allow firing.

This test is always made using dummy cartridges and should be conducted very carefully.

STANDARD TEST QUANTITY: One determination.

Prepared by: C.J. Kirchen
Compiled: 11/13/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #28

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

FOLLOW DOWN TEST

INTRODUCTION:

This test is to determine if the gun will fire when the trigger is held back and the action is allowed to close.

CONDITIONS OF TEST:

1. Insert live round in chamber and dummy round in magazine.
2. Close bolt.
3. Fire gun. Hold trigger back through complete reloading cycle. (On pump type, close action sharply.)
4. Check to see that barrel is not plugged.
5. Record number of blanks which fire in reloading cycles.

STANDARD TEST QUANTITY:

- | | |
|----|--------------|
| 10 | Live Rounds |
| 10 | Dummy Rounds |

Prepared by: C.J. Kirchen
Compiled: 11/14/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #29

- Uses: 1. Bolt Action Center
Fire Rifles
2. Bolt Action Rim Fire
Rifles

BOLT STOP RELEASE TEST

INTRODUCTION:

This test is designed to determine the efficiency of the bolt stop release during any concurrent firing test of a gun equipped with this device. The test is unique in that it is performed at specified points of some firing test being conducted at the time.

CONDITIONS OF TEST:

1. A firing test is to be made.
2. Shoot a magazineful of cartridges according to the conditions prescribed for the firing test being made.
3. Determine whether the bolt can be removed without operating the bolt stop release.
4. Position the bolt so it does not engage the bolt stop; operate the bolt stop release with the left hand and remove the bolt with the right hand.
5. Remove finger from the bolt stop release, and replace the bolt.
6. Check to see that the bolt can engage the bolt stop.
7. Record the number of times:
 - a. The bolt could be removed without operating the bolt stop release.
 - b. The bolt could not be removed when operating the bolt stop release.
 - c. The bolt was removed when operating the bolt stop release.

STANDARD TEST QUANTITY: One determination.

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AL 0023875

A

ACCEPTANCE TABLES
HOW MUCH SHOOTING

17
10/10/54

We frequently run into the problem of the amount of shooting necessary in gallery inspection of firearms or in their development to determine whether a design change improves gun function. An answer to this is presented in the "Acceptance Tables" on the following pages.

The "Acceptance Tables" are based on data obtained in testing programs of the M/121*, M/241**, and the M/550***. The pertinent data from these tests for an acceptance table for any model are:

- a. The overall percentage of malfunctions for all guns tested of a given model.
- b. The malfunction record of the poorest gun tested of the given model.

In addition, it is necessary to choose risks of rejecting a good gun and of accepting a poor gun. These have been chosen as one in twenty in each case. It must be kept in mind that the "Acceptance Tables" depend on items a and b above and on the one in twenty risks. If it becomes known that these have or should be changed, a review of the tables must be made before they are used for acceptance or rejection purposes.

An acceptance table is given in two parts:

- a. The maximum number of malfunctions which may occur in a certain number of rounds fired to result in acceptance.
- b. The minimum number of malfunctions which may occur in a certain number of rounds fired to result in rejection.

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Prepared by: C.J. Kirchen
Compiled: 11/20/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #30

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

EMERGENCY POSITION LIVE FIRING TEST

INTRODUCTION:

This test is performed for the same reasons as Test #12 and #12A. It differs in that firing is done with the gun in other than normal position. While these positions may be considered extreme, it is desired to know whether mere position is an important factor in gun operation.

CONDITIONS OF TEST:

These are the same as those for Test #12, except for Condition 4. Replace it by the following:

Change the position of the spring loaded rest so that when the stock is in position, the trigger guard is:

1. In Normal position.
2. On the right (90° from normal).
3. On the upper side (180° from normal).
4. On the left (270° from normal).

STANDARD TEST QUANTITY:

200 Rounds (50 in each position)

Prepared by: C.J. Kirchen
Compiled: 11/30/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #31

Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

SAFETY OPERATION TEST

INTRODUCTION:

The importance of the safety in the avoidance of accidents with firearms needs no emphasis, but assurance that the safety will function perfectly when "on" is absolutely mandatory. This test is designed to provide a routine which will test the safety mechanism.

CONDITIONS OF TEST:

1. Insert dummy round in chamber.
2. Put safety mechanism in "on" position.
3. Pull trigger, with greater than normal trigger pull force.
4. Move the safety to the "off" position.
5. Pull trigger.
6. Record if firing pin was released in Step No. 3.
7. Reload if firing pin was released in Step No. 4.

STANDARD TEST QUANTITY:

200 Cycles.

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Prepared by: C.J. Kirchen
Compiled: 12/4/45 - 1 Page
Revised: 1/9/69 - 1 Page

Gun Test #32

- Uses: 1. Center Fire Rifles
2. Shotguns
3. Rim Fire Rifles

FOLLOW UP TEST

INTRODUCTION:

This test is designed to determine whether a live round in the chamber of a cocked gun can be removed without firing the gun. For reasons of safety, primed cases are specified, and they serve the purpose of live rounds.

CONDITIONS OF TEST:

1. Place the muzzle of the firearm in the port of the shooting pit, with the stock in the spring loaded rest.
2. Feed a primed case into the chamber.
3. Cock the gun if this was not done in Step #2 above.
4. Remove the case. Note whether or not the case was fired in removing.

STANDARD TEST QUANTITY:

50 Cycles.

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Prepared by: H.C. Moss
Compiled: 1/14/46 - 3 Pages

Gun Test #33
Uses: 1. Rifles
2. Shotguns

GUN FURNITURE TEST

INTRODUCTION:

Considerable care is taken to process gun furniture in a manner which will insure maximum dimensional stability as well as a pleasing appearance. Relatively small dimensional changes may effect materially both the appearance and function of certain guns, the effect on proper function being more pronounced in autoloading and slide-action guns.

Since the effect of dimensional instability of gun furniture is very well known, it then is desirable to know the magnitude and location of dimensional change which may be reasonably expected and tolerated. Therefore, these tests are primarily concerned with the amount of dimensional change to be expected under certain severe climatic conditions and the effect of such changes on gun function.

The tests are designed to determine generally, the practicability of moulded plywood gun furniture and specifically the assembled M/750 fore-end shell and tip. It has been assumed that no perceptible dimensional change will be found in the moulded plastic fore-end tip, but some warpage is expected of the plywood shell when the assembly is subjected to extreme climatic conditions. The fore-end shall be in a condition identical with that which is normally used on the finished gun and shall include regular production type sanding, filling, touch up, lacquer, checkering, if any, and inspection.

Items of particular interest and those which shall be recorded are:

1. Dimensional changes - in determining dimensional changes, it is, of course, necessary to measure carefully certain parts of the fore-end before and after each test. The locations of of these measurements should be recorded so that measurements can be made in same places before and after testing.
 - a. Thickness variation of shell material. This shall determine any swelling or shrinkage of the plywood.
 - b. Deviation of sides from a longitudinal axis. This shall determine warp, bending or buckling of local areas or the whole part. This is determined with a surface plate and a square.

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2. General Appearance

- a. Splitting of the laminated layer.
- b. Buckling of some areas.
- c. Local discoloration.
- d. Loosening of plywood where it joins the plastic tip.

3. For purposes of comparison, the fore-ends for the M/121, M/31, M/11 and Sportsman, and M/141 shall be subjected to tests A, B, C, D and E at the same time and in the same manner as for the plywood fore-end.

4. Satisfactory performance shall be determined for the model under consideration.

CONDITIONS OF TEST:

A. Extremes of Humidity

- 1. Dip fore-end in tap water at room temperature for 3 minutes.
- 2. Withough drying, place fore-end in an atmosphere of 30 to 40 percent humidity at 110 to 135°F temperature for one (1) hour.
- 3. Measure and record dimensional change at once.
- 4. Repeat 1, 2, and 3 once.
- 5. After fore-end has come to room condition, repeat 3.

B. Extremes of Temperature

- 1. Dip fore-end in tap water for three (3) minutes.
- 2. With all the water which will adhere to the piece, subject to 0 - 30°F temperature for one (1) hour.
- 3. Measure and record dimensional change.
- 4. Repeat 1, 2 and 3 once.
- 5. Allow fore-end to come to room condition, repeat 3.

C. Localized Heat (To simulate a place near a stove)

- 1. Subject fore-end to 0- 30°F temperature for one (1) hour.
- 2. Apply dry heat (250°F) to one side only.
- 3. Measure and record dimensions, paying particular attention to warpage and appearance.
- 4. Allow fore-end to come to room condition, repeat 3.

D. Extreme Wear Test

1. Scrub the outside surface of the fore-end with fine sand (thru 65 mesh screen) and water in order to wear thru the lacquer in spots and also to wet thoroughly the worn areas.
2. With the fore-end wet, subject to 0 - 30°F temperature for one (1) hour.
3. Remove from freezing atmosphere and place in oven at 110°F, $\pm 10^\circ\text{F}$ for one (1) hour.
4. Measure and record dimensional changes.
5. Allow fore-end to come to room condition, repeat 4.

E. Simulating lengthy storage then use.

1. Place in oven at 130 - 135°F at 30 - 40 percent humidity for seven (7) days.
2. Expose fore-end to saturated steam for one (1) hour.
3. Record dimensional changes.
4. Allow fore-end to come to room condition, repeat 3.

STANDARD TEST QUANTITY:

Ten (10) pieces, two for each test.

Prepared by: C.J. Kirchen
Compiled: 2/18/46 - 1 Page

Gun Test #34
Uses: 1. 12 Ga. Pump
Shotgun

HEAVY FORE END TEST

INTRODUCTION:

This test employs a heavy fore-end in the form of a metal block to replace the standard one. Use of this heavy fore-end accelerates breakdown on the Action Bar Assembly so that the endurance of the assembly can be determined with fewer rounds than when the standard fore-end is in use.

- Equipment:
1. 8 lb. 2 oz. metal block, described in TS-271
 2. Nitro Express shot/shell, 12 Ga. 2 3/4" long; powder charge: 3 3/4 drams equivalent; shot charge: 7.5 chill, 1 1/4 oz.

CONDITIONS OF TEST:

1. Take pump shotgun and heavy fore-end to the foreman of shotgun assembly to have standard fore-end replaced by the heavy fore-end.
2. Follow Standard Live Firing Test #12, except for Standard Test Quantity.

STANDARD TEST QUANTITY:

Sufficient rounds to cause binding or breakdown of action bar and/or Action Bar Assembly.

AL 0023887

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NBAR FIRECONTROL DESIGN OBJECTIVES

- USER "FRIENDLY" DESIGN

- IMPROVED TACTILE FEEL OF THE TRIGGER

- IMPROVED TACTILE FEEL OF THE SAFETY

- CUSTOMER ABLE TO OPEN AND CLOSE BOLT WITH SAFETY "ON"

- BOLT LOCKED DOWN IN A "S" CONDITION

- CUSTOMER ADJUSTABLE TRIGGER PULL FORCE ONLY WITHIN
PRESCRIBED LIMITS

- BOLT STOP RELEASE RELOCATED WITH IMPROVE TACTILE FEEL

- LEFT HANDED VERSION TO BE DESIGNED

- DESIGN FOR MANUFACTURABILITY PRINCIPLES UTILIZED

- DESIGN FOR ASSEMBLY PRINCIPLES UTILIZED

- "SEALED" DESIGN

- RIFLE WILL NOT FIRE IF TRIGGER PULLED AND HELD AS
SAFETY IS MOVED FROM "S" TO "P"

- ROBUST AGAINST IMPACT

- COMPEL TRIGGER TO SUPPORT POSITION IN MOVING SAFETY
FROM "P" TO "S"

- "NO LUBRICATION" DESIGN

- ENHANCED CORROSION RESISTANCE

1 of 1
PLAINTIFF'S
EXHIBIT

3121

AL 0023959

WAW
10-15

CUSTOMER

POINT OF VIEW

HIGH

"EASE OF USE"

- QUICK TO FIND
- EASY TO OPERATE
- EASY TO UNDERSTAND
- RELIABLE TO OPERATE
- EASY TO USE WITH 'SCOPE
- CRISP TRIGGER PULL
- MINIMUM CREEP
- HIS OWN PERCEPTION OF "WHAT IS"

MEDIUM

- QUIET OPERATION
- MINIMUM BACKLASH (feedback)
- SINGLE STAGE PULL
- EASILY KNOWN STATUS ("S" OR "F")
- PLEASING APPEARANCE
- ADJUSTABLE FOR WEIGHT OF PULL

LOW

- LOCATION OF SAFETY (CONSISTENT WITH EASE OF USE)
- HOW MECHANISM PREVENTS UNINTENDED FIRING-WHAT IT BLOCKS
- MINIMUM TRIGGER OVER-TRAVEL

PLAINTIFF'S
EXHIBIT

3122

10f6
AL 0023960

MARKETING

POINT OF VIEW

HIGH

- RESPONSIVE TO THEIR ASSESSMENT OF WRITERS' & CUSTOMERS' PERCEPTIONS OF REALITY.
- AVOID MULTIPLE FEATURE OPTIONS WHICH WOULD COMPOUND/CONFUSE SALES INVENTORIES
- PRESERVE PRODUCTION CAPABILITY TO SATISFY M700 DEMAND
- EASY TO UNDERSTAND AND USE
- USER ABLE TO OPEN [AND CLOSE] BOLT IN A SAFE CONDITION ("3-POSITION SAFETY")
- BOLT LOCKED DOWN IN "S" CONDITION

MEDIUM

- CUSTOMER-ADJUSTABLE TRIGGER PULL FORCE ONLY DOWN TO MINIMUM SATISFACTORY LEVEL
- NOT ADJUSTABLE EXTERNALLY
- BOLT STOP RELEASE AWAY FROM "IN FRONT OF TRIGGER"
- NO SAFETY ON TANG
- LEFT-HAND VERSION (12-15% OF MARKET)

LOW

- FIELD-CONVERTIBLE FOR OPERATIONS WITH OR WITHOUT BOLT LOCK

NOT

- MAGAZINE-BOX DISCONNECT SYSTEM

WAW
10-15-93

MANUFACTURING

POINT OF VIEW

HIGH

- INTERCHANGEABILITY OF COMPONENTS AT SUB-ASSEMBLY AND FINAL ASSEMBLY.
- SATISFACTORY PERFORMANCE WITH NORMALLY-ACHIEVED TOLERANCES
- ONLY NORMAL TRAINING AND DEXTERITY REQUIRED TO PROCESS

MEDIUM

- READY-TO-ASSEMBLE SUB-ASSEMBLIES AT FINAL ASSEMBLY
- DESIGNED TO PREVENT INCORRECT ASSEMBLY OF COMPONENTS

LOW

- READILY REWORKABLE / SALVAGEABLE

10-15-93
WAW

LIABILITY

POINT OF VIEW

HIGH

- AVOID PATENT INFRINGEMENT
- NOT INTERCHANGEABLE OR RETROFITTABLE TO M700
- TWO POSITION "S" & "F"
- SEALED UNIT REQUIRING NO ORIGINAL OR FIELD LUBRICATION
- ROBUST AGAINST IMPACT - EXCEED SAAW/ANSI RECOMMENDATIONS BY WIDE MARGIN
- USER OPERATION CONSISTENT WITH PRECEDENT AND CONVENTION.
- ROBUST AGAINST EFFECTS OF TAMPERING/ADJUSTING
- HIGHLY INTUITIVE OPERATION

MEDIUM

- READILY DEFENSIBLE REASONS FOR DEPARTURE FROM CURRENT DESIGN
- ? • CONVERTIBLE & REVERSIBLE BOLT LOCK
- ? • INTERLOCK: WILL NOT FIRE IF TRIGGER IS PULLED AND HELD AS SAFETY

AL 0023963

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ENGINEERING PROCESSING

POINT OF VIEW

HIGH

- SHORT RECEIVER
- MACHINES, ROUNG, PROCESSES CONSISTENT WITH EXPECTED VOLUME
- HIGH-YIELD OPERATIONS
- MAINTAIN 11200 PRODUCTION CAPACITY

MEDIUM

- DESIGN TO INHIBIT/PREVENT INCORRECT ASSEMBLY OF COMPONENTS
- DESIGN TO PERMIT REWORK/SALVAGE

ENGINEERING DESIGN

10.15.93
WAW
POINT OF VIEW

HIGH

- SHORT DIMENSIONS PARALLEL TO CEBL
- AVOID ANY REASON TO PUT FINGER WITHIN TRIGGER GUARD EXCEPT TO INTENTIONALLY FIRE
- EASY TO UNDERSTAND - HIGHLY INTUITIVE OPERATION
- REALITY VS PERCEPTION RECONCILED THRU ACTUAL TESTING / PERFORMANCE
- PRESERVE ADVANTAGES OF RESILIENT (CONNECTOR) FUNCTION
- DO NOT ~~USE~~ SEAR AS BOLT STOP OR APPLY BOLT STOP IMPACT TO ASSEMBLY
- REDUCED LOCK TIME
- ACTUATE SAFETY WITH BOLT OPEN

MEDIUM

- QUIET OPERATION
- ENHANCED CORROSION RESISTANCE
- COMPEL TRIGGER TO SUPPORT POSITION IN MOVING SAFETY F → S
- FULL TRIGGER RETRACTION UPON PARTIAL PULL
- MEANS TO PREVENT INCORRECT ASSEMBLY / RE-ASSEMBLY OF COMPONENTS

OCT 23

WAW
10:15

CUSTOMER

POINT OF VIEW

HIGH

• EASE OF USE

- QUICK TO FIND
- EASY TO OPERATE
- EASY TO UNDERSTAND
- RELIABLE TO OPERATE
- EASY TO USE WITH SCOPE
- CRISP TRIGGER PULL
- MINIMUM CREEP
- HIS OWN PERCEPTION OF "WHAT IS"

BASICALLY

USER FRIENDLY

= DESIGN OBJECTIVES

MEDIUM

- QUIET OPERATION
- MINIMUM BACKLASH (feedback)
- SINGLE STAGE PULL
- EASILY KNOWN STATUS ("S" OR "F")
- PLEASING APPEARANCE
- ADJUSTABLE (Especially weight of pull)

LOW

- LOCATION OF SAFETY (CONSISTENT WITH EASE OF USE)
- HOW MECHANISM PREVENTS UNINTENDED FIRING-WHAT IT BLOCKS
- MINIMUM TRIGGER OVER-TRAVEL

improved MTLR REEL OF TRIGGER
" " " OF SAFETY

PLAINTIFF'S
EXHIBIT

3123

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AL 0023977

10/15/93
WAW

MARKETING

POINT OF VIEW

HIGH

- RESPONSIVE TO THEIR ASSESSMENT OF WRITERS' & CUSTOMERS' PERCEPTIONS OF REALITY.
- AVOID MULTIPLE FEATURE OPTIONS WHICH WOULD COMPOUND/CONFUSE SALES INVENTORIES
- PRESERVE PRODUCTION CAPABILITY TO SATISFY M700 DEMAND
- EASY TO UNDERSTAND AND USE
- USER ABLE TO OPEN [AND CLOSE] BOLT IN A SAFE CONDITION ("3-POSITION SAFETY")
- BOLT LOCKED DOWN IN "S" CONDITION

MEDIUM

- CUSTOMER-ADJUSTABLE TRIGGER PULL FORCE ONLY DOWN TO MINIMUM SATISFACTORY LEVEL
- NOT ADJUSTABLE EXTERNALLY
- BOLT STOP RELEASE ~~AWAY FROM~~ ^{REGULATED} ~~THE FRONT~~ ~~OF TRIGGER~~ WITH IMPROVED ~~MILK~~ ~~FULL~~
- NO SAFETY ON TANG
- LEFT-HAND VERSION (12-15% OF MARKET)

LOW

- FIELD-CONVERTIBLE FOR OPERATION WITH OR WITHOUT BOLT LOCK

NOT

- MAGAZINE-BOX DISCONNECT SYSTEM

MANUFACTURING

POINT OF VIEW

HIGH

- INTERCHANGEABILITY OF COMPONENTS AT SUB-ASSEMBLY AND FINAL ASSEMBLY.
- SATISFACTORY PERFORMANCE WITH NORMALLY-ACHIEVED TOLERANCES
- FINAL ASSEMBLY WITH READY-TO-ASSEMBLE SUB-ASSEMBLIES

MEDIUM

- ONLY NORMAL TRAINING AND DEXTERITY TO PROCESS
- DESIGNED TO PREVENT INCORRECT ASSEMBLY OF COMPONENTS

LOW

- READILY REWORKABLE / SALVAGEABLE

DESIGN FOR MANUFACTURABILITY PRINCIPLES
DESIGN FOR ASSEMBLY PRINCIPLES

10.15.93
WAW

LIABILITY

POINT OF VIEW

HIGH

- AVOID PATENT INFRINGEMENT *NO WRITING*
- NOT INTERCHANGEABLE OR RETROFITTABLE TO M700
- TWO POSITION "S" & "F"
- ROBUST AGAINST IN APPROPRIATE LUBRICATION
- ROBUST AGAINST IMPACT - ~~EXCEED~~ ^{AUSI} ~~RECOMMENDATIONS BY UNDE MARCHIN~~ ^{PASS A MIN 0'} ~~DRAP~~ ^{SAAMI/AUSI}
- USER OPERATION CONSISTENT WITH PRECEDENT AND CONVENTION.
- ROBUST AGAINST EFFECTS OF TAMPERING/ADJUSTING
- HIGHLY INTUITIVE OPERATION

MEDIUM

- READILY DEFENSIBLE REASONS FOR DEPARTURE FROM CURRENT DESIGN
- ? • CONVERTIBLE & REVERSIBLE BOLT LOCK
- ? • INTERLOCK: WILL NOT FIRE IF TRIGGER IS PULLED AND HELD AS SAFETY S → F

"SEALED" DESIGN

4 of 7

AL 0023980

10-15-93

WAW

ENGINEERING DESIGN

POINT OF VIEW

HIGH

- SHORT DIMENSIONS PARALLEL TO C/B/L
- AVOID ANY REASON TO PUT FINGER WITHIN TRIGGER GUARD EXCEPT TO INTENTIONALLY FIRE
- EASY TO UNDERSTAND - HIGHLY INTUITIVE OPERATION
- REALITY VS. PERCEPTION RECONCILED THRU ACTUAL TESTING / PERFORMANCE
- PRESERVE ADVANTAGES OF RESILIENT (CONNECTOR) FUNCTION
- DO NOT USE SEAR AS BOLT STOP OR APPLY BOLT STOP IMPACT TO ASSEMBLY
- NO LOBE "LUGS" DESIGN ←
 - REDUCED LOCK TIME
- ACTUATE SAFETY WITH BOLT OPEN

MEDIUM

- QUIET OPERATIONS
- ENHANCED CORROSION RESISTANCE
- COMPEL TRIGGER TO SUPPORT POSITION IN MOVING SAFETY F → S
- FULL TRIGGER RETRACTION UPON PARTIAL PULL
- MEANS TO PREVENT INCORRECT ASSEMBLY / RE-ASSEMBLY OF COMPONENTS

10.15.93
WAW

ENGINEERING PROCESSING POINT OF VIEW

HIGH

- SHORT RECEIVER
- MACHINES, TOOLS, PROCESSES CONSISTENT WITH EXPECTED VOLUME
- HIGH-YIELD OPERATIONS
- MAINTAIN 1200 PRODUCTION CAPACITY

MEDIUM

- DESIGN TO INHIBIT/PREVENT INCORRECT ASSEMBLY OF COMPONENTS
- DESIGN TO PERMIT REWORK/SALVAGE

60f 87

AL 0023982

NBAR FIRECONTROL DESIGN OBJECTIVES

- USER "FRIENDLY" DESIGN
- IMPROVED TACTILE FEEL OF THE TRIGGER
- IMPROVED TACTILE FEEL OF THE SAFETY
- CUSTOMER ABLE TO OPEN AND CLOSE BOLT WITH SAFETY "ON"
- BOLT LOCKED DOWN IN A "S" CONDITION
- CUSTOMER ADJUSTABLE TRIGGER PULL FORCE ONLY WITHIN
PRESCRIBED LIMITS
- BOLT STOP-RELEASE RELOCATED WITH IMPROVE TACTILE FEEL
- LEFT HANDED VERSION TO BE DESIGNED
- DESIGN FOR MANUFACTURABILITY PRINCIPLES UTILIZED
- DESIGN FOR ASSEMBLY PRINCIPLES UTILIZED
- "SEALED" DESIGN
- RIFLE WILL NOT FIRE IF TRIGGER PULLED AND HELD AS
SAFETY IS MOVED FROM "S" TO "F"
- ROBUST AGAINST IMPACT
- COMPEL TRIGGER TO SUPPORT POSITION IN MOVING SAFETY
FROM "F" TO "S"
- "NO LUBRICATION" DESIGN
- ENHANCED CORROSION RESISTANCE

*Orig.
Draft*

10.22.93
From D.S.F.

NBAR FIRECONTROL DESIGN OBJECTIVES

"TACTILE FEEL - ?
DON'T UNDERSTAND
THE INTENTION
HERE."

- USER "FRIENDLY" DESIGN
- "IMPROVED TACTILE FEEL OF THE TRIGGER
- "IMPROVED TACTILE FEEL OF THE SAFETY
- CUSTOMER ABLE TO OPEN AND CLOSE BOLT WITH SAFETY "ON"
- BOLT LOCKED DOWN IN A "S" CONDITION
- CUSTOMER ADJUSTABLE TRIGGER PULL FORCE ONLY WITHIN PRESCRIBED LIMITS
- "BOLT STOP RELEASE RELOCATED WITH IMPROVE TACTILE FEEL
- LEFT HANDED VERSION TO BE DESIGNED
- DESIGN FOR MANUFACTURABILITY PRINCIPLES UTILIZED
- DESIGN FOR ASSEMBLY PRINCIPLES UTILIZED
- "SEALED" DESIGN
- RIFLE WILL NOT FIRE IF TRIGGER PULLED AND HELD AS SAFETY IS MOVED FROM "S" TO "P"
- ROBUST AGAINST IMPACT
- COMPEL TRIGGER TO SUPPORT POSITION IN MOVING SAFETY FROM "P" TO "S"
- "NO LUBRICATION" DESIGN
- ENHANCED CORROSION RESISTANCE

ADDITIONAL DESIGN CRITERIA:

- TWO-POSITION SAFETY
- NOT INTERCHANGEABLE OR RETROFITABLE WITH M700
- SHORT AS PRACTICAL TO FACILITATE INTEGRAL DEL/REC'R INTERNAL PROCESSING.
- ROBUST AGAINST TAMPERING
- QUIET OPERATION

COMMENT
SOME USEFUL INFORMATION HAS BEEN
LOST IN CONSOLIDATION TO ONE PAGE.

Bill W 10.25.93

PLAINTIFF'S
EXHIBIT

3124

AL 0023984

1 of 1

FIREARMS RESEARCH DIVISION

Origination Date Jan. '82

Update(s) _____

Project Title: Center Fire Rifle System Research

Project No.: C-7500

Objective: This program provides for development in new center fire rifles such as one common rec. design for bolt actions and auto/pumps, new concepts in locking systems, also, new fire controls and bolt lock systems.

Commitment: Investigate ideas.
Layout & detail drawings.
Make prototypes or mockup models.
Artist rendering.
Investigate new calibers, etc.

Personnel Assigned: Martin

Design/Engineers .75 Man Years

Budget: Operating Expenses 1982 \$ 125M (including testing)
Research Capital Project/Expenses \$ -

Uncertainties:

- Can a two piece stock and fore-end be made that will be acceptable for a bolt action rifle?
- Can a new system be set up that will lock the bolt handle and still allow the full safety operation?

PLAINTIFF'S
EXHIBIT

3125

1082
AL 0024003

FIREARMS RESEARCH DIVISION

Program Steps and Timing

Responsibility

Completion Date

1.	Investigation	Martin	2-1-82
2.	Layouts/design for mockups.	Martin	4-1-82
3.	Complete look/ see types.	Martin	6-1-82
4.	Investigate new locking/extractors, etc.	Martin	3-1-82
5.	Layout/design and detail.	Martin	5-1-82
6.	Make prototypes	Martin	7-1-82
7.	Design test.	Martin	9-1-82

FIREARMS RESEARCH DIVISION

CATEGORY II

Jan.
Origination Date 1982

Update(s) _____

Project Title: Bolt Action Rifle Development Program

Project No.: Q-5000

Objective: To investigate and design a new concept bolt action rifle and assure our position in the market place for the dollar value. This project is to include a new receiver and stock design, new fire control, review of the bolt lock system, new scope mounts/sights, and review of the feed system (such as detachable box, etc.). Other concepts to be investigated include expendable case, electronic ignition, and light weight designs. The gun will retain the M/700 lock up and extractor design.

Commitment: The program will be in three parts. Part I, to be completed by January 1983, will include a new receiver/stock design, minor changes to the fire control, revised sights, and the addition of scope mounts. Part II, to be completed by June 1983, will add the feed system, bolt lock system, and light weight concept. Part III, to be completed in 1984, will include the investigation of expendable case ammunition and electronic ignition.

Personnel Assigned: Martin

Designers/Engineers 4 Man Years

Test Lab and N/C Support .5 Man Years

Budget: Operating Expenses 1982 \$ 430 M (including testing)
Research Capital Project/Expenses \$ _____

Uncertainties:

- Can a receiver be restyled and still be cost effective?
- Can a stock be manufactured on a production basis that meets the needs of the customer and marketing?
- Will expendable case ammunition be the answer for future gun designs?

PLAINTIFF'S
EXHIBIT

3126

AL 0024005

10f2

FIREARMS RESEARCH DIVISION

Program Steps and Timing

Responsibility

Completion Date

Part I

- Design new receiver and stock
- Design scope mounts and sights
- Design new fire control

Martin

July '82

Martin

Nov. '82

Martin

Jan. '83

Part II

- Design bolt lock system
- Design weight reduction
- Design feed system, box, etc.

Martin

Sept. '82

Martin

Jan. '83

Martin

June '83

Part III

- Design system for expendable
case ammunition
- Design electronic ignition system

Martin

Jan. '84

Martin

June '84

Note: These dates are only for design and do not establish any production or announcement dates.

AL 0024006

GUNSMITH CALL REPORT

C. J. Phinde
T. W. Phinde
Reporter Donald Hollings

to 8-34-82

for Name Sportswest-Div of Ray's Save Corp Gunsmith's Name Daniel Cowen

608 South Third Benton Washington 212 38335
No. & Street City State Zip

Gunsmith on Premises? YES If not, give address below:

Gunsmith's Address _____
No. & Street City State Zip

Recommended List (X) Open Acct. (X) % Disc. 30% Dealer (X) Large (X) Small ()
New Gun Repair

PERSONS INTERVIEWED and POSITION:

- 1. Daniel Cowen Gunsmith (2) _____
- 2. _____ (4) _____

SPECIFIC PROBLEMS ENCOUNTERED:

- 1. M700 still very heavy trigger pulls from factory.

SI

GENERAL DISCUSSION

No special problems. Lots of rebluing work, again because of the geographic location.

Dan did bring up the point that we are still sending out M700's with very heavy trigger pulls, 7-7½ pounds or heavier. This shop performs all the repair work for the chain of Sportswest stores in the north west area. Since the volume of stores sell a large number of M700's Dan receives several sent in from the other stores just to have the trigger pull lightened to the 3-4 pound range. This fact disturbs me because I wonder how many do it yourselves adjust their own triggers and do it improperly perhaps by reducing the sear engagement.

10/1

PLAINTIFF'S
EXHIBIT
3127

H
AL 0024034

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

STANDARD

PETERS

OUTLINE

xc: A. A. Hugick
F. E. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
September 27, 1977

TO: J. P. LINDE
FROM: C. J. MILLER / R. E. NIGHTINGALE
SUBJECT: 17 REM. PRIMER BLANKING

Work Order: C 1803

OBJECTIVE:

To confirm that primer blanking in the Model 700 rifle chambered for 17 Rem. would cause the trigger connector to break.

PROCEDURE:

The 17 Rem. ammunition was heated to 140° to increase the pressure to approximately 57,000 C.U.P. The heated ammunition was shot in three (3) Model 700 rifles, with sharp edges on the firing pin hole. Each fired case was observed for primer blanking.

RESULTS:

Rifle No. 6395444 was shot first and thirty three (33) out of the sixty one (61) rounds, had blanked primers. The trigger connector broke after the sixtieth round. The sixty first (61) round fired when the bolt was closed.

PLAINTIFF'S
EXHIBIT

3128

AL 0024072

1 of 2

To: J. P. Linde
From: C. J. Miller/R. E. Nightingale
17 Rem. Primer Blanking

September 27, 1977
Page 2

RESULTS: (Cont'd)

Rifle No. 6713463 was shot forty eight (48) rounds with twenty (20) of the primers blanking before the bolt started following down. The trigger connector was broken.

Rifle No. 6394666 was shot thirty three (33) rounds with twenty (20) of the primers blanking before the bolt started following down. The edge of the sear was rounded. The sear connector engagement was increased to allow to continue the test. Seventeen (17) more rounds were shot with twelve of the primers blanking, then again the gun followed down. The trigger connector was broken.

C.J.Miller/R.E.Nightingale:bd
Measurement/Test Lab
Illion Research Division

AL 0024073

cc: J.H. Chisnall

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPERPETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

July 21, 1977

JUL 25 1977

OFFICE - E. F. SIENKIEWICZ

TO: E. G. LARSON

FROM: E. F. SIENKIEWICZ

SUBJECT: MODEL 700, .17 CALIBER RIFLES

We have a potential primer blanking problem in our .17 caliber rifles due to an improper radius being performed on the firing pin hole in the bolt face.

This primer blanking condition can break the trigger connector by allowing gas to escape rearward through the firing pin hole, causing the striker to move rearward and hitting the sear down onto the trigger connector. With the trigger connector broken, a rifle could fire upon closing the bolt.

After receiving two primer blanking complaints in May, I examined the production drawings on the .17 caliber bolt and found that the .010" firing pin hole radius was not included on the drawings. This matter was brought to the attention of John Linde, who took immediate action and this was added in a DCR (Design Change Request) drawing, along with a tool drawing to perform this operation.

I met with Jim Conover, Foreman of the Model 700 Assembly, and instructed their bolt assembler how to use the tool supplied to obtain the proper radius, as he was only bumping the firing pin hole, causing a ridge to form, which would increase the blanking problem. Also, Arms Service personnel were instructed how to use the tool and a bolt with the proper radius on the firing pin hole was shown.

All of the corrective measures have now been implemented and production has been made aware of this potentially dangerous condition. However, several thousand of these rifles are now in the field and all can experience a primer blanking problem.

Sincerely,

E. F. Sienkiewicz

EFS: tpp

RECEIVED

JUL 22 1977

E. G. LARSON

PLAINTIFF'S
EXHIBIT

3129

AL 0024076

A
L
E
K
S
C
H

MODEL 700 PROBLEM

A Small quantity of Model 700, 7 and 40X rifles may have been made with an out of specification part. The sear safety cam in a limited quantity of rifles made between January 10 and March 6 may have been softer than our specification. This "soft" part may show premature wear and may eventually cause harder than normal safety switch forces.

Remington has checked the guns in our inventory and is taking steps to check all guns that were shipped. Teams of employees have been dispatched to the field to check and repair, if necessary, guns at our major accounts. Since the rifles in question were made quite recently, we feel that this will be effective in achieving the repairs of all rifles that may be involved.



AL 002446Z

cc: J. A. Stekl

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

January 23, 1980

To: D. J. Sanita

From: E. G. Larson

Dennis:

In our Safety Meeting review of the 600 recall yesterday, E. F. Barrett asked for a tabulation of safety related complaints received in the past six months on all bolt action centerfire rifles.

Would you please have your files reviewed, and list the model (either current or obsolete), and the number returned.

All complaints should be included, and if we have found some to be unjustified because owner changed screws, altered parts, etc., please note.

Many thanks.

E. G. Larson

EGL:lb

*Jerry Burns
supplying info. to Earl
per phone with Earl
1/24/80*

AL 0024608

PLAINTIFF'S
EXHIBIT

3131

1 of 1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

SUPER

PETERS

OPEN

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

February 22, 1979

TO:

E.G. LARSON

FROM:

E.F. SIENKIEWICZ

SUBJECT: RIFLES RETURNED FOR FIRE ON SAFE RELEASE

Since the Model 600 recall, hundreds of people owning Model 700 and other model firearms have contacted Remington alleging that their guns have fired when pushing the safety from on safe to off safe position without touching the trigger.

To date, all such inquiries have been handled by requesting the rifle be returned to Ilion for examination and repair at no charge.

Examinations of the returned guns received at Ilion have revealed no factory defects. All problems that have been found are due to customers tampering with the trigger adjusting screws, over oiling, (I.E. motor oil, salad oil, etc.) and other unauthorized alterations.

Several models returned are old obsolete Models 721, 722 rifles, some being 30 years old, that are worn from hard use, including the trigger assemblies. We do not have any replacement assemblies for these models; therefore, requiring extensive alterations to present Model 700 trigger assemblies for installation at no charge.

Each firearm returned requires 20 minutes examination time for each of three (3) engineers and \$25.00 to \$30.00 Arms Service charges for time and parts to make the repairs, totaling approximately \$50.00 to \$55.00 per gun on a no charge basis.

I believe that we should review this problem with our Legal Department and, if possible, reword our letters to customers on these alleged incidences to read: "Return your rifle for our examination and, if the rifle is found to be factory defective, the repairs will be made at no charge." If these guns have been tampered with, neglected, or parts are worn because of long usage, the customer should be responsible for the repairs.

In order to put this problem into proper prospective, 500 guns returned, examined and repaired on a no charge basis, is costing our Company between \$25,000 and \$27,000.

PLAINTIFF'S
EXHIBIT

3132

EFS:tpv

AL 0024651

10F1

bcc: R.B. Sperling
J.H. Chisnall
E.G. Larson
F.D. Cole
D.C. Brooks

February 26, 1979

2/27/79
CHECK
APV for
Have Steve & Anne
Charge WO. 51075
DC
APV 3/3 20
APV 3/3 20

Mrs. Susan McGinnis
Star Route, Box A-8 I.H.
Cuba, Missouri 65453

Dear Mrs. McGinnis:

Examination has been completed on your Model 660, .243 Win. caliber rifle, serial number 108687, which allegedly fired when the safety was pushed to the off position.

Our experts thoroughly examined the rifle and trigger assembly and found that the safety selector and trigger could be manipulated in such a way that subsequently moving the selector to the fire position did result in accidental discharge.

In view of our findings, we will have our Accounting section issue a check in the amount of \$73.90 for damages that occurred from the incident. This will be sent under separate cover and should be received within three (3) weeks.

Our Arms Service section will install a replacement trigger on your rifle, at no charge, and the rifle will be returned to you in the very near future. Once the rifle is again in your hands, we are sure you will find it satisfactory in every respect.

Thank you for bringing this matter to our attention, and for having afforded us the opportunity to be of service.

Sincerely,

J.A. Stekl, Supervisor
Firearms Product Service

JAS:tpg

1 of 5

PLAINTIFF'S
EXHIBIT

3133

AL 0024694

DO NOT REMOVE CARBONS OR COPIES

Remington

REMINGTON ARMS COMPANY, INC.

ILION, N. Y. 13357

ORIGINAL

RD-8538

3-1-79



INFORMATION FOR WHICH SPACES
HERE PROVIDED MUST BE SUPPLIED
BY SHIPPER OR INVOICE WILL BE
RETURNED AND DISCOUNT CALCUL-
ATED FROM DATE CORRECT INVOICE
IS RECEIVED

REMINGTON ORDER NO. _____
CONSIGNEE TO _____
SHIPPED VIA _____
CAR NO. & INITIAL _____
ORIGINATING POINT _____
SHIPPING WEIGHT _____ LBS.
PREPAID OR COLLECT _____

TERMS

PER CENT _____ DAYS _____ DAYS NET _____
DELIVERY _____

F. O. B. **NET CASH**

RECEIPTED EXPENSE BILL MUST ACCOMP. ANY ALL CHARGES FOR TRANSPORTATION

SELLER'S NO. _____ DATE 3-1-79

REMIT TO: Mrs. Susan McGinnis
ADDRESS TO WHICH REMITTANCE IS TO BE MAILED

STREET AND NO. Star Route, Box A-8 I.H.

CITY AND STATE Cuba, Missouri 65453

ORIGINAL BILL OF LADING MUST ACCOMPANY THIS INVOICE

QUANTITY	DESCRIPTION	PRICE PER UNIT	AMOUNT	TOTAL
	To Cover Damages Resulting from Defective		73.90	
	Safety Selector and Trigger.			

PRICES AND
TERMS
CORRECT

APPROVED

APPROVED FOR PAYMENT ONLY

ABOVE MATERIAL RECEIVED
AND SAME IS SATISFACTORY

AMOUNT
OF
INVOICE

73 90

CHARGE

5300 - ILION

51075

EXTENSIONS
CORRECT

PURCHASE
ORDER
CHECK

ENTERED

CHECKED BY
APPROVED BY

AUDITED

DO NOT WRITE BELOW THIS LINE

CASH
DISCOUNT

FREIGHT

NET

73 90

CHECK NO. AND DATE PAID

2 of 5

AL 0024695

REMINGTON ARMS COMPANY, INC.

Trigger Assembly Special Replacement Program

Ref. #

47512
2787

(A)

GUNSMITH

Name _____
Street _____
City, State Zip _____
Telephone _____
(Area Code) _____
Control No. _____
(For Rem. Use Only)

GUN OWNER

Name _____
Street _____
City, State, Zip _____
Telephone _____
(Area Code) _____
Control No. _____
(For Rem. Use Only)

(B) FIREARMS INFORMATION

Model (Check One)

- ☐ 1. Rem 600
☐ 2. Rem 660
☐ 3. Mohawk 600
☐ 4. XP-100

Caliber (Check One)

- ☐ 1. 222 Rem.
☐ 2. 6mm Rem.
☐ 3. 243 Win.
☐ 4. 308 Win.
☐ 5. 6.5mm Rem. Mag.

Caliber (Check One)

- ☐ 6. 350 Rem. Mag.
☐ 7. 35 Rem.
☐ 8. 228 Rem.
☐ 9. 221 Rem. "Fireball"
☐ 10. Redchambered

Serial No.

1 1 6 1 3

(C) MODIFICATION INFORMATION

Method Gun Received From Owner:

(Check One)

- ☐ Hand Delivered
☐ UPS
☐ U.S. Mail
☐ Other _____
(Specify)

Date Gun Received From Owner

Month Day Year
1 1 79

Estimated Completion Date

Month Day Year
1 1 79

(D) INVOICE DATA

Date Work Completed

Month Day Year
1 1 79

Charges: Modification Charge
Transportation
Other (Detail Below)

\$5.00

Gunsmith Signature _____

Date _____

Total

\$

GUNSMITH'S COPY
(to be retained by gunsmith)

3085

AL 0024697

MODEL: 660

GENERAL AVERAGE Good

81: 02787

NUMBER OF FRONT + REAR SIGHTS AND SCOPE

DATE: 1-18-79

SCREWS MISSING RECON PAD ADDED

MR3. SUSAN MCGINNIS
FROM: STAR AT BALAB

FIRE ARM TYPE. UNKNOWN

IA CUBA No.

4. CONDITION: _____

GUN # 1 108687

PRCC: 155 CHRG: 9 TEST: 57

CODE: LR = 2-68

HEADING: OK

GA./CAL.: 243

BREACH OPENING: OK

CHECKED BY: M. HARDY

ADDITIONAL ENVELOPES: OK

APPROVED: SAH 4/6/79

CHAMBERS: Good

APPROVED: 44-11679

1251 _____

APPROVED: E. J. 2-16-79

COMPONENT CONDITION: (Damaged, Broken, Old style)

APPROVED: 150R-4417-6

SLIGHT DENTS IN WOOD

COLT SHOWS COLOR WORN OFF

BOL BRIGHT AT MUZZEL

COMPLAINT: IF TRIG. IS DEPRESSED WHILE SAFETY IS

ON GUN WILL DISCHARGE WHEN SAFE IS MOVED

INCIDENT: SHOOT HOLE IN FLOOR OF PICK UP TRUCK

COMMENTS: Person involved in recent [illegible] [illegible]

Can be fired when safety triggers are manipulated.

4085

AL 0024698

A

DON'T SAY IT — WRITE IT

To

From

Date

3/6/79

1. m/bbo received 1/18/79 to Ed. Sinkiewicz
attention
2. Customer letter dated 12/12/78 +
3. Arms Service held for Personal or Property Damages
Examination — copy attached
4. Returned to Arms Service for storage
5. Examination report to Jack Marshall 2/22/79
6. Feb 26, 1979 instruction from J. H. Still to replace firing
control

SAFETY IS A WISE INVESTMENT

5 of 5

AL 0024699

CC: E.F. Sienkiewicz
J.E. Preiser
E.G. Larson
R.G. Sherman
J.H. Chisnall

December 11, 1978

Mr. O.K. Baxley
Vice President for Finance
Lamar University
P.O. Box 10003
Beaumont, Texas 77710

Dear Mr. Baxley:

Examination has been completed on your returned Model 700 ADL 6mm caliber rifle, serial number 307270.

We found the trigger assembly to be well within manufacturing specifications and we could not duplicate the problem that you had experienced. However, we did find excessive oil within the trigger assembly and strongly recommend that oil be used sparingly on the rifle with no lubrication added to the trigger mechanism.

In most of our investigations, concerning the problem that was experienced, we have found that the safety was pushed to the fire position with a finger on the trigger.

As a gesture of good will, we are replacing the entire trigger assembly, at no charge, and the rifle will be returned via Blue Label U.P.S.

Thank you for having afforded us this opportunity to be of service.

Sincerely,

E.F. Sienkiewicz, Supervisor
Firearms Product Service

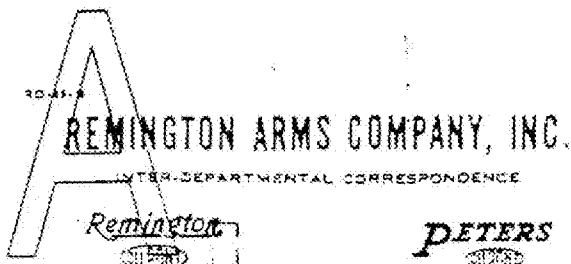
EFS:tpf

PLAINTIFF'S
EXHIBIT

3134

AL 0024700

10f1



cc: C.B. Workman
C.P. Glas
C.H. Carter
D.J. Sanita

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Illion, New York
May 2, 1980

P. H. HOLMBERG
Bridgeport

NEW FORMAT INSTRUCTION BOOK

Forwarded for review, comments and Marketing/Legal approval are printed versions of the proposed Model 700 Instruction Book. Ten printed copies are enclosed for distribution to Bridgeport personnel. Minor art and verbiage errors have been already detected.

Also forwarded are, copies of the instruction book in three different paper stock size: 60 lb., 70 lbs. and 80 lbs. It is recommended that the 80 lb. paper stock be used for the new style instruction book. This stock paper size would provide more rigidity. Cost of the new style book is 8.5¢ vs 4¢ for our present Model 700 manual.

It has been suggested that the new format booklet be used with the introduction of the Model 7400-7500 Rifles. Expediting the review and legal approval of the new Model 700 instruction book is required if we are to meet scheduled warehouse data for the new models.

A meeting should be scheduled to review comments, and required changes, additions or deletions.

R. L. Sassone
R. L. Sassone, Supervisor
Project Control & Admin. Services

RLS:sse
Enc.

PLAINTIFF'S
EXHIBIT

3135

AL 0025065

1 of 1

CALE

TO

Mr. Duane Ricci
Remington Arms Inc.
Ilion, New York 13357

DATE February 3, 1983

SUBJECT rejected trigger connect
I-80600; I-80550

(Rejected at Vendor)

4,500 rejected trigger connectors, undersized stock,

both processes completed (before & after heattreat) @ 163.24/M \$734.58

8,000 rejected for excessive radius on 075 short leg (inside) *(B)*

both processes completed (before & after heattreat) @ 163.24/M \$1305.92

8,000 rejected for excessive radius on 075 short leg (inside)

first process completed (before heattreat) @ 65.92/M \$ 527.36

☒ PLEASE REPLY ☐ NO REPLY NECESSARY

SIGNED

Ronald Cray

PLAINTIFF'S
EXHIBIT

3136

AL 0025181

1 of 1

~~John~~
A

11/200 Sea Safety Com

Potential customer complaints from insufficient charge
material analyzed from 6/13/78 - 1/31/80

Possible complaint

11/200 5

- 1) Delayed firing
- 2) Discharge when bolt handle raised
- 3) Discharge without pulling trigger
- 4) Accidental discharge
- 5) Trigger - Safety malfunction
- 6) Misfire

7

7

2

9

1

2

28 Total

PLAINTIFF'S
EXHIBIT

3137

AL 0025778

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: P. H. Holmberg
J. E. PreiserBridgeport, CT
October 19, 1981

TO: E. F. BARRETT
E. B. BEATTIE
H. K. BOYLE
J. P. GLAS
R. L. HALL

E. HOOTON, JR.
J. P. LINDE
J. P. McANDREWS
J. G. WILLIAMS
C. B. WORKMAN

FROM: T. W. RAWSON *trw*

SUBJECT: SUMMARY EXECUTIVE BOLT ACTION RIFLE COMPETITIVE AUDIT

On 10/15/81 the second Annual Executive Firearms Competitive Audit was held. Because of the competitive situation, bolt action rifles were chosen as the subject. Observations and discussion at this audit were limited to product. Once again the evaluation was restricted to visual impressions as would be typical in a store environment. Technical evaluation will be presented by R & D in November.

Attached is a matrix similar to the one filled out which summarizes the scoring. Following are observations on that scoring and a summary of the discussion.

- First, second and third place without price consideration went to 700 BDL, M70 Featherweight and Ruger M77 respectively.
- The overall scores did differ from the cumulative individual item scores indicating that overall impression and other factors than those cited contributed to ranking.
- The addition of pricing information (copy attached) did change the ranking. Ruger M77 went from third to a first place tie with the 700 BDL in this analysis. The M70 FWT fell from 2nd to 3rd reflecting the negative reaction to its higher price.
- Stock appearance honors went to M70 FWT, 700 BDL and Ruger M77 in that order suggesting some combination of the 3 might prove most desirable. While the 700 Classic was not audited a sample was reviewed. An oral consensus seemed to indicate our classic was the favorite style. The narrow forend, open styled pistol grip and straight comb of the M70 FWT received special mention.

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• Action smoothness, a characteristic discussed in market research panel studies, ranked Remington entries rather low. This ranking suggests the work being done on the recessed follower is in the right direction.

• Browning, known for its high quality appearance, ranked first in metal finish. Dropping back down the price scale the auditors seemed to agree, there was little difference between the major three contenders. Remington did outrank both WW and Ruger in this characteristic on the sample guns. Some auditors expressed surprise at this but warehouse audits and in store checks confirm, generally, this situation.

• Remington's BDL and ADL took the honors in the extractor, ejector, locking system category. It was mentioned that our design yields the cleaner, neater appearance as a system. Objectivity may have been compromised here as well because of what we believe to be true of the strength and safety of our system. While more bulky and less streamlined the Ruger extractor (Mauser type) does get a lot of play in the press and trade as the more impressive looking mechanism. It was noted that our extractor appears less than impressive and this is partly due to the crudely ground off rivet used to hold the extractor in place.

• The panel was asked to judge the safety not so much from its "safeness" which is difficult to judge in this environment, but from the point of view of convenience, quietness and quality of appearance. The Browning and Ruger took 1st and 2nd place respectively. Both rifles feature sliding, "shotgun type" tang safeties. Remington safety which is functionally similar to Ruger's was relegated to 4th place because of the side tang position which necessitates an elongated hole in the stock and yields relatively poor appearance.

• Ruger took first place for accessory parts (sights, scope mounts, grip caps, etc). Their combination of clean barrel (no sights, no holes) and scope mount plus absence of white line spacers at grip cap and butt seemed to be most preferred. The Ruger scope mount system is respected functionally but was described as rather bulky - visually. Negative comment was recorded regarding the safety message on Ruger's barrel. (cosmetic reaction).

Summary:

Within our price segment there was little to choose from an execution point of view between the big 3. (Rem., WW, Ruger).

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Remington's wood finish, fits and metal finish were at least as good as competition. Small details, like the previously mentioned white extractor rivet head were jarring footnotes.

While the functional analysis has yet to be heard there was little apparent, in the visual audit phase to suggest Remington's functional quality suffers by comparison.

Confining the conversation to product then, it appears that we suffer in the competitive comparison with design cosmetics. In the absolute sense our styling left something to be desired. The panels interest in the 700 Classic, M70 Featherweight and Ruger M77 all fairly well follow a documentable trend in bolt action rifle styling in evidence today. Considering the M700 in current form is basically 20 years old while the movement toward pre 64 M70 - classic styling started by Ruger with the M77 is but 10 years down the product life cycle, this is not surprising. More subtle however is the apparent visual quality of mechanical design from which people imply overall product quality. The M700 safety while functionally similar to the Ruger 77 suffers by comparison in the visual sense. The quality of our design from a styling point of view needs some upgrade as well as styling in the absolute.

Finally the audit also raises a more significant question relevant to quality. Our execution is acceptable and functional design adequate to superior. The styling differences seem short of a total explanation for slipping sales. The price value relationship is the key and as can be seen by the summary matrix the price does effect peoples opinion of gun desirability. Ruger with price added represents the significant threat to M700 sales. Price-cost relationships are the rub. Significant improvement in productivity through better management control of scrap, rework and warranty repair are the benefits of an improved quality system outlined in the quality plan. The changes called for in that plan are essential to improving the cost situation.

TWR:fd

attachment

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After inspecting all samples, please fill in matrix below. Best score = 1; Worst score = 7.
 Duplicates are acceptable.

	REM. 700-BDL	RUGER M/77	REM. 700-ADL	W-W 70-XTR	W-W 70-FWT	BROWNING BBR	S&W 1500
Stock Appearance	2	3	6	4	1	5	7
Action Smoothness	5	3	6	4	2	1	7
Metal Finish	2	5	3	6	4	1	7
Extractor, Ejector, Locking System	1	4	2	5	5	3	6
Safety	4	2	4	3	3	1	5
* Accessory Parts (Grip Caps, Sights)	2 (2)	1 (3)	6 (5)	5 (5)	4 (4)	3 (1)	7 (6)
Best Overall w/o Price	1	3	6	4	2	5	7
Best Overall with Price	1	1	2	4	3	5	6

* Number in Parenthesis is placement based on individual item scores above. Best overall W.O.
 and W. price reflect overall impression and other factors not identified as individual items.

COMMENTS:

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COMPETITIVE BOLT ACTION RIFLE AUDIT 1981

PRICING INFORMATION

	<u>M/700 BDL</u>	<u>RUGER M/77</u>	<u>M/700 ADL</u>	<u>W-W 70-XTR</u>	<u>W-W 70FWT</u>	<u>BROWNING BBR</u>	<u>S & W 1500</u>
suggested etail tart '81	399.95	325.**	334.95	412.	433.	429.95	334.95 Std. 379.95 Deluxe
etail Median elling Price 6/81	315.	269.	250.	385.	433.*	400.*	255. Std 305. Deluxe

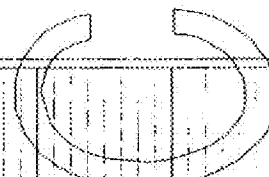
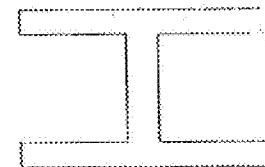
* Estimated

** 340. as of 6/1/81

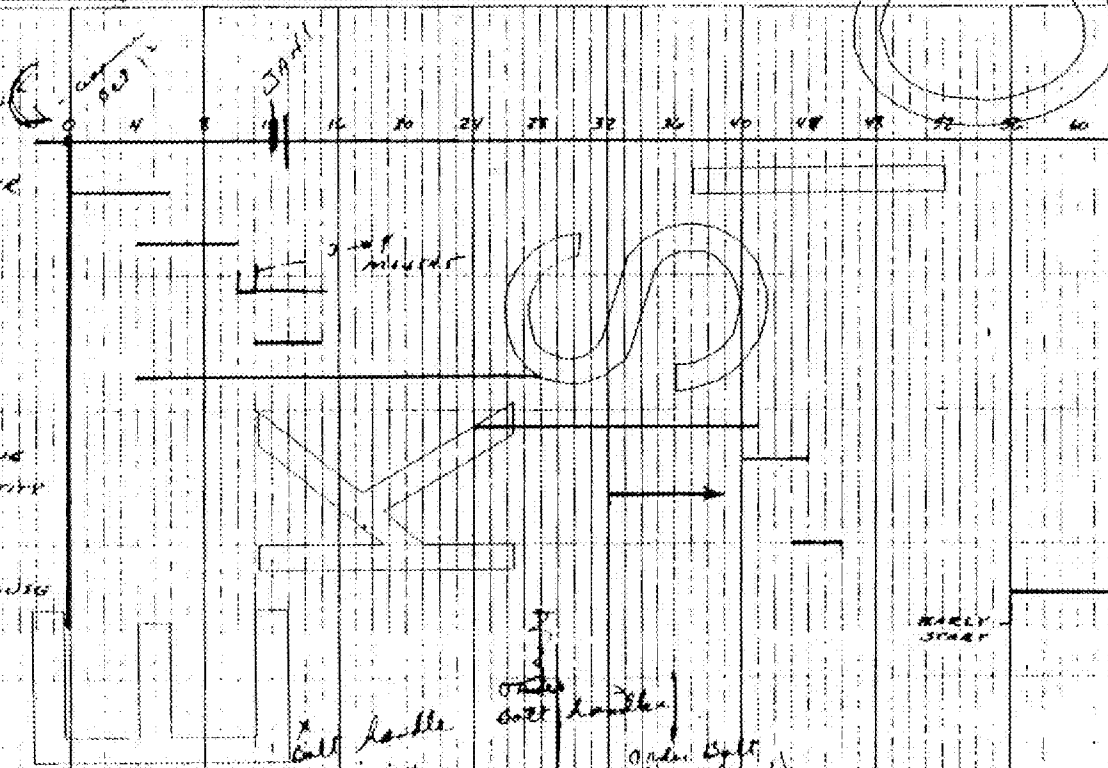
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Nov. 1 → Dec. 1



- OBTAIN ADVANCE FUNDS
- START TOOL DESIGN - ORDER STANDARD MACHINES
- PREPARE ENGINEERING ESTIMATES
- PREPARE AND REVIEW ECONOMICS
- PROJECT APPROVAL
- PROCURE TOOLING AND STANDARD MACHINES
- TRIAL AND PILOT
- R&D PURIFICATION TESTING
- ORDER PRODUCTION QUANTITY OF PARTS
- DESIGN AND/OR PROCESS REVISIONS
- PRODUCTION TO WORK HOUSE



FINAL
DESIGN DRAWING
OF FOLLOWER
& BOLT HANDLE

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EXHIBIT
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10/21/02 5566

Green Valley, AZ

Jan. 25, 1982.

To Clark Workman

From Wayne E. Leek

Subjects: Jan. 1982 report on Silhouette activities in

Arizona, matches attended, and repairs to

Remington products. Also a more detailed report

on suggestions supporting a new line of rifles

and shotguns.

Matches attended:

Cochise Gun Club Jan. 16, 82 Match winner Leek 27/40

Nogales Rifle Club Jan. 17, 82 Match 1 winner Leek 30/40

Match 2 winner Leek 30/40

Black Canyon Range Jan. 24, 82

Arizona Rifle and Pistol Assn. Championships

Match winner Yehl 32/40

1st. AAA Leek 31/40

Repairs to Remington Product:

A customer's M700 /30'8 Silhouette rifle would fail to fire about 30% of the time. Examination revealed an improper nose shape on the firing pin. After replacing with one of correct design consistent ignition was restored. Instead of having a radius for the nose it was flat. There was no indication of tapering. This firing pin will be sent upon your request.

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SUGGESTIONS SUPPORTING A NEW LINE OF BOLT ACTION RIFLES AND SHOTGUNS.

Introduction.

This program reviews the favorable and undesirable features of the M700 rifle with suggestions to support an improved M700, elevating it to a higher quality level of customer acceptance. The development will not be too expensive or time consuming and would provide a base rifle allowing time to accommodate the more innovative ideas.

A proposed foundation for a new bolt action shotgun follows the rifle program.

Program for the improved rifle.

The M700 action exceeds the strength of every known bolt action rifle by a substantial margin. Supporting the exposed head of the cartridge case by reinforcing it with the bolt shroud, barrel recess and receiver, prevents case rupture and a damaging amount of gas from escaping rearward during high pressure firing. The ring extractor used in the M700 eliminated the need for expensive qualification threading and extractor cut in the barrel receiver assembly so commonly used in previous bolt action rifles. The superior strength was a fortuitous spin-off of this design and not known until severe strength testing revealed the secret. Any future development should include the integrity of this principle and must be jealously guarded. This is not to say that the ring extractor is mandatory to protect the strength principle but the support of the cartridge case without rupture under high pressure is extremely important.

The M700 extractor has undergone a series of design changes to guarantee reliability and the latest is believed to be superior to previous attempts. Unfortunately a bad reputation of breakage, malfunctions, and difficult repairs

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has plagued the principle to the point that future customer acceptance is severely questioned.

During an Ordnance development of a tank machine gun by Remington, an improvement to the ring extractor was found in a German WWI machine gun resulting in a successful design for our program. This extractor was a claw type, small but efficient in nature housed in a cut in the bolt shroud. Its main feature, an ever-tightening grip as the load was increased, left little to be desired. The outside surface of this extractor replaced the cut-out portion of the shroud and was thoroughly supported by the barrel recess. Strength tests revealed that this combination provided all the strength of the ring-extractor design. It is suggested that this principle be used in the improved rifle.

In general the accuracy of the M700 is adequate for hunting, varmit, silhouette and target shooting. Special orders for bench-rest type rifles produced by the custom shop have proven accuracy superior to all but the finest match rifles. Modern barrel manufacturing methods such as used in Remington are to be credited for this achievement. Remington, however, is not in the league of competition for the position match shooter, dominated by Anschutz.

There are several areas where accuracy can and should be enhanced by changes in the basic design such as the barrel bracket. The cross-sectional area of the bracket adjacent to the barrel is considered weak by many gunsmiths and has now gained a bad reputation for lack of recoil support especially when using heavy-calibered ammunition. This situation is

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aggravated by improper bedding in the stock, especially if the bedding support contacts the bottom of the bracket.

Any shifting or bending of the bracket can cause accuracy problems. One made of powder metal or other means of greater rigidity as used in the M 788 would be of benefit.

A round surface on the bottom of the receiver as presented by the M700 was always been questioned by many gunsmiths, designers, and match shooters as a possible area of non-stability during the torquing of the receiver during firing. If true, and I believe the torque problem does exist, a conventional flat surface should be provided for proper bedding. The new barrel bracket design could be extended with a mating flat surface to fit the receiver.

Research is needed to explore the areas of bedding actions in an effort to determine the magnitude of advantages in barrel-dampening devices. Although some investigation in the past has shown advantages by using dampening methods inconsistencies have prevailed. I believe the results of past efforts were clouded by barrels which had varied wall thicknesses. Modern manufacture such as practiced by Remington virtually guarantee centralized bores in the barrels. Reliability in the use of bedding devices would be enhanced with these barrels. Such methods as electric bedding, 2-point and 3-point bedding, pre-determined muzzle pressure, free-floating barrels and other means should be explored.

There is some indication that accuracy is improved when accompanied by faster lock time in rimfire rifles and the same should be true in center fire rifles. It is believed that

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the fall of the firing pin sets up pre-vibrations in the barrel prior to ignition which disrupt accuracy. There also may be a more uniform ignition advantage.

Accuracy testing of thousands of production rifles has revealed that the M788 is superior to the M700. This fact was observed during the development of the M788 when compared to the M700. Using the same barrel process, stock bedding principles and the same lots of ammunition have ruled out most of the variables between the two rifles, the exception being the receiver (front vs rear lockup), heavy vs light barrel bracket, and the difference in lock time. M700 lock time is approximately 5.5ms and the M788 is 2.7ms. The shooters are also observing the accuracy advantage of the M788. It is believed that the faster lock time in the M788 gives this model accuracy advantage. Re-design of the M700 should involve reduced lock time to improve its accuracy and give the off hand competitor the advantage of this principle.

There are numerous ideas to achieve faster lock time. Such a design is a flat-type formed pin with rotary swaged nose as used in the M788. Other ideas include the use of lighter weight metals, ie, aluminum, titanium, tubular construction, carbide or alloy steel-tipped light weight pins, etc. It will be found that a nose diameter of .060" is necessary when using the lighter weight pin for proper ignition. Faster lock time approaching zero should be our objective.

Reliable accuracy is no more secure than the rigidity of the scope base mounting screws and in the M700 6/48 screws are

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not adequate. The use of 8/40 screws as used in the M788 or a fixed scope base of Ruger design is recommended.

Glass bedding methods are excellent to insure a perfect fit of the action to the stock. Also recent developments in custom designs provide extruded aluminum bedding elements which precisely fit the barreled action and are securely epoxied to the recesses of the stock. Fiber glass and other plastic materials are now appearing on the market, impervious to the elements and strikingly attractive. These items certainly suggest improvements in accuracy.

Accuracy is always enhanced by fine trigger mechanisms. Remington's M700 has a reasonable trigger which when properly adjusted, allowed a spread of pull weight from 12# to 20# with a crisp let off. However one must rely on the factory adjustment which is anchored with loc-tite cement plus staking with a center punch. The latter ruins the threads and side plates of the mechanism and the former fills the screw slots, all of which makes it virtually impossible to adjust by anyone, including gunsmiths. The excuse for this is in the name of safety to prevent the customer from making adjustments. However the shooters are attempting to make adjustments and often ruin the trigger adjusting means that has been damaged in assembly.

A more substantial approach is the Canjar design which in essence is a copy of Remington's principle but improved and of course more expensive. This assembly allows more contact area for the screws. The main adjustment of over travel is retained by a nylon pin. Canjar provides instruction for adjustment and a warning statement, which apparently relieves him of responsibility in case of accidental discharge due

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A to faulty adjustment. The screws are Allen-headed which eliminates the slot problem. Two-link and three-link systems are available-the latter can be adjusted down to a 2 oz. pull. Most match shooters resort to the Canjar or Kenyon design. It is suggested that before improvement to our trigger mechanism be made that we analyze Canjar, Anschutz, Kenyon and Feinwerkbau designs.

Remington's manual safety blocks the sear mechanism. The manual motion is in the same plane as the trigger movement and allows a dangerous condition to exist. Pulling the trigger at the same time the manual safe is moved to off, fires the rifle! This motion is not unlike taking the hammer off safe in a M94 Winchester or a revolver.

A manual safety should never be allowed to function in the same plane with the trigger unless a disconnecter is provided preventing firing if movement of the safety takes place while the trigger is pulled! A safer and more reliable manual safety is a 3-position type located on the cocking piece. It is recommended that these ideas be considered.

The stock design of the M700 is excellent, presenting good balance and symmetry. The RKW finish is appealing to those who desire a glossy shiny finish but has little appeal to the experienced sportsman who is accustomed to European walnut and hand-rubbed oil finishes.

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The effect of pressed checkering has down graded cut checkering and has led some shooters to search for stocks with other decorative designs. One attractive procedure is to ^{grained} use a stippling pattern as found on fine German-made firearms. Also there is a slight trend toward hunting scenes cut or impressed or transferred on the stock.

Approximately 13% of the population are left-handed and I believe it is prudent to continue providing these models for the left handed shooters.

For many years Remington was very aggressive in developing and promoting new calibers, leading the competition in the market place. Such successful developments as the 7MM Magnum -25-06, 222, 22-250 are examples. Naturally not all of our cartridge developments were a huge success and the inability to analyze a future market such as was done on the military 308 has in some degree hurt our posture. To keep our product alive new developments in cartridge design which provide a substantial improvement over the common place is needed. The 7/308 and the Remington 7MM Express are good examples of a policy to keep new cartridge development in the forefront.

A peen-hammered barrel presents desired effects of something special being done to high grade rifles. This process was used for years on the surface of a sterling silver bell on slide trombones manufactured by the Old's musical instrument company. They claimed exceptional tone qualities from this process due to the relief of surface tensions.

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on the bell, and this feature became an appearance of excellence among musketeers.

We achieve this appearance in our rotary swaging of barrels and then remove the surface by grinding. The idea of providing a super-grade barrel with this aesthetic effect was weekly presented to the operations committee several years ago. This lacked technical support of what might be desirable mechanical improvements in accuracy. Certainly the aesthetics of something special was there. Since then the fine custom Mauser rifles display their product with this appearance. I believe the surface condition if left might indeed support improved accuracy performance along with a desirable appearance and certainly would be obtainable at no extra expense.

PROPOSED IDEAS FOR FUTURE DEVELOPMENT.

Several ideas were suggested in my Sept. 21 report that would improve the performance of the match shooter in his quest for perfection in accuracy and these are repeated in this report.

Recoilless principles used in fine match-grade air rifles, (nullifying recoil caused by movement of the compression piston.)

Movement of a large mass prior to release of a bullet or pellet tends to throw the shooter's aim off target before exit of the projectile. This problem exists in such open-bolt centerfire rifles as the BAR, M3 and Thompson Sub machine guns and others. To nullify this unwanted problem in match grade air rifles four approaches have been taken as follows:

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1. Anschutz match air rifle uses an oil-filled hydraulic cylinder, an action similar to car-type shock absorbers to compensate for the forward motion of the compression piston.

2. Walther's match air rifle uses a single stroke pneumatic system which allows a piston to compress air into a chamber only a few times larger than the pellet. Movement of the trigger sear allows a heavy spring-loaded hammer to hit a striking lever which in turn pushes open an exhaust valve.

3. Beeman's match air rifle involves double-acting pistons which results in a smooth recoilless and vibration-free firing action.

4. Feinwerkbau's match air rifle uses a principle where movement of the compression piston at the moment of firing trips a sear which releases the entire barrelled receiver assembly to ride on a pair of hidden, hardened rails. The necessary "equal and opposite" reaction causes this heavy metal mass to slide back about $\frac{1}{4}$ " on the rails while the shooter holds the motionless stock and trigger. The shooter feels almost nothing and his sighting picture is undisturbed. The mechanism must be returned to its locked-forward position for the next shot.

Eliminating the disturbing recoil sensation caused by the moving piston prior to pellet movement in these excellent match air rifles allows the shooter to concentrate on all the fine points of shooting affecting his performance such as sight picture, hold, trigger pull and follow-through.

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Remington's patented recoilless principle.

Developed during bench rest shooting competition around 1947-1950, this system applied to powder-actuated fire arms. The objective was to eliminate the variable offered by the shooter's shoulder from shot to shot in an effort to improve accuracy. The principle was sound and was instrumental in winning bench rest matches in Johnstown, New York. It was also a factor in the development of the several accuracy devices now in use in gallery testing at the Ilion plant.

Basically the system allowed the barreled action with scope to move $3/4$ " rearwardly on bearings before being retarded. In other words the bullet would exit before rearward resistance could affect the shifting of the point of impact.

Remington's method is quite similar and preceded that used by Feinwerkbau.

A recommendation for consideration in future rimfire match rifle design.

Two variations in accommodating the movement of barreled actions until bullet exit were used in Remington's recoilless design.

1. The preliminary design allowed the action to float on lubricated lead bearings sliding rearwardly in a metal track.
2. In the final design the action was allowed to recoil on a series of cam followers until the bullet had exited.

The principle is sound, and now is being used successfully by Feinwerkbau in their championship winning air rifles. I used this system successfully in winning bench rest matches. Remington accuracy devices have proven successfu

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in millions of rounds fired. Therefore I believe the method could be introduced into a rimfire match rifle where the principle would nullify errors in the major problems associated with follow-through.

SUMMARY

Air rifle shooting has emphasized the need for follow-through in precision off hand shooting making one aware of the need for uniform resistance to recoil.

Olympic class air rifles have built-in designs to nullify any unnecessary movement of mass which would aggravate consistent resistance to recoil.

Remington's patented recoilless system provides a secure method of eliminating this effect in powder-actuated firearms.

It is recommended Remington consider incorporating this principle in future match rifle development.

Recoil reduction is uppermost in every shooter's mind and numerous ideas have been promoted to solve this disturbing element. Some ideas have been moderately successful such as the Cutts Compensator, a protruding device located ahead of the muzzle, where jetting gas following the bullet impinges upon flat metal surfaces pulling the gun forward. In use the result is an ear-splitting but reasonable recoil reduction of about 10% of the total recoil. However, the effect appears late during the recoil cycle and aids some shooters more than others depending upon how tightly they hold the gun to the shoulder. Many innovations to this principle less effective but possibly more attractive have been used such as providing drilled holes or cut slots in the barrel.

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Other ideas such as used in Remington's M1100 wherein a portion of gas energy is stored in a moving mass and then later transferred back into the gun has been successful and acceptable as a recoil reducer to the hunter, skeet and trap shooter.

Moving butt stocks which store energy in a spring or hydraulic absorbing means such as the so-called hydro-coil have been attempted but with questionable success. This principle allows the shooter's grip hand to recoil into his cheek with an unpleasant effect as the stock pull length is decreased. Naturally if used with a scope on a high recoil rifle this would result in eye injury.

The most common lowest cost and least effective method is the provision of rubber recoil pads designed with collapsing internal rubber fins. This device made of rubber stores recoil similar to a spring allowing an undesirable fast recovery. An analogy is the motion of suspension springs in automobiles which require shock absorbers to subdue the rebound of stored energy.

An ideal butt pad would be the type that resists compression up to a predetermined pre-load level, then absorbs the recoil without a spring-like action recovering gradually back to normal.

Such a device was developed by Remington with the assistance of DuPont-made of polyurethane foam. Tests of this device produced outstanding recoil absorbing characteristics and met the principles previously mentioned.

There were problems of color, matching surface to wood, and if sanded, water absorption. These problems I believe can be solved and if produced correctly would perform superbly far

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beyond any butt pad now produced.

A standard 30'06 caliber requires a 36" barrel to obtain maximum velocity. Therefore it is obvious that a considerable amount of gas energy is being wasted when using barrels of shorter lengths. The escaping gas from a 24" barrel in this caliber generates a muzzle pressure of 10,000#sq" and is escaping at velocities in excess of 2700 ft/sec. This escape produces a rearward jet effect which is approximately 1/3 of the total recoil energy, and is so significant that if prevented from happening would be one of the more important advances in gun design and recoil reduction in history. An adequate solution would stir the very foundation of the sporting and military gun industry and would provide a powerful edge of leadership. When achieved safely the principle has far-reaching implications in the commercial and military areas. For example with fully automatic rifles recoil would become nearly stabilized during firing, a feat long sought by the military. Reducing recoil in this magnitude could provide the hunter with potential big caliber performance and a recoil of a 223.

The idea is not a myth. A laboratory model was constructed by Remington personnel using a M760 in 30'06 caliber with the resulting measured recoil of a 223! It is conceivable that this principle could be used on shotguns as well and combined with the recoil-reducing principle in the M1100 could approach a recoil-free shotgun.

Initially some reliable means must be used to trip a

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valve mechanism closing the escape of gas. The most logical means is the bullet. Therefore it is assumed that the various suggestions of valve mechanisms discussed will be programmed to be activated by the bullet. Inertial problems are a big factor and careful calculations, computer analysis, and measurements are necessary. If the nose of the bullet activates a valve mechanism in sufficient time a difficult problem in timing is overcome. Conversely if more delay is needed earlier programming by the bullet in some selected area of the barrel is needed and careful analysis and design must be instigated to prevent dangerous premature muzzle closure before bullet exit.

The following suggestions are without calculation or measured foundation and are ideas only, to be examined and reviewed by design and laboratory personnel. It is hoped that they may cause an hedonic reaction by the readers to further enlarge the spectrum of thought.

Suggestion 1

Utilize a 3-section barrel. The first section is held rigid containing the chamber and is smooth bored. Being the longer of the three lengths allows the bullet to obtain maximum velocity. The second or middle section rotates like a nut in a threaded tube. This portion is relatively short and contains gain twist rifling. The rear portion of the barrel works like a collet closing a sphinter valve when rotated by the bullet trapping the expanding gas. The bullet continues into and thru the third rifled muzzle section

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finalizing its spin and accuracy. This section is held rigid. The middle section when rotated loads a spring which is programmed to open the valve, gradually releasing the stored gas by counter rotation at a later period.

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Suggestion II

Use a bullet design of two diameters.

Fig. 1

The front section, for example, could be .284" in diameter and the rear section .375" in diameter. The first 20" of 24" of the barrel is smooth bore to accommodate the .375" rear cylinder of the bullet and the last 4" a .284" rifled bore. The juncture of the two sections of bullet are sharp, creating an intentional stressed area. The bore provides a sharp shoulder from .375" to .284" to shear off the rear slug which acts as a plug preventing any further forward movement of gas.

Fig. 2

Fig. 3

The sheared .284" diameter forward section is allowed to enter the 4" of rifled barrel, spin stabilize, and exit from the muzzle. The remaining slug must be removed. If the front section of the barrel is allowed to slide forward due to the force generated by the forward motion of the bullet, an escape vent could be provided to discharge the slug and the pent-up lower velocity residual gas. It is believed that because of inertia in actuating the mechanism sufficient time to release the stored gas could be programmed to discharge at a gradual reduced rate with negligible effect on recoil reduction.

Fig. 4

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TITLE OF PROJ. _____

FIG. NO. _____

SUBJECT _____

WORKS _____

COMPUTER _____

DATE _____

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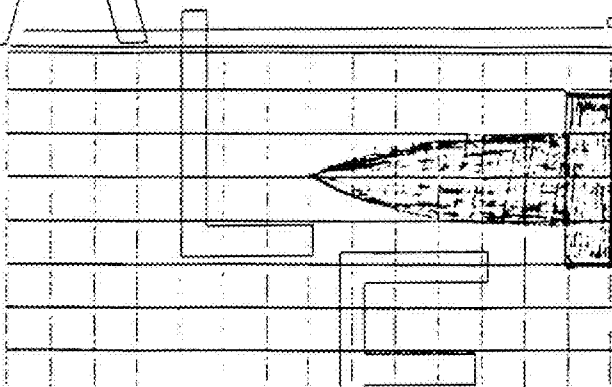


Fig. 1

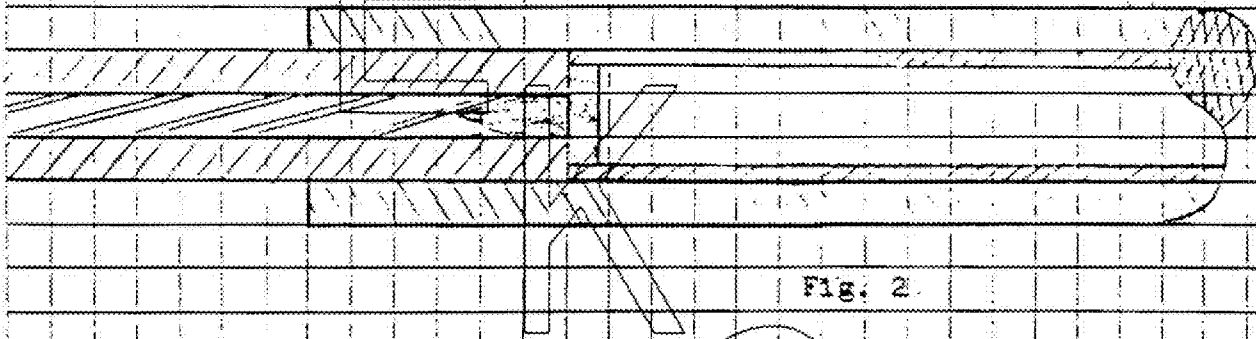


Fig. 2

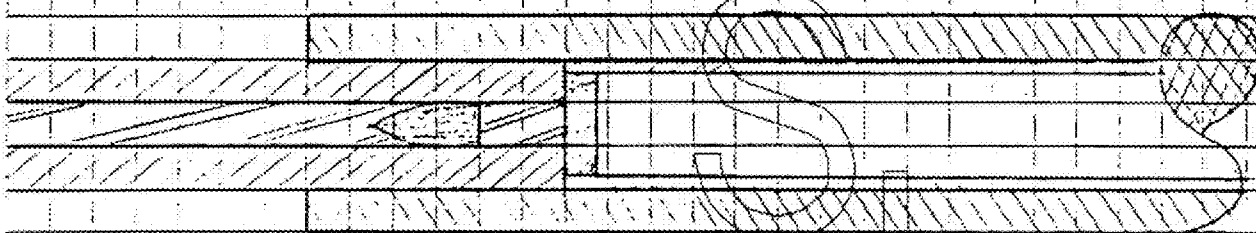


Fig. 3

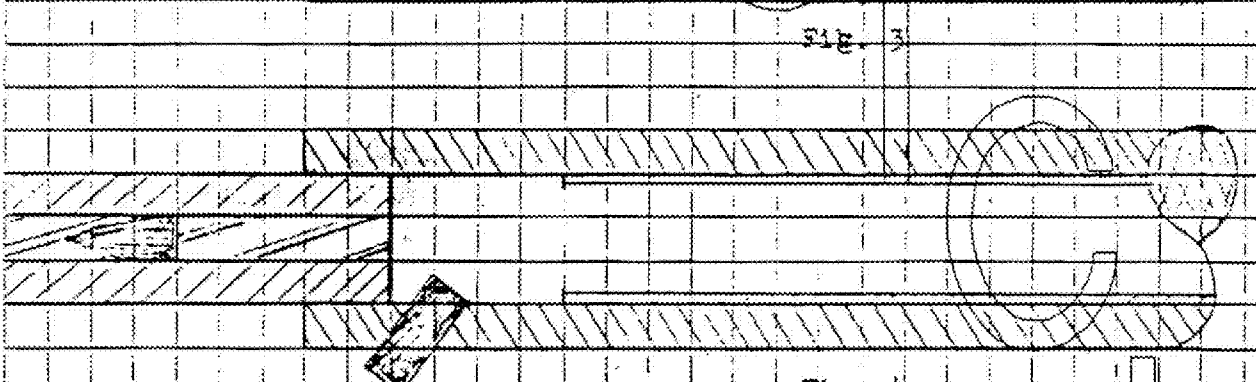


Fig. 4

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Suggestion III

This method has the appearance of petals on a tulip. In this system a series of metal petals surrounded by a very strong spring seals the exit of gas after the projectile forces its way through the petals. The projectile should have a long gradually-tapered section starting just back of the ogive, quite similar to a tapered heel except having a longer taper.

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Fig. 5
Fig. 6
Fig. 7
Fig. 8

The entire action is as follows: The petals, perhaps 8 in number, are closed tightly over the forward section of the muzzle surrounded by a strong circular spring. They must be completely tight, capable of preventing gas from leaking at a pressure of 10,000#sq". As the projectile passes past the muzzle and into the valve area the petals are forced open by the ogive of the bullet and start closing as the rear taper passes through the seals. Trapped residual gas could be allowed to escape through a valve at a later period somewhere in the barrel or by actually using the extraction of the cartridge case as a valve. It is also possible that a delayed blow back unlocking system could be designed wherein the residual gas would thrust the cartridge case rearward using the jet effect in reverse thus forcing the rifle forward. The result would be additional recoil reduction. In this case alteration to the locking mechanism

TITLE OF PROJECT _____ PROJECT NO. _____

SUBJECT _____ WORKS _____

COMPLETES _____ DATE _____ 19__

Fig. 5

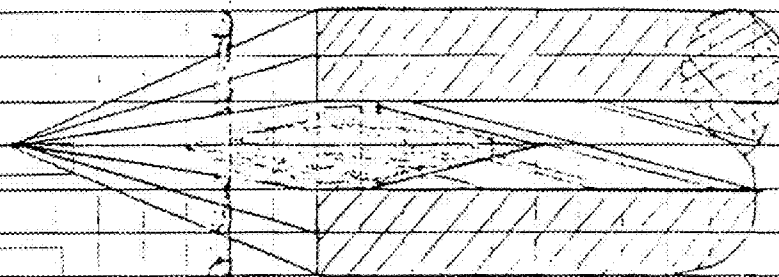


Fig. 6

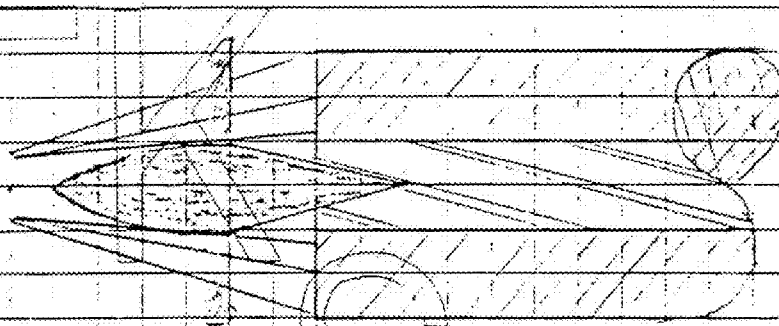


Fig. 7

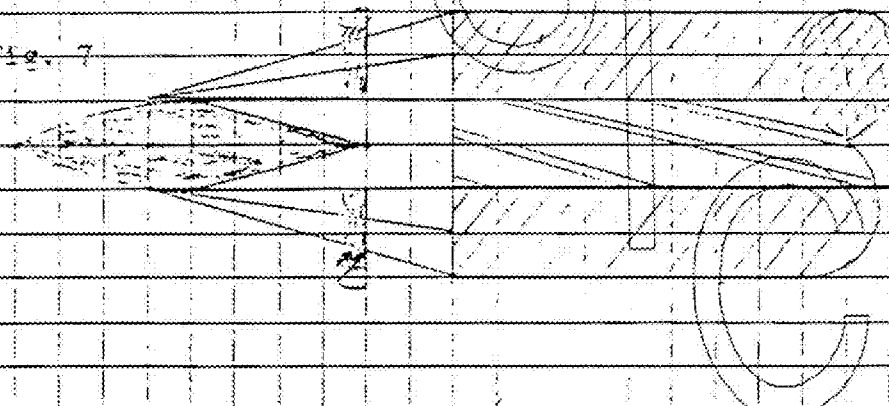
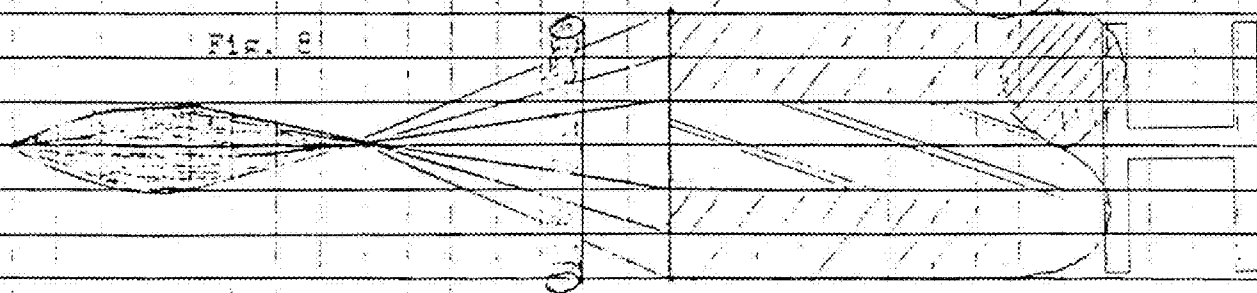


Fig. 8



and safe handling of the ^{rearward} exhaust gas would be in order.

The petal design must be so well engineered that accuracy is not impaired. If the long taper in the rear of the bullet doesn't allow enough working area for the gas, a driving band exposing a sharp shoulder of substantial working area followed by a long taper allows closing of the petals.

Ultra high velocity can be obtained by several means. One of the most successful, the Gerlich principle, was used by the Germans in large bore cannons during WWII. This principle used a tapered bore from breech to near the muzzle. The projectile contained one or more circular fins much larger in diameter than the main body exposing a large working area to the expanding gas.

Fig. 9

As the projectile moved toward the muzzle thru the tapered bore the fins folded into recesses attaining a finished bore dimension. During this movement down the tapered bore an exceedingly high velocity was obtained in the neighborhood

Fig. 10

Fig. 11

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REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT

FIG. NO.

FIG. NO.

FIG. NO.

SUBJECT

18

FIG. NO.

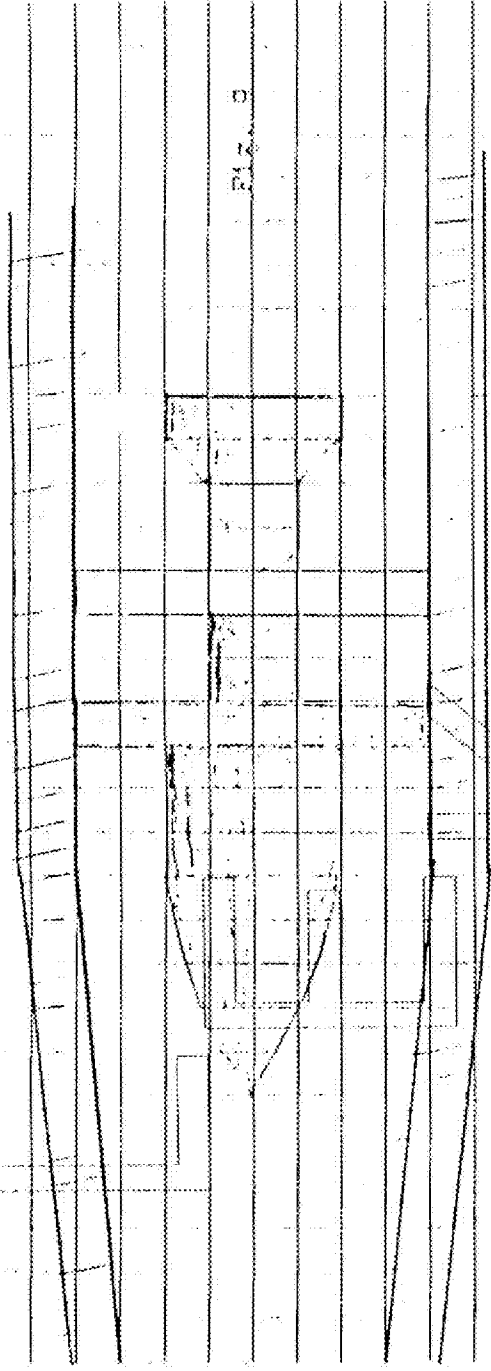


FIG. 9

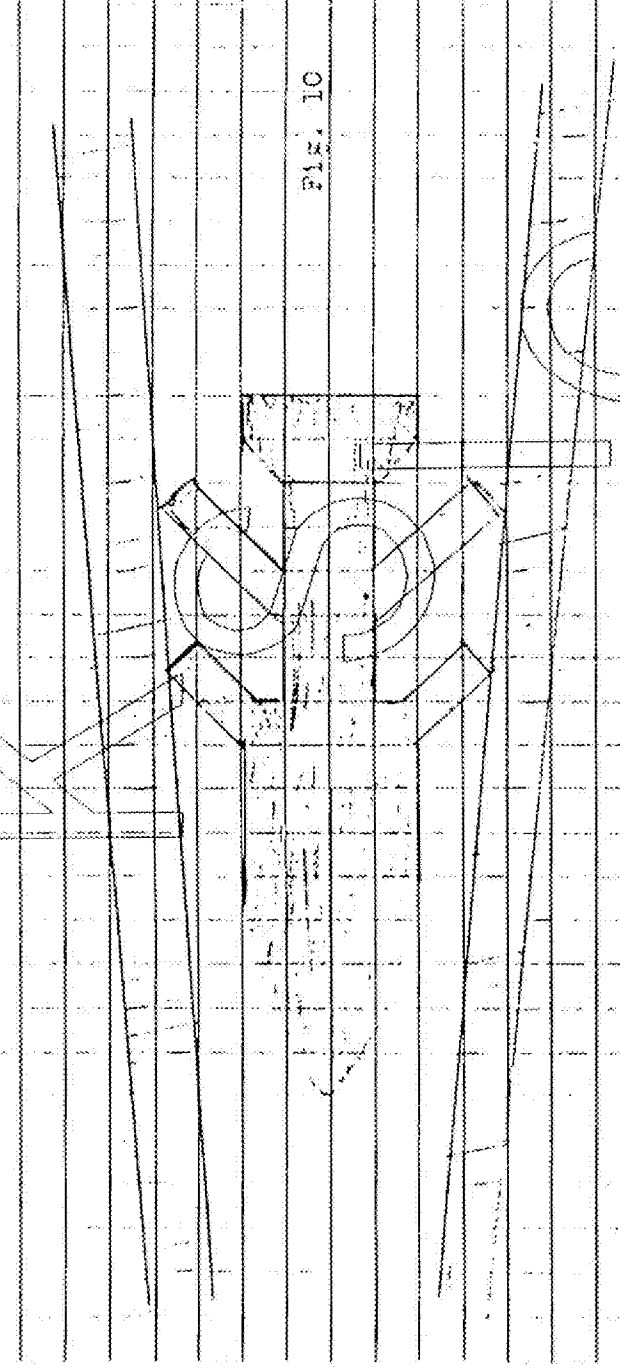


FIG. 10

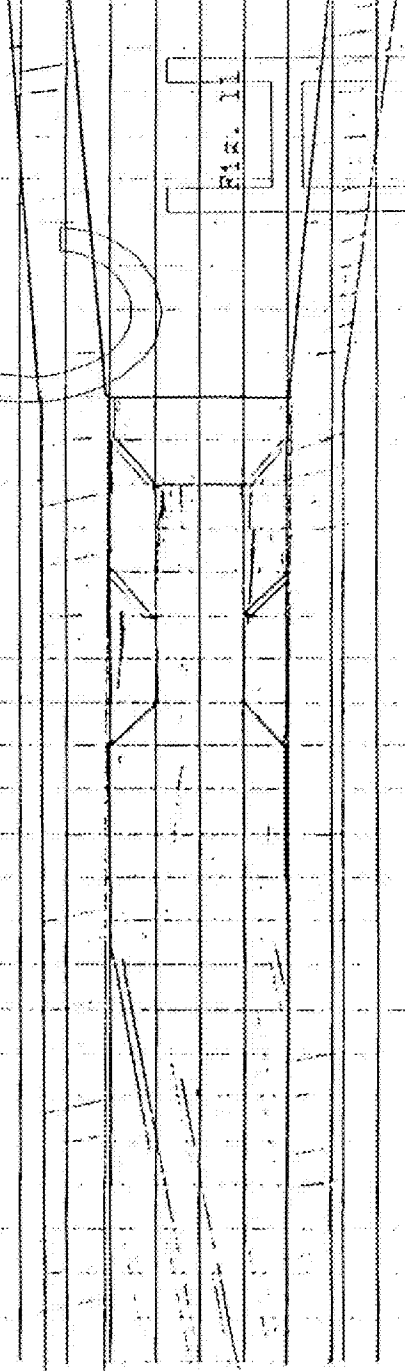


FIG. 11

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A of 5000 ft. per second. Naturally, with this velocity and projectile construction of high hardness and toughness qualities, penetration of armor was achieved with devastating results.

A bullet of 6mm size with two fins of .375" dia. could be used for the initial test of the Gerlich principle. The barrel should be approximately 26" in length with an initial smooth bore diameter of .375" gradually tapering to .240" in 20". The last 6" contains a gain twist rifling to achieve stability.

It seems possible that a projectile, if properly designed, could provide its own power supply. The core would be the actual projectile surrounded by the igniting material safe enough under normal handling to be of no concern. When initiated forward by the thrust of a base percussion type primer the friction caused by contact with the tapered bore would provide combustion. Because of the large working area extra thrust would be attained as the eroding bullet approached muzzle bore dimensions. At a point approximately 6" from the muzzle ignition would be complete and a gain twist would stabilize the projectile. In this design no ejection or extraction is needed and the design of the receiver could be shorter in length, thus lighter in weight, lower cost and would provide a faster lock time.

Fig. 12
Fig. 13
Fig. 14

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COMPUTATION SHEET

Sheet No.

Title of Project

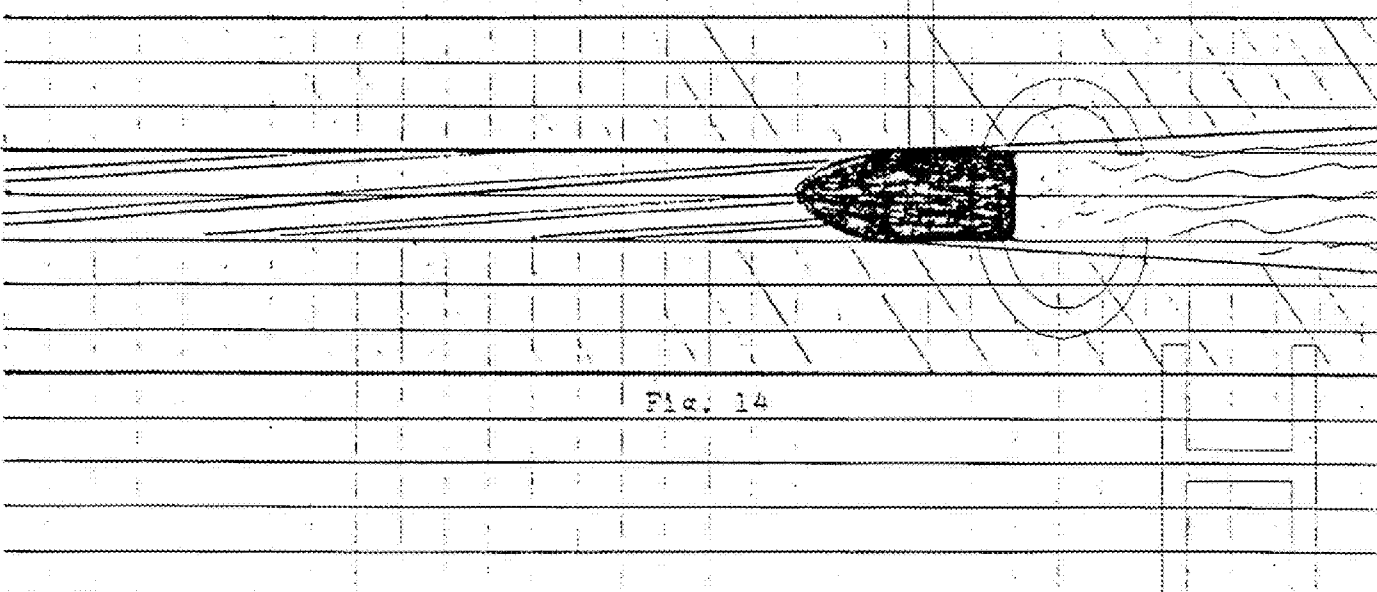
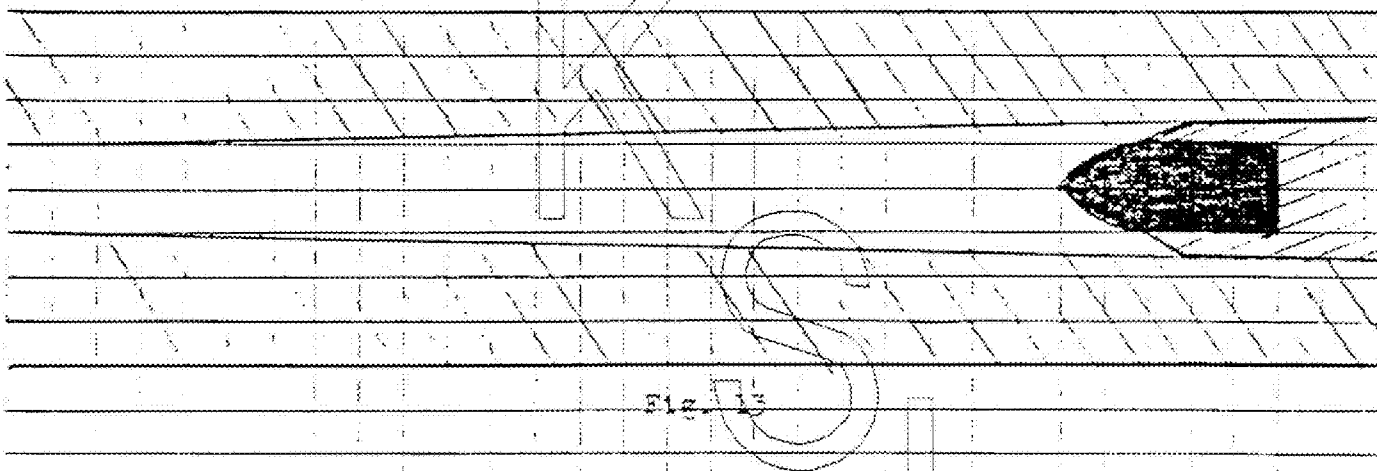
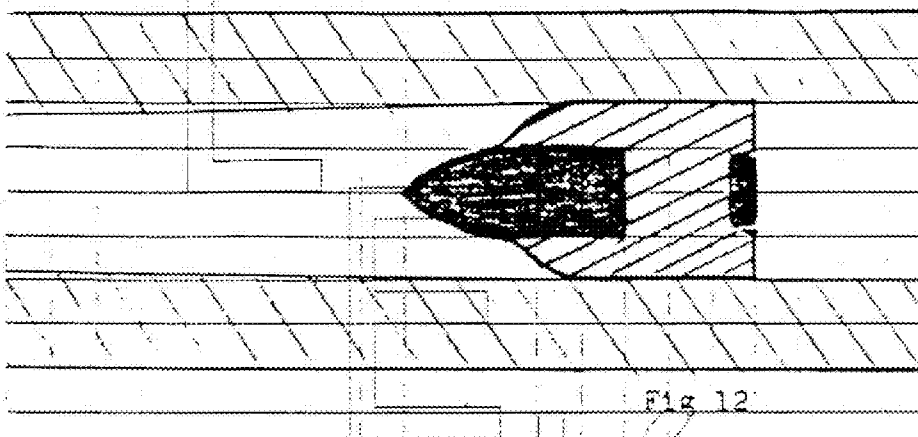
Proj. No.

Drawing

Notes

Brodie's Bullet

Date



Processed foundation for a new bolt action shotgun.

I believe this program can be achieved easily at low development and production cost, because the ground work for such a design was thoroughly covered during the M788 and M540 period.

The effort of simultaneous design to process concept was almost a success in the M788 development, and was attempted to eliminate the costly redesign to process that always occurred in previous attempts. The big problem was to nail down process engineering at the early design stage instead of after the model was tested and accepted for production.

We did achieve a measure of success with this approach by making our layouts of all essential cuts in the receiver the same whether they were for the M788-M540 or the proposed bolt action shotgun. This included the receiver lengths, diameters, ejection ports, feed opening and fire control slots, etc. The drawings of these similarities were presented to process in this manner.

Thus the bolt action shotgun concept was logical and simple for we needed 3 sizes of receivers for the various M788 cartridges and these sizes were ideal for the shotgun if we were to cover all the gauges from 410-12 ga.

I believe, because of this process design effort, that production machinery as now used for the M788-M540 receivers will accommodate the requirements for the shotgun.

The rear locking system was more than adequate in strength and proper for feeding shot shells. The design did not include a tubular feed system which was adverse to

A the M788 but that doesn't mean it couldn't be accomplished. I do not recall whether a model was made but I remember that strength testing of the competitive bolt action shotguns revealed weaknesses in their bolt handle lock up which would not be acceptable. Therefore our rear multiple lock method was superior. The trigger mechanism of the M788 was a natural for the shotgun and provided a clean crisp let off with very fast lock time of around 2.7 ms.

The reason we did not pursue the program further was because of Mr. Coleman's reluctance in lieu of a bad image for Remington which he thought would lower the status of the M1100.

At that time marketing speculated we would sell 50,000 units a year.

AL0026191

26826

Green Valley, Ariz.
Jan. 4, 1982

Mr. Rogers S. White
1426 Ute Ave. Box 2344
Grand Junction, Colo. 81501

Dear Mr. White;

Please excuse the delay in answering your letter. I wanted to give your questions careful thought.

Your list of manufacturing facilities and experience is certainly impressive and be-speaks of a quality organization. However, if you will pardon the constructive criticism, the experience outlined is lacking in several areas when it comes to producing a product for the market place that is considered in the dangerous category, such as a firearm. Your third sentence pertaining to product liability obligations should and has prompted your hesitation in the pursuit of the design and manufacture of trigger assemblies for they are definitely in the dangerous category. This item is especially critical when the design must function precisely in a product that is under the control of another company.

Canjar has been relatively successful with his product, but if the truth was known there is no question he has had problems. Imagine his frustrations in trying to keep abreast of design and dimensional changes after the fact in the various rifles he is trying to fit. It took many years of trial and error by his company to determine the mean dimensions of another product. During those early years product liability was not as serious as it is now, but it gave him time at least to determine the dimensional trends. I must admit he did very well but I certainly wouldn't have the fortitude to attempt such an effort in light of today's legal situation.

Liability suits, involving injury and death, are not in the magnitude of a mere hundred thousand dollars but in the millions. Often the one who pays is not at fault as in the case against Remington concerned with the alleged safety mechanism on the M600 rifle.

In the design and manufacture of a trigger mechanism there are so many dimensional variables and tolerances that testing of all the combinations requires hundreds and thousands of parts, several hundred thousand rounds of test firing*, and thousands of precise measurements. This is needed to detect dimensional variations in the manufacture and wear and damage during testing.

Within the last ten years computer analysis, coupled with automated drafting techniques allowing enlarged examination of dimensional variations, has been added to the designer's kit of tools to allow further examination in depth into the areas of critical control of parts in the dangerous category.

* In semiautomatic mechanisms this could approach one half million rounds.

PLAINTIFF'S
EXHIBIT

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Therefore this leaves the small company, no matter how dedicated with limited capital, facilities, experience, and equipment, to the mercy of chance--a very dangerous place to be and does not provide a secure base for product development such as you are suggesting. Such a program would be fraught with costly problems and liability suits.

In the area of trigger guards, sights and accessories, the liability problems are of no concern.

In the design and manufacture of an entire rifle especially by a small company the problems previously described involving the trigger mechanism are compounded by the additional necessity of dimensional control over the locking mechanism, strength of the action, and gas flow, another dangerous category. The only advantage one would have is the opportunity of complete control over the entire product.

To justify the design, testing, permanent or temporary tooling, and production requires a considerable amount of working capital and as problems arise, and they will, costs can soar. Also consider the cost of recall as this can happen in the best of circumstances.

Then there is the problem of advertising, sales promotion, and the establishing of marketing outlets. If there is a weakness in this area failure in the market is assured regardless of the sterling qualities of the product.

Venture-analysis into the market of a new concept or product is an excellent safeguard to be established before progressing beyond the model stage of development.

To support a rifle design that you mentioned I would estimate that 25,000 units a year would be necessary to break even on your costs. I doubt the market would support that volume.

In producing items in the low-volume category, production methods using investment castings and numerical control are ideal, with the individual parts at high cost but the tooling investment held at the minimum level.

In reviewing the history of success of new arms development over the past 20 years there have been numerous starts by small companies with almost 100% failures. These results should be seriously reviewed before undertaking a new venture in this area.

I suggest to you that these ventures are very risky.

Very truly yours,

Wayne E. Leek
Wayne E. Leek

AL 0026196

222

A

Model XP-100 Test Results
December 14, 1962

Test No. 1

ENDURANCE AND FUNCTION TEST

During the week of October 14 thru 20, 1962, an endurance and function test was run on one Model XP-100, Caliber .221 Fireball. This test was conducted by personnel of the R&D Test Unit. All firing was conducted indoors from mechanical shooting devices.

The ammunition used in the test was loaded at Bridgeport earlier in the year for Ilion R&D testing. The loading specifications were 15.8 grains of 4227 powder with a 50 grain Remington bullet.

The test gun was assembled completely with production parts and no alterations of any kind were made on any of the components. The gun was assembled and adjusted by R&D personnel.

No cleaning of any kind was conducted throughout the test.

Prior to commencing the test, the gun was reviewed by the author and members of the R&D Test Unit. Function and operation of the gun were explained at that time, and a pre-fire check was conducted on the weapon.

At frequent intervals during the test a series of 11 - 5-round groups were fired at 100 yards in an experimental accuracy device. It was the purpose of this targeting to determine the effect of wear on the accuracy of the gun.

Data from these and other checks are indicated on the attached test form. Results of the test have been interpreted by the author as follows:

1. No major change in headspace.
2. Trigger pull increased slightly during test. Probably caused by foreign matter in fire control.
3. Group size decreased from zero to about 2500 rounds, where it commenced to open slightly.
4. No looseness of trigger housing throughout test.
5. Firing pin protrusion and indent constant.
6. No development of trigger creep.
7. Rib and sight screws have tendency to loosen slightly after prolonged shooting.
8. Receiver - Stock bedding OK.
9. Feeding OK with gun horizontal.

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PLAINTIFF'S
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Model XF-100 Test Results
December 14, 1962

Page No. 2

TRIGGER PULL TEST

This investigation consisted of checking trigger pull weight on the first 64 completely assembled production guns to determine whether or not production specifications of 1.5# to 2.75# trigger pull could be met.

Results of the check are as follows:

a.	Total number of guns checked	64
b.	Average trigger pull	2.143 lbs.
c.	Max. trigger pull	3 lbs.
d.	Min. trigger pull	1.75 lbs.
e.	Number over 2 3/4 lb. limit	2
f.	Number under 1 1/2 lb. limit	0

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Model XP-100 Test Results
December 14, 1952

Test No. 3

ACCURACY TEST

This test consisted of firing from the XP-100 accuracy device two 5-shot groups at 100 yds. from each of 38 production guns. All ammunition used in the test was Rem. 50 grain factory loads. Groups were measured inside to inside, extreme spread.

Data and test results are as follows:

<u>Gun Serial No.</u>	<u>Group Size (in.)</u>	<u>Avg. Group Size</u>
1015	1.25 - 1.0	1.13
1018	3.0 - 1.0	2.0
1019	2.5 - 2.0	2.25
1024	2.8 - 1.0	1.9
1025	1.5 - 1.0	1.25
1028	1.6 - .75	.88
1029	3.5 - 3.0	3.25
1034	2.0 - 2.5	2.25
1043	1.5 - .75	1.13
1044	2.0 - 1.5	1.75
1050	3.5 - 3.0	3.25
1051	1.0 - 1.5	1.25
1052	2.0 - 1.8	1.9
1054	1.5 - 2.0	1.75
1065	3.5 - 3.0	3.25
1074	2.0 - 1.25	1.63
1082	1.0 - 1.2	1.1
1088	1.5 - 1.5	1.5
1089	1.0 - .75	.88
1091	2.5 - 3.0	2.75
1101	1.0 - .75	.88
1115	2.0 - 1.0	1.5
1119	2.0 - 2.5	2.25
1122	1.25 - 1.7	1.48
1125	1.5 - 1.0	1.25
1126	1.5 - 4.0	2.75
1132	2.5 - 3.0	2.75
1134	3.0 - 1.5	2.25
1136	2.0 - 1.5	1.75
1139	3.0 - 3.0	3.0
1140	1.0 - 1.3	1.15
1153	2.7 - 1.0	1.85
1155	1.5 - 1.0	1.25
1157	2.0 - 1.5	1.75
1162	1.8 - 1.0	1.4
1165	1.5 - 1.25	1.38
1171	1.8 - 1.0	1.4
1176	1.5 - 1.3	1.14

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A

Model XP-100 Test Results
December 14, 1962

Test No. 3
Sheet 2

ACCURACY TEST

Total guns tested	38
Average Group Size	1.802
No. of Guns with over 3" Group Percentage	3 7.9%
No. of Guns with Average over 3" Group Percentage	3 7.9%

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Model XP-100 Test Results
December 14, 1962

Test No. 4

EFFECT OF STOCK INTERCHANBEABILITY
ON
ACCURACY and POINT OF IMPACT

Several guns were fired by W.E. Leek and H.L. Chambers to determine the effect of interchanging stocks on accuracy and point of impact.

All shooting in this test was done off hand, out of doors.

Guns were fired by both shooters with common stocks to determine shootability and point of impact. Stocks were then interchanged and the guns were refired. No change in grouping or point of impact was noted.

It should be brought out at this point that production guns are targeted without stocks, and the effect of stock interchangeability on accuracy and point of impact becomes extremely critical.

HLC:T

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Model XP-100 Test Results
December 14, 1962

Test No. 5

FIRING PIN INDENT

The purpose of this test was to determine the amount of firing pin indent attained with production guns. Indents were checked with standard copper crushers supported by a crusher holder. A total of 36 guns were tested, each gun being checked five times.

The following data indicate the average of the five readings for each gun. In no case was there a variation in crusher indents greater than .001 in. for one gun.

<u>Gun Serial No.</u>	<u>Avg. of 5 Indents</u>	<u>Gun Serial No.</u>	<u>Avg. of 5 Indents</u>
1065	.0183	1173	.0180
1028	.0186	1026	.0193
1138	.0186	1044	.0166
1074	.0186	1167	.0186
1038	.0193	1151	.0190
1155	.0186	1171	.0173
1018	.0180	1146	.0176
1057	.0173	1133	.0176
1129	.0170	1122	.0206
1085	.0180	1126	.0186
1183	.0190	1043	.0186
1141	.0213	1082	.0200
1090	.0206	1041	.0190
1050	.0180	1154	.0196
1175	.0176	1129	.0203
1019	.0200	1140	.0200
1162	.0183	1071	.0176
1056	.0186	1174	.0180

Total Guns Checked	36
Max. Avg. Indent for 1 Gun	.0213
Avg. Indent for 36 Guns	.0187
Min. Avg. Indent for 1 Gun	.0166

HLC:T

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Model XP-100 Test Results
December 14, 1962

Test No. 5

PACKAGING RUST TEST

The purpose of this test was to determine whether or not the proposed plastic zipper case for the XP-100 would induce or retard rusting.

Sections of scrap barrels from the XP-100 were prepared for various treatments including color and no color, Steelgard, and also proprietary material called Rig, for the coating. These were sealed in a plastic zipper case and then the proposed paperboard outer wrap before being placed in the Research weatherometer. The equipment was cycled to provide some 90% humidity and also heated to prescribed temperatures. For control, a duplicate group of the same experimental barrel sections were packed in our regular paperboard gun box, sealed and submitted to the same test.

The packages were opened after 23 days in the weatherometer and conclusions were significantly favorable towards the plastic zipper case. Parts, which included one powder metal component, were very well preserved when colored to provide at least normal treatment. Those in the standard paperboard carton were considerably more rusted. The "Rig" was observed to be better than any other coating used. The samples which were treated with another proprietary oil marketed by Stoeger seemed to give little, if any, protection.

These results relieve any immediate concern; however, arrangements are being made to store one of the XP-100 Pistols in a case for long time exposure under natural conditions.

HLC:T

AL 0027822

7210

Model XP-100 Test Results
December 14, 1962

Test No. 7

LOCK TIME

One production Model XP-100 was checked by the Research Measurements Lab to determine lock time. A series of thirty readings was made. Results of the test are as follows:

Max. Lock Time	3.56 milliseconds
Avg. Lock Time (30 readings)	3.505 "
Min. Lock Time	3.45 "

An investigation is being carried on at the present time to determine an economical way to decrease lock time without weakening the firing system.

HLC:T

AL 0027823

8210

Model XP-100 Test Results
December 14, 1962

Test No. 8

GROUP SIZE COMPARISON
12" Twist vs. 14" Twist

On recommendation of the Ammunition Research Department at Bridgeport, the bore twist of the XP-100 was changed from 1 turn in 14 inches to 1 turn in 12 inches. The purpose of this change was to provide proper stability for a faster, lighter weight bullet. Until now, all XP-100 barrels have been made with the 14 inch twist. Recently, however, a limited number of barrels with 12 inch twist have been made, and it was the purpose of this test to compare group sizes fired in the two barrel types with various bullet weights.

Test data and results are shown below:

1. Group Measurement --
5 shot groups - 100 yds. - measured inside to inside.
2. All shooting done in accuracy device.
3. Ammunition Data
50 gr. - Rem. Factory Ammo. 15.8 gr. 4227
35 gr. - Handloads - Rem. Bullets - 16.6 gr. 4227
60 gr. - Handloads - Morse-Watkins Bullets - 15.0 gr. 4227
4. Guns - XP-100 Production Models

Gun Serial No.	Twist - 1 Turn in 12 in.		
	Group Size		
	35 gr.	50 gr.	60 gr.
1200	2.25	2.25	2.25
1219	1.75	2.25	2.25
1226	3	2.25	3
1197	3	1.5	1.5
1199	1.9	2.25	1.25
1217	2.13	1.75	1
1177	4.5	2.75	1.75
Average Group Size	2.647	2.143	1.571
No. of Groups Over 3 in.	1	0	0

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Model XP-100 Test Results
December 14, 1962

Test No. 8
Sheet 2

Twist - 1 Turn in 14 in			
Gun Serial No.	Group Size		
	35 gr.	50 gr.	60 gr.
1192	2.75	1.25	2.25
1185	3	1.75	3
1072	2.25	2.75	2.75
1206	1.75	2.5	2
1201	3.25	2	3.13
1220	2	2.75	2.25
1180	2.75	2	2.25
Average Group Size	2.536	2.143	2.519
No. of Groups Over 3 in.	1	0	1

RESULTS

Average Group Sizes

	12" Twist	14" Twist
35 gr.	2.547	2.536
50 gr.	2.143	2.143
60 gr.	1.571	2.519
Overall Avg. Group Size	2.120	2.399

HLC:T

AL 0027825

10 B10

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

Distribution: C. B. Workman
J. S. Martin
C. E. Ritchie
F. S. Martin

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RESEARCH TEST and MEASUREMENT REPORT - Report No. 812441

NEW DESIGN M/700 TRIGGER/SEAR BLOCK EVALUATION.

Prepared by: Ron Williams

Date Prepared: 9/10/82

Proofread and Cleared By:

J.H. Hennings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Mach. & Mech. Analysis Lab

Signature

Date

PLAINTIFF'S
EXHIBIT

3143

AL 0027889

10/11

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 812441
REPORT TITLE: New Design Trigger/Sear Block Evaluation
MODEL(S): 700 ADL
GAUGE OR CALIBER: 6MM Remington
DATE: 9/10/82
WORK ORDER NO.: C-1803-000
PART NAME: Trigger Assembly
DESIGNER/ENGINEER: F. Martin

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: Static
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 5

NO. OF ROUNDS PER GUN 2,500

TOTAL ROUNDS FIRED IN TEST: 12,500

AMMO TYPE: MACS. _____; TARGET: _____

RIM FIRE _____ CENTER FIRE 0mm

September 10, 1982

TO: J. H. Hamnings
FROM: R. Williams
REPORT TITLE: NEW DESIGN M/700 TRIGGER/SEAR BLOCK EVALUATION
ABSTRACT:

A total of (5) M /700 Fire control assemblies with the New Design safety assemblies, were delivered to the Test Lab by Fred Martin for testing. This safety assembly blocks the trigger and the sear so that the firing pin won't fall when the trigger is held back while the safety switch is pushed from the safe to fire position. Both dry cycle and live fire endurance tests were used to test the assemblies. A M/700 fire control assembly (Current Production) was used as a control and (4) out of the (5) New Design assemblies were used in the test.

SCOPE OF TEST

To evaluate the functional performance of the New Design safety assembly, in the M/700 Rifle during lab testing.

TEST RESULTS

No functional problems arose during testing. Both the New Design safety and the control functioned normally. There was no significant change in the safe On/Off forces measured before, during and after testing, on all the assemblies, including the control.

REPORT TEXT

All four (4) new trigger assemblies were subjected to the following trick test:

- o Place Safety Switch in the Safe "On" position.
- o Close the bolt.
- o Put constant pressure on the trigger attempting to fire the rifle.
- o Push the Safety Switch from the "On" position to the "Off" position.
- o Does the firing pin fall?

All four (4) New Design Trigger Assemblies with the trigger /sear blocked passed this test. In all four (4) guns the firing pin did not fall.

NOTE: The measurements recorded for the Safe On/Off forces are questionable. There is no way to determine if they are within Remington Standards, because there are no standards written for these forces with this fire control assembly. The only Remington Standards written for Safe On/Off forces, pertain to the common fire control. That Standard is:

4 - 8 lbs. - One sharp click
Double click not allowed

The Safe On/Off forces measured in this test range from 5.25 lbs to 10.2 lbs. - almost a 5 lb. difference. (Refer to Appendix A, Data Sheets No. 1 - 5 for all Safe On/Off measurements).

TEST PROCEDUREA. MEASUREMENTS

The following measurements were taken on the five rifles used in this test:

- o Headspace
- o Firing Pin Indent
- o Trigger Pull
- o Sear Lift
- o Sear Engagement
- o Safe On/Off Forces

B. TEST CONDITIONS

1. After every 20 rounds fired, the safety was checked. This was done by holding the trigger and pushing the safety switch from safe to fire.
2. After 1,000 rds. of live fire all the rifles were cleaned and they were remeasured. (Jack Shooting).
3. The rifles were then subjected to Safe On/Off dry cycle. Each rifle was cycled for 2,500 cycles, with Safe On/Off measurements taken every 500 cycles and Sear Lift and Engagement at the 2500 cycle level.
4. The rifles were then live-fired to the 2,000 round level. (Jack Shooting) Measurements were taken at this level.

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TEST PROCEDURE - CONT'D.

5. The rifles were then subjected to another Safe On/Off dry cycle test. They were brought to the 5,000 cycle level. (2,500 additional cycles) Safe on/off measurements were taken every 500 cycles and sear lift and engagement wear measured at the 5,000 cycle level.

These same procedures were followed until live fire totaled 2,500 rounds per rifle and safe On/Off dry cycle totaled 7500 cycles per rifle.

C. AMMUNITION

Remington 80 grain Pointed Soft Point.

A L E K S I C H

APPENDIX "A"

M-700 TRIGGER/SEAR BLOCK EVALUATION

No 1

A 31/982

R Williams

M-700 / 6MMCM / # A6752973	Sample No. 1	HEADSPACE	FIRING P-N INDENT	SAFE (lb)		TRIGGER PULL (lbs)	SEAR LIFT	SEAR ENGAGEMENT
				ON	OFF			
START OF TEST		MIN. +.004"	.025"	6.2	6.0	4.0	.0105"	.035"
LIVE FIRE								
after 1000 rds.		MIN. +.004"	.025"	6.2	6.8	4.25		
DRY CYCLE								
500 cyc				5.5	9.6			
1000 cyc				5.8	9.7			
1500 cyc				5.7	9.5			
2000 cyc				5.5	9.7			
2500 cyc				5.7	9.3		.0105"	.035"
LIVE FIRE								
after 2000 rds		MIN. +.004"	.025"	5.6	7.3	4.0	.0165"	.027"
DRY CYCLE								
3000 cyc				6.2	9.3			
3500 cyc				6.5	10.3			
4000 cyc				5.7	9.2			
4500 cyc				6.2	9.5			
5000 cyc				6.2	9.2		.0165"	.027"
LIVE FIRE								
after 2500 rds HL		MIN. +.004"	.025"	6.3	7.5	4.5		
DRY CYCLE								
5500 cyc				6.2	10.5	4.8		
6000 cyc				6.2	10.0	4.6		
6500 cyc				6.2	8.8	4.6		
7000 cyc				6.0	7.8	4.8		
7500 cyc				6.2	9.3	4.6		
AL 0027895 70711								

AL 0027895

7/27/11

M-700 TRIGGER/SEAR BLOCK EVALUATION

No. 2

31 AR2

R. Williams

M-700	6MM cal. #A67448K9 Sample No. 2	1		2		3		4		5		6	
		FIRING		SAFE		TRIGGER		SEAR		SEAR			
		HEADSPACE	POINT INDENT	(in lbs.)		PULL		LEFT		ENGAGEMENT			
				ON	OFF	(in lbs.)							
1													
2	START OF TEST	Min+.003"	.023"	6.5	5.3	4.3		.0135"		.026"			
3													
4	LIVE FIRE												
5	after 1000 cks	Min+.004"	.024"	6.4	5.2	4.4							
6													
7	DRY CYCLE												
8	500 cks			5.9	7.8								
9	1000 cks			6.0	6.7								
10	1500 cks			6.0	7.0								
11	2000 cks			5.5	6.7								
12	2500 cks			5.3	7.7			.015		.025			
13													
14	LIVE FIRE												
15	after 2000 cks	Min+.004"	.023"	5.7	4.8	4.2		.014"		.029"			
16													
17	DRY CYCLE												
18	3000 cks			6.5	8.0								
19	3500 cks			5.5	7.8								
20	4000 cks			5.8	7.2								
21	4500 cks			6.2	7.7								
22	5000 cks			7.8	8.0			.018		.0385			
23													
24													
25	LIVE FIRE												
26	after 2500 cks	Min+.004"	.023"	5.8	4.5	4.7							
27													
28	DRY CYCLE												
29	5500 cks			7.0	9.5	4.8							
30	6000 cks			6.7	8.7	4.5							
31	6500 cks			6.7	7.8	4.5							
32	7000 cks			7.2	7.8	4.8							
33	7500 cks			6.6	8.5	4.5							
34													
35													
36													
37													
38													
39													
40													

AL 0027896

8/2/11

M-700 TRIGGER / SEAR BLOCK EVALUATION

No. 3

R. Williams

3/31/1982

M-700	Serial # A6744915 Sample No. 3	HEADSPACE	FIRING		SAFE		TRIGGER PULL (lb)	SEAR LIFT	SEAR ENGAGEMENT
			PEN	INDENT	(in lb)	ON	OFF		
1									
2	START OF TEST	Min. +.004"		.025"	9.	6.4	4.7	.015"	.025"
3									
4	LIVE FIRE								
5	after 1000 rds.	Min. +.004"		.026"	9.7	6.7	4.1		
6									
7	DRY CYCLE								
8	500 cyc.				8.2	6.9			
9	1000 cyc.				8.3	7.0			
10	1500 cyc.				8.8	6.3			
11	2000 cyc.				9.2	7.0			
12	2500 cyc.				9.8	6.0		.012"	.032"
13									
14	LIVE FIRE								
15	after 2000 rds.	Min. +.005"		.026"	10.2	5.2		.013"	.033"
16									
17	DRY CYCLE								
18	3000 cyc.				8.5	8.5			
19	3500 cyc.				9.2	9.2			
20	4000 cyc.				9.2	9.0			
21	4500 cyc.				8.7	8.7			
22	5000 cyc.				9.5	12.2		.015"	.032"
23									
24									
25	LIVE FIRE								
26	after 2500 rds. HL	Min. +.005"		.025"	9.8	5.2			
27									
28	DRY CYCLE								
29	5500 cyc.				8.3	8.3			
30	6000 cyc.				9.2	8.8			
31	6500 cyc.				9.7	9.3			
32	7000 cyc.				8.5	12.0			
33	7500 cyc.				9.5	12.0			
34									
35									
36									
37									
38									
39									
40									

AL 0027897

9/7/82

M-700 TRIGGER / SEAR BLOCK EVALUATION No.4

31/1982

R. Williams

M-700	GMMCAL #6745544	HEADSPACE	FERRING PIN INMENT	SAFE (lb)		TRIGGER PULL (lb)	SEAR LIFT	SEAR ENGAGEMENT
				ON	OFF			
1	Sample No. 4							
2	START OF TEST	MIN 1002	022	83	54	38	018	034
3								
4	LIVE FIRE							
5	after 1,000 rds	MIN 1002	022	68	52	40		
6								
7	DRY CYCLE							
8	500 cyc.			77	77			
9	1,000 cyc.			78	75			
10	1,500 cyc.			68	73			
11	2,000 cyc.			78	72			
12	2,500 cyc.			72	77		017	035
13								
14	LIVE FIRE							
15	after 2,000 rds	MIN 1003	022	73	45	38	0155	035
16								
17	DRY CYCLE							
18	3,000 cyc.			67	87			
19	3,500 cyc.			75	97			
20	4,000 cyc.			77	67			
21	4,500 cyc.			75	77			
22	5,000 cyc.			77	68		017	036
23								
24								
25	LIVE FIRE							
26	after 2,500 rds	MIN 1003	022	88	43	43		
27								
28	DRY CYCLE							
29	5,500 cyc.			82	90	46		
30	6,000 cyc.			73	90	41		
31	6,500 cyc.			75	93	42		
32	7,000 cyc.			83	92	43		
33	7,500 cyc.			87	83	43		
34								
35								
36								
37								
38								
39								
40								

AL 0027898

1024

M-700 TRIGGER / SEAR BLOCK EVALUATION

REFUR. NO. 01027

No. 5

g. 31, 1982

R.W. Williams

M-700	SAMPLE #1747525	HEADSPACE	FIRING PIN INDENT	SAFE (lbs)		TIMER Pull (lbs)	SEAR LIFT	SEAR ENGAGEMENT
				ON	OFF			
1	Sample No. 5							
2	CONTROL GUN							
3	START OF TEST	Mint 003	.025	5.2	5.2	4.2	.019	.020
4	LIVE FIRE							
5	after 1,000 rds	Mint 003	.025	5.5	5.2	4.0		
6	DRY CYCLE							
7	500 cyc.			6.3	7.6			
8	1000 cyc.			5.6	8.3			
9	1500 cyc.			5.8	7.8			
10	2000 cyc.			6.1	8.5			
11	2500 cyc.			5.1	8.3		.021	.0205
12	LIVE FIRE							
13	after 2,000 rds	Mint 003	.025	5.5	5.1	4.5	.020	.020
14	DRY CYCLE							
15	3000 cyc.			6.6	8.1			
16	3500 cyc.			6.8	8.1			
17	4000 cyc.			6.1	7.6			
18	4500 cyc.			6.1	7.3			
19	5000 cyc.			6.0	6.5		.020	.020
20	LIVE FIRE							
21	after 2,500 rds H.L.	Mint 003	.025	5.1	4.8	5.2		
22	DRY CYCLE							
23	5500 cyc.			6.1	8.0	4.7		
24	6000 cyc.			6.1	8.0	4.6		
25	6500 cyc.			7.0	8.5	4.6		
26	7000 cyc.			6.8	8.1	4.7		
27	7500 cyc.			6.3	7.6	4.8		

AL 0027899

11/2/82

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REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE



Bridgeport, Connecticut
April 16, 1982

TO: T. L. CAPELETTI
FROM: T. W. RAWSON *WR*
SUBJECT: LONGER RANGE M700 REFORM PLANS

Per our phone conversation, I would very much like to be included in the planning sessions for the M700 rifle upgrade.

The research that I have done suggests an enumeration of features, which follows, should be helpful to identify the basic scope of work.

1. Barrel contour
2. Recoil bracket
3. Receiver shape
4. Bolt release
5. Safety
6. Bolt handle
7. Ejector/extractor
8. Trigger guard floor plate
9. Stock
 - a. Cheekpiece
 - b. Comb
 - c. Pistol grip shape
 - d. grip cap
 - e. Forend tip

PLAINTIFF'S
EXHIBIT

3144

AL 0027925

123

- A
- f. Butt pad
 - g. Checkering
 - h. Finish

I too believe there are some basically very desirable features of the 700 with a few less desirable details that can be upgraded to surpass competitive offerings.

While the committee will need to confront each of these items, I have suggestions which might speed up some of our evaluation.

It is believed the safety is a significant place for improvement. This is being called out here, however, only because an opportunity exists to evaluate an alternative. We have asked Bob Emmons to have Pete Grisel install a tang safety on our 4th prototype gun under contract. The tang safety is probably more desirable than our current mechanism because it will eliminate the appearance of a stamped part and the hole in the stock alongside the tang. The tang safety, however, is still a trigger lock safety and does not address the theoretical advantage of a striker lock safety. The Ken Jantz bolt sleeve safety that you and I viewed at the NRA show is seen as an alternative with appeal in several areas.

- It eliminates the stamped lever and hole in stock by virtue of bolt sleeve location.
- Is a striker lock system.
- Can provide the choice of two position or three position with the three position giving a choice of bolt lock and striker lock or blocked striker (only) for safe unloading.

This particular option is being mentioned now because Pete Grisel's work is going on - he may be able to replace or add the bolt sleeve safety to his barreled action work. While we would never produce a gun with both a tang and bolt sleeve safety the presence of both safety's on one gun does not cancel out the other and will provide a chance for instant comparison.

TWR/df

4/21/82
70

A

Check Piece Options as per Tom Revision

L

E

K

L

K

S

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I

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C

H

11/11/82

1-5-82

A

Best Action Play

1983

1 - reorganization of new concept. (see F 11)

2 - Some Living - for Children -

3 - 11/700 ADL - BDL -

11/700 ADL - BDL -

4 - 11/700 ADL -

K

5 - Emerson - - 84

Get a schedule for a completed study.

- 1984

-

-

11/700 ADL - 11/700 - 11/700 - 11/700

11/700 BDL - 11/700 - 11/700 - 11/700

11/700 Classic - 11/700 - 11/700 - 11/700

11/700 Detective Box -

11/700 Box - and 11/700 -

S

C

H

PLAINTIFF'S
EXHIBIT
3145

AL 0027940 102

A

Fire Control - Present
Connectorless Trigger

L

Fire Control - Proposed
Connectorless Trigger - ^{for Improved} Trip Safety

E

Side Plates Streamlined - for Improved Trip Safety

K

Test Cells - Fire Controls with
Becked Trip & Sensor
* Low Volt. To Comm.
Puncher Probs
* Heat Treat Trials

S

Sept. 51

I

C

H

December 21, 1981

Bolt Action Program
1984 Introduction
Fire Control Revision & Redesign

Add to Fire Control

- Trigger Block
- Housing Clearance
Skeletonize
- Sear Clearance
Relieve
- Remove Connector
- Restyle Trigger

Extractor - M-1911-A1 Style

New Receiver Configuration
Barrel Bracket - .250 thick
Lighten Barrel
Ruger Patent on Action Screw - Diagonal Tension
Detachable Magazine - Mag Con
Sights - Rear P.E. & C.
Safety On Bolt Plug
Safety On Tang
Feeding
Restyle Trigger

Add caliber to short action line to be based on 7mm BR case .25 caliber.

F. E. Martin:ws

PLAINTIFF'S
EXHIBIT

3146

AL 0027947 181

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
OUTPOST

PETERS
OUTPOST

cc: J. P. Glas
J. W. Brooks
J. S. Martin
A. A. Hugick
F. E. Martin
S. A. Fanelli

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
March 2, 1981

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: POTENTIAL IMPROVEMENTS TO BOLT ACTION RIFLES

Attached is a copy of my December 11, 1980 memorandum to J. P. Glas summarizing our suggestions concerning potential improvements to bolt action rifles. On February 19, 1981, I discussed these improvements again with John Brooks, Jim Martin, Adam Hugick, Fred Martin and Sal Fanelli. The December 11, 1980 memorandum remains a good summary of what we feel is needed or can be done to improve our market position with the bolt action rifles. In addition to our suggestions in the previous memorandum, I have summarized below our comments from our February 19, 1981 meeting. In general, we feel that our rifles are better than any competitively priced bolt actions on the market. However, there are some changes we can make in basic design, chamberings and styling features that would provide new offerings for our dealers to use in promotional campaigns. Furthermore, our marketing philosophy needs to center around a more aggressive advertising campaign based on the strengths of our designs (eg. strongest locking system on the market - we have test data).

Design

1.) Common receiver for all centerfire rifles

- We have a conceptual drawing of a common receiver design, but have not pursued to the engineering stage. The advantage would be use of a common magazine box and fire control for bolt actions, pumps, and autoloaders with no sacrifice in accuracy or durability of our current bolt actions.

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3147

AL 0028064

182

2.) Model 700 Limited Edition (Model 7)

A special edition bolt action rifle (M/700 LE or M/7) would be a natural extension of our Limited Edition line beyond the M/870 LE currently planned. We have built a prototype Model 7 with the following features:

- Octagon receiver
- Hammer forged barrel
- Lightweight firing pin (Gives a 25% reduction in lock time).
- 6 1/2 lb. total weight
- Redesigned fire control with blocked trigger and sear
- Redesigned follower for smoother action
- 22 inch barrel
- Fully enclosed bolt plug
- Cooking indicator

3.) Modify caliber offerings

— Due to overlap in our current offerings, we recommend the following changes in calibers:

- Delete the 223, 243, and 270
- Add the 220 Swift, 7mm Mauser and 358 Win.

4.) Redesign feed system

- Modify the magazine box to easily accommodate 3 magnum or 4 regular rounds
- Modify the follower to reduce feeding malfunction rates

5.) Redesign the fire control

- Implement new design with blocked trigger and sear
- "Skeletonize" the design to make components more visible and easier to keep clean

6.) Left handed rifles

- Expand line to include smaller calibers (eg. 243)

7.) Offer synthetic stocks in target rifles

Appearance

1.) Bolt handle

- A variety of designs were prepared for use on the bolt action carbine.

cc: C. B. Workman
J. S. Martin
F. E. Martin
S. A. Fanelli

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
December 11, 1980

TO: J. P. GLAS

FROM: T. L. CAPELETTI

SUBJECT: POTENTIAL IMPROVEMENTS TO BOLT ACTION RIFLES

I have discussed potential improvements to our bolt action rifles with Fred Martin and Sal Fanelli in response to your inquiries concerning why Remington may be losing position in that market and what we might do to regain that position. In view of the new Winchester Model 70 light weight, this is an opportune time to review results of those discussions for you. Fred and Sal's suggestions, summarized below, fall into three general categories: Improvements in a.) Design, b.) Appearance, and c.) Marketing Philosophy. These suggestions have not been fully reviewed with either Jim Martin or Clark Workman. However, I feel they merit further consideration. Significant change in our market position will probably require focused attention on a complete redesign of the firearms combined with a more aggressive marketing approach.

Design

Areas where design changes may be beneficial are in the receiver, feeding, and fire control systems. It may be possible to design a bolt action with enough commonality in the receiver to permit use of one magazine box and fire control system with all of our centerfire rifles (autoloader, pump, and bolt action). Commonality would have obvious cost improvement advantages and is worth serious consideration. However, our bolt actions have an excellent reputation for accuracy and durability and one of the program objectives would certainly be to maintain that performance and reputation.

Short of complete redesign of the line, improvements are possible in the feeding and fire control systems of the current designs. The magazine in the M/700 ADL 7mm magnum can only accommodate

PLAINTIFF'S
EXHIBIT

3148

AL 0028067

182

two (2) rounds with ease; holding three (3) rounds sometimes requires special adjustments. Magazines should be designed to easily accommodate three (3) magnum rounds or four (4) standard rounds. In fact, we need focused attention on the feeding systems on all our bolt actions, including the rimfires. Regarding the fire controls, we already have a program to develop improved systems. Those improvements should be aggressively pursued and implemented.

Appearance

When properly cleaned and displayed, our bolt action centerfires have an excellent appearance and give an impression of rugged dependability. However, out-of-the-box appearance is generally not as favorable due to salt bleedout problems, use of oil coatings for rust prevention, and dull sights. Salt bleedout is not a new problem and we have taken steps to eliminate bleedout where we have a known recurring problem. Oil coating for rust prevention is a standard Remington procedure which is not used by some of our competitors. We should investigate alternative protective coatings, such as dry lubricants. Our powder metallurgy sites have a dull appearance due to porosity even when polished. We should consider a complete change in our sight line.

Marketing Philosophy

Our marketing approach for bolt actions has been unchanged for many years. We need some innovations in design combined with more emphasis on strengths of our current line. The M/700 has the strongest locking system and is the most accurate bolt action centerfire rifle on the market. While our extractors are stronger than those of our competitors, they do not have the same massive appearance. We need to take advantage of existing test data to counter the implication that massive appearance correlates with strength. Finally, we should advertise availability of special calibers on custom orders or make special calibers available to preferred dealers or customers. One possibility is to introduce a special edition 35 Whalen caliber rifle as a commemorative to Col. Townsend Whalen.

CURRENT REMINGTON BOLT ACTION FIRE CONTROLS

1. M600
2. M700
3. M788
4. XP-100
5. 541-S
6. 540 XR
7. 580-81-82
8. 40XB
9. 40XB-20Z

TYPE OF SAFE	UNLOAD WITH SAFE ON	ADJUSTMENT				BOLT LOCK	INDEPENDENT BOLT LOCK	ON SAFE - STRIKER DOWN	INTERCHANGEABLE WITH M700	FITABLE - FIELD	FITABLE - PLANT
		OVERTRAVEL	ENGAGEMENT	PULL	PRE PLAY						
SB	NO	YES	YES	YES	NO	YES	NO	NO			
SB	NO	YES	YES	YES	NO	YES	NO	NO	YES	YES	YES
SB	YES	NO	NO	NO	NO	NO	NO	NO			
SB	YES	YES	YES	NO	NO	NO	NO	NO			
SB	YES	YES	YES	YES	NO	NO	NO	NO			
SB	YES	YES	YES	YES	NO	NO	NO	NO			
SB	YES	NO	NO	NO	NO	NO	NO	NO			
SB	NO	YES	YES	YES	NO	YES	NO	NO			
NO	NO	YES	YES	YES	NO	NO	NO	NO			
SB	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	YES
SB	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	YES
SB	YES	YES	YES	YES	NO	YES	YES	NO	NO	NO	YES
SB	NO	NO	NO	YES	NO	YES	NO	NO	YES	YES	YES
SB	YES	NO	NO	NO	NO	NO	NO	NO			
SB	YES	NO	NO	YES	LL	YES	YES	YES	YES	YES	YES
SB TB	YES	NO	NO	YES	LL	YES	YES	YES	YES	YES	YES

ALTERNATIVE DESIGNS

1. 3 POSITION
2. BOLT PLUG LOCK
3. BUTTON LOCK
4. FIXED ENG. & O.T.
5. REVISED 788-580
6. NEW DESIGN A
7. NEW DESIGN B

* ORIGINALLY PRODUCED WITH BOLT LOCK SIMILAR TO M700

PLAINTIFF'S
EXHIBIT

3149

AL 0028132

121

A

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING
ASSEMBLY ON MODEL SEVEN LIGHTWEIGHT

L

IMPORTANT NOTICE

E

Absolutely no alterations or adjustments are to be made to the replacement trigger assembly. If any of the conditions listed below are encountered during replacement of the Trigger Assembly, return the complete rifle to the factory.

- o Difficulty assembling Stock to receiver with guard screws.
- o Trigger projecting beyond side of trigger guard.
- o Binding of sear in housing.
- o Trigger binding on trigger guard plate.
- o Trigger binding on trigger guard.

S

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C

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PLAINTIFF'S
EXHIBIT

3150

124
AL 0028287

MAKE SURE FIREARM IS NOT LOADED AND THE MAGAZINE IS EMPTY

To Disassemble Firearm:

- o Put safety switch to "S" position.
- o Remove bolt assembly from action (See Page 5 of Model Seven Instruction Book).
- o Turn rifle upside down, Barrel pointing to your left.
- o Open floor plate by pushing front of latch. (See Picture 1).
- o Completely loosen front guard screw. (See Picture 2)
- o Completely loosen rear guard screw. (See Picture 2)
- o Lift Stock away from the barreled action. The floor plate base assembly, trigger guard front and rear guard screws will remain with the Stock.
- o Remove magazine from Receiver.
- o Turn firearm with left side up and Barrel pointing left. (See Picture 3)
- o With the Safety switch in the "S" position, tap out the front and rear sear pins from left to right and remove the trigger assembly from the Receiver. (See Picture 3)

To Reassemble Firearm:

- o Insert the new trigger assembly (with slave pins intact) into the Receiver. Align holes in housing with holes in Receiver and tap in sear pins from left to right (chamfered end first). (See Picture 3)

Note: Front sear pin must not protrude into the bolt stop slot.

CAUTION:

- o After assembling, push the bolt stop release. (See Picture 4 upward; bolt stop must pivot freely.

CAUTION: - Contd.

- o Put the safety switch in the "F" position, pull the trigger and hold. Depress the top rear of the safety cam to insure that the sear safety cam pivots freely and retracts without hesitation. (See Picture 5)
- o Push safety switch from "F" to "S" position several times to insure free movement with no binding and positive engagement of safety switch detents.
- o Restake both pins on the right side of the Receiver. Recheck to make sure bolt stop moves freely. (See Picture 6)
- o Reassemble the magazine into the Receiver. (See Picture 7)
- o Reassemble the Stock to the barreled action. This should include the floor plate base assembly trigger guard and front and rear guard screws if they were disassembled as a unit;
- o Be sure action is seated rearward in Stock.
- o Assemble front and rear guard screws to the Receiver. If any trouble is encountered in completing this step, return entire firearm to the factory.
- o Close floor plate.
- o Replace the bolt assembly.
- o After reassembling the rifle, check for clearance between the following parts; safety switch and stock, trigger and floor plate base.
- o Check for trigger projecting beyond side of trigger guard.
- o If any of these conditions are encountered, return the entire firearm to the factory.

SAFETY PERFORMANCE CHECK

The following checks for proper functioning of the safety must be made:

- o Close the bolt
- o Put the safety switch into the "S" position.

- o Pull the trigger (firing pin should not fall). Action of trigger pull must be smooth (no bind, drag, click, or catch).
- o Release the trigger (trigger must return forward to its original position).
- o Put the safety switch into the "F" position (firing pin must not fall).
- o Pull the trigger (firing pin must fall).
- o Repeat this test at least three time.
- o Push the safety switch from "F" to "S" position several times to insure free movement with no binding and positive engagement of safety switch detents.

CAUTION: IF "F" AND "S" POSITION ARE NOT POSITIVE, RETURN
COMPLETE RIFLE TO FACTORY FOR REPAIR

Check for "follow down" (firing pin moves to uncocked position as bolt is closed).

- o Put the safety switch into the "F" position.
- o Close the bolt smartly.
- o Firing pin must remain cocked. Pull the trigger to check. Firing pin must fall. Perform this operation several times.
- o If "follow down" occurs, RETURN THE RIFLE TO THE FACTORY.

JWB:js
Ilion Firearms Research Division

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
January 26, 1979

R. L. HALL

MODEL XP-100 SEQUENCE OF EVENTS

Model XP-100 sequence of events in modifying customer return guns and insuring integrity of production Trigger Assemblies is listed chronologically below:

<u>Date</u>	<u>Event</u>
10-24-78	Remington announced recall of M/600 and XP-100 pistol.
11-78	Engineering and Production effort concentrated on M/600. Gunsmith write-up - assemblies for gunsmith - establishing process for Trigger Assemblies to be shipped.
11-17-78	Present process reviewed - trick test for XP-100 reviewed with assemblers - shim test added (check for clearance between Sear and Sear Block with shim Stock, with Safety in null position).
12-1-78	Initial work on defining situation for customer repair XP-100's started - process reviewed, additions and clarifications were made.
12-15-78	Process developed for customer repair pistols; Engineers tried sample run. Customer repair gunsmith trained.
12-18-78	Initial lot of 25 customer guns modified to repair process. Lot rejected, two guns failed test. Shim test and trick test.

PLAINTIFF'S
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January 26, 1979

Date	Event
------	-------

12-18-78	Contd.
----------	--------

The trick test was re-evaluated and it was found that the engineer and gunsmith were using different techniques on standardized test. The shim test was also re-evaluated for consistent and easier operation.

It was also found that customers had made alterations to the Sear Housing Assemblies and they had to be readjusted to standards.

12-28-78	A second lot of 25 was modified to revised process. A large percent of pistols would not pass shim test and the new gaging technique was questioned - parts measured.
----------	---

1-4-79	Engineering analysis showed second lot of pistols was using a new shipment of Safety Assemblies which had .006" less lift on Sear. R & D altered drawing to increase lift - parts were ordered with higher lift. Shim test results were verified by using dial gage which fits into back of Receiver. <i>ANALYZED</i>
--------	---

1-10-79	New lot of 25 pistols started to process for modification - high lift Sear were used and pistols were audited - process verified.
---------	---

1-12-79	Repair verified on customer pistols - pistols being returned to customers. <i>STARTED</i> Production using new Safety levers; reject rate increased dramatically $\approx 50\%$.
---------	---

1-19-79	New Safety levers delivered to Ilion - found to have too much Sear lift, .002" over max. model drawing.
---------	---

1-22-79	New Safety levers in Assemblies - mechanism would lock up when put on Safe. Safety levers ground down to max. model drawing. Mechanism worked but rear of Sear interferes with Sear Housing Pin.
---------	--

1-23-79	Safety levers ground to mean model drawing - still binding. Drawing change made to grind clearance on Sear - parts tried, mechanism worked.
---------	---

R. L. HALL

-3-

January 26, 1979

<u>Date</u>	<u>Event</u>
1-24-79	Parts modified, Assemblies put together. Safety worked hard. Lubrication technique developed - parts delivered to Final Assembly - pistols put up.
1-25-79	Pistols tested satisfactorily. More parts were modified. Pistols which had been rejected were refitted with new Sear and lever.
1-26-79	More parts being modified - permanent process for part modification being developed.
1-29-79	Parts delivered to Customer Repair - to continue modifying guns - 147 shipped to date.

J. P. Linde, Superintendent
P E & C Section

JPL:eb

323
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RD-45

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"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Illion, New York
February 8, 1979

TO: B. K. DAUBENSPECK
BRIDGEPORT

XP-100

1. Changes to Sear

Sear redesigned to increase the lift clearance between the sear and the bolt stop cross pin to prevent hard "safety on" forces when the max. cam on the safety lever was used. This change was made to a non-critical area of the sear and does not adversely effect its operation or strength.

2. The front of the trigger was redesigned to eliminate possible interference with the trigger adjustment screw threads. Interference with the threads could cause the trigger to bind.

3. Redesign of the safety lever to better control tolerances is in progress. This is not yet complete.

C. B. Workman, Manager
Illion Research Division

CEW:T

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REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

DPST

File

c: D. M. Condon
C. A. Riley
W. H. Person
W. J. Weeks
A. O. Library

Bridgeport, Connecticut
January 27, 1983

T. W. RAWSON
R. E. SCHRADER

Send copy of letter to [unclear]

Study

CONSUMER CUES TO QUALITY - BOLT ACTION
CENTER FIRE RIFLES - FINAL REPORT

Three consumer group sessions were conducted in November 1982 with recent and prospective center fire bolt action rifle buyers to determine the "cues" by which a prospective buyer assesses the quality of a rifle. An "expert" (custom gun maker) session was also conducted to help provide added insight into this issue.

"Cues" are the visible/external elements of a product (in this case a gun) which a consumer uses to come to some determination of the overall workmanship and performance of that product. A "cue" on a gun is usually a more subtle element than an obvious feature like a hinged floor plate and less noticeable than an attribute like "good wood-to-metal fit". However, these latter elements could be considered strong "cues" to quality for some consumers.

"Cues" are generally the numerous details on a product which convey to the consumer a concern for how it was manufactured. The addition of "cues" tends to have a cumulative effect to a point where the gun emits an "aura" of fineness.

Prospective center fire rifle buyers are greatly influenced by the cosmetics/appearance of a gun. To these buyers, an attractive/"pretty" gun conveys quality. Since a center fire rifle's stock is the largest part of the gun, it has more of an impact on generating an impression of "attractiveness" than any other component.

This research indicates that a "cue" to an attractive stock is tapered/slender lines. A stock designed and manufactured

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A with these kinds of lines conveys an attention to detail by making sure that the wood "flows" into the metal rather than looking like a "pipe stuck on a 2" x 4".

The research strongly suggests that a center fire rifle should have an "integrated appearance". An example of this is the way various metal parts are finished. While consumers prefer all machined parts, they grudgingly accept stamped parts in certain areas if they are finished "well", that is, if an aluminum stamping looks like (after bluing) the machined steel in the receiver or barrel. If this is done the metal parts all look the same.

The above discussion, hopefully, has clarified the notion of "cues" and how they apply to center fire rifles. The final report attached itemizes and elaborates them more fully.

In conclusion, this research suggests that we should avoid making unnecessary internal changes if they only marginally improve a new gun's performance. The benefit of these kinds of changes (improved consumer acceptance) would probably not justify the cost of implementation.

J. H. CHAMBERS

JHC/kam

Att.
0001M

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cc: J.G. Williams

REMINGTON ARMS COMPANY, INC.

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FIREARMS RESEARCH DIVISION

June 1, 1982

P.H. HOLMBERG

NEW BOLT ACTION RIFLE

As a result of our recent meeting with R&D and Production, the following is my interpretation of our objective and, more importantly, the desirable features/model requirements.

OBJECTIVE

Replace current 700 HDL, Varmint, and Left-hand Specials with new bolt action rifles having demonstrable consumer-perceived value-in-use features and completely new styling at minimum cost and capital investment.

Specifically, the above objective can be broken down into four major categories. They are as follows:

1. Styling -

All-new look; i.e., stock, receiver, fore-end, barrel, trigger housing, etc.

2. Internal mechanical features -

Mechanical changes should only occur if needed to improve a current known deficiency or if providing demonstrably-perceived consumer advantage.

3. External Features -

Again, these features should represent consumer-perceived advantages such as scope mounts, external adjustable triggers, repositioning of safeties, etc.

4. Minimum Cost and Capital Investment -

In this area, we would hope to produce the new bolt action rifle at a cost equal to, or lower than, our current model; however, additional cost for a specific development may be incurred and

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June 1, 1982

accepted because they can be recovered in selling price. As for capital expenditures, if, in fact, we can develop this new gun in conjunction with the firearms modernization program, it would be most timely. Our basic goal is to introduce this new gun in the 1985 model year; however, if the situation requires, we could go as long as the 1986 model year.

Following are the desirable features/model requirements, along with some idea of what they mean, either to us in manufacturing or to the consumer.

Flat-bottom Octagonal Receiver

1. Easier to customize.
2. Reduce weight.
3. Narrower - allows narrower stock configuration.
4. Relates to trade likes - flat bottom.
5. Visually different.

Integral Recoil Lug

1. Consumer-perceived added strength.
2. Improved uniform appearance between barrel and receiver.

Integral and Standard Scope Mounts - (Integral preferably better than competition)

1. Flexibility in mounting systems.
2. Consumer-perceived value - windage and elevation adjustments.

Anti-bind Bolt

1. Consumer-perceived smoother action.
2. Reduced lateral motion of bolt through entire stroke.

Front Lock - (two-lug system (no change))

- *1. Possibly three-lug system.

* Low priority Adv.

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June 1, 1982

Short and Long Actions

1. Provide actions for cartridge - although not necessary but common in the industry.

New Bolt Stop - Release

- *1. Improve quality - appear stronger.
2. Possibly relocate.

Block Trigger and Firing Pins

1. Dual safety switch.
2. Reposition.
3. May be 3 position.

Bolt Lock

1. Separate switch - not mandatory.

Cocking Indicator

1. Shows red when cocked.

Fire Control

- Adjust-ments
1. Pounds pull - external - fail safe - down to 3 lbs.
 2. Over travel - external - safety limits - if a factor??
 3. Change sear to wrought iron.
 4. New fire control - desirable.
 5. Standard trigger.

Barrel

- *1. High gloss - hammer marks - aesthetics - looks different.
2. Lt. weight contour - lighter weight - new contour.
3. Target crown - protects end of barrel - maybe accuracy improved.
4. Recoil reducing muzzle - & reduction in recoil.
- *5. Stainless steel - option.
6. Clean barrel - no sights or holes.

Low priority Adv.
Cost factor possible.

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June 1, 1982

Feed System

1. Unload with bolt open.
2. No-bind follower.
3. Rotary magazine - better feed - no angles - more rigid receiver.
4. Magazine - 3 shots versus 4; and 4 versus 5 shots.
5. Jeweled follower.

Bolt

1. Claw-type extractor - more guts, heavier looking, etc.
2. Restyled bolt handle - styling - looks. Distinctive but functional.
3. Two-lug system - possibly 3.
4. Easy lift - no more than present 700.
5. Jeweled - aesthetics.
6. Reduced locked time - would not sacrifice for easy lift.
7. Restyled bolt plug - aesthetics.

Stocks

1. Walnut - appearance.
2. Cut checkered - 20 lpi. - full - scratchable fore-end.
3. Recessed slug swivel studs - styling.
4. Cast off and toe out - similar to Hygrade custom stocks.
5. Skeletonized butt and grip cap.
6. Epoxy bedding - strength.
7. Emmons stock - slim down grip, etc.
8. Medium gloss.
9. No spacers.

During our session, we also discussed the need to conduct market research on potential new bolt action rifles. Following are a couple of areas where we discussed specific testing. I'm sure that as we proceed, others will become obvious.

June 1, 1982

Test Guns

1. Barrel - hammered high gloss versus no hammer high gloss.
2. Barrel contour - new versus straight or current.

Please feel free to update this list and the objective any way you see fit. We do need to expeditiously confirm in writing our discussion with R&D. In addition, we should include in this document our version of performance specifications, i.e. accuracy, weight, etc.

C.A. RILEY

CAR:jt

AL 0028730

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A

REMINGTON ARMS CO.
RECEIVED

MAR 16 1982

225 E. Edgewood Dr. Apt. 98
Lakeland, Florida 33803
Mar. 12, 1982

Mr. Clark Workman FIREARMS RESEARCH DIVISION
Remington Arms Co.
Ilion, N. Y.

Dear Clark:

Jim was here today and we went over the bolt actions from A to Z.

These are some of the things I propose:

1. Please don't bring out a new bolt action, without a fool proof safety which is capable of locking the bolt. Make it at least as good as the present M/70, better if possible.

2. Suggest you push for a complete line of bolt action rifles that cover the price gamut from lowest to highest. I feel the Carbine should be as simple and plain as you can make it with a price to match.

3. Forget pressed checkering!

4. I feel the idea of a hex cross section for a new receiver will increase cost. I also feel that indexing barrels and receivers will also increase cost. Since I feel that present volume is low because of price structure, increasing cost is a no no!

5. I didn't mention this to Jim, but we should make a large effort to capitalize on the fact that the benchrest shooters think our present 700 - 600 - XP100 - 40X actions are the most accurate production actions available and use them when they can get them for bench rest competition.

6. I am ~~personally~~ in favor of the "as hammered" finish on barrels.

7. I do not think that Ruger is making more than 50000-77's per year. Anyone who says he is, is trying to mislead you.

8. The .243 has cost Win. and Sav. some fairly costly law suits due to its tendency to wear barrels quickly and cause high pressures due to excessive fouling. We have not had this problem because we use 6 MM barrel interiors for the .243, plus the fact that 700s do not come apart due to high pressure. To let the 6 MM die by taking it out of production in 700 is asinine. It's a better cartridge all the way than the .243 and we should make an effort to tell the customers. Letting the customers tell us in this instance, could get us into trouble.

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A 9. We obviously have some production or design problems with M/700 magazine feed. We need to get busy on this. Magazines too narrow or receiver openings too wide can cause the problem you are experiencing.

10. Jim mentioned that some one is pushing for a Mauser type extractor. Do they understand that the rifle will come apart same as the present competition with excessive pressure if we go to any extractor which breaks the bolt shroud?

11. Has anyone tried a floating wedge in the front of the present 700 trigger as an additional element to the safety? It would be operated and governed in position by a relatively long slot in the present safety arm on the exterior of the housing. The wedging action would hold it in position until the very last movement of the safety to the "off" position. It might be pushed to the "on" position by a light spring or by the final movement of the safety arm to the "on" position.

If I think of anything more I will call.

K
Sincerely,

M. H. Walker
M. H. Walker

DON'T SAY IT — WRITE IT

To: A.A. HUGICK

Date: 1-5-79

From: C.J. SWEET

M/700 CLASSIC PILOT LINE FIELD CYCLE TEST (243 CAL.)SUBJECT: BOLT LUBRICATIONWEATHER: 90° F - WINDY - LIGHT SNOW

Extremely hard bolt lift was experienced during Field Cycle Testing of the M/700 Classic Pilot Rifles. After one quarter of the test was shot (50 rds.), shooters found it difficult to lift the bolt handle to unlock the bolt. One gun was so severe, the bolt handle could not be lifted unless the gun was held between the legs, and the bolt handle was lifted by using both hands (One hand on the stock pulling down on the gun, and one hand on the bolt handle pulling up). Hard bolt lift was experienced after every fired round. A check was made by dry firing the guns. Hard bolt lift was evident, but not as severe as it was in live fire.

The bolts were then removed and inspected. The bolts had been lubricated with Molykote G-N Paste before testing. Small metal particles were noticed in the paste caused by the failure of the lubricant. The bolts were then cleaned and sprayed with WD-40 lubricant. The areas sprayed were the Cam Surface and the locking lugs. The bolts were then reassembled in the bolts and the test was completed (150 rds.). The bolts functioned well after lubrication with the WD-40.

The Molykote G-N Paste had hardened in the cold, which gummed up the bolt causing hard bolt lift.

THIS WAS APPLIED IN THE LAB JUST PRIOR
TO THE FIELD TEST. A.

CJS:js

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3156

DON'T BE SORRY — BE SAFE

1023
AL 0028926

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

Patent

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Distribution: C.B. Workman
C.E. Ritchie

RESEARCH TEST and MEASUREMENT REPORT -- Report No. 82 0331

Lubricant Evaluation: M700 Cock and Fire Simulation

Prepared by: Fred Supry

Date Prepared: 3-22-82

Proofread and Cleared By:

J.H. Hemmings / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mach. Analysis Lab

Signature

Date

2723
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A

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331
REPORT TITLE: Lubricant Evaluation: M700 Cock and Fire Simulation
MODEL(S): 700
GAUGE OR CALIBER: 30.06
DATE: 3-22-82
WORK ORDER NO.: C-1803-000
PART NAME:
DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: Static _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS. _____ TARGET: _____

RIM FIRE _____ CENTER FIRE _____

10. DRY CYCLE - NO. OF SAMPLES TESTED 5 - each lubricant
MAX. NO. OF CYCLES 25000

3723
AL 0029380

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings
FROM: F.L. Supry
REPORT TITLE: Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct a cock and fire evaluation on five spray lubricants.

1. Du Pont - Synthetic Diester
2. Krylon - Ten - 4
3. Sprayon - 711
4. CRC - 3-36
5. Houghton - HLP

These five lubricants were selected for evaluation from the results of a preliminary evaluation conducted by A.B. Hughes, Senior Consultant, ESD Maintenance Engineering Group, Du Pont. A copy of his evaluation for each of the five lubricants is located in Appendix "C".

Engineering Dept.

SCOPE OF TEST

To compare the five lubricants in a Model 700 cock and fire simulation test.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant, the following results were obtained.

<u>LUBRICANT</u>	<u>AVERAGE CYCLE LIFE (5 Samples)</u>
1. Du Pont - Synthetic Diester	21,181 cys.
2. Sprayon - 711	17,846 cys.
3. CRC - 3-36	14,382 cys.
4. Houghton - HLP	8,333 cys.
5. Krylon - Ten-4	2,830 cys.

REPORT TEXT

A. Trigger pull, sear lift, sear engagement, safe on, safe off, and bolt lift measurements were taken on each test vehicle at the start of the test, and at 5000 cycle intervals. Remington specifications for the M700 components used are:

- | | |
|---------------------|-------------------|
| • Trigger Pull | 3½ lbs. - 6½ lbs. |
| • Sear Lift | .005" - .018" |
| • Sear Engagement | .015" - .020" |
| • Safe "On" - "Off" | None Established |
| • Bolt Lift | None Established |

Refer to Appendix "A", data sheets No. 1 through No. 5, for individual results.

The Rc hardness was measured, at the cocking cam area, on each M700 bolt. Remington specifications Rc 37-46.

Refer to Appendix "A", data sheet No. 6, for individual hardness, lubricant used, simulator used and cycles completed.

A graphical analysis comparing the lubricants tested to their cycle life, and their cycle life to the simulator used is found in Appendix "B".

2. Lubrication Procedure - continued

- c. All other lubrication points were lubricated by holding the aerosol can approximately six inches away from the area to be lubricated and covering the area until a thin layer of lubricant forms on the surface. Duration of spray; approximately 1 second.

C. Pictorial Presentation

1. Lubrication points and procedures.
2. Cocking cam, sear face, and ~~striker~~ radius and track areas were photographed at the start and completion of the test and are available on request.

ALEXK SIC H

APPENDIX A
(Data Sheets)

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LUBRICANT EVALUATION

4-11-82

FIRST SAMPLE of EACH LUARIZANT

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT + LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	LOCKED	FIRE
REM - SPENS		34-6 1/2 lbs	.005"-.008"	.015"-.020"	(163)	(165)	(165)	(165)
1 - DUPONT		(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
2 - 711								
3 - CRC								
4 - HLP								
5 - Tex 4								
1		6.25	.005	.020	7.5	6.50	3.00	7.00
2		6.50	.006	.015	6.75	4.25	2.00	6.50
cycles	3	5.50	.005	.016	5.25	4.25	3.00	6.00
	4	6.00	.008	.017	7.00	5.75	3.00	6.50
5		6.50	.008	.016	6.75	4.50	4.50	7.50
1		6.00	.0055	.020	5.50	4.00	2.50	6.50
5000 cycles	2	6.00	.0065	.0175	6.00	5.50	2.50	6.50
	3	6.00	.006	.020	6.00	4.50	2.00	6.00
4		5.75	.010	.017	7.50	5.00	3.00	7.25
* 5		6.50	.010	.020	7.25	5.50	5.00	9.00
1		5.75	.008	.020	5.75	4.0	2.25	7.00
10,000 cycles	* 2	5.75	.008	.018	5.25	3.75	2.50	10.50
	3	5.25	.008	.022	4.50	3.75	2.01	7.00
4		6.25	.0095	.019	7.25	4.75	3.01	13.00
5		—	—	—	—	—	—	—
1		6.00	.009	.0205	6.00	4.00	2.00	8.50
15,000 cycles	2	—	—	—	—	—	—	—
	3	5.50	.009	.024	5.00	5.50	2.00	8.50
* 4		6.00	.0105	.019	6.50	4.50	3.00	18.00
5		—	—	—	—	—	—	—
* 1		6.00	.0095	.021	6.00	4.00	2.00	8.00
20,000 cycles	2	—	—	—	—	—	—	—
	* 3	5.50	.0105	.027	4.50	4.00	2.00	9.00
4		—	—	—	—	—	—	—
5		—	—	—	—	—	—	—
1		—	—	—	—	—	—	—
25,000 cycles	2	—	—	—	—	—	—	—
	3	—	—	—	—	—	—	—
4		—	—	—	—	—	—	—
5		—	—	—	—	—	—	—
* 1		FAILED	15594	CYCLES				
* 2		FAILED	6228	cycles				
* 3		FAILED	18359	cycles				
* 4		FAILED	10400	cycles				
* 5		FAILED	1990	cycles				

M700

COCK 1 FIRE SIMULATION

745

LUBRICANT EVALUATION

4-8-42

SECOND SAMPLE OF EACH LUBRICANT

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT-LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	CRACKED	FILED
REMISAEZS → 3 1/2 - 6 1/2 lbs		005"-.018"	015"-.020"	(1bs)	(1bs)	(1bs)	(1bs)	(1bs)
1	DUPONT	(AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
2	71E							
3	1PE							
4	HLP							
5	TEN 4							
	1	6.00	.009	.0185	6.00	4.50	4.00	8.00
	2	5.00	.006	.018	7.50	4.75	3.00	6.00
cycles	3	6.00	.012	.012	7.00	4.50	3.00	7.00
	4	6.75	.0095	.016	7.50	6.75	2.50	7.00
	5	5.50	.008	.016	7.50	5.50	3.50	7.00
5000	1	5.25	.0095	.0215	6.00	4.50	3.50	7.00
cycles	2	5.00	.0065	.019	5.75	4.00	3.50	6.00
	3	5.75	.013	.020	5.00	4.00	3.00	8.00
	4	6.25	.0095	.020	6.75	6.25	2.50	8.00
	* 5	5.00	.009	.020	5.75	4.00	3.50	13.00
10,000	1	5.50	.011	.025	5.75	4.25	3.50	7.00
cycles	2	4.75	.0065	.019	5.25	4.00	2.50	6.50
	* 3	6.00	.013	.023	6.25	3.75	3.00	15.00
	* 4	6.00	.0095	.021	6.50	5.75	3.00	25.00
	5	—	—	—	—	—	—	—
15,000	1	5.50	.011	.026	5.50	4.25	4.00	7.25
cycles	2	4.75	.0075	.019	5.00	4.00	3.00	7.00
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—
20,000	1	5.50	.011	.0265	5.50	4.00	4.00	9.25
cycles	2	4.75	.009	.019	5.25	4.50	3.00	6.50
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—
25,000	* 1	5.25	.011	.0285	5.50	3.75	4.00	14.00
cycles	* 2	4.50	.0095	.021	5.25	4.00	2.50	7.00
	3	—	—	—	—	—	—	—
	4	—	—	—	—	—	—	—
	5	—	—	—	—	—	—	—
	* 1	COMPLETED 25,000 cycles						
	* 2	COMPLETED 25,000 cycles						
	* 3	FAILED 8317 cycles						
	* 4	FAILED 6115 cycles						
	* 5	FAILED 2788 cycles						

DATA SHEET 2

9823
AL 0029387

M700 COCK & FIRE SIMULATION

FLS

LUBRICANT EVALUATION

3-8-82

THIRD SAMPLE OF EACH LUBRICANT

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT - LIFT	
		PULL	LIFT	ENGAGEMENT	OP	REF	SOCKET	FIRE
		2 1/2 - 6 1/2 lbs	.005" - .018"	.015" - .020"	(lbs)	(lbs)	(lbs)	(lbs)
1	1	DUPONT	(AVG OF 3)		(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
2	2	TII						
3	3	GRE						
4	4	HLP						
5	5	TEN 4						
6	1		5.75	.007	.015	7.25	4.50	2.50
7	2		6.00	.008	.015	7.50	7.50	2.50
8	3		6.25	.009	.017	6.75	5.50	3.00
9	4		5.75	.0125	.0195	8.00	5.50	3.00
10	5		5.50	.008	.015	8.00	5.00	2.50
11	1	5000	6.25	.009	.019	6.50	4.25	2.00
12	2	cycles	5.25	.009	.021	5.25	7.50	3.50
13	3		6.25	.0105	.0175	7.25	4.00	3.00
14	4		5.75	.0125	.021	7.00	5.00	3.00
15	* 5		5.50	.013	.021	6.00	3.75	2.50
16	1	10000	6.00	.010	.020	6.00	3.75	2.00
17	2	cycles	5.25	.009	.021	7.00	6.00	3.50
18	3		6.00	.015	.0195	6.75	4.75	3.00
19	* 4		5.75	.0125	.0225	6.50	4.50	3.50
20	5		—	—	—	—	—	—
21	1	15000	5.25	.0115	.020	5.75	4.00	2.00
22	* 2	cycles	5.50	.0095	.022	6.50	5.50	4.00
23	* 3		6.50	.015	.0195	6.75	4.00	3.00
24	4		—	—	—	—	—	—
25	5		—	—	—	—	—	—
26	1	20000	5.75	.0115	.020	6.00	4.00	2.00
27	2	cycles	—	—	—	—	—	—
28	3		—	—	—	—	—	—
29	4		—	—	—	—	—	—
30	5		—	—	—	—	—	—
31	* 1	25000	6.00	.0115	.021	6.25	3.75	2.00
32	2	cycles	—	—	—	—	—	—
33	3		—	—	—	—	—	—
34	4		—	—	—	—	—	—
35	5		—	—	—	—	—	—
36	* 1	COMPLETED	25,000	cycles				
37	* 2	FAILED	15,140	cycles				
38	* 3	FAILED	10,410	cycles				
39	* 4	FAILED	6,788	cycles				
40	* 5	FAILED	2,484	cycles				

DATA SHEET 3

10/23

AL 0029388

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT - LIFT		
		PULL	LIFT	ENGAGEMENT	ON	OFF	LOCKED	FIRED	
		14 - 6 1/2 lbs	.005" - .018"	.015" - .020"	(lbs)	(lbs)	(lbs)	(lbs)	
		(AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	
1	D. Pent								
2	711								
3	PRC								
4	HLR								
5	TEN 4								
	1	6.50	.0095	.019	6.75	4.25	4.00	8.00	
	2	6.50	.008	.019	8.50	5.25	3.50	7.00	
cycles	3	5.50	.008	.016	7.25	4.75	3.00	9.00	
	4	5.75	.009	.019	8.25	5.50	4.00	7.50	
	5	5.50	.005	.017	9.00	6.75	3.00	7.50	
5000	1	6.25	.010	.023	6.25	3.25	3.00	8.00	
cycles	2	6.00	.011	.020	7.50	4.25	3.50	7.00	
	3	5.50	.0085	.021	7.00	4.50	3.00	8.00	
	4	6.00	.010	.019	7.25	5.00	4.00	10.00	
*	5	5.75	.010	.0185	7.00	4.75	3.00	16.00	
10000	1	5.75	.010	.023	5.75	3.50	4.00	8.00	
cycles	2	6.00	.012	.022	7.00	4.00	3.00	8.00	
	3	5.50	.0085	.021	6.50	4.25	3.00	8.00	
	* 4	6.00	.010	.021	7.00	5.25	4.00	29.00	
	5	—	—	—	—	—	—	—	
15000	1	6.25	.0105	.024	5.25	3.00	3.50	9.00	
cycles	2	6.25	.013	.0225	7.50	4.00	3.50	9.00	
	* 3	5.50	.0105	.0215	6.75	4.50	3.25	22.00	
	4	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	
20000	* 1	5.75	.0115	.026	5.75	3.00	3.00	24.00	
cycles	* 2	5.75	.0125	.024	6.50	4.00	4.00	24.00	
	3	—	—	—	—	—	—	—	
	4	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	
25000	1	—	—	—	—	—	—	—	
cycles	2	—	—	—	—	—	—	—	
	3	—	—	—	—	—	—	—	
	4	—	—	—	—	—	—	—	
	5	—	—	—	—	—	—	—	
	* 1	FAILED	19520 cycles						
	* 2	FAILED	16865 cycles						
	* 3	FAILED	11830 cycles						
	* 4	FAILED	8576 cycles						
	* 5	FAILED	3667 cycles						
DATA SHEET 4									

DATA SHEET 4

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AL 0029389

FIFTH SAMPLE OF EACH LUBRICANT

		TRIGGER	GEAR	GEAR	SAFE	SAFE	BOLT - LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	COCKED	FIRE
		3" - 62.14	005" - 018"	015" - 020"	(lbs)	(lbs)	(lbs)	(lbs)
		(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
1	DUPONT							
2	711							
3	CR2							
4	HLR							
5	TEX 4							
6	1	6.00	.0095	.0117	7.00	4.75	2.00	7.00
7	2	5.75	.0085	.0155	6.75	5.00	3.50	7.00
8	cycles	3	5.75	.0105	.0215	6.50	5.00	3.00
9	4	6.25	.012	.016	7.00	4.50	3.00	8.00
10	5	6.25	.0081	.016	7.25	5.50	3.00	6.50
11	3000	1	5.50	.010	.0205	7.50	4.50	2.50
12	cycles	2	6.00	.0085	.016	5.75	4.00	4.00
13	3	5.75	.0105	.0215	5.50	4.25	3.00	8.00
14	4	6.25	.013	.019	6.50	4.25	4.00	7.50
15	*5	6.25	.010	.020	5.75	4.00	3.50	18.00
16	10000	1	5.25	.010	.021	7.50	4.00	3.00
17	cycles	2	5.50	.010	.018	5.75	3.75	4.00
18	3	5.75	.0105	.0215	5.50	4.25	3.00	7.50
19	*4	6.25	.0135	.025	7.25	3.75	4.00	27.00
20	5	—	—	—	—	—	—	—
21	15000	1	5.50	.0105	.021	6.50	4.00	3.00
22	cycles	2	5.75	.010	.018	5.75	4.00	3.50
23	3	6.00	.0105	.0215	5.50	4.50	3.00	7.00
24	4	—	—	—	—	—	—	—
25	5	—	—	—	—	—	—	—
26	20000	1	5.50	.0105	.021	7.00	3.75	3.50
27	cycles	2	6.25	.010	.019	5.50	4.00	3.50
28	3	5.75	.0105	.022	5.50	4.25	3.00	11.00
29	4	—	—	—	—	—	—	—
30	5	—	—	—	—	—	—	—
31	25000	*1	5.00	.0111	.022	7.00	4.00	3.00
32	cycles	*2	5.75	.011	.020	5.75	3.75	4.00
33	*3	6.25	.011	.023	5.25	4.00	4.00	15.00
34	4	—	—	—	—	—	—	—
35	5	—	—	—	—	—	—	—
36	*1	FAILED	20790	cycles				
37	*2	COMPLETED	25000	cycles				
38	*3	COMPLETED	25000	cycles				
39	*4	FAILED	9787	cycles				
40	*5	FAILED	3220	cycles				

DATA SHEET 5

LUBRICANT EVALUATION

3-10-82

Rc HARDNESS: M700 BOLT COCKING CAM AREA

REM. SPEEDS	Rc	LUBRICANT	SIMULATOR	CYCLES
Rc 37-46	HARDNESS	USED	USED	COMPLETED
+ BOLT NO. +				
C1	39	DUPONT	1	15 594
C9	40	DUPONT	3	25 000
C12	40	DUPONT	2	25 000
C19	38	DUPONT	4	19 520
C20	37	DUPONT	1	20 790
C3	38	711	3	6 226
C7	39	711	2	25 000
C16	39	711	1	15 140
C27	38	711	2	16 865
C29	39	711	4	25 000
C4	39	CRC 336	4	16 359
C10	39	CRC 336	1	8 317
C17	40	CRC 336	3	10 410
C21	39	CRC 3-X	2	11 830
C25	39	CRC 5-58	4	25 000
C11	39	HLP	4	10 400
C18	39	HLP	3	6 115
C24	39	HLP	2	6 788
C26	39	HLP	1	8 596
C28	38	HLP	1	9 787
C2	38	TEN-4	2	1 990
C5	38	TEN-4	2	2 788
C6	39	TEN-4	3	2 484
C8	38	TEN-4	4	3 667
C13	39	TEN-4	1	3 220
C22	39	DRY		0

DATA SHEET 6

13723
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A L E K S I C H

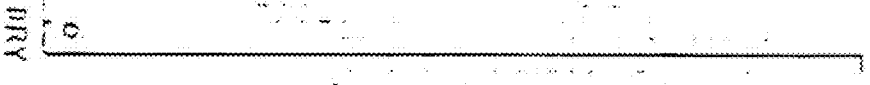
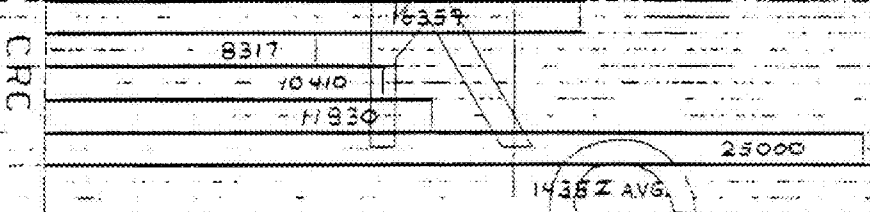
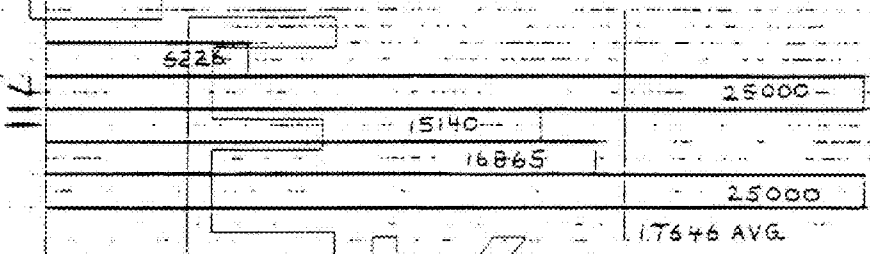
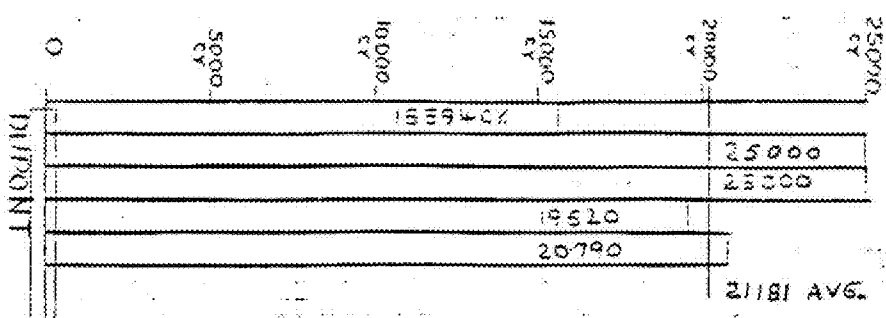
APPENDIX B

(Graphic Presentation)

14/23

AL 0029392

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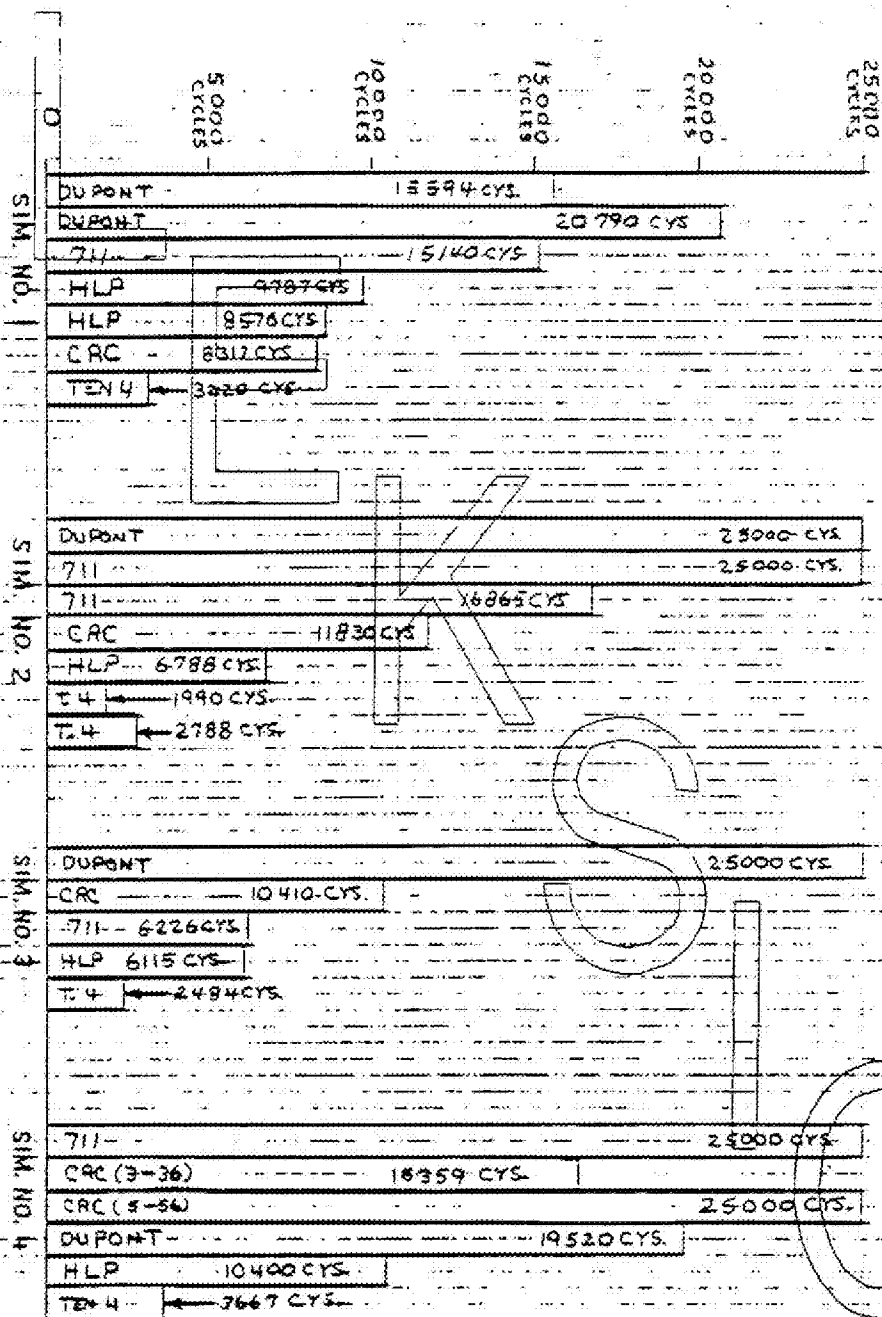
SPRAY LUBRICATION EVALUATION M700 COCK & FIRE SIMULATION

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SPRAY LUBRICATION EVALUATION - M700 (COKKY FINE SIMULATION)

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APPENDIX C

(Previous Evaluation)

17823

AL 0029395

Test # 20

Product: Du Pont - Synthetic Diester - 20%

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Synthetic chemical oily smell, not lasting
2. Feel: Light oily feel
3. Drying Rate: slow drying
4. Penetration: Rapid penetration and spreading, clear color
5. Surface Wetting: Local wetting, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, no dissolving, good cleanup
7. Type Container: 4 oz aerosol, nozzle with straw
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Wet look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Excellent
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 7

Test 2 - 7

Avg - 7.0

17. Reason for Elimination: Continue testing

A

Test # 14

Product: Soravon #711 Penetrant/Lube/Dampisturize

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Very oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Slow spreading, but continuous, clear color
5. Surface Wetting: Minimum spreading, removes oxidation, bright
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Very watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 6

Test 2 - 5

Avg - 5.5

17. Reason for Elimination: Continue testing

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AL 0029397

Test # 15

Product: GRC - 1-36

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Pleasant peppermint smell, lasting
2. Feel: Light Oily Feel
3. Drying Rate: Medium drying rate
4. Penetration: Medium penetrating and spreading, tan color
5. Surface Wetting: Slow spread, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, some dissolving, easy cleanup
7. Type Container: 1 oz aerosol, nozzle
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 4

Test 2 - 5

Avg - 4.5

17. Reason for Elimination: Continue testing

Test # 11

Product: E. F. Soughton - ELP All Purpose

Function: Multipurpose, prevents rust
displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Fly spray smell, not lasting
2. Feel: Oily feel
3. Drying Rate: Rapid drying
4. Penetration: Rapid spreading, med. spreading, can stain
5. Surface Wetting: Slow spreading, rapid dry to oily film, hard to clean
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Waxy, dark tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oil look, no rust within 24 hours
11. Rust Removal: No rust removal
12. Displace Moisture: Poor
13. Displace Solids: Fair
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:
 - Test 1 - 8
 - Test 2 - 3
 - Avg - 6.5
17. Reason for Elimination: Continue testing

Test # 13

Product: Krylon - Tan 4

Function: Multipurpose, prevents rust
Displaces moisture, gums, dirt and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Rapid absorption and spreading, dark tan stain
5. Surface Wetting: Slow spreading, oily appearance, good cleanup
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 11 oz aerosol, nozzle with spray
8. Liquid Appearance: Dark tan, watery
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Damp look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Good
13. Displace Solids: Good
14. Gun Barrel: Good
15. Wood Stuck: Good
16. Rust Prevention:

Test 1 - 8

Test 2 - 5

Avg - 6.5

17. Reason for Elimination: Continue testing

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APPENDIX D
(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test.
(Available upon request.)

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

Peters

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Distribution: C.B. Workman
C.E. Ritchie

RESEARCH TEST and MEASUREMENT REPORT - Report No. 82 0331

Lubricant Evaluation: M700 Cock and Fire Simulation

Prepared by: Fred Supry

Date Prepared: 3-22-82

Proofread and Cleared By:

J.H. Hemmings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

James H. Hemmings 4-14-82
Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Mens. & Mech. Analysis Lab

C. E. Ritchie 4-14-82
Signature Date

PLAINTIFF'S
EXHIBIT

3157

1 of 22

AL 0029379

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TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331
REPORT TITLE: Lubricant Evaluation: M700 Cock and Fire Simulation
MODEL(S): 700
GAUGE OR CALIBER: 30.06
DATE: 3-22-82
WORK ORDER NO.: C-1803-000
PART NAME:
DESIGNER/ENGINEER:

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: Static
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____
NO. OF ROUNDS PER GUN: _____
TOTAL ROUNDS FIRED IN TEST: _____
AMMO TYPE: MAGS _____ TARGET: _____
RIM FIRE _____ CENTER FIRE _____
10. DRY CYCLE - NO. OF SAMPLES TESTED 5 - each lubricant
MAX. NO. OF CYCLES 25000

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms M700 Cock and Fire Simulation

ABSTRACT

C.E. Ritchie requested that the Test Lab conduct a cock and fire evaluation on five spray lubricants.

1. Du Pont - Synthetic Diester
2. Krylon - Tan - 4
3. Sprayon - 711
4. CRC - 3-36
5. Houghton - HLP

These five lubricants were selected for evaluation from the results of a preliminary evaluation conducted by A.B. Hughes, Senior Consultant, ESD Maintenance Engineering Group, Du Pont. A copy of his evaluation for each of the five lubricants is located in Appendix "C".

Engineering Dept.

SCOPE OF TEST

To compare the five lubricants in a Model 700 cock and fire simulation test.

TEST RESULTS

In their order of finish, from the best performing lubricant to the poorest performing lubricant, the following results were obtained.

<u>LUBRICANT</u>	<u>AVERAGE CYCLE LIFE (5 Samples)</u>
1. Du Pont - Synthetic Diester	21,181 cys.
2. Sprayon - 711	17,046 cys.
3. CRC - 3-36	14,382 cys.
4. Houghton - HLP	8,333 cys.
5. Krylon - Ten-4	2,830 cys.

REPORT TEXT

A. Trigger pull, sear lift, sear engagement, safe on, safe off, and bolt lift measurements were taken on each test vehicle at the start of the test, and at 5000 cycle intervals. Remington specifications for the M700 components used are:

- | | |
|---------------------|-------------------|
| • Trigger Pull | 3½ lbs. - 6½ lbs. |
| • Sear Lift | .005" - .018" |
| • Sear Engagement | .015" - .020" |
| • Safe "On" - "Off" | None Established |
| • Bolt Lift | None Established |

Refer to Appendix "A", data sheets No. 1 through No. 5, for individual results.

The Rc hardness was measured, at the cocking cam area, on each M700 bolt. Remington specifications Rc 37-46.

Refer to Appendix "A", data sheet No. 5 for individual hardness, lubricant used, simulator used and cycles completed.

A graphical analysis comparing the lubricants tested to their cycle life, and their cycle life to the simulator used is found in Appendix "B".

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TEST PROCEDURE

A. Measurements

1. Trigger Pull
Trigger Pull measurements were conducted using a Chatillon Model IN-10 pull scale.
2. Sear Lift and Sear Engagement
Sear lift and sear engagement measurements were conducted using a Model FC-14 optical comparator and measuring machine.
3. Safe "ON" and "OFF" Forces.
Safe On and Off forces were taken using a Chatillon Model DPP-25, push-pull scale.
4. Bolt Lift
Bolt lift forces, both cocked and fired, were taken utilizing a Chatillon Model 80D pull scale mounted on a machine designed to be used for bolt lift measurements.
5. Rc Hardness
The Rc hardness measurements were taken by George Catta, a production inspector, utilizing a Wilson Rockwell Hardness Tester.

B. Lubrication - (Pictorial presentation - Appendix "D")

1. Lubrication Points
 - a. Receiver: Locking lug area.
Track on receiver tang.
 - b. Bolt: Cocking cam
Locking lugs
 - c. Firing Pin: Threads
Striker radius and track.
 - d. Trigger Assembly: Sear safety cam face.
Interior of trigger assembly, through sear inspection hole.
2. Lubrication procedure
 - a. Components to be lubricated were completely degreased, using the solvent degreasing tanks located in our Heat Treat Department.
 - b. The interior of the trigger assembly was lubricated by holding the spray can to direct the spray into the sear inspection hole. Duration of spray approximately 1 second.

NOTE: The two position nozzle on Du Pont aerosol can was more difficult to control for pin point application, than the standard plastic tubes on the other samples. (Pictorial example included.)

A L E K S I C H

APPENDIX A

(Data Sheets)

		1	2	3	4	5	6	7
		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT + LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	RELEASE	FIRE
REM - SAFES		3 1/2 - 6 1/2 lbs	.005" - .008"	.015" - .020"	(lbs)	(lbs)	(lbs)	(lbs)
1 - DUPONT		(AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
2 - 711								
3 - CRC								
4 - HLP								
5 - Ten 4								
1	1	6.25	.005	.020	7.5	6.50	3.00	7.00
2	2	6.50	.006	.015	6.75	4.25	2.00	6.50
3	3	5.50	.005	.016	5.25	4.25	3.00	6.00
4	4	6.00	.008	.017	7.00	5.75	3.00	6.50
5	5	6.50	.008	.016	6.75	4.50	4.50	7.50
1	1	6.00	.0055	.020	5.50	4.00	2.50	6.50
2	2	6.00	.0065	.0175	6.00	5.50	2.50	6.50
3	3	6.00	.006	.020	6.00	4.50	2.00	6.00
4	4	5.75	.010	.017	7.50	5.00	3.00	7.25
* 5	5	6.50	.010	.020	7.25	5.50	5.00	9.00
1	1	5.75	.008	.020	5.75	4.0	2.25	7.00
* 2	2	5.75	.008	.018	5.75	3.75	2.50	7.50
3	3	5.25	.008	.022	4.50	3.75	2.0	7.00
4	4	6.25	.0095	.019	7.25	4.75	3.0	13.00
5	5	—	—	—	—	—	—	—
1	1	6.00	.009	.0205	6.00	4.00	2.00	8.50
2	2	—	—	—	—	—	—	—
3	3	5.50	.009	.024	5.00	5.50	2.00	8.50
* 4	4	6.00	.0105	.019	6.50	4.50	3.00	18.00
5	5	—	—	—	—	—	—	—
* 1	1	6.00	.0095	.021	6.00	4.00	2.00	8.00
2	2	—	—	—	—	—	—	—
* 3	3	5.50	.0105	.027	4.50	4.00	2.00	9.00
4	4	—	—	—	—	—	—	—
5	5	—	—	—	—	—	—	—
1	1	—	—	—	—	—	—	—
2	2	—	—	—	—	—	—	—
3	3	—	—	—	—	—	—	—
4	4	—	—	—	—	—	—	—
5	5	—	—	—	—	—	—	—
* 1	1	FAILED	15594	CYCLES				
* 2	2	FAILED	6226	CYCLES				
* 3	3	FAILED	18359	CYCLES				
* 4	4	FAILED	10400	CYCLES				
* 5	5	FAILED	1990	CYCLES				

DATA SHEET 1

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT-LIFT	
		PULL	LIFT	ENGAGEMENT	ON	OFF	CRACKED	FIXED
	REMISARS	3 1/2 - 6 1/2 lbs	.005" - .018"	.015" - .020"	(lbs)	(lbs)	(lbs)	(lbs)
	1	DUPONT (AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
1	2	711						
2	3	188						
3	4	HLP						
4	5	TEN 4						
5	1	6.00	.009	.0185	6.00	4.50	4.00	8.00
6	2	5.00	.006	.018	7.50	4.75	3.00	6.00
7	3	6.00	.012	.012	7.00	4.50	3.00	7.00
8	4	6.75	.0095	.016	7.50	6.75	2.50	7.00
9	5	5.50	.008	.016	7.50	5.50	3.50	7.00
10	1	5.25	.0095	.0215	6.00	4.50	3.50	7.00
11	2	5.00	.0065	.019	5.75	4.00	3.50	6.00
12	3	5.75	.013	.020	5.00	4.00	3.00	8.00
13	4	6.25	.0095	.020	6.75	6.25	2.50	8.00
14	* 5	5.00	.009	.020	5.75	4.00	3.50	13.00
15	1	5.50	.011	.025	5.75	4.25	3.50	7.00
16	2	4.75	.0065	.019	5.25	4.00	2.50	6.50
17	* 3	6.00	.013	.023	6.25	3.75	3.00	15.00
18	* 4	6.00	.0095	.021	6.50	5.75	3.00	25.00
19	5	-	-	-	-	-	-	-
20	1	5.50	.011	.026	5.50	4.25	4.00	7.25
21	2	4.75	.0075	.019	5.00	4.00	3.00	7.00
22	3	-	-	-	-	-	-	-
23	4	-	-	-	-	-	-	-
24	5	-	-	-	-	-	-	-
25	1	5.50	.011	.0265	5.50	4.00	4.00	9.25
26	2	4.75	.009	.019	5.25	4.50	3.00	6.50
27	3	-	-	-	-	-	-	-
28	4	-	-	-	-	-	-	-
29	5	-	-	-	-	-	-	-
30	* 1	5.25	.011	.0285	5.50	3.75	4.00	14.00
31	* 2	4.50	.0095	.021	5.25	4.00	2.50	7.00
32	3	-	-	-	-	-	-	-
33	4	-	-	-	-	-	-	-
34	5	-	-	-	-	-	-	-
35	* 1	COMPLETED	25,000	cycles				
36	* 2	COMPLETED	25,000	cycles				
37	* 3	FAILED	8317	cycles				
38	* 4	FAILED	6115	cycles				
39	* 5	FAILED	2788	cycles				

DATA SHEET 2

M700 COCK & FIRE SIMULATION

F.L.S.

LUBRICANT EVALUATION

3-8-82

THIRD SAMPLE OF EACH LUBRICANT

		1	2	3	4	5	6
		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT - LIFT
		PULL	LIFT	ENGAGEMENT	ON	OFF	SOCKET
		24-64 lbs	0.05"-0.18"	0.15"-0.20"	(lbs)	(lbs)	(lbs)
		(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
1	1	5.75	.007	.015	7.25	4.50	2.50
2	2	6.00	.008	.015	7.50	7.50	2.50
3	3	6.25	.008	.017	6.75	5.50	3.00
4	4	5.75	.0125	.0195	8.00	5.50	3.00
5	5	5.50	.008	.015	8.00	5.00	2.50
6	1	6.25	.009	.019	6.50	4.25	2.00
7	2	5.25	.009	.021	5.25	7.50	3.50
8	3	6.25	.0105	.0175	7.25	4.00	3.00
9	4	5.75	.0125	.021	7.00	5.00	3.00
10	*5	5.50	.013	.021	6.00	3.75	2.50
11	1	6.00	.010	.020	6.00	3.75	2.00
12	2	5.25	.009	.021	7.00	6.00	3.50
13	3	6.00	.015	.0195	6.75	4.75	3.00
14	*4	5.75	.0135	.0235	6.50	4.50	3.50
15	5	—	—	—	—	—	—
16	1	5.25	.0115	.020	5.75	4.00	2.00
17	*2	5.50	.0095	.022	6.50	5.50	4.00
18	*3	6.50	.015	.0195	6.75	4.00	3.00
19	4	—	—	—	—	—	—
20	5	—	—	—	—	—	—
21	1	5.75	.0115	.020	6.00	4.00	2.00
22	2	—	—	—	—	—	—
23	3	—	—	—	—	—	—
24	4	—	—	—	—	—	—
25	5	—	—	—	—	—	—
26	1	5.75	.0115	.020	6.00	4.00	2.00
27	2	—	—	—	—	—	—
28	3	—	—	—	—	—	—
29	4	—	—	—	—	—	—
30	5	—	—	—	—	—	—
31	*1	6.00	.0115	.021	6.25	3.75	2.00
32	2	—	—	—	—	—	—
33	3	—	—	—	—	—	—
34	4	—	—	—	—	—	—
35	5	—	—	—	—	—	—
36	*1	COMPLETED	25,000	cycles			
37	*2	FAILED	15,140	cycles			
38	*3	FAILED	10,410	cycles			
39	*4	FAILED	6,788	cycles			
40	*5	FAILED	2,484	cycles			

DATA SHEET 3

		TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT -	LIFT
		PULL	WFT	ENGAGEMENT	ON	OFF	LOCKED	FIRED
		14-6 1/2 lbs	.005"-.018"	.005"-.020"	(lbs)	(lbs)	(lbs)	(lbs)
1	1	2x Point (AVG. OF 3)			(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)	(AVG. OF 3)
2	2	711						
3	3	CRP						
4	4	HLP						
5	5	TEN 4						
6	1	6.50	.0095	.019	6.75	4.25	4.00	8.00
7	2	6.50	.008	.019	8.50	5.25	3.50	7.00
8	3	5.50	.008	.016	7.25	4.75	3.00	9.00
9	4	5.75	.009	.019	8.25	5.50	4.00	7.50
10	5	5.50	.005	.017	9.00	6.75	3.00	7.50
11	1	6.25	.010	.023	6.25	3.25	3.00	8.00
12	2	6.00	.011	.020	7.50	4.25	3.50	7.00
13	3	5.50	.0085	.021	7.00	4.50	3.00	8.00
14	4	6.00	.010	.019	7.25	5.00	4.00	10.00
15	* 5	5.75	.010	.0185	7.00	4.75	3.00	16.00
16	1	5.75	.010	.023	5.75	3.50	4.00	8.00
17	2	6.00	.012	.022	7.00	4.00	3.00	8.00
18	3	5.50	.0085	.021	6.50	4.25	3.00	8.00
19	* 4	6.00	.010	.021	7.00	5.25	4.00	29.00
20	5	—	—	—	—	—	—	—
21	1	6.25	.0105	.024	5.25	3.00	3.50	9.00
22	2	6.25	.013	.0225	7.50	4.00	3.50	9.00
23	* 3	5.50	.0105	.0215	6.75	4.50	3.25	22.00
24	4	—	—	—	—	—	—	—
25	5	—	—	—	—	—	—	—
26	* 1	5.75	.0115	.026	5.75	3.00	3.00	24.00
27	* 2	5.75	.0125	.024	6.50	4.00	4.00	24.00
28	3	—	—	—	—	—	—	—
29	4	—	—	—	—	—	—	—
30	5	—	—	—	—	—	—	—
31	1	—	—	—	—	—	—	—
32	2	—	—	—	—	—	—	—
33	3	—	—	—	—	—	—	—
34	4	—	—	—	—	—	—	—
35	5	—	—	—	—	—	—	—
36	* 1	FAILED	19520 cycles					
37	* 2	FAILED	16865 cycles					
38	* 3	FAILED	11830 cycles					
39	* 4	FAILED	8576 cycles					
40	* 5	FAILED	3667 cycles					

DATA SHEET 4

			1	2	3	4	5	6
			TRIGGER	SEAR	SEAR	SAFE	SAFE	BOLT + LIFT
			PULL	LIFT	ENGAGEMENT	ON	OFF	COCKED
			3 1/2 - 6 1/2 lbs	.005" - .008"	.015" - .020"	(lbs)	(lbs)	(lbs)
			(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)
1	1	DISCONT						
2	2	711						
3	3	GRE						
4	4	W.P.						
5	5	TEX 4						
6	1		6.00	.0095	.0117	7.00	4.75	2.00
7	2		5.75	.0085	.0155	6.75	5.00	3.50
8	3		5.75	.0105	.0215	6.50	5.00	3.00
9	4		6.25	.012	.016	7.00	4.50	3.00
10	5		6.25	.008	.018	7.25	5.50	3.00
11	1	5000	5.50	.0101	.0205	7.50	4.50	2.50
12	2		6.00	.0085	.016	5.75	4.00	4.00
13	3		5.75	.0105	.0215	5.50	4.25	3.00
14	4		6.25	.013	.019	6.50	4.25	4.00
15	*5		6.25	.010	.020	5.75	4.00	3.50
16	1	10000	5.25	.010	.021	7.50	4.00	3.00
17	2		5.50	.010	.018	8.75	3.75	4.00
18	3		5.75	.0105	.0215	5.50	4.25	3.00
19	*4		6.25	.0135	.025	7.25	3.75	4.00
20	5		—	—	—	—	—	—
21	1	15000	5.50	.0105	.021	6.50	4.00	3.00
22	2		5.75	.010	.018	5.75	4.00	3.50
23	3		6.00	.0105	.0215	5.50	4.50	3.00
24	4		—	—	—	—	—	—
25	5		—	—	—	—	—	—
26	1	20000	5.50	.0105	.021	7.00	3.75	3.50
27	2		6.25	.010	.019	5.50	4.00	3.50
28	3		5.75	.0105	.022	5.50	4.25	3.00
29	4		—	—	—	—	—	—
30	5		—	—	—	—	—	—
31	*1	25000	5.00	.0111	.022	7.00	4.00	3.00
32	*2		5.75	.011	.020	5.75	3.75	4.00
33	*3		6.25	.011	.023	5.25	4.00	4.00
34	4		—	—	—	—	—	—
35	5		—	—	—	—	—	—
36	*1		FAILED	20790	cycles			
37	*2		COMPLETED	25000	cycles			
38	*3		COMPLETED	25000	cycles			
39	*4		FAILED	9787	cycles			
40	*5		FAILED	3220	cycles			

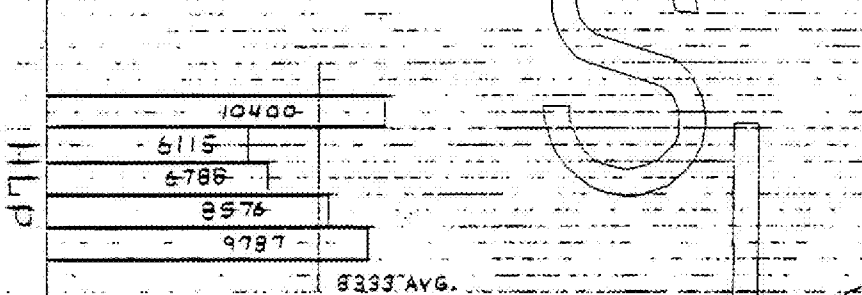
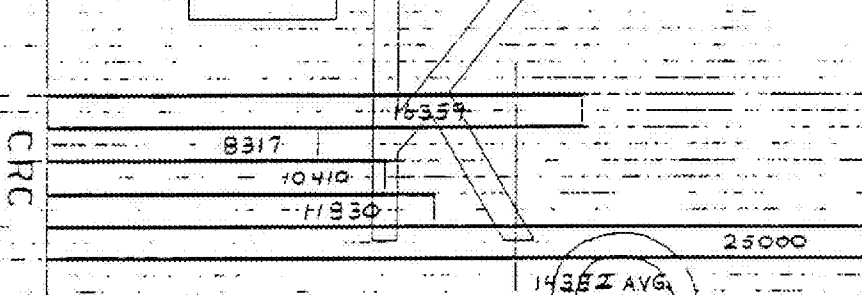
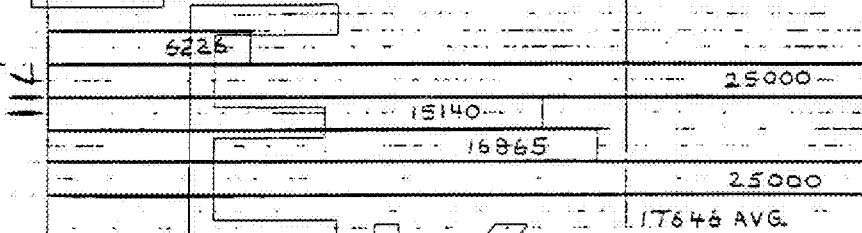
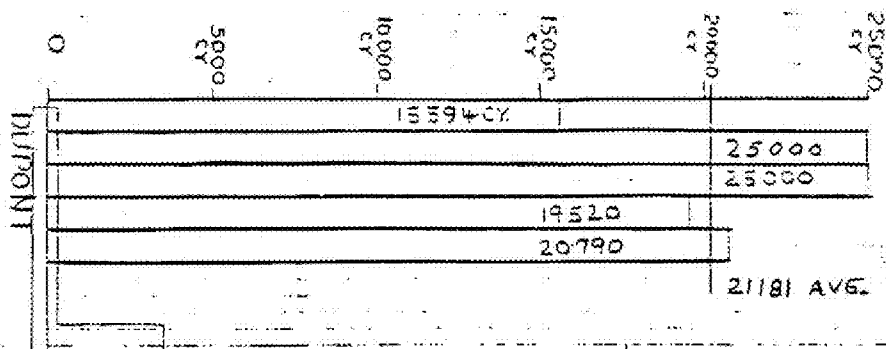
DATA SHEET 5

11 of 22
AL 0029390

ALEXISCH

APPENDIX B
(Graphic Presentation)

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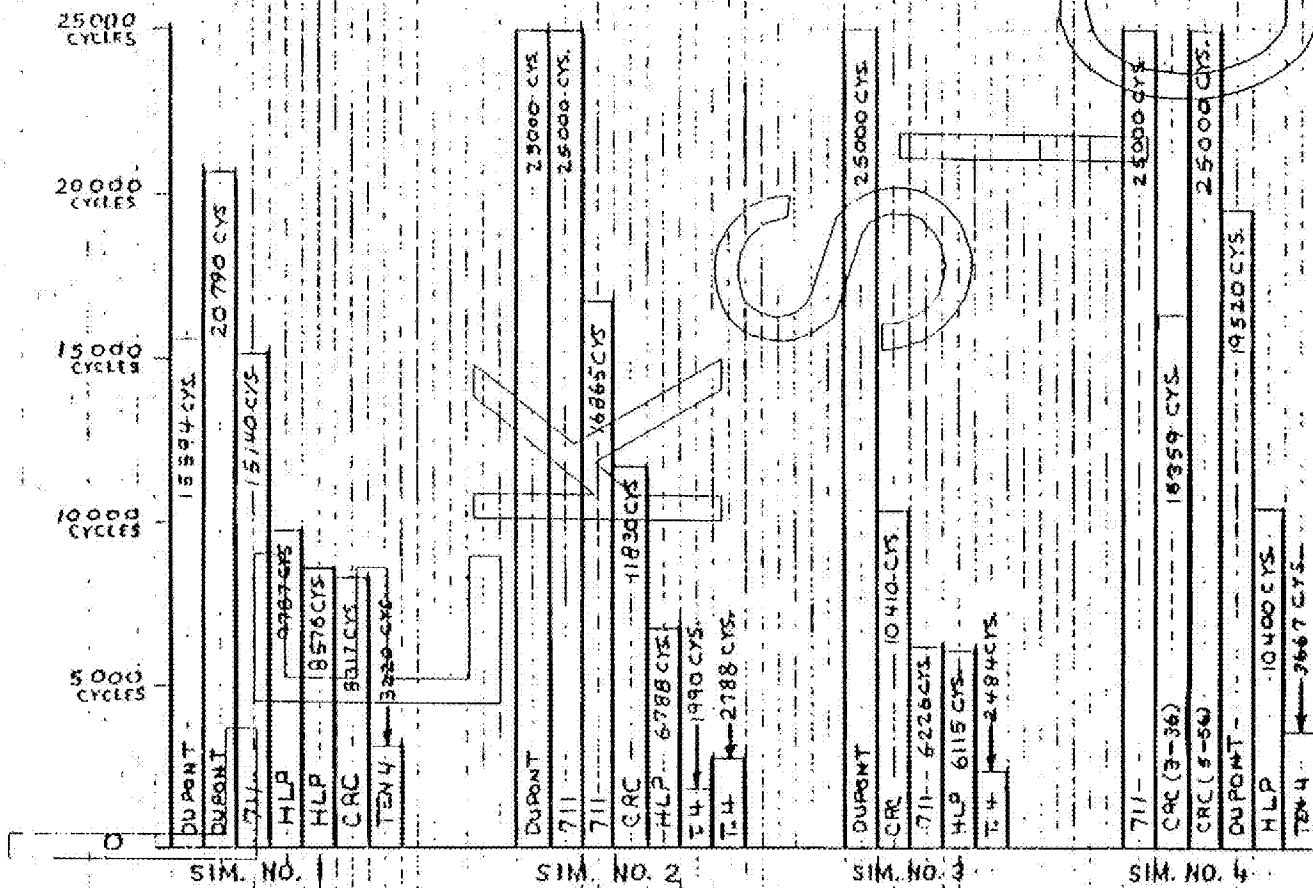


6-2-82

SPRAY Lubrication EVALUATION: M700 COCK & RIDE SIMULATION

A

SPRAY LUBRICATION EVALUATION - M700 COCK FIRE SIMULATION



5-1-84

15822
AL 0029394

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APPENDIX C

(Previous Evaluation)

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16 of 22

AL 0029395

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Test # 20

Product: Du Pont - Synthetic Diaster - 20%

Function: Multipurpose, prevents rust
Displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Synthetic chemical oily smell, not lasting
2. Feel: Light oily feel
3. Drying Rate: ~~slow drying~~
4. Penetration: Rapid penetration and spreading, clear color
5. Surface Wetting: Local wetting, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, no dissolving, good cleanup
7. Type Container: 4 oz aerosol, nozzle with straw
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Wet look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Excellent
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 7

Test 2 - 7

Avg - 7.0

17. Reason for Elimination: Continue testing

17 of 22

AL 0029396

Test # 14

Product: Surgavon #711 Penetrant/Lube/Demoisturize

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Very oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Slow spreading, but continuous, clear color
5. Surface Wetting: Minimum spreading, removes oxidation, bright
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Very watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:

Test 1 - 6

Test 2 - 3

Avg - 5.5

17. Reason for Elimination: Continue testing

18 of 22

AL 0029397

A

Test # 15

Product: GPC - 3-36

Function: Multipurpose, prevents rust
Displaces moisture and lubricates

Evaluation Notes

1. Odor: Pleasant peppermint smell, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Medium penetrating and spreading, tan color
5. Surface Wetting: Slow spread, removes oxidation, good cleanup
6. Grease Displacement: Rapid spreading, some dissolving, easy cleanup
7. Type Container: 1 oz aerosol, nozzle
8. Liquid Appearance: Watery, light tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oily look, no rust within 24 hours
11. Rust Removal: Some rust removed
12. Displace Moisture: Excellent
13. Displace Solids: Good
14. Gun Barrel: Excellent
15. Wood Stock: Excellent
16. Rust Prevention:
 - Test 1 - 4
 - Test 2 - 5
 - Avg - 4.5
17. Reason for Elimination: Continue testing

19 of 22

AL 0029398

Test # 11

Product: E. F. Houghton - ELP All Purpose

Function: Multipurpose, prevents rust
displaces moisture, dirt and lubricates

Evaluation Notes

1. Odor: Fly spray smell, not lasting
2. Feel: Oily feel
3. Drying Rate: Rapid drying
4. Penetration: Rapid spreading, med. spreading, can stain
5. Surface Wetting: Slow spreading, rapid dry to oily film, hard to clean
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 12 oz aerosol, nozzle with straw
8. Liquid Appearance: Waxy, dark tan
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Oil look, no rust within 24 hours
11. Rust Removal: No rust removal
12. Displace Moisture: Poor
13. Displace Solids: Fair
14. Gun Barrel: Good
15. Wood Stuck: Good
16. Rust Prevention:
 - Test 1 - 3
 - Test 2 - 3
 - Avg - 6.5
17. Reason for Elimination: Continue testing

Test # 13

Product: Krylon - Tan 4

Function: Multipurpose, prevents rust
Displaces moisture, gums, dirt and lubricates

Evaluation Notes

1. Odor: Strong fly spray, lasting
2. Feel: Light oily feel
3. Drying Rate: Medium drying rate
4. Penetration: Rapid absorption and spreading, dark tan stain
5. Surface Wetting: Slow spreading, oily appearance, good cleanup
6. Grease Displacement: Rapid spread, no dissolving, good cleanup
7. Type Container: 11 oz aerosol, nozzle with spray
8. Liquid Appearance: Dark tan, watery
9. Wood-Open Pore: Damp look, no damage
10. Metal Surface: Damp look, no rust within 24 hours
11. Rust Removal: Most rust removed
12. Displace Moisture: Good
13. Displace Solids: Good
14. Gun Barrel: Good
15. Wood Stock: Good
16. Rust Prevention:
 - Test 1 - 8
 - Test 2 - 5
 - Avg - 6.5
17. Reason for Elimination: Continue testing

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APPENDIX D
(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test.
(Available upon request.)

22 of 22

AL 0029401

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
DU PONT

PETERS
DU PONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

XC: L. R. Blackhurst	R. L. Joy
L. B. Bosquet	H. C. Munson
H. K. Boyle	C. O. Pardee
J. W. Brooks	D. I. Roark
J. J. Burns	D. J. Sanita
G. D. Campbell	J. R. Snedeker
J. H. Carter	W. C. VanSickle
W. W. Cook	W. A. Warren
G. E. Fletcher	E. G. Wilke
W. L. Ganey	<u>C. B. Workman</u>
M. C. Hardy	

March 5, 1982

J. P. LINDE

M/700 BOLT LOCK CHANGE
BOLT WILL OPEN WITH SAFE ON

Production change over has started as of February 26, 1982.
Guns are being marked as follows:

- All guns stamped with Final Inspection code AC or later.
- Approximate Serial Number changeover of guns was:
 - In Final Assembly - B6349XXX
 - Custom Shop - B630XXXX

by G. J. Hill 3/5/82
G. J. Hill, Supervisor
Process Engineering
Current Products

GJH/cac

PLAINTIFF'S
EXHIBIT

3158

121
AL 0034404

20th April 1982

Dear Clark,

Many thanks for the bits for the Remington Mohawk 600. Now I can go ahead with my plans to make up an ultra-light deer rifle for mountain hunting. I have been worrying over whether or not to turn the barrel down to a slimmer contour as I am afraid that it will lose some of its fine accuracy. As it is, it is the most consistently accurate sporter on my rack. But I want the lightest outfit I can get. Chet Brown sent me one of his fibreglass stocks for it and I already had one of his handy bolt release catches (this is one that Remington should adopt if they release a new Model 600).

I am going to have to do something about the trigger too. While I was deer hunting last week I went to load the magazine and chamber a round. When I did chamber a round the bloody rifle discharged and blew a hole through the wall of my tent! Luckily, I had my gunsmith friend along and a tool kit. He pulled it apart and re-adjusted it so that it now seems to work all right again. But this is the fourth time that it has screwed up.

When I get this darn rifle completed and write a story about it I will send you a copy. My friend is making up a similar outfit on the Ruger #77 .308. What we want is a light rifle to carry on back packing trips where every ounce counts.

I think Remington could well bring out a similar rifle in .308 and .7mm/08 on a Mohawk 600 action.

By the way, is Remington still making the Mohawk 600 action? Hope to get over to the States again this year and if I see you we will have a couple of small bears and a chat.

I am trying to get a hundred things done so that I can get up to the NT and hunt buffalo along the Roper River next month. I have a friend coming out from Germany. He works for Dynamit Nobel.

Kindest Regards,

(Nick Harvey) Gun Editor
Sporting Shooter Magazine

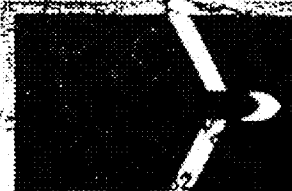
PLAINTIFF'S
EXHIBIT

3159

AL 0029409

A

BY AIR MAIL PAR AVION
AEROGRAMME



AUSTRALIA 23c
NSW-AUST

TO MR Clark Workman,
2 Johnson Ave,
Mohawk,
New York 13407,
COUNTRY OF DESTINATION U.S.A

SENDER'S NAME AND ADDRESS

Nick Harvey,
Sporting Shooter Magazine,
Hill End, Via Mudgee,
N.S.W 2850 Australia.
Postcode

FOLD SIDE FLAPS FIRST

FOLD SIDE FLAPS FIRST

Fold flaps before moistening gum, for maximum adhesion, press down for a few seconds. If anything is enclosed or new letter material, use this form.

C

H

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

August 19, 1981

c: T.L.Capeletti
J.R.Snedeker
J.P.Linde
J.W.Bower
C.E.Ritchie
K.R.Thondukulam

TO: C. B. WORKMAN

FROM: J. W. BROOKS

SUBJECT: MODEL 700 - Cleaning & Lubrication

Mr. Allan Hughes from the Du Pont Lubrication Lab will be here Wednesday, August 26th, at 9:00 AM to give us the information he has come up with during his investigation of a cleaner and lubricant for the Model 700 Fire Control.

If there are other people you feel would benefit from this discussion and presentation, please feel free to have them attend.

Place: Research Conference Room - 52-4

JWB:T

PLAINTIFF'S
EXHIBIT

3160

AL 0029472

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

copy to

xc: J. P. Glas
J. E. Preiser
J. S. Martin
P. E. Martin

@ workman

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
April 28, 1981

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI
SUBJECT: MODEL 700 FEATURES FOR POSSIBLE USE IN ADVERTISING

*file - This
basis list can be used to
develop an advertising
campaign in conjunction with
our competitive evaluation now
in progress*
Clark

In response to Marketing's inquiry concerning strengths of the M/700 design which may be used in advertising campaigns, I asked Fred Martin to itemize areas he felt were significant. Fred provided me with the following information:

- | | | |
|--------------|---|--|
| * Strength | - | Action - Ability to withstand abuse of inexperienced handloaders. |
| | | Extractor - Comparison of competitive systems. |
| * Accuracy | - | Still the most accurate production center fire rifle made. Accurate enough to be used competitively "out of the box". |
| Fire Control | - | Adjustable and smooth still the best production trigger available - with planned modifications, will have another safety feature to advertise. |
| Calibers | - | A caliber and a loading available for anything from ground squirrels to Kodiak and Brown bear or elephant and rhino. |
| Adaptable | - | Several variations are available for military and police work. Gun/cartridge combination can be tailored to individual application. |

As indicated by the *, Fred feels that strength of the action and extraction systems and accuracy are prime selling points for these rifles.

TLC:ws
Firearms Research Division

PLAINTIFF'S
EXHIBIT

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AL 0029490

A

REMINGTON MODEL 700
FIELD SERVICE
GUNSMITH BULLETIN

INSTRUCTIONS FOR REMINGTON RECOMMENDED GUNSMITHS FOR REPLACEMENT OF
MODEL 700 TRIGGER ASSEMBLIES AND SELECTED TRIGGER ASSEMBLY PARTS

WARNING: TRIGGER ASSEMBLY PARTS NOT LISTED ARE NOT INTERCHANGEABLE.
REPLACE COMPLETE TRIGGER ASSEMBLY

BOLT STOP PIN
BOLT STOP
BOLT STOP SPRING

To Disassemble - Remove the bolt assembly, trigger guard or trigger guard assembly, magazine, magazine follower, spring and stock. Put the safety switch in "S" position. Tap out the bolt stop pin from left to right and remove the bolt stop and bolt stop spring.

To Reassemble - Place bolt stop spring into the recess in the bottom left side of the receiver with the long end of the spring facing forward and the bent end facing outward. The short, bent end of the spring sets in the receiver at the back of the trigger assembly. Place the Bolt stop in slot with the contoured edge facing into the receiver and hole to the rear. Align the bolt stop, bolt stop spring and the trigger assembly holes with the bolt stop pin hole in the receiver. Insert the chamfered end of the bolt stop pin through bolt stop and bolt stop spring and tap pin into the receiver. Restake the bolt stop pin on the right side of the receiver.

CAUTION: After assembling the bolt stop - push bolt stop release upward, bolt stop must pivot freely. Push the safety switch to "F" position, pull the trigger and hold. Depress top rear of sear safety cam to insure that the cam pivots freely and retracts without hesitation.

Reassemble the magazine, magazine spring, follower, stock assembly, trigger guard and bolt assembly to the action. SEE SAFETY PERFORMANCE CHECK (PAGE 3).

SEAR PIN

To Disassemble - Remove the bolt assembly, trigger guard or trigger guard assembly, stock assembly, magazine, magazine follower, and spring. Put the safety switch in the "S" position. Tap out the bolt stop pin from left to right and remove the bolt stop and bolt stop spring. Tap out the sear pin from left to right.

To Reassemble - Align the sear safety cam and trigger assembly holes and tap in the sear pin from left to right (chamfered end first).

NOTE: Sear pin must not protrude into the bolt stop pin.

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PLAINTIFF'S
EXHIBIT

3162

Remington Arms Company, Inc.

183

Reassemble the bolt stop spring, bolt stop and bolt stop pin. Restake both pins on the right side of the receiver.

CAUTION: After reassembling, push bolt stop release upward; bolt stop must pivot freely.

Put the safety switch in the "F" position, pull the trigger and hold. Depress top rear of sear safety cam to insure that the safety cam pivots freely and retracts without hesitation.

Reassemble the magazine, magazine follower, spring, stock assembly, trigger guard and the bolt assembly to the action. SEE SAFETY PERFORMANCE CHECK (PAGE 3).

TRIGGER ASSEMBLY COMPLETE

To Disassemble - Remove the bolt assembly, trigger guard or trigger guard assembly, magazine, magazine follower and spring. Put the safety switch in the "S" position. Tap out the bolt stop pin from left to right and remove the bolt stop and bolt stop spring. Tap out the sear pin from left to right and remove the trigger assembly.

To Reassemble - Insert trigger assembly (with sear pin intact) into receiver. Align holes and tap in sear pin from left to right (chamfered end first).

NOTE: Sear pin must not protrude into the bolt stop slot.

Reassemble the bolt stop spring, bolt stop and bolt stop pin. Restake both pins on the right side of the receiver.

CAUTION: After reassembling, push the bolt stop release upward; bolt stop must pivot freely.

Put the safety switch in the "F" position, pull the trigger and hold. Depress top rear of sear safety cam to insure that the sear safety cam pivots freely and retracts without hesitation. Push safety switch from "F" to "S" position several times to insure free movement with no binding and positive engagement of safety switch detents.

Reassemble the magazine, magazine follower, spring stock assembly, trigger guard and bolt assembly to the action.

SEE SAFETY PERFORMANCE CHECK (PAGE 3)

SAFETY SWITCH SNAP WASHER
SAFETY SWITCH DETENT SPRING
SAFETY SWITCH DETENT BALL
SAFETY SWITCH PIVOT PIN
BOLT STOP RELEASE

To Disassemble - Remove the bolt assembly, trigger guard, stock assembly, magazine, magazine spring and follower. Remove the safety switch snap washer, safety switch detent spring and safety switch detent ball. Push safety switch pivot pin from right to left and remove the safety switch and bolt stop release.

AL 0029504

To Reassemble: Put the safety switch in the "S" position. Place the bolt stop release over the trigger pin on the left side of trigger assembly. Align holes in the bolt stop release, safety switch and trigger assembly. Push the safety switch pivot pin through the assembly from left to right. Set the safety switch detent ball into position in the safety switch. Place the safety switch detent spring over the safety switch. Make sure safety switch detent ball stays in position under the safety switch detent spring. Push the safety switch snap washer into position on the safety switch pivot pin on the right side of the trigger assembly.

CAUTION: After reassembly, push bolt stop release upward; bolt stop must pivot freely.

Put the safety switch in the "F" position, pull the trigger and hold. Depress top rear of sear safety cam to insure that the safety cam pivots freely and retracts without hesitation. Push the safety switch from "F" to "S" position several times to insure free movement with no binding and with positive engagement of safety switch detents.

Reassemble the magazine, magazine follower, spring stock assembly, trigger guard and bolt assembly into the action.

SAFETY PERFORMANCE CHECK

WARNING: CORRECT ALL MALFUNCTIONS 100% OR RETURN RIFLE TO FACTORY.

After reassembly, the following check for proper function of the safety must be made.

Close the bolt. Put the safety switch into the "S" position. Lift the bolt handle (bolt handle should not raise). Pull the trigger (firing pin should not fall). Action of the trigger pull must be smooth (no bind, drag, click or catch). Release the trigger (trigger must return to former position). Put the safety switch into the "F" position (firing pin must not fall). Pull the trigger (firing pin must fall). Repeat this test at least three (3) times. The safety switch must function in both of the two (2) positive positions, ON SAFE and FIRE. If the positions are not positive, check parts. Inspect the safety switch detent holes, safety switch snap washer, safety switch detent spring, safety switch detent ball and safety switch pivot pin for possible causes. Replace any worn or damaged parts.

CAUTION: IF STOP POSITIONS ARE NOT POSITIVE, REPLACE COMPLETE TRIGGER ASSEMBLY.

NOTE: Lubrication must not be used as a remedy for trigger assembly problems. The cause must be positively located and corrected.

After reassembling the stock assembly, check for clearance between the following parts: safety switch - stock; trigger - trigger guard; trigger - stock assembly.

Check for "Follow Down" (firing pin moves to uncocked position as bolt is closed). Put the safety switch into the "F" position. Close the bolt slowly. Firing pin must remain cocked (dry fire to check). If "Follow Down" occurs check for trigger being held back by interference between trigger and stock, trigger and trigger guard, or by the sear safety cam binding. Cause of "Follow Down" must be determined or the rifle should be returned to the factory.

WARNING: CORRECT ALL MALFUNCTIONS 100% OR RETURN RIFLE TO FACTORY.

AL 0029505

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RLS:im

Remington Arms Company, Inc.

383

RULES FOR RECORDING EXPERIMENTS

1. Original records are to be in ink.
2. Each notebook page whereon there is recorded a completed experiment should be signed and dated by the experimenter in the space provided.
3. Each notebook page containing a completed experiment should be read and signed by a witness who will place his signature and the date in the space provided. The witness is to be one who understands the purpose of the experiment and the result obtained but who is not likely to be the inventor or a co-inventor. The witness should sign on the same day as the experimenter, or, if this is impossible, as soon thereafter as feasible.
4. Where entries on a single experiment do not completely fill a page, the remainder of the blank page should be ruled out. Where the record of the experiment extends over several pages which are not consecutive, proper cross-references should be inserted.
5. The bound notebook is to be preserved intact. In no case should any page or part of a page be removed.
6. No erasures are to occur in the record. Any corrections or changes should be made by cancellation, leaving the original entry legible.
7. The same rules as to signing, dating and witnessing are to be followed when the original data are recorded on loose sheets or forms other than the standard bound notebook.

PLAINTIFF'S
EXHIBIT

3163

181
AL 0029556

SUBJECT FOR INDEXING THIS BOOK
MUST BE GIVEN BELOW

A M-700 Fire Control Design Page 1 -

M-700 Bolt Lock Page 3 - 6

M-700 - M-7 Scope Mounts Page 20

M-700 Rear Sight - Page 10

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PLAINTIFF'S
EXHIBIT

3164

1234
AL 0029557

DATE

SUBJECT OF EXPT.

14 JAN 1980

M-200 FIRE CONTROL DESIGN

1

As of this date the first model of the "new style" M-200 fire control has been assembled. The design requirements of this fire control to incorporate the following -
a trigger block & sear block,
a bolt lock & have an interceptor,
^{EXTERNAL} be adjustable & operate in both
the fired and unfired condition -

have not all been met. Possibly in subsequent models.

This Model has a separate bolt lock and does not block the trigger in the on safe position.

The sear can be blocked in both positions by putting the safety on.

This is done by a finger of the safety engaging one of two notches in the side of the sear (See Next Page).

EXPERIMENTER

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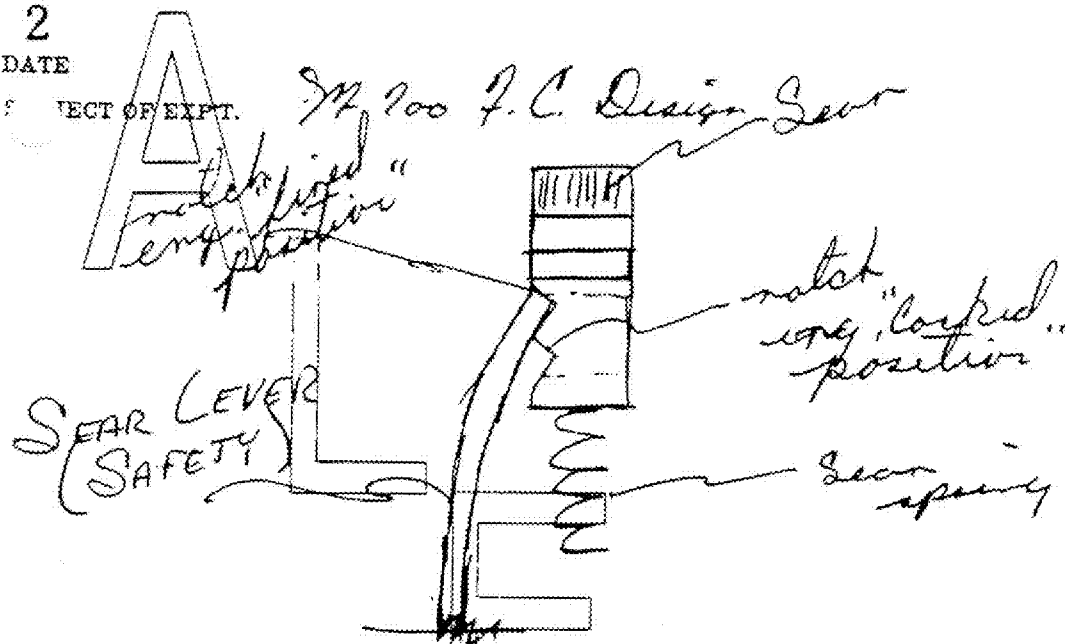
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SUBJECT OF EXPT.

M 700 F.C. Design Gear



The sketch shows the gear in the fired condition and the safety lever engaged on the bolt is operated down rearward the sear spring forces the sear upward the safety lever springs outward and then returns to the lower notch. With this done the sear has been effectively blocked in two conditions.

EXPERIMENTER
WITNESS

F.E. Martin

Jack East

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4-8-80

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4-9-80

3

SUBJECT OF REPT.

M-700 Bolt Lock

A method of allowing the shooter to open the bolt of his rifle while in a safe condition has been developed. The mechanism consists of a bolt plug, a lever, a plunger and plunger spring. The bolt body is altered to allow the lever to lock into it. The lever is actuated by the firing pin head.

- #1 - As the bolt is closed the spring loaded lever is urged into locked position and engages a notch cut in the rear of the bolt body.
- #2 - To open this weapon the lever is pushed down with the thumb and the bolt handle shifted with the index finger.
- #3 - If the rifle is fired the firing pin head comes the lever upward automatically unlocks the gun.
- #4 - As the bolt is open and then closed the firing pin head is retracted and the lever allowed to re lock bolt.

The three photos shown on the next page will show the operation of the bolt lock and its location relative to the safety lever.

Photo #1 - The bolt is closed with the safety in the "On - Safe" position and the bolt is locked.

EXPERIMENTER

WITNESS

Frederic E. Martini
Jack Kast

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SUBJECT OF EXPT. M-700 Bolt Lock

PHOTO #1

FIRING PIN
HEAD

SAFETY
LEVER

BOLT LOCK

LOCKING
NOTCH

BOLT HANDLE

PHOTO #2

The gun is in the same condition as in the previous photo, safety lever in "On-Safe" position, the bolt lock lever has been depressed with the thumb and the bolt handle raised to illustrate the method of opening.

AL 0029561

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Fred E. Martin
Jack Kest

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5

SUBJECT OF EXPT.

M-200 Bolt Lock

PHOTO #2

FIRING PIN
HEAD

BOLT
LOCK

BOLT
HANDLE
RAISED

SAFETY LEVER

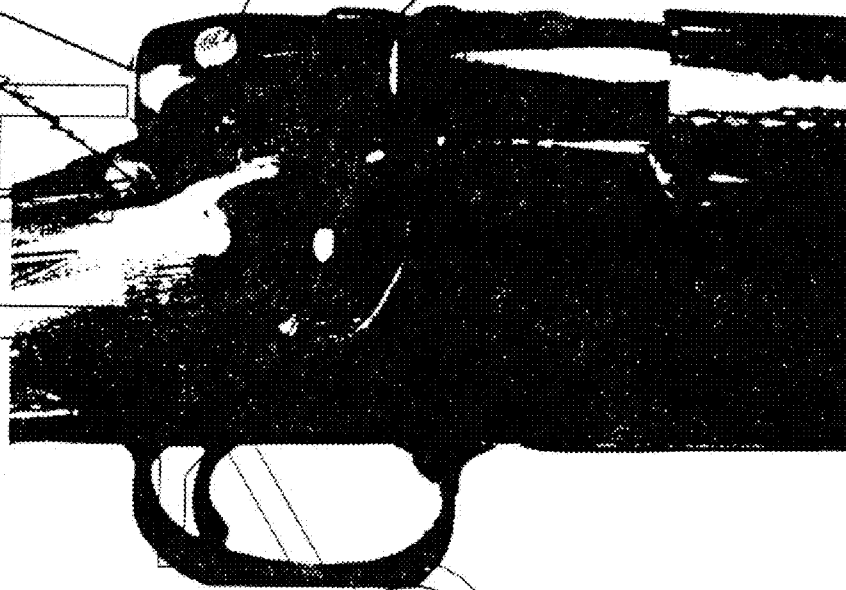
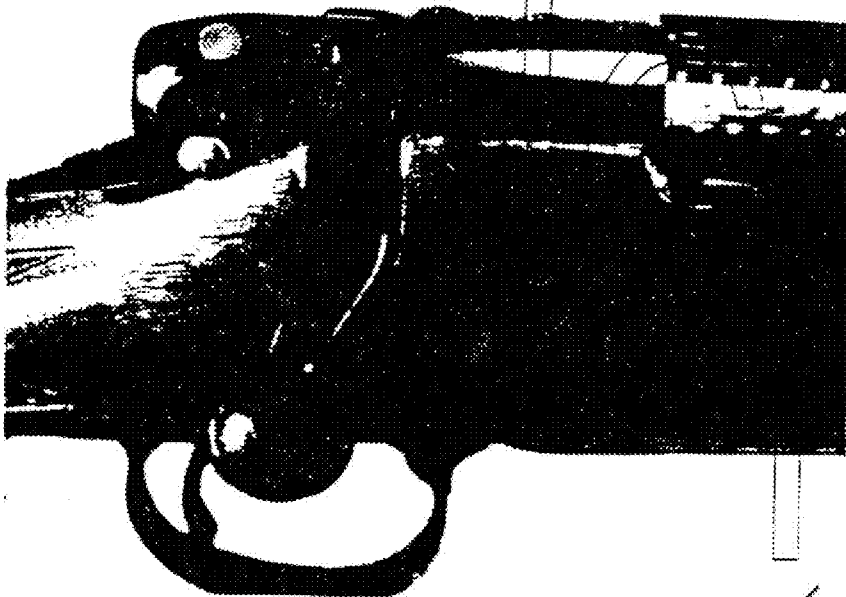


PHOTO #3



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4-9-80

M-700 Bolt Lock

Photo #3

This photo shows the gun in the
fired condition, firing pin down
bolt unlocked bolt ready to be
opened.

Work on the development and production of
this subject continues both to improve
operation and appearance. Work is being
done to also reduce cost.

K

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EXPERIMENTER

WITNESS

Pred E. Marti
Jack East

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SUBJECT OF EXPT.

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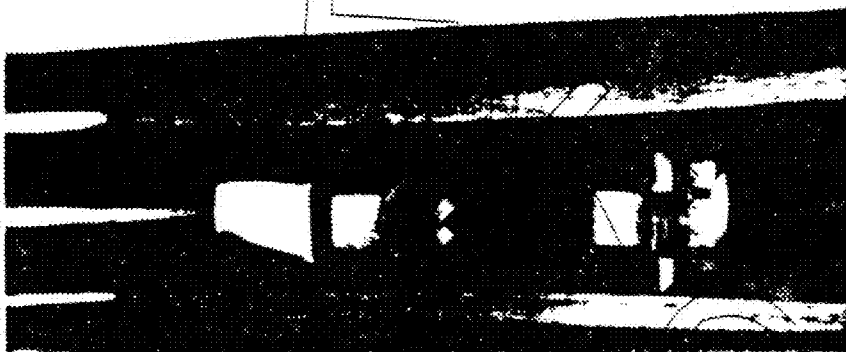
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AL 0029578

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SUBJECT OF EXPT.

March 18, '81

Scope Mounts

Have been asked by J. S. Martin to look at designing scope mount for M-1 & M-108 Bolt Action Rifles - Mount to be "UNIQUE" to Remington Rifle - May be of "Innovative" Concept - Cheap - Pleasant in appearance - Will look at previous attempts and evaluate. Buthe did some for Finkel - Soze did some for Walker - (way back) - First layout has been done and signed by S. A. Fomelle and A. R. Eddy picture of mount in below.

See Top of Next Page
For Photo

EXPERIMENTER

WITNESS

J. S. Martin
A. R. Eddy

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3-18-81

8/16/82

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AL 0029579

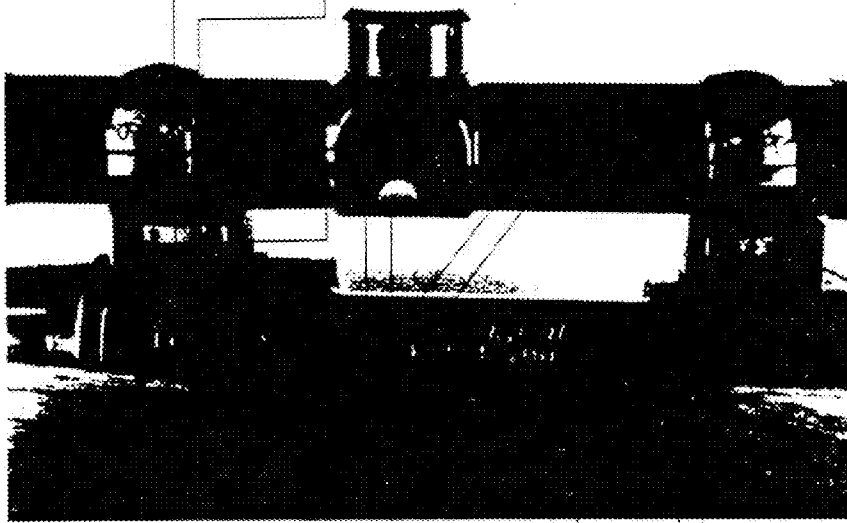
DATE

March 18, 81

SUBJECT OF EXPT.

Scope Mount

Prote type #1 used a dovetail cut in occasion
to receive a mating cut in the scope ring.

Recall
Bracketthrust
wheel

Rings were then locked in place by a jam-
screw that was activated by the thrust wheels
that are visible.

Forward motion was stopped by the front
scope mount hitting the rear of the recall
bracket.

Both rings functioned the same - rear ring
was higher by difference in sec. ring height.

Jam screw was kept in lower half of ring
to keep it from turning when tightening.

No shooting done on this sample.

EXPERIMENTER

Paul E. Martin
O R Eddy

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8/16/82

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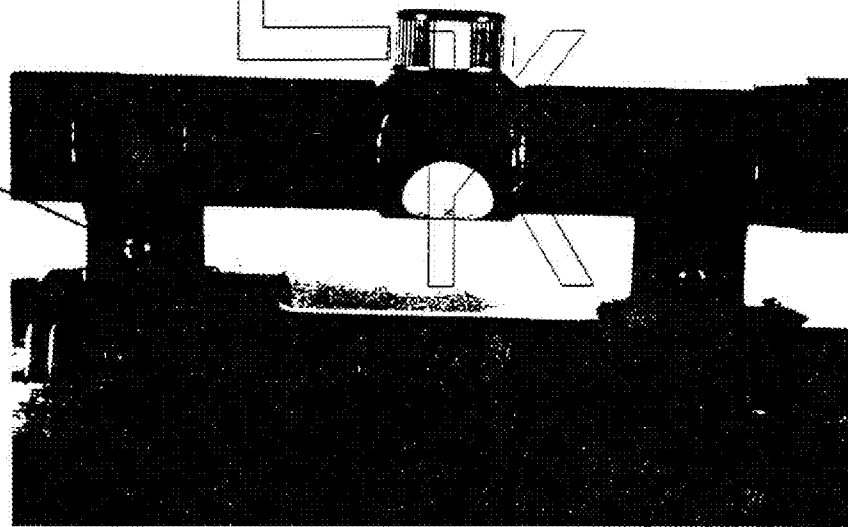
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SUBJECT OF EXPT.

July 10, 81
Scope Mount

Simple #2 is in keeping with the request to be made - cheap ⁴²⁸ I mean "cost efficient." It has been designed as a stamping, to be attached to a dovetail as in Sample #1, it uses one screw to clamp and also hold the scope.



This sample, as sample #1 is of two different heights and would be stopped by the second bracket.

Parts are 1020 or 1095 Mat'l. spring tempered, to ensure a good grip. Large diameter that wraps around scope tube is slightly smaller than tube to ensure interference and a good grip.

Go starting close with this sample.

EXPERIMENTER

WITNESS

Frederic J. Martin
A. L. Eddy

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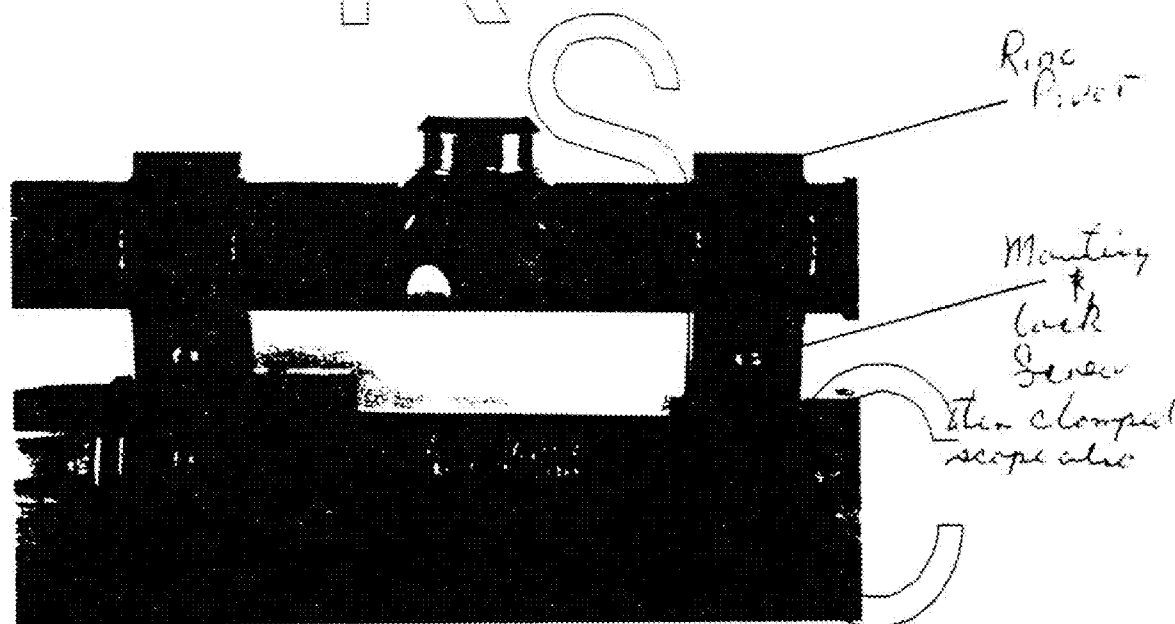
SUBJECT OF EXPT.

July 16, 81

Scope Mounts - again

Sample #3 is a variation of #2 hopefully
 a little easier to mount and assemble.
 This Mount was also designed as a stamping
 to be heat treated and mounted on a dove-
 tail cut in the receiver.

Picture to explain - One screw Mounting
 and clamping



As with other scopes mounting was some

No shooting yet.

Maybe some day

EXPERIMENTER

WITNESS

Paul J. Martin
 C.R. Bray

DATE

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7-10-81

8/16/82

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AL 0029582

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SUBJECT OF EXPT.

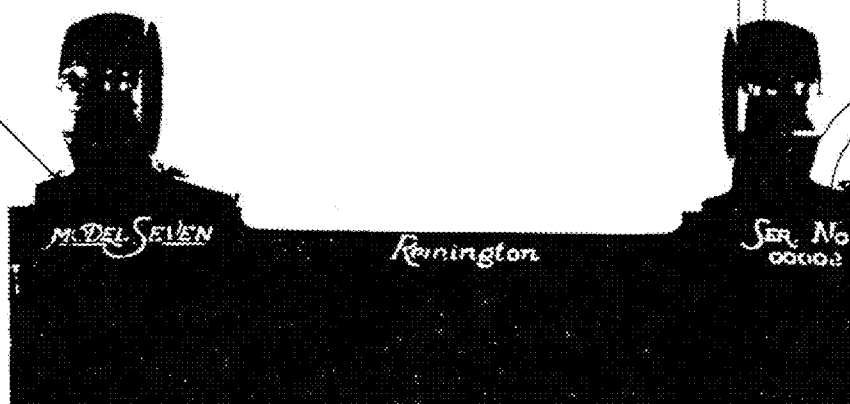
July 31, 81

Scope Mounts - and again

This sample is a variation of a mount system that I Bulke developed for the M-16 Bolt Action Rifle.

It does not use a mounting block instead it ~~is~~ ^{is} directly to the receiver in mounting like the ~~sample~~ ^{sample} complete disassembly is made when removing the mounts.

Mounting
Scopes
each
ring



EXPERIMENTER

Paul E. Hunter
A. R. Eady

WITNESS

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7-31-81

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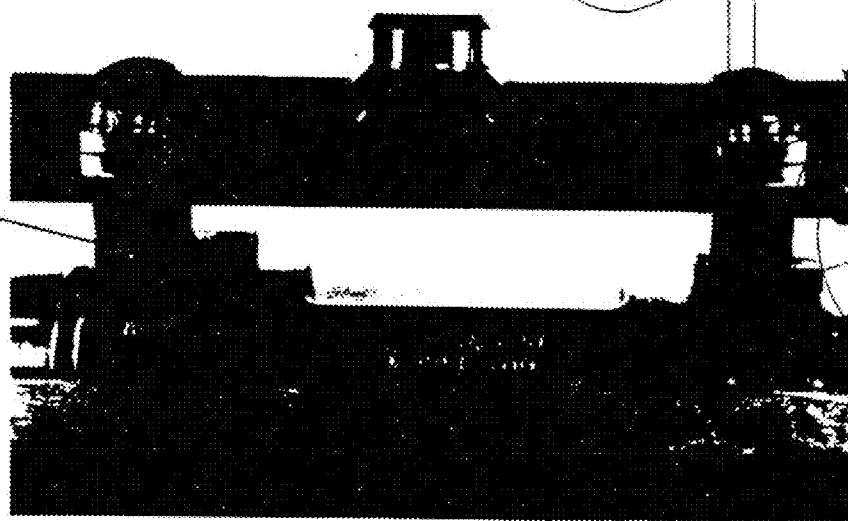
SUBJECT OF EXPT.

Aug 21, 81

Again Scope Mounts

25

The mount is similar to those marketed by
 Weaver and Tasci it uses a separate block
 to mount the ring and scope to the rifle.
 The sample shown does not have to be completely
 disassembled to remove from the rifle. It is
 shown as having two ring heights but
 could also be made for one ring height
 and two different block heights.
 Blocks are screw directly to receiver.

Lock
Screw
(3)Mounting
Block -
RearLock
Screw
(3)EXPERIMENTER
WITNESSFred C. Martin
Chas. E. EddyDATE
DATEMounting Block - Front
8-21-81
8/16/82

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AL 0029584

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DATE

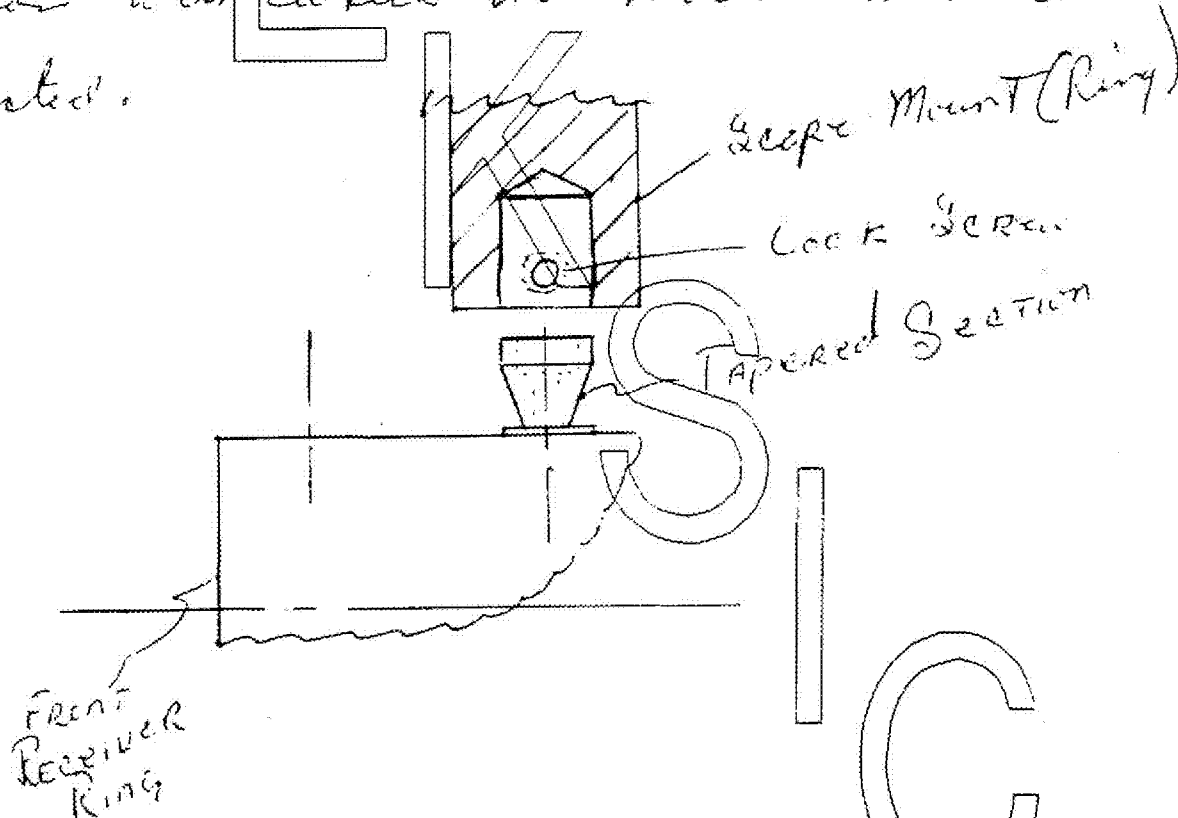
SUBJECT OF EXPT.

Aug 21, 81

Scope Mount (Continued)

A scope mount system that uses a mounting bushing instead of a mounting block was developed for use on the M-700 Bolt Action Rifle.

The bushing was formed with a tapered section with which the mount lock screw contacted.



Bushings was countersunk for mounting screw and could be mounted in any of the four scope screw holes on the receiver to facilitate the use of a variety of scopes.

EXPERIMENTER

WITNESS

Fred J. Martin
G.R. Eddy

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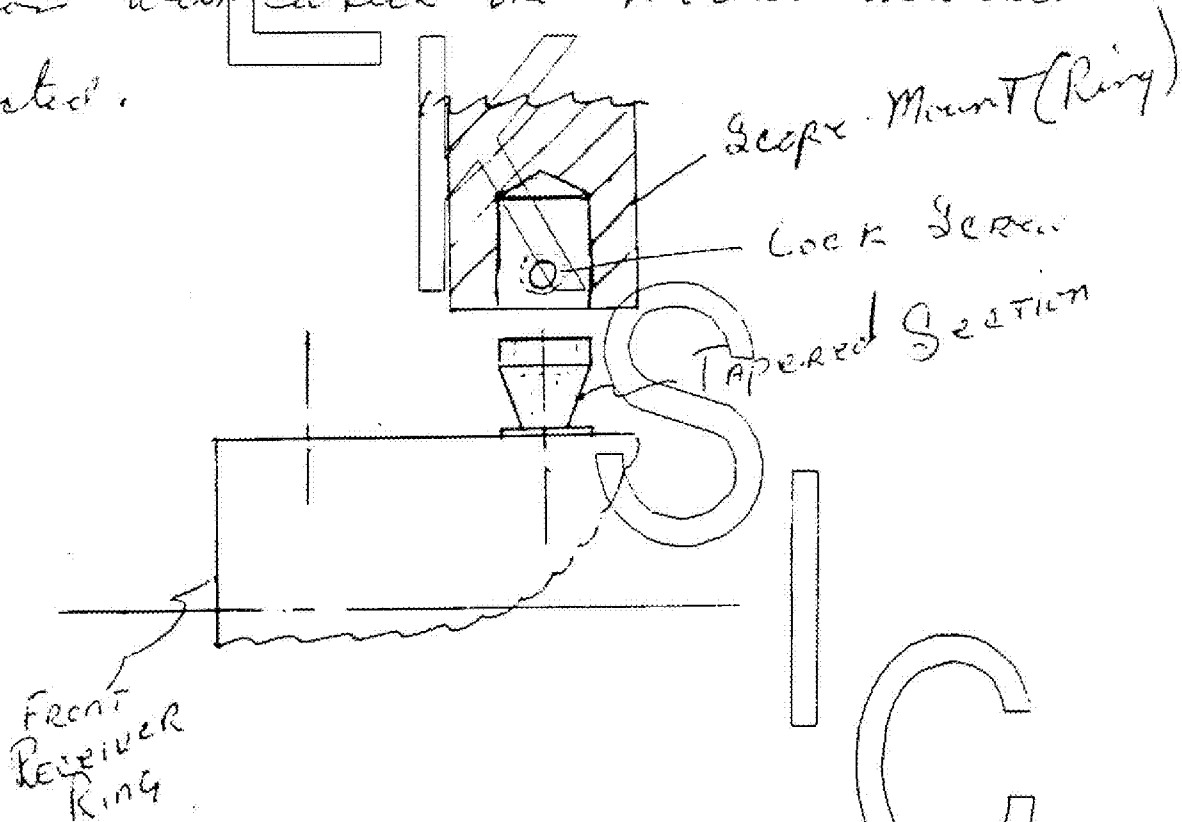
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SUBJECT OF EXPT.

Aug 21, 81
Scope Mount (Continued)

A scope mount system that uses a mounting bushing instead of a mounting block was developed for use on the M-700 Bolt Action Rifle.

The bushing was formed with a tapered section with which the mount lock screw contacted.



Bushing was countersunk for mounting screw and could be mounted in any of the four scope screw holes on the receiver to facilitate the use of a variety of scopes.

EXPERIMENTER

Fred J. Martin

DATE

8-31-81

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WITNESS

G.R. Eddy

DATE

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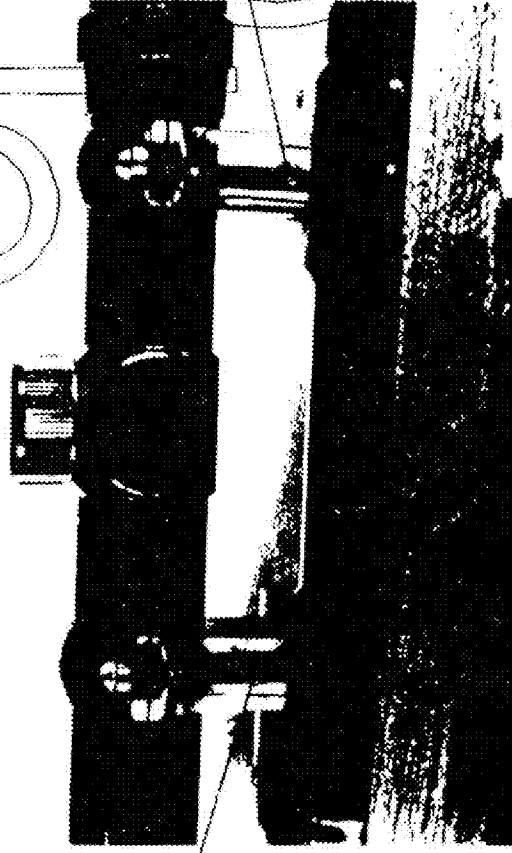
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SUBJECT

Camp 51, E. M. (Monte)

Scope Mount (Monte)

Bottom of the Scope Ring had been drilled and removed from a ship felt over the bushings. If the individual sawing the rifle wished he could increase the scope by loosening the lock screws and still be able to use the same sight without interference. Photos are the Scope mounted. Locked in to position. It's shown bushings can be moved for different scopes.

Lock
ScrewLock
ScrewLock
Screw
1 inch dia.
1/2 inch diam.

EXPERIMENTER

WITNESS

Fred S. Martin
C. R. Eddy

DATE

DATE

8-21-81

F/16/82

310734

AL 0025587

28

DATE

S' ECT OF EXPT.

Jan 13, 1982

Integral Scope Mounts for M-7

This scope mount was intended and designed to be unique to Remington Bolt Action Rifles. By this I mean the mounting of a scope using these rings could only be done on a Remington Rifle.

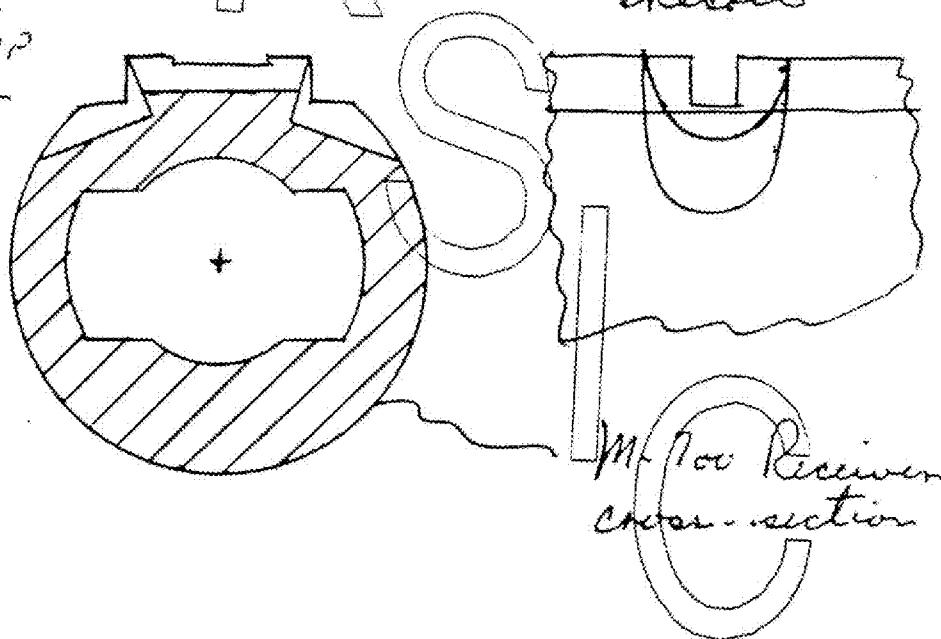
There are normally three components necessary to mount a scope to a rifle; first the scope second the rings and thirdly the bases.

By making the base as part of the receiver we can eliminate the base and use a ring of our design.

This system that we have here is series of cuts on the top of the M-700 Receiver

Cuts in Top
of Receiver

Slot to take
Recoil



The scope ring designed for use with this system has to clamp to engage the angles recessed in the receiver and a lug to engage the slot.

EXPERIMENTER

Frederic E. Martin
C.K. Eddy

DATE

1-13-82

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5/16/82

WITNESS

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AL 002988

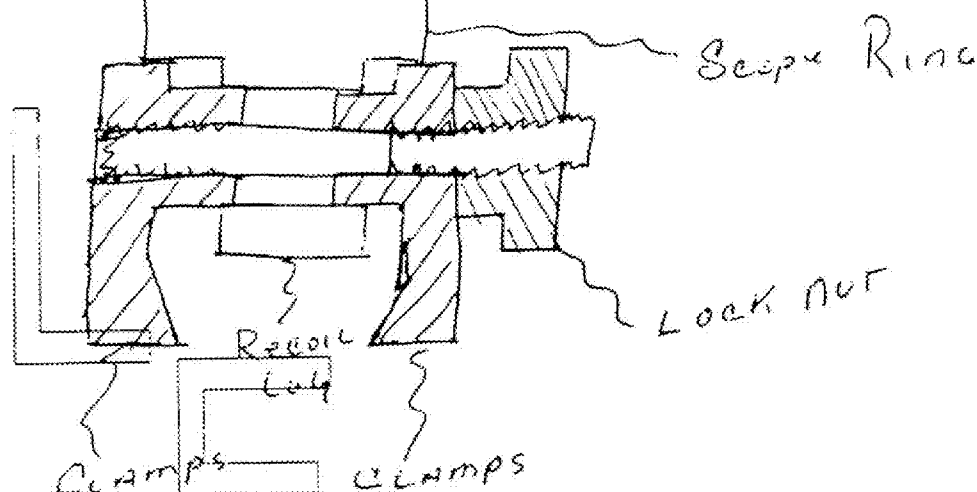
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SUBJECT OF EXPT.

Jan 13, 1982

Integral Scope Mounts (Continued)

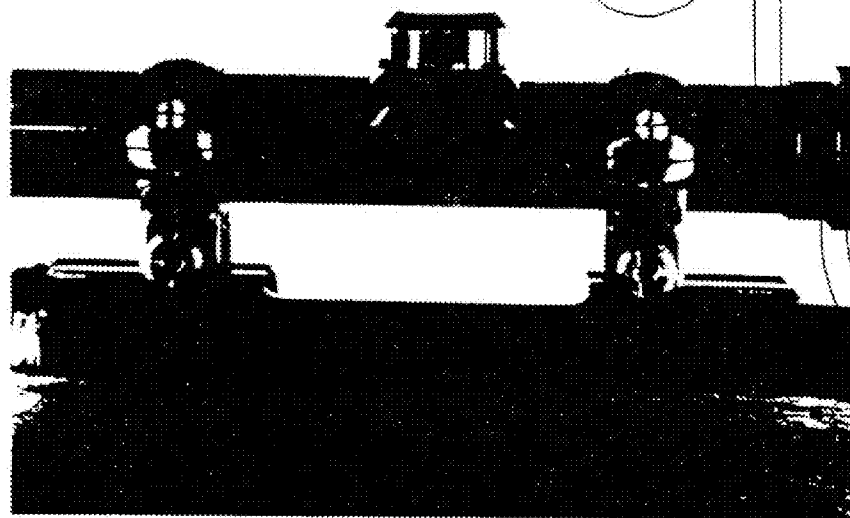
A



A variation of this system would be to have only one moveable clamp.

The picture shows the system mounted on a Remington Bolt Action Rifle.

An advantage of this system is that should the individual ~~with~~ want to remove the scope he can unscrew the clamp, replace it with no change in sight occupancy.



EXPERIMENTER
WITNESS

Fred E. Martin
C.R. Eddy

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1-13-82
3/16/82

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DATE

SUBJECT OF EXPT.

NOTEBOOK COMPLETE - NO FURTHER ENTRIES WILL BE MADE IN THIS BOOK.

JUL 23 1987

THIS BOOK MICROFILMED
AS COMPLETE
MAKE NO ADDITIONAL ENTRIES

EXPERIMENTER

WITNESS

DATE

DATE

34-234
AL 0029590

RESEARCH NOTEBOOKS

<u>Book No.</u>	<u>Assigned To</u>	<u>Description</u>	<u>Date Issued</u>
1050	T.G. Bauman	Left Hand Model 870 and 1100 - 12 & 20 Ga.	7-22-69
1087	L.W. Baum	Powder Metals - General	1-18-68
1095	Bob Merhar	Powder Metal Research	
1178	Bob Merhar	Powder Metal Research	
1179	D.S. Findlay	7400-7600 Magazine Box	11-8-79
1180	D.S. Findlay	Magazine Box Design Testing 7400	11-28-79
1181	J.L. Kast	XSG Design	11-9-79
1182	G. Reinhardt	Powder Metallurgy	2-3-80
1183	R.J. Balaska	Stamped Gun Concept	3-26-76
2007	J.S. Martin	Powder Metallurgy	2-3-80
2008	A. R. Eddy	M/742-760 New Generation (7400-7600 Design)	9-20-76
2011	J.L. Kast	66 New Generation .22 Rimfire Semi Automatic	8-17-77
2031	W. A. Balcewicz	Programmable Manipulator Applications	10-3-78
2036	C. Lall	Powder Metallurgy	2-3-80
2038	J. R. Palmer	XSG Gas and Operating Systems	2-5-80
2039	A.A. Hugick	XSG Design Project	2-7-80
2040	F.E. Martin	Bolt Action Rifles - Misc. Design Projects	4-7-77
2041	D.S. Findlay	XSG	5-19-80
2042	K.C. Rowlands	New .22 Rimfire Autoloader	4-7-77
2043	W.A. Balcewicz	High Energy Beam Applications	10-3-78
2044	J. L. Kast	"XPG" Design (Experimental Slide Action Shotgun)	7-25-80
WP 8-19-80			

PLAINTIFF'S
EXHIBIT
3165

AL 0029592

RESEARCH DEPARTMENT

PROCEDURE

TECHNICAL NOTEBOOKS

Introduction

Employees of the Research Department are engaged in the conduct of experimental work which is of great importance to the Company. Its importance cannot always be adequately judged at the time the work is done. For this reason it is essential that all experimental work be recorded in bound notebooks, following procedures which will protect the Company's interests.

Purposes

There are two main purposes for Research notebooks:

1. To provide a clear record of the conception of ideas and experimental development of those ideas which will provide a sound basis for patent prosecution if the ideas are patentably novel.
2. To provide a clear and permanent record of the important details of experimental work so that Research employees in the future can determine what was done and the results obtained if they are interested in doing similar work. With a well-kept record, duplication of effort can be avoided in the future, even if the original experimenter is not available for questioning.

Procedures

Each exempt Research employee who conducts experiments, or directs non-exempt employees in conducting experiments, is expected to keep a notebook in which the details and results of his experiments are recorded. Enough narrative should be included in the record to enable anyone skilled in the art to find out what was done without having to question the experimenter.

Procedures for the use of Research notebooks are as follows:

Notebooks

Technical bound notebooks, 8-1/2" x 11" in size, shall be used, and may be procured from the designated custodian.

PLAINTIFF'S
EXHIBIT

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RESEARCH DEPARTMENT

PROCEDURE

TECHNICAL NOTEBOOKS

Entries

Notebook entries shall be in strict accordance with the general Rules for entries appearing therein, and the following more-detailed instructions:

1. All entries shall be legibly written in waterproof ink. Standard, generally-accepted nomenclature should be employed.
2. All entries in a given notebook shall ordinarily pertain to a single general topic of research, and shall be made in chronological order from the first to the last page. However, it may sometimes prove desirable to divide a notebook into sections to record entries concerning several different and unrelated topics that are being worked on concurrently or intermittently by the experimenter. In that case, the title of each section and the page number on which it begins, should be entered on the index page concurrently with the establishment of the section. Each section is thereafter treated as a separate notebook.
3. Blank spaces should be eliminated. When an entry does not fill a page, the next succeeding entry on the same subject matter may begin on the same page, with no space between the two. If it is preferred to start a new page for the next entry, any blank space on the preceding page should be ruled out, so that it would be virtually impossible to add anything to that entry at a later date.
4. The top of each notebook page should clearly state what subject matter the entries on the page relate to. It is not required to repeat the subject matter heading if it covers several consecutive pages. However, if it becomes necessary to continue a subject on a non-consecutive page, notations such as "continued on page ____" and "continued from page ____" should be made.
5. The author (and the experimenter, if he is not the author) should sign and date each notebook page after each independent entry is made. Each notebook page should also be read, signed, and dated

RESEARCH DEPARTMENTPROCEDURETECHNICAL NOTEBOOKS

A

by a witness who understands the subject matter recorded, but who is neither an inventor nor a co-inventor of any new concept that is discussed on that page. The witness should preferably sign on the same day as the author or, if this is not possible, as soon thereafter as may be feasible. In the case of multiple entries on a single page, the signatures and dates should appear immediately following each entry. There should be no writing below the last signatures and dates entered on a page.

Read and Understood By: _____ Date _____

6. The bound notebook is to be preserved intact. In no case should any page or part of a page be removed.
7. No erasures are to be made in the notebook. Any corrections or changes should be made by crossing out the incorrect entry, but leaving it legible.
8. The same rules as to signing, dating and witnessing are to be followed when the original notes are recorded on loose sheets, drawings, or forms other than a standard bound notebook.

Coding of Samples

Samples should be coded by marking them with the technical notebook number and page number on which the sample is first described. If more than one sample is referred to on one page, they may be distinguished by suffix letters, such as "250-16A", "250-16B". These would refer to notebook No. 250, page 16, samples A and B.

Inserts

The use of inserts should be kept to a minimum. However, any material which forms an important part of the record of the progress of experimental work should be permanently attached to the notebook by gluing or stapling directly to a notebook page. Materials left loose, put in with transparent tape, or inserted in an envelope in the notebook, are not considered part of the notebook and are therefore not a part of the legal record of the experiment described. If material is inserted in the notebook, adherence to the following instructions will simplify the microfilming of the records:

H

RESEARCH DEPARTMENT

PROCEDURE

TECHNICAL NOTEBOOKS

1. It is preferable to attach and fold insert material so that it covers only the space on a single page between the subject and the signature. The page number and subject should not be obscured by the insert, nor should the space for signature and witnessing. The material should be fastened with staples or glued securely. To form a part of this permanent record, written inserts should be done in waterproof ink. Writing should appear on only one side of an insert.
2. If writing underneath the insert is desirable, the insert should be fastened only along the outside edge of the notebook. When the insert is unfolded, no part of the writing on the page should be obscured. If there is no writing under the insert, the statement "no writing underneath" should appear on the page below the insert.

Drawings and Sketches

All drawings and sketches should be initialed by the draftsman and signed and dated by the individual requesting the drawing.

Signatures

Except in extraordinary circumstances, notebook entries should be made by the experimenter and not by any other party. When necessary, another party may act as recorder for the experimenter, but the entry must so indicate and must be read, approved, and personally signed and dated by the actual experimenter.

"Active" versus "Complete" Notebooks

1. An "active" notebook is one in which further entries are to be made. Pages or portions of pages of an active notebook which are intended to be left blank should have a line drawn through them and should be signed and dated at the indicated place on the page.
2. A "complete" notebook is one in which no further entries are to be made, even if all the pages are not filled. Such notebooks should have a notation

RESEARCH DEPARTMENT

PROCEDURE

TECHNICAL NOTEBOOKS

on the last written page to the effect that no further entries will be made in the book. They should be turned over to the custodian as soon as possible after completion. Individuals should not retain notebooks in their possession which are not in everyday use. Under no condition should a notebook issued to one person be transferred to another. The person to whom a notebook is issued is held individually responsible for it.

Index

An index of notebooks will be maintained by the designated custodian.

Approved By:

N. Skovran 6/2/81
N. SKOVVAN
Chief Patent Counsel

J.P. Glas 6/1/81
J.P. GLAS
Director of Research

RESEARCH DEPARTMENTPROCEDURETECHNICAL BOUND NOTEBOOKS

Technical notebooks, 8-1/2" x 11" in size, will be used, and may be procured from the designated custodian. (Barbara) 1000

Entries in such notebooks will be in strict accordance with the Rules for Recording Experiments appearing therein, in addition to which the following will be observed:

Entries

1. Entries in notebooks will ordinarily be in chronological order from the first to the last page. If it is found necessary to divide a notebook into sections, the subject of each section and the page number beginning such section will be entered on the index page concurrently with the establishment of the section; each section is thereafter treated as a separate notebook.
2. All entries will be legibly written in waterproof ink.
3. The subject at the top of each notebook page should clearly indicate what the data on the page concern. It is not necessary to repeat the subject notation if it covers several pages, provided that notations like "continued to page ____" and "continued from page ____" are made in appropriate places. There should be no writing below the signature or below the printing on the page.
4. Standard nomenclature should be employed.
5. No blank spaces will be left. When an entry does not fill a page, the next succeeding entry should begin on the same page, with no blank space between the two. If it is found desirable to start a new page for a particular entry, any blank space on the preceding page should be ruled out before the next entry is made, so that it will be virtually impossible to add anything to any entry at a later date.

10/11/68

PLAINTIFF'S
EXHIBIT

3167

184
AL 0029599

A

Research Department
Procedure
Technical Bound Notebooks

Coding

1. Samples are coded by employing the technical notebook number and page number on which the sample is first described.
2. Variations on the basic code can be made by using letters, and these in turn can be subdivided by employing numbers. Thus, 250-16A1 would imply technical notebook No. 250; that the sample was first described on page 16; and that this particular sample was the number "1" modification of the "A" modification of sample 250-16.

Inserts

The use of inserts should be kept to a minimum. However, any material which forms an important part of the legal record of an experiment should be permanently attached to the notebook by gluing or stapling directly to a notebook page. Materials left loose, put in with transparent tape, or inserted in an envelope in the notebook, are not considered part of the notebook and are therefore not a part of the legal record of the experiment described. If material is inserted in the notebook, adherence to the following instructions will simplify the micro-filming of the records:

1. It is preferable to attach material so that it covers only the space on a single page between the subject and the signature. The page number and subject should not be obscured by the insert, nor should the space for signature and witnessing. The material should be fastened with staples or glued on all four sides. At the bottom of the insert, the statement, "no writing underneath," should be written. Inserts which form a part of the permanent record should be done in waterproof ink.
2. If writing under the insert is desirable, the insert should be fastened along the outside edge of the notebook so that the insert covers the page. When the insert is folded back, no part of the writing on the page should be obscured.
3. When it is absolutely necessary to insert material larger than the space for recording data on a single page, the material should be fastened and folded so that, when it is opened for inspection, it falls within the boundaries of the open notebook. None of the writing on the notebook pages should be obscured when the insert is folded back to reveal the pages underneath. Writing should appear on only one side of the inserted sheet.

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AL 0029600

A

Research Department
Procedure
Technical Bound Notebooks

Drawings and Sketches

All drawings and sketches should be initialed by the draftsman and signed and dated by the individual requesting the drawing.

Signatures

Except in extraordinary circumstances, notebook entries should be made by the experimenter and not by any other party. When necessary, another party may act as recorder for the experimenter, but the entry must so indicate and must be read, approved, and personally signed and dated by the actual experimenter.

Witnessing

Each notebook page must be witnessed by a person who is neither a sole or joint inventor of the subject matter disclosed, and who is capable of understanding and does understand the entries on the page. The witness may be the experimenter's supervisor, a staff member in the same group, or some other qualified person. The witness must date his own signature.

Notebook entries witnessed some time after the date of writing, or by someone unfamiliar with the experiment, are not good legal evidence.

"Active" versus "Complete" Notebooks

1. A "complete" notebook is one in which no further entries are to be made even if all pages are not filled. Such notebooks should have a notation on the last written page to the effect that no further entries will be made in the book. They should be turned over to the custodian as soon as possible after completion. Individuals should not retain notebooks in their possession which are not in every-day use. Under no conditions should a notebook issued to one person be transferred to another. The person to whom a notebook is issued is held individually responsible for it.
2. An "active" notebook is one in which further entries are to be made. Pages or portions of pages which are to be left blank in an "active" notebook should have a line drawn through them and should be signed and dated at the indicated place on the page.

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AL 0029601

Research Department
Procedure
Technical Bound Notebooks

Index

An index of notebooks will be maintained by the designated
custodian. (*Barbara - 1960*)

Approved by:

J. H. Lewis, Jr.
Patent Attorney

G. M. Calhoun
Director of Supporting Research

GMC:ND
10/11/68

424
AL 0029602

PLAINTIFF'S
EXHIBIT
3168

1003
AL 011506

RELATIVE STRENGTHS OF HIGH POWER CENTER FIRE RIFLES

MODEL NO.	RECEIVER AREA IN TENSION SQ. IN.	BOLT AREA IN SHEAR SQ. IN.	BOLT AREA IN COMPRESS. SQ. IN.	EXPECTED DEFLECTION OF BOLT IN RECEIVER BY YOUNG'S MODULUS $P = 9000 \times E \times 3 \times 10^6$ INCHES	BOLT STEEL AISI OR N.E. N.B.	NOMINAL YIELD POINT 1000 #/SQ. IN.	LOAD WHEN BOLT WITHOUT CASE MAX. PEN. DEFORMATION = 1.45 LB.S.	BOLT		BARREL SIZE OR PITCH DIA. OF TRING AT SHANK DIA. IN INCHES	STEEL AISI NO. YIELD POINT #/SQ. IN.	BARREL	
								MEAN PRESSURE POSSIBLE	MEAN PRESSURE POSSIBLE			MEAN PRESSURE POSSIBLE	MEAN PRESSURE POSSIBLE
								IN. 30-06	IN. 375			IN. 30-06	IN. 375
720	.443	.397	.109	.0015	2340	190	20,790	82,000	64,000	1.086	X-4130 120,000	58,000	54,000
721	.480	.429	.141	.0013	1335 2340	75 190	10,600 26,800	42,000 106,000	33,000 83,000	1.071	X-4130 120,000	57,000	53,000
IX-760*	.303	.206	.114	.0014	1335 2340	75 190	8,600 21,790	34,000 86,000	27,000 68,000	.897	X-4130 120,000	49,000	44,000
2X-760	.355		.071	.0150	1315 2340	75 190	5,390 13,500	21,000 53,000	17,000 42,000	.892	X-4130 120,000	48,000	43,000
HL903A3	.470	.329	.084	.0020	8620	190	10,900	43,000	34,000	1.011	1350 75,000	34,000	32,000
M-70-W	.537	.400	.086	.0020	Rock 48	190	16,400	65,000	51,000	.959	X-4130 120,000	52,000	48,000

(*) The Barrel Extension is the Receiver in the IX-760.

NOTE: The above Force and Pressure figures are theoretical and should be used for comparison only. According to experience actual figures would be higher.

M. H. W.
2-25-44

RELATIVE STRENGTHS OF HIGH POWER CENTER FIRE RIFLES

MODEL NO.	RECEIVER AREA IN TENSION SQ. IN.	BOLT AREA IN SHEAR SQ. IN.	BOLT AREA IN COMPRESS. SQ. IN.	EXPECTED DEFLECTION OF BOLT & RECEIVER BY YOUNG'S MODULUS P = 9000 C. X 3X10 ⁶ INCHES	BOLT STRENGTH	NOMINAL YIELD POINT	LOAD	CLEAN	CLEAN	BARREL SIZE OR BORE DIA. IN INCHES	STEEL AISI #	MEAN PRESSURE	MEAN PRESSURE
720	.143	.397	.109	.0015	23400	190	20,000	82,000	64,000	1.085	T-4130	58,000	54,000
721	.480	.429	.141	.0013	23400	190	20,000	82,000	64,000	1.071	T-4130	57,000	53,000
1X-760*	.303	.206	.114	.0014	23400	190	20,000	82,000	64,000	.897	T-4130	49,000	44,000
2X-760	.355		.071	.0150	23400	190	20,000	82,000	64,000	.892	T-4130	48,000	43,000
M1903A3	.470	.329	.084	.0020	8620	130	10,900	43,000	34,000	1.011	135	34,000	32,000
M-70-W	.537	.400	.086	.0020	8620	130	10,900	43,000	34,000	.959	T-4130	52,000	48,000

(*) The Barrel Extension is the Receiver in the 1X-760

NOTE: The above Force and Pressure figures are theoretical and should be used for comparison only. According to experience actual figures would be higher.

3083
AL 0029605

TITLE OF PROJ. _____

PROJ. NO. _____

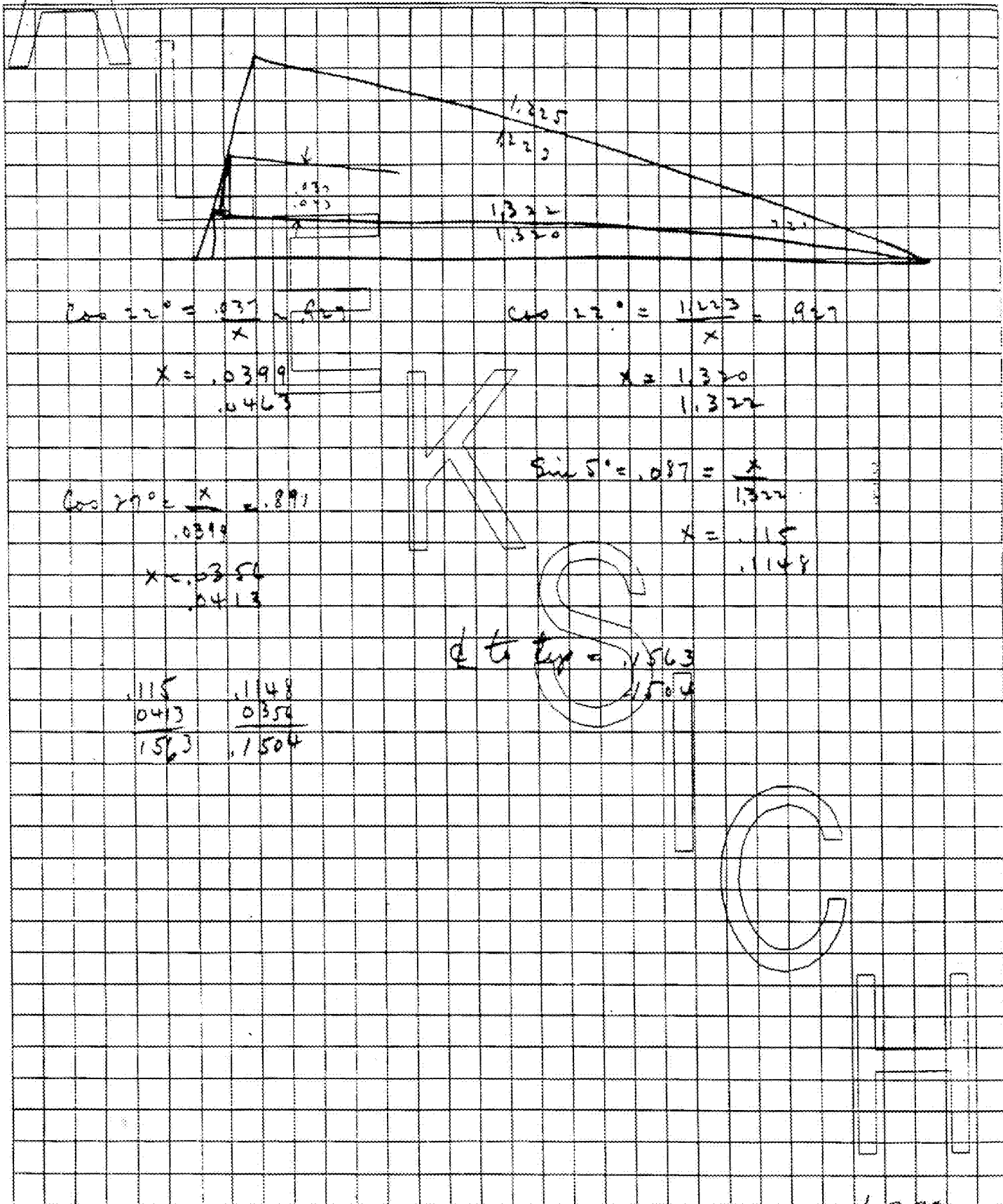
SUBJECT _____

WORKS _____

COMPUTER _____

DATE _____

19 _____



$$\cos 22^\circ = \frac{0.37}{x} = 0.927$$

$$x = \frac{0.37}{0.927} = 0.400$$

$$\cos 22^\circ = \frac{1.223}{x} = 0.927$$

$$x = \frac{1.223}{0.927} = 1.320$$

$$\cos 27^\circ = \frac{x}{0.891} = 0.891$$

$$x = 0.891 \times 0.891 = 0.794$$

$$\sin 5^\circ = 0.087 = \frac{x}{1.322}$$

$$x = 0.087 \times 1.322 = 0.115$$

$$\frac{0.115}{0.413} = \frac{0.1148}{0.354} = 0.28$$

$$\frac{0.115}{0.413} = \frac{0.1148}{0.354} = 0.28$$

TITLE OF PROJ. _____

PROJ. NO. _____

SUBJECT _____

WORKS _____

COMPUTER _____

DATE _____

19 _____

1561

182

3381

1502

178

3382

1504

3645

5749

3381

1748

1563

364

5208

3282

1926

543

349

96

0066

2026

1703

0323

540

350

190

0022

1898

1864

0014

531

335

196

528

336

790

Asphy
life

338

190

148

335

1969

1381

518

196

370

522

138

384

518

160

358

522

1670

372

4144
384
030

428
384
030

444
384
030

428
384
030

my eye must

5083

AL 0029607

$$\begin{aligned}
 &1.230 \pm .001 \\
 + &.062675 \pm .000175 \\
 = &1.302675 \pm .001175 \\
 - &.06245 \pm .00005 \\
 = &1.240225 \pm .001225 \\
 + &.000225 \pm .000225 \\
 = &1.240450 \pm .001450 \\
 - &.972 \pm .01 \\
 = &.26845 \pm .00245 \\
 - &.075 \pm .001 \\
 = &.19345 \pm .00345
 \end{aligned}$$

$$\begin{aligned}
 &.000,01 \\
 &.000,000,306 \\
 &.000,000,025 \\
 &.000,001,506 \\
 &.000,01 \\
 &.000,01
 \end{aligned}$$

E

diff. $.17835 \pm .00805$
 $= .1703 \text{ to } .1864$

$$\begin{aligned}
 &.650 \pm .001 \\
 - &.280 \pm .002 \\
 = &.370 \pm .003 \\
 + &.062675 \pm .000175 \\
 = &.432675 \pm .003175 \\
 - &.06245 \pm .00005 \\
 = &.370225 \pm .003225 \\
 + &.062675 \pm .000175 \\
 = &.432900 \pm .003400 \\
 - &.124 \pm .001 \\
 = &.3089 \pm .0044 \\
 + &.0629 \pm .0002 \\
 = &.3718 \pm .0046 \\
 - &.1845 \pm .0015 \\
 = &.1873 \pm .0061
 \end{aligned}$$

$$\begin{aligned}
 &.000,01 \\
 &.000,01 \\
 &.000,000,306 \\
 &.000,000,025 \\
 &.000,000,306 \\
 &.000,01 \\
 &.000,000,4 \\
 &.000,0225
 \end{aligned}$$

top of trigger from fire control hole

$$\begin{aligned}
 &19345 \\
 &1873 \\
 &.00615 \pm .00850 \\
 &.0029 \pm .00615 \\
 &.00905 \pm .01470 \\
 &.00325 \pm .00240
 \end{aligned}$$

$$\begin{aligned}
 &.00850 \\
 &.01710 \\
 &.0148 \\
 &.0058 \\
 &.0287 \\
 &.01710
 \end{aligned}$$

$$\begin{aligned}
 &.0058 \\
 &.0024 \\
 &.0035
 \end{aligned}$$

$$.000,084374 = \pm .0029$$

$\begin{array}{r} 700 \\ 698 \\ \hline 26002 \\ 001 \end{array}$
 $\begin{array}{r} 4500 \\ 4500 \\ \hline 000 \end{array}$

$\begin{array}{r} 4552 \\ 4048 \\ \hline 260104 \\ 0052 \end{array}$

$\begin{array}{r} 700 \\ 698 \\ \hline 26002 \\ 001 \end{array}$

$\begin{array}{r} 4500 \\ 4500 \\ \hline 000 \end{array}$

$\begin{array}{r} .004 \\ .005 \\ .00275 \\ .00165 \\ .435 \\ \hline .44860 \\ 432 \end{array}$

$\begin{array}{r} .01360 \\ .002 \\ \hline .0156 \end{array}$

$\begin{array}{r} 2835 \\ 2811 \\ \hline 26002 \\ 001 \end{array}$

$\begin{array}{r} 2855 \\ 2800 \\ \hline 26055 \\ 0071 \end{array}$

$\begin{array}{r} 4306 \\ 0156 \\ \hline 4144 \\ 433 \end{array}$

$\begin{array}{r} 2813 \\ 2811 \\ \hline 010 \end{array}$

$\begin{array}{r} 2833 \\ 2800 \\ \hline 26033 \\ 00161 \end{array}$

$\begin{array}{r} 435 \\ 0156 \\ \hline 4144 \\ 438 \end{array}$

S

Seaw

$\begin{array}{r} .1518 \\ .178 \\ \hline .3298 \\ .1969 \\ \hline .1329 \end{array}$

$\begin{array}{r} 437 \\ 388 \\ \hline 044 \\ 442 \end{array}$

$\begin{array}{r} 4144 \\ 3891 \\ \hline 0253 \end{array}$

$\begin{array}{r} .521 \\ .1329 \\ \hline .3881 \end{array}$

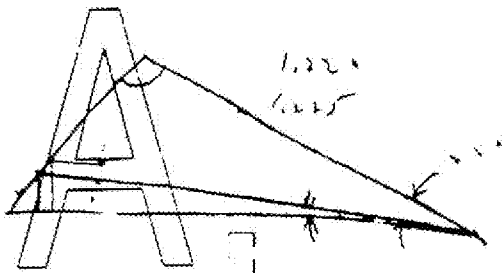
$\begin{array}{r} 4486 \\ 369 \\ \hline 0766 \\ 0356 \end{array}$

$\begin{array}{r} 428 \\ 1368 \\ \hline 0 \end{array}$

C

H

$\begin{array}{r} 062675 \\ 57245 \\ \hline 000225000000 \end{array}$



$$\cos 22^\circ = \frac{1.220}{x} = .9272$$

$$x = 1.316$$

$$1.376$$

$$\sin 5^\circ = \frac{y}{1.316} = .08715$$

$$= .1149$$

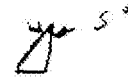
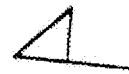
$$1.52$$

$$\begin{array}{r} .1149 \\ .1369 \\ \hline .1518 \checkmark \\ 177 \\ \hline .3298 \\ 19 \end{array}$$

$$\begin{array}{r} .1152 \\ .0478 \\ \hline .1530 \checkmark \\ 182 \\ \hline .3400 \end{array}$$

$$\begin{array}{r} .19345 \\ .00345 \\ \hline .190 \\ .19690 \end{array}$$

$$\begin{array}{r} 1.220 \\ \times 1.316 \\ \hline 1.60592 \end{array}$$



$$\cos 5^\circ = \frac{z}{.043} = .9062$$

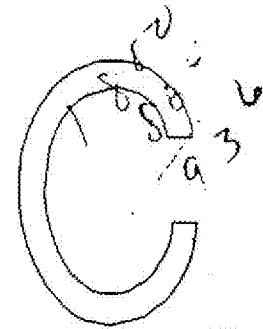
$$= .426$$

$$= .0369$$

K

S

I



H

9883

AL 0029613

BOOK # 236

A
L
E
K

Issued to M. H. Walker
on m/721 (9/10/43)

To be returned on request.

236

S
I
C

H

10283
AL 0029615

A

THIS BOOK MICROFILMED
AS COMPLETE
MAKE NO ADDITIONAL ENTRIES

L

RULES FOR RECORDING
EXPERIMENTS

1. Original records are to be in ink.
 2. Each notebook page whereon there is recorded a completed experiment should be signed and dated by the experimenter in the space provided.
 3. Each notebook page containing a completed experiment should be read and signed by a witness who will place his signature and the date in the space provided. The witness is to be one who understands the purpose of the experiment and the result obtained but who is not likely to be the inventor or a co-inventor. Preferably the witness signs on the same day as the experimenter and in any event as soon thereafter as possible.
 4. Where entries on a single experiment do not completely fill a page, the remainder of the blank page should be ruled out. Where the record of the experiment extends over several pages which are not consecutive, proper cross-references should be inserted.
 5. The bound notebook is to be preserved intact. In no case should any page or part of a page be removed.
 6. No erasures are to occur in the record. Any corrections or changes should be made by cancellation, leaving the original entry legible.
 7. The same rules as to signing, dating and witnessing are to be followed when the original data are recorded on loose sheets or forms other than the standard bound notebook.
- S
- C
- H

SUBJECT FOR INDEXING THIS BOOK
MUST BE GIVEN BELOW

A
L
E
K
S
i
C
H

12/83
AL 0029617

DATE
SUB

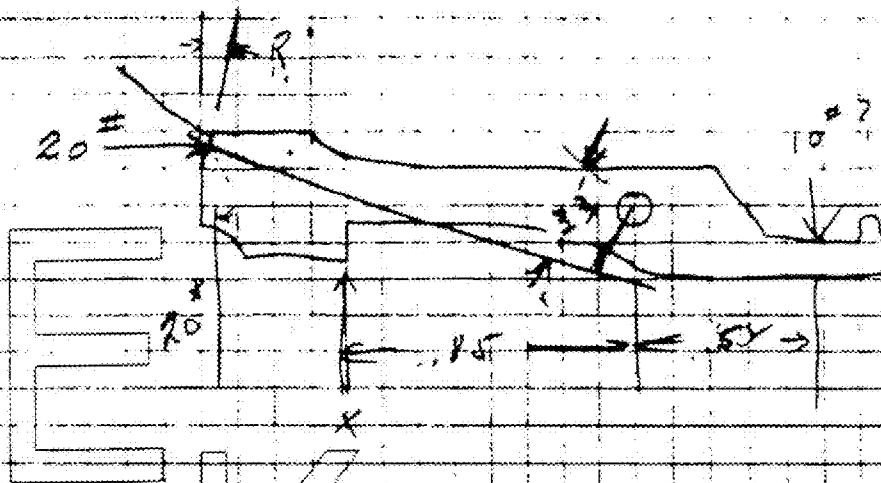
EDGE
WITH

DATE

9-10-43

SUBJECT OF EXPT.

Blocked semi trigger



$$(10) .52 < 24 (.33)$$

$$5.2 < 8$$

$$24 (.33) = 10 (.52) + x (.85)$$

$$8 = 5.2 + x (.85)$$

$$2.8 = x$$

$$x = 3.3$$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029618

13783

DATE

9-3-63

SUBJECT OF EXPT.

Dimensions - Resin

B.H.
Thinks

OAL - 8.85

M. 720

1.27

.692

1.15 Cane
Box

.577

Springfield

OAL - 8.59

1.178

Length

5.52

M 70

1.24

OAL - 8.15

1.375

720 8.59

1.35

1.59

1.125

EXPERIMENTER

WITNESS

DATE

DATE

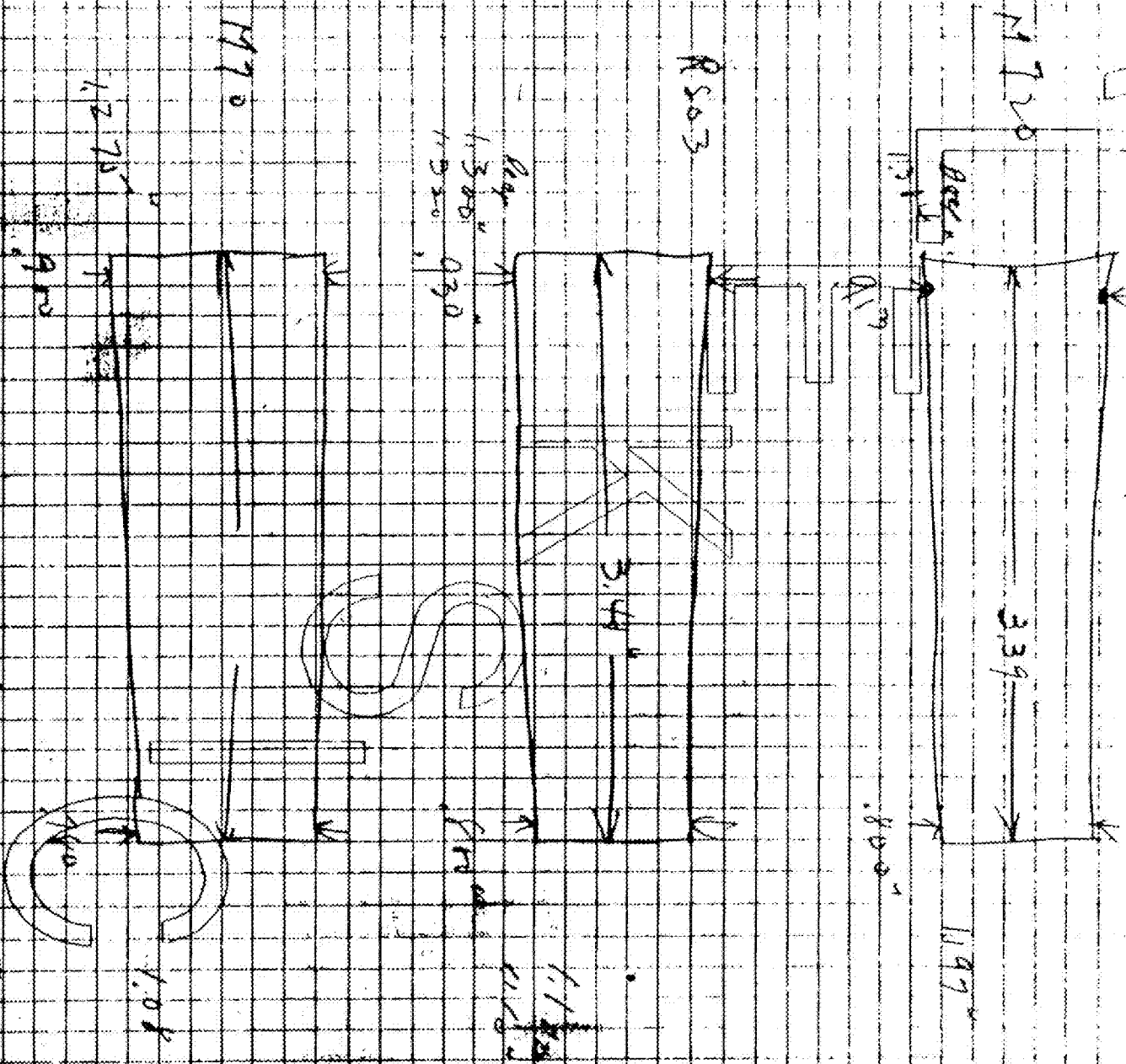
14/83
AL 0029619

DATE

9-15-43

SUBJECT OF EXPT.

3 o.s. & 1 m.s. pyrogon



Outline of working part

720 - 530
R5 - 1530
700 - 544

EXPERIMENTER

WITNESS

DATE

DATE

15-883

AL 0029620

A

9-15-43

DATE

SUBJECT OF EXPERIMENT

Dimensions - measurements

Recess Rail to bottom of May. Floor

17.700

17.5

1.52

RS03

17.5

1.58

M 70

17.2

1.54

17.760

1.60

1.48

top with 7.5

Bottom view 9.5

Bottom Profile 8.5

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EXPERIMENTER
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DATE

16/3/83
AL 0029621

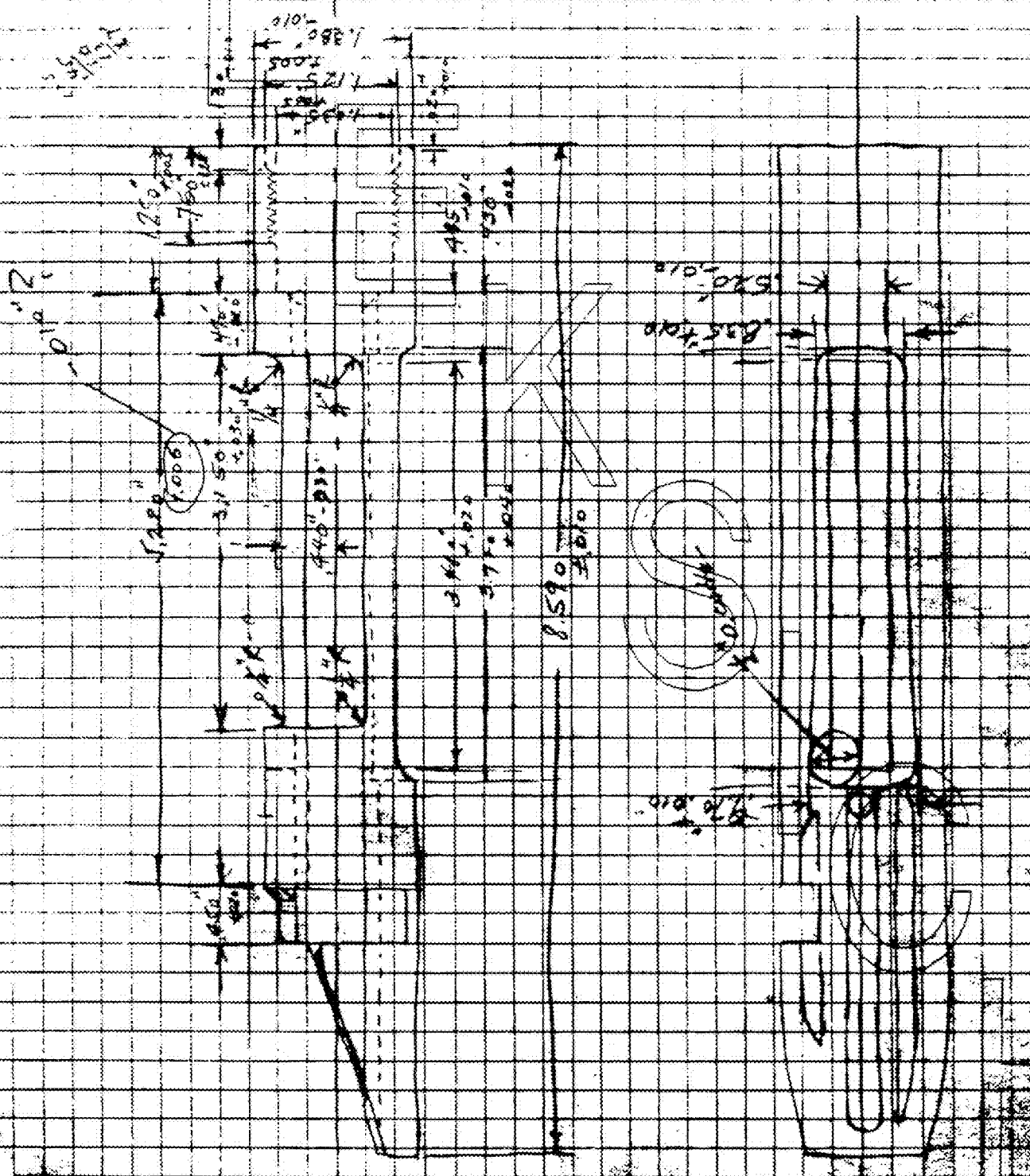
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9-16-43

SUBJECT OF EXPT.

721 Reamer Dimensions



EXPERIMENTER

WITNESS

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DATE

AL 0029622

17283

DATE

A-17-43

SUBJECT OF EXPT. Receiver Calculations

Strength of Receiver Ring

$$Min\ 0.0 = 1.370"$$

$$Max\ 1.0 = 1.130"$$

$$Area\ OD = \left(\frac{1.379}{2}\right)^2 \pi = 1.475\ sq\ in.$$

$$Area\ ID = \left(\frac{1.130}{2}\right)^2 \pi = 1.004\ sq\ in.$$

$$Cross\ Section\ Area = 471\ sq\ in.$$

$$Yield\ Strength\ of\ X1315\ Steel\ needed =$$

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EXPERIMENTER

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18.08.83

AL (U)29623

DATE

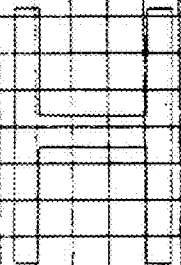
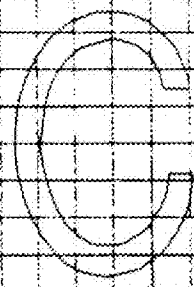
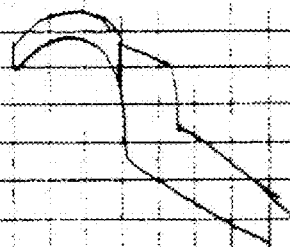
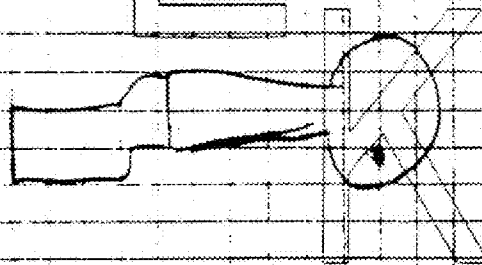
9-28-43

SUBJECT OF EXPT.

Stock dimension 721

Drop at comb $1\frac{11}{16}$ "
Drop at heel $2\frac{5}{8}$ "
Length $13\frac{1}{2}$ "
Pitch with 24" $25\frac{1}{2}$ "

not used



EXPERIMENTER

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19483

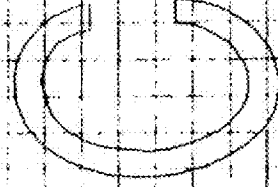
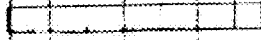
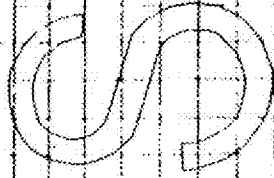
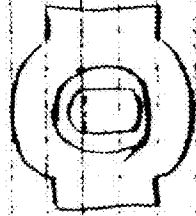
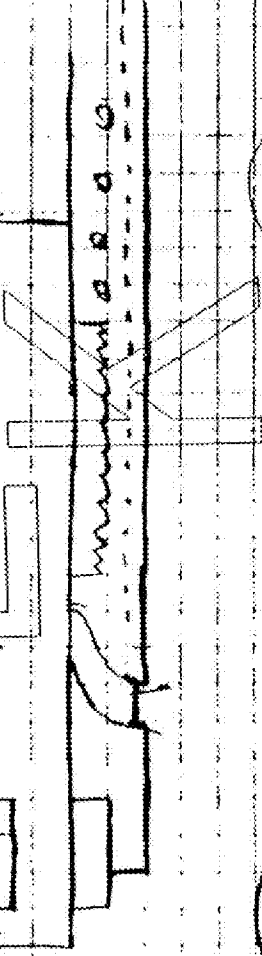
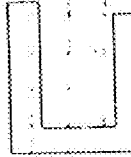
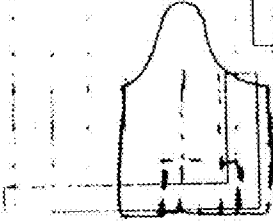
AL 0029624

8

DATE

SUBJECT OF EXPT

A 9-30-43
Boat



EXPERIMENTER

DATE

WITNESS

DATE

20483

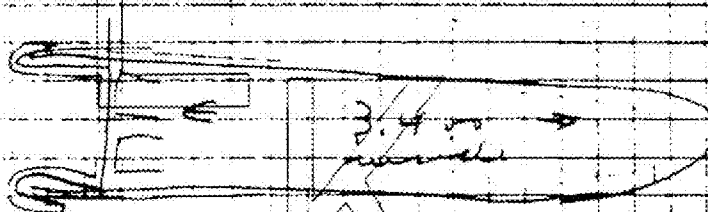
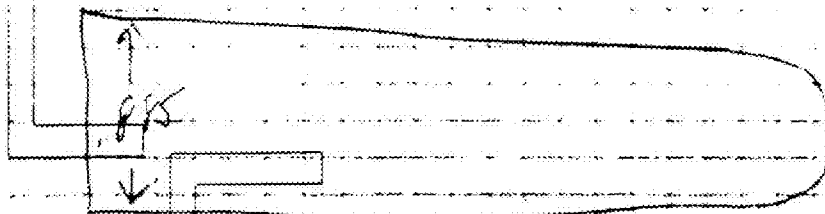
AL 0029625

DATE

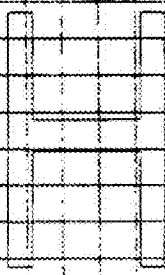
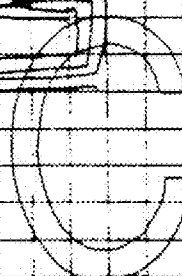
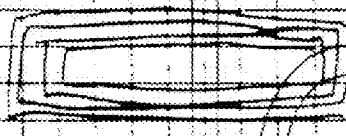
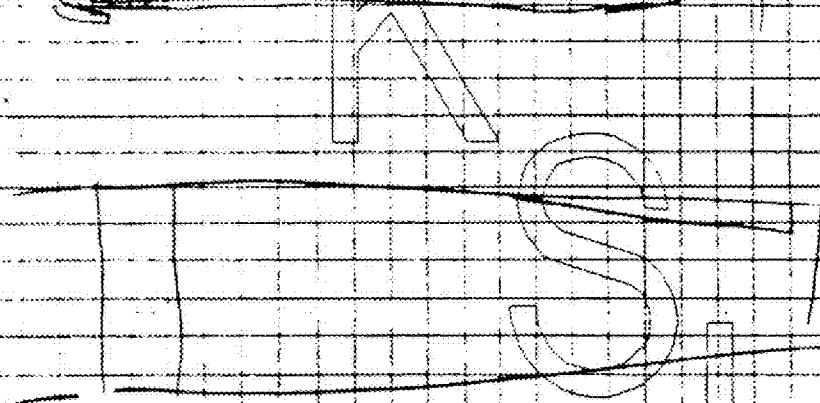
10-1-43

SUBJECT OF EXPT.

Mazda



0.62



EXPERIMENTER

WITNESS

DATE

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AL 0029626

21083

A

10

DATE

SI CT OF EXP.

11-16-43
Magazine dimensions

\$75 1 man 30
\$25 1 man 50

30,000

30,000

Win 70 Low 70

Length Front to back

" Rear "

Width Rear

Width Front

Girth - runner ring

Girth back of "

Girth front of knee bridge

" Stock thickness

Grip circumference

1.43.4"

1.66.6"

9x"

28"

7 1/8"

6 7/8"

7 1/8"

1.817

5 1/8"

1.45.0"

1.68.2"

9x"

7 1/8"

7 1/8"

7"

7 1/8"

1.815

5 1/8"

270

5 1/8"

5 1/8"

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029627

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II

DATE

SUBJECT OF EXPT.

2-23-41
7x1 train Spring

FIRE LENGTH 3.375

COCKED LENGTH 3.030

d = .055

D = 395 - 055 = 340

n = 38 ACTIVE

19 at 3.375 = 6.75 ENERGY

$$P = \frac{f d^3}{8 n D^3}$$

$$P = f \left(\frac{9.5 \times 10^{-6}}{8 \times 38 \times 0.0375} \right)$$

Set from

78 to

63

$$= 7.8 \times 10^{-8}$$

$$P.P (L - 3.375) = 7.9$$

$$L = \frac{19}{8.8} + 3.375$$

$$L = 5.485$$

$$FIRE P = 19$$

$$COCKED P = 8.8 (5.50 - 3.03) = 21.7$$

$$STAKED P = 6.8 (5.50 - 3.12) = 29.6$$

$$W = \frac{8 P D}{\pi d^3} = P \left(\frac{1 \times 10^6}{\pi (0.055)^3} \right)$$

$$W = P (5200)$$

$$FIRE 3 = 19 (5.700) = 98.000 P.P$$

$$COCKED 3 = 26.7 (5.700) = 113.000 P.P$$

$$STAKED 5 = 27.6 (5.700) = 157.000 P.P$$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029628

23083

12

DATE

SUBJECT OF EXPT

I - 23 - 44

Shut on 721, Drain Spring

1" Shutter

FIRED LENGTH = 2.375

COILED LENGTH = 2.030

$$d = .055$$

$$D = .395 - .055 = .340$$

19" at 2.375 = 6" ENERGY

Stacked L = .030 - .600 = 1.430 = 2.5 Active Coils

$$P = 13.4 f$$

$$13.4 (L - 2.375) = 2.0$$

$$L = 3.66$$

$$\text{FIRED } P = 48$$

$$\text{COILED } P = (3.66 - 2.030) 13.4 = 21.8$$

$$\text{STACKED } P = (3.66 - 1.43) 13.4 = 30$$

$$S = P(5200)$$

$$\text{FIRED } S = 5200 \times 14 = 93,500$$

$$\text{COILED } S = 21.8 \times 5200 = 113,000$$

$$\text{STACKED } S = 5200 \times 30 = 156,000$$

$$5200 \times 30 =$$

set from
to

EXPERIMENTER

WITNESS

DATE

DATE

24883
AL 0029629

DATE

3-29-44

SUBJECT OF EXPT.

FIRING PIN PROTRUSION

MAX BOLT LENGTH

MIN PIN LENGTH

.451
 .315
 .433
 .064
 1.263

1.810
 - .500
 1.310

MIN PROTRUSION = $1.310 - 1.263 = .047$

MIN BOLT LENGTH

MAX PIN LENGTH

.449
 .309
 .427
 .060
 1.245

1.813
 - .498
 1.315

MAX PROTRUSION = $1.315 - 1.245 = .070$

EXPERIMENTER

WITNESS

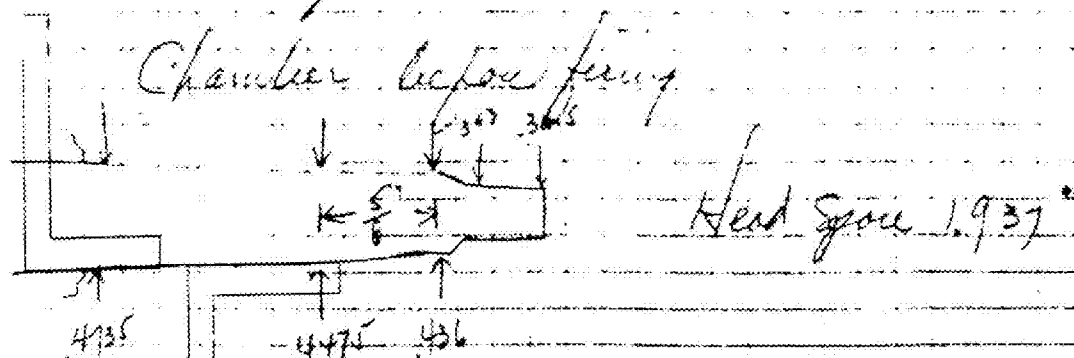
DATE

DATE

25883
 AL 0029630

A

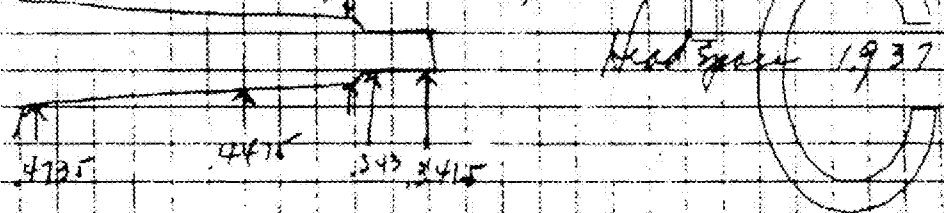
First cartridge Fired on 11/7/37



A standard 30.06 Rem. U.S. S.P. was fired after some trouble getting the indent up to .018. The case stretched in front of the solid head and ruptured enough to let out some gas. The primer was smeared to more than $\frac{1}{4}$ " diameter.

It is fairly evident that the loading plug took up on the body instead of the shoulder of the chamber causing these head space.

Chamber after firing



No Swell is evident.

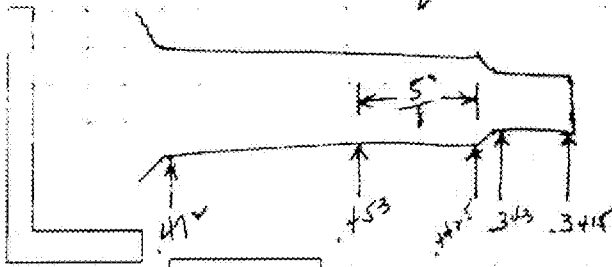
Ejector Spring

.026 dia
137.00

DATE

4-10-44

SUBJECT OF EXPT.

First Cartridge in 721 after reheading
Before FiringHead Space
1.957

No change in case diameter after 10 prop/loads

E

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EXPERIMENTER

DATE

WITNESS

DATE

27283
AL 0029632

DATE

SUBJECT OF EXPT

May 8, 1944

New basic bush dimensions

$$S = \frac{P(R_1^2 + R_2^2)}{(R_1^2 - R_2^2)}$$

P = 100.57 1067

P, 29.4 Win. PRESSURE = 84,000 PSI

$$R_1^2 = (474 - 2)^2 = 237^2 = .0562$$

$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

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$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

$$R_2^2 = (1067 - 2)^2 = 524^2 = .785$$

EXPERIMENTER

DATE

WITNESS

DATE

28083
AL 0029633

DATE: June. 5, 1943
 SUBJECT OF EXPT. 721 Lock Time

721 Spring Pin = 61.5 gms.

721 Spring = 12.8 gms.

722 Spring Pin = 52.4 gms.

722 Spring = 9.1 gms.

721 Lock Time = $2 \times 67.9 \times 300 \times .0012 = 3.33 \text{ ms}$

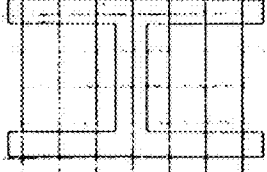
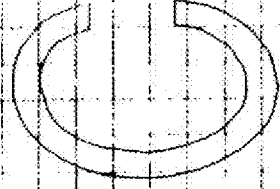
$$21 \times .32 \times .12$$

722 Lock Time = $2 \times 56.9 \times 300 \times .0012 = 3.02 \text{ ms}$

$$21 \times .32 \times .12$$

$$21 \times .32 \times .12$$

5
 10
 15
 20
 25
 30
 35
 40
 45
 50
 55
 60
 65
 70
 75
 80
 85
 90
 95
 100



EXPERIMENTER

WITNESS

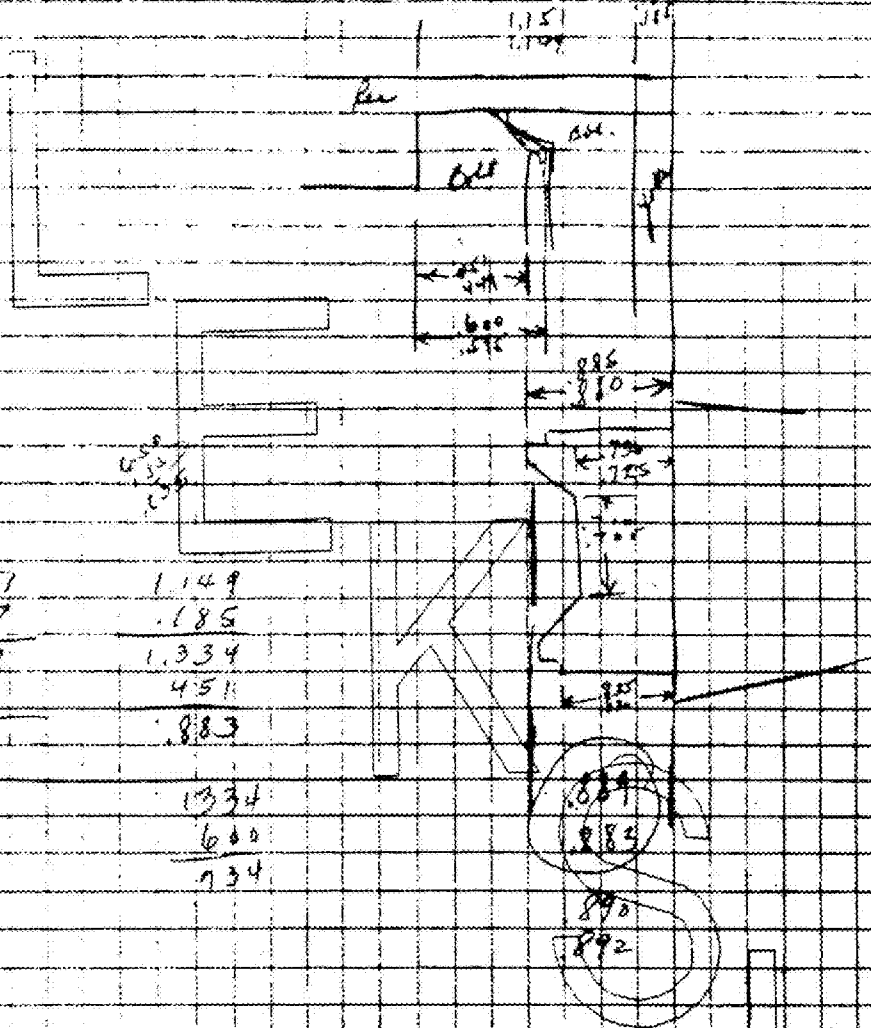
DATE

DATE

29283

AL 0029634

Baird, Bolt & Brewer. Tolsonus



1.151
1.187
1.338
429
889

1.149
- 185

1.334
- 451


883

$$\begin{array}{r} 1334 \\ 600 \\ \hline 734 \end{array}$$

890
892

Yoke

$1:36$



334
602
722

1834
885
477

$$\begin{array}{r} 680 \\ 37 \times \\ \hline 703 \end{array}$$

EXPERIMENTER

WITNESS

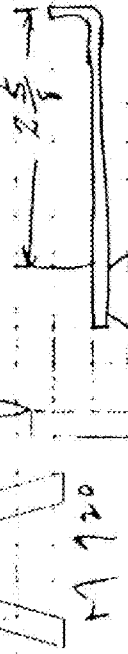
DATE _____

DATE _____

30/83
AL 0029635

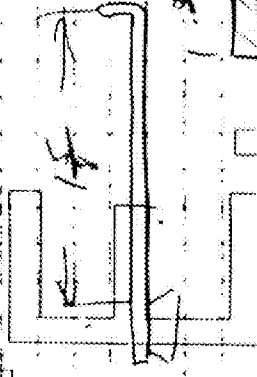
DATE
SUBJECT OF EXPT.

Jan 12, 1944
Rear Sight

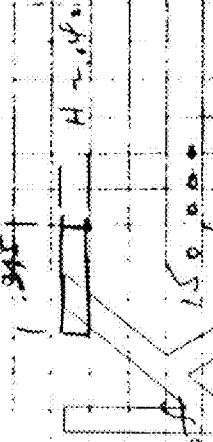


74 - 18/100

Reflex = 172



1720



Assume S of 150,000

F = 2520 H = 2520
3 E H

$$H = \frac{2(150,000)(172)}{3(2520^2)} = 0.044$$

$$P = \frac{8640}{6(172)} = 8.2$$



EXPERIMENTER
WITNESS

DATE
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31883
AL 0029636

20

DATE
SUBJECT OF EXP

A

June 13, 1944
721 & 722 Calibers

M 721

284 Rem Mag.

30.06

280 Rem

M 722

224 Rem (.25-300)

220 Rem (.25-2059)

M 710 (Single Shot)

220 Rem (.25-2055)

M 514 (Single Shot)

22 L.R. Target Model

S

C

H

EXPERIMENTER
WITNESS

DATE
DATE

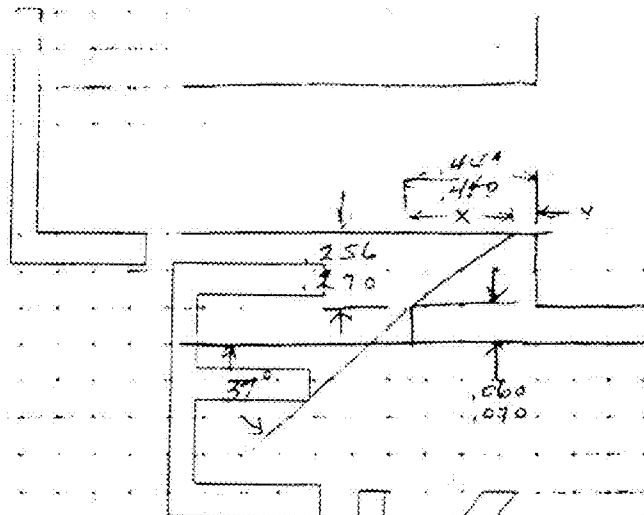
32883
AL 002963

DATE

6-19-44

SUBJECT OF EXPT.

CARRIAGE RAMP



$$\begin{array}{r} 1.355 \\ .6775 \\ \hline 3515 \\ .3760 \\ .070 \\ \hline 2560 \end{array}$$

$$\tan 37^\circ = .7536$$

$$X = \frac{256}{.7536} = 340$$

$$X = \frac{270}{.7536} = 358$$

$$\text{MAX } Y = 440 - 340 = .109$$

$$\text{MIN } Y = 440 - 358 = .082$$

$$\begin{array}{r} 1.360 \\ .680 \\ \hline 350 \\ .330 \\ .60 \\ \hline 270 \end{array}$$

$$\begin{array}{r} 4230 \\ 3716 \\ \hline 514 \end{array}$$

$$\begin{array}{r} 4230 \\ 3020 \\ \hline 959 \end{array}$$

$$\begin{array}{r} 3740 \\ 3740 \\ \hline 0 \end{array}$$

EXPERIMENTER

WITNESS

DATE

DATE

33283
AL 0029638

300 SOUTH MAGNOLIA

DATE:

34883
AL 0029639

DATE

6-27-74

SUBJECT OF EXPT.

M-722 KEIN-PR-HW

FIRED LENGTH = 2.475

COCKED LENGTH = 2.155

 $J = 0.05$ $D = 395 - 407 - 0.55 = 352 \text{ MAX.}$

SMALLER LENGTH = 1.540

2.5 TIGHT COILS 216 ACTIVE

 $P = 11.6 \text{ } \mu\text{in}$

4" FREE LENGTH

FIELD P = $(1400 - 2475) / 11.6 = 197 \text{ } \mu\text{in}$ COCKED P = $(1400 - 2180) / 11.6 = 21.1 \text{ } \mu\text{in}$

21" AT 20.50 - 23.0

S

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EXPERIMENTER

DATE

WITNESS

DATE

37883

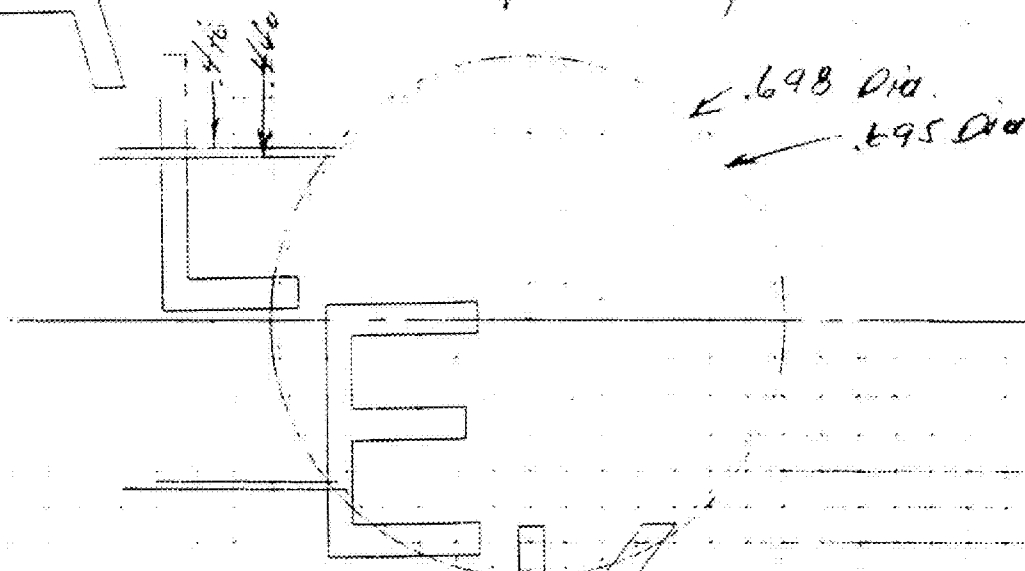
AL 0029642

26

DATE
SUBJECT OF EXPT.

7-12-44

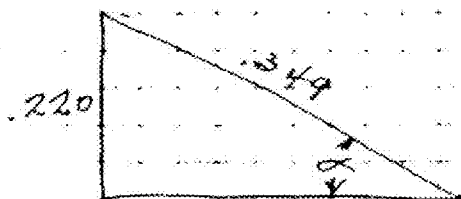
Bolt Body and Log Intersection



← .698 Dia.

← .695 Dia.

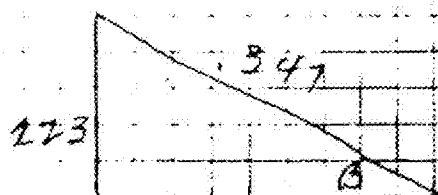
MIN. LUG & MAX BOLT

 $\sin \alpha =$

$$\frac{220}{349} = .6304$$

$$\alpha = 39^\circ - 4' - 47''$$

MAX LUG & MIN BOLT

 $\sin \beta =$

$$\frac{123}{347} = .6976$$

$$\beta = 39^\circ - 59' - 5''$$

$$\beta - \alpha = 54' - 18'' = 54.3'$$

$$\frac{54.3}{360 \times 60} \times .698 \times \pi = \text{Linear Movement Approx}$$

$$= .00552''$$

EXPERIMENTER

WITNESS

DATE

DATE

30283

AL 0029643

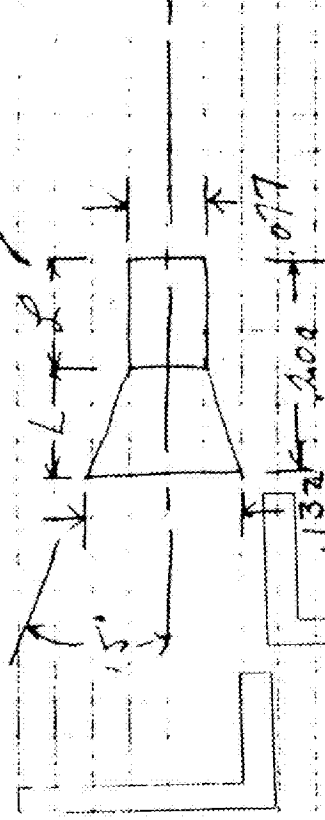


DATE

SUBJECT OF EXPT.

7-14-44
Bolt Head - Spring Saw

27



Find Min L

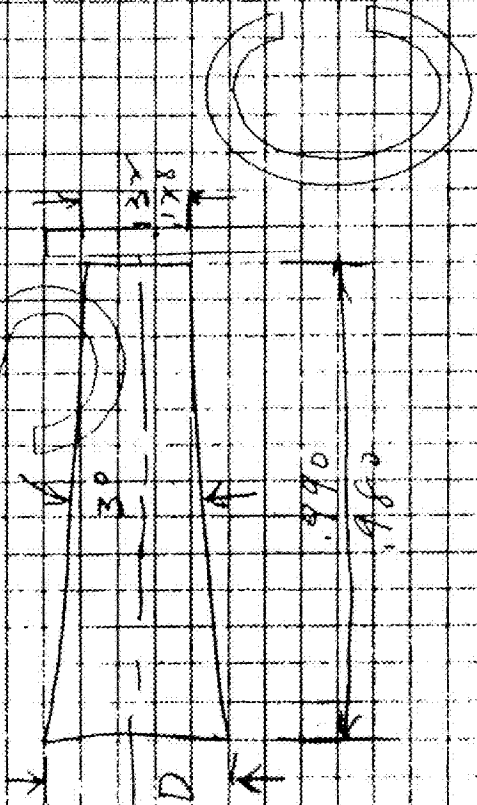
$$1.32 - .07 = L = \tan 15^\circ$$

$$= .2679$$

$$\frac{1.32}{.075} = 17.6$$

$$L = \frac{0.275}{2.679} = .1027$$

$$\text{Min. } L = 2.00 - .103 = .897$$



Find Max & Min D

$$\frac{D_{\text{max}} + 1.32}{2} = .990 = \tan 15^\circ = .0262$$

$$D_{\text{max}} = .132 = .990 \times 0.0262 \times 2 = .0518$$

$$\frac{1.79}{1.705} = 1.0485$$

$$D_{\text{max}} = .1838$$

$$D_{\text{max}} + .128 = .980 \times 0.0262 \times 2 = .0513$$

$$\frac{.092}{.0765} = 1.202$$

$$D_{\text{max}} = .1783$$

39883

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029644

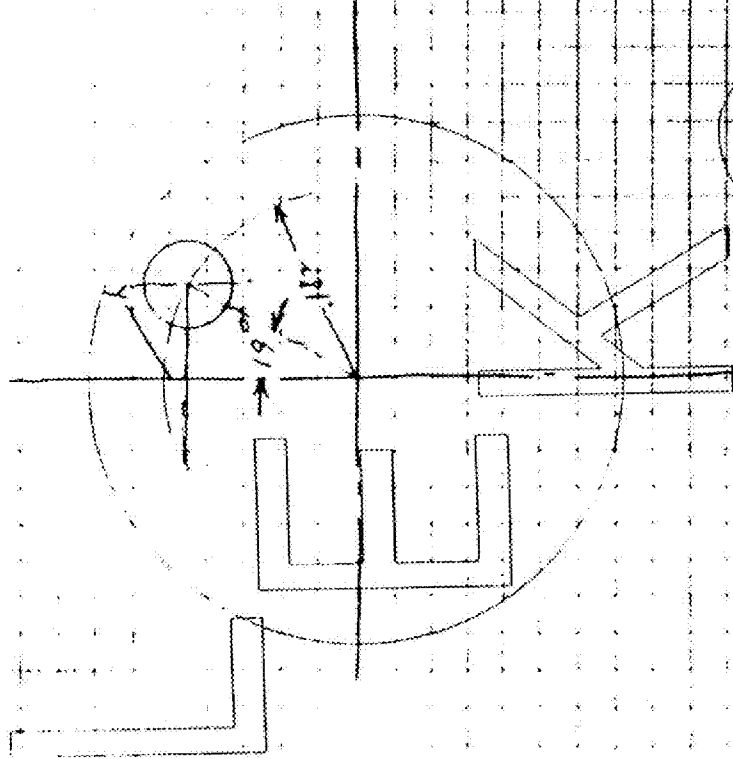
28

DATE

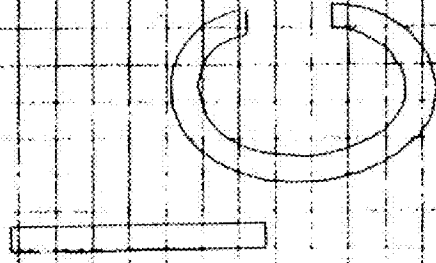
SUBJECT OF EXP.

7-19-44

Placement of gyator pin hole



$$\begin{aligned}
 h &= .18x - (.18 \times \cos 18^\circ) \\
 &= .18x - (.18 \times .9511) \\
 &= .18x - .1721 \\
 &= .019^\circ
 \end{aligned}$$



EXPERIMENTER

DATE

WITNESS

DATE

AL 0029645

4107283

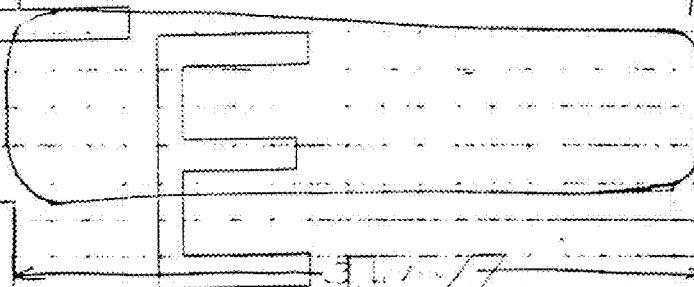
DATE:

7-18-44

SUBJECT OF EXPT.

300 H-4 Follower

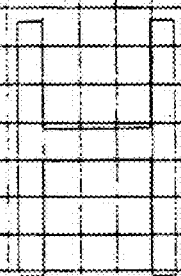
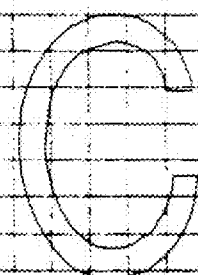
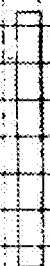
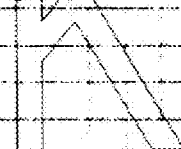
8.12
8.10



10.25
6.15

3.590
3.575

2726
852
3,590



EXPERIMENTER

WITNESS

DATE

DATE

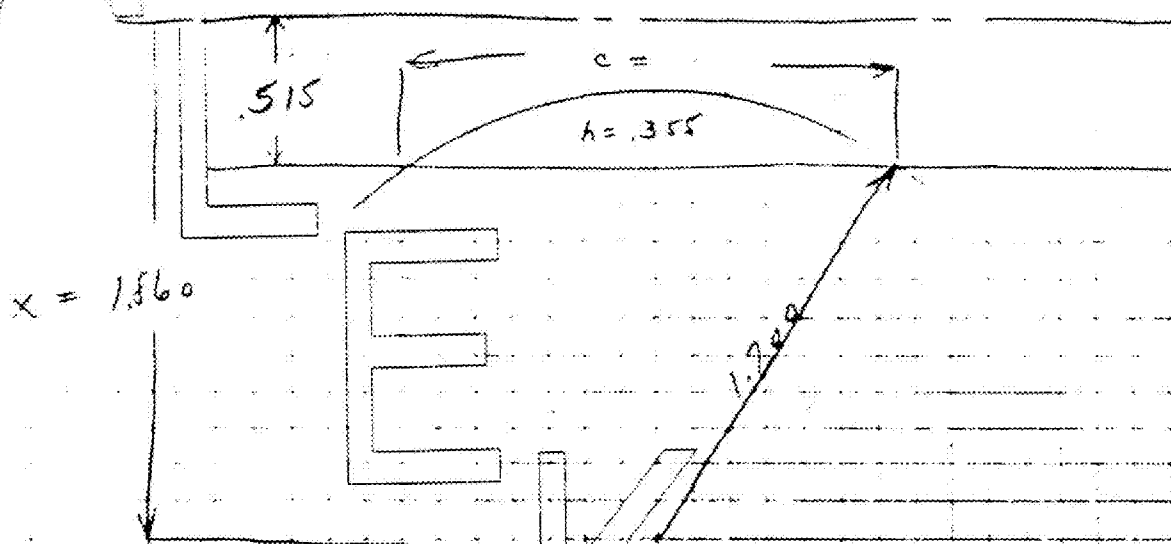
41 083
AL 0029646

30

DATE
SUBJECT OF EXPT.

7-19-42

Calculations of cutter centers for Fine control



$$\begin{array}{r} 1.860 \\ - 0.515 \\ \hline 1.345 \\ - 1.700 \\ \hline -0.355 \end{array}$$

$$\frac{h}{r} = \frac{0.355}{1.700} = 0.2088$$

$$\frac{0.022}{0.054} \times 0.13 = 0.053$$

$$\frac{c}{r} = 1.223$$

$$C = 2.080$$

For 1.645 cutter

$$\frac{c}{r} = \frac{2.080}{1.645} = 1.265$$

$$\frac{0.022}{0.13} \times 0.053 = 0.0088$$

$$\frac{h}{r} = 0.2254$$

$$h = 0.371$$

$$X = 1.645 - 0.371 + 0.515 = 1.789$$

EXPERIMENTER

WITNESS

DATE

DATE

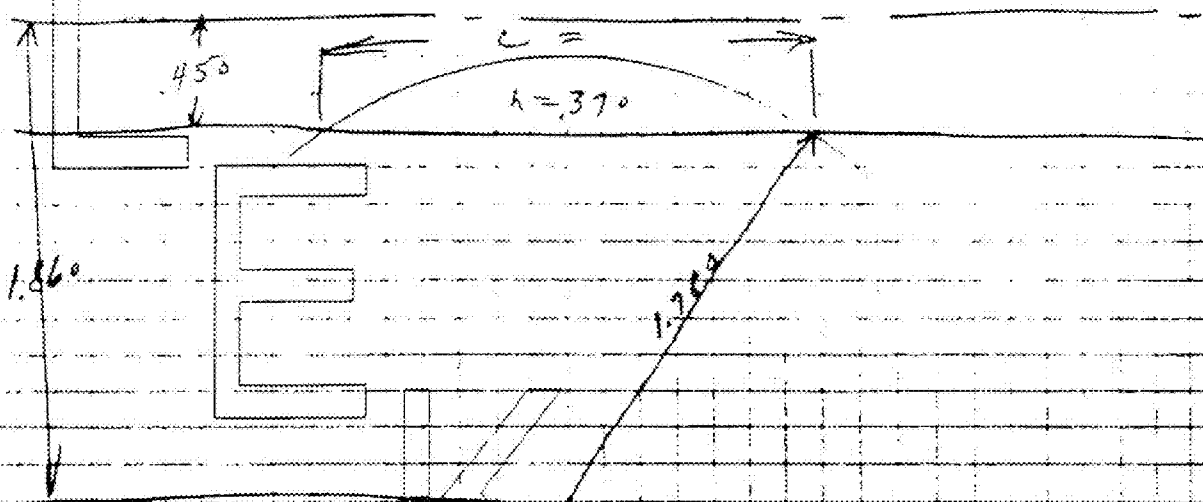
AL 0029647

DATE

7-19-44

SUBJECT OF EXPT.

Cutter centers



$$\frac{1860}{450} = 4.133$$

$$\frac{1860}{450} = 4.133$$

$$\frac{h}{r} = \frac{370}{1780} = .208$$

$$\frac{0.001}{0.001} \times 0.13 = \frac{0.0013}{0.001}$$

$$\frac{c}{r} = 1.221$$

$$C = 2.173$$

For 1.750 cutter

$$\frac{c}{r} = \frac{2.173}{1.750} = 1.242$$

$$\frac{0.001}{0.001} \times 0.050 = \frac{0.0005}{0.001}$$

$$\frac{h}{r} = 1.162$$

$$h = 378$$

$$X = 1.750 - .378 + .450 = 1.822$$

EXPERIMENTER

WITNESS

DATE

DATE

43 883
AL 0029648

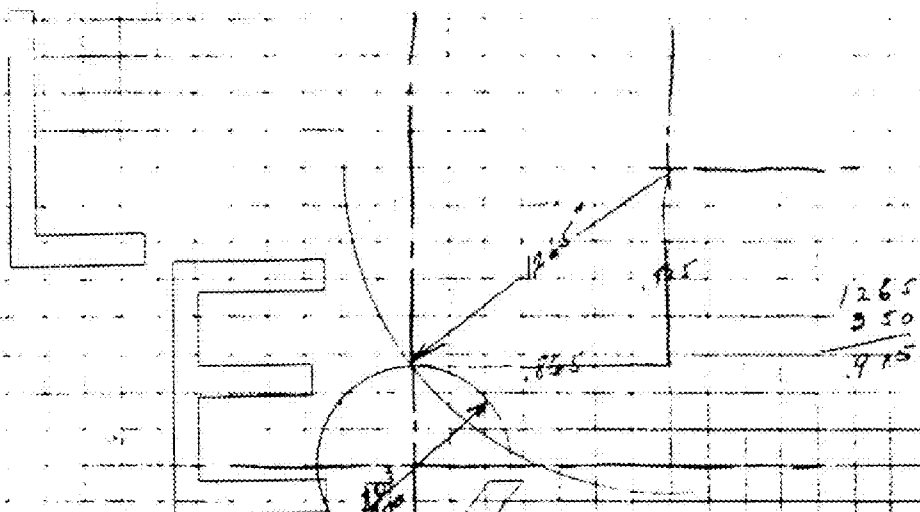
32

DATE

7-20-44

SUBJECT OF EXPT.

Extraction from Carter Center



$$\sqrt{.865^2 + .915^2}$$

$$\sqrt{.748^2 + .837^2}$$

$$\sqrt{.458.5}$$

S

C

EXPERIMENTER

WITNESS

DATE

DATE

44-283
AL 0029649

DATE 9-5-44
SUBJECT OF EXPT. Cell 4201

SUBJECT OF EXPT.

Consistency of the 71st and 72nd

Two of the four models were mounted
completely - 3-5-10. The first three were
turned on and placed to determine their
action when the very common

On 7x1 300 4x4

Mr. J. J. Jones

Headquarters

1848

10

Col. E. S. Smith

Moore & Co.

Island News

The m=721 showed very high pressure on proofing.

Other notes showed only ordinary pneumonia or prof.

The major will find his troops more than
sufficient. The gun will destroy it. However
it will make satisfactory for putting
a 15" diameter one and in the best
body of the 12" and the 15" and 12" and 12"

one
Considerable trouble was experienced with
the delays. Captain Clark and I found
it would not meet the morning. The delay
was caused by the fact that we had no
money and no food.

EXPERIMENTER
WITNESS

DATE
DATE

AL 0029650

45883

DATE
SUBJECT OF EXPT

8-11-46
M-722 heart blood & legality

At approximately 4:30 p.m. 300 hours
since the M-722 both blood testis lower
a record time. Evaporation of the joint
showed that the legs were not sufficient
the heart was found as that there was
a ring of 1000° above bottom in a ring
apart on the shell. All the same time
seemed that especially when made up and
checked on the handle mechanism very difficult
keeping temperature. The mechanism joint through
extended with a joint body joint was 700° &
joint to separate head and body. The heat joint
gave 2.500° & it was decided that the
joint of keeping compound in a solid spot
concluded the test joint.

The M-722 both handle joint during the
piercing due to head operation (rough handling).
Opening the shell by cutting with a side of steel
caused the handle. The handle was exposed and
the shoulder caused.

EXPERIMENTER
WITNESS

DATE
DATE

AL 0029651

4/6/83

DATE

9-13-45

SUBJECT OF EXPT.

Line control characteristics

$$\begin{array}{r} 1.046 \\ .315 \\ \hline 1.361 \end{array} \text{ min. seal and trip}$$

$$\begin{array}{r} 1.241 \\ .571 \\ \hline 1.762 \end{array} \text{ Max diam. Lug hole to Rec E}$$

$$\begin{array}{r} 1.762 \\ 1.361 \\ \hline .401 \end{array}$$

$$\begin{array}{r} .430 \\ .401 \\ \hline .029 \end{array}$$

Min seal engagement

$$\begin{array}{r} 1.048 \\ .335 \\ \hline 1.383 \end{array}$$

$$\begin{array}{r} 1.239 \\ .519 \\ \hline 1.758 \end{array} \text{ min diam. Lug hole to Rec E}$$

$$\begin{array}{r} 1.758 \\ 1.383 \\ \hline .375 \end{array}$$

$$\begin{array}{r} .435 \\ .375 \\ \hline .050 \end{array}$$

Max seal engagement

$$\begin{array}{r} .521 \\ .060 \\ \hline .581 \end{array}$$

$$\begin{array}{r} .435 \\ .050 \\ \hline .385 \end{array}$$

$$\begin{array}{r} .585 \\ .335 \\ \hline .920 \end{array}$$

$$\begin{array}{r} .720 \\ .078 \\ \hline .798 \end{array}$$

$$\begin{array}{r} .798 \\ .195 \\ \hline .603 \end{array}$$

.581 Max diam. Rec E to bottom of Bolt stop pin

.603 Min diam. Rec E to seal contact on bolt stop

Thru .022 = min clearance

$$\begin{array}{r} .391 \\ .195 \\ \hline .586 \end{array}$$

$$\begin{array}{r} .586 \\ .160 \\ \hline .646 \end{array}$$

$$\begin{array}{r} .646 \\ .646 \\ \hline .003 \end{array}$$

Min clearance between
Seal & Bolt stop pin with
safety on.47883
AL 0029652

EXPERIMENTER

DATE

WITNESS

DATE

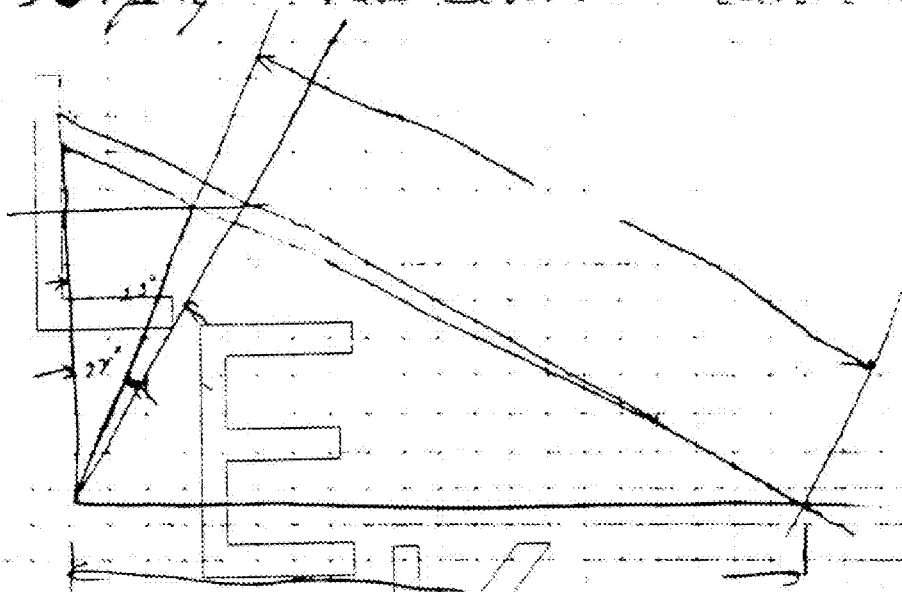
36

DATE

SUBJECT OF EXPT.

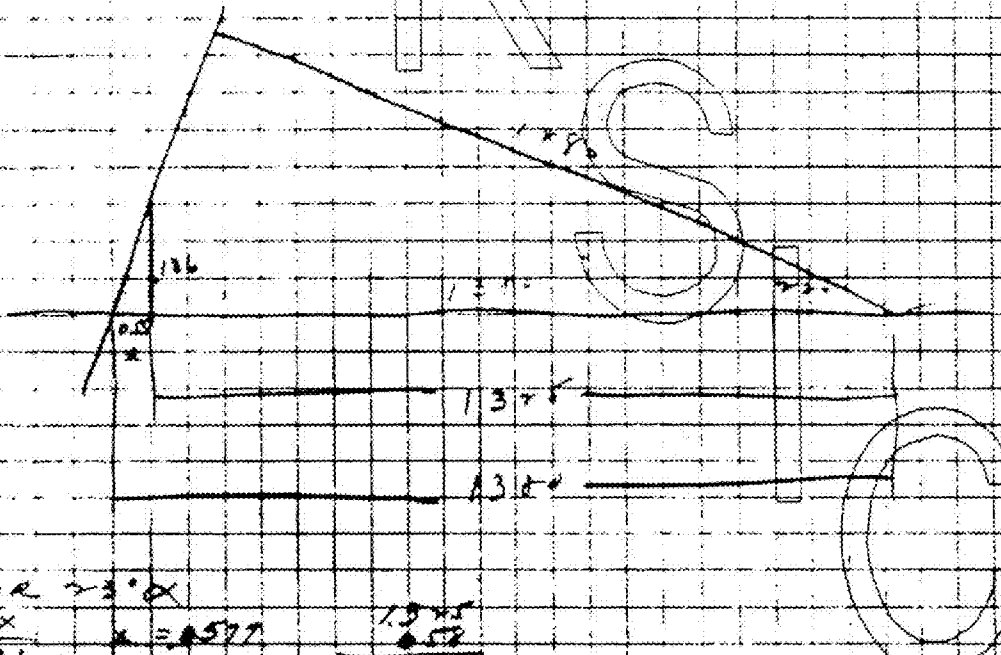
9-13-54

Safety of Fire Control Characteristics (Cont.)



$$\frac{2780}{0.77} = \frac{143}{4}$$

0.17



For 23° X

$$\frac{13.6}{13.7} = \frac{x}{13.8}$$

$$\frac{13.6}{13.7} = \frac{13.8}{x}$$

$$9 \times 0 (13.8) = 1.273$$

$$\frac{13.6}{13.7} = \frac{13.8}{x}$$

how slow
they the

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029653

DATE

9-13-44

SUBJECT OF EXPT.

Safety conditions

$$\begin{array}{r} 1.048 \\ 078 \\ \hline .970 \end{array}$$

$$\begin{array}{r} 1.241 \\ .651 \\ \hline .590 \\ .387 \\ \hline .977 \end{array}$$

$$\begin{array}{r} .977 \\ .970 \end{array}$$

Min. Safety interference = .007

$$\begin{array}{r} 1.046 \\ 82 \\ \hline .964 \end{array}$$

$$\begin{array}{r} 1.248 \\ .649 \\ \hline .599 \\ .391 \\ \hline .990 \\ .964 \end{array}$$

Max. Safety Int. = .019

Changed scan to make new old and max 026

EXPERIMENTER

WITNESS

DATE

DATE

49883
AL 0029654

38

DATE

EFFECT OF EXPT.

Thousand Spring design

Thick. OD - .170

Thin. OD - .164

ASSUME MEAN DIA. .161

LEAD 1. .380 EXTENDED .050 4th

LEAD 2. .340 SPRINGNESS LEAD

$$d^3 = \frac{2.55 PD}{S} = \frac{2.55 (4) .141}{70,000} = .00025$$

$$d = .079" \text{ USE } .078$$

$$\text{SOLIO HT. SAY } .270 = 9 \text{ COILS APPROX}$$

$$\frac{P}{F} = 36.2$$

$$F = \frac{4}{36.2} = .11$$

$$.380 + .110 = .490 \text{ FREE LENGTH}$$

$$4^{\text{th}} \text{ LEAD } S = \frac{2.55 PD}{d^3} = \frac{2.55 (4) .139}{.000219} = 4,700 \text{ PSI}$$

5th LEAD

$$= 8,100 \text{ PSI}$$

6th LEAD

$$= 97,000 \text{ PSI}$$

EXPERIMENTER

WITNESS

DATE

DATE

50883

AL 0029655

DATE
SUBJECT OF EXPT.

9-12-44
Steel Spring (Cont)

$$\frac{P}{F} = \frac{3 d^4}{8 D^3 N}$$

$$= \frac{11,500,000 (.000000615)}{11 (.00068)} = 36.6 \frac{\text{in}}{\text{lb}}$$

FREE LENGTH = .490

90% =

$$Wt COCKED = (.490 - .380) 36.6 = 4 \frac{\text{in}}{\text{lb}}$$

$$Wt FIRED = (.490 - .340) 36.6 = 5.5 \frac{\text{in}}{\text{lb}}$$

$$Wt STACKED = (.490 - .280) 36.6 = 7.7 \frac{\text{in}}{\text{lb}}$$

$$\frac{D}{d} = 5 \quad \text{WALL } K = 1.31$$

$$S = P \frac{255(1.31)}{.0000719} K = P 16200 K$$

$$\text{COCKED } S = 4 (16,200) 1.31 = 85,000 \text{ PSI}$$

$$\text{FIRED } S = 5.5 = 117,000 \text{ PSI}$$

$$90\% S = 6.1 = 139,000 \text{ PSI}$$

$$\text{SOLID } S = 7.7 = 163,000 \text{ PSI}$$

EXPERIMENTER
WITNESS

DATE
DATE

51283
AL 0029656

40
DATE
SUBJECT OF EXPT.

A

9-12-55
Sea Spring (second)

1.32

36

4d
5.5

$$36(4) = 1.32 P$$

$$P = 1.1$$

$$36(5.5) = 1.32 P$$

$$P = 1.5$$

Second Spring

O.D. - 1.67

WIRE - 0.06

MEAN D - 1.41

$$29.5(X - 380) = 4$$

$$X = \frac{38}{29.5} + 380 = 500 \text{ FREE LENGTH}$$

$$\frac{P}{E} = \frac{11,800,000 (0.0000001)}{64 (0.0076)} = 29.3$$

$$10 \text{ d x } 5.4 = 1.78 \text{ WALL K}$$

COILED	(500 - 380)	29.3	= 3.5	K
FIRE	(500 - 340)	"	= 4.1	K
STACKED	(500 - 240)	"	= 7.8	K
80%	(215)	"	= 6.2	K

COILS	3.5	(20,400)	1.78	= 92,000 PSI
FIRE	4.1	"	"	= 123,000
STACKED	7.8	"	"	= 204,000
80%	6.2	"	"	= 162,000

EXPERIMENTER

WITNESS

DATE

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52,983

AL 0029657

DATE
SUBJECT OF EXPT.

9-18-44

Low Spring (Flind)

$$\frac{P}{F} = \frac{G d^4}{32 D^3 N}$$

$$\begin{aligned} 0.18 &= d \\ 1.12 &= D \\ 8 &= N \end{aligned}$$

$$= \frac{11,500,000 (0.000000315)}{64 (.00268)} = 41.2 \text{ in}$$

$$21.2 (X - 380) = 3.5$$

$$X = \frac{3.5}{41.2} + 380 = 380.085 = \text{FREE LENGTH}$$

$$\text{WT. COILED} = 380 (41.2) = 3.5$$

$$\text{FIXED} = 380 = 5.1$$

$$\text{STRETCH} = 752 = 8.8$$

$$\text{80\%} = 491 = 7.0$$

$$S = P \cdot FSS (1.59) \quad R = P \cdot 16700K$$

$$\frac{P}{d} = 5 \quad R = 1.31$$

$$\text{COILED } S = 3.5 (16700) 1.31 = 74,000$$

$$\text{FIXED } S = 5.1 \quad " \quad " = 108,000$$

$$\text{STRETCH } S = 8.8 \quad " \quad " = 187,000$$

$$\text{80\% } S = 7.0 \quad " \quad " = 148,000$$

EXPERIMENTER

WITNESS

DATE

DATE

53083

AL 0029658

28-23-42
M-722 Primary Tests

A 360° preliminary soundation in the m-722 gave our position to find out the cartridge base locking under the bolt. The bolt on the m-722 is noticeably hard on closing due to the extractor. A few of these 360 were fired at the target with very good results.

E K S I C

H

EXPERIMENTER

DATE

WITNESS

DATE

5/18/83

AL 0029659

DATE

SUBJECT OF EXPT.

4-21-45

M-721 Preliminary tests

After prop. after M 721 head. cool
spec. head spec. (2.27"). Max heading
on assembly and from contact on the, large
condensation in this condition.

E K S I C I

EXPERIMENTER

DATE

WITNESS

DATE

55-283

AL 0029660

11

DATE
SUBJECT OF EXPT.

9-26-44 Spring Pin Tolerance Check (Repeat)

min 1.311

Bolt
.451
.315
.433
.064

1.263

1.311

.048 min Protusion

064
5.414
1.317
6.731
6.731

FP
max 1.317

.449
.309
.457
.060

1.245

1.317

.072 max Protusion

0.1800
.450

225
5.3
7.20

min over all length

Rec + Seal

4819 48.71 Rec Heat
1.365 min 1.384 Sec
6.190
6.128

Bolt

5.360
.492
4.863
.265

4.598 max

895
170
205

560
172
173

Tan 23° = 42.45 = X

X = .0467

140
30
110

4.451
X

X = .064

Cocking Pin

56.5
450
1.010 max
4.598
5.606

Long Pin from
to shoulder

6.84
6.4
6.120

6.190
6.4
6.126

EXPERIMENTER
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DATE
DATE

56883
AL 0029661

DATE

SUBJECT OF EXPT.

9-26-44

Cocking Tolman's clock (Repeat)

Some dimensions on 1st floor

$$1.16 = \frac{x}{2.5} = 1.27$$

$$x = 1.27 \times 2.5 = 3.175$$

Rec Bolt min D.H. max

5.715 min

309

315

5.220 max

335

5.360

5.664

5.675

421

434

5.341 closed

Rec of Bolt from
shoulder

5.229 closed

1.00

1.05

"

5.327 locked

5.346

.35

.32

Cocking Piece noted

5.292

5.316

553

400

415

153

5.602

5.731

400

437

434

560

6.129

6.165

145

6.137

-15

812

5.325 notch to stop shoulder

5.125

3.00 Max stroke

497

145

315

.444

.812

.589

309

150

5.602

6145

497

450

796

796

.600

5.825

5.349 notch to stop shoulder

notch 4 finger on shoulder

5008

0.341

Max Stroke

5.602

3.001

EXPERIMENTER

WITNESS

DATE

DATE

57283

AL 0029662

46

DATE

SUBJECT OF EXPT.

9-27-44

Max Solid Height of Main Spring

$$\begin{array}{r} 1.000 \\ .530 \\ \hline \end{array}$$

1.830

1.810

7.840

Solid Height

450

560

1,010 Cocking Piece

5.600

.250

5.363

2.840

2.513

Max Solid Height 721

722

4.758

.250

4.503

2.840

1.663

Max Solid Height 722

EXPERIMENTER

DATE

WITNESS

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55083

AL 0029663

DATE
SUBJECT OF EXPT.

9-27-44

Main Springs

in - 72
Avg # A-753-7

Load 24.4 - 26.8 at 2.17 28" defn.

Length joined

985
365
620
330
950
742
1692

430
62
492
250
742
5357
1692

Stress .313
Prot .054

3465
850
2815

297
330
635
3175

3.346
850
2.498

3.665 Length joined 19 #

3.348 Length cracked 21 #

5800
3465
2435 = 18.5 #
26.1 #
24396

5800
3346
2452 = 21.1 #

24.4
26.8
51.2
25.6
663

2.97
2.20
77

3.348
3628
290
145
349

19.8 # X 297 = 5.9" # Min Energy

Stacked
 $S = \frac{8 P D}{\pi d^3} = \frac{8 (52.2) .345 (6.0)}{\pi (1.416)^3} = 167,000$

Max Working Stress = 121,000

in 72
69283

EXPERIMENTER
WITNESS

DATE
DATE

AL 0029664

Main Spring m72

Screwdriver for Gun Hole

" " " on 783° Pm

New 1/2 inch 1.600" Free Length

055 wire

400 outside

29 total coils

29 outside

$$\text{Spring Rate } \frac{F}{\Delta} = \frac{G d^4}{8 D^3 N} = \frac{11,500,000 (0.030915)^4}{8 (29)^3 (64.12)} = 11.9$$

Coiled Length 2.496

Final Length 2.815

- 21 =

17#

Stress

31.3

Plot 0.54

4.1

$$\begin{array}{r} 2(5353) \\ 2656 \\ 1490 \\ \hline 4286 \end{array}$$

S

$$S(\text{stress}) = \frac{8 P D}{\pi d^3} = \frac{(31.3)(345/100)}{3.14(0.030915)^3} =$$

$$\text{Wt. Coiled} = 4.2 - 2.496 (11.8) = 20.1 \text{#}$$

$$\text{Wt. FIRED} = 4.2 - 2.815 (11.8) = 16.5 \text{#}$$

$$18.3 \times 2.97 = 5.41 \text{ 1/2 Energy}$$

$$\text{Max Working Stress} = 117,000 \text{#}$$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029665

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DATE

SUBJECT OF EXPT.

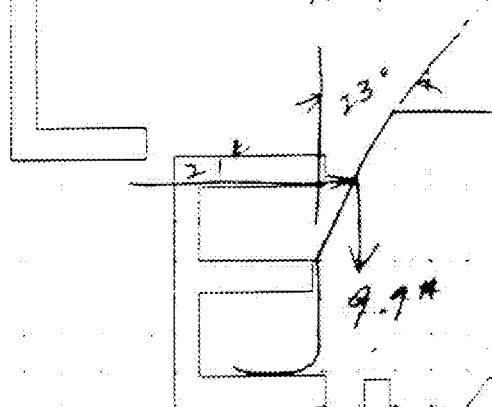
12-20-44

New Sec + Safety

(Cont)

Calc on old sec + Safety

$$\text{Actual } L = \frac{8.5(1.5)}{1.29} = 9.9^{\circ}$$



4.3/1 = ADVANTAGE

$$3.6(1.24) + 22.8(41) - 2(129) \pm 1.29 L$$

$$4.52 + 9.35 - 2.58 = 1.29 L$$

$$\text{Then } L = \frac{11.29}{1.29} = 8.8^{\circ}$$

Actual Load to put safety on = 6° off = 4° Theoretical on = 1.8° neglecting safety friction

G include the detent

Detent = $3\frac{1}{2}^{\circ}$

$$\frac{N}{8.8} = \cos 45^{\circ} = .707$$

$$N = 6.2^{\circ}$$



$$\frac{X}{390} = \cos 45^{\circ} = .707$$

$$X = 276$$

$$F_{\text{safety}} = \frac{276 \times 6.2}{97} = 1.8^{\circ}$$

By case $\frac{9.9}{4.3} = 2.3^{\circ}$ to put safe on

$$\text{actual} = 6^{\circ} - 3\frac{1}{2}^{\circ} = 2.5^{\circ}$$

EXPERIMENTER

WITNESS

DATE

DATE

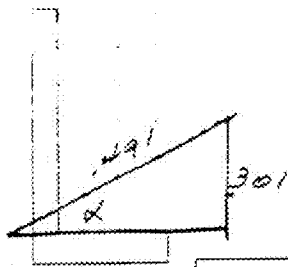
62783
AL 0029667

DATE

1-3-48

SUBJECT OF EXPT.

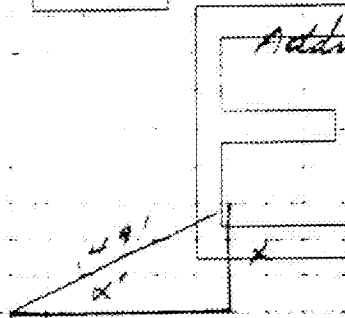
new location of Safety Detector Hole in Housing



$$\sin \alpha = \frac{301}{491} = .613 \quad \alpha = 37^{\circ}-41'$$

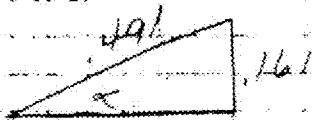
Adding 5' to α

$$\alpha' = 42^{\circ}-46'$$



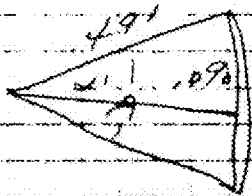
$$\sin \alpha' = .6792 = \frac{x}{491}$$

$$x = 334 \quad \text{not satisfactory}$$



$$\sin \alpha = \frac{161}{491} = .3277$$

$$\alpha = 19^{\circ}-8'$$



$$\sin \alpha' = \frac{49}{491} = .0998$$

$$\alpha' = 5^{\circ}-43'$$

$$A = 21^{\circ}-6'$$

$$10.45$$

$$21.36$$

$$10$$

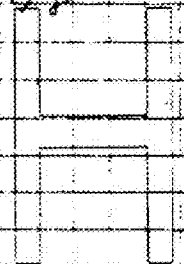
$$41.81$$

$$\alpha + A = 40^{\circ}-14'$$

$$37^{\circ}-41'$$

USE $46^{\circ}-48'$

$$\sin 46^{\circ}-48' = .7237 = \frac{x}{491} \quad x =$$



63883

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029668

52

DATE

10-18-65

SUBJECT OF EXPT.

COCKING & TOL. CHECK.

SEAR IN HOLE FROM LOG = 3.971 MAX
 " " " TO SEAR POINT = 1.3036 MAX

LOG SEAT TO POINT OF SEAR 5.2746 MAX

MAX LOG TO BOLT HANDLE = 4.380

MIN LOG TO COCKING POINT

30.9 3 BOLT HEAD

4.505 5 BOLT BODY

4.814

- .035 5 CAM SEAT

4.779

1.550 5 CAM POINT TO SHOULDER

5.329

- .145 5 SHOULDER TO MATCH

5.184

4.380

8.04

MIN BOLT HANDLE TO COCKING POINT

4.365 MIN LOG TO BOLT HANDLE SEAT

1.50 MIN PRIM EXT.

5.269

MIN LOG TO MATCH BOLT OPEN

+ .030 for coming into match in bolt

giving .025 MIN OVER TRAVEL

IF PRIMARY EXTRACTION CAM
 IS O.K.

Tan 27° = Log 5 = $\frac{x}{.140}$

$x^m = .0714$

$x^m = .0765$

Cos 27° = .891 = $\frac{y}{1.375}$

$y^m = 1.375$

$y^m = 1.369$

1.375 - .0714 = 2^m

.0714

1.3036

1.369 - .0765 = 2^m

.0765

1.2925

1.3036

2.5961

2.98

6.4283

EXPERIMENTER

WITNESS

DATE

DATE

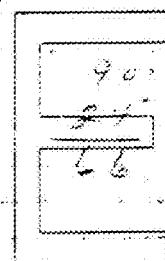
AL 0029669

DATE

SUBJECT OF EXPT.

10-18-45

PRIMER EXTENSION CHECK



$$\sin \alpha = \frac{10}{35} = .2857$$

$$\alpha = 16.35'$$

$$\begin{array}{r} 45 \\ 5 \\ 16.35 \\ \hline 66 \end{array}$$

$$3\alpha = 5/4000$$

$$\begin{array}{rcl} \text{Scar Pin hole from Rec Lug} & = & 3.770 \pm 1 \\ \text{Scar Pin hole to scar notch} & = & 1.298 \pm 5/6 \\ \hline & & 5.268 \pm 6/6 \end{array}$$

$$\text{Bolt Head} = 3.12 \pm 3$$

$$\text{Bolt Body} = 4.5075 \pm 2.5$$

$$\text{Cam Seat} = 4.6195 \pm 5/5$$

$$\text{Cam point to shoulder} = 4.7870 \pm 8.0$$

$$\text{Shoulder to Notch} = 5.3420 \pm 13.0$$

$$\text{Lug to Bolt Head} = 5.1945 \pm 15.5$$

$$\text{Rec shoulder to Ext cam} = 4.3675 \pm 2.5$$

$$\text{Cam} = 4.1025 \pm 2.5$$

$$\text{Lug to Bolt Head} = 4.4700 \pm 5$$

$$\text{Rec shoulder to Ext cam} = 4.3675 \pm 2.5$$

$$\text{Cam} = 4.1025 \pm 2.5$$

$$\text{Lug to Bolt Head} = 4.4700 \pm 5$$

$$\text{Rec shoulder to Ext cam} = 4.3675 \pm 2.5$$

$$\text{Cam} = 4.1025 \pm 2.5$$

EXPERIMENTER

WITNESS

DATE

DATE

AL 0029670

$$\sqrt{2} \sigma = \pm 10.2$$

$$65783$$

54

DATE 10-22-45
SUBJECT OF EXPT.New section part & section came out the section
as per request of engineering.

$$\begin{array}{r} 2.272 \\ 16.10 \\ \hline 1.361 \end{array}$$

$$\begin{array}{r} 2.272 \\ 16.10 \\ \hline 1.361 \end{array}$$

$$\begin{array}{r} 70.5 \\ 9.607 \end{array}$$

$$76 = \frac{1361}{1.791} = 760.1$$

$$\alpha = 40.32^\circ$$

$$\tan \alpha = .855 = \frac{x}{1.361}$$

$$x = 1.165$$

$$\sin A = \frac{2}{(1.13)2.97} \sqrt{2.175(1.824)(1.05)(2.45)}$$

$$30.11^\circ \quad \frac{1.213}{x} = \cos 30.11^\circ = .865$$

$$A = 9.13^\circ$$

$$\begin{array}{r} 2.040 \\ 1.331 \\ \hline 1.331 \\ 1.331 \\ \hline 1.331 \end{array}$$

$$\begin{array}{r} 2.175 \\ 1.175 \\ \hline 1.175 \end{array}$$

$$\begin{array}{r} 30.0^\circ \\ 2.3 \\ \hline 1.175 \end{array}$$

$$\sin 43.25^\circ = \frac{x}{1.328} \quad x = 1.328$$

$$\sin \alpha = \frac{1.163}{1.351}$$

$$57.38^\circ$$

$$3.37$$

EXPERIMENTER
WITNESSDATE
DATE6/6/83
AL 0029671

DATE
SUBJECT OF EXPT.

$$h = 351(1 - .8454)$$

$$= 551(1 - .8454)$$

$$= .0402$$

N.G.

Angle of chord on ext com on Rec = 13° 47' with H

E

$$\frac{117}{112}$$

$$\frac{1.93}{1.79}$$

$$1.14$$

$$\tan x = \frac{1.145}{1.14} =$$

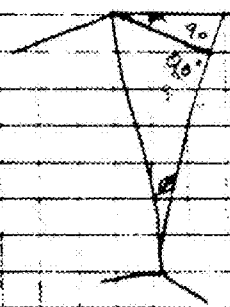
N.G.

$$x = 39^{\circ} 16'$$

$$9 + 355 = \frac{7}{.351}$$

$$\frac{1712}{320}$$

$$1.392$$



$$\frac{21256}{351}$$

$$21256$$

$$106280$$

$$63760$$

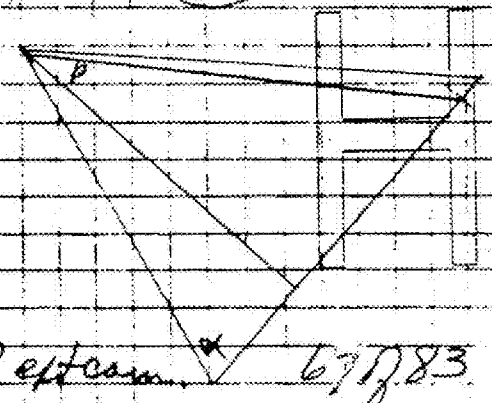
$$7460851$$

$$2$$

$$149212$$

$$\sin 25^{\circ} = .4067 = \frac{x}{.351}$$

$$\frac{1.712}{1.392}$$



$$\frac{1.165}{1.43}$$

$$1.308$$

$$1.392$$

$$\sin 43.13' = \frac{1.308}{x}$$

$$6847$$

$$x = 1910 \text{ outer Reft cam.}$$

$$677783$$

EXPERIMENTER
WITNESS

DATE
DATE

AL 0029672

56

DATE

SUBJECT OF EXPT.

A

$$\sin A = \frac{r}{b c} \sqrt{s(s-a)(s-b)(s-c)}$$

$$a = .493$$

$$b = 2.070$$

$$c = 1.900$$

$$4.469$$

$$2.2345$$

$$1.400$$

$$1.7355$$

$$2.2345$$

$$2.070$$

$$.1645$$

$$2.2345$$

$$1.9$$

$$.3345$$

$$= .508$$

$$\sin A = .2348$$

$$A = 13.5 - 3.5$$

$$34 = 12$$

$$47 - 47$$

$$\sin 47 = \frac{x}{1.900} = .7406$$

$$x = 1.407$$

$$1.165$$

$$\cos \alpha = \frac{1.43}{1.46}$$

$$\alpha = 11.45^\circ \text{ ept cam chord angle with Hody}$$

$$2.0791$$

$$351$$

$$2.0791$$

$$103955$$

$$62373$$

$$.07297641$$

$$2$$

$$.14594$$

$$1.910$$

$$1.79$$

$$.120$$

$$1.185$$

$$1.20$$

$$.84$$

$$A = 43.39^\circ \text{ ept cam angle with Rec.}$$

$$2.527$$

EXPERIMENTER

WITNESS

DATE

DATE

68883

AL 0029673

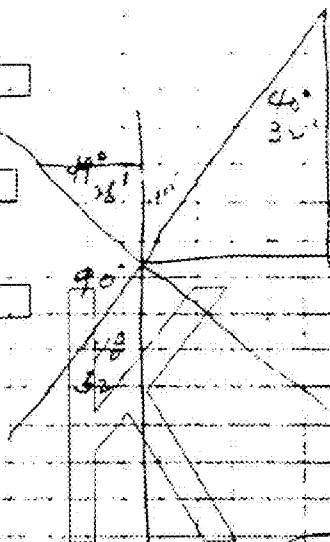
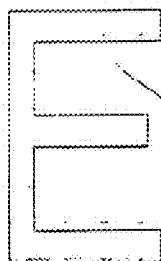
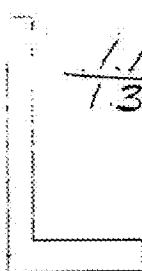
DATE

SUBJECT OF EXPT.

$$\frac{1.165}{1.361} = \tan \alpha$$

$$\alpha =$$

$$\frac{1712}{1351} = 1.267$$



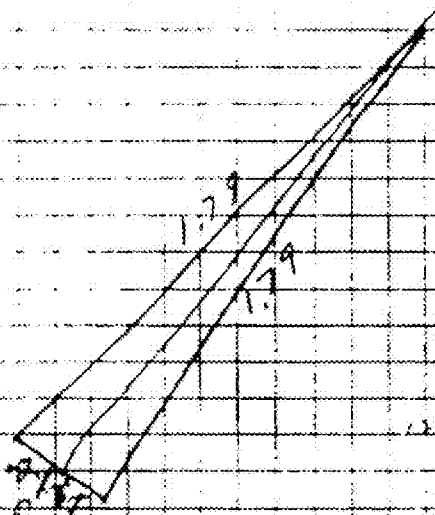
$$\frac{179}{138.32} = 1.294$$



$$\cos 49^{\circ} 28' = \frac{1405}{X}$$

$$X = 1649$$

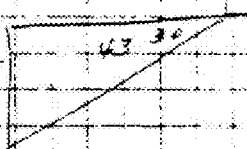
$$X = 2161$$



$$\sec 49^{\circ} 28' = 1.5382$$

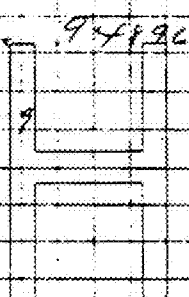
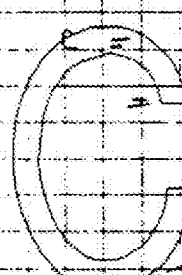
$$X = 1.5387 (1405)$$

$$X = 2161$$



$$\tan 43.30 = \frac{1225}{X}$$

$$X = 129$$



67883

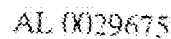
EXPERIMENTER
WITNESS

DATE
DATE

AL 0029674

SUBJECT OF EXP

6-43
Clinton Howings

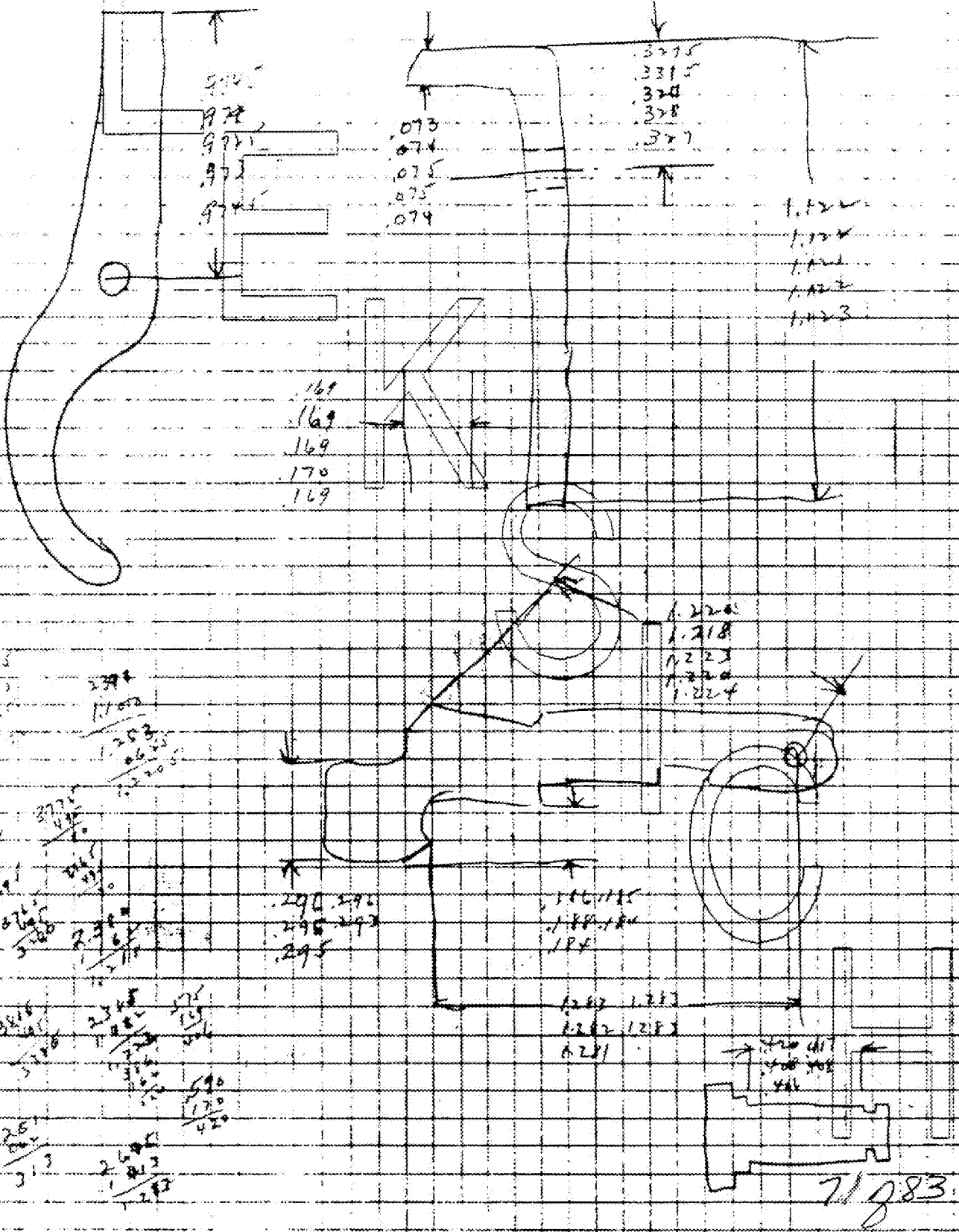


~~DATE~~

SUBJECT OF EXPT.

71-12-45

check on TOGGERS ETC.



EXPERIMENTER

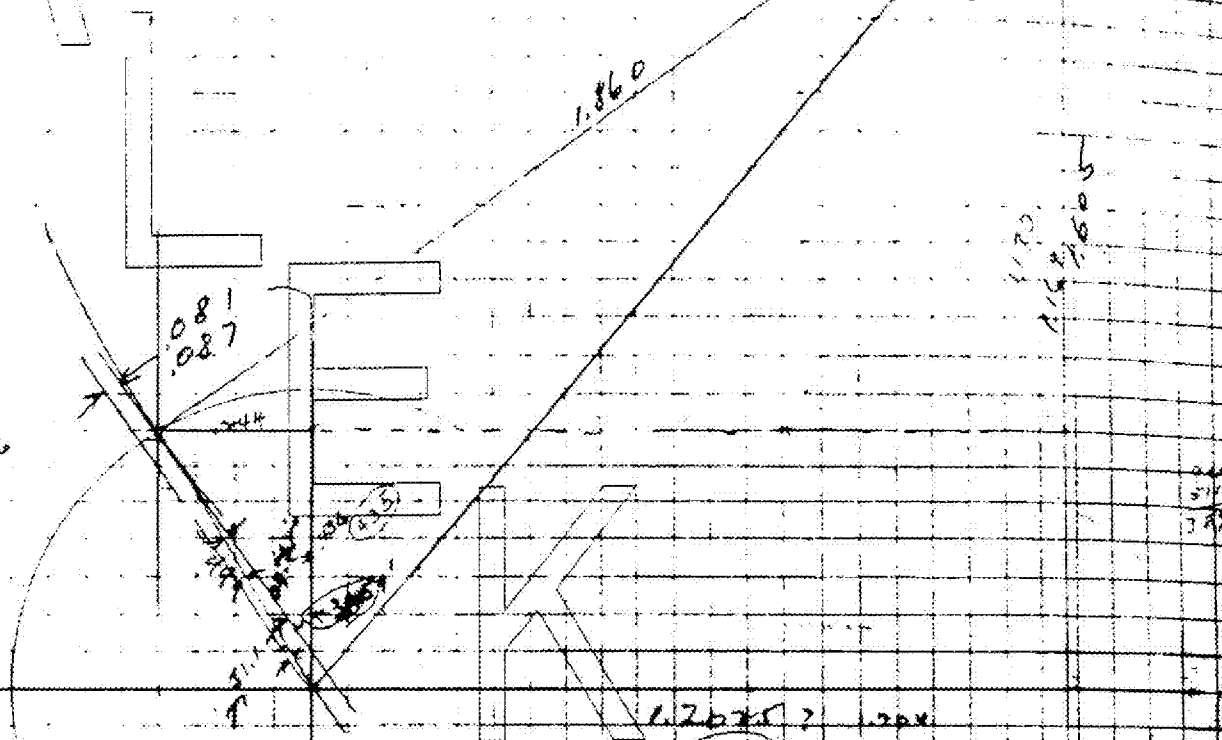
WITNESS

DATE _____

DATE:

AL 0029676

Extraction corn



$x = 3/4$

386

$$T_{\text{max}} = 15^\circ = 54^\circ \text{W} = 54^\circ$$

* - 456

$$\lim_{x \rightarrow 0} \frac{1}{x} = \infty$$

4-154

$$\sin 9.44^\circ = \frac{x}{490} = .167$$

天竺寺

4-660


120757 1207

1-2-8

$8012.74 - 189 = 480962$

$$2^9 - 16 = 48$$

1.2020
240



1665

444

7747

$$\sin \beta = \frac{1.446}{1.86} = 0.777$$

B-517

$$\text{Frac. } \phi = \frac{1.4465}{1.169} = 1.236$$

$$\beta \in ST_{n,1}$$

$$\frac{\lambda}{1.190} = 1.235 \quad \text{72.983}$$

EXPERIMENTER

WITNESS

DATE _____

DATE _____

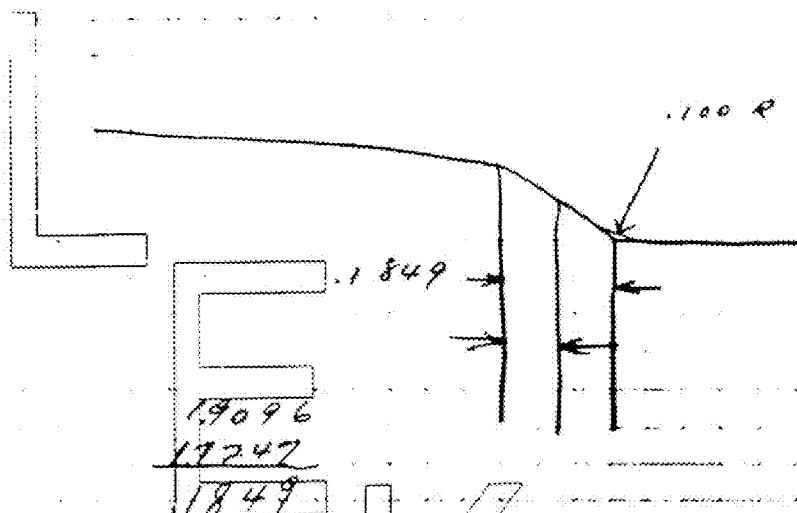
AL 0029677

DATE

4-8-46

SUBJECT OF EXPT.

.274 Rem.



$$\begin{array}{r} 214314 \\ 2157 \end{array}$$

$$\begin{array}{r} 4314 \\ 292 \\ \hline 211394 \\ 10697 \end{array}$$

$$\begin{array}{r} 875 \\ 1275 \end{array}$$

$$\begin{array}{r} 17222 \\ 17247 \\ \hline .0030 \end{array}$$

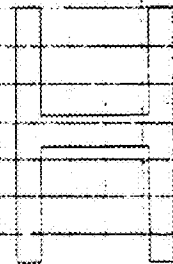
$$\begin{array}{r} 4294 \\ 2147 \\ \hline 19117 \\ 19096 \\ \hline .0021 \end{array}$$

$$\begin{array}{r} 300 \\ 028 \\ \hline 2375 \\ 1689 \end{array}$$

$$\begin{array}{r} 20542 \\ 1988 \\ \hline .5062 \end{array}$$

$$\begin{array}{r} 20542 \\ 1988 \\ \hline .5062 \end{array}$$

$$\begin{array}{r} 20542 \\ 1988 \\ \hline .5062 \end{array}$$

$$\begin{array}{r} 20542 \\ 1940 \\ \hline 1079 \end{array}$$


73883

AL 0029678

EXPERIMENTER

WITNESS

DATE

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62

DATE

SUBJECT OR EXPT.

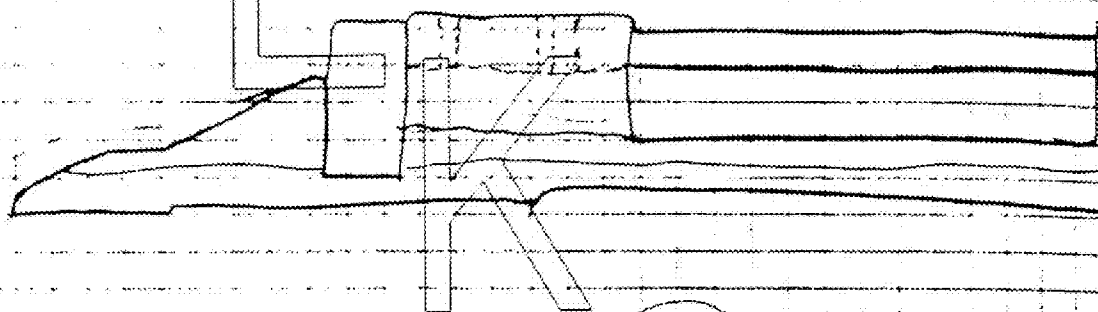
5-21-46

SKETCH FOR SCIENTS

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EXPERIMENTER

WITNESS

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DATE

24-283

AL 0029679

DATE

SUBJECT OF EXPT.

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WITNESS

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DATE

76283

AL 0029680

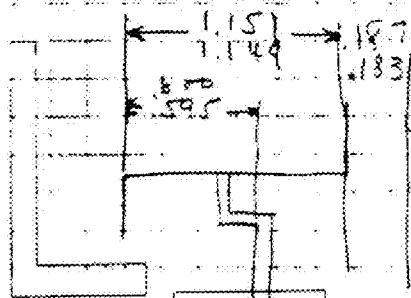
64

DATE

8-25-47

SUBJECT OF EXPT.

Bolt + Bolt. Class.



93

95

718

1.149

.183

1.332

.718

.604

.662

.004 from

1.151

.187

1.338

.723

.615

.595

.020 mark

.4485

1.151

.187

1.338

.4485

.887

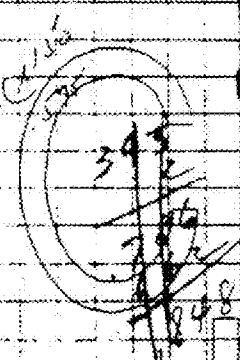
1.149

.183

1.332

.4515

.8805



EXPERIMENTER

WITNESS

DATE

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76783

AL 0029681

DATE
SUBJECT OF EXPT.

10-1-48

New Calculations for Report in
Product Engineering Article

BARREL STRENGTH

FORMULAE Lame's

$$S = \frac{P(r_2^2 + r_1^2)}{r_2^2 - r_1^2}$$

S = stress tang.

P = Int press.

r₁ = inside r

r₂ = outside r

$$r_1 = .750 = .0625$$

$$r_2 = .515 = .331$$

$$S = \frac{1}{2} r P \quad t = \text{thickness}$$

$$P = 84000 \text{ psi}$$

$$= \frac{1}{2} (250) 84000$$

$$S = \frac{84000 (.343)}{.269}$$

$$S = 18,250 \text{ tangit.}$$

$$= 123,000 \text{ psi}$$

$$\frac{123000}{1.675} = 104,750$$

ORDNANCE

$$\theta = \frac{P}{\frac{3}{2} \left(\frac{r_2^2 - r_1^2}{r_2^2 + r_1^2} \right)}$$

θ = Elastic limit
of material
used.

$$= \frac{84000}{\frac{3}{2} \left(\frac{.269}{.724} \right)}$$

$$= \frac{84000}{.724}$$

$$= 116,000$$

$$= 150,000$$

EXPERIMENTER
WITNESS

DATE
DATE

77883
AL 0029682

66

DATE

SUBJECT OF EXPT.

10-4-68

Cox's

$$Y = \frac{2}{3} \frac{P}{W^2 - 1} (2W^2 + 1)$$

$$W = \frac{\text{outside dia}}{\text{inside dia}}$$

P = Pressure unit

$$Y = \text{Stress}$$

$$W = \frac{1.15}{.57} = 2.017$$

$$Y = \frac{2}{3} \frac{8400}{4.19} = 15200$$

AVERAGE S using LAMES $P_0 = 0$

$$S = P \left(K_1^2 + \frac{r_1^2 r_2^2}{r^2} \right) / (r_2^2 - r_1^2)$$

Substituting

$$r = .750 \quad S_r = 123,000$$

$$r = .331 \quad S_r = 80,600$$

$$r = .412 \quad S_r = 57,200$$

$$r = .494 \quad S_r = 45,600$$

$$r = .575 \quad S_r = 38,800$$

EXPERIMENTER

WITNESS

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AL 0029683

72783

DATE
SUBJECT OF EXPT.

10-4-48
CONT.

$$\text{AREA} = \frac{123,000 + 80,600}{2} (.081) = 8230$$

$$\frac{80,600 + 57,200}{2} (.081) = 5580$$

$$\frac{57,200 + 45,600}{2} (.082) = 4160$$

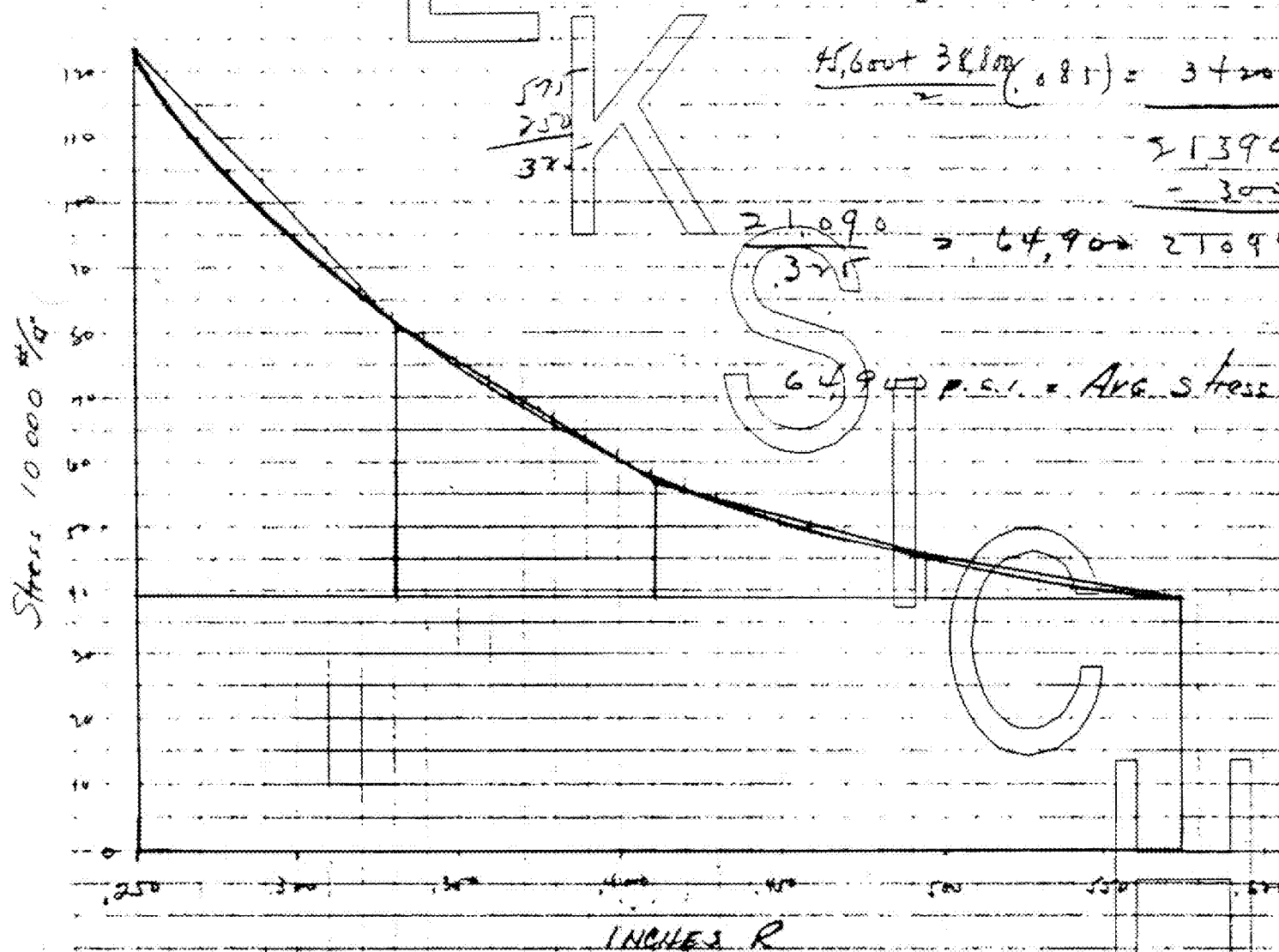
$$\frac{45,600 + 38,100}{2} (.081) = 3420$$

$$21390$$

$$- 3000$$

$$\frac{21090}{375} = 64,900 \rightarrow 21090$$

64,900 p.s.i. = Avg. stress



EXPERIMENTER
WITNESS

DATE
DATE

AL 0029684

A

10-11-48
Cont. LOCK TIME

$$E = \frac{1}{2} MV^2$$

$$E = 15$$

$$V = \frac{V_1 - V_2}{2}$$

$$V_1 = 0$$

$$V = \frac{V}{2}$$

$$V = \frac{2.5}{T}$$

$$V = \sqrt{\frac{2E}{M}}$$

$$T = \frac{2.5}{\sqrt{\frac{2E}{M}}}$$

$$2 \left(\frac{.300}{12} \right)$$

S

$$2(6.25)$$

$$\frac{2(21) \frac{.300}{12}}{67.9 \times 1012}$$

$$\sqrt{\frac{1.05}{.00067}}$$

$$= \frac{.025}{\sqrt{2246}}$$

$$= \frac{.056}{14.9}$$

$$= .00334$$

C

$$21 \left(\frac{.300}{12} \right) = \frac{1}{2} \frac{67.9(1012)}{32} V^2$$

$$T^2 = \frac{4S^2}{2PS}$$

$$T^2 = \frac{2SM}{P}$$

3.48
3.48
3.48
3.48
3.48

80783

DATE

SUBJECT OR EXPT.

A

$$T = \frac{\sqrt{2MS}}{P}$$

$$E = \frac{1}{2}mv^2 \quad E = PS$$

E

K

S

I

C

H

EXPERIMENTER

WITNESS

DATE

DATE

81 253

AL 0029686

70

DATE

SUBJECT OF EXPT.

A

E

THIS BOOK MICROFILMED
AS COMPLETE
MAKE NO ADDITIONAL ENTRIES

K

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EXPERIMENTER

WITNESS

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82283
AL 0029687

DATE
SUBJECT OF ENTRY

THIS BOOK MICROFILMED
AS COMPLETE
MAKE NO ADDITIONAL ENTRIES

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EXPERIMENTER
WITNESS

DATE
DATE

83283
AL 0029688

RECEIVING and ESTIMATE REPORT

ORDER R **22286**

FROM DATE 11/14/76 RECEIVED 917K ESTIMATED W33 VIA up CHARGES

FROM Peoria Police Dept

542 St Adams St Peoria, ILL

MODEL and GRADE 700 BDL variant 223rem SERIAL NO. H6234126 DATE CODE X2

FOR COMPUTER REFER ONLY Lights REPAIR CHG 80 55

GUN CONDITION (New) (Slightly worn) (Very worn) (Misused) (Others) W TOTAL

CUSTOMER'S COMPLAINT Safety moved from safe to fire

Position + he wrapped around fire

MAIN FAULT Trigger connector Bracket

GALLERY REPORT 19461 - trigger connector

File - M/700 Customer Complaint

PLAINTIFF'S EXHIBIT
3169

123
AL 0029689

RECEIVING and ESTIMATE REPORT

ORDER R 22285

FROM DATE 7-14-76 ESTIMATED 9-17-76 VIA VP CHARGES

FROM PEORIA Police Dept
42 SW Adams St PEORIA, ILL
MODEL and GRADE 700BOL vrenmt 223 Rem SERIAL NO AL 36452 DATE CODE XZ 2/75

FOR COMPUTER REFER. ONLY
GRADE CODE
REPAIR CHG. 80.55
PARCEL POST

GUN CONDITION (New) (Slightly worn) (Very worn) (Messed) (Ruined)
TOTAL

CUSTOMER'S COMPLAINT Safety not work safe to fire
position + he was afraid to fire
MAIN FAULT

gun water Broken Trigger ADS
Screws not properly 45 outside factory

GALLERY REPORT

19461 - Trigger gun water

7-14-76
Customer Complaints
ADS Trigger (H)

(Clean) (Test) (Target)
Inspection

223
AL 0029690

POLICE DEPARTMENT

AL
POLICE DEPARTMENT

Sept. 3, 1976

Remington Arms

Arms Service Division

Elion, N.Y. 13357

Gentlemen:

Enclosed please find two Remingtons, Model 700, Varmint Special, .223 Cal.
rifles- Serial #'s A6237986 and A6236452. R22285

These rifles were purchased by this department earlier this year from
Varmint Guns Inc., Belle Fontaine, Ohio. Both of these weapons were found
defective and when we contacted them, we were informed to send the weapons
back to the manufacture as they would be the only ones who would repair
them.

Both these weapons are used by our Tactical Unit, and we are waiting
as soon as possible.

Both of these weapons were fired less than 100 rounds when it was found that
they were unsafe. With a live round in the chamber and the bolt closed, the
safety was moved from the "safe" to "fire" position the weapon would fire.
This did not happen every time, but it did happen intermittently.

Sincerely,

Sergeant Russell Davis

5425W Adams
Rockville, Md. 20852
202/678-2521

AL 0029691
303

Handy Saylor

A

section gives us this model, instead of expensive
specimen ammunition, as firing in closing due to the
firing pin striking forward.

10/20/70: Repair gun forward -

This was a problem some time ago when the seating
operation was performed by the First Lieutenant.
If too much cement was put on the same hole,
in the process of turning the housing to seat the
seams on the opposite side, the excess cement
would go between the slides in the area of
the Sea Spring. The procedure now is for this
operation to be done by a sub-assembly who
braces the housing in one position until the cement
dries. Then the housing is turned over, and the
opposite seam cemented.

John Bunker
11/29/75

SIC

H

PLAINTIFF'S
EXHIBIT

3170

1071
AL 0029692

cc: E. R. Carr
J. P. Linde

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

ROPER

PETERS

ROPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____ March 10, 1975

C. B. WORKMAN

Re: M/700, 600 FIRE CONTROL MALFUNCTIONS

One M/700, and one M/600 were returned recently from Texas with complaints that the gun would not fire when the Trigger was pulled. On both of these guns, manipulating the Bolt Handle after the Trigger was pulled caused the gun to fire.

An investigation of both guns produced the same result. The Fire Control slots and Firing Pin Head slots in the Receivers were not properly lined up. As a consequence, when the Trigger was pulled the Firing Pin Head went forward until it hit the Fire Control Housing Side Plate which was protruding into the Firing Pin Head slot. Moving the Bolt Handle rotated the Firing Pin Head sufficiently to clear the Housing Side Plate and strike the Firing Pin.

Both guns were repaired by filing a lead on the Firing Pin Head and Fire Control Housing Side Plate.

These guns were able to pass our Gallery tests due to our lubrication practices. The M/700 was made in 1970. By the time this gun was used all of the lubrication that was on it when it left Ilion had dried up. The gun was made functionally acceptable again by oiling the Bolt without doing anything else to it.

JWB:jc

J. W. Boyer
Sr. Process Engineer

PLAINTIFF'S
EXHIBIT

3171

121
AL 0029693

1928 SPRING BRANCH DRIVE
HOUSTON, TEXAS 77058
713/487-3016

PURCHASE ORDER

Les Freer

GUN SHOP

FIREARMS DEALER
LICENSE NO. 74-6344

ORDER NO. 7476
THIS NO. MUST APPEAR ON
INVOICE, B/L, AND CASES.

DATE

Jan. 28, 1975

ISSUED TO

Hold
Give
Mr. George Martin
Remington Arms Co.
Illion, New York # 13357

SHIPPING DATE

VIA

RECEIVED

For prompt payment mail invoice showing order number with bill of lading after shipment is made.
Acknowledge and advise promptly if unable to make immediate shipment.
Goods subject to our inspection, notwithstanding prior payment to obtain cash discount.

FEB 04 1975

QUANTITY

NUMBER

DESCRIPTION

G. W. MARTIN

Dear George:

Subject: Trigger malfunctions

Re our phone conversations, I am forwarding one Model 700BDL, 25/06, serial #6356761 just as we received it from GLOBE STORE #3, 6200 Bellaire Blvd., Houston.

We produced a malfunction in this trigger assembly as follows: cocked the bolt, put the safety on and pulled the trigger - the safety held as it should (did not fire) - then the safety was moved to "fire" position and the trigger pulled again but then the sear failed to trip (did not fire); however a few more pulls on the trigger and it suddenly fired.

Like most trigger malfunctions we have found, this one may be difficult to reproduce, may require several attempts to demonstrate but if you keep trying it will occur.

Although this particular malfunction is not the same as most recent ones it is closely related to the overall problem. Hope it is of some help to you.

SHIPPED UNDER SEPARATE COVER

Best regards,

Les
Les Freer

ON 1-31-75 VIA *Parcel Post*
Please acknowledge receipt

PLAINTIFF'S
EXHIBIT

3172

AL 0029694

8928 SPRING BRANCH DRIVE
HOUSTON, TEXAS 77055
713/467-3016

PURCHASE ORDER

Les Freer

GUN SHOP

FIREARMS DEALER
LICENSE NO. 74-6344

ORDER No. 7477
THIS NO. MUST APPEAR ON
INVOICE, B/L, AND CASES

DATE

Jan. 29, 1975

ISSUED TO

Mr. George Martin
Remington Arms Co.
Ilion, New York 13357

SHIPPING DATE

VIA

For prompt payment mail invoice showing order number with bill of lading after shipment is made.
Acknowledge and advise promptly if unable to make immediate shipment.
Goods subject to our inspection, notwithstanding prior payment to obtain cash discount.

QUANTITY	NUMBER	DESCRIPTION
		<p>Dear George:</p> <p>Subject: M/600 Trigger Malfunction</p> <p>Here is another Model 600 trigger problem, serial No. 6651698, cal. 6mm, just as we received it from the owner - we have disturbed nothing on the gun, have not even removed it from its stock for inspection.</p> <p>Purchased last Saturday from Carter's Country, Houston, the owner fired half dozen rounds on the rifle range when he had a malfunction by simply failing to get a firing pin fall by pulling the trigger with the safety in normal "fire" position. He then removed his finger from the trigger and the gun discharged as he reached for the bolt handle.</p> <p>The owner assures us that no one has tinkered with any part of the rifle since he purchased it. We failed to produce the same malfunction after several attempts but we find the trigger pulls so creepy and rough we have to believe the owner. Here again we find performance of the trigger erratic and frustrating, but very dangerous for this reason. If we were to repair this one we probably would choose to replace the trigger assembly.</p> <p>Hope this helps to point up the problem.</p> <p>Owner: Raymond Osbon 11703 No. Petershan Houston 77071 Ph 498-8312</p>

AL 0029695

PLAINTIFF'S
EXHIBIT

3173

Best regards

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

cc: C. B. Workman

J. P. Linde

C. F. Prosser

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

March 18, 1975

E. R. CARR

PROGRESS REPORT - M/600 - 700 FIRE CONTROL

All assemblers have been instructed in how to check for the gun firing when the Safety is released. Included in this instruction is the technique of attempting to hang the Safety up halfway between the on and off positions. The instructions will be included in the Process Records by 3/21.

An operation to swage the coming surface of the M/600 Safety is being done. This provides additional lift on the Sear.

Research is contemplating several design changes on the M/600. These include the following:

1. Heat treating the Housing stamping. This is currently soft and the Safety Detent Ball wears a groove in it which facilitates the Safety hanging up.
2. A change in the Safety to provide additional lift of the Sear.
3. A redesign of the countersink on the Housing to provide a minimum flat between the on and off position, which will mean a more positive Safety.
4. Eliminating the stamped Housing and going to side plates and spacers similar to the M/700. Costs are being developed on this proposal to determine if it is economically feasible.

JWB:jc

J. W. Bower
Sr. Process Engineer

Bob - Add to this list a positive method of measuring sear lift when the safety is in the "On" position to a "gage" tolerance range.

Clark

(note) Either optically or on dial indicators.

PLAINTIFF'S
EXHIBIT

3174

1271
AL 0029703

A

L

E

2-24

Fred Miller

DON'T SAY IT—WRITE IT

To *M. Delays*

DATE December 21, 1973

FROM E. R. Carr

M/TOO - CUSTOMER COMPLAINTS

Fires on Safe - Follows down

Over three years ago, all guns in the above category began to be referred to P.E. & C. for examination and diagnosis. It began to be readily apparent that these guns were all the result of minimal Connector-Sear engagement.

In June of 1972, an operation was initiated making the adjustment on a comparator which assured a minimum engagement of .015".

It is my opinion that review of these guns, except in the case of Damaged Actions or Personal Injury guns, is no longer justified and should be discontinued.

*Does this present any problem to you
like*

*Not at all. We
will stop sending
to P.E. & C. this type
of complaint as of 1/2/74
F. Plunkett*

TO BE SAFE, FIRST THINK YOU MIGHT NOT BE

H



AL 0029705

Cust. Complaint.

No GUN EXAMINATION REPORT NUMBER: MODEL: 700 ADL
 GENERAL CONDITION: GOOD R #: 002805
 OUTSIDE WORK: SWIVELS AND SCOPE MOUNT- DATE: 2-1-73
 ED. FROM: FULKS SPORTING
 FIRED AMMO TYPE: CLARKSBURG, W.VA.
 & CONDITION: GUN #: 6247427
 PROOP: R.E.P.-A INSP. 73 TEST: 87 CODE: KS = 5/69
 HEADING: O.K. GA./CAL.: 270 WIN.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED:
 CHAMBER: O.K. APPROVED:
 TEST: NO APPROVED:
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

SEAR-TRIGGER CONNECTOR ENGAGEMENT .010 (MIN. IS .020)

CONNECTOR CLEARANCE ON TRIGGER = .069 (MODEL = 1.076 DRAINING = 1.079)

OF TRIGGER PIN HOLE TO TOP OF TRIGGER = .974 (.973 .971)

COMPLAINT: "FIRES WHEN SAFETY IS MOVED TO FIRE POSITION."

INCIDENT: FOLLOW DOWN

COMMENTS: THE EXCESSIVE MOVEMENT BETWEEN TRIGGER &
 TRIGGER CONNECTOR WILL ALLOW INTERFERENCE
 BETWEEN THE SEAR AND CONNECTOR WHICH PREVENTS
 RETRACTION INTO COCKED POSITION. THE PRESENCE
 OF HARDENED LUBRICANT INCREASES THE POSSIBILITY
 OF A MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3176

AL 0029706

Carl Cuyler

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL

GENERAL CONDITION: NEW R #: 003187

OUTSIDE WORK: NO DATE: 1-30-73

FROM: J. FOSTER

FIRE AMMO TYPE: - LYNCHBURG, VA.

& CONDITION: _____ GUN #: 6326074

PROOF: R.E.P. A INSP.: 9 TEST: 55 CODE: CT = 4/70

HEADING: O.K. GR./CAL.: 25-06

BRECH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR-TRIGGER CLEARANCE = 1.084 (MODEL 1.050 DRAWING 1.083) TRIGGER.

CONNECTOR CLEARANCE = 1.072 (1.076 CENTER LINE OF PIN HOLE

TO TOP OF TRIGGER: .974 (.973 CENTER OF PIVOT HOLE

IN SAFETY TO TOP OF CAM: .291 (.292 .286)

COMPLAINT: "FIRED WITH SAFETY ON"

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3177

COMMENTS: THE RIFLE WILL NOT FIRE WITH THE SAFETY ON.

THE CONDITIONS LISTED ABOVE: .005 TOO MUCH CLEAR-

ANCE BETWEEN CONNECTOR & TRIGGER, TOP OF TRIGGER

.001 OVER MAX. AND SAFETY .001 UNDER MIN., ALL

CONTRIBUTE TO AN INTERFERENCE BETWEEN THE

CONNECTOR AND SEAR WHICH WOULD PREVENT

RETRACTION INTO COCKED POSITION TO CAUSE FOLLOW

AL 0029707

DOWN.

191

Cust. Complaint

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 002158
 OUTSIDE WORK: SCOPE MOUNTED DATE: 1-23-73
 FROM: SPORTSMAN'S HEADQUARTERS
 FIRED AMMO TYPE: _____ GRAND FORKS, N.D.
 & CONDITION: _____ GUN #: 6451849
 PROOF: R.E.P.-L INSP. 9 TEST: 53 CODE: PU = 6/71
 HEADING: O.K. GA./CAL.: 2006
 BREACH OPENING: _____ CHECKED BY: G. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

HOUSING .069 AT TOP (MODEL DRAWING: 173) TRIGGER
.173 LOWER END (MODEL DRAWING: 172) METAL CHIPS
AROUND PIN HOLE ON TRIGGER. SEAR-TRIGGER
CONNECTOR ENGAGEMENT .010 (MIN. .15 .020)

COMPLAINT: "WILL FIRE WHILE REMOVING UNFIRED SHELL
FROM THE CHAMBER"

INCIDENT: FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3178

COMMENTS: THE CUSTOMER'S MALFUNCTION NOT DUPLICATED.
THE BINDING TRIGGER AND SEAR FAILING TO RETRACT
ALONG WITH UNDER MIN. ENGAGEMENT PROBABLY
CAUSED THE FOLLOW DOWN.

Custom Gun

... NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: GOOD R #: 001432
OUTSIDE WORK: SCOPE MOUNTED DATE: 1-16-73
FROM: BEIKIRCH AMMUNITION CORP.
FIRED AMMO TYPE: - ROCHESTER, N.Y.
& CONDITION: _____ GUN #: 375936
PROOF: REP. INSP.: U TEST: 87 CODE: ER = 10/68
HEADING: OK GA./CAL.: 3006
BREECH OPENING: - CHECKED BY: C. PROSSER
RECOIL SHOULDERS: OK APPROVED: _____
CHAMBER: OK APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONSIDERABLE DIRT (INCLUDING METAL PARTICLES
INSIDE HOUSING. HARDENED LUBRICATION ON TRIGGER.
CONNECTOR = 1.083 (^{1.080}1.083 MODEL DRAWING) TRIGGER = 1.076
(^{1.076}1.079 MODEL DRAWING) SAFETY & TO CAM = .291 (^{1.292}1.296 MODEL
DRAWING)

COMPLAINT: "FIRES WITH SAFETY ON"

INCIDENT: FOLLOW DOWN

COMMENTS: THE CONNECTOR CAN WORK UP TO INTERFERE
WITH THE SEAR AND PREVENT RETRACTION INTO
COCKED POSITION.

PLAINTIFF'S
EXHIBIT

3179

Curt Corp

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700

GENERAL CONDITION: FAIR R #: -

OUTSIDE WORK: RECEIVER RE-COLORED, DATE: 1-22-73
NEW BARREL FITTED, SPECIAL SLINGS, FROM: _____

FIRED AMMO TYPE: -

& CONDITION: DIATHALON GUN GUN #: 6403732
(SPEC FROM BUE ADAMS)

PROOF: NO MARKING IN SP. TEST: - CODE: NO MARKING

HEADING: MAX. GA./CAL.: 22 P

BREACH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERS: EXCESSIVE RADIUS - REAR APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: 20 ROUNDS - AFTER FITTING NEW BOLT APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

OLD STYLE SAFETY - COCKING CAM DAMAGED
BY SAFETY. HEADING MAX DUE TO BEARING ON
EXCESSIVE RADIUS AT REAR OF RECOIL SHOULDERS.

COMPLAINT: _____

INCIDENT: _____

PLAINTIFF'S
EXHIBIT

3180

COMMENTS: THE BEARING ON THE RADIUS AT REAR OF RECOIL
SHOULDERS CAUSED HEAVY BOLT LIFT, FURTHER
INTERFERENCE BY CLOSING AND LOCKING THE
BOLT WITH THE SAFETY "ON" COULD CAUSE A
JAM AND DAMAGE TO THE COCKING CAM.

1. NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: GOODOUTSIDE WORK: SCOPE MOUNTEDFIRED AMMO TYPE: -

& CONDITION: _____

PROOF: R.E.P. INSP: U TEST: ?HEADING: O.K.BREACH OPENING: -RECOIL SHOULDERS: O.K.CHAMBER: O.K.

TEST: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

Carl. Conpl.MODEL: 700ADLR #: 000972DATE: 1-15-73FROM: COOPER'S
SPORTING GROUPSMANSEFIELD, PA.GUN #: 300043CODE: NP = 8/67GA./CAL.: 270WIN.CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

BOLT HANDLE BROKEN OFF. TRIGGER BINDING -HEAVY LUBRICANT - CONNECTOR STUCK TOTRIGGER. CORNER OF SEAR BROKEN DOWN.COMPLAINT: FIRES WHEN SAFETY IS TAKEN OFF.INCIDENT: FOLLOW DOWNPLAINTIFF'S
EXHIBIT3181COMMENTS: THE TRIGGER BINDING AS A RESULT OF THE
DRIED OUT LUBRICANT FAILED TO RETRACT,
REMAINING IN FIRED POSITION, CAUSED THE
FOLLOW DOWN.

Cust Enqsl

I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
 GENERAL CONDITION: GOOD R #: 000918
 OUTSIDE WORK: NO DATE: 1-12-73
 FIRED AMMO TYPE: _____ FROM: C.H. DANA JR.
 & CONDITION: _____ ST. JOHNSBURY, VT.
 PROOF: R.E.P. INSP. U TEST: 49 GUN #: 104573
 HEADING: _____ CODE: BR-1/68
 BREACH OPENING: _____ G.K./CAL.: 222
 RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO. APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR BIND - HEAVY LUBRICANT + BURRS AROUND PIN
HOLES IN HOUSING. FIRING PIN HEAD MARKS IN THE
HOUSING LEFT, REAR.

COMPLAINT: GUN GOES OFF BY ITSELF.

INCIDENT: FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3182

COMMENTS: CUSTOMER'S MALFUNCTION NOT DUPLICATED.

THE SEAR, BINDING FROM BURRS AT THE PIN HOLES
AND HEAVY LUBRICANT, PROBABLY REMAINED IN FIRED
POSITION ALLOWING THE FIRING PIN TO FOLLOW DOWN.

Cust Gnyh

1. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 ADLGENERAL CONDITION: GOODR #: 000130OUTSIDE WORK: SCOPE MOUNTED, BUTT PADDATE: 1-11-73FITTED.FROM: ESTELL CURRY

FIRED AMMO TYPE: _____

GATESVILLE, TEXAS

& CONDITION: _____

GUN #: 165224PROOF: R.E.P.

INSP.:

DTEST: 87CODE: WM = 8/65HEADING: -GR./CAL.: 243 WIN.BREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

STEEL CHIPS BETWEEN TRIGGER AND CONNECTOR.HARDENED LUBRICANT AROUND SEAR. EVIDENCE OF
FIRING PIN HEAD CATCHING ON REAR-LEFT CORNER
OF HOUSING.COMPLAINT: FIRED AS BOLT WAS UNLOCKEDINCIDENT: FOLLOW DOWNPLAINTIFF'S
EXHIBIT

3183

COMMENTS: THE CHIPS BETWEEN TRIGGER AND CONNECTOR
CAUSE SEAR-CONNECTOR ENGAGEMENT TO VARY
LEADING TO FOLLOW-DOWN. THE HARDENED
LUBRICANT AND FIRING PIN HEAD-HOUSING INTER-
FERENCE ALSO CONTRIBUTES TO FOLLOW-DOWN
MALFUNCTIONS.

Asst Compt.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL

GENERAL CONDITION: GOOD R #: 000394

OUTSIDE WORK: NO DATE: 1-9-73

FROM: JOHN'S SPORTS CENTER

FIRED AMMO TYPE: _____ PITTSBURGH, KAN.

& CONDITION: _____ GUN #: 6432940

PROOF: R.E.P.-L INSE. 73 TEST: B4 CODE: CU-4/71

HEADING: _____ GA./CAL.: 243 WIN.

BRECH OPENING: _____ CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

BOLT CAM MARRED BY SAFETY. GROOVE CUT INTO
LEFT REAR OF HOUSING BY FIRING PIN HEAD. SEAR-
TRIGGER CONNECTOR ENGAGEMENT .015 (MIN. .13 .020)
CONNECTOR BINDING ON TRIGGER.

COMPLAINT: "WENT OFF WHEN THE BOLT WAS CLOSED"

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3184

COMMENTS: THE TRIGGER CONNECTOR PROBABLY FAILED TO
RETRACT INTO POSITION UNDER THE SEAR, ALLOWING
THE FIRING PIN TO FOLLOW DOWN.

Cash Corp.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL

GENERAL CONDITION: FAIR R #: 000014

OUTSIDE WORK: SCOPE MOUNTED, BUTT PAD DATE: 1-4-73
FITTED. SEALS REMOVED - TRIGGER FROM: W.K. FRAYSUR
HOUSTON, TEXAS

FIRED AMMO TYPE: _____ GUN #: 69329

& CONDITION: _____ CODE: PK-5/63

PROOF: R.E.P. INSP.: 5 TEST: 13 GR./CAL.: 270

HEADING: ? CHECKED BY: C. PROSSER

BREECH OPENING: - APPROVED: _____

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: - APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

EXCESSIVE LUBRICANT, TRIGGER BIND ON TRIGGER
GUARD POSSIBLE.

COMPLAINT: "WILL FIRE ACCIDENTALLY ON PUSHING OFF THE
SAFETY"

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3185

COMMENTS: THE CUSTOMER'S MALFUNCTION NOT DUPLICATED.
IT PROBABLY IS ASSOCIATED WITH TRIGGER BIND
AND TYPE OF LUBRICATION USED.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: GOOD R #: 027716
 OUTSIDE WORK: SCOPE MOUNTED, ALL SEALS DATE: 1-4-73
 BROKEN ON TRIGGER ASSEMBLY FROM: DUNHAM'S
 FIRED AMMO TYPE: _____ MEDFORD, OREGON
 & CONDITION: _____ GUN #: 369419
 PROOF: R.E.D. INSP.: ASSEMBLER 13 TEST: ? CODE: DR = 9/68
 HEADING: O.K. SK./CAL.: 3000
 BREACH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

HARDENED LUBRICANT CAUSING TRIGGER BIND. TRIGGER
 STOP SCREW OUT OF POSITION BINDING IN CONNECTOR.

COMPLAINT: FIRES ON RELEASING SAFETY

INCIDENT: FOLLOW DOWN

COMMENTS: THE OUT OF POSITION STOP SCREW HOLDS THE
 TRIGGER CONNECTOR IN FIRED POSITION CAUSING
 FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3186

AL 0029716

Cust. Compl.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: NEW R #: 027329
OUTSIDE WORK: NO DATE: 1-2-73
FIRE AMMO TYPE: — FROM: OSHMAN'S SPORTING GDS. CO.
& CONDITION: ASSEMBLER 56 BEAUMONT, TEXAS.
PROOF: R.E.P.-M INSP.: 73 TEST: 13 GUN #: 6521466
HEADING: O.K. CODE: AW = 3/72
BREECH OPENING: — GA./CAL.: 3006
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPLAINT: GUN FIRED WHEN SAFETY WAS REMOVEDINCIDENT: FOLLOW DOWNCOMMENTS: THE CUSTOMER'S MALFUNCTION COULD NOT BE
DUPLICATED. THE PRESENCE OF EXCESSIVE LUBRICANT
POSSIBLY CONTRIBUTED TO POOR TRIGGER RETRACT-
ION AND CAUSED FOLLOW DOWN.PLAINTIFF'S
EXHIBIT

3187

AL 0029717

*Cust. Conf.*GUN EXAMINATION REPORT NUMBER: NOMODEL: 700 BDLGENERAL CONDITION: NEWR# : 027443OUTSIDE WORK: SCOPE MOUNTEDDATE: 12-22-72FIRED AMMO TYPE: -FROM: KAYTON MFG. CO.& CONDITION: ASSEMBLERALLENTOWN, PA.PROOF: REP-D INSP.: 74 TEST: 55GUN #: 6241978CODE: K5 = 5/69HEADING: -GR./CAL.: 243BREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

SEAR - TRIGGER CONNECTOR ENGAGEMENT O.K. TRIGGER
BINDING IN HOUSING. LUBRICATION LIKE GREASE ON
SEAR

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.INCIDENT: FOLLOW DOWN.

COMMENTS: THE LUBRICANT USED PROBABLY CAUSED
SLUGGISH TRIGGER-CONNECTOR-SEAR RETRACTION
INTO COCKED POSITION, RESULTING IN FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3188

AL 0029718

10/1
2

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 027515
 OUTSIDE WORK: NO DATE: 12-22-72
 FROM: MORLEY BRO.
 FIRED AMMO TYPE: _____ SAGINAW, MICH.
 & CONDITION: _____ GUN #: 6241128
 PROOF: R.E.P.-K INSP. 93 TEST: 13 CODE: KU=5/71
 HEADING: - OK./CAL.: 25-06
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: EXCESSIVE RADIUS-REAR APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: _____ APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT.025
BURRS ON TRIGGER. TRIGGER TOO CLOSE TO
GUARD ON RIGHT SIDE. THERE ARE INDICATIONS
OF PRIMER PIERCING ON FIRING PIN ASSEMBLY.

COMPLAINT: "WILL FIRE DURING FEEDING OPERATION."

INCIDENT: FOLLOW DOWN.

COMMENTS: THE CUSTOMER'S MALFUNCTION COULD NOT BE
DUPLICATED. TRIGGER BIND MAY HAVE PREVENTED
PROPER RETRACTION.

PLAINTIFF'S
EXHIBIT

3189

AL 0029719

Cust Complaint

NO GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 BDL

GENERAL CONDITION: GOOD

R #: 027088

OUTSIDE WORK: No

DATE: 12-18-72

FROM: VALLEY HUNTS^{CO.} SQUAD

FIRED AMMO TYPE: -

MILES^{PA.} BURG, PA.

& CONDITION: ASSEMBLER - P

GUN #: 6261266

PROOF: R.E.P.-D INSP.: 9 TEST: 13

CODE: OS = 7/69

HEADING: 0.12.

Gk./CAL.: 302 W.D.

BREACH OPENING: -

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

EVIDENCE OF TRIGGER BURRS BINDING. TRIGGER 1.074

(MODEL DRAWING 1.076) EXCESSIVE LUBRICANT - TOO HEAVY.

TRIGGER CONNECTOR - SEAR ENGAGEMENT .015 (MIN. 13.020)

COMPLAINT: "FIRED WHEN SAFETY WAS RELEASED"

INCIDENT: FOLLOW-DOWN.

COMMENTS: THE TRIGGER BIND, HEAVY LUBRICANT COMBINATION
PROBABLY CAUSED THE FOLLOW DOWN.PLAINTIFF'S
EXHIBIT

3190

AL 0029720

P.1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: GOOD R #: 026555
 OUTSIDE WORK: SCOPE MOUNTED DATE: 12-18-72
 FROM: Sgt. WIS, SPT. CENT.
 FIRED AMMO TYPE: _____ BELOIT, WIS.
 & CONDITION: _____ GUN #: 6580387
ASSEMBLER 73
 PROOF: R.E.P.-B INSP.: 73 TEST: 97 CODE: OW = 7/72
 HEADING: O.K. GA./CAL.: 3006
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

HEAVY LUBRICANT AROUND SEAR BURR AT REAR OF
HOUSING FROM FIRING PIN HEAD.

COMPLAINT: "FIRES SOMETIMES WITH SAFETY ON"

INCIDENT: PROBABLY FOLLOW-DOWN.

COMMENTS: THE HEAVY LUBRICANT COMBINED WITH SEAR-
BIND PROBABLY HELD THE SEAR IN FIRED POSITION
AND CAUSED FOLLOW-DOWN.

PLAINTIFF'S
EXHIBIT

3191

AL 0029721

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: NEW R #: 027181
OUTSIDE WORK: SCOPE MOUNTED DATE: 12-18-72
FROM: BRUCE WIGGINS
SPORTS SHOP
FIRED AMMO TYPE: - BEAUMONT, TEXAS
& CONDITION: _____ GUN #: 6418163
PROOF: R.E.P. INSP.: 73 TEST: 55 CODE: AU = 3/71
HEADING: O.K. GA./CAL.: 17 REM.
BREECH OPENING: - CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .010 (MIN. IS .020)

BURRS ON TRIGGER, SMALL BURR ON SEAR.

COMPLAINT: FIRES WHEN SAFETY IS RELEASED.

INCIDENT: FOLLOW DOWN.

COMMENTS: CUSTOMER'S MALFUNCTION NOT DUPLICATED.
APPARENTLY THE TRIGGER-SEAR BIND WAS ENOUGH
TO PREVENT RETRACTION INTO COCKED POSITION.

PLAINTIFF'S
EXHIBIT

3192

AL 0029722

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 026826
 OUTSIDE WORK: SCOPE MOUNTED DATE: 12-18-72
 FROM: DICK'S SPT. SHOP
 FIRED AMMO TYPE: _____ STAHLSTOWN, PA.
 & CONDITION: _____ GUN #: 6223531
 PROOP: R.E.P. INSP.: ? TEST: 87 CODE: AS = 3/69
 HEADING: O.K. GA./CAL.: 3006
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .015 (MIN.
IS .020) BURRS ON SEAR AND TRIGGER. TRIGGER
1.074 (MODEL DRAWING = 1.076) CONNECTOR 1.081 (1.080)
1.079) 1.083)
SAFETY CENTER OF PIVOT TO TOP OF CAM .290 (.292)
.296)

COMPLAINT: "MISFIRES WHEN HE PUSHES THE SAFE OFF"

INCIDENT: FOLLOW DOWN

COMMENTS: FOLLOW DOWN COULD HAVE BEEN DUE TO
BURRS BINDING AND PREVENTING RETRACTION OR
EXCESSIVE CONNECTOR-TRIGGER CLEARANCE
ALLOWING THE CONNECTOR TO WORK UP TO INTERFERE
WITH THE SEAR WHICH THE SAFETY DID NOT LIE
ENOUGH TO CLEAR.

PLAINTIFF'S
EXHIBIT

3193

AL 0029723

700 Custom Gunfair

1. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: GOOD R #: 026289
 OUTSIDE WORK: SCOPE MOUNTED DATE: 12-15-72
 FIRED AMMO TYPE: _____ FROM: GALLINGHAM & JONES INC. CHENALIS, WASH.
 & CONDITION: _____ GUN #: 6295844
 PROOF: R.E.P.-E INSP. 9 TEST: 18 CODE: X5 = 12/69
 HEADING: _____ GA./CAL.: 300 WIN. M.S.
 BREACH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .015 (MIN. IS .020)
CONNECTOR 1085 (MODEL DRAWING 1080) SAFETY 291 (MODEL
DRAWING 292) TRIGGER BINDING IN HOUSING.

COMPLAINT: FIRE WHEN CLOSING ACTION.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE BINDING TRIGGER PROBABLY FAILED TO
RETRACT CAUSING THE ACTION TO FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3194

AL 0029724

700 Cust. Comp

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: GOOD R #: 025940
 OUTSIDE WORK: BUTT PAD ADDED, TRIGGER DATE: 12-15-72
PULL RE-ADJUSTED. FROM: BEST PRODUCTS
 FIRED AMMO TYPE: _____ HAMPTON, VA.
 & CONDITION: _____ GUN #: 6517902
 PROOF: R.E.P.-B INSP. 55 TEST: 97 CODE: BW = 1/72
 HEADING: O.K. ON INSPECTION MAX. GR./CAL.: 300G
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER BINDING ON GUARD, TRIGGER PULL ADJUSTED
DOWN TO 2-2 1/2 LBS. BY CUSTOMER, EXCESSIVE LUBRICANT.

COMPLAINT: GUN FIRES WHEN SAFETY IS RELEASED.

INCIDENT: FOLLOW DOWN.

COMMENTS: CUSTOMER'S MALFUNCTION NOT DUPLICATED.

HOWEVER WITH TRIGGER PULL REDUCED BELOW
SPECIFICATIONS (3 TO 5 LBS.) THE BINDING TRIGGER
PROBABLY DID NOT RETRACT SUFFICIENTLY TO COCK THE
FIRING PIN.

PLAINTIFF'S
EXHIBIT

3195

AL 0029725

710 *Conf. Complaint*

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R #: 025800
 OUTSIDE WORK: NO DATE: 12-14-72
 FROM: BILL'S SPT. & HOBBY SHOP
 FIRED AMMO TYPE: _____ ONEONTA, N.Y.
 & CONDITION: _____ GUN #: 6365666
 PROOP: R.F.P.-C INSP. BB TEST: 29 CODE: WT = 8/70
 HEADING: O.K. GA./CAL.: 3006
 BREACH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .015 (MIN. 15.020)
 CONNECTOR CLEARANCE ON TRIGGER = 1.073 (MODEL DRAWING = 1.079)
 BURRS ON TOP SIDES OF TRIGGER.

COMPLAINT: GUN FIRED WHEN SAFETY WAS PUSHED OFF.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE TRIGGER BIND COULD CAUSE FAILURE TO
 RETRACT AND FOLLOW DOWN, THE UNDER MIN. ENGAG-
 EMENT CONTRIBUTING TO THE MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3196

AL 0029726

Just Complaint

A
01-61
NEW

EXAMINATION REPORT NUMBER: _____

MODEL: 700

R #: 025981

DATE: 12-7-72

FROM: GRAF & SONS INC.

MEXICO, MO.

GUN #: 6439493

CODE: KU=5/71

GA./CAL.: 25-06

CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

FIRE TYPE: _____

& CONDITION: _____

PROOF: R.E.P.-L INSP.: 73 TEST: 53

HEADING: O.K.

BREECH OPENING: -

RECOIL SHOULDERS: O.K.

CHAMBER: O.K.

TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

FEAR-TRIGGER CONNECTOR ENGAGEMENT, 0.10 (MIN. 15.020)
DURRS ON SIDE OF TRIGGER.

COMPLAINT: 'GUN GOES OFF WHEN BOLT IS CLOSED.'

INCIDENT: FOLLOW DOWN

COMMENTS: THE CUSTOMER'S MALFUNCTION NOT DUPLICATED,
HOWEVER THE TRIGGER BIND COMBINED WITH UNDER
MIN. ENGAGEMENT MAY HAVE CAUSED A FOLLOW
DOWN.

PLAINTIFF'S
EXHIBIT
3197

1/1
AL 0029727

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: GOOD R #: 025024
 OUTSIDE WORK: SCOPE MOUNTED, ALL DATE: 12-5-72
 TRIGGER ADJUSTMENTS CHANGED. FROM: COMMUNITY HDW. CO.
 FIRED AMMO TYPE: _____ THOMASVILLE, N.C.
 & CONDITION: _____ GUN #: 6338169
 PROOF: R.E.P. INSP.: 9 TEST: 87 CODE: KT: 5/70
 HEADING: O.K. GR./CAL.: 25-06
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: 15 ROUNDS - NO PIERCING APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN, SEAR DAMAGED. PRIMER
 PIERCING IS INDICATED.

COMPLAINT: "BOLT FIRES WHEN YOU PUSH IT DOWN."

INCIDENT: FOLLOW DOWN

COMMENTS: WITH THE TRIGGER CONNECTOR BROKEN THERE IS NO WAY
 THE ACTION CAN BE COCKED. THE BREAK DOWN EVIDENTLY
 STARTED WITH PRIMER PIERCING.

PLAINTIFF'S
EXHIBIT

3198

AL 0029728

No GUN EXAMINATION REPORT NUMBER: MODEL: 700
 GENERAL CONDITION: NEW R #: 026064
 OUTSIDE WORK: SCOPE MOUNTED DATE: 12-5-72
 FROM: HERTER'S INC.
 FIRED AMMO TYPE: — OLYMPIA, WASH.
 & CONDITION: ASSEMBLER 65 GUN #: 6524373
 PROOF: R.E.P.-B INSP. 74 TEST: 97 CODE: CW = 4/72
 HEADING: O.K. GR./CAL.: 300G
 BREACH OPENING: — CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .025/MIN IS
 (.020) CONNECTOR = 1.088 MODEL DRAWING = 1.080, TRIGGER
 MEASURES 1.074, MODEL DRAWING = 1.076

COMPLAINT: "FIRES WHEN SAFETY IS PUSHED OFF"

INCIDENT: FOLLOW DOWN

COMMENTS: THE CUSTOMER'S MALFUNCTION COULD NOT BE
 DUPLICATED, HOWEVER, THE .007 OVER MAX. CLEARANCE
 BETWEEN THE TRIGGER AND CONNECTOR WILL ALLOW
 THE CONNECTOR TO INTERFERE WITH THE SEAR AND
 FAILING TO RETRACT INTO COCKED POSITION, CAUSE
 A FOLLOW-DOWN.

PLAINTIFF'S
EXHIBIT

3199

AL (X)29729

Carl. Crupl

NO GUN EXAMINATION REPORT NUMBER: MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 024573
 OUTSIDE WORK: SCOPE & RECOIL PAD FITTED. DATE: 11-27-72

FROM: FRONTIERSMAN
 SPORTS INC.

FIBER AMMO TYPE: -

MINNEAPOLIS, MINN.

& CONDITION:

GUN #: 6365254

PROSP: R.E.P. INSP: 74 TEST: 49

CODE: DT = 9/70

HEADING: O.K.

GR./CAL.: 3006

BREACH OPENING: -

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED:

CHAMBER: O.K.

APPROVED:

TEST: NO

APPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED:

SEAR-TRIGGER CONNECTOR ENGAGEMENT .005 (MIN. .020)

TRIGGER CONNECTOR CLEARANCE ON TRIGGER = 1.075,

M/D = 1.076
 M/D = 1.079; TRIGGER CLEARANCE ON CONNECTOR = 1.086,M/D = 1.080
 M/D = 1.083, FIRING PIN CAN CATCH ON REAR CORNER
 OF HOUSING. LAPPING ON CONNECTOR CROOKED.

COMPLAINT: RIFLE DISCHARGED WHEN LOADING CARTRIDGE.

INCIDENT: FOLLOW DOWN

COMMENTS: THERE IS EVIDENCE OF TRIGGER BIND. THIS COMPLIES
 WITH UNDER MIN. ENGAGEMENT AND EXCESSIVE TRIGGER
 CONNECTOR CLEARANCE, CAUSES FOLLOW DOWN.

PLAINTIFF'S
 EXHIBIT

3200

AL 0029730

Cust. Cr.
 1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: GOOD R #: 024437
 OUTSIDE WORK: SCOPE MOUNTED, RECOIL PAD DATE: 11-22-72
ADDED, FROM: DONALDSON'S GUN SHOP
 FIRED AMMO TYPE: _____ MINNEAPOLIS, MINN.
 & CONDITION: _____ GUN #: 309624
 PROOF: R.E.P. ASSEMBLER 63 INSP. 96 TEST: 87 CODE: EP = 10/67
 HEADING: O.K. GA./CAL.: 300G
 BREECH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR CLEARANCE ON TRIGGER .003 UNDER MIN.
BURRS ON SIDES OF TRIGGER HOUSING PROTRUDING
INTO FIRING PIN HEAD SLOT. SEAR-TRIGGER CONNECTOR
ENGAGEMENT .025

COMPLAINT: FIRE UPON LOCKING THE BOLT.

INCIDENT: FOLLOW DOWN

COMMENTS: THE CUSTOMER'S MALFUNCTION CAN NOT BE
DUPLICATED AND THERE IS NO EVIDENCE OF SUCH
MALFUNCTION, HOWEVER, THE TRIGGER BURRS,
EXCESSIVE TRIGGER-TRIGGER CONNECTOR CLEARANCE,
AND HOUSING PROTRUDING COULD CONTRIBUTE -
TO SUCH A MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3201

AL 0029731

Cust. Anglen

1. No GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 BDLGENERAL CONDITION: NEWR # : 000219OUTSIDE WORK: NoDATE: 1-4-72

FIRED AMMO TYPE: _____

FROM: BAY CITY HON. CO.BAY CITY, MICH.

& CONDITION: _____

GUN # : 6425267PROOF: RF 3-K

INSP.: _____

TEST: 87CODE: CU = 4/71HEADING: O.K.GR./CAL.: 300 WIN. MAG.BREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO BROKEN OR DAMAGED COMPONENTS.TRIGGER PULL 5 POUNDS, HORIZONTAL ENGAGEMENT .020(MIN. IS .020) VERTICAL ENGAGEMENT .035 (MIN. IS .015)TRIGGER DOES NOT RUB ON TRIGGER GUARD.COMPLAINT: "WHEN SAFETY IS PULLED BACK GUN FIRES WITHOUT PULLING TRIGGER."INCIDENT: FOLLOW DOWN.COMMENTS: CAN FIND NO DEFECT WHICH MIGHT LEAD TO THE CUSTOMER'S MALFUNCTION. HIS MALFUNCTION NOT DUPLICATED.PLAINTIFF'S
EXHIBIT

3202

AL 0029732

G.I. NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: GOODOUTSIDE WORK: ALL TRIGGER ADJUSTINGMODEL: 700 BDLR #: 023941DATE: 11-16-72FROM: CHARLES W. FISHERFIRED AMMO TYPE: REMINGTONCOLUMBUS, OHIO

& CONDITION: _____

GUN #: 6418265PROOF: R.E.P.-1 INSP.: 9 TEST: 13CODE: AU= 3/71HEADING: O.K.GA./CAL.: 17 REM.BREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: 20 ROUNDS NO PRIMER PIERCING

APPROVED: _____

AFTER SWAGING FIRING PIN HOLE.

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

TRIGGER STOP AND ENGAGEMENT SCREWS OUT OF ADJUST-
MENT. FIRING PIN HOLE NOT SWAGED. SEAR AND TRIG-
GER CONNECTOR DAMAGED.

COMPLAINT: PIERCES PRIMERS, FIRES CLOSING BOLT.INCIDENT: FOLLOW DOWN

COMMENTS: PRIMER PIERCING CAUSE! DAMAGE TO THE
CORNERS OF THE SEAR AND TRIGGER CONNECTOR.
RESULTING IN FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3203

AL 0029733

F 5542-1 Rev. 2-15-61

P.I. NO GUN EXAMINATION REPORT NUMBER: _____

GENERAL CONDITION: NEW

OUTSIDE WORK: NO

FIRE AMMO TYPE: _____

& CONDITION: _____

PROOF: R.E.P.-L INSP.: 74 TEST: 53

HEADING: O.K.

BREACH OPENING: -

RECOIL SHOULDERS: O.K.

CHAMBER: O.K.

TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDL

R #: 023622

DATE: 11-15-72

FROM: MONTGOMERY WARD

RICHMOND, CAL.

GUN #: 6471558

CODE: WU: 8/71

GA./CAL.: 3006

CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .025

TRIGGER HOUSING PROTRUDING INTO FIRING PIN

HEAD CLEARANCE SO FIRING PIN HEAD CAN BE

PREVENTED FROM ASSUMING ITS POSITION AGAINST
THE SEAR.

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.

INCIDENT: FOLLOW DOWN

COMMENTS: THE INTERFERENCE BETWEEN FIRING PIN

HEAD AND HOUSING CREATES A BURR WHICH

CAUSES SEAR BIND. SEAR STICKS DOWN IN
POSITION RESULTING IN FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3204

AL 0029734

Cost Complaint

NO GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 BDL

GENERAL CONDITION: NEW

R# : 023451

OUTSIDE WORK: NO

DATE: 11-13-72

FROM: RON SHIRKS
SHOOTERS SUPPLIES

FIRED AMMO TYPE: ✓

LEBANON, PA.

& CONDITION: _____

GUN # : 6494579

PROOF: R.E.P.-M INSP.: U TEST: 84

CODE: RU = 11/71

HEADING: O.K.

GA./CAL.: 270 WIL.

BREECH OPENING: -

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

TRIGGER ASSEMBLY COMPONENTS STUCK TOGETHER
MAKING IT INOPERABLE.

S

COMPLAINT: WONT COCK

I

INCIDENT: FOLLOWS DOWN.

C

COMMENTS: TRIGGER ASSEMBLY WAS RENDERED INOPERABLE
BY SOME HARDENED SUBSTANCE.

H

PLAINTIFF'S
EXHIBIT

3205

AL 0029735

Curtis

No GUN EXAMINATION REPORT NUMBER: MODEL: 700

GENERAL CONDITION: GOOD R #: 023332

OUTSIDE WORK: No DATE: 11-13-72

FIRED AMMO TYPE: - FROM: GRANTS' FOR GUN INC. COSTA MESA, CAL.

& CONDITION: ASSEMBLER 73 GUN #: 0449597

PROOF: REP-N INSP. 87 TEST: 53 CODE: WV = 8/71

HEADING: O.K. PR./CAL.: 3006

BREECH OPENING: CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED:

CHAMBER: O.K. APPROVED:

TEST: No APPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

SEAR - TRIGGER CONNECTOR ENGAGEMENT = .012

(MIN. IS .020) BURRS ON SIDES OF TRIGGER

COMPLAINT: GUN FIRES WHEN SAFETY IS TAKEN OFF.

INCIDENT: FOLLOW DOWN

COMMENTS: IT APPEARS THAT TRIGGER BIND MAY HAVE PREVENTED FULL RETRACTION OF CONNECTOR UNDER THE SEAR REDUCING THE UNDER MIN. ENGAGEMENT TO ZERO.

PLAINTIFF'S
EXHIBIT

3206

AL 0029736

Crest Comp.

1 No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDLGENERAL CONDITION: GOOD R #: 022218OUTSIDE WORK: SCOPE MOUNTED. TRIGGER DATE: 11-10-72PULL WEIGHT CHANGED. FROM: JOHN PAYNEFIRED AMMO TYPE: _____ MT. VIEW, ARK.& CONDITION: _____ GUN #: 6504815PROOF: R.E.P.-M INSP.: U TEST: 13 CODE: XU = 12/71HEADING: O.K. BK./CAL.: 222BREACH OPENING: — CHECKED BY: E. PROSSERRECOIL SHOULDERS: EXCESSIVE RADIUS REAR-LUGS. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: No APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .025 (ADJUST-
MENT UNDISTURBED) TRIGGER STOP & ADJUSTING SCREWS
SEALS BROKEN. TRIGGER CONNECTOR WARPED.

COMPLAINT: RIFLE FIRED WHEN SAFETY WAS PUSHED OFF.INCIDENT: FOLLOW DOWN.PLAINTIFF'S
EXHIBIT

3207

COMMENTS: WITH THE TRIGGER PULL REDUCED TO TWO POUNDS
TRIGGER CONNECTOR RETRACTION WOULD BE ERRATIC.
THE WARPED CONNECTOR ALSO WOULD CAUSE ERRATIC
ENGAGEMENT AND COULD RESULT IN FOLLOW DOWN.

REMIND CUSTOMER REMINGTON DOES NOT
RECOMMEND UNDER THREE POUND TRIGGER PULL.

Customer Complaint

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL

GENERAL CONDITION: GOOD R #: 022245

OUTSIDE WORK: SCOPE MOUNTED DATE: 10-30-72

FROM: LOAR JEWELRY CO.

FIRE AMMO TYPE: _____ GRAFTON, W. VA.

& CONDITION: _____ GUN #: 6246723

PROOF: R.E.P.-D INSP. 7A TEST: 49 CODE: PS = 6/69

HEADING: O.K. GA./CAL.: 7MM REM. MAG.

BREECH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

RECEIVER AND BOLT RUSTED. SEAR-TRIGGER
CONNECTOR ENGAGEMENT .025 (MIN. .15, .020) BURRS
ON SIDES OF TRIGGER, TRIGGER CLEARANCE ON
CONNECTOR 1.085 MODEL DRAWING = 1.080
CLEARANCE ON TRIGGER = 1.070 MODEL DWG. = 1.076
1.079

COMPLAINT: FIRES WHEN SAFETY IS MOVED TO OFF POSITION.

INCIDENT: FOLLOW DOWN

COMMENTS: THE EXCESSIVE CLEARANCE BETWEEN THE
TRIGGER AND CONNECTOR ALLOWS THE CONNECTOR
TO INTERFERE WITH THE SEAR, FAILING TO RETRACT
INTO COCKED POSITION.

PLAINTIFF'S
EXHIBIT

3208

AL 0029738

GUN EXAMINATION REPORT NUMBER: GENERAL CONDITION: GOODOUTSIDE WORK: NOFIRED AMMO TYPE: & CONDITION: PROOF: P.P.C. INSP. 97 TEST: 98HEADING: O.K.BREECH OPENING: RECOIL SHOULDERS: O.K.CHAMBER: O.K.TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDLR #: 031212DATE: 10-20-72FROM: HALSTEDSONSMITHSONIAN INSTITUTIONGUN #: 6381922CODE: ET-10/P.H.GA./CAL.: 300 WILSONCHECKED BY: C. PROCTORAPPROVED: APPROVED: APPROVED: APPROVED:

TRIGGER ASSEMBLY CORRECTLY SCREWED BUT ADJUSTMENT
NEVER TO HAVE BEEN ADJUSTED.

COMPLAINT: DISCHARGED THREE TIMES WITHOUT FINGER ON
TRIGGER.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE EXCESSIVE TRIGGER MOVEMENT
WAS DUE TO THE TRIGGER SPRING BEING TOO WEAK
TO HOLD THE TRIGGER IN THE "UP" POSITION.

PLAINTIFF'S
EXHIBIT

3209

AL 0029739

GUN EXAMINATION REPORT NUMBER: 117MODEL: 700 ADLGENERAL CONDITION: GOODR # : 020432OUTSIDE WORK: BY ARDEN SPORTS UNLIMITEDDATE: 10/1/72SACRAMENTO, CAL.FROM: DENNY'S HOMEFIRED AMMO TYPE: -ARBUCKLE, CAL.& CONDITION: -GUN # : 642945PROOF: R.E.P. INSP.: 9 TEST: STCODE: AU = 3/2HEADING: OKGA./CAL.: 5006BREACH OPENING: -CHECKED BY: C. F. BROWNRECOIL SHOULDERS: OKAPPROVED: -CHAMBER: OKAPPROVED: -TEST: NOAPPROVED: -

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: -

SEMI-TRIGGER CONNECTOR ENGAGEMENT DID
(MIN. 15,000) TRIGGER PULL SET TOO LIGHT.

COMPLAINT: SAFETY DOES NOT WORKINCIDENT: FOLLOW DOWNCOMMENTS: COMP. SET AT LIGHT TRIGGER PULL, 15,000MIN. ENGAGEMENT SET AT 15,000 BARSTESTED TO 15,000 IN F.I.E.D. POSITION15,000 BARSPLAINTIFF'S
EXHIBIT

3210

AL 0029940 181

Just - Comp.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
GENERAL CONDITION: NEW R #: 020090
OUTSIDE WORK: SCOPE MOUNTED DATE: 10-10-72
FIRE: W-W SUPER FROM: SOUTHERN GUN ^{INC.} 7K
& CONDITION: _____ MIAMI, FLORIDA
PROOF: R.E.P.-M INSP.: 73 TEST: 59 GUN #: 656296B
HEADING: _____ CODE: KW= 5/72
BREACH OPENING: - GR./CAL.: 7MM REV. MAG.
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
SEAR-TRIGGER CONNECTOR ENGAGEMENT. 020, STEEL
SHAVINGS BETWEEN SEAR AND HOUSING AT SEAR PIN
HOLE.
COMPLAINT: FIRES WHEN CLOSING BOLT
INCIDENT: FOLLOW DOWN.
COMMENTS: THE STEEL SHAVINGS PROBABLY CAUSED THE
SEAR TO BIND AND FAILED RETRACT TO LOCKED
POSITION THUS, FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3211

AL 0029741

RD-6542-1 Rev. 2-15-61

P.I. No GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700

GENERAL CONDITION: NEW

R # : 019718

OUTSIDE WORK: No

DATE: 10-5-72

FIRE AMMO TYPE: _____

FROM: K MART ENTERPRISE

& CONDITION: _____

ROYAL OAK, MICH.

GUN # : 6258285

PROOF: R.E.P.-A INSP. 58 TEST: 49

CODE: 05-7/69

HEADING: O.K.

GR./CAL.: 3006

BREACH OPENING: _____

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

SEAR - CONNECTOR ENGAGEMENT 010 (MIN. 15.020)

SOLIDIFIED LUBRICANT ON SIDE OF SEAR.

COMPLAINT: "FIRES WHEN EJECTING SHELLS"

INCIDENT: FOLLOW DOWN

COMMENTS: THE SOLIDIFIED LUBRICANT CAUSED THE SEAR
TO STAY DOWN IN FIRED POSITION, WHEN THE BARREL
WAS ROTATED TO LOCK-UP. FOLLOW DOWN OCCURRED.

PLAINTIFF'S
EXHIBIT

3212

AL 0029742

Cast. Complaint

No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
GENERAL CONDITION: GOOD R #: 019853
OUTSIDE WORK: SCOPE MOUNTED DATE: 10-4-72
FIRE AMMO TYPE: _____ FROM: DESA IND.
CONDITION: _____ PARK FOREST, ILL.
PROOF: R.E.P. INSP. J TEST: 13 GUN #: 6401425
HEADING: _____ CODE: LU = 2/71
BREECH OPENING: _____ GA./CAL.: 6MM
RECOIL SHOULDERS: O.K. CHECKED BY: CIPROSSER
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .005 (MIN. 15
.020) BURRS ON SIDES OF TRIGGER.

COMPLAINT: FIRES ON CLOSING.

INCIDENT: FOLLOW DOWN.

COMMENTS: POOR RETRACTION COMBINED WITH UNDER
MIN. ENGAGEMENT ALLOWED THE SEAR TO SLIP
BY THE CONNECTOR AND THE FIRING PIN TO FOLLOW
DOWN.

PLAINTIFF'S
EXHIBIT

3213

AL 0029743

P.1. NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: GOODOUTSIDE WORK: NO

FIRED AMMO TYPE: _____

& CONDITION: _____

PROOF: R.E.P. INSP.: 58 TEST: 49HEADING: -BREACH OPENING: -RECOIL SHOULDERS: EXCESSIVE RADIUS REAR LUGS.CHAMBER: O.K.TEST: 20 ROUNDS

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDLR #: 016530DATE: 8-24-72FROM: KLINEDINST & HOPPERLOGANVILLE, PA.GUN #: 6401603CODE: BU = 1/71GR./CAL.: 6MM REM.CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

ENGAGEMENTS O.K., TRIGGER FULL O.K. EXCESSIVE
RADIUS REAR OF LOCKING LUGS ON BOLT CAUSING
CLOSE HARD.

COMPLAINT: "SHELLS DON'T CHAMBER, FIRES WHEN YOU CLOSE
IT."

INCIDENT: CLOSE HARD & FOLLOW DOWN.PLAINTIFF'S
EXHIBIT

3214

COMMENTS: THE CLOSE HARD WAS CAUSED BY REAR
OF A RADIUS BACK OF LOCKING LUGS INTERFERENCE
ON THE FINE SURFACES. THE FOLLOW DOWN
PROBABLY WAS CAUSED BY RUBBER BLOUSE TO
TOP OF THE TRIGGER CATCHING ON THE INSIDE OF
THE HOUSING AND FAILING TO RETRACT.

N/700 Custom Gun

GUN EXAMINATION REPORT NUMBER: MODEL: 700 ADL
 GENERAL CONDITION: NEW R #: 016319
 OUTSIDE WORK: FIRING PIN HEAD GROUND DATE: 8-24-72
ON BOTTOM FROM: SCHEIDT & CO.
 FIRED AMMO TYPE: DALLAS, TEXAS
 & CONDITION: GUN #: 6481075
 PROOF: R.E.P.M INSP.: 9 TEST: 52 CODE: EV-10/71
 HEADING: G.K./CAL.: 7MM M.M.
 BREACH OPENING: CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED:
 CHAMBER: O.K. APPROVED:
 TEST: No APPROVED:
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

ENGAGEMENT (HORIZONTAL) BETWEEN SEAR AND TRIGGER
CONNECTOR .025 (VERTICAL ENGAGEMENT ZERO BEHIND
OF THE GROUND FIRING PIN HEAD)

COMPLAINT: "WITH STOCK OFF GUN FOLLOWS DOWN."

INCIDENT: FOLLOW DOWN

COMMENTS: IT APPEARS THAT THE CUSTOMER GROUND THE
FIRING PIN HEAD REDUCING THE FIRING PIN HEAD-SE
ENGAGEMENT TO ZERO, CAUSING THE FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3215

AL 0029/45

M/700 Custom Complaint

GUN EXAMINATION REPORT NUMBER: NOMODEL: 700GENERAL CONDITION: NEWR #: 016257OUTSIDE WORK: NODATE: 8-16-72FIRED AMMO TYPE: -FROM: HENRY L. FRAMEW. BARRINGTON, R.I.& CONDITION: ASSEMBLEDGUN #: 297377PROOF: R.E.P. INSP.: 14 TEST: 49CODE: WR = 8/68HEADING: -GR./CAL.: 270 WIN.BRESCH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.APPROVED: -CHAMBER: O.K.APPROVED: -TEST: NOAPPROVED: -

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: -TRIGGER PULL 3 1/2 LBS. SEAR-TRIGGER CONNECTORENGAGEMENT .005 (MIN. IS .020) STICKY LUBRICANTINSIDE HOUSING. CORNER OF TRIGGER CONNECTORWORN ROUND.COMPLAINT: "IT DISCHARGES PREMATURELY"INCIDENT: FOLLOW DOWNCOMMENTS: WITH INSUFFICIENT ENGAGEMENT BETWEENSEAR & CONNECTOR THE CONNECTOR BROKE DOWNON THE CORNER ALLOWING THE FOLLOW DOWNMALEFUNCTION.PLAINTIFF'S
EXHIBIT

3216

AL 0029746

GUN EXAMINATION REPORT NUMBER: NOGENERAL CONDITION: NEWOUTSIDE WORK: NOFIRED AMMO TYPE: FACTORY LOADS& CONDITION: ASSEMBLER 74PROOF: R.E.P.E INSP.: 74 TEST: 49HEADING: MAX. WITH ASSEMBLY MAX.BREACH OPENING: -RECOIL SHOULDERS: EXCESSIVE RADIUS BACK OF LUGS.CHAMBER: O.K.TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDLR # : 015571DATE: 8-14-72FROM: HIGHSPIRE SPTG.
GROUPS INC.HIGHSPIRE, PA.GUN # : 6312165CODE: LT-2/70GA./CAL.: 3006CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

SEAR-TRIGGER CONNECTOR ENGAGEMENT .010 (MIN. IS .030)
BURRS ON SIDES OF UPPER PART OF TRIGGER SHOW FRICTION
MARKS. POOR COLOR ON BARREL AT REAR SIGHT.

COMPLAINT: "FIRE JUST AS BOLT IS CLOSED."INCIDENT: FOLLOW DOWN

COMMENTS: THE TRIGGER BIND WITH UNDER MIN. ENGAGEMENT
CAUSED ERRATIC TRIGGER RETRACTION AND FOLLOW
DOWN.

PLAINTIFF'S
EXHIBIT

3217

AL 0029747

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

SUPPLY

PETERS

SUPPLY

CC: E. R. Carr
H. K. Boyle

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

8/1/702 Customer Complaint

Ilion, New York
August 14, 1972

L. J. BOYLE
S. M. ALVIS

The attached trip report by Harvey Boyle is relative to a complaint that difficulty was being experienced in fitting telescopes to Model 700 rifles. In addition to the scope complaints, 11 rifles were returned to Ilion and Bridgeport with a list of visual complaints. In our analysis of the returned guns, some complaints were justified but many were not. Because of the problem in determining the magnitude of the complaints and the fact that we were able to sight scopes on each of the returned rifles, Harvey Boyle, Denny Anderson and W. B. Cockman visited Jerry's Sport Center and E. L. Blair.

As a result of the trip (report attached), both Jerry's Sport Center and E. L. Blair are satisfied that corrective action has been taken. The Plant is investigating the scope sight hole process to initiate improvements.

It is further suggested that Research contact Leupold and remind them that their 3x-9x variable power scope has only 1/3 the windage adjustment of competitive scopes making adjustments difficult if used with bases without windage adjustments.

LF
L. Fox, Supt.
P E & C Section

LF:I
Attach.

PLAINTIFF'S
EXHIBIT

3218

183
AL 0029748

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

REPORT

PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

July 28, 1972

TO: L. FOX

FROM: H. K. BOYLE/D. J. ANDERSON

TRIP REPORT

Places visited: Jerry's Sport Center, Olyphant, Pa. 7/24/72
 E. L. Blair & Son Sporting Goods,
 Williamsport, Pa. 7/25/72

Reference: M/700 Quality Complaint

1. Scope holes in Receiver out of alignment--
can't bore sight rifles with a collimator.
2. Visual defects.

D. J. Anderson, Process Engineer; W. B. Cockman, Field Representative;
 and the writer visited the following establishments and reviewed the
 referenced M/700 Quality Complaints:

Jerry's Sport Center, Olyphant, Pa. - Jerry Warsky, Distributor/Jobber.

Mr. Warsky stated that M/700 rifles were unable to be collimated
 when equipped with a Leupold 3x-9x variable power scope mounted
 with fixed Weaver rings and mounts. Two (2) M/700 BDL, 30-06 Cal.
 rifles and one (1) Leupold 3x-9x scope were selected from Mr.
 Warsky's inventory and collimated satisfactorily. One (1) of the
 original complaint guns was selected and collimated satisfactorily
 with the Leupold scope. All three (3) guns were successfully targeted
 with live ammunition for point of impact; however, one (1) had very
 little additional windage or elevation adjustment remaining.

The visual items observed on the returned guns were reviewed and
 the program for corrective action discussed.

E. L. Blair & Son, Williamsport, Pa. - Sporting Goods Dealer (retailer)

Mr. Blair verified that the Leupold 3x-9x variable power scope and Weaver fixed rings and mounts were the primary problem although the Redfield 3x-9x variable power and the Redfield 4x have also been incapable of sighting in at times. He estimated that about 40% of the M/700-Leupold-Weaver combination could not be collimated as assembled and that shim stock was necessary for proper targeting. When shimming was necessary it was always applied to the left side of the rear base. Of the five (5) guns originally returned to Ilion by Mr. Blair and hand carried to his gunshop by this writer, two (2) could not be collimated with a Leupold 3x-9x scope selected from his inventory.

Comments and Observations:

The Leupold 3x-9x variable power scope has only 28 inches total windage and elevation adjustment (± 14 inches). This is only about 1/3 of the adjustment available in other hunting scopes. Because adjustment appears to be limited in one direction only, the Leupold Company should be contacted on this matter.

Mr. Warsky and Mr. Blair are both good friends of Remington, and they appeared glad that such attention was being given to M/700 quality. They pointed out that Remington has the major portion of the centerfire rifle market and practically all of the shotgun market.

HKB/DJA/bd

383
AL (K) 29750

M/700 Customer Complaint

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700GENERAL CONDITION: Good R #: 014720OUTSIDE WORK: SCOPE MOUNTED, BUTT PLATE DATE: 7-24-72CHANGED TO RECOIL PAD. FROM: S.E. MAYHOLFIRED AMMO TYPE: - MELBOURN, FLA.& CONDITION: _____ GUN #: 357864PROOF: R.E.P. INSP.: 0 TEST: A7 CODE: RP = 11/67HEADING: O.K. GR./CAL.: 3006BRESCCH OPENING: - CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER ADJUSTING SCREWS NOT SEALED (NO INDICATION
THE EVER HERE). ENGAGEMENT SEAR TO TRIGGER CONNECTOR
020, TRIGGER PULL ALPS, TRIGGER RUBS ON GUARD.
GREASE LIKE LUBRICANT ON TRIGGER INSIDE HANDGUN

COMPLAINT: FIRES WHEN THE SAFETY IS THROWN OFF.INCIDENT: FOLLOW DOWN

COMMENTS: THE HEAVY LUBRICANT COMBINED WITH FRICTION
OF THE TRIGGER AGAINST THE TRIGGER GUARD
CAUSED TRIGGER RETRACTION TO BE ERRATIC
RESULTING IN FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3219

AL 0029751

N/100 Customer Complaint

... N/2 GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 VARMINT

ORIGINAL CONDITION: NEW R # : 014704

OUTSIDE WORK: SCORE MOUNTED. DATE: 7-21-72

FIRE TYPE: _____ FROM: BILLINGS P.D.

& CONDITION: _____ BILLINGS, MONT.

PROOF: R.E.P. IMP.: 7.5 TEST: 55 GUN # : 318117

READING: _____ GA./CAL: 22-250

BREACH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERING: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: _____ APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN.

COMPLAINT: "GUN FIRES ON CLOSING THE BOLT." ALSO REPORTED TO

KEYHOLE.

INCIDENT: FALLON DOWN

COMMENTS: THE FALLON DOWN WAS A RESULT OF THE BROKEN

TRIGGER CONNECTOR FAILING TO RETRACT.

PLAINTIFF'S
EXHIBIT

3220

AL 0129752

M/710 Cust. Complaint

... No OWN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: Good R #: 014609
 OUTSIDE WORK: SCORP MEXTRD DATE: 7-21-72
 FROM: LEO D. JONES
 FIRED INFO TYPE: 150 GR. SUPER X HARREN, OHIO
 & CONDITION: _____ GUN #: 6282457
 PROOF: R.E.P.-D TEMP.: 73 TEST: Q7 CODE: ES-10/69
 READING: O.K. ME./OAL: 7MM REM. MAG
 BREAKER OPERING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERING: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: _____ APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SCOR-TRIGGER CONNECTOR ENGAGEMENT .005 (MIN. IS .020)
STEP IN FACE OF BOLT. TRIGGER NOT DE-BURRED.

COMPLAINT: "UPON OPENING THE BOLT THE GUN DISCHARGED."
"SHELLS HARD TO CHAMBER"

INCIDENT: FOLLOW DOWN, CLOSERS HARD

COMMENTS: FOLLOW DOWN WAS CAUSED BY .005 ENGAGEMENT
AND SLIGHT TRIGGER BIND. THE CLOSERS HARD WAS DUE
TO THE STEP IN THE BOLT FACE WHICH CREATED A MIN.
HEADER CONDITION NOT PICKED UP BY THE HEADING
DUMMY.

PLAINTIFF'S
EXHIBIT

3221

AL0029753

GUN EXAMINATION REPORT NUMBER: 700 MODEL: 700
 GENERAL CONDITION: Good R #: 014102
 OUTSIDE WORK: SCOPE MOUNTED DATE: 7-14-72
 FIRED AMMO TYPE: - FROM: GUSTAVE GUNDERSON
 & CONDITION: - CONRAD, MONTANA
 PROOP: R.E.P. ASSEMBLER 79 GUN #: 6226860
 INSP.: 73 TEST: 87 CODE: A5 = 3/69
 HEADING: - G1./CAL.: 22-250
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR - SEAR ENGAGEMENT .010 (MIN. IS .020) TRIGGER
PULL $2\frac{1}{2}$ LBS. (3 LBS. IS MIN.) RE-ADJUSTED BY CUSTOMER.
SEAR BEARING OF CONNECTOR CROOKED. TRIGGER MEASURED -
.008 UNDER MIN. ON CONNECTOR CLEARANCE, .002 OVER MAX. ON
LIF PIN HOLE TO TOP.

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF TRIGGER PULL
TOO HEAVY.

INCIDENT: FOLLOW DOWN

COMMENTS: LIGHT TRIGGER PULL RESULTS IN ERRATIC RETRACTION.
THE TRIGGER HOLDING THE CONNECTOR TOO HIGH AND
ALLOWING IT TO WORK UP .008 TO INTERFERE WITH THE
SEAR COULD MAKE RETRACTION IMPOSSIBLE, FOLLOW
DOWN WOULD RESULT.

**PLAINTIFF'S
EXHIBIT**

3222

AL 0029754

V1700 Custom Compound

I. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 VARMINTGENERAL CONDITION: NEWR #: 014137OUTSIDE WORK: FRONT TRIGGER ADJUSTINGDATE: 7-13-72SCREWS ADJUSTED.FROM: H.L. PETERS INC.FIRED AMMO TYPE: —BUFFALO, N.Y.& CONDITION: —GUN #: 6519891PROOF: R.E.R.-M INSP.: 48 TEST: 44LW: 2/72
CODE: PW: 6/72HEADING: —GR./CAL.: 25-06 REM.BREACH OPENING: —CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

CONNECTOR - SEAR ENGAGEMENT .010 (MIN. .020) TRIGGER
ADJUSTING SCREW BACKED OUT ELIMINATING SPRING TENSION
REQUIRED TO RETRACT TRIGGER & TRIGGER CONNECTOR.

COMPLAINT: FIRES WHEN CLOSING BOLTINCIDENT: FOLLOW DOWN

COMMENTS: APPARENTLY THE CUSTOMER ATTEMPTING TO
ADJUST THE TRIGGER PULL, BACKED THE ADJUSTING
SCREW OUT TOO FAR WHICH ELIMINATED ALL SPRING
TENSION. WITHOUT THIS, THE TRIGGER AND CONNECTOR
FAILED TO RETRACT RESULTING IN FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3223

AL 0029755

M/700 Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R #: 013812
 OUTSIDE WORK: SCOPE MOUNTED DATE: 7-12-72
 FROM: CHRISTMAN'S INC.
 FIRED AMMO TYPE: REMINGTON DARIEN, CT.
 & CONDITION: _____ GUN #: 6394467
 PROOF: R.E.P. ASSEMBLER 97 INSP.: 7A TEST: _____ CODE: XT = 12/70
 HEADING: O.K. *./CAL.: 222
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: 10 ROUNDS - O.K. APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR - SEAR ENGAGEMENT .010 (MIN.) .020 TRIGGER
PULL = 2 LBS. (MIN. 15 LBS.) NECK MEASURES .460 (MIN. .4518)
THROAT IS SHALLOW.

COMPLAINT: "CHAMBER NECK IS TOO SHORT, CHECK TRIGGER AT LIGHT SETTING"

INCIDENT: POTENTIAL FOLLOW DOWN.

COMMENTS: THIS RIFLE WAS RETURNED QUESTIONING THE FRONT
OF THE CARTRIDGE CASE BEING MARKED, WHICH IS
THE MARK OF THE CASE WIDING ACROSS THE RECHAMBER
IN BEING EJECTED. THE LIGHT TRIGGER PULL AND UNDER
MIN. ENGAGEMENT COULD HAVE LED TO A MORE SERIOUS
COMPLAINT LATER.

PLAINTIFF'S
EXHIBIT

3224

AL 0029756

1. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 013324
 OUTSIDE WORK: No DATE: 7-6-72
 FROM: MEYER HOWER'S ^{INC.} SPTAS,
 FIRED AMMO TYPE: _____ GOLDEN, COLO.
 & CONDITION: _____ GUN #: 6230255
 PROOF: R.E.P. INSP.: 73 TEST: 87 CODE: AS = 3/68
 HEADING: _____ G.K./CAL.: 6 MM REM.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR CLEARANCE ON TRIGGER .004 UNDER MIN. .006
PIN TO TOP OF TRIGGER ON MAY. TRIGGER HITS TRIGGER
HOUSING. HEAVY LUBRICANT USED INSIDE HOUSING.
SAFETY P. .001 UNDER MIN. CORREL. OF SAFETY .001
WITH SAFETY ON.

COMPLAINT: "HAMMER FALLS"

INCIDENT: FOLLOW DOWN

COMMENTS: THE COMBINATION OF LOW SAFETY, HIGH TRIGGER
AND TRIGGER BIND CAUSES FAILURE TO RETRACT WHEN
TRIGGER IS PULLED WITH SAFETY ON, THEN FOLLOW
DOWN WHEN SAFETY IS PUSHED OFF.



AL 0029757

GUN EXAMINATION REPORT NUMBER: NOMODEL: 700 *Curt*GENERAL CONDITION: NEWR # : 013117OUTSIDE WORK: SCOPE MOUNTEDDATE: 6-19-72FIRED AMMO TYPE: -FROM: SPORTSMEN'S DENMT. SHASTA, CAL.& CONDITION: ASSEMBLER 65GUN # : 6249832PROOF: R.F.P.-D INSP.: 74 TEST: 87CODE: PS=6/69, CH3=4/72HEADING: O.K.GA./CAL.: 7MMBREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.APPROVED: CHAMBER: O.K.APPROVED: TEST: NOAPPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: SEAR-TRIGGER CONNECTOR ENGAGEMENT .010 (MIN=.020)BOTH SEAR AND CONNECTOR DAMAGED ON ENGAGEMENT
CORNERS. CONDITION OF FIRING PIN HOLE & FIRING PIN
POINT INDICATE PRIMER PIERCING HAS BEEN EXPERIENCED.COMPLAINT: WILL NOT FIREINCIDENT: FOLLOW DOWNCOMMENTS: THE CUSTOMER PROBABLY EXPERIENCED A RECEDPRIMER WHICH WITH THE .010 ENGAGEMENT, CAUSED THE
SEAR-CONNECTOR DAMAGE RESULTING IN FOLLOW-
DOWN.PLAINTIFF'S
EXHIBIT

3226

AL 0029758 *14/*

M/100 Complaint

1. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700

GENERAL CONDITION: NEW R #: 012925

OUTSIDE WORK: No DATE: 6-14-72

FIRED AMMO TYPE: _____ FROM: LEO'S CUSTOM STXNS

& CONDITION: _____ BETHEL PARK, PENN.

PROOF: R.E.P.N. INSP.: 73 TEST: 13 GUN #: 6445877

HEADING: O.K. CODE: PU-6/71

BRECH OPENING: - OK./CAL.: 17REM.

RECOIL SHOULDERS: O.K. CHECKED BY: CIPRESSER

CHAMBER: O.K. APPROVED: _____

TEST: NO - 20 ROUNDS WITH NO BLOWN PRIMERS APPROVED: _____

AFTER NEW BOLT.

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR & SEAR ENGAGEMENT .010, BOTH
CORNERS BROKEN OFF, FIRING PIN ASSEMBLY RUSTED,
BOLT BODY STAINED & FIRING PIN HOLE AT HEADING SHARP.

COMPLAINT: WHEN HE CLOSED THE BOLT ON THE FOURTH ROUND
IT WENT OFF.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE CORNER BREAKAGE ON THE SEAR AND
TRIGGER CONNECTOR, WHICH RESULTED IN FOLLOW-DOWN,
IS THE RESULT OF INSUFFICIENT ENGAGEMENT AND PRIMER
PICKING.

PLAINTIFF'S
EXHIBIT

3227

AL 0029759

M/700 Customer Complaint.

.. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700GENERAL CONDITION: NEW R #: 012758OUTSIDE WORK: FRONT ADJUSTING SCREWS DATE: 6-12-72UNSEALED. FROM: J.V. ELIOT JR.FIRED AMMO TYPE: _____ SAN MEOTO, CALIF.& CONDITION: _____ GUN #: 6446926PROOF: R.E.P.-L INSP.: ASSEM. 30 TEST: B4 CODE: DU: 9/71HEADING: O.K. DR./CAL.: 17 REM.BREACH OPENING: _____ CHECKED BY: C. PROSSERRECOIL SHOULDERS: EXCESSIVE RADIUS APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CORNER OF SEAR CHIPPED OFF. FIRING PIN HOLE NOT
ROUNDED. FIRING PIN HOLE, REAR, NOT CLEANED - FIRING
PIN ASSEMBLY RUSTY. ENGAGEMENT UNDER MIN. - SEAR TO
CONNECTOR.

COMPLAINT: FOLLOWS DOWNINCIDENT: FOLLOW DOWN

COMMENTS: EVIDENTLY THE CUSTOMER EXPERIENCED A PEAKED
PRIMER, WHICH WITH UNDER MIN ENGAGEMENT CAUSED
THE CORNER OF THE SEAR TO CHIP OFF.

PLAINTIFF'S
EXHIBIT

3228

AL 0029760

Customer Complaint

P-1, NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDLGENERAL CONDITION: GOOD R #: 12354OUTSIDE WORK: SCOPE MOUNTED, TRIGGER DATE: 6-16-71ASSEMBLY ADJUSTED (FRONT SCREWS) FROM: RON MCKINNEY

FIRED AMMO TYPE: _____ THOMASTON, TEXAS

& CONDITION: _____ GUN #: 6324285PROOF: R.E.P.-G INSPE: 73 TEST: 87 CODE: AT-3/70HEADING: CLOSES ON MAX. HEADING DUMMY GR./CAL.: 25-06BREACH OPENING: - CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

FIRING PIN POINT FLAT ON SHOULDER, TRIGGER CONNECTOR,
BROKEN, GRIP CAP OFF, RADIUS AT REAR OF RECOIL
SHOULDERS ON BOLT.

COMPLAINT: "CANNOT GET THE TRIGGER TO STAY IN ADJUSTMENT."
"WHEN I SHOOT THE RIFLE, THE FIRING PIN KNOCKS HOLES IN THE PRIMER"
 INCIDENT: FOLLOW-DOWN & PIERCED PRIMER.

COMMENTS: THE BROKEN TRIGGER CONNECTOR FAILING TO RETRACT
CAUSED THE FOLLOW-DOWN. PRIMER PIERCING MAY
HAVE BEEN CAUSED BY THE DEFORMED FIRING PIN POINT.
REPLACED TRIGGER CONNECTOR,
REPLACED BOLT ASSEMBLY & FIRING PIN - SEE ABOVE.

PLAINTIFF'S
EXHIBIT

3229

AL 0029/61

Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 EDL

GENERAL CONDITION: NEW R #: 010030

OUTSIDE WORK: NO DATE: 5-1-72

FIRED AMMO TYPE: _____ FROM: ODELL HOWE, JR.

& CONDITION: _____ GREENSBORO, N.C.

PROOF: R.F.E.-H INSP.: 51 TEST: 13 GUN #: 6429469

HEADING: O.K. CODE: EU-10/1

BREECH OPENING: - GA./CAL.: 3006

RECOIL SHOULDERS: O.K. CHECKED BY: C. FODDERER

CHAMBER: O.K. APPROVED: _____

TEST: NO. APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN COMPONENTS. CONNECTOR, SCAR ENGAGEMENT = .006 MIN. 15.020 ALSO FOUND METAL CHIP BETWEEN TRIGGER & CONNECTOR.

COMPLAINT: WILL NOT FIRE.

INCIDENT: FOLLOWS DOWN.

COMMENTS: THE METAL CHIP BETWEEN THE TRIGGER AND CONNECTOR REDUCED THE CONNECTOR-SCAR ENGAGEMENT TO ZERO CAUSING THE FOLLOWS DOWN.

PLAINTIFF'S
EXHIBIT

3230

AL 0029762

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: NEW R #: 010133
 OUTSIDE WORK: NO DATE: 5-1-72
 FIRED AMMO TYPE: _____ FROM: RUDY'S GUN EVID.
 & CONDITION: _____ WYNDMERE, N.DAK.
 PROOF: R.E.P.-L INSP. 55 TEST: - GUN #: 6450564
 HEADING: O.K. CODE: PU= 6/71
 BRESCHE OPENING: - GRA./CAL.: 3006
 RECOIL SHOULDERS: O.K. CHECKED BY: CIPROSTER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO. APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN.

COMPLAINT: "TRIGGER DOES NOT WORK PROPERLY AND GUN WONT COCK"

INCIDENT: FOLLOWS DOWN

COMMENTS: THE BROKEN TRIGGER CONNECTOR FAILS TO RETRACT,
 SO THAT THE SEAR, BEING UNSUPPORTED DOES NOT
 STOP THE FIRING PIN WHICH FOLLOWS DOWN,

PLAINTIFF'S
EXHIBIT

3231

AL 002976Z

121
6

*Customer Complaint*P.I. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 BDLGENERAL CONDITION: GOODR #: 23021OUTSIDE WORK: SCOPE MOUNTED TRIGGERDATE: 11-15-71ADJUSTMENTS CHANGEDFROM: WILLIAM H. ULERYFIRED AMMO TYPE: -OBERLIN, KANSAS.& CONDITION: ASSEMBLER 73GUN #: 6456668PROOF: R.E.P. - O. INSP. 73 TEST: 66CODE: OU = 7/71HEADING: CLOSES OVER MAX. BELT GAGE.GA./CAL.: 7MMBRECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: EXCESSIVE RADIUS AT REAR.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED COMPONENTS.COMPLAINT: WENT OFF ACCIDENTALLY WHILE UNLOADING, AGAIN LATER WHILE LOADING.INCIDENT: FOLLOW DOWN.

COMMENTS: CUSTOMER'S MALFUNCTION NOT VERIFIED BY WRITER,
HOWEVER HIS READJUSTING HAS MADE IT IMPOSSIBLE TO
DETERMINE WHETHER THE RIFLE WAS CORRECTLY
ADJUSTED ON FINAL ASSEMBLY.

PLAINTIFF'S
EXHIBIT

3232

AL 0029764 101

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: GOOD R #: 22791
 OUTSIDE WORK: NO DATE: 11-12-71
 FROM: CHRISTY GUN WORKS
 FIRED AMMO TYPE: _____ SACRAMENTO, CAL.
 & CONDITION: _____ GUN #: 6372120
 PROOF: R.E.P.-A INSP.: NONE TEST: 13 CODE: NO COD
 HEADING: BOLT CLOSURE ON ASSEMBLY MAX. GA/CAL.: 3006
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
NO DAMAGED COMPONENTS.

COMPLAINT: GUN FIRES WHEN SAFETY IS RELEASED.

INCIDENT: FOLLOW DOWN.

COMMENTS: MALFUNCTION NOT VERIFIED BY WRITER.
HOWEVER, EXAMINATION OF THE TRIGGER REVEALS
SEVERAL SMALL METAL SHAVINGS WHICH MAY HAVE,
IF CONCENTRATED IN ONE POSITION, REDUCED THE
ENGAGEMENT TO A DANGEROUS LEVEL.
TRIGGER PULL WAS FOUR POUNDS, SEAR-CONNECTOR
ENGAGEMENT WAS .020.

PLAINTIFF'S
EXHIBIT

3233

AL 0029765

181
0

Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: MODEL: 700
 GENERAL CONDITION: GOOD R #: 19457
 OUTSIDE WORK: SCOPE MOUNTED. DATE: 10-4-71

FROM: GEN. SPT. SUPPLY CO.

FIRED AMMO TYPE: SYRACUSE, N.Y.

& CONDITION: GUN #: 6279663

PROOF: R.E.P.E. INSP.: 74 TEST: 87 CODE: E5 = 10/69

HEADING: O.K. GR./CAL.: 3006

BREACH OPENING: - CHECKED BY: G. PROSSER

RECOIL SHOULDERS: O.K. APPROVED:

CHAMBER: O.K. APPROVED:

TEST: NO APPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

NO DAMAGED OR BROKEN COMPONENTS.

COMPLAINT: FIRES WHEN SAFE IS PUSHED OFF.

INCIDENT:

PLAINTIFF'S
EXHIBIT

3234

COMMENTS: THE CUSTOMER'S MALFUNCTION COULD NOT BE
 DUPLICATED ANY WAY. IT WAS NOTED AND VERIFIED
 BY K. CHADWICK THAT THE CUSTOMER HAD ADDED
 A LUBRICANT WHICH IS TOO HEAVY (THICK) TO THE
 TRIGGER ASSEMBLY. THIS, IN COLD CLIMATES WOULD
 CAUSE A MALFUNCTION SUCH AS THAT CLAIMED BY
 THE CUSTOMER.

AL 0029766

Customer Complaint... No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700VAR.GENERAL CONDITION: Good R #: 010987OUTSIDE WORK: No DATE: 5-9-72FIRED AMMO TYPE: - FROM: ALVIN A. SMITH

& CONDITION: _____ CORYDON, IND.

PROOF: R.F.P.-C INSP. 9 TEST: 41 GUN #: 6342627HEADING: O.K. CODE: KT-5/70BREACH OPENING: _____ GR./CAL.: 222RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSERCHAMBER: O.K. APPROVED: [Signature]TEST: No APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN. NO STOCK ETC.COMPLAINT: REPAIRINCIDENT: FOLLOW DOWNCOMMENTS: THE BROKEN TRIGGER CONNECTOR COULD NOT
PERFORM ITS FUNCTION OF SUPPORTING THE SEAR
AGAINST THE THRUST OF THE FIRING PIN HEAD.PLAINTIFF'S
EXHIBIT

3235

AL 0029767

1. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 S&W
 GENERAL CONDITION: New R #: 006500
 OUTSIDE WORK: From Manufacturer DATE: 3-13-72
 FIRED AMMO TYPE: _____ FROM: Pradco, Hous. Co.
 & CONDITION: _____ Brown-Peters, Pa.
 GUN #: 624334
 PROOF: RLR INSP.: 79 TEST: B7 CODE: 05-2/28
 READING: _____ GR./CAL.: 508
 BREACH OPENING: _____ CHECKED BY: C. P. H. H.
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SERIAL INST. ENDOGEN. 1.099 (1.099) TRIGGER
 CLEARANCE ON CONNECTOR: 1.099 (1.099) THIS ADDS UP TO
 .014 MORE CLEARANCE BETWEEN CONNECTOR AND TRIGGER THAN
 SPECIFICATIONS.
 COMPLAINT: FIRING WHEN SHOTGUN IS REARMED

INCIDENT: FOLLOW DOWN

COMMENTS: THE EXCESSIVE CLEARANCE
AND CORRESPONDING ALIGNMENT
CAUSING FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3236

AL 0029768

P. 100 GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: USED R #: 000153
 OUTSIDE WORK: TRIGGER ADJUSTING SCREENS RE- DATE: 3-10-72
ADJUSTED, SCOPE MOUNTED, & SIGHTS REMOVED. FROM: GIBSON PRODUCTS CO.
 FIRED AMMO TYPE: _____ MISSOULA, MONTANA
 & CONDITION: _____ GUN #: 6325677
 PROOF: P.F.D.-D INSP.: 9 TEST: 41 CODE: CT = 4/70
 HEADING: _____ GA/CAL.: 250G
 BREACH OPENING: _____ CHECKED BY: PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN - DAMAGED COMPONENTS. CONNECTOR CLEARANCE
IN TRIGGER 1.070 (MIN. 1.033) TRIGGER CLEARANCE IN CONNECTOR
1.091 (MIN. 1.033) ADJUSTMENTS HAVING BEEN ALTERED MADE IT
IMPOSSIBLE TO DETERMINA CONDITION OF THE FINAL ASSEMBLY.
AS RECEIVED. SEAR CONNECTOR ENGAGEMENT 0.05 MIN. IS .020.
 COMPLAINT: "SAFETY DEFECTIVE"

INCIDENT: MAY HAVE BEEN FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3237

COMMENTS: THE CUSTOMER'S MALFUNCTION COULD HAVE BEEN THE
RESULT OF LIGHT TRIGGER HILL, 3L33, AND 1.033 MIN.
SEAR CONNECTOR ENGAGEMENT - THIS WOULD PERMIT JAM
UP. IT COULD ALSO HAVE BEEN THE RESULT OF THE
1/4 EXCESS CLEARANCE BETWEEN TRIGGER & CONNECTOR
WHICH PREVENTS CONNECTOR - SEAR INTERFERENCE PREVENT-
ING PROPER TRIGGER - CONNECTOR RETENTION.

P NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660GENERAL CONDITION: NEW R #: 006930OUTSIDE WORK: SCORE MOUNTED, SWIVELS ADDED DATE: 3-13-72CEMENT REMOVED - REAR ADJUSTING SPRING FROM: ACKERMAN'S FIRST
AID SUPPLIESFIRED AMMO TYPE: — GROVE CITY, PA.& CONDITION: _____ GUN #: 111373PROOF: R.C.D. ASSEMBLED INSP.: 73 TEST: 79 CODE: KR = 5/68HEADING: — GA./CAL.: 223 W.M.BREACH OPENING: — CHECKED BY: PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR AND TOP INSIDE OF HOUSING COATED WITH DRIED
LUBRICANT OR OTHER MATERIAL.COMPLAINT: "GOES OFF WITHOUT WARNING."INCIDENT: FOLLOW DOWNCOMMENTS: THE INCIDENT OR WHATEVER, SOURCE OF THE
RESPONSE OF TRIGGER ASSEMBLY - TRIGGER FAILURE TO
RESET - SEAR FAILURE TO RETURN TO COCKED POSITION.PLAINTIFF'S
EXHIBIT

3238

- 1 of 1
AL 0029770

P NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 ADLGENERAL CONDITION: FAIRR #: 006152OUTSIDE WORK: SCOPE MOUNTED, SIGHTSDATE: 3-8-72REMOVED.FROM: GIBSON PRODUCT CO.

FIRED AMMO TYPE: _____

MISCELLANEOUS

& CONDITION: _____

GUN #: 6222426PROOF: R.F.P.ASSEMBLER 30

INSP.: _____

13TEST: 49CODE: PS-6/69HEADING: -GA./CAL.: 3006

BREECH OPENING: _____

CHECKED BY: PROSNERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO BROKEN, DAMAGED COMPONENTS. SEAR CONNECTORENGAGEMENT .06 (MIN. IS .020) TRIGGER CLEARANCE INCONNECTOR = 1.091 (M/D = 1.083, 1.080); CONNECTOR CLEARANCE ONTRIGGER = 1.071 (M/D = 1.079) CONNECTOR IS WARPED ANDTRIGGER HAS EXCESSIVE RADIUS UNDER CONNECTOR ON TOP.COMPLAINT: DEFECTIVE SAFETYINCIDENT: FOLLOW DOWN IS POSSIBLEPLAINTIFF'S
EXHIBIT

3239

COMMENTS: THE EXCESS CLEARANCE BETWEEN THE CONNECTOR
AND TRIGGER (.013 EXCESS) COULD ALLOW THE CONNECTOR
TO WORK UP TO INTERFERE WITH THE SEAR PREVENTING
RETRACTION WITH THE SAFETY ON. PUSHING THE
SAFETY OFF THEN WOULD RESULT IN A FOLLOW DOWN.

P No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: GOOD R #: 005856
 OUTSIDE WORK: NO DATE: 3-7-72
 FIRED AMMO TYPE: — FROM: CONNORS SAT. ADS.
 & CONDITION: — MOBERLY, MO.
 PROOF: R.E.P.-5 INSP.: 9 TEST: 13 GUN #: 6243-06
 HEADING: — CODE: 05-6/69
 BREECH OPENING: — GA./CAL.: 308 W.M.
 RECOIL SHOULDERS: OK CHECKED BY: C. PROSSER
 CHAMBER: OK APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGES, BROKEN COMPONENTS. TRIGGERS FULL 3 LBS.

NO TRIGGER-TRIGGER GUARD INTERFERENCE. REAR-LOCK-
 ECTOR ENGAGEMENT = .020 (MIN. IS .020) SEALS INTACT.
 HEAVILY OILED.

COMPLAINT: "GUN SOMEHOWS WILL FIRE AT 300 YDS. BLOW UP"

ENGAGED WITHIN TRIGGER GUARD AREA.

INCIDENT: FORGOTTEN DOWN

COMMENTS: IT APPEARS DEFECTS BEING REPAIRING

ONE USED PROBABLY CAUSE OF TRIGGER TO
 REMAIN IN FREE POSITION, PREVENTING THE FOLLOWING
 DOWN MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3240

1 of 1

AL 0029772

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: GOOD R #: 005424
 OUTSIDE WORK: TRIGGER STOP SCREEN SEAL DATE: 2-25-72
 FROM: DONALD GAGNON
 FIRED AMMO TYPE: _____ CHICAGO, ILLINOIS
 & CONDITION: _____ GUN #: 6362419
 PROOF: R.E.P.-A INSP.: 58 TEST: 13 CODE: DT-9/70
 HEADING: _____ GA./CAL.: 300 GSPR.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: _____ APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGED COMPONENTS. HORIZONTAL ENGAGEMENT
 .030 MIN. = .020 CONNECTOR CLEARANCE ON TRIGGER =
 1.072 MID = ^{1.079} 1.076 TRIGGER CLEARANCE ON CONNECTOR =
 1.089 MID = ^{1.083} 1.080. TRIGGER STOP SCREEN SEAL BROKEN.
 TRIGGER BIND DETECTABLE, LUBRICANT TOO HEAVY.
 COMPLAINT: FIRES WHEN SAFETY IS RELEASED.

INCIDENT: TRIGGER FAILS TO RETRACT.

COMMENTS: THE FIT OF THE TRIGGER TO THE HOUSING, TOO
 HEAVY LUBRICANT & EXCESS CLEARANCE BETWEEN
 CONNECTOR AND TRIGGER (.010) COULD LEAD TO THE
 CUSTOMER'S MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3241

1. NA GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: GOOD R #: 22234
 OUTSIDE WORK: TRIGGER SCREWS READJUSTED DATE: 12/7/67
 FIRED AMMO TYPE: UNKNOWN FROM: WILLER WEIDEN
 & CONDITION: _____ ARMS INC
705 SECOND ST
SAN FRANCISCO CAL
 GUN #: 300523
 PROOF: (REP) INSP.: 14 TEST: 58 8-67
 HEADING: OK 20 WIN
 BREACH OPENING: _____ CHECKED BY: MT
 RECOIL SHOULDERS: NORMAL APPROVED: [Signature]
 CHAMBER: _____ APPROVED: [Signature] 1/3/68
 TEST: _____ APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

STOCK CRACKED, BUTT PLATE MISSING, MAGAZINE
BOX DEFORMED

GUN FIRED WHEN SAFE WAS MOVED TO
POSITION (PER CUSTOMER)

INCIDENT: GUN APPARENTLY FIRED WHEN SAFE WAS RELEASED AND
TRIGGER INADVERTENTLY PULLED AT SAME TIME OR GUN WAS
HIT CAUSING JAR OFF DUE TO IMPROPER SETTING.

COMMENTS: SEAL WAS REMOVED FROM TRIG. ADJUSTING SCREW AND EN-
GAGEMENT SET LESS THAN RECOMMENDED. (20 MIN. ENGAGEMENT
SCREW ALSO SHOWS EVIDENCE OF HAVING BEEN MOVED)
TRIGGER PULL WAS CHANGED SO THAT [REDACTED] APPROXIMATE
1 1/2 LBS. EVEN SO WAS NOT ABLE TO [REDACTED] FOLLOW-
DOWN AT PRESENT SETTING AS CUSTOMER MAINTAINS.

PLAINTIFF'S
EXHIBIT

3242

AL 0029774

1 of 1

NOT A BLOW-UP

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R #: 1514
 OUTSIDE WORK: TRIGGER PULL ADJUSTED. DATE: 1-22-70
 FIRED AMMO TYPE: — FROM: DENVER,
— COLORADO
 & CONDITION: _____ GUN #: 6227025
 PROOP: R.E.F. INSP.: 73 TEST: _____ = 3/69
 HEADING: — _____ = 250
 BREACH OPENING: — CHECKED BY: E. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: DRY FIRED - MALFUNCTION VERIFIED. APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SAFETY FIRES WHEN RELEASING SAFETY TO OFF POSITION.

INCIDENT: SAFETY DOES NOT LIFT SEAR CLEAR OF TRIGGER CONNECTOR.

COMMENTS: SAFETY, HOUSING, TRIGGER CONNECTOR & TRIGGER
WERE MEASURED. ONLY THE TRIGGER WAS FOUND TO
BE NOT TO SPECIFICATIONS. DIMENSION FROM 4 OF 2.
HOLE TO TOP BEING .9782 (MODE - DRAWING = .971)

PLAINTIFF'S
EXHIBIT

3243

AL 0029775

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 22570
 OUTSIDE WORK: NO DATE: 11-2-70
 FROM: LIMA, OHIO
 FIRED AMMO TYPE: _____
 & CONDITION: _____ GUN #: 6233914
 PROOP: _____ INSP.: _____ TEST: _____ CODE: CS = 4/69
 HEADING: _____ GA./CAL.: 222
 BREECH OPENING: _____ CHECKED BY: G. PROSSER
 RECOIL SHOULDERS: _____ APPROVED: _____
 CHAMBER: _____ APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
 O.K.

COMPLAINT: FIRES WHEN SAFE IS RELEASED.

INCIDENT: TRIGGER CONNECTOR MOVES UP WHEN TRIGGER IS PULLED WITH THE SAFETY ON.

COMMENTS: TRIGGER CONNECTOR IS .007 OVERSIZE ON TRIGGER
 CLEARANCE. TRIGGER IS .006 UNDERSIZE ON CONNECTOR
 CLEARANCE. THIS EXCESSIVE CLEARANCE ALLOWS THE
 CONNECTOR TO WORK UP, INTERFERE WITH THE SEAR AND
 FAIL TO RETRACT UNDER THE SEAR RESULTING IN
 FOLLOW DOWN WHEN THE SAFETY IS PUSHED OFF.

PLAINTIFF'S
EXHIBIT

3244

1 of 1
AL 0029776

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: LIKE NEW R #: _____
 OUTSIDE WORK: NO DATE: 11-3-70
 FIRED AMMO TYPE: _____ FROM: EAU CLAIRE,
 & CONDITION: _____ WISCONSIN.
 GUN #: 6258555
 PROOF: - INSP.: _____ TEST: _____ CODE: 03 = 7/69
 HEADING: - GA./CAL.: 3006
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: - APPROVED: _____
 CHAMBER: - APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
 O.K.

PLAINTIFF'S
 EXHIBIT
 3245

COMPLAINT: GUN FIRES WHEN SAFETY IS PUSHED ON FIRE.

INCIDENT: NOT VERIFIED.

COMMENTS: HEAVY LUBRICANT PRESENT. PARTS MEASURED
 INDICATE EXCESSIVE CLEARANCE (.013) BETWEEN
 TRIGGER & CONNECTOR, WHICH WOULD ALLOW THE CONNECTOR
 TO MOVE UP & INTERFERE WITH THE FRONT
 OF THE SEAR AND PREVENT RETRACTION.
 SEAR-CONNECTOR ENGAGEMENT .010.

Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R #: 02095
 OUTSIDE WORK: SCOPE MOUNTED DATE: 1-24-71
 FROM: NAGEL'S GUN SHOP
 FIRED AMMO TYPE: _____ SAN ANTONIO, TEXAS.
 & CONDITION: _____ GUN #: 6206774
 PROOF: R.E.P. INSP.: 9 TEST: 13 CODE: B5-1/69
 HEADING: O.K. GA./CAL.: 270 WIN.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPLAINT: "FIRES WHEN YOU RELEASE SAFETY"INCIDENT: FOLLOWS DOWN
 PLAINTIFF'S
 EXHIBIT
 3246

COMMENTS: TRIGGER CLEARANCE ON TRIGGER CONNECTOR = 1.091
MODEL DRAWING = 1.080
1.063 DVERSIZE .008; CONNECTOR
CLEARANCE ON TRIGGER = 1.068 MODEL DRAWING = 1.076
UNDERSIZE .008. ALTHOUGH THE MALFUNCTION COULD
NOT BE DUPLICATED, THE EXCESSIVE CLEARANCE BETH-
EEN CONNECTOR & TRIGGER WOULD ALLOW INTERFER-
ANCE BETWEEN CONNECTOR & SEAR AND RESULT
IN FOLLOW DOWN.

Customer Complaint

F... NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADLGENERAL CONDITION: NEW R #: 06640OUTSIDE WORK: NO DATE: 3-9-71FIRED AMMO TYPE: _____ FROM: JOE W. HARRIS& CONDITION: _____ GUN #: 6364870PROOF: R.E.P.-A INSP.: D TEST: 13 CODE: WT = 11/70HEADING: O.K. GR./CAL.: 270 WIN.BREACH OPENING: _____ CHECKED BY: C. PROLDERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN OR DAMAGED COMPONENTSCOMPLAINT: FIRE WHEN SAFETY WAS PUSHED OFF.INCIDENT: FOLLOWED DOWNPLAINTIFF'S
EXHIBIT

3247

COMMENTS: CONNECTOR-SEAR ENGAGEMENT .010, MIN. IS .015THIS COUPLED WITH A TOO HEAVY LUBRICANT AND SLIGHTLY
ROUNDED SEAR, PROBABLY LED TO THE MALFUNCTION.THE MALFUNCTION COULD NOT, HOWEVER, BE
DUPLICATED HERE.

1 of 1

ENGAGEMENT RE-ADJUSTED TO .015. AL 0029779

1 NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 ADLGENERAL CONDITION: FAIRR #: 11954OUTSIDE WORK: SCOPE MOUNTEDDATE: 6-2-71

FIRED AMMO TYPE: _____

FROM: NATIONAL RIFLE ASSN.

& CONDITION: _____

KAHULUI, MAUI, HAWAIIPROOF: R.E.P.-E. INSP.: U TEST: 87GUN #: 6258351CODE: 05 = 7/69HEADING: O.K.GAT/CAL.: 3006BREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO BROKEN ETC. COMPONENTS.CONNECTOR CLEARANCE ON TRIGGER = 1.069 M/D = 1.079 - .007TRIGGER CLEARANCE ON CONNECTOR = 1.089 M/D = 1.083 + .006CONNECTOR - SEAR ENGAGEMENT = 0.015 (0.005 UNDER MIN.)TRIGGER PULL FIVE POUNDS. EXCESSIVE LUBRICANTSCOMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.PLAINTIFF'S
EXHIBIT

3248

INCIDENT: TRIGGER CONNECTOR FAILED TO RETRACTCOMMENTS: CAN NOT DUPLICATE CUSTOMER'S MALFUNCTION.THE TRIGGER-CONNECTOR & TRIGGER NOT TO MODELDRAWING PERMIT SEAR, CONNECTOR INTERFERENCEFAILURE TO RETRACT.

P NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: FAIROUTSIDE WORK: SCOPE MOUNTEDFIRED AMMO TYPE: -& CONDITION: -PROOF: R.E.P.-F INSP.: U TEST: 37HEADING: O.K.BREECH OPENING: -RECOIL SHOULDERS: O.K.CHAMBER: O.K.TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

NO COMPONENT BROKEN.ADJUSTED CLEARANCE ON TRIGGER = 1.090 M/D = 1.074 T.000TRIGGER CLEARANCE ON CONNECTOR = 1.090 M/D = 1.083 T.010CONNECTOR - SEAR ENGAGEMENT O.K.COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.INCIDENT: TRIGGER CONNECTOR FAILED TO RETRACT.COMMENTS: CAN NOT DUPLICATE CUSTOMER'S MALFUNCTION.THE TRIGGER CONNECTOR-SEAR MEETS NO - TO
MODEL DRAWING. PERMIT SEAR, CONNECTOR
INTERFERENCE - FAILURE TO RETRACT.PLAINTIFF'S
EXHIBIT

3249

AL 0029781

Castro Complaint

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: FAIR R #: 12923
 OUTSIDE WORK: SCOPE MOUNTED DATE: 6-28-71
 FIRED AMMO TYPE: _____ FROM: NAT. PARK SERV.
 & CONDITION: _____ KAHULUI, MAUI, HAWAII
 PROOF: R.E.P.-E INSP.: 11 TEST: B7 GUN #: 6258663
 HEADING: O.K. CODE: 05-7/69
 BREECH OPENING: - G.K./CAL.: 3006
 RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN COMPONENTS.

CONNECTOR CLEARANCE ON TRIGGER 1.062 M/D = $1.079 - 0.014$

TRIGGER CLEARANCE ON CONNECTOR 1.097 M/D = $1.085 + 0.004$

CONNECTOR-SEAR ENGAGEMENT $.025$ - O.K.

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.

INCIDENT: TRIGGER CONNECTOR FAIL TO RETRACT

COMMENTS: CAN NOT DUPLICATE THE CUSTOMER'S MALFUNCTION.
THE TRIGGER CONNECTOR & TRIGGER NOT TO MODEL
DRAWING PERMIT SEAR, CONNECTOR INTERFERENCE
FAILURE TO RETRACT.

PLAINTIFF'S
EXHIBIT

3250

1 of 1

AL 0029782

M700 Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: MODEL: 700

GENERAL CONDITION: GOOD R #: 19055

OUTSIDE WORK: SEAL MISSING ON TRIGGER ADJ. DATE: 9-26-71

ADJUSTING SCREW. FROM: ALLEN L. WOOD

FIRED AMMO TYPE: T CLINTON, MO.

& CONDITION: GUN #: 6291404

PROOF: R.E.P.-E INSP.: D TEST: 13 CODE: RS-11/69

HEADING: O.K. GA./CAL.: 3006

BREECH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED:

CHAMBER: O.K. APPROVED:

TEST: NO APPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

NO BROKEN OR DAMAGED COMPONENTS. STOCK MISSING.

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF

INCIDENT: FOLLOW DOWN

COMMENTS: ENGAGEMENT O.K., TRIGGER FULL 5 1/2 LBS. SEAL
 MISSING AND ADJUSTING SCREW, FRONT, BACKED OUT 50.
 NO TENSION REMAINED TO RETRACT THE TRIGGER.

PLAINTIFF'S
EXHIBIT

3251

AL 0029783

Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 ADL

GENERAL CONDITION: USED

R #: 22448

OUTSIDE WORK: SCOPE MOUNTED

DATE: 11-8-71

FIRED AMMO TYPE: -

FROM: THE SPORTSMAN

HARLINGEN, TEXAS

& CONDITION: _____

GUN #: 276664

PROOF: R.E.P. INSP.: 9 TEST: 87

CODE: RP. 5/67, OTS: 7/70

HEADLUG: _____

CHK./CHK.: _____

BREECH OPENING: -

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED, OR BROKEN COMPONENTS

TRIGGER BINDS ON GUARD. TRIGGER PULL 2 1/2 POUNDS.

COMPLAINT: "FIRED WHEN SAFETY IS PUT IN FIRE POSITION"

INCIDENT: FOLLOWS DOWN

COMMENTS: WITH THE TRIGGER PULL LIGHT (2 1/2 POUNDS) AND THE TRIGGER BINDING ON THE GUARD, IT IS POSSIBLE THAT TRIGGER CONNECTOR RETRACTION WOULD BE SENSITIVE. THIS COULD CAUSE FOLLOW ON DOWN WHEN THE TRIGGER IS PULLED WITH THE SAFETY ON.

PLAINTIFF'S
EXHIBIT

3252

AL 0029784

1 of 1

Customer Complaint

P NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 500 AD.GENERAL CONDITION: NEWR #: 24695OUTSIDE WORK: NODATE: 12-14-71

FIRED AMMO TYPE: _____

FROM: BIG BEAR STORES INC.

& CONDITION: _____

BILLINGS, MONTPROOF: R.E.P.-E INSP.: U TEST: 29GUN #: 6360196CODE: WT: 8/10HEADING: O.K.GR./CAL.: 270 WIN.BREECH OPENING: -CHECKED BY: C. P. GOSSETRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED, BROKEN COMPONENTS.TRIGGER PULL 7 POUNDS, SEAR-TRIGGER CONNECTIONENGAGEMENT O.K. TRIGGER BUILT IN TRIGGER GUARD.COMPLAINT: FIRE WHEN SAFETY IS RELEASED.INCIDENT: FOLLOW DOWNPLAINTIFF'S
EXHIBIT

3253

COMMENTS: THE CUSTOMER'S MALFUNCTION NOT DUPLICATED.HOWEVER, AN INTERFERENCE BETWEEN THE TRIGGER ANDTRIGGER GUARD WAS NOTED WHICH LIKELY CAUSEDTHE TRIGGER TO FAIL TO RETRACT INTO COCKEDPOSITION.

1 of 1

F NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: GOODOUTSIDE WORK: NOFIRED AMMO TYPE: -& CONDITION: -PROOF: R.E.A.-A INSP.: J TEST: BTREADING: OKBREECH OPENING: -RECOIL SHOULDERS: OKCHAMBER: OKTEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

NO BROKEN OR DAMAGED COMPONENTS.TRIGGER CONNECTED 1.00 (MID-1935) TRIGGER 1.065 (MID-1935)CONNECTED - SEAR ENGAGEMENT 0.30 MID 1915, TRIGGERPULL 4 TO 4 1/2 LBS. LUBRICANT USED APPLIED TO 35 TBSHEAVY.COMPLAINT: WHEN PUSHING SAFETY OFF THE GUN DOES OFF.INCIDENT: FALLING DOWN.Carat ComplaintMODEL: 700 ADLR # : 23155DATE: 11-18-71FROM: BIGGS SGT. GON.PENSACOLA, FLA.GUN # : 6344022CODE: KT-5/10GA./CAL.: 22-250CHECKED BY: G.F. GON.

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

PLAINTIFF'S
EXHIBIT

3254

COMMENTS: WITH THE EXCESSIVE CURRENTS BETWEEN THETRIGGER COILS AND THE TRIGGER COILS AND THE TRIGGERTHE TRIGGER COILS AND THE TRIGGER COILS AND THE TRIGGERIT COULD BE THE TRIGGER COILS AND THE TRIGGER COILSIN THE TRIGGER COILS AND THE TRIGGER COILS AND THE TRIGGERBECAUSE THE TRIGGER COILS AND THE TRIGGER COILS AND THE TRIGGER

104

R 342-1 Rev. 2-15-61

P.I. 145 GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 ADL

GENERAL CONDITION: GOOD

R # : 27191

OUTSIDE WORK: SCOPE MOUNTED

DATE: 12-27-71

FIRED AMMO TYPE: _____

FROM: PECOS 500 GDS.

PECOS 5.7mm

& CONDITION: _____

GUN # : 6383778

PROOF: PECOS INSP.: 73 TEST: 27

CODE: RT-11/7-

HEADING: OK

GA./CAL.: 2506 CM

BREECH OPENING: -

CHECKED BY: CHAS. J. C.

RECOIL SHOULDERS: OK

APPROVED: _____

CHAMBER: OK

APPROVED: _____

TEST: 1/2

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

SEAR-CONNECTOR ENGAGEMENT (OBS). TRIGGER PULL 10
POUNDS. STOCK ETC. NOT INCLUDED. MARK ON TRIGGER
SIDE INDICATES POSSIBLE END OF TRIGGER GUARD.
NO STOCK, MAGAZINE OR AMMUNITION FOUND IN
SPRING.

COMPLAINT: DISCHARGED WHEN SAFETY WAS MOVED FROM SAFE
TO FIRE POSITION.

INCIDENT: FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3255

COMMENTS: THE CUSTOMER'S MALFUNCTION WAS NOT DUPLICATED
HOWEVER IT MAY HAVE BEEN CAUSED BY TRIGGER PULL
IN THE TRIGGER POUND.

1 of 1

AL 0029787

10-072-7 Rev. 2-15-61

F. 112 GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 ADL

GENERAL CONDITION: NEW

R # : 002696

OUTSIDE WORK: N/O

DATE: 2-1-72

FROM: SUPPLY,
DUNN'S SCAFFOLD

FIRE AMMO TYPE: _____

APPROVAL: N/A

& CONDITION: _____

GUN # : 6310545

PROOF: PER - N INSP.: 71 TEST: 49

CODE: LT = 2/70

READING: O.K.

GR/CAL.: 300% ST

BREECH OPENING: -

CHECKED BY: C. FROST

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: N/O

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

TRIGGER PULL 4 LBS. ENGAGEMENT 0.12 (MIN) 0.20

MARKS TO BE MADE ON SIDE OF TRIGGER AND PULL
ON TOP SIDE EDGES (RUE MARKS LOWER SIDE EDGES)

COMPLAINT: RIFLE DISCHARGED BY ITSELF THE LAST OF JAN. 1972
FIRED.

INCIDENT: FOLLOW DOWN.

COMMENTS: MARKS ON THE TRIGGER INDICATE FRICTION. THE
COMBINATION OF FRICTION, HEAVY INTERLOCK AND UNDER
MIN. ENGAGEMENT PROBABLY PREVENTED TRIGGER
CONNECTOR RETRACTION CAUSING FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3256

AL 0029788

F No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: NEW R #: 002678
OUTSIDE WORK: No DATE: 2-2-72
FROM: BILL DOTSON'S INC.
FIRED AMMO TYPE: _____ DECATUR, ILL.
& CONDITION: _____ GUN #: 6294075
PROOF: R.E.P.-A INSP.: 9 TEST: 13 CODE: X5 = 12/69
HEADING: O.K. GA./CAL.: 270 WIN.
BREACH OPENING: - CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER PULL 6 LBS., ENGAGEMENT .020. TRIGGER
BIND IS NOTICEABLE. IN DIS-ASSEMBLING THE TRIGGER
HAS WHAT APPEARS TO BE DRIED STEEL GUARD ON
THE SIDES CAUSING IT TO BIND.

COMPLAINT: "WHEN BOLT IS PUT IN ALL THE WAY THE GUN WILL
GO OFF!"

INCIDENT: FOLLOW DOWN

COMMENTS: THE SLUGGISH TRIGGER PROBABLY FAILED TO
RETRACT RESULTING IN A FOLLOW DOWN MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3257

1 of 1
AL 0029789

F AN GUN EXAMINATION REPORT NUMBER: _____MODEL: 680GENERAL CONDITION: GOODR # : 0018-3OUTSIDE WORK: SCORE MOUNTEDDATE: 1-31-72

FIRED AMMO TYPE: _____

FROM: ROBERT EDDY INC.

& CONDITION: _____

HARRIS 0.11 PMGUN # : 127052PROOF: R.F.P.INSP.: UTEST: 13CODE: ER-10/12

LOADING: _____

GR./CAL.: 6.5MM

BREACH OPENING: _____

CHECKED BY: C. F. EDDYRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: 13

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

JUST ABOVE TRIGGER AND BETWEEN PULL
FIRING PIN & BOLT ASSEMBLY. TRIGGER FULL SET,
(SPEC. 4 TO 6) ENGAGEMENT .010 (SPEC. .020 MIN.)

COMPLAINT: FIRING TRIGGER WHEN SAFETY WAS PUT IN OFF POSITIONINCIDENT: FOLLOW DOWNPLAINTIFF'S
EXHIBIT

3259

COMMENTS: AS RECEIVED, BOLT AT FIRING PIN ASSEMBLY MADE IT
DIFFICULT TO CLOSE AND LOCK BOLT. FIRING PIN
WOULD NOT FALL. IT IS PROPOSED THAT THE FIRE
AROUND THE TRIGGER COMPARED WITH UNDER MINERALS
AND UNDER MIN. TRIGGER PIN, CAUSED THE TRIGGER
CONNECTOR TO FALL - EXTRAP - WHEN PULLED IN
THE FIREWALL OF BOLT. THE SAFETY ALLOWED
THE FIREWALL TO FALL.

GUN EXAMINATION REPORT NUMBER: MODEL: 700 BDLGENERAL CONDITION: NEW (SOME RUST) R #: 001869OUTSIDE WORK: NO DATE: 1-28-72FIRED AMMO TYPE: FROM: MACY RD, SUTHERLAND, CA& CONDITION: GUN #: 6290291PROOF: R.E.P.-F INSP.: 9 TEST: 55 CODE: RS-11/39HEADING: O.K. GRA./CAL.: 3006.500.BREACH OPENING: - CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: CHAMBER: O.K. APPROVED: TEST: NO APPROVED: COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

NO BROKEN COMPONENTS. EXTRACTOR PISTON, BOLT
BODY ALSO. SUBSTANCE RESEMBLING DEER FEATHER
ON TRIGGER & SEAR. TRIGGER PULL 2 1/2 LBS. ENGAGE-
MENT .010. LUMP ON BOLT

COMPLAINT: "FIRST SHELL HE TRIED TO CHARGE DISCHARGED"INCIDENT: FOLLOW DOWNPLAINTIFF'S
EXHIBIT

3260

COMMENTS: THE MATERIAL ON THE SEAR & TRIGGER CAUSED
THE TRIGGER TO STICK IN FIRED POSITION. WHEN THE
ACTION WAS CLOSED THE FIRING PIN FOLLOWED DOWN
FIRED THE BOMB

1 of 1

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 002023
 OUTSIDE WORK: NO DATE: 1-27-72
 FIRED AMMO TYPE: _____ FROM: BAY CITY HOW. CO.
 & CONDITION: _____ BAY CITY, MICH.
 PROOF: P.E.P.-M INSP.: ASSEMBLER 44 GUN #: 6500965
 TEST: 13 CODE: NONE
 HEADING: O.K. GA./CAL.: 243 WIN.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

MINUS STACK, TRIGGER PULL 4 1/2 LBS. - O.K. ENGAGEMENT
 .008 (.020 MIN.) NEW RIVETED HOUSING CONNECTOR
 1.093 MID = 1.060 TRIGGER 1.076 MID = 1.076
 1.079. BURS ON
 CONNECTOR SIDES.

COMPLAINT: "FIRES ON SAFE"

INCIDENT: MAY HAVE FOLLOWED DOWN WHEN SAFE WAS RELEASED.

COMMENTS: ENGAGEMENT IS SET TOO CLOSE, WITH THE
BURS ON THE CONNECTOR AND CLOSE ENGAGEMENT
IT IS POSSIBLE THAT THE CONNECTOR FAILED TO
RETRACT WHILE THE SAFETY WAS ON THEN FOLLOW
DOWN OCCURRED WHEN THE SAFETY WAS RELEASED.

1 of 1

Customer Complaint

P No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADLGENERAL CONDITION: NEW R #: 001648OUTSIDE WORK: SCOPE MOUNTED, SWIVELS & DATE: 1-26-72RECOIL PAD FITTED.FROM: DUNN'S SPS. GOS. INC.

FIRED AMMO TYPE: _____

PEVELY, MISSOURI

& CONDITION: _____

GUN #: 332321PROOF: R.E.P. INSP.: D TEST: 49CODE: BL = 1/64HEADING: 0.12GA./CAL.: 3000BREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED, BROKEN COMPONENTS. SEAR-CONNECTORENGAGEMENT .010 (MIN. .020) TRIGGER PULL = 3 1/2 (MIN. = 3 LBS.)TRIGGER CLEARANCE ON CONNECTOR 1.087 M/D = 1.080CONNECTOR CLEARANCE ON TRIGGER 1.073 M/D = 1.074(.014 CLEARANCE WHERE .007 IS MAX.)COMPLAINT: FIRES WHEN SAFE IS RELEASEDINCIDENT: CONNECTOR FAILS TO RETRACT.PLAINTIFF'S
EXHIBIT

3262

COMMENTS: THE EXCESSIVE CLEARANCE BETWEEN CONNECTORAND TRIGGER ALLOWS THE CONNECTOR TO CREEP UP INTOAN INTERFERENCE POSITION WHERE IT FAILS TO RETRACTWITH THE SAFETY ON. WHEN THE SAFETY ISRELEASED THE FIRING PIN FOLLOWS DOWN.

1 of 1

P... NO GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: GOODOUTSIDE WORK: NO

FIRED AMMO TYPE: _____

& CONDITION: _____

PROOP: R.E.P.

INSP.: _____

TEST: 79HEADING: O.K.BREECH OPENING: -RECOIL SHOULDERS: O.K.CHAMBER: O.K.TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDLR # : 000999DATE: 1-12-72FROM: CADDIE LABAR'S

DISTR. CO.

DALLAS, PENN.GUN # : 232943CODE: WN = 8/66GA./CAL.: 280 REM.CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

NO DAMAGED OR BROKEN COMPONENTS. TRIGGER PULL FOUR
POUNDS, ENGAGEMENT .015, TRIGGER BINDING ON GUARD
SLIGHTLY. GREASE-DIRT COATING ON HIDDEN PARTS
INCLUDING INSIDE & OUTSIDE OF TRIGGER ASSEMBLY.

COMPLAINT: SOMETIMES IT WILL FIRE, OTHER TIMES IT WON'T, SOMETIMES
IT WILL BE A DELAYED FIRING.

INCIDENT: SEAR DOES NOT RELEASE FIRING PIN.PLAINTIFF'S
EXHIBIT

3263

COMMENTS: THE CUSTOMER'S MALFUNCTION WAS DUPLICATED WITH
STOCK IN PLACE BUT WORKED O.K. WITH S-SCB ATT.
APPARENTLY THE TRIGGER-THROTTLE GUARD BIND
COMBINED WITH THE TOO HEAVY LUBRICATION WAS
THE CAUSE OF HIS TROUBLE.

P. 10 GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: NEWOUTSIDE WORK: SCOPE MOUNTED, REGULARSIGHTS REMOVED.FIRED AMMO TYPE: R.P.& CONDITION: ONE PERCED PRIMERPROOF: R.E.P.-B INSP.: 71 TEST: 49READING: O.K.BREECH OPENING: -RECOIL SHOULDERS: O.K.CHAMBER: O.K.TEST: TEN ROUNDS OF 120 GR. ~~WAD~~ PERCED PRIMERS.

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 A.D.L.R #: 26180DATE: 12-21-71FROM: H. H. SOTG, GOS. INC.AMARILLO, TEXAS.GUN #: 633,2550CODE: CT-4/70GA./CAL.: 25-06 TCHECKED BY: C. PROCTOR

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

FIRING PIN POINT TOO FLAT. TRIGGER CONNECTORDAMAGED. SEAR-TRIGGER CONNECTOR ENGAGEMENT
.005COMPLAINT: RIFLE WILL NOT COCK.INCIDENT: FOLLOWS DOWN.PLAINTIFF'S
EXHIBIT

3264

COMMENTS: THE .010 UNDER MIN. ENGAGEMENT CAUSED THEBACKLASH FROM FIRING PRIMERS FORCE DOWNTHE CORNER OF THE TRIGGER CONNECTOR RESULTINGIN THE FOLLOWING DOWN MALFUNCTION.

1 of 1

Guthrie Co., Inc.

NO GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 ADL

GENERAL CONDITION: NEW

R # : 24301

OUTSIDE WORK: NO

DATE: 12-13-71

FIRED AMMO TYPE: -

FROM: JENSEN BYRD CO.

SPokane, WASH.

& CONDITION: _____

GUN # : 6411367

PROOF: R.I.P.-1 INSP.: 55 TEST: 49

CODE: AU-3/71

HEADING: O.K.

GA./CAL.: 300G

BREECH OPENING: -

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED BROKEN COMPONENTS. TRIGGER PULL 5.5-5.8-
TRIGGER CONNECTOR ENGAGEMENT AND SENS-FRAME PIN
HEAD ENGAGEMENT WITHIN SPECIFICATIONS. TRIGGER CLEAR
TRIGGER GUARD.

COMPLAINT: FIRES WHEN BOLT IS CLOSED

INCIDENT: FOLLOW DOWN

**PLAINTIFF'S
EXHIBIT
3265**

COMMENTS: THE CUSTOMER'S MALFUNCTION CANNOT BE DUPLICAT-
ED. SOME FOREIGN MATERIAL IS NOTED ON THE TRIGGER
CONNECTOR WHICH MAY HAVE CAUSED IT TO STICK IN
FIRED POSITION, RESULTING IN A FOLLOW DOWN.

RD 542-1 Rev. 2-15-61

Customer Complaint

P.I. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL

GENERAL CONDITION: Good R #: 25226

OUTSIDE WORK: No DATE: 12-8-71

FIRE AMMO TYPE: _____ FROM: QUEEN CITY MFG. CO.

& CONDITION: _____ ALBUQUERQUE, NM.

PROOF: REP-M INSP.: 9 TEST: 87 GUN #: 6448127

READING: O.K. CODE: PU- 6/71

BREECH OPENING: - GUN/CAL.: 3006 S&W

RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER

CHAMBER: O.K. APPROVED: _____

TEST: No APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CORNER OF TRIGGER CONNECTOR DAMAGED. CONNECTOR-
SEAR ENGAGEMENT .005.

COMPLAINT: "FIRES UPON CLOSING ACTION."

INCIDENT: FOLLOWS DOWN.

PLAINTIFF'S
EXHIBIT
3266

COMMENTS: TRIGGER CONNECTOR-SEAR ENGAGEMENT SET TOO
CLOSE. THE CONNECTOR CORNER BROKE DOWN SO THAT IT
BECAME IMPOSSIBLE FOR THE ARM TO STAY COCKED.

17-6741-1, 2-15-61

Customary Complaint

GUN EXAMINATION REPORT NUMBER: _____ MODEL: 750 3.75

GENERAL CONDITION: 1/2 E.H. R.F.: 1/2 E.H.

OUTSIDE WORK: ☒ DATE: 12-9-71

FIRED AS NO TYPE: _____ FROM: G. H. P. & S. Co.

& CONDITION: _____ GUN # : 6520017

PROOF: 1/2 E.H. INSP.: 0 TEST: 24 CODE: FT = 1/2 E.H.

READING: 0.00 BK./CAL.: 550000

BRECH OF BING: _____ CHECKED BY: G. H. P. & S. Co.

RECOIL SHOULDERS: 0.00 APPROVED: _____

CHAMBER: 0.00 APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGES - BROKEN COMPONENTS.

TRIGGER CONNECTOR - CLEARANCE 1.092 (N/D = 1.083) ENGAGEMENT - .000

CLEARANCE 1.092 (N/D = 1.083) ENGAGEMENT - .000

TRIGGER PULL 0.00 SLIGHT COILS BEHIND

SEARCH TRIGGER CONNECTOR CAPABLE

COMPLAINT: FIRE WHEN SAFE IS RELEASED.

INCIDENT: FOLLOWING DOWN

PLAINTIFF'S
EXHIBIT

3267

COMMENTS: CUSTOMER'S MALFUNCTION NOT CONFIRMED. IT IS

POSSIBLE WITH COMPONENTS SEARCHED FOR BY THE

TRIGGER CONNECTOR TO WORK UP TO THE TRIGGER (CLEARANCE

ANCE, 0.017 OVER MAX., ALSO TRIGGER MAY HAVE BEEN

INTERFERED DUE TO BIND IN THE TRIGGER GUARD CAUSED BY

OUT OF POSITION SEARCH HOLES IN THE S-BOL.

10 of 1

GUN EXAMINATION REPORT NUMBER: 700 MODEL: 700
 GENERAL CONDITION: NEW R #: 24195
 OUTSIDE WORK: SEAR ANGLE ON FIRING PIN DATE: 11-30-71
HEAD MAY HAVE BEEN COLORED BY USE FROM: BOB'S GUN SHOP
 FIRED AMMO TYPE: LANING, MICH.
 & CONDITION: ASSEMBLER 30 GUN #: 6361958
 PROOF: R.E.P.-E INSP.: 9 TEST: 29 CODE: W.T. = 8/70
 HEADING: O.K. GA./CAL.: 7MM REM. MAG.
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGED, OR BROKEN COMPONENTS. SOME FRICTION
MARKS ON TRIGGER AND INSIDE HOUSING. CONNECTOR-
SEAR ENGAGEMENT .005 MIN. F.O.I.S. TRIGGER PULL
FOUR POUNDS.

COMPLAINT: "GUN DISCHARGES WHEN BOLT IS BEING OPENED"

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3268

COMMENTS: CUSTOMER'S MALFUNCTION NOT DUPLICATED.

IT IS POSSIBLE THAT A SLIGHT TRIGGER PINN CAUSED
FAILURE TO RETRACT, REDUCING THE CONNECTOR-SEAR
ENGAGEMENT SO THAT A MOVEMENT OF THE BOLT
HANDLE RELEASED THE FIRING PIN TO FIRE THE
ROUND IN THE CHAMBER.

1 of 1

P.L. 110 GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL

GENERAL CONDITION: Good R# : 22615

OUTSIDE WORK: NO DATE: 11-8-71

FIRED AMMO TYPE: _____ FROM: BOWLING GREEN, KY.

CONDITION: _____ GUN # : 6820972

PROCP: R.E.P.H. INSP: 75 TEST: 27 CODE: ATC 3/10, HT 2: 8/10

HEADING: _____

BREECH OPENING: - CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGED OR BROKEN COMPONENTS

COMPLAINT: "COULD NOT GET IT TO FIRE - THE TRIGGER"

INCIDENT: FELL OFF DOOR (VERIFIED BY WITNESS)

**PLAINTIFF'S
EXHIBIT**
3269

COMMENT: TRIGGER FULL RECOIL TEST - BOWLING GREEN

WENT OFF (WENT OFF) NO INDICATION OF FIRE WHEN

ALIGNED.

APPROXIMATE ENGAGEMENT OF SEAR AND COUPLER

WENT OFF IN GOOD POSITION WHEN THE TRIGGER FULL

STROKE WAS AT THE END.

1 of 1

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: NEW R #: 15003
OUTSIDE WORK: TRIGGER PULL REDUCED TO DATE: 7-30-71
ONE POUND. FROM: UNITED DIST.
FIRED AMMO TYPE: _____ GALVESTON, TEXAS
CONDITION: _____ GUN #: 6408400
PROOF: REP INSP.: 74 TEST: 98 CODE: LO = 2/71
HEADING: O.K. GRA/CAL.: 270 WIN.
BREACH OPENING: - CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

ADJUSTING SCREW FOR TRIGGER PULL UNSEALED
AND ADJUSTMENT ALTERED.

COMPLAINT: FIRING PIN ENGAGES & FIRES WHEN BOLT IS
PUSHED FORWARD.

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT
3270

COMMENTS: WHEN TRIGGER PULL WAS CORRECTED ENGAGE-
MENT OF SEAR AND TRIGGER CONNECTOR WAS .025-
MIN. IS .015 WITH TRIGGER PULL REDUCED THE
SPRING WILL NOT RETRACT THE TRIGGER CONNECTOR
CORRECTLY AND FOLLOW DOWN MAY RESULT.

1 of 1

RD-542-1 Rev. 2-15-61

P.I. NO GUN EXAMINATION REPORT NUMBER: _____

GENERAL CONDITION: NEW

OUTSIDE WORK: NO

FIRE AMMO TYPE: _____

& CONDITION: _____

PROOF: R.E.P.-C INSP.: 9 TEST: 49

HEADING: O.K.

BREECH OPENING: -

RECOIL SHOULDERS: O.K.

CHAMBER: O.K.

TEST: 40 ROUNDS, REMINGTON

COMPONENT CONDITION: (Damaged, Broken, Old Style)

MODEL: 700 BDL VAR.

R # : 12943

DATE: 6-29-71

FROM: H.P. Cox
MEER HIGH SCHOOL
ARLEY, ALABAMA

GUN # : 540 B.C.D.

CODE: LU-2/71

GR./CAL.: 223

CHECKED BY: C. PROSSER

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____

SEAR AND TRIGGER CONNECTOR COENERS BROKEN OFF,
ENGAGEMENT P.015 (.005 UNDER MIN.) FIRING PIN PULL
RADIUS TOO LARGE.

COMPLAINT: FIRE ON CLOSING, FIRED WHEN SAFE WAS PUSHED
OFF, PIERCED PRIMERS.

INCIDENT: FOLLOWED DOWN.

COMMENTS: THE PRIMER PIERCING WAS NOT DUPLICATED IN TEST.
ING. IT MAY HAVE SPEEDED UP THE CONNECTOR - SEAR
BREAK-DOWN

PLAINTIFF'S
EXHIBIT

3271

1 of 1

AL 0029803

P. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDLGENERAL CONDITION: NEW R #: 19298OUTSIDE WORK: NO DATE: 6-29-71FROTH: _____ FROM: J.C. PENNEYFIRED AMMO TYPE: - KING OF RUSSIA, PO.& CONDITION: _____ GUN #: 6274124PROOF: P.E.P.-E INSP.: 58 TEST: 13 CODE: DS-9/69HEADING: O.K. GA./CAL.: 270BRSSCH OPENING: _____ CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN OR DAMAGED COMPONENTS.TRIGGER CONNECTED - SEAR ENGAGEMENT. DID (1,000 - 1 MIN.)TRIGGER ONLY. 4 1/2 LBS. A SMALL METAL CAP - CAUTIONBETWEEN TRIGGER CONNECTOR & STRIKER.COMPLAINT: "FIRES DURING SPELL EXTRACTION."INCIDENT: FOLLOWS DOWNPLAINTIFF'S
EXHIBIT

3272

COMMENTS: THE CUSTOMER'S MALFUNCTION COULD NOT BEDUPLICATED. THE USED MIN. DISCHARGE WAS CALLEDBY THE METAL CAP (HELD IN PLACE BY A PROTECTIVECOATING APPLIED BY THE CUSTOMER) PROBABLY CAUSEDA MALFUNCTION.

1 of 1

Cust. Complaint ✓1... No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700GENERAL CONDITION: FAIR R #: 11955OUTSIDE WORK: SCOPE MOUNTED DATE: 6-3-71FROM: NATIONAL PARK SERVICEFIRED AMMO TYPE: T KAHULUI MAIL, HAWAII& CONDITION: _____ GUN #: 6258362PROOF: R.E.P.-E INSP.: 11 TEST: 87 CODE: 05 = 7/69HEADING: O.K. GA./CAL.: 3006BREECH OPENING: - CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

16 BROKEN, ETC. COMPONENTS.CONNECTOR CLEARANCE ON TRIGGER = 1.070 MID = 1.074 - .002TRIGGER CLEARANCE ON CONNECTOR = 1.089 MID = 1.083 + .006CONNECTOR-SEAR ENGAGEMENT = .020 EXCESSIVELUBRICANT OIL DIRTY, TRIGGER PULL FOUR POUNDS.COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.INCIDENT: TRIGGER CONNECTOR FAILED TO RETRACT.COMMENTS: CAN NOT DUPLICATE CUSTOMER'S MALFUNCTION.THE TRIGGER & TRIGGER CONNECTOR NOT TO MODELDRAWING PERMIT SEAR-TRIGGER CONNECTOR INTERFERENCEFAILURE TO RETRACT.PLAINTIFF'S
EXHIBIT

3273

1 of 1

AL 0029805

P No GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 BDLGENERAL CONDITION: GOODR# : 10002OUTSIDE WORK: TRIGGER PULL WEIGHT AND STOPDATE: 4-28-71SCREWS RE-ADJUSTED, SCOPE MOUNTED.FROM: MAX MERHELSTEIN DIST. CO.

FIRED AMMO TYPE: _____

CARBONDALE, PENNA.

& CONDITION: _____

GUN # : 6333602PROOF: R.E.P. - G INSP. INCOMPLETE TEST: 55CODE: CT - A/10HEADING: MAX.GA./CAL.: 25-06BRESCHE OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: EXCESSIVE RADIUS REAR CORNER

APPROVED: _____

CHAMBER: _____

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO DAMAGED, BROKEN COMPONENTS.PLAINTIFF'S
EXHIBIT

3274

COMPLAINT: "BOLT LOCKS SHUT, GUN HAS FIRED WITH SAFETY ON""FACTORY BULLETS SEAT IN RIFLING."

INCIDENT: _____

COMMENTS: CAN NOT DUPLICATE CUSTOMER'S "FIRED WITH SAFETY ON."SEAR-CONNECTOR ENGAGEMENT .020 - SPECIFICATIONS MIN. .020.

THERE IS EVIDENCE OF CUSTOMER RE-ADJUSTING OF TRIGGER
STOP & PULL WEIGHT SCREWS. DECREASING TRIGGER PULL
W/OUT REDUCES SEAR-CONNECTOR ENGAGEMENT MAKING
A FOLLOW UP DOWN LIKELY.

P No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADLGENERAL CONDITION: Good R #: 07215OUTSIDE WORK: SCOPE MOUNTED DATE: 4-23-71FIRED AMMO TYPE: _____ FROM: SCHOENSTEIN'SORD, NEBRASKA.& CONDITION: _____ GUN #: 6320412PROOF: R.E.P.B ASSEMBLER #1 INSP.: 9 TEST: 49 CODE: AT-3/10HEADING: O.K. GA./CAL.: 270BREECH OPENING: _____ CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: TEN ROUNDS APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN OR DAMAGED COMPONENTS. SLIGHT BURRROUND EJECTOR HOLE.COMPLAINT: "LOADING SHELL INTO BARREL IT WENT OFF, ALSOUNABLE TO EXTRACT SHELL."

INCIDENT: _____

PLAINTIFF'S
EXHIBIT

3275

COMMENTS: UNABLE TO DUPLICATE FIRES ON CLOSING. IN TESTEJECTOR STUCK BACK CAUSING FAILURE TO EJECT.EJECTOR WAS FREED UP AND BURR REMOVED AFTERWHICH RIFLE FUNCTIONED O.K.

No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
GENERAL CONDITION: Good R #: 07367
OUTSIDE WORK: No DATE: 4-26-71
FROM: MONTGOMERY WARD
FIRED AMMO TYPE: _____
& CONDITION: _____ GUN #: 6204725
PROOF: REP INSP: 9 TEST: 41 CODE: XR = 12/68
HEADING: O.K. GR./CAL.: 270 WIN.
BREACH OPENING: _____ CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: No. APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

No DAMAGED OR BROKEN COMPONENTS.

COMPLAINT: "FIRED WHEN BOLT WAS CLOSED."

INCIDENT: _____

PLAINTIFF'S
EXHIBIT

3276

COMMENTS: COULD NOT DUPLICATE CUSTOMER'S MALFUNCTION.
HOWEVER, TRIGGER-CONNECTOR CLEARANCE BEING EXCESS-
IVE & TOO HEAVY LUBRICANT MAY HAVE CONTRIBUTED TO
SUCH A FAILURE IN COLD TEMPERATURES.
CONNECTOR .006 OVERSIZE (1.089)
TRIGGER .009 UNDERSIZE (1.067) 1 of 1
REPLACED TRIGGER & CONNECTOR ENGAGEMENT O.K.

P. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
GENERAL CONDITION: GOOD R #: 09523
OUTSIDE WORK: "REPAIRED LOCALLY ONE TIME" DATE: 4-22-71
FIRED AMMO TYPE: _____ FROM: TEMPE, ARIZONA
& CONDITION: _____ POLICE DEPT.
PROOF: R.E.P. INSP.: POOR STAMP TEST: 49 GUN #: 386831
HEADING: O.K. CODE: RS-11/69
BREECH OPENING: - GR./CAL.: 223 REM.
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN

COMPLAINT: FIRES CLOSING

INCIDENT: _____

PLAINTIFF'S
EXHIBIT

3277

COMMENTS: THE BROKEN TRIGGER CONNECTOR FAILS TO RETRACT
UNDER THE SEAR SO WHEN THE SAFETY IS PUSHED OFF,
FIRING PIN FALLS AND FIRES ROUND.

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
GENERAL CONDITION: NEW R #: 07070
OUTSIDE WORK: TRIGGER ENGAGEMENT SCREW DATE: 4-23-71
SEAL REMOVED. FROM: LLOYD CO.
FIRED AMMO TYPE: - LITTLE ROCK, ARK.
& CONDITION: ASSEMBLER 65 GUN #: 6266361
PROOF: R.I.P.-E INSP.: 73 TEST: 87 CODE: WS = 8/69
HEADING: O.K. GR./CAL.: 22-250
BREECH OPENING: - CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN. TRIGGER SPRING MISSING.
TRIGGER ENGAGEMENT SCREW OUT OF ADJUSTMENT.

COMPLAINT: "LEVER IN TRIGGER HOUSING BROKEN"

INCIDENT: -

COMMENTS: APPARENTLY A DEFECTIVE TRIGGER CONNECTOR WAS
USED.

PLAINTIFF'S
EXHIBIT

3278

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R #: 06681
 OUTSIDE WORK: NO DATE: 3-15-71
 FIRED AMMO TYPE: _____ FROM: KENNETH JOHNSON
 & CONDITION: _____ STURTEVANT, WISC.
 PROOF: R.E.P.A. INSP.: 73 TEST: 87 GUN #: 6312955
 HEADING: O.K. CODE: L.T. 2/70
 BREACH OPENING: _____ GA./CAL.: 7MM
 RECOIL SHOULDERS: EXCESSIVE RADIUS AT REAR CHECKED BY: C. PROSSER
 CHAMBER: O.K. BODY. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPLAINT: CLOSES HARD OVER SHELL. FIRED WHILE TRYING TO CLOSE.

INCIDENT: CLOSE HARD

PLAINTIFF'S
EXHIBIT

3279

COMMENTS: THE EXCESSIVE RADIUS AT REAR OF RECOIL SHOULDER
CAUSES THE BOLT TO CAM HARD WITH A ROUND IN THE
CHAMBER. THERE APPEARS TO BE NOTHING WRONG WITH
THE TRIGGER ASSEMBLY. THE CUSTOMER LIKELY, (NADVERT-
ENTLY TOUCHED THE TRIGGER WHILE TRYING TO FORCE
THE BOLT HANDLE DOWN.

1 of 1

I. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: GOOD R #: 6319824
 OUTSIDE WORK: NO DATE: 3-1-71
 FIRED AMMO TYPE: — FROM: GLOBE #10
 & CONDITION: _____ TUCSON, ARIZONA
 GUN #: 6319824
 PROOP: R.E.P.-E INSP.: 58 TEST: NO STAMP CODE: AT= 3/70
 HEADING: O.K. GA./CAL.: 270 WIN.
 BREECH OPENING: — CHECKED BY: C. P. ...
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO COMPONENT DAMAGED OR BROKEN. TRIGGER-CONNECTOR
SEAR ENGAGEMENT = .005 (MIN. IS .015)

COMPLAINT: FIRES ON CLOSING BOLT

INCIDENT: FOLLOW DOWN

COMMENTS: THE TRIGGER CONNECTOR-SEAR ENGAGEMENT IS
NOT ENOUGH FOR PROPER SUPPORT, ALLOWS THE
FIRING PIN TO FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3280

AL 0029812

10 of 1

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: Good R #: 03978
 OUTSIDE WORK: NO DATE: 3-1-71
 FROM: ERRACHERS SPORTS CENTER
 FIRED AMMO TYPE: - MARLBOROUGH, OHIO
 & CONDITION: _____ GUN #: 278328
 PROOF: R.E.P. INSP.: D TEST: 87 CODE: EP-4/37
 HEADING: O.K. GA./CAL.: 7MM MAG.
 BREACH OPENING: - CHECKED BY: C.P.
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO COMPONENT DAMAGE OR BREAKAGE.

COMPLAINT: "FIRED TWOTIMES WHEN CLOSING BOLT."

INCIDENT: FOLLOW DOWN

PLAINTIFF'S
EXHIBIT

3281

COMMENTS: TRIGGER CONNECTOR-SEAR ENGAGEMENT .025. THE
TRIGGER ETC. WAS FOUND TO BE COATED WITH A HEAVY-
GREASE-LIKE LUBRICANT WHICH WOULD CAUSE TRIGGER
RETRACTION TO BE ERRATIC. THIS APPARENTLY HAPPENED
TO THE CUSTOMER - TRIGGER DID NOT RETRACT AND
WHEN THE BOLT WAS CLOSED THE FIRING PIN
FOLLOWED DOWN.

1 of 1

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: GOOD R #: 01780
 OUTSIDE WORK: SCOPS MOUNTED, REAR SIGHT DATE: 1-26-71
LEAF REMOVED. FROM: GREEN BROOK, SET 5-10
 FIRED AMMO TYPE: _____ GREEN BROOK, N.J.
 & CONDITION: _____ GUN #: 6362025
RESEMBLES P
 PROOF: R.E.P.-E INSP.: 74 TEST: 87 CODE: WT = 8/70
 HEADING: O.K. SKT./CAL.: 7MM M25
 BREACH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPONENTS O.K.

COMPLAINT: "UPON RELEASING THE SAFETY WAS FIRE"

INCIDENT: FELL-W DOWN

PLAINTIFF'S
EXHIBIT
3282

COMMENTS: THE MALFUNCTION CAN NOT BE DUPLICATED,
HOWEVER, THE SEAR-CONNECTOR ENGAGEMENT IS NOT
TO SPECIFICATION (.008 SHOULD BE .015 MIN.) THIS COUPLED
WITH ANY TRIGGER BIND, SUCH AS TOO HEAVY LUBRICANT,
MIGHT CAUSE A MALFUNCTION. ENGAGEMENT
CORRECTED.

1. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R# : 29996
 OUTSIDE WORK: ABOUT TRIGGER ADJUSTING DATE: 1-4-71
SEARING RE-ADJUSTED. FROM: LEFAYETTE 5015
 FIRED AMMO TYPE: - WINCHESTER 12
 & CONDITION: MEMBER 12 GUN # : 6369151
 PROOF: R.E.F. INSP. TEST: 98 CODE: DT = 9/70
 READING: O.K. SK/CHL: 3005
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: N.C. APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
NO DAMAGED OR BROKEN PARTS.

COMPLAINT: "SEVERAL TIMES GUN WENT OFF WHEN CLOSING BOLT."

INCIDENT: FOLLOWS DOWN

COMMENTS: SEAR-TRIGGER CONNECTOR ENGAGEMENT .005.

MINIMUM IS .015. THIS LETS THE SEAR SLIP OFF THE
CONNECTOR UNDER PRESSURE AND FELL ON DOWN
RESULTS.

PLAINTIFF'S
EXHIBIT

3283

1 of 1

Castro Gunsmith

P.I. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BOL
 GENERAL CONDITION: USED-GOOD R #: 00931
 OUTSIDE WORK: SCOPE MOUNTED DATE: 1-12-71
 FIRED AMMO TYPE: - FROM: JOHN M. ANGELO
 & CONDITION: DISSEMBLER C LANSING, MICH.
 GUN #: 247248
 PROOF: R.E.R. INSP.: D TEST: 87 CODE: EN-10/66
 HEADING: O.K. GA./CAL.: 3006 SPS.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
NO BROKEN COMPONENTS.

COMPLAINT: FIRED AS BOLT WAS PULLED HALF WAY UP.INCIDENT: APPARENTLY TRIGGER FAILED TO RETRACTPLAINTIFF'S
EXHIBIT

3284

COMMENTS: TRIGGER-CONNECTOR-SEAR ENGAGEMENT .020.

NO INTERFERENCE INDICATED AND MALFUNCTION NOT
DUPLICATED. SOME EVIDENCE OF TOO HEAVY A
LUBRICANT BEING USED. SUGGEST CLEANING AND
INFORMING CUSTOMER HE SHOULD USE VERY LIGHT
OR NO LUBRICANT.

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

PETERS

CC: J. E. Dickey - Bdpt.
F. E. Morgan - "
A. D. Kerr

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
December 10, 1969

D. LEE BRAUN

CORRESPONDENCE REGARDING MODEL 700
TO HUGH WILSON, NOVEMBER 3, 1969

Pete Morgan has asked us to comment on a series of letters dating back to October 10, 1969 concerning problems encountered by Hugh Wilson on Model 700, 7mm magnum rifles. These problems include burrs on bolts, feeding from the magazine and undersized chambers.

We have audited our warehouse, gallery and assembly line, and reviewed our quality control reports for 1969, looking for similar deficiencies at the factory.

- . Burrs on bolts - We have had minor but persistent problems this year in fitting extractors to the Model 700 bolt. Both gallery and final inspection reports include "hard close" defects because of this extractor problem. We are now changing our process and expect immediate relief.
- . Feeding from magazine - We have had isolated cases of feeding problems. Usually the follower spring is upside down or the spring detent in the follower is improperly formed.
- . Undersized chamber - Our center fire rifles have head space and chamber dimensions measured 3 separate times during the manufacturing process. However, to recheck, we have measured warehouse rifles. We also checked Winchester, Federal and Remington factory ammunition and can find no dimensions out of specification. Without having the rifles here at Ilion, we cannot establish the cause.

PLAINTIFF'S
EXHIBIT

3285

AL 0029817

1 of 2

A
D. LEE BRAUN

-2-

December 10, 1969

Lee, the following comments are pure conjecture and may not be related to the Model 700, 7mm magnum chamber problems reported by Hugh Wilson. The appearance of an undersized chamber in magnum calibers can be caused by defective extractors, rusty chambers (even in stainless steel), oversized cartridge cases, reloads, burrs in the chamber or damaged heading shoulders. We do have some instances of the magnum heading shoulder being damaged by poor technique in measuring head space.

Polishing the chamber almost always improves feeding and chambering. However, polishing can lead to reload problems, max. head space or oversized chambers. The hazard of max. headers or oversized chambers is over-rated, but can lead to poor performance and unhappy customers. If a customer has doubts about magnum rifle chamber dimensions, I suggest the rifle be returned to us.

As you can see, I have not really answered any of your questions other than try to relate to current production problems. If you can return some of the rifles to us, then we can be more specific.

R. A. Williamson
Plant Manager

by

L. Fox, Supt.
P E & C Section

LF:I

2 of 2
AL (K)29818

LA 100-257-22

1990

No. 2000-00000

DATE: 4-2-78

FROM: [redacted]

GUN # 1 6 5 1 1 1 1 1

CODE: 0-2-40

GA/CAL.: 27-2

CHECKED BY: *C. F. ...*

APPROVED:

APPROVED:

APPROVED:

APPROVED:

INCIDENT:

3286

COMMENTS: THE CUSTOMER PULLED THE BULLET OUT OF THE
CASE LEAVING IT IN THE THROAT. THIS APPARENTLY
IS AN AMMUNITION PROBLEM (PER M. WALKER).
THE BOLT CATCHING IS CAUSED BY RISING THE
SAFETY ON BEFORE LOCKING THE BOLT THUS CATCH-
ING THE SAFETY WIPER IN THE LOCKING CAM.

P.I. No GUN EXAMINATION REPORT NUMBER: _____MODEL: 700 BDLGENERAL CONDITION: NEWR #: 23406OUTSIDE WORK: NoDATE: 11-2-70FROM: OCONTO, WIS.FIRED AMMO TYPE: -

& CONDITION: _____

GUN #: 6248578PROOF: - INSP.: _____ TEST: _____CODE: PS- 9/69HEADING: -GA./CAL.: 7MMBREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: -

APPROVED: _____

CHAMBER: -

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

TRIGGER CONNECTOR BROKEN.COMPLAINT: FIRES WHEN SAFE IS REMOVED & WONT COCK AT TIMES.

INCIDENT: _____

COMMENTS: MALEFUNCTION WAS CAUSED BY THE BROKEN TRIGGER CONNECTOR.PLAINTIFF'S
EXHIBIT

3287

1 of 1

AL (1129820)

Custom Complaint

P.I. AC GUN EXAMINATION REPORT NUMBER: _____ MODEL: 750 151

GENERAL CONDITION: NEW R # : 22213

OUTSIDE WORK: NO DATE: 11-2-73

FIRE AMMO TYPE: - FROM: SHARP SHOOT.

& CONDITION: _____ GUN # : 2211234

PROOF: 1357 INSP: 7-1 TEST: _____ CODE: BT = 1/70

HEADING: O.K. GA./CAL.: 3006

BREECH OPENING: - CHECKED BY: C. F. COOPER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: _____ APPROVED: _____

TEST: 1/70 APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

PARTS O.K.

COMPLAINT: "EVERY TIME YOU PUSH THE ROCKET UP TO THE FIELD FIRES"

INCIDENT: FOLLOWS DOWN

COMMENTS: THE ENGAGEMENT OF THE SEAR, TRIGGER CON-
NECTOR SET TOO CLOSE AT FINAL ASSEMBLY (0.005")

PLAINTIFF'S
EXHIBIT
3288

AL 0029821

Custom Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: NEW R #: 26143
 OUTSIDE WORK: NO DATE: 11-12-70
 FIRED AMMO TYPE: - FROM: DARIN FETTER, CO.
 & CONDITION: _____ BANGOR, MAINE
 PROOF: R.E.P. INSP.: _____ ASSEMBLER: 41 GUN #: 6219140
 HEADING: O.K. CODE: LS-2/69
 BREACH OPENING: - GA/CAL.: 3006
 RECOIL SHOULDERS: - CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN.

COMPLAINT: "WILL NOT STAY COCKED"

INCIDENT: FOLLOWS DOWN

COMMENTS: THE BROKEN CONNECTOR MAKES RETRACTION
UNDER SEAR UNCONTROLLABLE. THE CONNECTOR
FAILING TO RETRACT CAUSES FOLLOW DOWN.

PLAINTIFF'S
EXHIBIT

3289

1 of 1

Customer Complaint

A.I. ALO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
GENERAL CONDITION: NEW R #: 26910
OUTSIDE WORK: NO DATE: 11-17-70
FROM: GOLD BUSH SALES
FIRED AMMO TYPE: _____ BROOKLYN, N.Y.
& CONDITION: _____ GUN #: 6288540
PROOF: REP. INSP.: ASSEMBLER #30 TEST: 79 CODE: CS-4/69
HEADING: O.K. BREECH OPENING: _____ GA/CAL.: 3006
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
COMPONENTS O.K.

COMPLAINT: FIRED UPON CLOSING BOLT.INCIDENT: APPARENTLY FOLLOWED DOWN.COMMENTS: ENGAGEMENT O.K. NO REASON FOR MALFUNCTION COULD BE FOUND. THE MALFUNCTION COULD NOT BE REPRODUCED.PLAINTIFF'S
EXHIBIT

3290

1041
AL 0029823

Customer Complaint

NAME: AL DATE: 10-10-74
ST. ADDRESS: 1700 R.F.: 1
CITY: ST. LOUIS STATE: MO ZIP: 63104
FIRED W/ S. TYPE: 1
S. CONDITION: 1
PROOF: 1 INSP.: 1 TEST: 1
READING: 1
BREACH OPENING: 1
RECOIL SHOCKBRES: 1
CHAMBER: 1
TEST: 1
COMPONENT CONDITION: (Damaged, Broken, Old Style)
GUN #: 1
CODE: 1
GAT./CAL.: 1
CHECKED BY: C. P. 10-10-74
APPROVED: 1
APPROVED: 1
APPROVED: 1
APPROVED: 1

NO PARTS OR DAMAGED COMPONENTS.

COMPLAINT: GUN FIRES WHEN BOLT IS CLOSED.

INCIDENT: FOLLOWS DOWN

COMMENTS: THE GEAR-CONNECTOR ENGAGEMENT WAS SET TOO CLOSE BY FINAL ASSEMBLY.

PLAINTIFF'S
EXHIBIT

3291

AL 0029824

*Infantry Complaint.*P.I. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDLGENERAL CONDITION: GOOD R #: 27632OUTSIDE WORK: STOCK BEDDING ALTERED. DATE: 12-3-70SCOPE MOUNTED. FROM: R. ROYSEFIRED AMMO TYPE: - PORTLAND, OREGON.& CONDITION: _____ GUN #: 6275235PROOF: R.E.P. INSP.: 9 ASSEMBLER 90 TEST: 55 CODE: ES-10/69HEADING: O.K. GRA./CAL.: 7MM REV. V.I.BREACH OPENING: - CHECKED BY: C. PRESSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: No APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPLAINT: POOR GROUPS, FIRED WHEN SAFETY WAS PUSHED
TO FIRE POSITION.INCIDENT: BARREL BORE ROUGH, FOLLOWED DOWN.COMMENTS: THE FOLLOW DOWN CAN NOT BE DUPLICATED.BARREL BORE EXCESSIVELY ROUGH - SHOULD BE
REPLACED.PLAINTIFF'S
EXHIBIT

3292

1 of 1
AL 0029825

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: NEW R# : 27287
 OUTSIDE WORK: NO DATE: 11-23-70
 FROM: SINGLE ELEC. CO.
 FIRED AMMO TYPE: - VERNAL, UMAN
 & CONDITION: _____ GUN # : 6296977
 PROOF: R.E.P. 2 INSP: 74 TEST: 55 CODE: LT-2/70
 HEADING: - GR./CAL.: 3006
 BREECH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: - APPROVED: _____
 CHAMBER: - APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR CLEARANCE .003 OUTSIDE MODEL
 DRAWING; CONNECTOR; TRIGGER CLEARANCE +.005 OUTSIDE
 MODEL DRAWING. THIS ADDS UP TO .008 MORE MOVE-
 MENT UP, OF CONNECTOR THAN THERE SHOULD BE TO
 POSSIBLE INTERFERENCE WITH THE SEAR.

COMPLAINT: "TRIGGER FIRES SOMETIMES WHEN TAKEN OFF
 SAFE" (EXTRACTOR FAULTY)

INCIDENT: FOLLOWS DOWN WHEN SAFE IS TURNED OFF.

COMMENTS: THE FALLS DOWN MALFUNCTION COULD NOT
 BE VERIFIED ALTHOUGH EXCESSIVE CONNECTOR
 MOVEMENT IS PRESENT.

EXTRACTOR CHAIN DAMAGED.

PLAINTIFF'S
 EXHIBIT
 3293

1 of 1

*Customer Complaint*P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700GENERAL CONDITION: NEW R #: 27774OUTSIDE WORK: NO DATE: 12-10-70FIRED AMMO TYPE: - FROM: K206650-4 FARM& CONDITION: _____ SUPPLY DURANGO, COLO.PROOF: R.E.P.A. INSP.: 318 TEST: 13 GUN #: 6367225HEADING: - CODE: DT=9/70BREACH OPENING: - GA./CAL.: 3006RECOIL SHOULDERS: - CHECKED BY: C. PROSSERCHAMBER: - APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPONENTS D.K.COMPLAINT: "HAMMER IN BOLT WILL NOT STAY COCKED."INCIDENT: FOLLOWS DOWN.COMMENTS: SEAR, TRIGGER CONNECTOR, ENGAGEMENTADJUSTED TOO CLOSE (.005) MINIMUM IS .015, THIS
LETS THE SEAR SLID OFF THE CONNECTOR UNDER
PRESSURE & FIRING PIN FOLLOWS DOWN.RE-ADJUSTED ENGAGEMENT.PLAINTIFF'S
EXHIBIT

3294

1 of 1
AL 0029827

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 BDL
 GENERAL CONDITION: GOOD R #: 29327
 OUTSIDE WORK: EXTRACTOR BUSH - BEARING OFF DATE: 12-15-70
TAILGATE ADJUSTED - EXTRACTOR SCREW FROM: HARPER S-T CO.
APPLIERS UNTOUCHED. WILLIAMSPOOT, PA.
 FIRED AMMO TYPE: _____ GUN #: 6262372
 & CONDITION: _____ CODE: WS-8/10
 PROOF: R.E.P.E INSP.: 17 TEST: 55 EN./OIL: 7/10
 BRESCH OPENING: - CHECKED BY: C. PRASER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
NO DEFECTIVE OR BROKEN COMPONENTS.

COMPLAINT: "FIRED UPON CLOSING"

INCIDENT: FOLLOWED DOWN

COMMENTS: SEAR-CONNECTOR ENGAGEMENT .003, MINIMUM IS .015,
THIS LETS THE SEAR SLIP OFF THE CONNECTOR UNDER
PRESSURE AND FOLLOW DOWN RESULTS.

PLAINTIFF'S
EXHIBIT

3295

AL 0029828

1 of 1

P.I. NO GUN EXAMINATION REPORT NUMBER: _____

MODEL: 700 EDL

GENERAL CONDITION: NEW

R # : 29277

OUTSIDE WORK: NO

DATE: 12-21-70

FROM: LEONARDOS

FIRED AMMO TYPE: _____

EDL - 420000-1000

& CONDITION: _____

GUN # : 636-752

PROOF: 2.25 INSP.: 0 TEST: 49

CODE: WT = 8/10

HEADINGS: O.K.

GA./CAL.: 270 WIN.

BREACH OPENING: -

CHECKED BY: C. ROSSER

RECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

SAFETY CAN BE TAKEN OFF OF SEAR.

COMPLAINT: 'SAFETY DOES NOT WORK'

INCIDENT: FIRE IN THE SAFE

COMMENTS: SAFETY CAN NOT FUNCTION WITHOUT THE CAN ON THE SEAR - SAFETY CAN.

PLAINTIFF'S
EXHIBIT

3296

10/1
AL 0029829

P.I. 111 GUN EXAMINATION REPORT NUMBER:

MODEL: 700 S&W

GENERAL CONDITION: Good

R # : 28794

OUTSIDE WORK: No

DATE: 10-21-70

FIRE AND TYPE:

FROM: ILR #111

& CONDITION:

DETROIT MICHIGAN

GUN # : 28794

PROOF: R.F.P. INSP: TEST: ✓

CODE: R.F.P. #111

HEADING: C.L.

GR./CAL.: 300 MIN. M.

BRECH OPENING:

CHECKED BY: C. PROFFER

RECOIL ENGAGEMENTS: 2.0

APPROVED:

CHAMBER: C.L.

APPROVED:

TEST: No

APPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED:

COMPLAINT: "GUN FIRED WHEN PICKED UP"

INCIDENT: FOLLOWING FALL

COMMENTS: TRIGGER CONNECTOR-SEAR ENGAGEMENT .010
MIN. ENGAGEMENT=.015. MALFUNCTION NOT DUPLICATED.
ENGAGEMENT RE-ADJUSTED.

PLAINTIFF'S
EXHIBIT

3297

AL 0029830

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
 GENERAL CONDITION: NEW R #: 00285
 OUTSIDE WORK: NO DATE: 1-6-71
 FIRED AMMO TYPE: - FROM: K MART SP-6, DEL
 & CONDITION: ASSEMBLER 12 ST. CLAIR SHORES, MICH
 PROOF: R.E.P. INSP.: _____ TEST: _____ GUN #: 6248840
 HEADING: O.K. CODE: P.S. = 6/69
 BREACH OPENING: - EX./CAL.: 7MM REM.
 RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

BROKEN TRIGGER CONNECTORCOMPLAINT: DEFECTIVEINCIDENT: FOLLOWS DOWN

COMMENTS: THE BROKEN TRIGGER CONNECTOR FAILS TO
RETRACT TO SUPPORT THE SEAR IN COCKED POSIT-
ION. WITHOUT SUPPORT, THE SEAR FOLLOWS DOWN.

PLAINTIFF'S
EXHIBIT

3298

AL 0029831

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: USED R #: 00598
 OUTSIDE WORK: NO DATE: 1-11-71
 FROM: REM. ARMS OF CAN.
 FIRED AMMO TYPE: _____ TORONTO, ONT., CANADA
 & CONDITION: _____ GUN #: 6216023
 PROOF: R.E.P. ASSEMBLER # 64 INSPECTION: U TEST: 55 CODE: LS-2/69
 HEADING: _____ SK./CAL.: 350 REM. MAG.
 BREACH OPENING: _____ CHECKED BY: _____
 RECOIL SHOULDERS: _____ APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN COMPONENTS.COMPLAINT: SEAR WILL NOT HOLD.INCIDENT: FOLLOW DOWN.

COMMENTS: SEAR-TRIGGER CONNECTOR ENGAGEMENT O.K.; MAL-
FUNCTION COULD NOT BE DUPLICATED. HOWEVER BRIGHT
EDGE ON TRIGGER (TOP) INDICATES A SLIGHT INTERFER-
ENCE WHICH MAY HAVE CAUSED THE MALFUNCTION.

PLAINTIFF'S
EXHIBIT

3299

1 of 1
AL 0029832

MODEL 700 CUSTOMER GUNS RETURNED BY COMPLAINT-MONTH RECEIVED AND YEARLY TOTAL

1963

1962

	Tot.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total Guns Returned:	355	81	86	71	55	62	34	42	54	70	83	87	87	812
Total Complaints:	397	83	89	72	61	62	34	42	54	70	83	87	87	824
Total Functional Complaints	130	29	28	24	19	21	8	13	23	24	30	29	27	275
Ejection	6	1	1		1	3	1	1	1		1	2	2	14
Firing	8	1		1	2	1			3	1	1			9
Extraction	10	1	7	5	1	3	1	1	1	3	2		4	28
Feeding	31	4	6	1	5	4	1	1	4	5	6	5	2	44
Closing	12	5	5	10	4	2			2	1	1	4	1	35
Bolt Binds	8	1	1	1			2		1	1	3	1	3	13
Trigger Pull	5	2	3	1		1		2	3	6	3	6	6	33
Safe	6	2		1	1								3	8
Damaged or Blown Cases or Primers	18	3	2	5	5	7	2	7	5	4	4	7	5	56
Ejector Binds or Stuck in Bolt	6	1	1						1	2		1	1	7
Jr., Repair Etc.	5	2												3
Up to Standard (Functional)	4	6	2				1		2	3	8	3		26
Total Intermediate Complaints	206	47	48	44	32	40	24	25	31	40	46	49	53	462
Stock Broken, Cracked	70	21	16	17	12	14	6	6	11	14	16	20	35	187
Stock Finish or Checkering	83	12	14	17	6	11	9	5	6	11	14	12	7	124
Stock Cracked at Barrel Groove														
Accuracy (Point of Impact)	2		2	1	3	3	4	5		2	2	5	3	29
Accuracy (Group Size)	11	4	5	2	3	6	6	5	8	5	2	3	2	46
Bolt Handle Broken-Loose	13	2	1				1	1		2	4	2	7	20
Sights Crooked-Tipped Etc.	5	1		2		2		1		1	1	1	1	9
Sights Out of Line			1							1				2
Scope Mounting Trouble	6	1						2	4	1				8
Sights Broken		1	3							1				5
Bolt Pulls Out	1													1
Up to Standard (Intermediate)	15	3	1	1	2	1	3			3	7	6		37
Broken Steel Parts	11	2	5	4	6	3			2		1			23
Total Visual Etc.-Complaints	61	7	13	4	10	1	2	4		6	7	9	5	68
Misc. Visual Complaints	52	7	11	4	10		2	4		5	7	7		57
Misc. Non-Functional	8					1				1		2	5	9
Up to Standard (Non-Functional)	1													1

PLAINTIFF'S
EXHIBIT
3300

AL 0029833

10 of 1

Model 700 Total Complaints (except up to Std.)

Date Prepared
per Month

Mo. Code	1962												1963												Total
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
1961																									
Jan.																									
Feb.																									
Mar.																									853
Apr.																									3400
May																									4846
June																									4621
July																									4412
Aug.																									4524
Sept.																									6931
Oct.																									7688
Nov.																									7023
Dec.																									3262
Jan.																									4150
Feb.																									3620
Mar.																									3577
Apr.																									3649
May																									3743
June																									3427
July																									3821
Aug.																									3012
Sept.																									4854
Oct.																									4066
Nov.																									1964
Dec.																									826

PLAINTIFF'S
EXHIBIT

3301

AL 0029834

1 of 1

Model 700 - Professional

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan.																															
Feb.																															
Mar.																															
Apr.																															
May																															
June																															
July																															
Aug.																															
Sept.																															
Oct.																															
Nov.																															
Dec.																															

AD-Sayons, H. J.
 3302
 PLAINTIFFS
 EXHIBIT

PENGASAS: Bayonne, N. J.

**PLAINTIFF'S
EXHIBIT**

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835

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+

Model 900 Stock Broken/Stock Finish & Checkering

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
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22												
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25												
26												
27												
28												
29												
30												
31												

PENGAD-Bayonne, N. J.
PLAINTIFFS
EXHIBIT
3303

PROJECT NO. M1700 TRIAL USE OF LPS INSTEAD

SUBJECT OF MOLYCOTE FOR CONTROL OF TRIGGER PULL

COMPUTER

DATE 5-18

1974

REPORTED BY LOADS OF TWENTY RIFLES.

REJECTED
FOR CRECP

PASSED

lay,

11

8

2

15

4

15

13

7

5

15

6

14

3

17

9

11

12

8

5

15

4

16

4

16

7

13

4

16

4

16

This is a report on
using LPS Lubricant
instead of Moly-cote. It
doesn't look very good. This
is about the reject rate we
get with no lube.

Jim

K S I C H

PLAINTIFF'S
EXHIBIT
3304

1071

AL 0029838

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT

DUPONT

COMPUTATION SHEET

SHEET NO.

TITLE OF PROJECT

M/700 TRIGGER & TRIGGER CONN.

SUBJECT

WORKS

COMPUTER

DATE

19

TRIGGER

DIM. 1.076/1.080

TRIG.
CONNECTOR

DIM. 1.080/1.083

1.085

1.084

1.083

1.082

1.081

1.080

1.079

1.078

1.077

1.076

|||||

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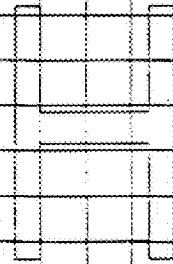
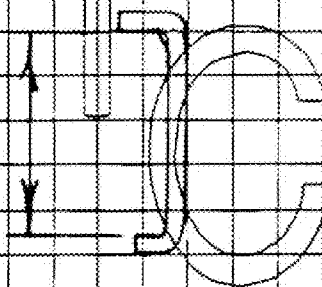
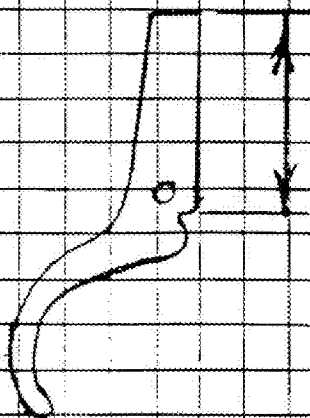
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TOL.

TOL.



PLAINTIFF'S
EXHIBIT
3305

AL 0029839

ME-1582-1 Rev. 2-15-61

M/710 Fire Control

OWN EXAMINATION REPORT NUMBER: _____ MODEL: 700 PDL
GENERAL CONDITION: Good R #: 22760
OUTSIDE WORK: ADD TRIGGER ADJUSTMENT DATE: 10-16-70
SCREWS UNLEADED, ADJUSTMENTS CHANGED FROM: CENTRAL

FIRED AMMO TYPE: _____ 14410012

& CONDITION: _____ GUN #: 193513

PROOF: R.E.P. INST. 9 TEST: _____ CODE: W13 = 5/70
LN = 2/1

READING: _____ GA./CAL.: 222

BREACH OPENING: _____ CHECKED BY: E.F. ROBERT

RECOIL SHOULDERS: _____ APPROVED: _____

CHAMBER: _____ APPROVED: _____

TEST: _____ APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

OLD STYLE SEAR SAFETY LEVER HEAVY ON USE

TRIGGER CONNECTOR BROKEN

COMPLAINT: FOLLOWS DOWN

INCIDENT: _____

COMMENTS: FOLLOW DOWN WAS CAUSED BY THE BROKEN CONNECTOR

PLAINTIFF'S
EXHIBIT
3306

AL 0029841

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
 GENERAL CONDITION: NEW R #: 22775
 OUTSIDE WORK: No DATE: 10-15-70
 FROM: MARKLEYSBURG, PA.
 FIRED AMMO TYPE: _____
 & CONDITION: _____
 PROOF: R.E.P. INSP.: 9 TEST: _____
 HEADING: O.K. GA./CAL.: 22-250
 BREACH OPENING: — CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: — APPROVED: _____
 CHAMBER: — APPROVED: _____
 TEST: FUNCTION ONLY APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

COMPLAINT: FOLLOWS DOWN WHEN SAFETY IS PUSHED OFF.

INCIDENT: _____

COMMENTS: THE DIMENSION FROM THE TOP OF THE TRIGGER TO
 CENTER OF TRIGGER PIN HOLE BEING .011 OVERSIZE
 ELIMINATES MOST OF THE CLEARANCE NEEDED FOR THE
 TRIGGER-CONNECTOR TO RETRACT WITH THE SAFETY ON

PERIOD-Report, N. 1

PLAINTIFF'S
EXHIBIT

3307

101
AL 0029842

P NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700 ADL
GENERAL CONDITION: NEW R #: 22730
OUTSIDE WORK: NO DATE: 10-16-70
FROM: LIVONIA, MICH.
FIRED AMMO TYPE: _____
& CONDITION: _____ GUN #: 6278113
PROOF: -R.E.P. INSP: _____ TEST: _____ CODE: _____
HEADING: _____ GR./CAL.: 3006
BRECH OPENING: _____ CHECKED BY: C. PROSSER
RECOIL SHOULDERS: _____ APPROVED: _____
CHAMBER: _____ APPROVED: _____
TEST: FUNCTION ONLY APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR IS .005 UNDERSIZE ON 1.080 DIMENSION (TRIGGER CLEARANCE)

COMPLAINT: FOLLOWS DOWN

INCIDENT: _____

COMMENTS: CONNECTOR BEING TIGHT ON TRIGGER DID NOT RETRACT, ACTION WOULD NOT COCK. AS LONG AS THE CONNECTOR STAYED IN POSITION ON THE TRIGGER THE RIFLE WOULD WORK O.K.



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AL (X)29843

P.T. NP GUN EXAMINATION REPORT NUMBER: _____ MODEL: 700
GENERAL CONDITION: GOOD R #: 21196
OUTSIDE WORK: SCOPE MOUNTED DATE: 10-2-70
FIRED AMMO TYPE: _____ FROM: DAVISON
& CONDITION: _____ MICHIGAN
GUN #: 6216922
PROOF: R.E.P. INSP.: 9 TEST: 87 CODE: LS = 2/69
HEADING: O.K. CAT/CAL.: 243 WIN.
BREECH OPENING: _____ CHECKED BY: _____
RECOIL SHOULDERS: _____ APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER CONNECTOR BROKEN.

COMPLAINT: FIRING PIN FOLLOWS DOWN

INCIDENT: _____

COMMENTS: THE CONNECTOR BEING BROKEN, ENGAGEMENT
BETWEEN IT AND THE SEAR WAS UNLIKELY THEREFORE
THE FIRING PIN WAS FREE TO FOLLOW DOWN.



AL 0029844

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE




"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

XC: K. W. Augustine R. L. Joy
 S. D. Bennett M. J. Kantor
 L. R. Blackhurst H. C. Munson
 L. B. Bosquet C. O. Pardee
 H. K. Boyle D. F. Polley
 J. W. Brooks D. D. Ricci
 J. J. Burns D. I. Roark
 G. D. Campbell D. J. Sanita
 W. L. Ganey D. S. Valent
 B. H. Gilbert W. C. VanSickle
 M. C. Hardy L. G. Wilke
 P. G. Johnson

February 8, 1982

J. H. CARTER, G. E. FLETCHER, J. P. LINDE

M/700 FIRE CONTROL - REMOVE BOLT LOCK

MEETING HELD 2/8/82 TO REVIEW IMPLEMENTATION

BELOW IS AGREED UPON SCHEDULE

START DATE - FEBRUARY 26, 1982

A. Items needing completion to meet above date:

1. Process Record needed, new Part Numbers for components - Issue by 2/12/82.
2. Push new safe arms thru production:
 - 9,700 in Stores, 3,000 of these issued 2/5/82.
 - 10,000 more to be sent to Vendor for clipping.
 - Additional sent to Vendor for clipping as needed to meet schedule.
3. New instruction folders available.
4. A quantity of 5,000 old style safe arms to be sent to Arms Service for use on customer guns.
5. Old Instruction Folders - Gather up and dispose of.

S. Bennett
J. Brooks

M. Kantor

S. Bennett
D. Ricci

M. Kantor

J. Carter

D. Roark
J. CarterD. Roark
W. Ganey

N/700 FIRE CONTROL - REMOVE BOLT LOCK - Contd.

- B. On starting date, Final Assembly area will do the following:
1. All assembled guns, repairs included, will be torn down and a new Safe Arm will be assembled to the Fire Control.
 2. All guns packed on February 26, 1982 and thru March, will be stamped AL (March 82). This includes guns and packing labels.
 3. Mark gun labels "S".
 4. Guns must have modified Safe Arm and new instruction folder.
 5. Custom Gun Shop to use new Safe Arms in Fire Controls in guns from February 26th forward. New instruction folders must also be used.

by Still 2/9/82
G. J. Hill, Supervisor
Process Engineering
Current Products

GJH/cac

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AL 0029846

M/700 FIRE CONTROL CONVERSION - REMOVE BOLT LOCK

- Start Date - Beginning of March (February 26th)
- Push clipped arms thru process
- Process needed
- All assembled guns/in stocks - complete to warehouse - old instruction folders
- All assembled actions and fire control remove old safe arm, replace new safe arm
 - Perform any required tests
 - Send fire controls to custom Repair
- Mark gun labels -
 - Insert new instruction folders
- How many old style safe arms to send to square stamping
- How many for Custom Repair.

GJH/cac

[Handwritten signature]



1081
AL 0029847

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

Xc: J. W. Bower
J. W. Brooks
J. S. Martin
C. E. Ritchie

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

December 16, 1981

TO: C. B. WORKMAN
FROM: T. L. CAPELETTI *TC*
SUBJECT: ACTION ITEMS FROM DECEMBER OPERATIONS COMMITTEE MEETING

Items requiring action by the Research Division are as follows:

1) M/870 Competition Trap

Ed Barrett indicated that we need to proceed as-soon-as-possible with our endurance testing to confirm acceptability of the 0.035 inch bolt clearance specification. Complete prior to the January meeting.

2) M/700 Scope Mounts

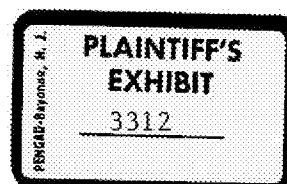
Ed Barrett agrees that including the extruded aluminum mounts with the .257 Roberts special offering in 1982 is a good idea. We need to confirm by the January meeting our ability to make 3,000 sets. Ed also requested a detailed program outline at the January meeting on how we plan to prove out the .257 Roberts design.

3) M/700 Lubrication of Fire Controls

As part of the Annual Quality Review, Dick St. John summarized the most serious and most frequent complaints received from gunsmiths during visits by field personnel. I suggest we have Dick and John Linde repeat their presentations for Research personnel. However, the first item Dick covered was that of sticking sears on M/700's. Ed Barrett indicated that we need to resolve the following ASAP:

- a) Replacement for "Steelguard" during assembly in the Plant. (Approve John Linde's solution?)
- b) Recommendations in Owner's Manual for lubricants to be used in the field.

TLC:ws



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AL 0029854

Recommendations for Expediting Project Approvals

These recommendations are the result of the efforts in obtaining approval of the metal injection molding project, which was accomplished in four weeks, from writing of the preliminary draft to final project approval.

I. Presentation to Management

The level of Management required to give project authorization is presented with the proposed program. At this time, estimated costs and benefits, the implementation schedule, and sufficient detail to explain the program are shown.

This is best presented orally to facilitate response to questions, but can be done in writing if an oral presentation is impractical. It may also be advantageous to submit a written version either before or after the oral presentation to generate additional questions. The goal of this entire procedure is to have all concerns addressed before the final draft of the project is circulated.

II. Preliminary Project Draft

A preliminary project draft is then typed. In the case of the injection molding project, this draft was circulated to everyone below General Management who would eventually sign the project. Sending copies to everyone indicates that special attention is being given. It is, therefore, recommended that this approach only be used on selected projects.

The Project Review Group should always be sent a copy if the level of authorization requested necessitates their eventual review.

Any department who has a stake in the project should always be given a copy, and a personal review of the project with these departments is highly recommended. In the case of the injection molding project, Plant Engineering and Powder Metal were contacted personally and their concerns addressed.

A date should be specified for return of the preliminary draft and any questions. This date is dependent on the complexity of the project and how quickly the final version must be approved. Typical times will range from 3 to 10 days.

III. Final Project Writeup

Once all of the questions have been considered, the final draft of the project can be typed for circulation. If recommendations made by departments in Step II were not incorporated into the final draft, it is important to make contact with that person and explain why it was not used.

IV. Circulate Project for Approval

By this stage all questions should have been answered, and this should now be just a formality. In most cases circulation is by mail. However, for those projects in which authorization time is critical, the project can be hand carried. Hand carrying of projects should be done very selectively, as repeated use of this procedure will de-emphasize its purpose.

12/9/81
JWB

A

Green Valley, Arizona

Jan. 15, 1982

To Clark Workman

From Wayne E. Leek

Subjects: December 1981 report on Silhouette activities
and an outline on ideas to support a new bolt
action line of rifles and shotguns.

Matches attended: 22 RF Silhouette
Dec. 20 Nogales Rifle Club

Match Winner	Leek	28/40
"	"	24/40

Dec. 27 Tucson Rifle Club

Match Winner	Leek	27/40
"	"	29/40

Jan. 1982 report on more details supporting new
bolt action designs.

Suggestions to support new bolt action rifle design:

I Analysis of K700 CF rifle

A. Positive features

1. Superior strength.
2. Adequate accuracy.
3. General appearance satisfactory.
4. Complete range of popular calibers.
5. Priced competitively.
6. Right and left-hand models.

B. Negative features

1. Weak recoil bracket.
2. Ring extractor (bad reputation).
3. Round receiver (unreliable bedding).
4. Trigger adjustment insecure and weak.
5. Lock time (slow)
6. Manual safety (inadequate)
7. Scope base mounting (inadequate).
8. Match rifles (not competitive).

II Proposed foundation for improved rifle.

- A. New bedding and recoil bracket.
- B. Redesigned claw extractor.



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AL 0029868

- A
- C. Redesigned trigger elements.
 - D. Reduced lock time.
 - E. Manual Safety (function off cocking piece).
 - F. Scope base mounting (use 8/40 screws or permanent base mounting).
 - G. Match grade (superior to Anschütz) (Redesigned stock, accessories and trigger mechanism).

III Proposed ideas for future development of bolt action rifles.

- A. Recoil reduction
 - 1. Butt plate area.
 - 2. Barrel area.
 - B. Ultra-high velocities.
 - C. Elimination of cartridge case.
 - D. Accuracy improvements.
 - E. Improved barrel dampening and bedding methods.
 - F. Reduced lock time.
 - G. Improvements in aesthetics.
 - 1. Barrel finish.
 - 2. Stock finish.
 - H. Improvements in Match rifle design.
 - 1. Stock
 - 2. Trigger mechanism.
 - 3. Lock time.
 - 4. Accuracy.
 - 5. Sights.
- S I C H

Suggestions to support new bolt action Shotgun design:

I. Analysis of competitive products.

- A. Positive features.
- B. Negative features.

II. Proposed foundation for new bolt action Shotguns.

- A. Gauge.
- B. Stock design.
- C. Feeding system.
- D. Sights.
- E. Locking mechanism.
- F. Trigger mechanism.
- G. Barrel length.
- H. Manufacturing facilities.
- I. Safety mechanism.

Enc. Letter from the Rogers Arms and Machine Co., Inc.
and my reply.

Green Valley, Ariz.
Jan. 4, 1982

Mr. Rogers S. White
1426 Ute Ave. Box 2344
Grand Junction, Colo. 81501

Dear Mr. White:

Please excuse the delay in answering your letter. I wanted to give your questions careful thought.

Your list of manufacturing facilities and experience is certainly impressive and speaks of a quality organization. However, if you will pardon the constructive criticism, the experience outlined is lacking in several areas when it comes to producing a product for the market place that is considered in the dangerous category, such as a firearm. Your third sentence pertaining to product liability obligations should and has prompted your hesitation in the pursuit of the design and manufacture of trigger assemblies for they are definitely in the dangerous category. This item is especially critical when the design must function precisely in a product that is under the control of another company.

Canjar has been relatively successful with his product, but if the truth was known there is no question he has had problems. Imagine his frustrations in trying to keep abreast of design and dimensional changes after the fact in the various rifles he is trying to fit. It took many years of trial and error by his company to determine the mean dimensions of another product. During those early years product liability was not as serious as it is now, but it gave him time at least to determine the dimensional trends. I must admit he did very well but I certainly wouldn't have the fortitude to attempt such an effort in light of today's legal situation.

Liability suits, involving injury and death, are not in the magnitude of a mere hundred thousand dollars but in the millions. Often the one who pays is not at fault as in the case against Remington concerned with the alleged safety mechanism on the M600 rifle.

In the design and manufacture of a trigger mechanism there are so many dimensional variables and tolerances that testing of all the combinations requires hundreds and thousands of parts, several hundred thousand rounds of test firing*, and thousands of precise measurements. This is needed to detect dimensional variations in the manufacture and wear and damage during testing.

Within the last ten years computer analysis, coupled with automated drafting techniques allowing enlarged examination of dimensional variations, has been added to the designer's kit of tools to allow further examination in depth into the areas of critical control of parts in the dangerous category.

* In semiautomatic mechanisms this could approach one half million rounds.



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Therefore this leaves the small company, no matter how dedicated with limited capital, facilities, experience, and equipment, to the mercy of chance--a very dangerous place to be and does not provide a secure base for product development such as you are suggesting. Such a program would be fraught with costly problems and liability suits.

In the area of trigger guards, sights and accessories, the liability problems are of no concern.

In the design and manufacture of an entire rifle especially by a small company the problems previously described involving the trigger mechanism are compounded by the additional necessity of dimensional control over the locking mechanism, strength of the action, and gas flow, another dangerous category. The only advantage one would have is the opportunity of complete control over the entire product.

To justify the design, testing, permanent or temporary tooling, and production requires a considerable amount of working capital and as problems arise, and they will, costs can soar. Also consider the cost of recall as this can happen in the best of circumstances.

Then there is the problem of advertising, sales promotion, and the establishing of marketing outlets. If there is a weakness in this area failure in the market is assured regardless of the sterling qualities of the product.

Venture-analysis into the market of a new concept or product is an excellent safeguard to be established before progressing beyond the model stage of development.

To support a rifle design that you mentioned I would estimate that 25,000 units a year would be necessary to break even on your costs. I doubt the market would support that volume.

In producing items in the low-volume category, production methods using investment castings and numerical control are ideal, with the individual parts at high cost but the tooling investment held at the minimum level.

In reviewing the history of success of new arms development over the past 20 years there have been numerous starts by small companies with almost 100% failures. These results should be seriously reviewed before undertaking a new venture in this area.

I suggest to you that these ventures are very risky.

Very truly yours,

Wayne E. Leek
Wayne E. Leek

A

FILED

Green Valley, AZ

Jan. 29, 1982.

To Clark Workman

From Wayne E. Leek

Subjects: Jan. 1982 report on Silhouette activities in Arizona, matches attended, and repairs to Remington products. Also a more detailed report on suggestions supporting a new line of rifles and shotguns.

Matches attended:

Cochise Gun Club Jan. 16, 82 Match winner Leek 27/40
Nogales Rifle Club Jan. 17, 82 Match 1 winner Leek 30/40
Match 2 winner Leek 30/40
Black Canyon Range Jan. 24, 82
Arizona Rifle and Pistol Assn. Championships
Match winner Yehl 32/40
1st. AAA Leek 31/40

Repairs to Remington Product:

A customer's M700 /30'8 Silhouette rifle would fail to fire about 30% of the time. Examination revealed an improper nose shape on the firing pin. After replacing with one of correct design consistent ignition was restored. Instead of having a radius for the nose it was flat. There was no indication of tampering. This firing pin will be sent upon your request.

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A

SUGGESTIONS SUPPORTING A NEW LINE OF BOLT ACTION RIFLES AND SHOTGUNS.

Introduction.

This program reviews the favorable and undesirable features of the M700 rifle with suggestions to support an improved M700, elevating it to a higher quality level of customer acceptance. The development will not be too expensive or time consuming and would provide a base rifle allowing time to accommodate the more innovative ideas.

A proposed foundation for a new bolt action shotgun follows the rifle program.

Problems for the Improved Rifle.

The M700 action exceeds the strength of every known

bolt action of rifle by a substantial margin. Supporting

the exposed head of the cartridge case by reinforcing it with

the bolt shroud, barrel recess and receiver, prevents case

rupture and a damaging amount of gas from escaping rearward

during high pressure firing.

The ring extractor used in the

M700 eliminated the need for expensive ball-injection threading

and extractor cut in the ^{Barrel} ~~barrel~~ receiver assembly so

commonly used in previous bolt action rifles. The superior

strength was a fortitious spin-off of this design and not

known until severe strength testing revealed the secret.

Any future development should include the integrity of this

principle and must be jealously guarded. This is not to say

that the ring extractor is mandatory to protect the strength

principle but the support of the cartridge case without

rupture under high pressure is extremely important.

The M700 extractor has undergone a series of design

changes to guarantee reliability and the latest is believed

to be superior to previous attempts. Unfortunately a bad

reputation of breakage, malfunctions, and difficult repairs

has played the principle to the point that future customer acceptance is severely questioned.

During an Ordnance development of a tank machine gun by Remington, an improvement to the ring extractor was found in a Garrett M1 machine gun resulting in a successful design for our program. This extractor was a claw type, small but efficient in nature housed in a cut in the bolt shroud. Its main feature in ever-tightening ELP as the load was increased, left little to be desired. The outside surface of this extractor replaced the cut-out portion of the shroud and was thoroughly supported by the barrel recess. Strength tests revealed that this combination provided all the strength of the ring-extractor design. It is suggested that this principle be used in the improved ring

In general the accuracy of the M700 is adequate for hunting, varmint, silhouette and target shooting. Special orders for bench-rest type rifles produced by the custom shop have proven accuracy superior to all but the finest match rifles. Modern barrel manufacturing methods such as used in Remington are to be credited for this achievement. Remington, however, is not in the league of competition for the position match shooter, dominated by Anschütz.

There are several areas where accuracy can and should be enhanced by changes in the basic design such as the barrel bracket. The cross-sectional area of the bracket adjacent to the barrel is considered weak by many gunsmiths and has now gained a bad reputation for lack of recoil support especially when using heavy-calibered ammunition. This situation is

A aggravated by improper bedding in the stock, especially if the bedding support contacts the bottom of the bracket.

Any shifting or bending of the bracket can cause accuracy problems. One made of powder metal or other means of greater rigidity as used in the M 788 would be of benefit.

A round surface on the bottom of the receiver as presented by the M700 has always been questioned by many gunsmiths, designers, and match shooters as a possible area of non-stability during the torquing of the receiver during firing.

If true, and I believe the torque problem does exist, a conventional flat surface should be provided for proper bedding. The new barrel bracket design could be extended with a mating flat surface to fit the receiver. *Flat Bottom Receiver*

Research is needed to explore the areas of bedding actions in an effort to determine the magnitude of advantages in barrel-dampening devices. Although some investigation in the past has shown advantages by using dampening methods inconsistencies have prevailed. I believe the results of past efforts were clouded by barrels which had varied wall thicknesses. Modern manufacture such as practiced by Remington virtually guarantee centralized bores in the barrels. Reliability in the use of bedding devices would be enhanced with these barrels. Such methods as electric bedding, 2-point and 3-point bedding, pre-determined muzzle pressure, free-floating barrels and other means should be explored.

There is some indication that accuracy is improved when accentuated by faster lock time in rifle rifles and the same should be true in center fire rifles. It is believed that *rock*

the fall of the firing pin sets up pre-vibrations in the barrel prior to ignition which disrupt accuracy. There also may be a more uniform ignition advantage.

Accuracy testing of thousands of production rifles has revealed that the M788 is superior to the M700. This fact was observed during the development of the M788 when compared to the M700. Using the same barrel process, stock bedding principles and the same lots of ammunition have ruled out most of the variables between the two rifles, the exception being the receiver (front vs rear locking), heavy vs light barrel braced, and the difference in lock time. M700 lock time is approximately 5.5ms and the M788 is 2.7ms. The shooters are also observing the accuracy advantage of the M788. It is believed that the faster lock time in the M788 gives this model accuracy advantage. Re-design of the M700 should involve reduced lock time to improve its accuracy and give the old hand competition the advantage of this principle.

There are numerous ideas to achieve faster lock time. Such a design is a flat-type forced pin with rotary sweep nose as used in the M788. Other ideas include the use of lighter weight recoils, ie, aluminum, titanium, polymer construction, carbide or alloy steel-tipped light weight pins, etc. It will be found that a nose diameter of .060" is necessary when using the lighter weight pin for proper ignition. Faster lock time approaching zero should be our objective.

Reliable accuracy is no more require than the reliability of the scope base mounting screws and in the M700 6/45 screws are

not adequate. The use of 2/40 screws as used in the M766 or a fixed scope base of Ruger design is recommended.

Glass bedding methods are excellent to insure a perfect fit of the action to the stock. Also recent developments in custom designs provide extruded aluminum bedding elements which precisely fit the barreled action and are securely epoxied to the recesses of the stock. Fiber glass and other plastic materials are now appearing on the market, impervious to the elements and strikingly attractive. These items certainly suggest improvements in accuracy.

Accuracy is always enhanced by fine trigger mechanisms.

Huntington's M700 has a reasonable trigger which when properly adjusted, allowed a spread of pull weight from 1# to 8# with a crisp let off. However one must rely on the factory adjustment which is anchored with 100-psi cement plus striking with a center punch. The latter will break the threads and side plates of the mechanism and the former will break the screw slots, all of which makes it virtually impossible to adjust by anyone, including gunsmiths. The excuse for this is in the name of safety to prevent the customer from making adjustments. However the shooters are attempting to make adjustments and often ruin the trigger adjusting means that has been designed in assembly.

A more substantial approach is the Genger design which in essence is a copy of Huntington's principle but improved and of course more expensive. This assembly allows more contact area for the screws. The main adjustment of over travel is retained by a nylon pin. Genger provides instruction for adjustment and a warning statement, which apparently believes that of responsibility in case of accidental discharge due

A to faulty adjustment. The screws are Allen-headed which eliminates the slot problem. Two-link and three-link systems are available-the latter can be adjusted down to a 2 gr. pull. Most match shooters resort to the Canjar or Kenyon design. It is suggested that before improvement to our trigger mechanism be made that we analyze Canjar, Anschutz, Kenyon and Feinwerkrau designs.

Remington's manual safety blocks the rear mechanism. The manual motion is in the same plane as the trigger movement and allows a dangerous condition to exist. Pulling the trigger at the same time the manual safe is moved to off, fires the rifle! This motion is not unlike taking the hammer off safe in a M94 Winchester or a revolver.

A manual safety should never be allowed to function in the same plane with the trigger unless a disconnecter is provided preventing firing if movement of the safety takes place while the trigger is pulled! A safer and more reliable manual safety is a 3-position type located on the cocking piece. *Safety*
it is recommended that these ideas be considered.

The stock design of the M700 is excellent, presenting good balance and symmetry. The RK's finish is appealing to those who desire a glossy shiny finish but has little appeal to the experienced sportsman who is accustomed to European walnut and hand-rubbed oil finishes.

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The effect of pressed checkering has been graded out checkering and has led some shooters to search for stocks with other decorative designs. One attractive procedure is to use a ^{stained} stippling pattern as found on fine German-made firearms. Also there is a slight trend toward hunting scenes cut or impressed or transferred on the stock.

Approximately 15% of the population are left-handed and I believe it is prudent to continue providing these models for the left-handed shooters.

For many years Remington was very aggressive in development and producing new calibers, leading the competition in the market place. Such successful developments as the 7MM Magnum -25-06, 222, 22-250 are ^{excellent} ^{naturally} not all of our cartridge developments were a ^{success} ^{and} the inability to analyze a future target such as was done on the military job has in some degree hurt our position. To keep our product alive new developments in cartridge design which provide a substantial improvement over the common place is needed. The 7/308 and the Remington 700 Express are good examples of a policy to keep new cartridge development in the forefront.

A peen-hammered barrel presents desired effects in something special being done to high grade rifles. This process was used for years on the surface of a sterling silver bell on slide chamber manufactured by the Old's custom instrument company. They claimed exceptional tone qualities from this process due to the relief of surface tensions.

on the bell, and this feature became an appearance of excellence among muzzleloaders.

We achieve this appearance in our rotary swaging of barrels and then remove the surface by grinding. The idea of providing a super-Grade barrel with this aesthetic effect was weekly presented to the operations committee several years ago. This lacked technical support of what might be desirable technical improvements in accuracy. Certainly the aesthetic effect of something special was there. Since then the fine custom Remington rifles displayed the product with this appearance. I believe the surface condition if left alone indeed support improved accuracy performance along with a desirable appearance and certainly would be obtainable at no extra expense.

PROPOSED IDEAS FOR FUTURE DEVELOPMENT.

Several ideas were suggested in my Sept. 21 report that would improve the performance of the muzzle shooter in the quest for perfection in accuracy and these are repeated in this report.

Recall these principles used in the super-Grade air rifles, (nullifying recoil caused by movement of the compression disc).

Recall
Reduction

Movement of a large mass prior to release of a bullet or pellet tends to throw the shooter's aim off target before exit of the projectile. This problem exists in such open bolt centerfire rifles as the EBR, M3 and Thompson Sub Machine Guns and others. To nullify this unwanted problem in super Grade air rifles four approaches have been taken as follows:

1. Anschutz watch air rifle uses an oil-filled hydraulic cylinder, an action similar to car-type shock absorbers to compensate for the forward motion of the compression piston.

2. Walther's watch air rifle uses a single stroke pneumatic system which allows a piston to compress air into a chamber only a few times larger than the pellet. Movement of the trigger seat allows a heavy spring-loaded hammer to hit a striking lever which in turn pushes open an exhaust valve.

3. Beeman's watch air rifle involves double-acting pistons which results in a smooth recoilless and vibration-free firing action.

4. Feinwerkbau's watch air rifle uses a principle where movement of the compression piston at the moment of firing trips a seat which releases the entire barrelled receiver assembly to ride on a pair of hidden, hardened rails. The necessary "equal and opposite" reaction causes this heavy metal mass to slide back about $\frac{1}{4}$ " on the rails while the shooter holds the recoilless stock and trigger. The shooter feels almost nothing and his sighting picture is undisturbed. The mechanism must be returned to its locked-forward position for the next shot.

Eliminating the disturbing recoil sensation caused by the moving piston prior to pellet movement in these excellent watch air rifles allows the shooter to concentrate on all the fine points of shooting affecting his performance such as sight picture, hold, trigger pull and follow-through.

Remington's patented recoilless principle.

Developed during bench rest shooting competition around 1947-1950, this system applied to powder-actuated fire arms. The objective was to eliminate the variable offered by the shooter's shoulder from shot to shot in an effort to improve accuracy. The principle was sound and was instrumental in winning bench rest matches in Johnstown, New York. It was also a factor in the development of the several accuracy devices now in use in gallery testing at the Ilion plant.

Basically the system allowed the barreled action with scope to move $3/4$ " rearwardly on bearings before being retarded. In other words the bullet would exit before rearward resistance could affect the shifting of the point of impact.

Remington's method is quite similar and preceded that used by Feinwerkbau.

A recommendation for consideration in future rifle match rifle design.

*Remington
Match
Rifles*

Two variations in accommodating the movement of barreled actions until bullet exit were used in Remington's recoilless design.

1. The preliminary design allowed the action to float on lubricated lead bearings sliding rearwardly in a metal track.

2. In the final design the action was allowed to recoil on a series of cam followers until the bullet had exited.

The principle is sound, and now is being used successfully by Feinwerkbau in their championship winning air rifles. I used this system successfully in winning bench rest matches. Remington accuracy devices have proven successful

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in millions of rounds fired. Therefore I believe the method could be introduced into a rimfire match rifle where the principle would nullify errors in the major problems associated with follow-through.

SUMMARY

Air rifle shooting has emphasized the need for follow-through in precision off hand shooting making one aware of the need for uniform resistance to recoil.

Olympic class air rifles have built-in designs to nullify any unnecessary movement of the shooter which would aggravate consistent resistance to recoil.

Hemington's patented recoilless system provides a secure method of eliminating this effect in powder-actuated firearms.

It is recommended Hemington consider incorporating this principle in future match rifle development.

Recoil reduction is important in every shooter's mind

and numerous ideas have been proposed to solve this disturbing element. Some ideas have been moderately successful such as the

Outis Compensator, a protruding device located ahead of the muzzle, where jettisoning the bullet impinges upon flat metal surfaces pulling the gun forward.

It uses the recoil reduction method as an ear-splitting but reasonable recoil reduction of about 10% of the total recoil. However, the effect appears

late during the recoil cycle and aids some shooters more than others depending upon how tightly they hold the gun to the shoulder. Many innovations to this principle less effective but possibly more attractive have been used such as providing drilled holes on cut slots in the barrel.

Other ideas such as used in Remington's M1100 wherein a portion of gas energy is stored in a moving mass and then later transferred back into the gun has been successful and acceptable as a recoil reducer to the hunter, skeet and trap shooter.

Moving butt stocks which store energy in a spring or hydraulic absorbing means such as the so-called hydro-coil have been attempted but with questionable success. This principle allows the shooter's grip hand to recoil into his cheek with an unpleasant effect as the stock will length is decreased. Naturally if used with a scope on a high recoil rifle this would result in eye injury.

The most common lowest cost and least effective method is the provision of rubber recoil pads designed with collapsing internal rubber fins. This device made of rubber stores recoil similar to a spring allowing an undesirable fast recovery. An analogy is the action of automobile springs in automobiles which require shock absorbers to subdue the rebound of stored energy.

An ideal butt pad would be the type that resists compression up to a predetermined pre-load level, then absorbs the recoil without a spring-like action recovering gradually back to normal.

Such a device was developed by Remington with the assistance of DuPont-labs of polyurethane foam. Tests of this device produced outstanding recoil absorbing characteristics and met the principles previously mentioned.

There were problems of color, matching surface to wood, and it ended, were absorption. These problems I believe can be solved and it produced correctly would perform superbly for

A beyond any butt pad now produced.

A standard 30'06 caliber requires a 36" barrel to obtain maximum velocity. Therefore it is obvious that a considerable amount of gas energy is being wasted when using barrels of shorter lengths. The escaping gas from a 24" barrel in this caliber generates a muzzle pressure of 10,000#sq" and is escaping at velocities in excess of 2700 ft/sec. This escape produces a rearward jet effect which is approximately 1/3 of the total recoil energy, and is so significant that if prevented from happening would be one of the more important advances in gun design and recoil reduction in history. An adequate solution would stir the very foundation of the sporting and military gun industry and would provide a powerful edge of leadership. When achieved safely the principle has far-reaching implications in the commercial and military areas. For example with fully automatic rifles recoil would become nearly stabilized during firing, a feat long sought by the military. Reducing recoil in this magnitude could provide the hunter with potential big caliber performance and a recoil of a 223.

Gas
cut
offs

The idea is not a myth. A laboratory model was constructed by Remington personnel using a M760 in 30'06 caliber with the resulting measured recoil of a 223! It is conceivable that this principle could be used on shotguns as well and combined with the recoil-reducing principle in the M110C could approach a recoil-free shotgun.

Initially some reliable means must be used to trip a

Valve mechanism closing the escape of gas. The most logical means is the bullet. Therefore it is assumed that the various suggestions of valve mechanisms discussed will be programmed to be activated by the bullet. Inertial problems are a big factor and careful calculations, computer analysis, and measurements are necessary. If the nose of the bullet activates a valve mechanism in sufficient time a difficult problem in timing is overcome. Conversely if more delay is needed earlier programming by the bullet in some selected area of the barrel is needed and careful analysis and design must be integrated to prevent dangerous premature muzzle closure before bullet exit.

The following suggestions are without calculation or measured foundation and are ideas only, to be examined and reviewed by design and laboratory personnel. It is hoped that they may cause an immediate reaction by the readers to further enlarge the spectrum of thought.

Suggestion 1

Utilize a 3-section barrel. The first section is held rigid containing the chamber and is smooth bore. Being the longer of the three lengths allows the bullet to obtain maximum velocity. The second or middle section rotates like a nut in a threaded tube. This portion is relatively short and contains full twist rifling. The rear portion of the barrel works like a collar closing a splinter valve when rotated by the bullet tracking the expanding gas. The bullet continues into and thru the third rifled muzzle section

Thru
Sectn
Barrel

A finalizing its spin and accuracy. This section is held
rigid. The middle section when rotated loads a spring which
is programmed to open the valve, gradually releasing the
stored gas by counter rotation at a later period.

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Suggestion II

Use a bullet design of two diameters.

Fig. 1

*Bullet
with
Two
Diameters*

The front section, for example, could be .284" in diameter and the rear section .375" in diameter. The first 20" of 24" of the barrel is smooth bore to accommodate the .375" rear cylinder of the bullet and the last 4" a .284" rifled bore. The juncture of the two sections of bullet are sharp, creating an intentional stressed area. The bore provides a sharp shoulder from .375" to .284" to shear off the rear slug which acts as a plug preventing any further forward movement of gas.

Fig. 2

Fig. 3

The sheared .284" diameter forward section is allowed to enter the 4" of rifled barrel, spin stabilize, and exit from the muzzle. The remaining slug must be removed. If the front section of the barrel is allowed to slide forward due to the force generated by the forward motion of the bullet, an escape vent could be provided to discharge the slug and the pent-up lower velocity residual gas. It is believed that because of inertia in actuating the mechanism sufficient time to release the stored gas could be programmed to discharge at a gradual reduced rate with negligible effect on recoil reduction.

Fig. 4

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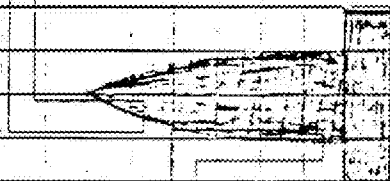


Fig. 1

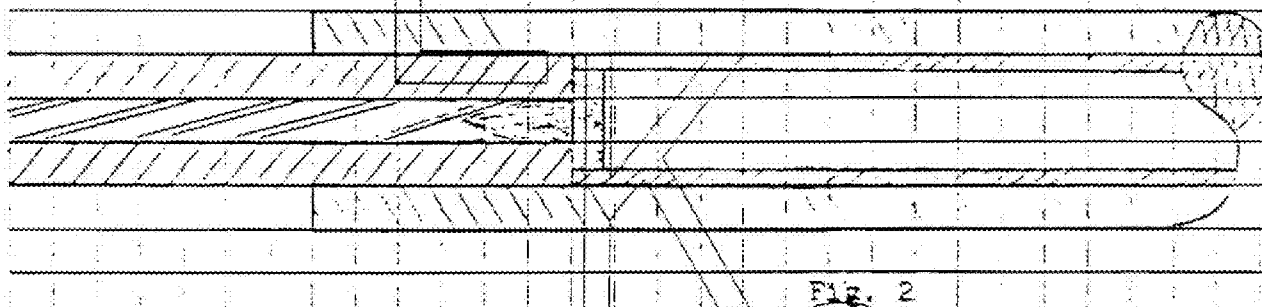


Fig. 2

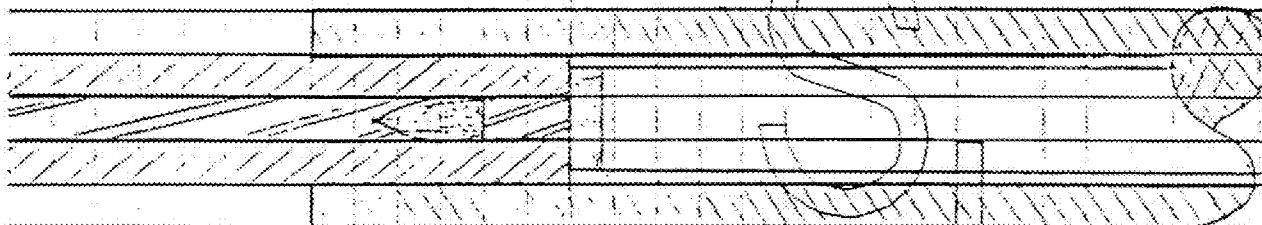


Fig. 3

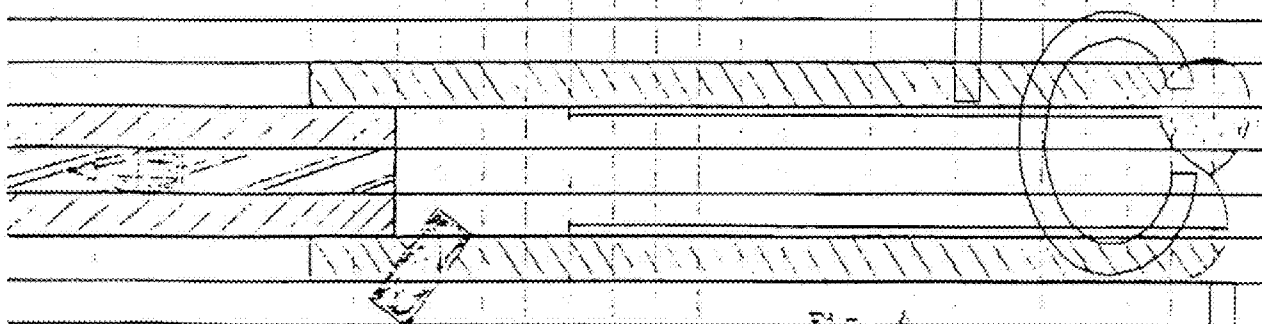


Fig. 4

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Suggestion III

This method has the appearance of petals on a tulip. In this system a series of metal petals surrounded by a very strong spring seals the exit of gas after the projectile forces its way through the petals. The projectile should have a long gradually tapered section starting just back of the ogive, quite similar to a tapered heel except having a longer taper.

*Barrel
with
metal
petals*

Fig. 5
Fig. 6
Fig. 7
Fig. 8

The entire action is as follows: The petals, perhaps 8 in number, are closed tightly over the forward section of the muzzle surrounded by a strong circular spring. They must be completely tight, capable of preventing gas from leaking at a pressure of 10,000#sq". As the projectile passes past the muzzle and into the valve area the petals are forced open by the ogive of the bullet and start closing as the rear taper passes through the seals. Trapped residual gas could be allowed to escape through a valve at a later period somewhere in the barrel or by actually using the extraction of the cartridge case as a valve. It is also possible that a delayed blow back unlocking system could be designed wherein the residual gas would thrust the cartridge case rearward using the jet effect in reverse thus forcing the rifle forward. The result would be additional recoil reduction. In this case alteration to the locking mechanism

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REMINGTON ARMS COMPANY, INC.

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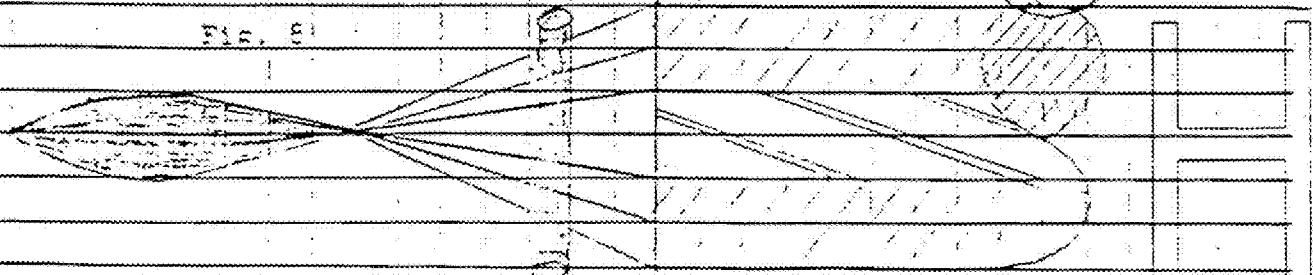
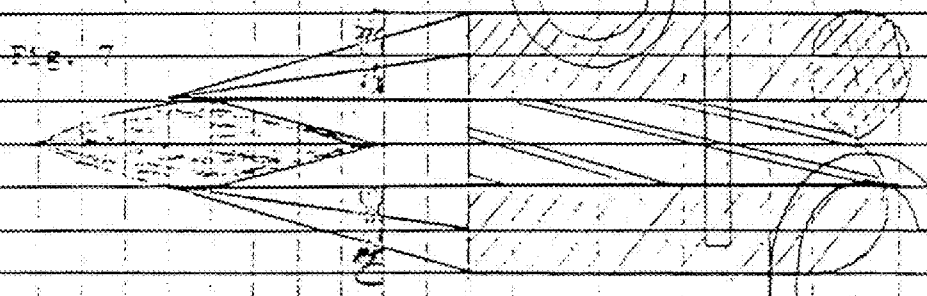
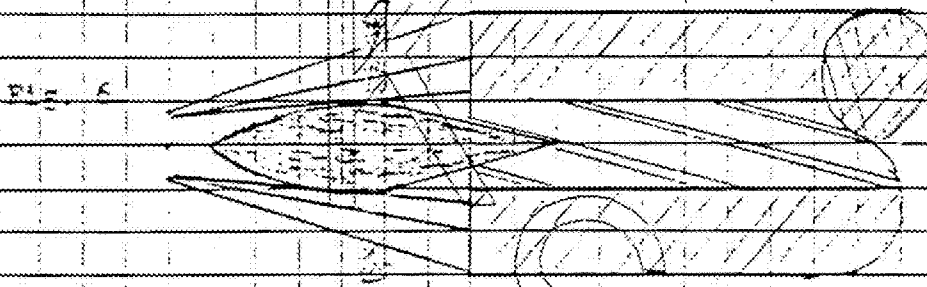
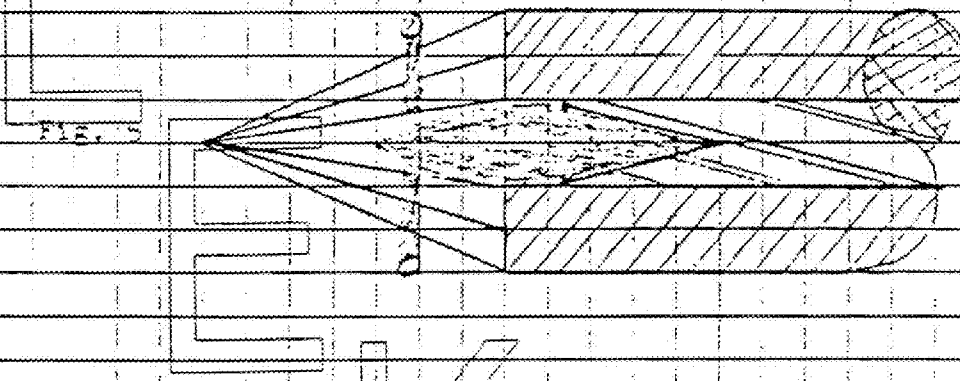
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A and safe handling of the ^{rearward} exhaust gas would be in order.

The petal design must be so well engineered that accuracy is not impaired. If the long taper in the rear of the bullet doesn't allow enough working area for the gas, a driving band exposing a sharp shoulder of substantial working area followed by a long taper allows closing of the petals.

Ultra high velocity can be obtained by several means.

One of the most successful, the Gerlich principle, was used by the Germans in large bore cannons during WWII. This principle used a tapered bore from breech to near the muzzle. The projectile contained one or more circular fins much larger in diameter than the main body exposing a large working area to the expanding gas.

Fig. 9

As the projectile moved toward the muzzle thru the tapered bore the fins folded into recesses attaining a finished bore dimension. During this movement down the tapered bore an exceedingly high velocity was obtained in the neighborhood

Fig. 10
Fig. 11

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Fig. 9

Fig. 10

Fig. 11

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A of 5000 ft. per second. Naturally, with this velocity and projectile construction of high hardness and toughness qualities, penetration of armor was achieved with devastating results.

A bullet of 6mm size with two fins of .375" dia. could be used for the initial test of the Gerlich principle. The barrel should be approximately 26" in length with an initial smooth bore diameter of .375" gradually tapering to .240" in 20". The last 6" contains a gain twist rifling to achieve stability.

It seems possible that a projectile, if properly designed, could provide its own power supply. The core would be the actual projectile surrounded by the igniting material safe enough under normal handling to be of no concern. When initiated forward by the thrust of a base percussion type primer the friction caused by contact with the tapered bore would provide combustion. Because of the large working area extra thrust would be attained as the eroding bullet approached muzzle bore dimensions. At a point approximately 6" from the muzzle ignition would be complete and a gain twist would stabilize the projectile. In this design no ejection or extraction is needed and the design of the receiver could be shorter in length, thus lighter in weight, lower cost and would provide a faster lock time.

Fig. 12
Fig. 13
Fig. 14

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Eroding bullet

DATE _____

19__

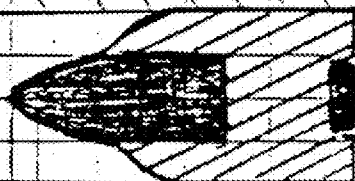


FIG. 12

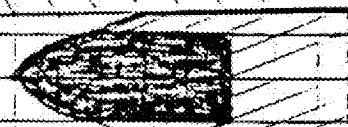


FIG. 13



FIG. 14

24726

Bolt
Action
ShotgunProposed foundation for a new bolt action shotgun.

I believe this program can be achieved easily at low development and production cost, because the ground work for such a design was thoroughly covered during the M788 and M540 period.

The effort of simultaneous design to process concept was almost a success in the M788 development, and was attempted to eliminate the costly redesign to process that always occurred in previous attempts. The big problem was to nail down process engineering at the early design stage instead of after the model was tested and accepted for production.

We did achieve a measure of success with this approach by making our layouts of all essential cuts in the receiver the same whether they were for the M788-M540 or the proposed bolt action shotgun. This included the receiver lengths, diameters, ejection ports, feed opening and fire control slots, etc. The drawings of these similarities were presented to process in this manner.

Thus the bolt action shotgun concept was logical and simple for we needed 3 sizes of receivers for the various M788 cartridges and these sizes were ideal for the shotgun if we were to cover all the gauges from 410-12 ga.

I believe, because of this process design effort, that production machinery as now used for the M788-M540 receivers will accommodate the requirements for the shotgun.

The rear locking system was more than adequate in strength and proper for feeding shot shells. The design did not include a tubular feed system which was adverse to

25826
AL 0029901

A the M788 but that doesn't mean it couldn't be accomplished. I do not recall whether a model was made but I remember that strength testing of the competitive bolt action shotguns revealed weaknesses in their bolt handle lock up which would not be acceptable. Therefore our rear multiple lock method was superior. The trigger mechanism of the M788 was a natural for the shotgun and provided a clean crisp let off with very fast lock time of around 2.7 ms.

The reason we did not pursue the program further was because of Mr. Coleman's reluctance in lieu of a bad image for Remington which he thought would lower the status of the M1100.

At that time marketing speculated we would sell 50,000 units a year.

A

File 9

REMINGTON ARMS CO.
RECEIVED

MAR 16 1982

225 E. Edgewood Dr. Apt. 98
Lakeland, Florida 33803
Mar. 12, 1982

Mr. Clark Workman FIREARMS RESEARCH DIVISION
Remington Arms Co.
Ilion, N. Y.

Dear Clark:

Jim was here today and we went over the bolt actions from A to Z.

These are some of the things I propose:

1. Please don't bring out a new bolt action, without a fool proof safety which is capable of locking the bolt. Make it at least as good as the present M70, better if possible.
2. Suggest you push for a complete line of bolt action rifles that cover the price gamut from lowest to highest. I feel the Carbine should be as simple and plain as you can make it with a price to match.
3. Forget pressed checkering!
4. I feel the idea of a hex cross section for a new receiver will increase cost. I also feel that indexing barrels and receivers will also increase cost. Since I feel that present volume is low because of price structure, increasing cost is a no no!
5. I didn't mention this to Jim, but we should make a large effort to capitalize on the fact that the benchrest shooters think our present 700 - 600 - XP100 - 40X actions are the most accurate production actions available and use them when they can get them for bench rest competition.
6. I am personally not in favor of the "as hammered" finish on barrels.
7. I do not think that Ruger is making more than 5000097's per year. Anyone who says he is, is trying to mislead you.
8. The .243 has cost Win. and Sav. some fairly costly law suits due to its tendency to wear barrels quickly and cause high pressures due to excessive fouling. We have not had this problem because we use 6 MM barrel interiors for the .243, plus the fact that 700s do not come apart due to high pressure. To let the 6 MM die by taking it out of production in 700 is asinine. It's a better cartridge all the way than the .243 and we should make an effort to tell the customers. Letting the customers tell us in this instance, could get us into trouble.

PLAINTIFF'S
EXHIBIT
3316

182
AL 0029957

A
9. We obviously have some production or design problems with M/700 magazine feed. We need to get busy on this. Magazines too narrow or receiver openings too wide can cause the problem you are experiencing.

10. Jim mentioned that some one is pushing for a Mauser type extractor. Do they understand that the rifle will come apart same as the present competition with excessive pressure if we go to any extractor which breaks the bolt shroud?

11. Has anyone tried a floating wedge in the front of the present 700 trigger as an additional element to the safety? It would be operated and governed in position by a relatively long slot in the present safety arm on the exterior of the housing. The wedging action would hold it in position until the very last movement of the safety to the "off" position. It might be pushed to the "on" position by a light spring or by the final movement of the safety arm to the "on" position.

If I think of anything more I will call.

K
Sincerely,

M. H. Walker
M. H. Walker

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPPORTPETERS
SUPPORT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

March 16, 1982

TO: T. L. Capeletti

FROM: F. E. Martin

SUBJECT: Suggestion - G. H. Lee

I have numbered each paragraph of this letter. Responses will be directed to specific numbers.

- #1 - The M/600 - 660 carbines, were not intended for overall popularity; instead its calibers and design lent its uses to horseback and heavy timber.
- #2 - We, at Remington, know the reason for the M/600 - 660 failure.
- #3 - M/94 Winchester and Marlin 336 are popular because of price. The .30 - 30 cartridge with its 170 grain flat nose bullet is considered by most to be totally inadequate unless used by an experienced hunter and shooter.

The M/788 bolt action rifle was originally offered in .30 - 30 Win from 1967 to 1973 along with .44 Rem. Mag. It was not a big success.

- #4 - I feel carbine barrels should be shorter 16 $\frac{1}{4}$ " - 18".

Individual recoil absorption is a function of stock design. I found the M/660 .350 Rem. Mag. more pleasant to shoot than a M/700 chambered for the same caliber.

On muzzle blast, "to each his own".

PLAINTIFF'S
EXHIBIT

3317

182
AL 0029959

#5

I feel that by using a cartridge of this configuration and not redesigning the bolt head would cause a great deal of extraction problems.

Remington has a whole family of cartridges based on this case .25 Rem., .30 Rem., .32 Rem., and .35 Rem. The 6mm and .243 Win. account for the good share of deer sized game taken every year.

- #6 - The 6.5 Rem. Mag. and .350 Rem. Mag., in my estimation, have bad reputations because of the gun - cartridge combination. The use of the short action required that the bullet be seated deep enough to feed. By doing this, optimum velocity and bullet performance were never realized.
- #7 - See #5
- #8 - Not everybody hunts turkey.
- #9 - No comment
- #10 - Mannlicher stocks tend to defeat the purpose of a carbine by adding weight.
- #11 - No comment
- #12 - No comment

FEM:ws

Cust Complaint

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: MOHAWK 600
 GENERAL CONDITION: NEW R #: 001422
 OUTSIDE WORK: NO DATE: 1-23-73
 FIRED AMMO TYPE: _____ FROM: OSHMAN'S
 & CONDITION: _____ HOUSTON, TEXAS
 PROOP: R.E.P.-M INSP. 73 TEST: 13 GUN #: 6431114
 HEADING: _____ CODE: LW = 2/72
 BREACH OPENING: _____ Gk./CAL.: 243
 RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONSIDERABLE SALT BLEED-OUT FROM TRIGGER.
 ENGAGEMENT BETWEEN CONNECTOR AND TRIGGER
 ZERO DUE TO BLEED-OUT.

COMPLAINT: "FIRES WHEN BOLT IS THROWN CLOSED"

INCIDENT: FOLLOW DOWN

COMMENTS: THE SALT BLEED-OUT DEVELOPED BETWEEN
THE CONNECTOR AND TRIGGER ELIMINATING EN
AGEMENT BETWEEN THE CONNECTOR AND SEAR SO THAT
THE ACTION COULD NOT BE COCKED.

RECEIVED - Bureau, N.Y.

PLAINTIFF'S
EXHIBIT

3318

AL 0029978

181

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: MONARD 600GENERAL CONDITION: NEW R #: 026948OUTSIDE WORK: SEALS BROKEN ON TRIGGER DATE: 12-20-72ASSEMBLY - FROM: DICK CHALOT
SPORTING GOODSFIRED AMMO TYPE: _____ FRANKLIN, PA.& CONDITION: _____ GUN #: 6416354PROOP: R.E.P. INSP.: LL TEST: 59 CODE: _____HEADING: O.K. ON INSPECTION MAX. GA./CAL.: _____

BREECH OPENING: _____ CHECKED BY: _____

RECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

TRIGGER DIMENSION FROM THE TOP TO CENTER LINE OF
PIN HOLE .004 OVER MAX. CONNECTOR .843 (MODEL
DRAWING = .841
.838)COMPLAINT: GUN WENT OFF PUTTING ON THE SAFE.INCIDENT: FOLLOW DOWNCOMMENTS: THE EXCESS TRIGGER HEIGHT HOLD THE
CONNECTOR UP TO INTERFERE WITH THE SEAL
MAKING RETRACTION IMPOSSIBLE.

AL 0029979

Crest Corp

P.I. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 600
 GENERAL CONDITION: Good R #: 020681
 OUTSIDE WORK: SCARF MOUNTED DATE: 10-11-72
 FIRED AMMO TYPE: _____ FROM: JAMES A. HASTER
 & CONDITION: _____ LITTLE FALLS, N.Y.
 PROOF: REP INSP.: 49 TEST: 54 GUN #: 61732
 HEADING: O.K. CODE: KP = 6/27
 BREECH OPENING: _____ GK./CAL.: 303 WIN.
 RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

SEAR SPRING INCORRECTLY POSITIONED. TRIGGER
RUSTED AND INMOVABLE. EXCESSIVE LUBRICANT ON
SEAR-SAFETY CAM.

COMPLAINT: FIRE WHEN CLOSING, RELEASING SAFETY

INCIDENT: FOLLOW DOWN

COMMENTS: THE SEAR SPRING SHOULD NOT PUSH THE SEAR
UP AND PREVENTION TO HOLD THE FIRING PIN IN COCKED
POSITION. THE TRIGGER RUSTED IN FIRED POSITION
COULD NOT RETRACT TO HOLD THE SEAR IN COCKED
WITH THE FIRING PIN.

PLAINTIFF'S
EXHIBIT

3320

AL 0029980

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 600
GENERAL CONDITION: NEW R #: 013900
OUTSIDE WORK: SWIVELS ADDED DATE: 7-6-72
FIRED AMMO TYPE: - FROM: AL KNAB
& CONDITION: FLERTWOOD, PA.
PROOF: REP INSP: U TEST: _____ GUN #: 96981
HEADING: - CODE: EP = 10/67
BRESCH OPENING: - G.K./CAL.: 6MM REM.
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: NO APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR-SEAR ENGAGEMENT .010 MIN. IS .020. TRIG-
GER PULL 4 POUNDS. FRONT TRIGGER ADJUSTING SCREW
BACKED OUT SO THAT TRIGGER RETRACTION IS NOT POSITIVE.
TRIGGER RUBBING LEFT SIDE OF HOUSING.

COMPLAINT: "SHELL FIRED WHEN I TOOK THE RIFLE OFF SAFETY."

INCIDENT: FOLLOW DOWN

COMMENTS: THE COMBINATION OF UNDER MIN. CONNECTOR-SEAR
ENGAGEMENT, ERRATIC RETRACTION AND SLIGHT TRIGGER
BIND RESULT IN FOLLOW DOWN.



AL 0029981

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

cc: Norman Wilson, Bridgeport

E. R. Carr

L. Fox

F. Plunkett

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York

June 30, 1972

Miss Customer Complaint

A. D. KERR

TELE TO N.Y.C. POLICE ACADEMY

Arrived at Police Academy at 9:00 A.M. Tuesday, June 27, 1972. Discussed problem with Lt. Francis Hayes.

Examined approximately 300 filed cases finding no Remington cases with pierced primers which we consider the underlying cause of the breaking of Connectors and Seals. In the sample, however was found a quantity of "Norma" ammunition which almost 100% showed primer piercing. We then examined the rifles which had malfunctioned and found evidence of primer piercing in each of these. The writer explained the function of the Connector, why it should not be soldered to the Trigger and how piercing the primer causes breaking. We then repaired the rifles to instruct the Police Gunsmith in all phases of correction, from replacing Connectors and Seal, to complete Trigger Assembly replacement including adjusting, staking and sealing. As time permitted, the most used group of rifles was checked over replacing the old style Connector which is more easily broken due to the reduction in wall thickness around the Stop Seal hole.

It was agreed that the Police Gunsmith would replace Connectors in all rifles as the trucks containing them came in for regular servicing. The Gunsmith will furnish the necessary components. Also the Seals in all 200 rifles will be altered to minimize primer piercing by swaging a roller (used for M/ Cal.) around the firing pin hole. The tool for this was loaned to the Gunsmith by the writer.

C. F. Prosser
Process Engineer

OFF:gc

PLAINTIFF'S
EXHIBIT
3322

AL 0029982

M/600 Customer Complaint

FBI OFFICE: GUN EXAMINATION REPORT NUMBER: _____

FIRE: 600

GENERAL CONDITION: Good

R# : 10-424

OUTSIDE WORK: Tested & found to be in good condition DATE: 5-17-71Thompson Sub. Co.FIRE: John C. EganFIRE: John C. EganJohn C. Egan

& CONDITION: _____

GUN # : 200-3FIRE: AGE #

INSP.:

75TEST: 15CODE: 200-4/17HEADING: OKGA/REL: 348BREATH OPENING: OKCHECKED BY: S. P. EganRECOIL SHOULDERS: OK

APPROVED: _____

CHAMBER: OK

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

No Broken Damaged Components. Evidence of Dry
Lubricant Inside Trigger Mechanism.

COMPLAINT: "If Covered With Safety On And Trigger Is Released
When The Safety Is Released It Will Fire. Sometimes
It Will Not Go Off On Closing."

INCIDENT: Fall of 1960

REMARKS: 1- Apparent Time To Drive Lubricant Chamber
The Trigger And Safety To Remain In Field For 10
After Firing.

FBI/DOJ, R. I.

PLAINTIFF'S
EXHIBIT

3323

AL (X)29983

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 600

GENERAL CONDITION: FAIR R #: 09920

OUTSIDE WORK: ? TRIGGER ASSEMBLY ADJUST- DATE: 4-27-71
MENTS INCORRECT FROM: N. SHORE S&TG. GDS.

FIRE AMMO TYPE: _____ RICE LAKE, WIS.

& CONDITION: _____ GUN #: 75441

PROOF: R.E.P. INSP.: U TEST: 66 CODE: ON: 7/66

HEADING: O.K. GR./CAL.: 308 WIN.

BREECH OPENING: _____ CHECKED BY: C. PROSSER

RECOIL SHOULDERS: O.K. APPROVED: _____

CHAMBER: O.K. APPROVED: _____

TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGED, BROKEN COMPONENTS.

SEAR CONNECTOR ENGAGEMENT .0607 (MAY HAVE BEEN CHANGED
BY CUSTOMER) DIRT AROUND SEAR AND TRIGGER SPRING.

COMPLAINT: FIRE WHEN SAFETY IS PUSHED OFF - TRIGGER PULLED
WITH SAFETY ON.

INCIDENT: FOLLOWS DOWN.

COMMENTS: COULD NOT DUPLICATE CUSTOMER'S MALFUNCTION.
HOWEVER, TRIGGER-CONNECTOR DIMENSIONS PLUS DIRT INSIDE
HOUSING COULD PERMIT A MALFUNCTION OF THIS TYPE.
TRIGGER CLEARANCE ON CONNECTOR .003 OVER MAX.
CONNECTOR CLEARANCE ON TRIGGER .002 UNDER MIN.
CONNECTOR COULD WORK UP, INTERFERE WITH SEAR AND FAIL
TO RETRACT.



AL (K)29984

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 600
 GENERAL CONDITION: Good R #: 05361
 OUTSIDE WORK: NO DATE: 3-12-71
 FROM: OLBON SPTG. GDS.
 FIRED AMMO TYPE: - OTTUMWA, IOWA
 & CONDITION: _____ GUN #: 33903
 PROOF: R.E.P. INSP: U TEST: 49 CODE: LM* 2/65
 HEADING: _____ GR./CAL.: 350 MAG.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: NO APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN, DAMAGED COMPONENTS.COMPLAINT: MISFIRES, FIRES WHEN GUN IS OPENED.INCIDENT: FIRING PIN HEAD CATCHES ON HOUSING.

COMMENTS: THE CUSTOMER'S MALFUNCTION WAS NOT DUPLICATED. HOWEVER A MARK LEFT ON THE INSIDE, LEFT REAR CORNER OF THE HOUSING BY THE FIRING PIN HEAD INDICATES AN INTERFERENCE WHICH MIGHT CAUSE SUCH MALFUNCTION. ALSO, SEAR AND SAFETY CAM WERE FOUND TO BE STUCK TOGETHER WITH SOME EXCESSIVELY HEAVY LUBRICANT.

PENGAD-BOWSER, R. J.

**PLAINTIFF'S
EXHIBIT**
3325

AL 0029985

MODEL 600 CUSTOMER GUNS RETURNED
BY COMPLAINT - MONTH RECEIVED AND YEARLY TOTAL

RECEIVED
JAN 31 1967

1966 1967

CURRENT PRODUCTION

Tot. Tot. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.

Total Guns Returned:	234	286	37	34	39	26	16	16	22	17	20	33	27	62	1
Total Complaints:															
Total Functional Complaints	46	74	7	8	7	5	6	2	3	6	4	9	11	19	5
Ejection	2	2	1						1	1					
Firing	8	1			1								3		
Extraction		4			1										
Feeding	4	4	3										1	1	
Closing	4	6		1			1						3	1	2
Bolt Binds	2	2			1			1		1					3
Trigger Pull	11	18		4	2	3	2		3		2	2	2	6	
Safe	4	6								1	1			1	
Damaged or Blown Cases or Primers	6	8		1						1	1	2	1	2	8
Ejector Binds or Stuck in Bolt		1													
jams, Repair, etc.	3	12			1	1	2	1	1			4	2	12	
Up to Standard (Functional)	2	10	3	2	2								3	10	
Total Intermediate Complaints	161	205	26	25	31	14	14	14	16	9	17	23	16	41	249
Stock Broken, Cracked	53	55	8	6	5	5	1	6	5	1	4	6	6	9	62
Stock Finish or Checkering	11	40	8	7	7	3	4		2	1	1	2		16	57
Stock Cracked at Barrel Grooves															
Accuracy (Point of Impact)	5	7	2	1	1		1		1		4	1	3	3	17
Accuracy (Group Size)	2	6		1			1		1	1		1		1	6
Bolt Handles Broken - Loose	7	21	3	4	6	2	1	2	2	2	1	1	2	5	31
Sights Crooked - Tipped etc.	5	13	1	4	2	1									9
Sights out of Line	3					1									2
Scope Mounting Trouble	1	1	1												2
Sights Broken	2	4			2	1							1		6
Bolt Pulls Out															
Broken Steel Parts		5	1												2
Trigger Guard Broken	1	2		1		1	1	6	1	1	1	2	1	3	18
Up to Standard (Intermediate)	4	9			4		1		3		2	3	1	2	16
Rib Warped	65	54	4	1	4				1	3	4	3	2		20
Total Visual etc. - Complaints	7	7	2	1	1	1	1							2	17
Visual Complaints	7	5	2	1	1		1								10
Visual - Functional	1	2													3

PLAINTIFF'S
EXHIBIT
3326

AL 0029986

10714

600 TOTAL COMPLAINTS (Excerpt up to Std.)
 MONTH RETURNED 1963 MONTH RETURNED 1966

Month Pro- duced	1964																									Came Prod. Per Month
No Code	TOTAL	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
1963	6	1	1	3	1	2	1				2	1	5	17	3	2	2		2	2	1	1	2	3		
J	38	2	1	2	4				1				10	1								2	1			1162
F	41			2	1		1	1	1		1		8	1	1			1	2	1			1	1		1889
M	23	2	3		1						1	2	1	10	2	1	1	1	1	1	1	1	1	1	1	2004
A	27	1			1				2	4	3	5	16	2	1	1	1					1				2102
M	16	2		1	1				1	7		12		1	1	2					2	2				2213
J	8	1	1	4	1	1				1	2	12				2		1	1			2	1			2024
J	20			2			1		4	2	3	2	1	15	1	1	2		2	2		1	1	1	2	2674
S	13	2	3		3	3	2		3	1	2	2	2	23	3		1	1	1		1	1	1	3		3044
A	9	2								1	3	6		1	1	1							1			1545
S	4	4	1	2	2	1		1	1	2	1	2	19	2	3	2					1		1	1	3	2940
O	3	1	1	3	3	3				2	4	2	2	27	2		1	1	1	2	2			1		2744
N		1		1	2				1		2	1	8	2	1		1			1		2	1			2404
D				1	2	1		1			1	1	8	2	2	1		1	2	1	2	1	1	2		2544
J				1	1	3	1	3	3	2	3	4	1	22	1	1			1		1	2	3			2400
F				1	1					2	2	3	1	10	1	2	3	1		2		1		2		2209
M						1	2	2	1	1	3	1	5	4		1							1			2563
A				1	1	2	2	4	1	1	3	15		1	3	2	1	1		1	1					2526
M						2	1				3	1	2	1								3	2			2404
J						1		2	3	3	9	1	1	2		2						1	1			2642
J								1	3	2	6	4		1	1	2			1			2	2			2528
A									2	2	4	1	4									1	1			1445
S									1	2	3	3	2		2	1		2	2	1		1	3			2526
O										1	1	3	1	2	2		2	1	2			1	3			2407
N														1			1		1	2			3			2316
D															2	1	2		1	1	1	1	2			2315
J																	1		1	2	1	2				2104
F																		1	1	1	2					2009
M																	1	1	1			1	1	1		2320
A																						1	3			1700
M																							2	2		1786
J																							3	1		1870
J																							1	4		1706
A																						1	1	1		1459
S																										1710
O																							1	4		1514
N																								1		1579
D																										

MONTH RETURNED 1968

AL 0029988

3814

600 STOCK BROKEN / STOCK FINISH & CHECKING
MONTH RETURNED 1965 MONTH RETURNED 1966

Month	1964	TOTAL	J	F	M	A	M	J	J	A	S	O	N	D	TOT	J	F	M	A	M	J	J	A	S	O	N	D
No	2																										
Code	1																										
1965	8																										
J	7																										
F	3																										
M	6																										
A	4																										
M	1																										
J	7																										
J	4																										
A	1																										
S	1																										
O	2																										
N																											
D																											
J																											
F																											
M																											
A																											
M																											
J																											
J																											
A																											
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F																											
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M																											
J																											
J																											
A																											
S																											
O																											
N																											
D																											

MODEL 600 CUSTOMER GUNS RETURNED
BY COMPLAINT - MONTH RECEIVED AND YEARLY TOTAL

1964 1965

Tot. Tot. Jan. Feb. Mar. Apr. May June Jul. Aug. Sep. Oct. Nov. Dec. Total

Total Guns Returned: 214 286 37 34 39 20 16
Total Complaints:

Total Functional Complaints 46 74 7 8 7 5 5

Ejection 2 2 1

Firing 8 1 1

Extraction 4 1

Feeding 4 4 3

Closing 4 6 1 1

Bolt Binds 2 2 1

Trigger Pull 11 18 4 2 3 2

Safe 4 6

Damaged or Blown Cases or Primers 6 8 1

Ejector Binds or Stock in Bolt 1

Jams, Repair, etc. 3 12 1 1 2

Up to Standard (Functional) 2 10 3 2 2

Total Intermediate Complaints 161 205 24 25 31 14 14

Stock Broken, Cracked 53 55 8 6 5 5 1

Stock Finish or Checkering 11 40 8 7 7 3 4

Stock Cracked at Barrel Groove

Accuracy (Point of Impact) 5 7 2 1 1 1

Accuracy (Group Size) 2 6 1 1

Bolt Handle Broken - Loose 7 21 3 4 6 2 1

Sights Crooked - Tipped etc. 5 1 1 4 2 1

Sights out of line 3 1

Scope Mounting Trouble 1 1 1

Sights Broken 2 4 2 1

Bolt Pulls Out

Broken Steel Parts 5 1

Trigger Guard Broken *OR Warped* 1 2 1 1 1

Up to Standard (Intermediate) 4 9 4 1

Rib Warped 68 54 4 1 4

Total Visual etc. - Complaints 7 7 2 1 1 1 1

Misc. Visual Complaints 2 5 2 1 1 1

Misc. Non-Functional 4 2 1

Up to Standard (Non-Functional)

RECEIVED
JUN 30 1968

CURRENT PRODUCTS
Process Engineering

AL 0029990

5814

600 TOTAL COMPLAINTS (Except up to Std.)
 MONTH RETURNED 1963 MONTH RETURNED 1968

MONTH RETURNED 1965													MONTH RETURNED 1968													Guns Prod. Per Month
Month Pro- duced	1964	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
No Code	6	1	1	3	1	2		1			2	1	5	17	3	2	2									
1963	38	2	1	2	4			1					10	1											1182	
J	41			2	1		1	1	1		1			8	1	1									1888	
F	23	2	3		1						1	2	1	10	2	1	1	1							2004	
M	27	1			1				2	4	3	5		16	2	1	1	1							2102	
A	16	2		1	1				1		7			12	1	1	2								2215	
M	8	1	1	4	1	1					1	2	12				2								2026	
J	20			2			1	4	2	3	2	1	15	1	1	2									2674	
J	13	2	3		3	3	2		3	1	2	2	2	23	3		1	1							3044	
A	9	2								1	3		6	1	1	1									1545	
S	4	4	1	2	2	1		1	1	2	1	2	2	19	2	3	2								2940	
O	3	1	1	3	3	3				2	4	2	2	2	2	1	1								2794	
N	1			1	2					1	2	1	8	2	1	1									2424	
D				1	2	1		1	1		1	1	8	2	2	1	1								2544	
J				1	1	3	1	3	3	2	3	4	1	22	1	1	1								2408	
F				1	1					2	2	3	1	10	1	2	3	1							2209	
M						1	2	2	1	1	3		10	5		4	1								2563	
A						1	1	2	2	4	1	1	3	15		1	3	2	1						2526	
M								2	1				3	1	2	1									2404	
J							1		2		3	3	9	1	1	2	2								2642	
J											1	3	2	6	4		1	1	2						2528	
A											2	2	4	1	4										1445	
S											1	2	3	3	2	2	1								2526	
O												1	1	3	1	2	2								2427	
N																1									2316	
D																2	1								2315	
J																									2104	
F																									2009	
M																									2320	
A																									1700	
M																									1796	
J																										
J																										
A																										
S																										
O																										
N																										
D																										

MONTH RETURNED 1968

AL (X)29992

7814



MODEL 600 CUSTOMER GUNS RETURNED BY COMPLAINT - MONTH RECEIVED AND YEARLY TOTAL

1964 1965
Total Jan. Feb. Mar. Apr. May June Jul. Aug. Sep. Oct. Nov. Dec. Total

Total Guns Returned:	276	21	12	29	24	19	10	13	25	26	35	
Total Complaints:												
Total Functional Complaints	16	5	4	5	9	4	4	3	1	5	7	
Ejection	2											
Firing	8		1									
Extraction						1			1			
Feeding	1					1	1		1			
Cleaning	1	1		1		1			1			
Bolt Binds	2											
Trigger Pull	11			3	3			1	1	1	1	
Safe	1	1			1	1						
Damaged or Blown Cases or Primers	6		1		3						1	
Ejector Binds or Stuck in Bolt												
Jump, Repair, etc.	5	1	1		2		2	2		1	1	
Up to Standard (Functional)	8	2	1	1			1				1	
Total Intermediate Complaints	161	16	8	18	14	15	6	9	24	19	28	
Stock Broken, Cracked	51	7	6	2	6	3	2	1	7	4	4	
Stock Wished or Checkering	21	4		4	1	6	1		4	4	2	
Stock Cracked at Barrel Groove												
Accuracy (Point of Impact)	5					1		2	1	2		
Accuracy (Group Size)	2			1	2	1			1			
Bolt Handle Broken - Loose	7		1	2	2	3		2			3	
Sights Crooked - Tipped etc.	5											
Sights out of Line	3											
Scope Mounting Trouble	1									1		
Sights Broken	2							1		2		
Bolt Pulls Out												
Broken Steel Parts		1			1			1		1	1	
Trigger Guard Broken	1	1		1								
Up to Standard (Intermediate	4			1	1	1	2		2		1	
Rib Warped	68	3	1	7	1		1	2	9	5	17	
Total Visual, etc. - Complaints	7			1				1		1		
Total Visual Complaints	2							1		1		
Total Functional	6			1								
Total Up to Standard (Functional)												

AL 0029994

9/14

MODEL 600 CUSTOMER GUNS RETURNED
BY COMPLAINT - MONTH RECEIVED AND YEARLY TOTAL

	1964	1965												
	Total	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Total Guns Returned:	274	21	12	23	24	19	10	13	25	25	35			
Total Complaints:														
Total Functional Complaints	46	5	4	5	4	4	4	3	1	5	7			
Ejection	2													
Firing	8		1											
Extraction						1				1				
Feeding	4					1	1			1				
Closing	4	1		1	1					1				
Bolt Binds	2													
Trigger Pull	11			3	3			1	1	1	4			
Safe	4	1			1	1								
Damaged or Blown Cases or Primers	6		1	3							1			
Ejector Binds or Stuck in Bolt										2				
Jams, Repair, etc.	9	1	1	2	2	2				1	1			
Up to Standard (Functional)	2	2	1	1		1					1			
Total Intermediate Complaints	163	16	8	18	14	15	6	9	24	19	28			
Stock Broken, Cracked	53	7	6	2	6	3	2	1	7	4	4			
Stock Finish or Checkering	11	4		4	1	1	1		4	4	2			
Stock Cracked at Barrel Groove														
Accuracy (Point of Impact)	3					1		2	1	2				
Accuracy (Group Size)	2			1	2	1			1					
Bolt Handle Broken - Loose	7		1	2	2	3		2			3			
Sights Crooked - Tipped, etc.	5													
Sights out of Line	3													
Scope Mounting Trouble	1									1				
Sights Broken	2							1		2				
Bolt Pulls Out														
Broken Steel Parts		1			1			1		1	1			
Trigger Guard Broken	1	1		1										
Up to Standard (Intermediate)	4			1	1	1	2		2		1			
Rib Warped	46	3	1	7	1		1	2	9	5	17			
Total Visual, etc. - Complaints	7			1				1		1				
Miss, Visual Complaints	2							1		1				
Miss, Non-Functional	4			1										
Up to Standard (Non-Functional)														

AL 0029995

10/2/14

THE UNIVERSITY OF CHICAGO

二六六

AL 0029996
11/2/14

1964

Jan. Feb. Mar. Apr. May June Jul. Aug. Sep. Oct. Nov. Dec. Total

Total Complaints:

14 15 15 8 9 28 28 52 16

Total Functional Complaints:

4 2 2 2 1 4 7 9 5

Election

References

Extraction

Feeding

320109

Bolt Binder

Triffoer Fall

Spine

Damaged or Blown Cases or Primers:

Electer Bind, or Stock in Bolt

Jams, Repair, etc.

Up to Standard (Functional)

Total Intermediate Complaints

Stock Broken, Cracked

Stock Finish or Checkering

Stock Cracked at Barrel Groove

Accuracy (Point of Impact)

Accuracy (Group Size)

Solt Handle Broken - Loose

Sights Crooked - Tipped etc.

Sights out of line

Scope Mounting Trouble

Flights Broken

Page 22 of 22

Broken Steel Parts

Trigger Guard Broken

Up to Standard (Intermediate)

Total Visual etc. - Complaints

Misc. Visual Complaints

Misc. Non-Functional

Up to Standard (Non-Functional)

AL 0029997

10. 11. 1950

MORTA RETURNED

Exhibit

AL 0029998

13214

600 FUNCTIONAL

MONTH 1964

MONTH RETURNED

1965

PRODUCED

Na Code

1963

Jan.

Feb.

Mar.

Apr.

May

June

July

August

Sept.

October

November

December

Jan.

Feb.

Mar.

Apr.

May

June

July

August

Sept.

October

November

December

AL 0029999

14014

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
DUPONT

PETERS
DUPONT

cc: W. E. Leek
A. D. Kerr

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

February 7, 1975

TO: R. L. HALL *File*

RE: MOHAWK 600 SAFETY MALFUNCTION

Subsequent to a series of complaints from the Dallas, Texas area, it was found that if the Mohawk 600 was manipulated in a certain sequence some guns could be made to fire when the safety was moved from "on" to "off". Such guns could be made to fire if the safe was positioned between "full safe on" and "full safe off", the trigger firmly squeezed and released followed by manipulation of the safe.

As a result of this determination, the warehouse and assembly was held until the condition could be corrected. It was further determined that this condition existed in original design guns as well as "Manufacturing Sample" guns.

Analysis of the problem showed that the present design of the cam portion of the Safety contacting the rear end of the Sear Safety Cam was not in contact long enough for the Safety Detent to always snap forward to the "off safe" position. Thus, a fixture was set up to slightly "swage" this cam portion of the Safety to provide longer contact with the Sear Safety Cam.

Of the 2446 Mohawk 600 guns in the warehouse, 1945 have been inspected to date. Results have shown 511 or 26% did not exhibit the malfunction and were returned to the warehouse in their present condition. 1434 more have been repaired by replacing the Safety with a swaged Safety or new fire control, and returned to the warehouse. Shipments have been resumed and it is expected that inspection and repair of the remaining 501 warehouse guns will be complete by Feb. 10, 1975.

For future production, we will continue to use swaged Safeties in Mohawk 600 guns, including a test incorporating the manipulation which would show the malfunction if present. Research and Development personnel are reviewing possible design modifications to assure freedom from the condition.

C. B. Workman
Supt. P.E. & C.

E. R. Carr
E. R. Carr
Supt. Process Engineering-
Current Products

ERC:jc



AL 0030000

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE




xc: C. B. Workman
R. E. Carr
 J. P. Linde
 F. E. Martin
 File

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
 January 28, 1975

TO: W. E. LEEK
 FROM: A. A. HUGICK - F. E. MARTIN
 DATE: January 27, 1975
 WORK ORDER: G 0410
 SUBJECT: MOHAWK 600 RIFLE QUALITY AUDIT

INTRODUCTION:

Per request of Design, twenty (20) Mohawk 600 rifles were withdrawn from the warehouse for a Research Quality Audit check. The twenty (20) gun selection was five (5) rifles in each of the four (4) calibers current in the Mohawk 600 rifle line. The audit request was initiated by field complaints regarding M/600 rifles being fired by manipulation of the safe. This quality audit activity is focused on field complaint review.

TEST OBJECTIVE:

Investigate and review the Mohawk 600 rifle for ability to fire the rifle with manipulation of the safe.

TEST OBSERVATIONS:

1. All twenty (20) rifle safes exhibited normal functions with safes in the full safe on position.
2. Sixteen (16) rifles could be made to produce striker fall if the safe was positioned between full safe on and full safe off, the trigger firmly squeezed, followed by manipulation of the safe.
3. Four (4) rifles could not be made to produce a striker fall if the safe was positioned between full safe on - and full safe off, the trigger firmly squeezed, followed by manipulation of the safe.

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975

Page 2

TEST OBSERVATIONS: (Cont'd)

4. A check of the production sample 2/73, and Research Design Test rifles exhibited this ability to produce a striker fall with manipulation of the safe.
5. Two (2) rifles had steel drilling chips located in the fire controls. ←
6. One (1) rifle had a large wood chip located next to the fire control housing in the stock assembly.
7. Trigger pull and sear-to-connector engagement was checked and found to be normal with one exception. Excessive (.050") sear-to-connector engagement was noted on 6786714 - 308 cal. -EY-96.
8. Six (6) rifles could be made to follow down. This was accomplished by maintaining forward bolt handle pressure during cocking of the striker assembly.
9. One (1) rifle had the rear sight broken off. This was not located in the packing box. This rifle 6807380 - 6mm-XY-96 also had the rear sight spacer block backward which may have caused this breakage.
10. Results of reviewing these twenty(20) rifles have been reviewed with Design and PE&C.

6786690-308-EY-96

1. Can be made to follow down - if the bolt is rotated and maintained in forward position.
2. Can be made to fire with safety if safe thumb piece is positioned at approx. 1/2 way between safe on - safe off, and trigger is pulled.
3. Trigger pull: 4.25, 3.75, 4.00.
4. Sear-to-connector engagement appears normal.

2813
AL 0030003

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975
Page 3

6786650 - 308-BZ-96

1. Can be made to follow down
2. Can be made to fire with safe.
3. Trigger pull - 5.00, 4.75, 4.75
4. Sear-to connector engagement appears - below normal.
5. Drilling chip removed from fire control.

6786714 - 308-EY-96

1. Can be made to follow down.
2. Can be made to fire with safe
3. Trigger pull 3.75, 3.75, 4.00
4. Sear-to-connector engagement appears excessive plus.

6786492-308-EY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 5.0, 5.0, 5.0
4. Sear-to-connector engagement appears Normal.

6786394-308-EY-96

1. Can not be made to follow down
2. Can be made to fire with safe
3. Trigger pull 4.00, 4.25, 4.25
4. Sear-to-connector engagement appears Normal.

3013
AL 0030004

To: W. L. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975
Page 4

674531-222-EY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 4.25, 4.25, 4.25
4. Sear-to-connector engagement appears below Normal.
5. Drilling chip removed from fire control.

6808449-222-XY-96

1. Can be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 4.50, 4.25, 4.25
4. Sear-to-connector engagement appears below Normal.

6808576 - 222-XY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 3.75, 3.75, 3.50.
4. Sear-to-connector engagement appears Normal.

6808461 - 222-XY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull 3.50, 3.25, 3.50
4. Sear-to-connector engagement appears normal.

4813
AL 0030005

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975
Page 5

6806518-6mm-XY-59

1. Can be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 4.25, 4.00, 3.75
4. Sear-to-connector engagement appears normal.

6807129-6mm-XY-96

1. Can not be made to follow down.
2. Can not be made to fire with safe.
3. Trigger Pull - 3.50, 4.25, 4.25
4. Sear-to connector engagement appears below normal.

XXX

6806550 - 6mm-XY-59

1. Can not be made to follow down.
2. Can not be made to fire with safe.
3. Trigger Pull - 3.00, 2.75, 2.75
4. Sear-to-connector engagement normal.

XXX

6807245-5mm-XY-59

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 3.50, 3.00, 3.50
4. Sear-to-connector engagement appears normal.

5813
AL 0030006

To: W. L. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975
Page 6

6807380-6mm-XY-96

XXX

1. Can not be made to follow down.
2. Can not be made to fire with safe.
3. Trigger pull 3.00, 2.50, 2.50.
4. Sear-to-connector engagement appears normal.
5. Rear sight broken, spacer block is backward which is possible cause.

6785732-243 Cal. -EY-96

1. Can be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull 4.00, 3.75, 3.75
4. Sear-to-connector engagement appears normal.

6785572-243 Cal. - DY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull 3.50, 4.25, 4.25.
4. Sear-to-connector engagement appears normal.

6786165-243 Cal. - EY-96

1. Can not be made to follow down.
2. Can be made to fire with safe.
3. Trigger pull - 4.25, 4.50, 4.25
4. Sear-to-connector engagement appears normal.

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Audit

Jan. 28, 1975

Page 7

6785580 - 243 Cal. - DY-96

XXX

1. Can not be made to follow down.
2. Can not be made to fire with safe.
3. Trigger Pull - 4.50, 4.25, 4.25,
4. Sear-to-connector engagement appears normal.
5. Large wood chip inside stock next to fire control

6785586 - 243 Cal. - DY-96

1. Can not be made to follow down.
2. Can be made to fire with safe
3. Trigger pull 4.50, 4.50, 4.25
4. Sear-to-connector engagement appears below normal.

6807766 - 222 Cal. - BZ - 96

1. Can not be made to follow down
2. Can be made to fire with safe.
3. Trigger pull 6.00, 5.50, 5.50
4. Sear-to-connector engagement appears normal.

AAH/FEM/bds
Measurement/Test Lab
Illion Research Division

Attachments (4)

7813
AL 0030008

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975

Page 8

MOHAWK 600

308

6714 - EY Oct. 74
6492 - EY Oct. 74
6650 - BZ Jan. 75
6394 - EY Oct. 74
6690 - EY Oct. 74

243

5580 - DY Sept. 74
6165 - EY Oct. 74
5572 - DY Sept. 74
5532 - EY Oct. 74
5586 - DY Sept. 74

222

8461 - XY Dec. 74
5531 - EY Oct. 74
8449 - XY Dec. 74
7766 - BZ Jan. 75
8576 - XY Dec. 74

6mm

6518 - XY Dec. 74
7129 - XY Dec. 74
6550 - XY Dec. 74
7245 - XY Dec. 74
7380 - XY Dec. 74

K
S
I
C

1/23/75

AL

8013

AL 0030009

To: W. E. Leek
From: A. A. Hugick - F. E. Martin
Subject: Mohawk 600 Rifle Quality Audit

Jan. 28, 1975
Page 1

MOHAWK 600

6mm

6807380
6807245 - Burr on Trigger Guard
6806550 - Poor finish on stock
6807129 - Poor finish on stock - marred
6806518

243

6785586
6785580 - Open grain - right side of stock - rough trigger
6786165 - Burr on trigger Guard
6785572
6785732 - Poor finish left side stock

308

6786690
6786394 - Catch when closing bolt
6786650
6786492
6786714

222

6808449 - Fore-end on stock - marred
6745531

XY 6808461 - marred fore-end
EZ 6808576 - Barrel marred
6807766 - Poor finish on both side/pistol grip

1/23/75

AL

9813
AL 0030010

A

LARGE WOOD CHIP + STRING

REMOVED FROM STOCK - NEXT
TO FIRE CONTROL

E

K

S

6785580- 243- DY-96

I

C

H

10/13
AL 0030011

A

L

E

K

TAKEN FROM REAR OF
SEAR

S

678th 6650 - 308 - 88-96

I

C

H

11-7-13

AL 0030012

A

L

E

TAKEN FROM REAR OF
SEAT

K

6945531-222-EP-96

S

I

C

H

12/13

AL 0030013

RD 6508

cc: J. McIntyre

TO: R. E. SMITH

ILION RESEARCH DIVISION

FIREARMS WITHDRAWAL ~~XXXXXXXXXX~~

DATE January 23, 1975

QUANTITY 29

LETTER NO. 1484

MODEL Mohawk 600

CAL. ~~108~~ Various

WORK ORDER E 0257

SERIAL NOS.

6150
6807766

6808216
6808461

6808499

6745531

222

6151
6786714

6786492

6786394

6786650

6786690
308

6154
6785580

6785586
6785592

6786165

6785732

243

6152
6807380

6806550

6807245
6806518

6807129

6 mm

REMARKS: Testing.

Approved

JPLinder:T

AL 0030014

GUN EXAMINATION REPORT NUMBER: 110MODEL: 660GENERAL CONDITION: GoodR #: 01767OUTSIDE WORK: NoDATE: 1-24-71FROM: LEONARD R. GRIFFITHFIRED AMMO TYPE: LYONS, KANSAS& CONDITION: LYONS, KANSASGUN #: 116922PROOP: R.F.P.INSP. 9TEST: 13CODE: PR-6/66HEADING: O.K.GAT/CAL.: 223 R-MBREECH OPENING: —CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.APPROVED: CHAMBER: O.K.APPROVED: TEST: NoAPPROVED:

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: COMP. COND. O.K.COMPLAINT: "FIRE ACCIDENTALLY FIRED BOLT GOES CLOSED"INCIDENT: FIRE ON CLOSINGPLAINTIFF'S
EXHIBIT

3329

COMMENTS: THE MALFUNCTION COULD NOT BE DUPLICATED.TRIGGER CONNECTOR-TEAR ENGAGEMENT OK AT020, TRIGGER PULL ON MIN. AT FOUR POUNDSTRIGGER ASSEMBLY LEANT SLIGHTLY RIGHT, MAYBECAUSE TRIGGER TO BIND IN THE TRIGGER GUARDAND FAIL TO EXTRACT THUS FOLLOW DOWN.

660
~~700~~ Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: MODEL: 660
 GENERAL CONDITION: GOOD R #: 018859
 OUTSIDE WORK: NO DATE: 10-3-72
 FIRED AMMO TYPE: FROM: GEO. ORNDUFF
 & CONDITION: NEW MARTINSVILLE, W. VA.
 PROOF: R.E.P. INSP. TEST: 13 GUN #: 131278
 HEADING: O.K. CODE: AR-3/62
 BREECH OPENING: CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED:
 CHAMBER: O.K. APPROVED:
 TEST: NO APPROVED:
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED:

HOUSING CUT IN RECEIVER OF CENTER.
 ENGAGEMENT BETWEEN CONNECTOR & SEAR, 0.05 (MIN. IS
 .020). EXCESSIVE LUBRICANT INSIDE TRIGGER ASSEMBLY.

COMPLAINT: DISCHARGED WHEN SAFETY WAS MOVED FROM
ON TO OFF.

INCIDENT: FOLLOW DOWN



COMMENTS: THE MALFUNCTION MAY HAVE BEEN CAUSED
 BY THE FIRING PIN HEAD CATCHING ON THE EXPOSED
 SIDE OF THE HOUSING INSTEAD OF SEATING ON THE
 SEAR THE RESULTING BURR IN THE HOUSING
 CAN CAUSE THE SEAR TO STICK.

1. NP GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
GENERAL CONDITION: FAIR R #: 013303
OUTSIDE WORK: SCORE MOUNTED. DATE: 6-21-72
FIRED AMMO TYPE: _____ FROM: NY.C. POLICE DEPT
& CONDITION: _____ BRONX, N.Y.
PROOF: R.E.P. INSP.: U TEST: 13 GUN #: 125253
HEADING: O.K. CODE: ER=10/63
BREECH OPENING: - BR./CAL.: 223
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: 20 ROUNDS APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

FRONT SCREWS UNSEATED, SAFETY SHAP MANDREL OUT OF
POSITION. CONNECTOR BROKEN. SEAR CONNECTOR ENGAGE-
MENT SHEARED OFF.

COMPLAINT: FIRE ON CLOSING.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE CUSTOMER PROBABLY EXPERIENCED FIRED
PRINTS WHICH RESULTED IN THE SHEARED CORNERS
AND BROKEN CONNECTOR.



I NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
GENERAL CONDITION: FAIR R #: 013306
OUTSIDE WORK: SCOPE MOUNTED, SOLDERED DATE: 6-21-72
CONNECTOR TO SEAR. FROM: N.Y.C. POLICE DEPT.
FIRED AMMO TYPE: _____ BRONX, N.Y.
& CONDITION: _____ GUN #: 125447
PROOF: R.E.P. INSP.: U TEST: 13 CODE: ER-10/68
HEADING: O.K. GA./CAL.: 223
BREECH OPENING: _____ CHECKED BY: C. PROSSER
RECOIL SHOULDERS: O.K. APPROVED: _____
CHAMBER: O.K. APPROVED: _____
TEST: 20 ROUNDS. APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

CONNECTOR BROKEN-TOP PIECE SOLDERED TO TRIANGLE.
SEAR-CONNECTOR ENGAGEMENT SHEARED OFF.

COMPLAINT: FIRE ON CLOSING.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE CUSTOMER PROBABLY EXPERIENCED MISSED
PRIMERS WHICH RESULTED IN THE SHEARED CORNERS
AND BROKEN CONNECTOR.



AL 0030018

N/660 Customer
ComplaintI NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: FAIRR #: 013304OUTSIDE WORK: SCOPE MOUNTEDDATE: 6-21-72

FIRED AMMO TYPE: _____

FROM: N.Y.C. POLICE DEPT.BRONX, N.Y.

& CONDITION: _____

GUN #: 125237PROOF: R.E.P. INSP.: 9 TEST: 13CODE: PR-9/68HEADING: O.K.GA./CAL.: 223BRESCH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: 20 ROUNDS

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

OLD STYLE CONNECTOR BROKEN, SEAR-CONNECTORENGAGEMENT SHEARED OFF.COMPLAINT: FIRE ON CLOSING.INCIDENT: FOLLOW DOWNCOMMENTS: THE CUSTOMER PROBABLY EXPERIENCED PIERCEDPRIMERS WHICH RESULTED IN THE SHEARED ENGAGE-MENT AND BROKEN CONNECTOR.10/1
AL 0030019

NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
 GENERAL CONDITION: GOOD R #: 013305
 OUTSIDE WORK: SCREWS MOUNTED, CEMENT ON DATE: 6-21-72
TRIGGER ETC. DOES NOT LOOK LIKE DUPONT, FROM: N.Y. CITY POLICE DEPT.
 FIRED AMMO TYPE: _____ BRONX, N.Y.
 & CONDITION: _____ GUN #: 125445
 PROOP: R.E.P. INSP.: 95 TEST: 13 CODE: ER = 10/68
 HEADING: O.K. GUN/CAL.: 223
 BREACH OPENING: _____ CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: 20 ROUNDS APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
CONNECTOR BROKEN, SEAR & CONNECTOR ENGAGEMENT
CORNERS BROKEN OFF, BROKEN PIECE OF CONNECTOR
SOLDERED TO TRIGGER, CONSIDERABLE RUST ETC. ON
TRIGGER & IN HOUSING, CEMENT ON SCREWS DOES NOT
HAVE THE SAME APPEARANCE AS DUPONT, USED EXCESSIVELY.
 COMPLAINT: FIRE ON CLOSING.

INCIDENT: FOLLOW DOWN.

COMMENTS: THE CUSTOMER PROBABLY EXPERIENCED PIERCED
PRIMERS WHICH RESULTED ABOUT THE CORNERS BREAKING
OFF AND THE BROKEN CONNECTOR



AL 0030020

660

Customer Complaint

NO GUN EXAMINATION REPORT NUMBER: MODEL: 660
GENERAL CONDITION: NEW R #: 011064
OUTSIDE WORK: SCOPE MOUNTED DATE: 5-17-72
FIRED AMMO TYPE: FROM: LAKEVIEW SPT. SHOP
& CONDITION: SANDY LAKE, PENNA.
PROOF: R.E.P. INSP.: U TEST: 87 GUN #: 106009
HEADING: O.K. CODE: LR = 2/68
BREACH OPENING: - GA./CAL.: 243 WIN.
RECOIL SHOULDERS: O.K. CHECKED BY: C. PROSSER
CHAMBER: O.K. APPROVED: _____
TEST: No APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN COMPONENTS. SLIGHT ROUNDING AT EDGE OF CONNECTOR. BURR ON CORNER OF SEAR. GREASE TYPE OF LUBRICATION INSIDE HOUSING & ON SIDES OF TRIGGER. SEAR - CONNECTOR ENGAGEMENT .015 TRIGGER PULL 4 POUNDS.

COMPLAINT: "WHEN THE SAFETY IS RELEASED, IT FIRES."

INCIDENT: FOLLOW DOWN

COMMENTS: THE CUSTOMER'S MALFUNCTION WAS NOT DUPLICATED. THE BURR ON THE SEAR COMBINED WITH TOO HEAVY LUBRICANT PROBABLY BROUGHT ABOUT FAILURE OF CONNECTOR-TRIGGER TO RETRACT AND FOLLOW DOWN.



P.I. No GUN EXAMINATION REPORT NUMBER: _____GENERAL CONDITION: NEWOUTSIDE WORK: No

FIRED AMMO TYPE: _____

& CONDITION: _____

PROOF: R.C.B.INSP. 1TEST: 70HEADING: O.K.BREACH OPENING: -RECOIL SHOULDERS: O.K.CHAMBER: O.K.TEST: N/C

COMPONENT CONDITION: (Damaged, Broken, Old Style)

No Damaged Broken ComponentsCOMPLAINT: FIBED WHEN BOLT WAS PUSHED FORWARDINCIDENT: FELLSHALL DOWN

COMMENTS: 1. HAVING BEEN IN THE FIBED POSITION FOR A LONG TIME, THE BOLT WAS FOUND TO BE IN THE FIBED POSITION WHEN IT WAS FIRST INSPECTED.
2. THE BOLT WAS FOUND TO BE IN THE FIBED POSITION WHEN IT WAS FIRST INSPECTED.

Christine G. Gandy

MODEL: 660R #: 14453DATE: 7-16-71FROM: W. H. Smith Hdw.Providence, R.I.GUN #: 117252CODE: PR-2/1/1GR./CAL.: 222 REM.CHECKED BY: C. PROCTOR

APPROVED: _____

APPROVED: _____

APPROVED: _____

APPROVED: _____



AL 0030022

P. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: NEWR #: 010974OUTSIDE WORK: NODATE: 5-16-72

FIRED AMMO TYPE: _____

FROM: SCHNEIDER'SLONGVIEW, WASH.

& CONDITION: _____

GUN #: 115110PROOF: R.E.P. ASSEMBLER ES INSP.: 11 TEST: 13CODE: OR = 7/68HEADING: O.K.GA./CAL.: 243

BREECH OPENING: _____

CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

2 BROKEN COMPONENTSCOMPLAINT: WONT COCKINCIDENT: FOLLOWS DOWN.COMMENTS: APPARENTLY DIRT BETWEEN TRIGGER AND INSIDE OF
HOUSING (TRIGGER & CONNECTOR LAY TO THE LEFT) CAUSED THE
TRIGGER TO STICK IN FIRED POSITION.

AL 0030023

P. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660GENERAL CONDITION: NEW R #: 27164OUTSIDE WORK: SCOPE MOUNTED DATE: 12-28-71FIRED AMMO TYPE: _____ FROM: J.W. CUMMINGS SR.AVERILL PARK, N.Y.& CONDITION: _____ GUN #: 127752PROOF: R.E.P. INSP.: 97 TEST: 13 CODE: PR = 6/1/3
BU = 1/71
RV = 2/71HEADING: O.K. GR./CAL.: 350 REM. MAG.BREECH OPENING: - CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO DAMAGED, BROKEN COMPONENTS.SEAR-TRIGGER CONNECTOR ENGAGEMENT .025. TRIGGER
PULL 5 POUNDS - CREEPS. TOO MUCH - TOO HEAVY
LUBRICATION IN HOUSING ASSEMBLY. TRIGGER RIDES
LEFT INSIDE OF HOUSING.COMPLAINT: CREEPY TRIGGER PULL. RIFLE FIRED WHEN
BOLT HANDLE WAS RAISED.INCIDENT: FOLLOW DOWN.COMMENTS: THE CUSTOMER'S MALFUNCTION, FOLLOWING DOWN,COULD NOT BE DUPLICATED. THE EXCESSIVE LUBRICATION
WITH THE TRIGGER RIDING THE INSIDE WALL OF THE
HOUSING COULD CAUSE THE MALFUNCTION ESPECIALLY
IN COLD WEATHER.

FENGAD-Bequeno, R. J.

PLAINTIFF'S
EXHIBIT

3338

12/1
AL 0030024

Cust. Complaint

P.I. NY GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: POORR # : 268-6OUTSIDE WORK: SCREW MOUNTED. IN. 12-10DATE: 12-27-71FIREARM MAKE: REMINGTON-UMCFROM: THOMPSONFIREARM TYPE: HORNED, B.L.GUN # : 104294

& CONDITION: _____

PROOF: REM INSP. 73 TEST: 55CODE: ER-1/10READING: 0.00GA./CAL.: 222 REMBREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: OK

APPROVED: _____

CHAMBER: OK

APPROVED: _____

TEST: AD

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO EVIDENCE OF DAMAGE COMPONENTS. MACHINE ATTEMPTED TO FIRE BUT NOT RECOILED PROPERLY, CAUSE A.P. FOR THIS IS INTERFERENCE. BREECH PLATED AT STUCK BEARING, ALL EXPOSED METAL PARTS COATED. FUEL DIRTY AND OVER-LUBRICATED, GEAR ENDS IN H.A. 100

COMPLAINT: FIRE WHEN SAFETY IS RELEASED.INCIDENT: FOLLOW DOWN

COMMENTS: ALL THE CONDITIONS MENTIONED ABOVE CONTRIBUTE TOWARD A MALFUNCTION WHICH IS CORRECTED. HOWEVER, THE MALFUNCTION SEEMED TO DISAPPEAR WHEN THE SAFETY WAS REMOVED.



RD-5542-1 RAY 2-15-61

F. 170 GUN EXAMINATION REPORT NUMBER: _____

GENERAL CONDITION: GOOD

OUTSIDE WORK: SCORE MOUNTED

FIRED AMMO TYPE: 7

& CONDITION: _____

PROOF: EEA

INSP: 44

TEST: 13

HEATING: OK

EBBING OPENING: -

RECOIL SHOULDERS: OK

CHAMBER: OK

TEST: NO

COMPONENT CONDITION: (Damaged, Broken, Old Style)

NO BRASS COMPONENTS, TRIGGER & TRIGGER GUARD
AS SUPPLIED BY SUPPLY.

COMPLAINT: IT HAS MISFIRED TWO OR THREE TIMES. THE FIRST

THREE TIMES WHEN THE FIGHTER WAS DOWN.

INQUIRY: TRIGGER DOWN.

REMARKS: THE GUN - DISCHARGED WHEN THE FIGHTER WAS DOWN.

THE GUN WAS NOT FIRED AGAIN UNTIL THE FIGHTER WAS DOWN.

THE GUN WAS NOT FIRED AGAIN UNTIL THE FIGHTER WAS DOWN.

PLAINTIFF'S
EXHIBIT

3340

AL 0030026

P.1 NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: NEWR # : 18582OUTSIDE WORK: NODATE: 9-23-71FROM: GUN RACK INC.FIRED AMMO TYPE: -NORTHUNAEZLAND, PA.

& CONDITION: _____

GUN # : 127166PROOF: R.E.P.INSP. 73TEST: 13CODE: ER* 10/68

HEADING: _____

GA./CAL.: 6.5 REM. MAG.BREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

NO BROKEN, DAMAGED COMPONENTS.COMPLAINT: FOLLOWS DOWN.INCIDENT: FOLLOWS DOWN.COMMENTS: ENGAGEMENT OF CONNECTOR & SEAR .O.K.

TRIGGER PULL = 3 LBS. MIN. IS 4 LBS. APPARENTLY THE
STAKE FAILED TO HOLD THE TRIGGER PULL ADJUSTING SCREW,
BEING OUT OF POSITION AND THE SCREW WORKED LOOSE
UNTIL THERE WAS NO LONGER ANY SPRING TENSION TO
RETRACT THE TRIGGER AND CONNECTOR BACK INTO POSITION
UNDER THE SEAR.

10/ AL0030027

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660GENERAL CONDITION: NEW R #: 15018OUTSIDE WORK: NO DATE: 7-28-71FIRED AMMO TYPE: _____ FROM: R.J. GRAMAZIOYARMOUTH, MASS.& CONDITION: _____ GUN #: 6210588PROOF: R.E.P. INSP. 96 TEST: 32 CODE: LS = 2/69HEADING: O.K. OK./CAL.: .308BREACH OPENING: _____ CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K. APPROVED: _____CHAMBER: O.K. APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

NO BROKEN ETC. COMPONENTS. TRIGGER CONNECTOR -
SEAR ENGAGEMENT = .005 (.020 MIN.). SLIGHT UPSET AT
LEFT REAR CORNER OF HOUSING CAUSED BY THE FIRING
PIN HEAD CATCHING ON IT.

COMPLAINT: 'GUN WENT OFF JUST PUTTING A SHELL IN THE CHAMBER.'INCIDENT: FOLLOWED DOWN

COMMENTS: THERE WAS NOT ENOUGH ENGAGEMENT BETWEEN
THE TRIGGER CONNECTOR AND SEAR. THIS BEING REDUCED
TO ALMOST ZERO BY A SLIGHT TRIGGER BIND, LED TO THE
CUSTOMER'S MALFUNCTION.



AL 0030028

P. No GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: NEWR #: 14966OUTSIDE WORK: NoDATE: 7-28-71FROM: COAST TO COAST ^{STORES}

FIRED AMMO TYPE: _____

NAMPA, IDAHO

& CONDITION: _____

GUN #: 115149PROOF: R.E.P.INSP. 94TEST: 55CODE: PR = 6/68HEADING: O.K.GR./CAL.: 243 W.N.BREACH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: No

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

SAFETY BROKEN. SEAL BROKEN ON ENGAGEMENT
SCREEN.COMPLAINT: "FIRES WITH SAFETY IN ON POSITION"INCIDENT: FIRES ON SAFE.COMMENTS: WITH THE CAM BROKEN OFF THE SAFETY COULD
NOT PREVENT FIRING.

P.J. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: GOODR #: 06392OUTSIDE WORK: SCOPE MOUNTEDDATE: 9-15-71FROM: CHUBON'S HDN.FIRED AMMO TYPE: -KANE, PA.

& CONDITION: _____

GUN #: 6270126PROOF: R.E.P.-E INSP.: D TEST: 13CODE: RT: 12/70HEADING: BOLT WILL NOT CLOSE ON MIN. HEAD.GA./CAL.: 243BREECH OPENING: +DUMMY.CHECKED BY: C. PROSSERRECOIL SHOULDERS: O.K.

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

REAR SIGHT LEAF ASSEMBLY REMOVED.COMPLAINT: BOLT WILL NOT CLOSE OVER SHELL. FIRES WHEN
SAFETY IS PUSHED OFF.INCIDENT: MIN. HEADER. FOLLOW DOWN.

COMMENTS: HEADING REAMER MAY HAVE BEEN WORN. APPARENTLY
THE WARPED TRIGGER CONNECTOR MADE ENGAGEMENT WITH
THE SEAR ERRATIC (AS LITTLE AS .007, PROCESS RECORD
SPECIFIES .020) THIS, COUPLED WITH EXCESSIVE CLEAR-
ANCE BETWEEN TRIGGER & CONNECTOR, CAUSED THE
FOLLOW DOWN MALFUNCTION.

Customer Complaint

P. No GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
 GENERAL CONDITION: Good R #: 28218
 OUTSIDE WORK: No DATE: 12-8-70
 FROM: JAMES RITCHIE
 FIRED AMMO TYPE: _____ HANDGUN AMMO
 & CONDITION: _____ GUN #: 6236572
 PROOF: R.E.P.A. INSP. 58 TEST: 13 CODE: K5-5/69
 HEADING: O.K. GA./CAL.: 243 WIN.
 BREACH OPENING: - CHECKED BY: C. PROSSER
 RECOIL SHOULDERS: O.K. APPROVED: _____
 CHAMBER: O.K. APPROVED: _____
 TEST: No APPROVED: _____
 COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____
NO BROKEN COMPONENTS.

COMPLAINT: FIRE WHEN THE BOLT WAS CLOSED.INCIDENT: FIRE ON CLOSING.COMMENTS: THE CUSTOMER'S MAINTENANCE CANNOT BE DOWNGRADED.

SUGGEST HE BE INSTRUCTED TO CHECK FOR
TRIGGER BIND WITH THE STOCK ASSEMBLED TO
THE ACTION.

FEDERAL BUREAU OF INVESTIGATION

PLAINTIFF'S
EXHIBIT

3345

Customer Complaint

P.I. NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: NEWR #: 26048OUTSIDE WORK: -DATE: 11-16-70FIRED AMMO TYPE: -FROM: FLORIDA DRIVE CO.JACKSONVILLE, FLA.& CONDITION: -GUN #: 6200421PROOF: RE.P.INSP: UASSEM. 18TEST: 13CODE: LS = 2/69HEADING: O.K.GA./CAL.: 6MM.BREECH OPENING: -CHECKED BY: C. PROSSERRECOIL SHOULDERS: -

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

PARTS O.K.COMPLAINT: TRIGGER DEFECTIVEINCIDENT: FOLLOWS DOWNCOMMENTS: SALTS RELEASED BY THE POWDER METAL TRIGGER CAUSED IT TO REMAIN IN FIRED POSITION.

PENGAD-Systems, N. J.

PLAINTIFF'S
EXHIBIT

3346

10/1
AL 0030032

Cushman Company

P. No NO GUN EXAMINATION REPORT NUMBER: _____MODEL: 660GENERAL CONDITION: GOODR #: 25759OUTSIDE WORK: SEALS BROKEN ON TRIGGERDATE: 11-6-70ADJUSTING SCREWS.AL FISHING TACILE,
FROM: PATROUSE

FIRED AMMO TYPE: _____

LONG ISLAND.

& CONDITION: _____

GUN #: 97965PROOF: R.E.P. INSP. _____

TEST: _____

CODE: RP = 11/67

HEADING: _____

GAT./CAL.: 308 WIN.

BREACH OPENING: _____

CHECKED BY: C. PROSSER

RECOIL SHOULDERS: _____

APPROVED: _____

CHAMBER: O.K.

APPROVED: _____

TEST: NO

APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style)

APPROVED: _____

COMPLAINT: FIRES WHEN SAFETY IS PUSHED OFF.INCIDENT: FOLLOWING DOWN

COMMENTS: EXCESSIVE CLEARANCE BETWEEN THE TRIGGER
CONNECTOR (.009) ALONG WITH THE SAFETY LIFT BEING
REDUCED (.012) CREATES AN INTERFERENCE
BETWEEN SEAR AND CONNECTOR WHICH, WHEN THE
TRIGGER IS PULLED WITH THE SAFETY ON PREVENTS
THE CONNECTOR RETRACTING WITH THE TRIGGER
INTO FIRING POSITION.

1081
AL 0030033

Customer Complaint

A
P. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660
GENERAL CONDITION: GOOD R #: 23355
OUTSIDE WORK: NO DATE: 11-2-70
FROM: GREENE, N.Y.
FIRED AMMO TYPE: _____
& CONDITION: _____
PROOF: — INSP. — TEST: — GUN #: 113447
HEADING: — CODE: KR = 5/68
BREECH OPENING: — GAZ/CAL.: 243
RECOIL SHOULDERS: — CHECKED BY: C. PROSSER
CHAMBER: — APPROVED: _____
TEST: FUNCTION ONLY APPROVED: _____
COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

S
TRIGGER CONNECTOR APPARENTLY WARPED IN HEAT
TREAT (BROKE WHEN STRAIGHTENING WAS ATTEMPTED)
COULD NOT SEAT PROPERLY ON TRIGGER.

C
COMPLAINT: GUN FIRES WHEN SAFETY IS MOVED TO "OFF".

INCIDENT: _____

COMMENTS: SEAR, CONNECTOR ENGAGEMENT INCORRECTLY
ADJUSTED AT FINAL ASSEMBLY, PROBABLY BECAUSE
OF WARPED TRIGGER CONNECTOR.



AL 0030034

*Customer Complaint*P. NO GUN EXAMINATION REPORT NUMBER: _____ MODEL: 660GENERAL CONDITION: Good R #: 24671OUTSIDE WORK: NO DATE: 11-4-70FROM: BX, N.Y. N.Y.

FIRED AMMO TYPE: _____

& CONDITION: _____ GUN #: 6226157PROOF: — INSP.: _____ TEST: _____ CODE: AS-3/69HEADING: — GRA/CAL.: 350 NAGBREECH OPENING: — CHECKED BY: C. PROSSERRECOIL SHOULDERS: — APPROVED: _____CHAMBER: — APPROVED: _____TEST: NO APPROVED: _____

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: _____

BOLT HANDLE PARTIALLY OFF. TRIGGER BROKEN AT PIN HOLE.COMPLAINT: GUN FIRES WHEN SAFE IS RELEASED.INCIDENT: FOLLOWS DOWNCOMMENTS: WITH THE TRIGGER BROKEN, RETRACTION WAS ERRATIC, THE CONNECTOR CATCHING ON THE SEAR INSTEAD OF RETRACTING UNDER IT. THE BOLT HANDLE PARTLY OFF ATTRIBUTED TO POOR BRACEPLAINTIFF'S
EXHIBIT

3349

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

MODELS 600, 660 AND MOHAWK 600 ONLY

10-27-78

IMPORTANT NOTICE: ABSOLUTELY NO ALTERATIONS OR ADJUSTMENTS ARE TO BE MADE TO THE REPLACEMENT TRIGGER ASSEMBLY. IF ANY UNUSUAL PROBLEMS ARE ENCOUNTERED DURING REPLACEMENT OF TRIGGER ASSEMBLY, RETURN FIREARM TO FACTORY.

Inspect Chamber and Magazine for live ammunition.

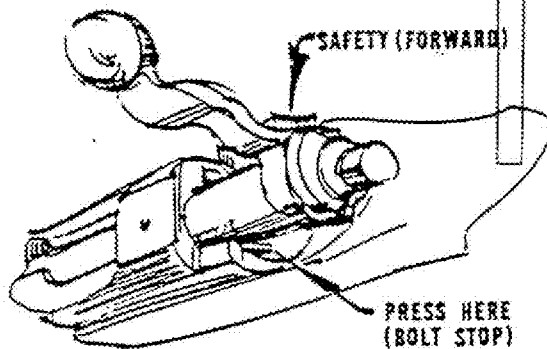
A. With firearms pointed in safe direction, open Bolt and visually inspect Chamber and Magazine.

1. Firearm must be free of live ammunition.

Remove Bolt Assembly from Firearm.

A. Pull Bolt rearward until Bolt Stop halts Bolt.

B. Insert small tool against Bolt Stop and press downward. This will release Bolt. (See Figure below)



A

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

2.

Remove Trigger Guard and Stock Assembly.

- A. Unscrew front and rear guard screws.
- B. Remove Trigger Guard.
- C. ~~Lift away and remove~~ Stock Assembly from Action.
- D. Remove Magazine Assembly from Receiver.

Remove Trigger Assembly from Action.

- A. Pull Safety lever rearward beyond the safe detent position to clear the rear Sear Pin.
- B. Tap out both Sear Pins from left to right.
- C. Pull Trigger Assembly from Receiver.

Assemble Replacement Trigger Assembly.

- A. Insert Trigger Assembly, identified with "V" stamped on left side of Trigger, with slave pins intact, into Receiver and align Sear Pin holes to Receiver.
- B. Lightly tap slave pins to engage Sear Pin holes in Receiver. Put Safety to "On" safe position.
- C. Insert tapered end of Sear Pins in left side of Receiver. Seat pins flush to slightly below Bolt stop with slot. Make sure pins do not protrude into Bolt Stop slot in Receiver.
- D. Prick punch Receiver at Sear Pin holes on left side. Bolt stop must not bind in slot.

2810

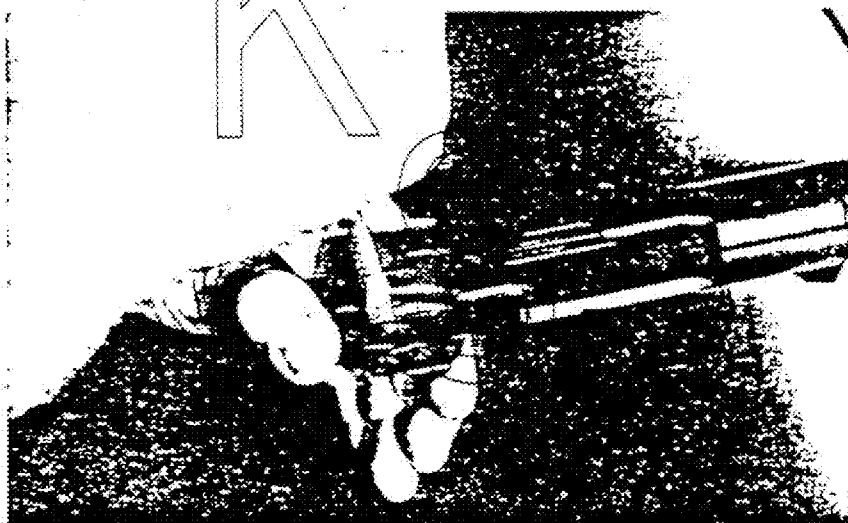
A

RE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

3.

E. Push Safety lever to "Off-Safe" position, pull Trigger and hold. Depress top rear of Sear safety cam to insure that it moves freely in Trigger Housing. The Sear safety cam must not bind and must retract without hesitation.

1. If binding occurs, insert wide blade screwdriver and carefully spread walls of housing against side of Receiver, and recheck Element "E", above. (See Figure below.)



2. Visually check alignment of inner walls of Trigger Housing with Firing Pin head guide slot in Receiver.

F. Push Safety lever from "On-Safe" position to "Off-Safe" position, to insure free movement with no binding and positive engagement of detents. Check Bolt lock area of the Safety lever to make sure it works freely in Receiver slot. If slight binding occurs on Receiver,

3010
AL 0030038

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

4.

F. Contd.

file Receiver slot. If excessive binding occurs, then use another Trigger Assembly.

G. ~~Insert Bolt Assembly in Action.~~

H. Put removed Trigger Assembly in an individual envelope for return to Remington (one assembly per envelope).

Check Clearance

- A. With gun cocked, locate Safety lever to halfway point between "On-Safe" and "Off-Safe" location to position the safety ball detent between the indents with the Safety lever; in this unstable location insert an 1/8" wide screwdriver into the front of Trigger Housing (see Figure Pg. 6). Look through the engagement view hole to check for clearance between the Connector and Sear, while rotating Trigger back and forth. There must be clearance between the Connector and Sear, the Connector cannot catch on Sear. If clearance does not exist, install new Trigger Assembly.

A

ARE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLY

6.
CLEARANCE

ENLARGED VIEW
SEAR & CONNECTOR
CLEARANCE

SEAR

CONNECTOR

TRIGGER

SAFETY
LEVER

TRIGGER
HOUSING

SAFETY
DETENT
BALL

ROTATE

PUSH UPWARD

SCREW DRIVER

NULL
LOCATION

H

6/2/10
AL 0030041

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

7.

Trigger Assembly Clearance.

- A. Assemble Barrel Action to Stock to check Trigger Assembly clearance. The brass reinforcing screw located forward of the Trigger Assembly clearance cut may possibly interfere with the new design Trigger Assembly. If this occurs, bend center reinforcing screw toward muzzle for proper clearance. (Note illustration)

Safety Lever Clearance in Stock.

- A. For Safety lever clearance, wood is to be removed from the rear of the Safety clearance cut.
1. With the Barrel Action removed from the Stock, measure 6.530" from the rear edge of the recoil lug shoulder to rear of Safety lever clearance cut and remove wood for Safety lever clearance, leaving a 1/8" to 3/16" radius in the rear corner. This wood removal can be performed with proper chisels and/or a rotary type high speed grinder. (Note illustration)

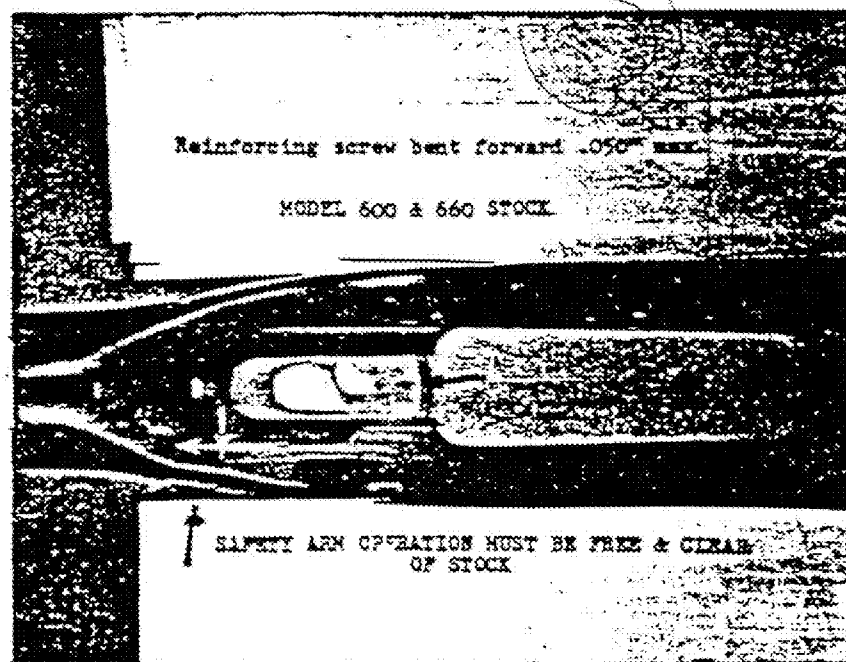
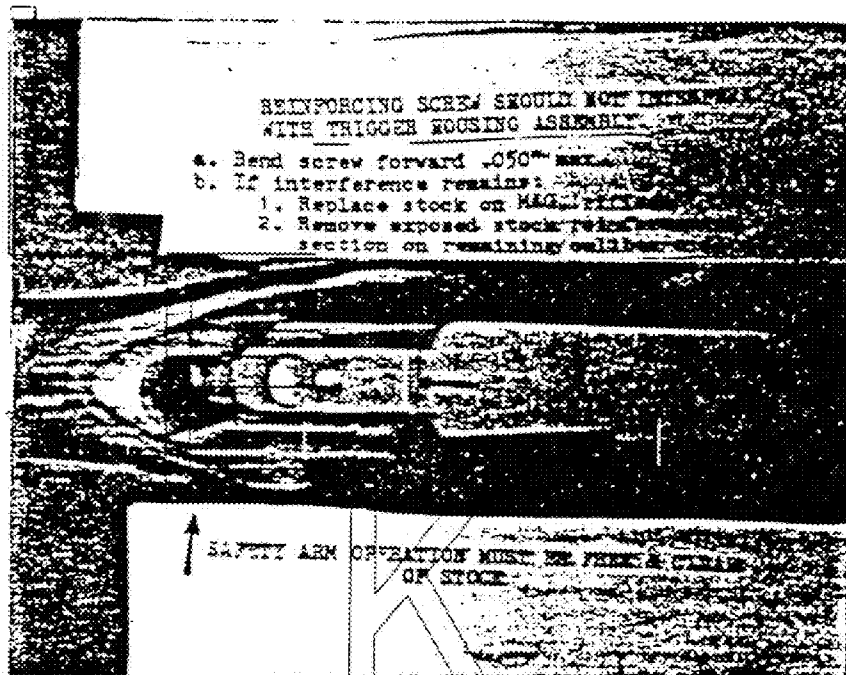
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PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

8.



PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

9.

- A. After completing this operation, insert Barrel Action into Stock holding recoil lug tightly against recoil shoulder and with the Bolt in the closed position, pull the Safety rearward. Check Bolt lift to insure Safety arm has secured the Bolt in the locked position. Inspect the Safety lever for binding or contact with the Safety lever clearance cut in the Stock. Should the Safety lever, in the "On-Safe" position, contact the Stock, remove wood until clearance is obtained.
- C. After proper wood clearance has been obtained, complete the assembly of rifle. Check for clearance between Trigger and Trigger guard. Close the Bolt, put the Safety lever in the "On-Safe" position, pull the Trigger rearward and release. The Trigger should move rearward and forward freely with no binding. If any contact is found, the Trigger guard is to be filed.
- D. Check freeness of Safety. Safety must not bind. The Safety must snap in detent in both the "On-Safe" and "Off-Safe" positions.
- E. Check function of Safety. Cock rifle and move Safety to "On-Safe" position. No click or catch permitted when Trigger is pulled and the Trigger must readily retract when released. The Firing Pin must not fall.

Contd.

Move Safe to "Off-Safe" position. The Firing Pin must not fall.

Pull Trigger. The Firing Pin must fall.

Cock rifle and close Bolt firmly. The Firing Pin must not fall. (Repeat several times.)

Open Bolt, pull Safety to "On-Safe" position and close Bolt. The Bolt must lock down. The Safety must remain in "On-Safe" position and the Bolt must not open until Safety is pushed to the "Off-Safe" position.

With gun cocked, locate Safety lever to halfway point between "On-Safe" and "Off-Safe" location to position the Safety ball detent between the indents, with the Safety lever in this unstable location.

Pull Trigger. No click or catch permitted when Trigger is pulled and the Firing Pin must not fall. Remove finger from Trigger. The Trigger must retract. Push Safe to "off-Safe" position. The Firing Pin must not fall. Pull Safe back slightly toward "On-Safe" position and release. Safety must snap forward to "Off-Safe" position. Pull Trigger. The Firing Pin must fall.

Open Action.

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PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

MODEL 600, 660 AND MOHAWK 600 ONLY

IMPORTANT NOTICE: ABSOLUTELY NO ALTERATIONS OR ADJUSTMENT ARE TO BE MADE TO THE REPLACEMENT TRIGGER ASSEMBLY. IF ANY UNUSUAL PROBLEMS ARE ENCOUNTERED DURING REPLACEMENT OF TRIGGER ASSEMBLY, RETURN FIREARM TO FACTORY.



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AL 0030106

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

Remove Trigger Guard and Stock Assembly

- A. Unscrew front and rear guard screws.
- B. Remove trigger guard.
- C. Lift away and remove stock assembly from action.
- D. Remove magazine assembly from receiver.

Remove Trigger Assembly from Action

- A. Pull safety lever rearward beyond the safe detent position to clear the rear sear pin.
- B. Tap out both sear pins.
- C. Pull trigger assembly from receiver.

Assemble Replacement Trigger Assembly

- A. Insert trigger assembly, identified with "V" stamped on left side of trigger, with slave pins intact, into receiver and align sear pin holes to receiver.
- B. Lightly tap slave pins to engage sear pin holes in receiver. Put safety to "On" safe position.
- C. Insert tapered end of sear pins in left side of receiver. Seat pins flush to slightly below bolt stop with slot. Make sure pins do not protrude into bolt stop slot in receiver.
- D. Prick punch receiver at sear pin holes on left side. Bolt stop must not bind in slot.
- E. Push safety lever to "off-safe" position, pull trigger and hold. Depress top rear of sear safety cam to insure that it moves freely in trigger housing. The sear safety cam must not bind and must retract without hesitation.
 1. If binding occurs, insert wide blade screwdriver and carefully spread walls of housing against side of receiver, and recheck element "E", above.
 2. Visually check alignment of inner walls of trigger housing with firing pin head guide slot in receiver.

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

Assemble Replacement Trigger Assembly (continued)

- F. Push safety lever from "On-Safe" position to "Off-Safe" position, to insure free movement with no binding and positive engagement of detents. Check bolt lock area of the safety lever to make sure it works freely in receiver slot. If slight binding occurs on receiver, file receiver slot. If excessive binding occurs, then use another trigger assembly.
- G. Insert bolt assembly in action.
- H. Put removed trigger assembly in an individual envelope for return to Remington (one assembly per envelope), to the attention of D. Sanita, Arms Service Division, Ilion, New York 13357.

Trigger Assembly Clearance

- A. Assemble barrel action to stock to check trigger assembly clearance. The brass reinforcing screw located forward of the trigger assembly clearance cut may possibly interfere with the new design trigger assembly. If this occurs, bend center reinforcing screw toward muzzle for proper clearance. (Note illustration)

Safety Lever Clearance in Stock

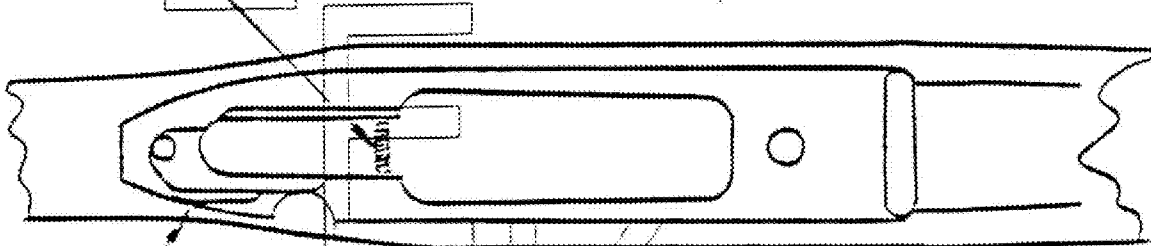
- A. For safety lever clearance, wood is to be removed from the rear of the safety clearance cut.
 - 1. With the barrel action removed from the stock, measure 6.530" from the rear edge of the recoil lug shoulder to rear of safety lever clearance cut and remove wood for safety lever clearance, leaving a 1/8" to 3/16" radius in the rear corner. This wood removal can be performed with proper chisels and/or a rotary type high speed grinder. (Note illustration)

PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

Reinforcing screw should not interfere with trigger housing assembly.

- A. Bend screw forward .050" max.
- B. If interference remains or the screw breaks, remove exposed stock reinforcing screw section and file flush with interior walls of stock.

Possible interference point with
trigger housing assembly



Model 600 & 660 Stock

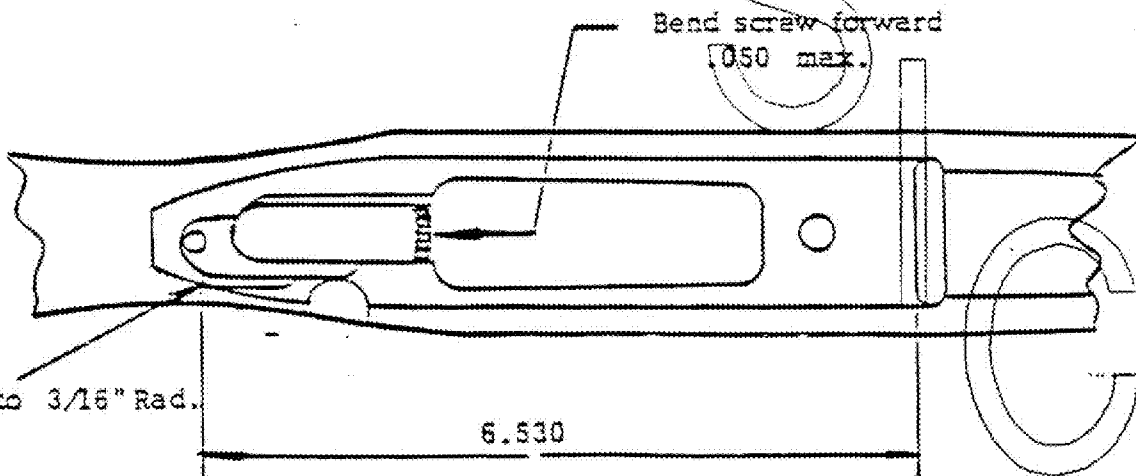
Safety arm operation must be free & clear of stock.

Interference point of safety lever

Bend screw forward
.050 max.

1/8" to 3/16" Rad.

6.530



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PROCEDURE FOR REPLACEMENT OF TRIGGER HOUSING ASSEMBLIES

- B. After completing this operation, insert barrel action into stock holding recoil lug tightly against recoil shoulder and with the bolt in the closed position, pull the safety rearward. Check bolt lift to insure safety arm has secured the bolt in the locked position. Inspect the safety lever for binding or contact with the safety lever clearance cut in the stock. Should the safety lever, in the "On-Safe" position, contact the stock, remove wood until clearance is obtained.
- C. After proper wood clearance has been obtained, complete the assembly of rifle. Check for clearance between trigger and trigger guard. Close the bolt, put the safety lever in the "On-Safe" position, pull the trigger rearward freely with no binding. If any contact is found, the trigger guard is to be filed.
- D. Check ~~freeness of~~ safety. Safety must not bind. The safety must snap in detent in both the "On-Safe" and "Off-Safe" positions.
- E. Check function of safety. Cock rifle and move safety to "On-Safe" position. No click or catch permitted when trigger is pulled and the trigger must readily retract when released. The firing pin must not fall. Move safe to "Off-Safe" position. The firing pin must not fall. Pull trigger. The firing pin must fall. Cock rifle and close bolt firmly. The firing pin must not fall. (Repeat several times) Open bolt, pull safety to "On-Safe" position and close bolt. The bolt must lock down. The safety must remain in "On-Safe" position and the bolt must not open until safety is pushed to the "Off-Safe" position.
- # CH

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Na//Screw Driver Test Page 1 of 3

M600 & M700 "SCREWDRIVER" TEST - CUSTOMER REPAIR

PURPOSE: THIS TEST ASSURES ADEQUATE WORKING CLEARANCE BETWEEN TOP OF CONNECTOR AND BOTTOM OF SEAR SAFETY CAM WITH CONNECTOR^{POKE} AS HIGH AS POSSIBLE.

NOTE: TEST IS MOST EASILY PERFORMED WITH STOCK AND TRIGGER GUARD REMOVED. GUN HELD IN VISE.
REFER TO FIGURES 1 & 2.

COCK FIREARM.

MOVE SAFETY LEVER FROM "OFF SAFE" POSITION TOWARD "ON SAFE" POSITION, TO LOCATE AND STOP SAFETY LEVER AT THE FOREWARD MOST NULL LOCATION.*

*Forewardmost null location is that "just-stable" place between "On" and "Off" safe, closest to "Off" safe, where the Safety Lever will not spring forward to the "Off" safe position when released.

SAFETY LEVER MUST REMAIN IN NULL LOCATION DURING TEST.

PLAINTIFF'S
EXHIBIT

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DESCRIPTIVE INFORMATION

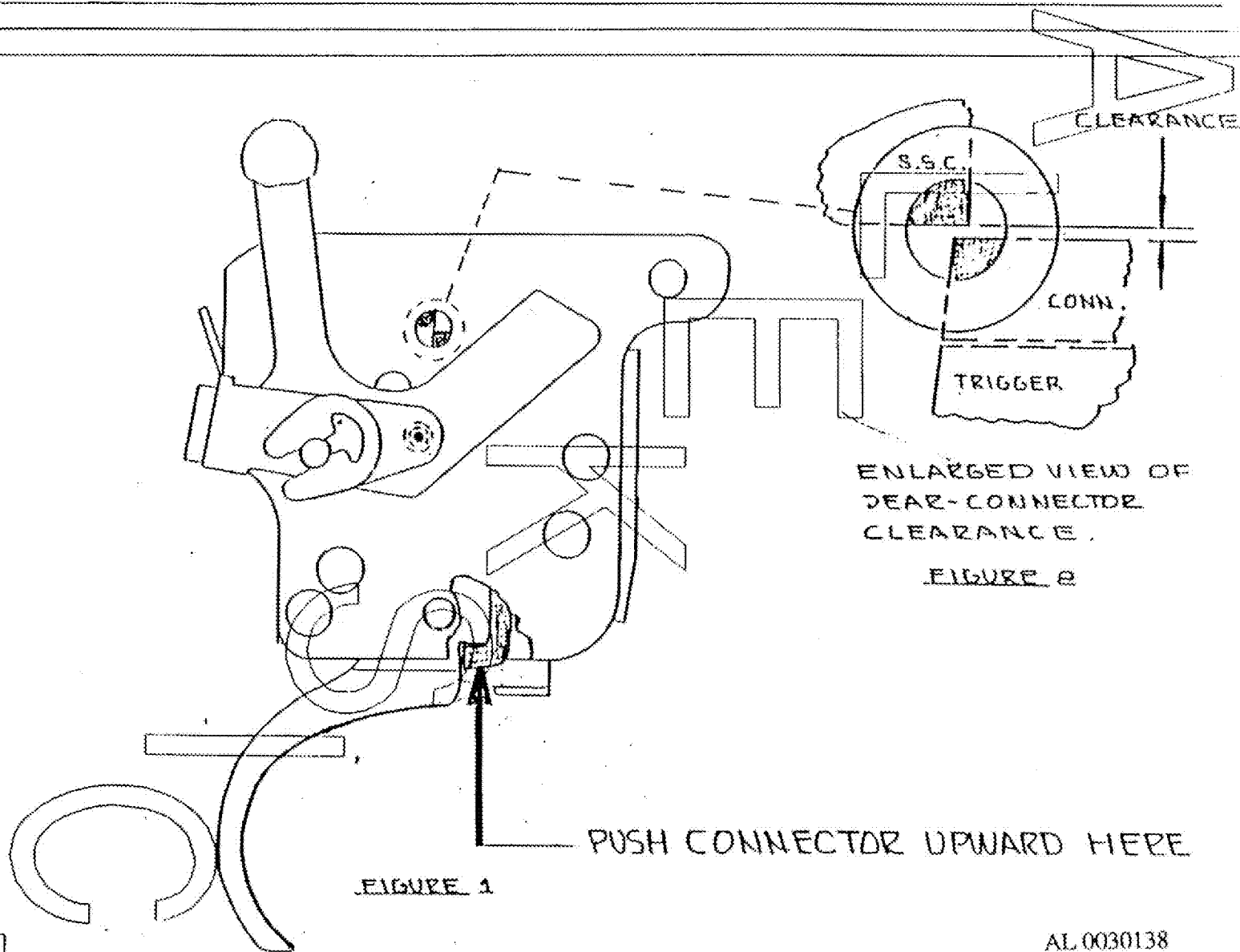


FIGURE 1

FIGURE 2

AL 0030138

RT NAME _____ COOLANT _____ SET UP TIME _____ MODEL No. 7 00 8 600 OPER. No. _____
 PE "SCREWDRIVER" TEST @ ASSEMBLY MACH. HRS. _____ DEPT. No. _____ PAGE 2 OF 3
 CUSTOMER REPAIR MACHINE

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M600 & M700 "SCREWDRIVER" TEST - CUSTOMER REPAIR

INSERT SUITABLE TOOL BETWEEN TRIGGER AND BOLT STOP RELEASE.

PUSH CONNECTOR FIRMLY UPWARD (TOWARD SEAR SAFETY CAM) AND HOLD. THEN, SIMULTANEOUSLY:

PULL TRIGGER.

- THERE MUST BE NO CLICK OR CATCH IN PULL.

• REJECT IF CONNECTOR IS TRAPPED FORWARD. RELEASE FORCE ON CONNECTOR THEN:

RELEASE TRIGGER SLOWLY.

- TRIGGER MUST RETURN TO FULL FORWARD POSITION AND CONNECTOR MUST RETURN UNDER SEAR SAFETY CAM. VERIFY THRU VIEW HOLE.

• REJECT IF CONNECTOR IS TRAPPED FORWARD. PUSH SAFETY LEVER TO "OFF" SAFE POSITION.

- FIRING PIN MUST NOT FALL

END OF "SCREWDRIVER" TEST

RD 1886-2875

REMINGTON ARMS COMPANY, INC.
APPROPRIATION REQUEST

Department Technical

Works Illion

Project No. FD-721

Request for \$17,170 Reduction

Part III
Date 4/13/48

Category Established Product

Title MODEL 721-722 BOLT ACTION HIGH POWER CENTER FIRE RIFLE

Parts I & II - Previously Authorized - \$1,113,170.
Part III - This Request - (17,170.) Reduction
\$1,096,000.

This project is included
in Forecast No. 2 in
the amount of \$79,790.

To be commenced Upon Approval

To be ready for use

To be physically completed Sept. 1948

Estimate prepared by

K. C. Gilmore

4/12/48
Date

Approved as to form, accounting
aspects, and rules compliance

R. D. Jack

Treasurer or
Assistant Treasurer

4-20-48
Date

Approved as Authorized		Date
H. A. Brown		4-14-48
H. K. Faulkner		4-14-48
J. M. Christman		4-16-48
G. O. Clifford		4-16-48
R. E. Coleman		4-20-48
W. F. H. Mattlage		4-20-48
M. R. Warden		4-20-48
C. K. Davis		4-22-48
President and General Manager		
Authorized	BOARD OF DIRECTORS	4-30-48

R. D. Jack,
Secretary

Preliminary approvals:

Date

Date

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4/13/48

PLAINTIFF'S
EXHIBIT

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RT-154

REMINGTON ARMS COMPANY, INC.

SUMMARY OF ESTIMATED EXPENDITURES

PROJECT NO. FD-721 - Ilion WORKS

	<u>Labor</u>	<u>Material</u>	<u>Total</u>
Land	\$ -----	\$ -----	\$ -----
Manufacturing buildings	-----	-----	-----
Manufacturing equipment	-----	401,527	401,527
Power and service facilities	-----	-----	-----
Cooling	94,075	198,800	292,875
Dismantling and rearranging	-----	-----	-----
Product development	401,598	-----	401,598
Machine development	-----	-----	-----
Project administration	-----	-----	-----
Other	-----	-----	-----
	\$ 495,673	\$ 600,327	\$ 1,096,000
Provision for advancing wages and material prices	-----	-----	-----
TOTAL	\$ 495,673	\$ 600,327	\$ 1,096,000

ACCOUNTING DISTRIBUTION OF EXPENDITURES

	<u>Expenditures Previous Parts</u>	<u>Expenditures This Part</u>	<u>Adjusting Entries</u>	<u>Final Net Results in Accounts</u>
Plant increase	\$ 701,402	\$(7,000)Red.	*\$(2,935.48)	\$ 691,466.52
Operations	411,768	(10,170)Red.	-----	401,598.00
Depreciation	-----	-----	* 2,935.48	2,935.48
	\$ 1,113,170	\$(17,170)Red.	-----	\$1,096,000.00

*Write off of five worn obsolete type of machines used for cutter sharpening.
(See schedule in Project FI-172)

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REMINGTON ARMS COMPANY, INC.

GENERAL INFORMATION

PROJECT NO. FD-721 Part III - Ilion Works

INTRODUCTION:

Part II of this project authorized funds in the total amount of \$1,113,170 to complete all work required to place Model 721-722 Rifles in production in eight calibers, including three new Remington calibers as follows:

280 Remington
224 Remington
222 Remington

A review of the program involved in adding these three new Remington cartridges to the ammunition line and providing Model 721 and 722 Rifles to handle them indicated insufficient economic justification for calibers 280 Remington and 224 Remington. Deletion of these two calibers was recommended in a combined meeting of the Arms and Ammunition Product Committees on March 26, 1948.

DESCRIPTION OF PROPOSED WORK:

In conformance with this decision, all work on the development of Model 721 for caliber 280 Remington and Model 722 for caliber 224 Remington has been stopped. Development of Model 722 for caliber 222 Remington, however, will be completed for production.

REMARKS:

A revision in Estimated Earnings and Return on Investment is attached. Net Earnings of \$140,736 are estimated with a return of 11.7%.

The R & M Estimate approved April 1, 1948, included the \$1,113,700 authorized in Part II and this project therefore anticipates an underrun of \$17,170.

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4/15/48

Revised 4-16-48
WEG:hsk

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REMINGTON ARMS COMPANY, INC.

ESTIMATED EARNINGS AND RETURN ON INVESTMENT

Project No. FD-721 Part III - Ilion Works
6 Cal.

CATEGORY: ESTABLISHED PRODUCT

	Normal Year		
	Operation before Project No. FD-721	Operation after Project No. FD-721	Results from Project No. FD-721
Quantity	262,010	274,810	12,800
Outside Sales	\$6,229,197	\$6,618,387	\$ 389,190
Less: Mill cost	\$4,962,070	\$5,107,982	\$ (145,912)
Selling and administrative expense	661,839	661,839	
	\$5,623,909	\$5,769,821	\$ (145,912)
Operative Earnings	\$ 605,288	\$ 848,566	\$ 243,278
Less: All other expense @ 11% (excludes Federal taxes on income)			26,761
Net earnings before Federal taxes on income			\$ 216,517
Less: Federal taxes on income @ 35%			75,781
<u>NET EARNINGS</u>			<u>\$ 140,736</u>
<u>INVESTMENT</u>			
Total appropriation request under this project (including development)			\$1,096,000
Less: Amount included therein for manufacturing facilities subject to allocation:			
Equipment	\$ 401,527		604,402
Tooling	292,875		\$ 401,598
Add: Investment in facilities used directly in this operation and applicable service and other manufacturing facilities			819,341
Total investment			\$1,220,939
Working capital			386,724
Total capital required			\$1,607,663
Less: Portion of this project to be charged to operations (including development) or depreciation reserve			401,598
Total investment after completion of this project			\$1,206,065
<u>RETURN ON INVESTMENT</u>			
Total capital required			8.8%
Total investment after completion of this project			11.7%
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REMINGTON ARMS COMPANY, INC.

ESTIMATE OF SAVINGS Present Model vs. Proposed Model

BASED ON NORMAL YEAR

PROJECT NO. FD-721 Part III - Ilion WORKS
6 Cal.

	<u>Total Line Including</u>		
	<u>Present</u>	<u>Proposed</u>	<u>Difference</u>
	<u>Model</u>	<u>Model</u>	
Quantity	262,010	274,810	12,800
Outside Sales	\$6,229,197	\$6,618,387	\$ 389,190
Factory costs:			
Direct Material	836,874	919,266	(82,392)
Direct Labor	822,043	864,807	(42,764)
Expense:			
Direct and Indirect	2,790,632	2,797,303	(6,671)
Fixed	250,000	250,000	
Inventory adjustment	93,991	96,628	(2,637)
Deferred tooling cost	168,530	179,978	(11,448)
Total factory cost	\$4,962,070	\$5,107,982	\$(145,912)
Selling and administrative expense	661,839	661,839	-----
	<u>\$2,623,909</u>	<u>\$5,769,821</u>	<u>\$(145,912)</u>
Operative earnings	\$ 605,288	\$ 848,566	\$ 243,278
Less: All other expense @ 11%			<u>26,761</u>
Estimated savings before Federal taxes on income			\$ 216,517
Less: Federal taxes on income @ 35%			<u>75,781</u>
Estimated net savings (normal year)			\$ 140,736
Total estimated expenditure, excluding \$250,000 of equipment for other models			\$ 846,000
Net return on expenditure			16.6%
Total estimated expenditure, excluding \$401,527 of equipment*			\$ 694,473
Net return on expenditure			20.3%

*Equipment for general use which would have to be purchased on a necessity basis at a reasonably early date.

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4/14/48

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REMINGTON ARMS COMPANY, INC.

DETAIL ESTIMATE OF EXPENDITURES
M/721-722 - Project FD-721 - Part III

	Amount Previously Authorized	Amount Requested This Part	Added Cost To Complete	Total Estimated Cost
<u>DEVELOPMENT (FD-721-1)</u>				
Design				
Investigation	\$ 1,061	\$ -----	\$ -----	\$ 1,061
Design	15,616	-----	-----	15,616
Design Revisions	33,053	(1,003)	-----	32,050
Model Making	18,080	-----	-----	18,080
	\$ 67,810	\$ (1,003)	\$ -----	\$ 66,807
Specifications				
Testing	\$ 20,687	\$ (1,000)	\$ -----	\$ 19,687
Specifications	8,213	-----	-----	8,213
	\$ 28,900	\$ (1,000)	\$ -----	\$ 27,900
Product Engineering				
Process Engineering	\$ 94,700	\$ (1,500)	\$ -----	\$ 93,200
Trial Run	29,950	(1,000)	-----	28,950
	\$ 124,650	\$ (2,500)	\$ -----	\$ 122,150
Tooling Revisions				
Tool Design Revisions	\$ 35,400	\$ -----	\$ -----	\$ 35,400
Tool Revisions	46,935	(935)	-----	46,000
	\$ 82,335	\$ (935)	\$ -----	\$ 81,400
Administrative				
Engineering Files	\$ 6,219	\$ (851)	\$ -----	\$ 5,368
Project Engineering	15,381	(1,381)	-----	14,000
	\$ 21,600	\$ (2,232)	\$ -----	\$ 19,368
<u>TOOLING (FD-721-2)</u>				
Design	\$ 96,075	\$ (3,000)	\$ -----	\$ 93,075
Tools	203,800	(4,000)	-----	199,800
	\$ 299,875	\$ (7,000)	\$ -----	\$ 292,875
<u>SPECIAL MACHINERY (FD-721-3)</u>				
<u>STANDARD MACHINERY (FD-721-4)</u>				
	374,527	\$ -----	\$ -----	\$ 374,527
<u>PRODUCTION AIDS (FD-721-5)</u>				
	\$ 27,000	\$ -----	\$ -----	\$ 27,000
<u>PILOT OPERATIONS (FD-721-6)</u>				
Quality Audit	\$ 3,230	\$ -----	\$ -----	\$ 3,230
Methods Engineering	1,460	-----	-----	1,460
Machine Changes&Additions	10,060	(3,500)	-----	6,560
Machine Rearrangement	1,900	-----	-----	1,900
Pilot Lot Manufacture	61,823	2,000	-----	63,823
Tool Replacement	8,000	(1,000)	-----	7,000
Credit for O.K. Guns	-----	-----	-----	-----
	\$ 86,473	\$ (2,500)	\$ -----	\$ 83,973
SUB TOTAL	\$ 411,768	\$ (10,170)	\$ -----	\$ 401,598
CONTINGENCIES				
TOTAL	\$ 1,113,170	\$ (17,170)	\$ -----	\$ 1,096,000

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4/13/48

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AL 0030149

TECHNICAL DEPARTMENT REQUEST - FINANCIAL CLOSING NOTICE

PLANT - Elish PROJECT - FD-721
DIVISION - Arms CLOSING DATE - February 21, 1950

TITLE - Model 721-722 Bolt Action High Power Center
Fire Rifles

All work on the subject project having been
completed, the project is to be closed out in its
entirety.

Preliminary Approvals
D. H. White Technical Dept. Manager
A. H. Hahn Engrg. Service Division Supvr.
Dr. Badley Works Accountant
H. K. Paulkner Plant Manager

Approvals
Wm. Caldwell Technical Director
W. H. Hoffman Treasurer or Asst. Eng.
W. H. Hoffman Director of Production
Wm. R. Ward Vice President and General Manager

SUMMARY OF EXPENDITURES
PROJECT FD-721

	<u>Expended</u>	<u>Authorized</u>	(OverRun) <u>Underrun</u>
Manufacturing Equipment	398,851.39	401,527.00	2,675.61
Tooling	293,983.90	292,875.00	(1,108.90)
Dismantling & Rearrangement	947.79		(87.79)
Product Development	379,307.17	401,598.00	22,290.83
Other	615.96	-	(615.96)
	<u>1,073,706.21</u>	<u>1,096,000.00</u>	<u>22,293.79</u>
	UnderRun		2.0%

<u>Account</u>	<u>Authorized</u>	<u>Expended</u>	<u>UnderRun</u>
721-1 Development Operations	317,625.00	297,823.74	19,801.26
721-2 Tooling Pl. Incr.*	292,875.00	293,983.90	(1,108.90)
721-4 Standard Machinery Pl. Incr.*	374,527.00	373,742.56	784.44
		3.85	(3.85)
721-5 Production Aids Pl. Incr.*	27,000.00	25,108.83	1,891.17
		913.94	(913.94)
		615.96	(615.96)
721-6 Pilot Operations Operations	83,973.00	81,483.43	2,489.57
	<u>1,096,000.00</u>	<u>1,073,706.21</u>	<u>22,293.79</u>
			2.0%

*Detail attached.

Cutter Grinder #10956 written off on PIT-RI-461
Cutter Grinder # 8608 written off on PIT-RI-661
Bench Lathes #2266 & #2873 and attachments are required for
present volume of production.

DETAIL OF EXPENDITURES
PROJECT FD-721

	<u>Expended</u>	<u>Authorized</u>	(OverRun) <u>UnderRun</u>
<u>Development</u>			
<u>Design (1)</u>			
Investigation	551.11	1,061.00	509.89
Design	15,143.13	15,616.00	472.87
Design Revisions	33,098.07	32,050.00	(1,048.07)
Model Molding	19,326.69	18,080.00	(1,246.69)
	<u>68,119.00</u>	<u>56,807.00</u>	<u>(1,312.00)</u>
<u>Specifications</u>			
Testing	19,785.11	19,687.00	(98.11)
Specifications	9,313.95	8,213.00	(1,303.95)
	<u>29,302.07</u>	<u>27,900.00</u>	<u>(1,402.07)</u>
<u>Product Engineering</u>			
Process Engineering	87,326.86	93,200.00	5,873.14
Trial Run	24,382.26	28,950.00	4,567.74
	<u>111,709.12</u>	<u>122,150.00</u>	<u>10,440.88</u>
<u>Tooling Revisions</u>			
Tool Design Revisions	32,864.43	35,400.00	1,535.57
Tool Revisions	36,953.40	46,000.00	9,046.60
	<u>69,817.83</u>	<u>81,400.00</u>	<u>11,582.17</u>
<u>Administrative</u>			
Engineering Files	5,367.79	5,368.00	.21
Project Engineering	12,507.93	14,000.00	1,492.07
	<u>17,875.72</u>	<u>19,368.00</u>	<u>1,492.28</u>
<u>Tooling (2)</u>			
Design	89,110.39	93,075.00	3,964.61
Tools	204,873.51	199,800.00	(5,073.51)
	<u>293,983.90</u>	<u>292,875.00</u>	<u>(1,108.90)</u>
<u>Special Machinery (3)</u>			
Standard Machinery (4)	373,746.41	374,527.00	780.59
<u>Production Aids (5)</u>	26,668.73	27,000.00	331.27
<u>Pilot Operations (5)</u>			
Quality Audit	2,329.81	3,230.00	400.19
Methods Engineering	1,210.27	1,460.00	249.73
Mach. Changes & Additions	1,083.58	6,560.00	476.42
Mach. Rearrangement	2,189.37	1,900.00	(289.37)
Pilot Lot Mfg.	68,740.53	53,823.00	(14,917.53)
Tool Replacement	4,705.07	7,000.00	2,294.93
Credit for OK Guns	(275.35)	-	275.35
	<u>81,483.43</u>	<u>83,373.00</u>	<u>2,489.57</u>
<u>Sub Total (1-6)</u>	<u>360,307.17</u>	<u>411,598.00</u>	<u>22,290.83</u>
<u>Total</u>	<u>1,073,706.21</u>	<u>1,096,000.00</u>	<u>22,293.79</u>

PLANT INCREASE DETAIL
PROJECT FD-721

721-2 Tooling

Design
Tools

\$ 89,110.39
204,873.51

\$ 293,983.90

721-4 Standard Machinery

Inv.No.	W.O.No.	Description	
12184	80704	Dennison Press	1,159.49
11869	80705	Drill Sharpener	1,450.85
12413		Install. Charges	85.84
12366	80707	Lathe	1,768.45
12367		Motor	35.00
11875	80710	J&L Lathe	8,032.14
11890 &)		Motors	290.00
12376			
22024	80712	Lathe	2,763.52
11884	80714	Cincinnati Grinder	3,601.75
12150 &)		Motors	105.00
12151			
12401	80716	LaPointe Broach	5,334.69
12438		Motor	130.00
12193	80717	Porter Cable Sander	1,301.97
12418		Motor	78.06
11878	80719	Landis Grinder	6,454.25
11996 &)		Motors	170.00
11997			
12302	80725	Sellers Grinder	457.75
11877	80726	Lipe Lathe	2,904.06
11995		Motor	110.00
12369	80727	Lipe Lathe	3,206.96
12373		Motor	112.00
12370	80728	Lipe Lathe	2,861.68
12374		Motor	112.00
12371	80729	Lipe Lathe	2,818.03
12375		Motor	112.00
12446	80733	Cincinnati Miller	3,006.48
12445	80734	Cincinnati Miller	2,777.65
22013		Motor	25.00
12379	80735	Cincinnati Miller	5,622.91
12386 &)		Motors	95.06
22007			
12404	80736	Thread Miller	4,627.38
12423		Motor	35.00
12308	80737	Delta Motor	27.60
12307	80738	Delta Drill Press	73.80
12320	80739	Dip Tank	89.10
12380	80741	Cincinnati Miller	3,783.20
12387		Motor	64.08
11876	80744	Screw Machine	5,444.79
12302	80745	Sellers Gr. Cabinet	76.09
12382	80763	Screw Machine	13,171.82
12419		Motor	293.00
12439	80900	LaPointe Broach	5,760.63
12440		Motor	220.00

PLANT INCREASE DETAIL
PROJECT PD-721

-2-

721-# Standard Machinery Continued

Inv No.	W.O.No.	Description	
12378	80901	Cincinnati Miller	6,471.73
12385		Motor	82.72
12402	80902	Cincinnati Miller	2,895.06
12462	81409	Base for Tocco Brazier	333.01
12479	81502	Cincinnati Miller	5,360.03
12480 &)		Motors	75.00
12481)			
11876	81508	Pulley Shafts for	32.70
		Screw Machine	
12342	81511	Modern Bond Shavers	217.38
12343		(2)	217.39
12368 &)		Motors	30.00
12372)			30.00
6235-6-)	81516	Lyons Tool Toters	45.85
7-8)			
12470	81517	Cincinnati Profiler	15,706.29
12471-2-)	81517	Motors	170.00
3-4)			
12394	81519	Barnes Driller	40,365.04
22636-7-)		Motors	1,886.60
8-9-40)			
41-2-3-)			
4-22703)			
22645		Motor	465.00
12396	81520	Barnes Reamer	41,052.53
22167-8-)		Motors	1,114.00
9-70)			
22174	81521	Kingsbury Miller	10,026.78
12384	81523	Lipe Lathe	1,889.01
12389		Motor	99.63
11878	81528)	Parts for Landis	201.93
	81529)	Grinder	1,405.03
12383	81532	Drill Press, 2 Spdl.	2,055.87
12415	81533	" " , 3 Spdl.	4,652.82
12414	81534	" " , 3 Spdl.	2,571.35
12476	81535	Cincinnati Miller	6,637.27
12477 &)		Motors	153.00
12478)			
12441	81542	Chucking Machine	25,888.65
12442-3-)		Motors	358.00
-4)			
12361	81544	Carboloy Grinder	1,430.35
12453	81545	LaPointe Broach	3,742.79
12454 &)		Motors	43.00
12455)			
22037	81546	Surface Grinder	3,658.49
22079-80-)		Motors	335.00
81-82)			
12492	81549	Gorton Engraver	1,351.49

11839
AL 0030154

PLANT INCREASE DETAIL
PROJECT PD-721

-3-

721-4 Standard Machinery Continued

<u>Inv.No.</u>	<u>W.O.No.</u>	<u>Description</u>	
12489)	81557	Screw Machines	13,330.42
22093)			
22334)			
22335 & 6)		Motors	260.00
22094 - 5)			
12381	81558	Cincinnati Grinder	33,513.88
12388		Motors	759.00
12398			
12447 - 8)			
- 9)			
12484	81559	Marking Machine	3,155.87
23538	81560	Steel Shelving	220.12
11878	81575	Water Nozzle for Landis Grinder	38.91
22058	81577	Logan Assembly Machine	3,528.02
22059		Motor	90.00
12489)	81579	Attach for Screw Machines	2,965.00
22334)			
22093)			
22700)			
11876	81584	Parts for Screw Mach.	14.73
12382	81586	Feed Gears - Screw Machine	80.97
12371)			
11877)	81587	Switches for Carbo Lathes (4)	357.13
12369)			
12370)			
12371)			
12397	81593	Hoffman Filter	1,563.60
12398 &)		Motors	128.00
12399)			
11875	81595	Concrete Pad for Lathe	665.58
12460	81596	Conversion of Dbl. End Countersinking Machine to 2 D/Ps #23929 & 23930	2,457.71
22015 &)		Motors	110.00
22017)			
11878	81602	Grinder Parts	379.52
12414)	81603	Parts for Drill Presses	108.19
12415)			
12393)			
Various Machines	81607	Design Work	771.21
46-1)	81608	" "	1,002.48
22047	81610	Final Assen Reamer	553.25
22523		Motor	20.00
21873	81612	Bar Feed	207.30
12453	81617	Inst. Broach	229.13
12132	81618	Inst. Comparator	71.88
12401	81628	Coolant Lines on Broach	35.71

12839
AL 0030155

PLANT INCREASE DETAIL
PROJECT PD-721
-R-

721-4 Standard Machinery Continued

<u>Inv. No.</u>	<u>W.O. No.</u>	<u>Description</u>	
12389	81629	Parts for Motors	23.63
22563	81631	E-C Sander	394.63
12493	81632	Trolley	81.48
22711		Holst	115.67
12379-80	81637	Blow Guns on Cinn.	45.40
12445-6		Millers	
12462	90229	Tocco Brazier	11,870.18
-	90252	Cuprodine System	1,949.58
-	90253	Cuprodine piping	1,215.29
12330	90254	Cuprodine Tanks	710.00
22600-1- 2-3-4 22605		Cuprodine Piping	427.79
-	90257	Cuprodine Design	656.98
-	91201	Design - tempering	219.06
12382	91202	Oil Filter-Scr. Mach.	66.10
12453	91203	Magnetic Chuck	272.75
	91204	Arbor Support for Cincinnati Miller	80.64
22046	91205	Holst Assembly	850.66
22607	91205	Holst Assembly	209.00
12379-12402) 12378-12380) 12445-12446) 22025-12476) 12479-22029) 22632-22042)	91206	Trip dogs on 12 machines	103.93
23492	91208	Hot Oil Tempering Bath	127.87
22052	91209	Gorton Grinder	770.28
22053		Motor	25.22
22562	91210	Sellers Grinder	164.77
22583		Motor	87.00
22026	91211	Tap Grinder	600.41
23492	91212	6 Oil Heaters for Tempering Bath	129.85
12441	91213	Centering Device	600.78
22090	91214	Roto-Clone	266.41
22091		Motor	40.00
22034	91215	Sellers Grinder	335.10
22134		Motor	22.08
22355	91216	Hob Sharpener	3,934.38
22357-6		Motor	107.00
11875	91217	Slide Support	154.41
12396	91222	Install Reamer	1,367.42
12402	91223	Time Delay for Cincinnati Miller	265.00
12394)	91224	Engrg. Design and Layout for Barnes Drillers	721.18
12416)			
22527)			

PLANT INCREASE DETAIL
PROJECT PD-721

-5-

721-4 Standard Machinery Continued

<u>Inv. No.</u>	<u>W.O. No.</u>	<u>Description</u>		
22750	91225	Surface Grinder	1,699	58
22038	92803	Router	1,140	78
22618		Freq. Changer	374	86
-	92806	Exhaust pipe for above	1	74
				\$ 373,742.56

721-5 Production Aids

23551)	81888	2 Barrel Racks	420	91
23552)				
-	81256	Browning Racks (8)	1,249	55
12429	81566	Comparator	2,867	27
12408	90118	Comparator	3,232	48
-	90131	4 Assembly trays	47	87
-	90148	Benches 46-1	403	57
6243 & 6282	90149	Rack Conveyors (40)	3,342	57
-		400 Metal Trays	3,052	53
23537	90150	Rack for Steel	189	12
-	90151	35 Steel Trucks	332	10
-	90152	17 Steel Trucks	1,033	03
-	90153	50 Barrel Trucks	478	86
-	90154	Exhaust for Dip Tanks	76	87
-	90155	180 wood bottoms in barrel trays	681	73
-	90156	" " " "	488	14
-	90159	120 Assembly Bins	65	93
-		80 " "	75	23
12405)	90160	Plast-O-Dip tanks	150	58
12406) & 12407			128	70
12461)	90162	Stanley Bench	46	06
12409)		Grinders	46	06
19851	90163	Kardex File	145	06
19129-19067)	90164	Lyons Racks	314	61
-19153)				
6551-2-3	90165	Tool stands	67	98
-	90166	500 Stacking tote pans "B"	1,259	20
23540	90168	Gr. Wheel rack	104	35
23541-2-3-4)	90169	Tool Crib Racks	419	22
5-6-7)				
6219 & 6292	90170	Truck for Compar. Screens	73	47
12408	90171	Rack for Comparator	149	28
-	90173	4 Assembly Trays	29	88
-	90174	4 Assembly Trays	45	50
-	90202	Design & Layout Time for Prod. Aids	813	21
6554-6556	90209	2 Rack Conveyors	180	40
-	90211	Burn-Off Rack	185	40
6293	90213	6-Wheel Truck	39	95

PLANT INCREASE DETAIL
PROJECT PD-721

-6-

721-5 Production Aids Continued

Inv.No.	W.O.No.	Description	
23539	90226	Matching Rack for	80.26
		M721 B. Plates	
12494-5	90236	Wash tanks, etc.	38.75
22051		Floor pan	18.49
-		Exhaust Pipe	178.07
-		Steam & water	261.60
12486		Fan, etc.	130.45
12475	90237	Hoist & Reel	352.72
-	91401	4 Wire Baskets (oil quench)	42.60
-	91402	Lindberg Racks & Baskets (7)	506.31
23541	91403	Arbor Rack	82.93
22596	91404	Move Hoist & Clean	15.73
	91405	Portable Support Truck	105.71
-	91406	Temp. Contoller	190.61
-	91407	Blow pipe for brazing	4.41
-	91408	Tray lifting fixture	13.36
12462	91409	Modify Tocco Brazier	115.85
12462	91410	Tocco Valves	12.04
-	91411	Gage Rack	24.17
12441	91412	Tray for Machine #21441	41.47
12382	91413	Chute on Screw Mach	9.95
-	91414	Reamer Rack	18.97
12439	91415	Rack on Broach #12439	12.18
12378 &)	91416	3 Chip baskets for Miller	43.22
12476)			
-	91417	500 Inv. # Tags on 500 Tote Pans	31.59
6427-6428	91420	2 Stock Trucks	122.23
6487 to 6518	91421	28 Gage Benches - Wood	235.18
-	91422	3 Wash Racks	125.79
		6 Pickling basets	25,168.83

T
2-21-50

AL 0030158

A

REMINGTON ARMS COMPANY, INC. APPROPRIATION REQUEST

Department

Technical Works Division

Project No.

FD-721

Request for \$

17,170. REDUCTION

Date

PART III
4/13/48

Category

ESTABLISHED PRODUCT

Model 721-722 BOLT ACTION HIGH POWER CENTER FIRE RIFLE.

PARTS I+II - PREVIOUSLY AUTHORIZED - \$1,113,170.

PART III - THIS REQUEST

(17,170) REDUCTION.

\$1,096,000.

This project is included

in Forecast No. 2 in
the amount of \$29,790.

To be commenced

upon approval

Date

Approved or
AuthorizedApproved or
AuthorizedApproved or
AuthorizedApproved or
AuthorizedApproved or
Authorized

Estimate prepared by

W. H. H. H.

Date

4/12/48

President and
General ManagerApproved as to form, accounting
aspects, and rules compliance

Authorized

BOARD OF DIRECTORS

Treasurer or
Assistant Treasurer

Date

with this request for appropriation

Preliminary approvals:

Date

Date

AL-0030159

16739

REMINGTON ARMS COMPANY, INC.

SUMMARY OF ESTIMATED EXPENDITURES

PROJECT NO. FD 721 - Ilion WORKS

	<u>Labor</u>	<u>Material</u>	<u>Total</u>
Land	—	—	—
Manufacturing buildings	—	—	—
Manufacturing equipment	—	401,527	401,527
Power and service facilities	94,075	198,800	292,875
Tooling	—	—	—
Dismantling and rearranging	—	—	—
Product development	401,598	—	401,598
Machine development	—	—	—
Project administration	—	—	—
Other	—	—	—
	<u>649,673</u>	<u>600,327</u>	<u>1,250,000</u>
Provision for advancing wages and material prices	<u>495,673</u>	<u>600,327</u>	<u>1,096,000</u>
TOTAL			

ACCOUNTING DISTRIBUTION OF EXPENDITURES

	<u>EXPENDITURES PREVIOUS PARTS</u>	<u>Expenditures This Period</u>	<u>Adjusting Entries</u>	<u>Net Change in Assets</u>
Plant increase	701,402.	(7,800) RED.	(16,750)	676,852
Operations	411,768.	(10,170) RED.	—	401,598.
Depreciation	1,113,170.	(12,170) RED.	2,935.48	1,096,000.00

Write off of five worn obsolete type of machines used for cutting sharpeners. (See schedule in Project FI-172)

171739

General Information
Project No. FD721 Part II - New Work

Introduction

Part II of this Project authorized funds in the total amount of \$1,113,170. to complete all work required to place Model 721-722 Rifle in production in eight calibers, including three new Remington calibers as follows:-

280 Remington
224 Remington
222 Remington

A review of the program involved in adding these three new Remington cartridges to the ammunition line and providing Model 721 and 722 Rifle to handle them indicates insufficient resource participation for caliber 280 Remington and 224 Remington.

Action of these two calibers was recommended in a combined meeting of the Arms and Ammunition Product Committee on Mar. 26, 1956 and approved by Management on

181839

Description of Proposed Work

In conformance with this decision, all work on the development of Model 721 for caliber 280 Remington and Model 722 for caliber 222 Remington has been stopped. Development of Model 722 for caliber 222 Remington, however, will be completed for production.

Remarks

A revision in Estimated Earnings and Return on Investment is attached. The Total Investment after completion of this project is reduced by \$40,700 from \$1,246,765 to \$1,206,065. Net Earnings are increased (or decreased) to \$213,469 and the Return on Investment is increased (or decreased) from 13.1% to 17.2%.

cc: C. K. Davis
D. F. Carpenter
W. U. Reisinger
B. E. Strader
M. R. Warden
J. F. Craig
E. C. Hadley

H. Gregg

Bridgeport, Connecticut
March 24, 1948

TO: W. L. CLAY (18)
FROM: G. O. CLIFFORD
SUBJECT: NEW CENTER-FIRE CARTRIDGES

In accordance with the Products Committee Chairman's request of March 5, 1948, we submit herewith the attached study covering the overall story of guns and ammunition on the subject caliber.

The results of this study indicate the return on the combination gun and ammunition development is only 10.4%. Therefore, the project should be examined in view of this information, to determine if there are any other reasons why it should be continued. It was also found that the ballistics of the cartridges developed are approximately those of the original objectives.

It is suggested the report and recommendations be reviewed at a combined meeting of the Arms and Ammunition Division and the Products Committee.

G. O. Clifford
Technical Director

GHJ/fgh
Attachs.

*Revised to
280 & 224
help
224
RHW*

H

20739

AL 0030163

SUMMARY

Purpose of Study

The proposal to develop a line of new "Remington" high power center fire cartridges has been under consideration for a number of years. Experimental work with the cartridges has been underway since January 1946 and recently culminated in pilot production runs (up to 6000) of the following:

.280	Remington-150	gr. S.P.C.L.
.280	"	130 gr. S.P.C.L.
.224	"	56 gr. S.P.
.222	"	48 gr. S.P.

The major portion of the gun development and tooling of the new model rifles to accommodate the three new calibers is yet to be done.

There has always been considerable question as to the economics of the three new cartridge and gun developments. Recent information indicates a \$2.00 increase in each rifle cost for the Caliber .224 Remington. Further review indicates the ballistics of some items are less desirable than was anticipated. In view of this the March 4, 1948 meeting of the Products Committee recommended the discontinuance of gun and cartridge work on the Caliber .280 Remington until a final decision is reached on the 130 gr. bullet design, which was followed by a request for a complete review of the program.

The work reported herein includes an economic and ballistic evaluation based on current information.

Results

1. Economics of the new cartridges based on Pointed S.P. bullets in .224 Remington, .222 Remington and S.P.C.L. bullet in .280 Remington, 130 gr. and pointed core-lokt in .280-130 gr. are as follows:

	<u>Cash</u> <u>Outlay</u>	<u>Working</u> <u>Capital</u>	<u>Total</u> <u>Investment</u>	<u>Net</u> <u>Gain</u>	<u>%</u> <u>Return</u>
.280-150 gr. S.P.C.L.	\$ 7,020)		40,880	2340)	14.1
.280-130 gr. Pointed C.L.	23,800)	\$10,280		2310)	
.224 Rem.-56 gr.S.P.Pointed	14,270	770	17,040	388	1.3
.222 Rem.-48 gr.S.P.Pointed	12,570	5,500	17,870	3430	13.6
Total	\$59,460	16,330	75,790	2588	3.4

2. Economics of the new model guns chambered for the new calibers are as follows:

Note: Based on M/721-722 only.

	Added Quantity	Cash Outlay	Working Capital	Total	Net Gain	% Return
.280 Rem. M/721 *	500	\$13,108	\$29,000	42,108	3,032	7.2%
.224 Rem. M/722	330	13,108	4,700	17,808	2,113	11.9%
.222 Rem. M/722	1000	49,308	14,000	63,308	7,687	12.1%
Total	1830	\$75,524	\$47,700	123,224	12,832	10.4%

3. Economics of the new cartridge-gun combination are as follows:

	Cash Outlay & Working Capital	Net Gain	% Return
.280 Rem.	\$2,988	\$8,812	10.6%
.224 Rem.	34,848	2,501	7.2%
.222 Rem.	81,178	10,107	12.5%
Total	\$119,014	\$21,420	10.8%

Expended to date all calibers guns and ammunition - \$47,584

Return on unexpended balance - \$21,420 ÷ \$151,430 = 14.1%

4. According to the records the ballistics developed for the three new cartridges are very close to the original ballistic objectives. It may be pointed out the original objectives envisioned new center fire cartridges for the new model rifles having the "Remington" name and with only marginal ballistic advantage over existing competitive cartridges.

Recommendations

- 1- The economics are border line, therefore, a decision as to continuance of the project should be based upon a realistic evaluation of the intangible advantages.
- 2- If it is decided to go ahead with the development we recommend the bullet design of the .280 Remington caliber be limited to either the S.P.C.L. design or the pointed so-called "alb nose" design.

* Normal Sales Forecast of 2000, .280 Remington caliber and decrease of 1500 in 270 caliber

BIBLIOGRAPHY

Exhibit A

Cost Evaluation Summary - New Center Fire Cartridges

Exhibit B

Cost Evaluation Summary - 280 Rem - 224 Rem - 222 Rem
Calibers for Model 721/22 Guns

Exhibit C

Historical information on ballistics of new Center Fire
cartridges

- 1 Letter dated August 19, 1944 - From J. H. Hodgson to H.A. Brown
Subject: Proposed New Cartridges
- 2 Letter dated September 7, 1944 - From H. A. Brown to
J. H. Hodgson
Subject: Center Fire Ammunition Development
- 3 Letter dated September 18, 1944 - From E. L. Wemple to
C. B. Wells
Subject: New Center Fire Cartridges
- 4 Tabulation showing ballistics of new Center Fire
cartridges compared to objective
- 5 Historical account of Products Committee action on
new Center Fire cartridge development.

NEW CENTER FIRE CARTRIDGES
SUMMARY COST EVALUATION 3-22-48

Exhibit A

24839
AL 0030167

Order of Magnitude Estimates - Abstract of Costs - 0 to 100%

	280-150 gr. S.P.C.L.	280-130 gr. Pointed C.L.	301-44 gr. R.P.	301-44 gr. L.P.	Total
Normal Sales Volume-Ram.	88 M	100 M	24 M	100 M	492M
Peters	13	28	4	29	75
Total	101	218	28	229	587
Outside Sales \$	\$7,700	\$18,700	\$1,800	\$9,800	\$35,400
Gross Margin	3,280	6,400	660	4,050	
Less 8% of all other Exp.	260	610	52	320	
	3,000	5,890	598	3,730	
Less 35%	1,050	2,060	210	1,310	
Net Prospective Gain	1,950	3,830	388	2,420	8,588
Expenditures:					
Technical Division	5,560	14,600	14,800	11,100	
Plant	1,470	9,000	1,470	1,470	
Total	7,020	23,600	16,270	12,570	\$59,460
Added Working Capital	3,220	7,040	770	5,300	16,330
Total Investment	10,240	30,640	17,040	17,870	75,790
Return on Investment	19%	12.5%	2.3%	13.4%	11.3%
Unexpended	\$1,500	\$20,600	\$2,000	\$1,500	\$25,600

Revised 3/22/48 for new Normal Sales Forecast.

OHJ/ad

REMINGTON ARMS COMPANY, INC.

COST EVALUATION - SUMMARY M/721-722 - Added Calibers 280 Rem., 222 Rem. and 224 Rem.

EXHIBIT B

25839
AL 10030168

	Basic 3 Calibers	Add 280 Rem.	Deduct Part Of 270 Rem.	Net Add For 280 Rem.	4 Calibers	2 Calibers	Add 222 Rem.	3 Calibers	Add 224 Rem.	4 Calibers
Sales Quantity	11,430	2,000	1,500	500	11,930	2,370	1,000	3,370	330	3,700
Outside Sales	499,605	87,420	65,565	21,855	521,460	97,075	40,960	138,035	13,517	151,552
Factory Cost										
Direct Material	70,752	12,380	9,285	3,095	73,847	14,670	6,210	20,880	2,828	23,708
Direct Labor	59,207	10,360	7,770	2,590	61,797	12,277	5,230	17,507	1,709	19,216
Mfg. Expense	162,083	27,350	20,513	6,837	168,920	49,319	13,807	63,126	4,512	67,638
Plant Overhead	56,668	-	-	-	56,668	17,575	-	17,575	-	17,575
Inv. Adjustment	6,917	1,002	751	251	7,168	1,859	505	2,364	181	2,545
Tool Amortization	22,905	3,840	-	3,840	26,745	7,104	1,920	9,024	634	9,658
Total	378,532	54,932	38,319	16,613	395,145	102,804	27,672	130,476	9,864	140,340
Admin. & Sales Expense	52,146	-	-	-	52,146	15,155	-	15,155	-	15,155
Total Commercial Cost	430,678	54,932	38,319	16,613	447,291	117,959	27,672	145,631	9,864	155,495
Operative Earnings	68,927	32,488	27,246	5,242	74,169	(20,884)	13,288	(7,596)	3,653	(3,943)
Net Earnings	39,874	18,794	15,762	3,032	42,906	-	7,687	-	2,113	-
Investment	920,677	32,600	-	32,600	953,277	255,588	29,600	285,188	8,300	293,488
Development Cost	215,426	9,508	-	9,508	224,934	143,618	33,708	177,326	9,508	186,834
Total	1,136,103	42,108	-	42,108	1,178,211	399,206	63,308	462,514	17,808	480,322
Net % Return				7.2%			12.1%		11.9%	

WEO:hak

3-23-48

A

Exhibit C-1

cc: A. E. Buchanan, Jr.
G. O. Clifford
R. E. Evans
G. R. McCormick

Bridgeport, Connecticut
August 19, 1944

TO: H. A. BROWN
FROM: J. H. HODGSON
SUBJECT: PROPOSED NEW CARTRIDGES

Because of the excessive variety of ammunition now being manufactured here, it is thought that new cartridges should be considered for production only if they meet one of the following qualifications:

1. Will fill a performance deficiency in the line of products - such as a high power low cost rimfire cartridge like the .267 Rim Fire.
2. Provide more universal performance and will, therefore, actually obsolete several products now being made.
3. Will be capable of withstanding higher pressures than existing ammunition and, therefore, when combined with a gun which is stronger than competitors, will furnish a combination which will offer better performance than is now available.

This last qualification will be difficult to meet as ammunition is in general loaded to maximum safe pressure limits and even a slight increase results in case casualties or primer difficulties.

The proposed new cartridges are evaluated on this basis below.

A. .284 Remington Magnum

Proposed Bullets - 139 grain M Core Lekt, 139 grain Pointed Soft Point, and 175 grain Pointed Soft Point.

Ballistics

139 grain M Core Lekt	M.V. 3280 ft/sec.	M.E. 3320 ft. lbs/sec.
139 grain Pointed Soft Point	M.V. 3380 ft/sec.	M.E. 3500 ft. lbs/sec.
175 grain Pointed Soft Point	M.V. 3060 ft/sec.	M.E. 3640 ft. lbs/sec.

Established cartridges within 500 ft. lbs. per sec. muzzle energy.

1. .300 Magnum

Comments:

There should be some demand for a cartridge of this type for long range big game hunting. However, as .300 Magnum has the same ballistic potential and is already established, it would seem better to develop additional bullets for the latter rather than design a new cartridge. If the Pointed Core Lokt bullet now being developed proves successful, that this be used universally rather than carrying both Mushroom and Pointed Soft Point types.

B. .280 Remington

Proposed Bullets - 139 grain Mushroom Core Lokt, 139 grain Pointed Soft Point and 175 grain Pointed Soft point.

Ballistics

139 grain Mushroom Core Lokt	M.V. 3080 ft/sec.	M.E. 2930 ft. lbs/sec.
139 grain Pointed Soft Point	M.V. 3230 ft/sec.	M.E. 3220 ft. lbs/sec.
175 grain Pointed Soft Point	M.V. 2660 ft/sec.	M.E. 2750 ft. lbs/sec.

Established cartridges within \pm 500 ft. lbs. per sec. muzzle energy.

1. .300 Magnum
2. .30-06 Springfield
3. .270 Winchester
4. .348 Winchester

Comments:

As the .30-06 Springfield is too well established to be affected seriously by other cartridges having the same ballistics and as the proposed new cartridge offers nothing not available in this and the .270 Winchester, the production of this cartridge is not recommended.

C. .276 Remington

Proposed Bullets - 130 grain Mushroom Core Lokt, 150 grain Soft Point Core Lokt.

Ballistics

130 grain Mushroom Core Lokt	M.V. 2830 ft/sec.	M.E. 2310 ft. lbs/sec.
150 grain Soft Point Core Lokt	M.V. 2420 ft/sec.	M.E. 1950 ft. lbs/sec.

Established cartridges within \pm 500 ft. lbs. per sec. muzzle energy.

1. 7 m/m Mauser
2. 7.92 m/m Mauser
3. 8m/m Lebel
4. .220 Swift
5. .257 Remington-Roberts
6. .270 Winchester
7. .30-30 Winchester
8. .30 Remington
9. .300 Savage
10. .30-40 Krag

- A
11. .303 Savage
 12. .303 British
 13. .32 Remington
 14. .32 Winchester
 15. .348 Winchester
 16. .35 Remington
 17. .35 Winchester
 18. .401 Winchester
 19. .405 Winchester
 20. .45-70 High Velocity

Comments:

In view of the excessive number of cartridges available with approximately the same muzzle energy and because these cartridges are used mainly for deer and medium game hunting which does not have critical ballistic requirements, the production of this cartridge is not recommended.

D. .224 Remington

Proposed Bullets - 48 grain Pointed Soft Point, 55 grain Mushroom.

Ballistics

48 grain Pointed Soft Point M.V. 1200 ft./sec. M.E. 1880 ft.lbs./sec.
55 grain Mushroom M.V. 3950 ft./sec. M.E. 1910 ft.lbs./sec.

Established cartridges within \pm 300 ft. lbs. per sec. muzzle energy.

1. 6.5 m/m Mannlicher
2. .220 Swift
3. .25-35 Winchester
4. .250 Savage
5. .257 Remington-Roberts
6. .30-30 Winchester
7. .30 Remington
8. .300 Savage
9. .30-.40 Krag
10. .303 Savage
11. .32 Remington
12. .32 Winchester

Comments:

All the cartridges in the above list do not compare directly with the proposed .224 Remington for specific use on predatory game but are shown as "all around" cartridges which can successfully be used in this type of shooting. They also have the advantages of other uses and, therefore, represent sales competition to this product. It is thought that the great majority of shooters would prefer a more adaptable cartridge than this and as there is sufficient choice available for various cartridges, its production is not recommended unless it can be shown that it will definitely obsolete several other cartridges.

E. .220 Remington

Proposed Bullets - 45 grain Soft Point.

Ballistics

45 grain soft Point M.V. 3150 ft./sec. M.E. 990 ft.lbs/sec.

Established cartridges within \pm 300 ft. lbs. per sec. muzzle energy.
(.22 to .30 Cal.)

1. .219 Bee
2. .219 Zipper
3. .22 Hornet
4. .22 Savage
5. .25-20 Winchester
6. .30 Carbine

Comments:

This cartridge is a border-line case. It offers attractive ballistics for woodchuck and crow shooting but this is countered by a fairly wide selection of other cartridges in the same range for a rather limited field of shooting. If it could be counted on to obsolete .218 Bee, the .22 Hornet, the .25-20 Winchester and the .32-20 Winchester, its production is recommended otherwise not.

General:

The classification of established cartridges with approximately the same ballistic performance as the proposed cartridge is known to be somewhat empirical and open to criticism. It is, however, intended to show the wide selection already available to shooters and to indicate the complexity of manufacturing all these items.

As the comments on the above cartridges largely represent only the manufacturing view point and are probably somewhat prejudiced in favor of simplification, it is suggested that this program be discussed at the next Staff Meeting.

Engineering Superintendent
Ammunition Section

JHH/hb

Exhibit C-2

CC: A. E. Buchanan, Jr.)
G. O. Clifford) 1
R. E. Evans
G. R. McCormick

Bridgeport, Connecticut
September 7, 1944

TO: J. H. HODGSON
FROM: H. A. BROWN
SUBJECT: CENTER FIRE AMMUNITION DEVELOPMENT

Your comments contained in your letter of August 19 are interesting. It is true that a wide selection of center fire cartridges is available for sportsmen; conceivably more than are actually needed. However, obsolescence of calibers for which a quantity of guns is at present available consumes appreciable time because of the traditional pride not only of ownership of old guns but also of continuing use of these guns.

This situation, however, has not prevented competition from developing new cartridges identified by their name, thereby gaining valuable prestige in the market. The 1942 listing of center fire ammunition includes 73 calibers. Eliminating "Miscellaneous" and "Foreign" and using only those cartridges which carry an Arms Company name, we have 51 cartridges, divided as follows:

<u>Name</u>	<u>Number</u>	<u>Percent</u>
Winchester	23	45.1%
Colt	11	21.6
Remington	5	9.8
Smith and Wesson	5	9.8
Savage	4	7.8
Springfield, Krag, Government	3	6.0
	51	100.0

In addition to the above, some miscellaneous items are recognized by the trade as Winchester developments: .218 Bee, .219 Zipper, .220 Swift. Winchester and Western also are credited with sponsoring the .300 and .375 Magnums. The .22 Hornet was developed at the Springfield Armory but was promoted commercially by Winchester. In this picture there is a glaring dearth of

September 7, 1944

SUBJECT: CENTER FIRE AMMUNITION DEVELOPMENT

"Remington" calibers.

Sportsmen, when buying ammunition of Remington manufacture, are undoubtedly speaking the names Winchester, Savage, Springfield, etc., to the clerk in making their wants known. The .30/30 cartridge is known as ".30/30 Winchester" or "Winchester Center Fire (WCF)" and not as ".30/30 Remington" or "Remington Center Fire". The name is ".270 Winchester"; not ".270 Remington" - ".300 Savage"; not ".300 Remington". In only five of the 73 items listed for sale does the name Remington identify the cartridge.

To impress the trade with the fact that we can and do contribute to new developments in the ammunition field, we have proposed new "Remington" calibers. These, we believe, are susceptible to relatively simple, inexpensive and prompt development so as to be available for our new guns which are being designed wisely to handle greater pressures than present standards. This objective in gun design, therefore, will permit further improvement to ammunition in the future whereby even greater speed, pressure, power and flatter trajectory can be achieved.

The proposed bullets have been selected from existing designs to obtain greater sustained velocity and flatter trajectory. Undoubtedly better bullets will, and should be, conceived in the future and introduced as improvements to keep the line "alive".

In your discussion you have listed established cartridges within plus or minus 500 foot pounds muzzle energy of the proposed new items. In our opinion, this consideration is too broad. On such a premise, the following more recent popular cartridges could not have justified development:

.22 Hornet	.300 Savage
.220 Swift	.270 Winchester
.250 Savage	.35 Remington

These cartridges, however, were introduced and they definitely increased trade prestige of the identifying names. Remington's contribution has been mighty meagre. We hope it can be revived promptly and kept "alive" in the future.

The superior performance of new cartridges should eventually replace existing ones and in their adaptation to our new gun designs they will stimulate arms sales.

HAB:MM

31039
AL 0030174

Exhibit C-3

cc: G. O. Clifford
R. E. Evans

Bridgeport, Connecticut
September 18, 1945

TO: C. B. WELLS
FROM: B. L. WEMPLE
SUBJECT: NEW CENTER FIRE CARTRIDGES

In recent years a number of suggestions have been received for Remington to develop and market new design center fire cartridges. Herewith is material which lists and describes many of the proposed center fire cartridges. The same type of descriptive material is supplied for existing center fire cartridges. The proposed new cartridges considered are:

220 Remington	308 Remington Magnum
224 Remington	350 Remington Magnum
276 Remington	400 Remington Magnum
268 Remington	450 Remington Magnum
280 Remington	Donaldson Wasp
350 Remington	22 High Velocity
284 Remington Magnum	355 G&W

The material is arranged as follows:

1. Proposed new Remington cartridges with descriptive material.
2. A letter by J. H. Hodgson listing present cartridges that would compete with several of the proposed new cartridges.
3. A board showing appearance samples and some descriptive material for some of the proposed new cartridges.
4. Comments on each of the new cartridges relative to the manner in which the new cartridge would fit into the present line.

C. B. Wells

-2-

September 18, 1945

SUBJECT:

NEW CENTER FIRE CARTRIDGES

5. Full descriptive material on existing rifle cartridges grouped as follows:

- a. 22 Cal.
- b. 25 Cal.
- c. 270 Cal.
- d. 30 Cal.
- e. 32 Cal.
- f. 35 Cal.
- g. 375 Magnum and 30 Cal.
- h. 40 Cal.
- i. 44 Cal.

6. A tabulation showing factory cost, commercial cost and net selling price for typical center fire cartridges at 1939 and at 1945 costs.

E. L. Wemple, Manager
Development Division
Technical Department

ELW:MR
Att.

33839
AL 0030176

COMMENTS ON
PROPOSED NEW CENTER FIRE CARTRIDGES

220 REMINGTON

\$70.00 M retail price is too high. Comparable cartridges sell for much less money.

224 REMINGTON

This cartridge has a higher velocity than competing cartridges except the 220 Swift and it does have a slightly higher energy than the 220 Swift. The 224 Remington might have some advantage over competition if the 4,000 f/s velocity can be regularly obtained and if the accuracy is equal to or better than the Hornet, Swift and Zipper.

276 REMINGTON

It is planned to sell this at the same price as the 300 Savage, yet it has lower velocity and bullet energy.

258 REMINGTON

This cartridge lies between the 257 Roberts 100 grain bullet with 2800 f/s velocity and the 30-06 110 grain bullet with 3200 f/s velocity.

280 REMINGTON

This cartridge is almost identical with 30-06 and 270 Winchester and would not appear to have any advantage over these cartridges.

350 REMINGTON

This cartridge has the same ballistic characteristics as the 35 Newton. It is slightly more powerful than the 30-06 220 grain cartridge and has much more power than the 348 Winchester, 35 Winchester and 35 Remington.

284 REMINGTON MAGNUM

This cartridge is almost identical with the 300 Magnum.

308 REMINGTON MAGNUM

This cartridge is more powerful than the 300 Magnum but is not as powerful as the 375 Magnum. It would probably be a small sales volume item.

COMMENTS ON
PROPOSED NEW CENTER FIRE CARTRIDGES

359 REMINGTON MAGNUM

This cartridge compares with the 375 Magnum but has a slightly lower velocity and lower 300 yard bullet energy.

400 REMINGTON MAGNUM

This cartridge is somewhat more powerful at 300 yards than the 375 Magnum.

450 REMINGTON MAGNUM

This cartridge is more powerful than the 375 Magnum.

THE DONALDSON WASP

This cartridge has the same characteristics as the 224 Remington but has a rimmed case.

22 HIGH VELOCITY (G. R. McCormick)

This cartridge has the same ballistic characteristics as the 224 Remington but has a larger case. Personnel in the Ammunition Technical Division are not familiar with this cartridge and considerable investigation work is needed.

333 OKH

This cartridge, with its different bullet weights, has approximately the velocity and energy of the 350 Remington, 375 Remington and 400 Remington Magnums but has a much smaller case. Much additional investigation work would be necessary to determine if this would be a practical cartridge to load and sell. Such problems as sensitivity, pressure and load techniques would require thorough investigation.

ELW:MR
9-18-45

35839
AL 0030178

TABULATION SHOWING BALLISTICS OF NEW CENTER FIRE CARTRIDGES COMPARED TO OBJECTIVE

.222 REMINGTON

.224 REMINGTON

Exhibit C-4

	Green Board 11-8-48 .220 Rem. 45 gr. S.F. (Approx.)	Dec.-1948 Report .222 Rem. 45 gr. S.F.	May, 1949 Development .222 Rem. 45 gr. S.F.	Green Board 11-8-48 .224 Rem. 45 gr. S.F. (Approx.)	Dec.-1948 Report .224 Rem. 45 gr. S.F.	May, 1949 Development .224 Rem. 45 gr. S.F.
Velocity-Muzzle		3110	3160		4000	3954
Instrumental	3000		3000	4000 — 3800		3800
100 yds.		2850	2850		3455	3380
200 "			2700			2854
300 "			1870			2378
500 "			1100			1698
Energy - Muzzle		1030	1036		1990	1942
100 yds.		776	714		1510	1419
200 "			470			1012
300 "			287			702
500 "			129			317
Pressure-Max.Aver.(10)			50000			51000
Trajectory-Bullet Drop						
100 yds.						
200 "						
300 "						
Accuracy-M.R.-200 yds.			1.5"			1.5"

GHJ:dd
3-24-48

AL 0030179

361239

.380 REMINGTON

Green Board
11-8-46 Products Committee

Dec. - 1946
Report

Exhibit C-4
May - Oct. 1947
Development

.280 Rem.
139 Pt.S.P.
Proposed Cartridge
(Approx.)

.280 Rem.
135 Msh.
Proposed Cartridge
(Approx.)

.280 Rem.
175 Pt.S.P.
Proposed Cartridge
(Approx.)

.380 Rem.
150 S.P.
Core Lekt

.380 Remington -
150 S.P. 150 S.P. 150 Pointed
Core Lekt Core Lekt Core Lekt

Velocity-Muzzle

Instrumental 3150
100 yds.
200 "
300 "
500 "

3000

2930

2930

2908

3148

3175

2900

3000

3065

2834

2628

2775

2709

2215

2440

1937

1876

2150

1517

1393

1685

Energy - Muzzle

100 yds.
200 "
300 "
500 "

2930

2810

2857

2908

2180

2123

1991

2220

1623

1415

1717

1250

1015

1333

765

560

819

Pressure-Max.Aver.(10)

50000

52000

Trajectory-Bullet Drop

100 yds.
200 "
300 "

2.3"

2.0"

1.9"

10.0"

9.0"

8.4"

24.9"

23.3"

20.9"

GHJ:dd
3-24-48

37239
AL 030180

CC: S. M. Alvis A. J. Greene
G. M. Calhoun W.F.H. Mattlage
H. K. Faulkner J. J. Phillips
K. G. Gilmore (5) A. J. Seckner
Ilion Tech. File

ADVICE OF PHYSICAL COMPLETION

Technical Department

WORKS - Ilion

DATE - 12/19/49

PROJECT - FD-721

TO: G. W. Radley

FROM: K. C. Gilmore

SUBJECT: MODEL 721-722 BOLT ACTION HIGH POWER
CENTER FIRE RIFLE

All work having been completed on this project, it is now being physically closed in its entirety.

[Signature]
Arms Technical Division

Requested by

[Signature]
Approved by

m1
12/19/49

AL 0030181

38239

CC: W. E. Gregg

Ilion, New York
April 14, 1948

TO: W. G. Barckel
FROM: K. C. Gilmore
SUBJECT: PROJECT PD-721 Part III
MODEL 721-722 BOLT ACTION HIGH POWER CENTER
FIRE RIFLE

We are transmitting herewith forty nine (49) copies of the subject Project. The copy containing Ilion's signatures has been forwarded to W. E. Gregg, as per his request, for review prior to securing the Bridgeport signatures.

I would suggest that you contact Mr. Gregg and have him turn over the copy containing the signatures to you for circulation at Bridgeport so that all necessary approvals are secured.

(SIGNED) K. C. GILMORE

K. C. Gilmore
Supervisor-Control Unit
Ilion Technical Division

ml
att. 49

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS

Distribution: C. B. Workma
C. E. Ritchie
J. W. Brooks
J. P. Linde

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RESEARCH TEST and MEASUREMENT REPORT - Report No. 830423

M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

Prepared by: C. E. Ritchie

Date Prepared: 2-12-83

Proofread and Cleared By:

J.H. Hennings / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature

Date

PLAINTIFF'S
EXHIBIT

3354

11836
AL 0030245

February 12, 1983

TO: C. B. WORKMAN
FROM: C. E. RITCHIE
REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION

ABSTRACT

Recently, Production received M/700 Trigger Connectors from the vendor which were slightly (0.001" to 0.003") out of specification. Process Engineering, through J. W. Brooks, Supervisor Current Products Design, requested the Test Lab to determine whether this dimensional difference would adversely affect the safe operation of the Trigger Assembly and ultimately the M/700 rifle itself.

SCOPE OF TEST

To evaluate the out of specification M/700 Trigger Connector by testing 4 specially prepared M/700 rifles, 2 rifles with a minimum stack-up of dimensional tolerances and 2 with a maximum stack-up of dimensional tolerances.

(Refer to sketches in Appendix "A" Page 3 and 4.)

TEST RESULTS

All four (4) test rifles went through the dry cycle, live fire and drop test with no trigger related malfunctions.

(Refer to Appendix "A" Page 1 and 2 for individual results.)

REPORT TEXT

1. All four (4) test rifles reached 25,000 dry cycles with no trigger related malfunctions.
2. All four (4) test rifles were Jack Fired 100 live rounds using Remington 180 grain P.S.P. Cal. .308 ammo. with no trigger related malfunctions.
3. All four (4) rifles were pendulum drop tested, against both a neoprene and a hardwood backstop, at the three foot level in the following modes:

Muzzle First - with Safe "On" and with Safe "Off"	
Butt First - " " " " " " " "	
Left Side - " " " " " " " "	
Right Side - " " " " " " " "	

There were no trigger related malfunctions (firing pin did not fall) in any of the test rifles during the drop test.

4. At finish of test the following measurements were taken: Trigger Pull, Safe "On-Off" and Sear Lift. Present Remington Specs. are:

Trigger Pull	-	3.0 to 5.0 lbs.
Safe "On - Off"	-	None Established
Sear Lift	-	.005" to .018"

NOTE: It was noted that the two min. condition test rifles had a higher reading on Trigger Pull, Safe "On - Off" and Sear Lift tests than the two max. condition rifles.

Refer to Appendix "A" for individual results.

SECRET

H

TEST PROCEDUREA. Measurements

Sear Lift was measured at the conclusion of dry cycle, live fire and drop tests.

B. Test Conditions

1. All four (4) test rifles were dry cycle tested on the 4 cock and fire dry cycle machines in the R & D Test Lab Dry Cycle Room.

All rifles were lubricated liberally with DuPont Teflon Wet Lubricant, in and around the Bolt Cocking Cam surface, Sear Safety Cam (top), and the Trigger Housing inspection hole every 5,000 cycles starting at 0 cycles.

2. After dry cycle testing, all 4 rifles were live round fired 100 rounds each with Remington 180 grain P.S.P. ammunition. All rifles were shot 20 rounds each, then allowed to cool/able to touch with the hand until all 100 rounds had been shot.
3. A drop test was then conducted on all four rifles at the 3 foot test height, on both hardwood and neoprene backstops from the muzzle, butt and both sides.
4. Sear Lift was then measured using the optical comparator in the R & D Model Shop.

C. Ammunition

Remington 180 grain P.S.P. Code R308W3.

D. Rifles used in the test:

Remington M/700, 1983 Restyle, Cal. .308

Rifle No. 8	Serial No. B6440493	(Min. Condition)
Rifle No. 5	Serial No. B6438179	" "
Rifle No. 7	Serial No. B6438908	(Max Condition)
Rifle No.	Serial No. B6438658	" "

ALEXANDER K S I C H

" A P P E N D I X " A "

Report No. 830423

M-700 Modified Trigger Connector

J. Baggetta

2-12-83

Data Sheet No 1

Gun No.	1	2	3	4	5	6
	Min.	Min	MAX	MAX	Test Results	
Dry Cycles	25000	25000	25000	25000	OK	
Rounds Fired	100	100	100	100	OK	
Rem 180gr PSP						
Drop Test						
Neoprene Pad						
Muzzle First						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
BUTT First						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
Right Side						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
Left Side						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
Drop Test						
Hardwood Pad						
Muzzle First						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
BUTT First						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
Right Side						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		
Left Side						
Safe ON	OK	OK	OK	OK		
Safe OFF	OK	OK	OK	OK		

SEAR Lift .0205" .0265" .0070" .0060"

Remington

Spec. SEAR Lift .005" to .018"

AL 0030251

6/36

REPORT #830423

M/700 MODIFIED TRIGGER CONNECTOR

2-12-83

R. HOWE

DATA SHEET No. 2

GUN No.	1	2	3	4	5
	MIN	MIN	MAX	MAX	REMINGTON SPEC.
CONDITION	CONDITION	CONDITION	CONDITION	CONDITION	
TRIGGER PULL POUND FORCES (RESULT OF THREE MEASUREMENTS)	5.9 LBS.	5.3 LBS.	4.9 LBS.	5.2 LBS.	3.0 to 5.0 LBS.
SAFE "ON" POUND FORCES (RESULT OF THREE MEASUREMENTS)	11.1 LBS.	16.5 LBS.	6.0 LBS.	6.2 LBS.	NONE ESTABLISHED
SAFE "OFF" POUND FORCES (RESULT OF THREE MEASUREMENTS)	9.3 LBS.	8.8 LBS.	5.0 LBS.	8.0 LBS.	NONE ESTABLISHED

AL 0030252

7/34

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
GEAR	C	.1975- .198	.1975- .198	.1975- .198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975- .198	.1865
	D	.8705- .871	.870- .8695	.8705- .871	.8655	.8655	.8645	.870- .8695	.863	.865	.871	.869- .8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072- .0715	.071- .0705	.071	.071	.071	.074	.071	.071	.074	.072- .0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

B6438179

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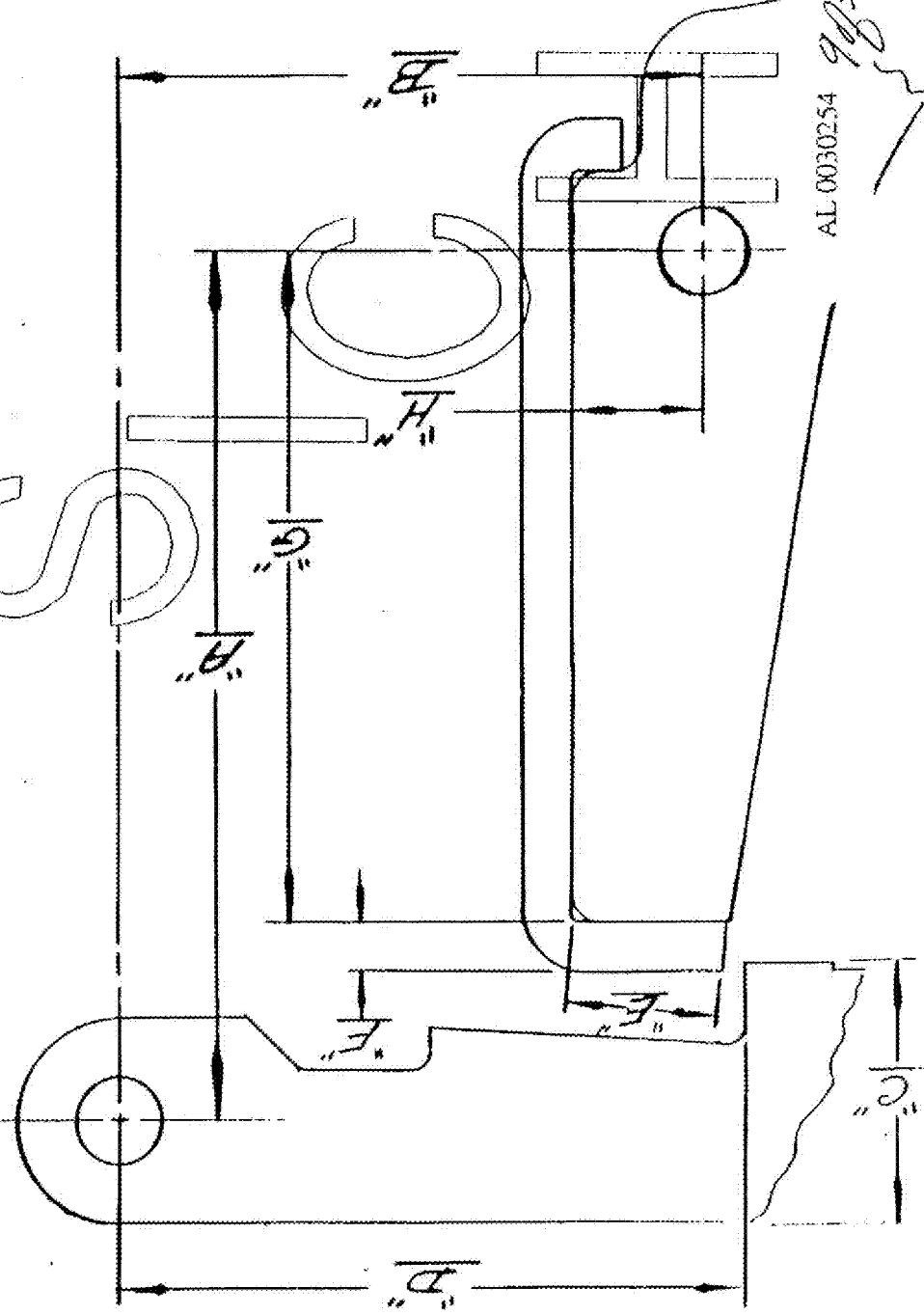
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AL 0030253

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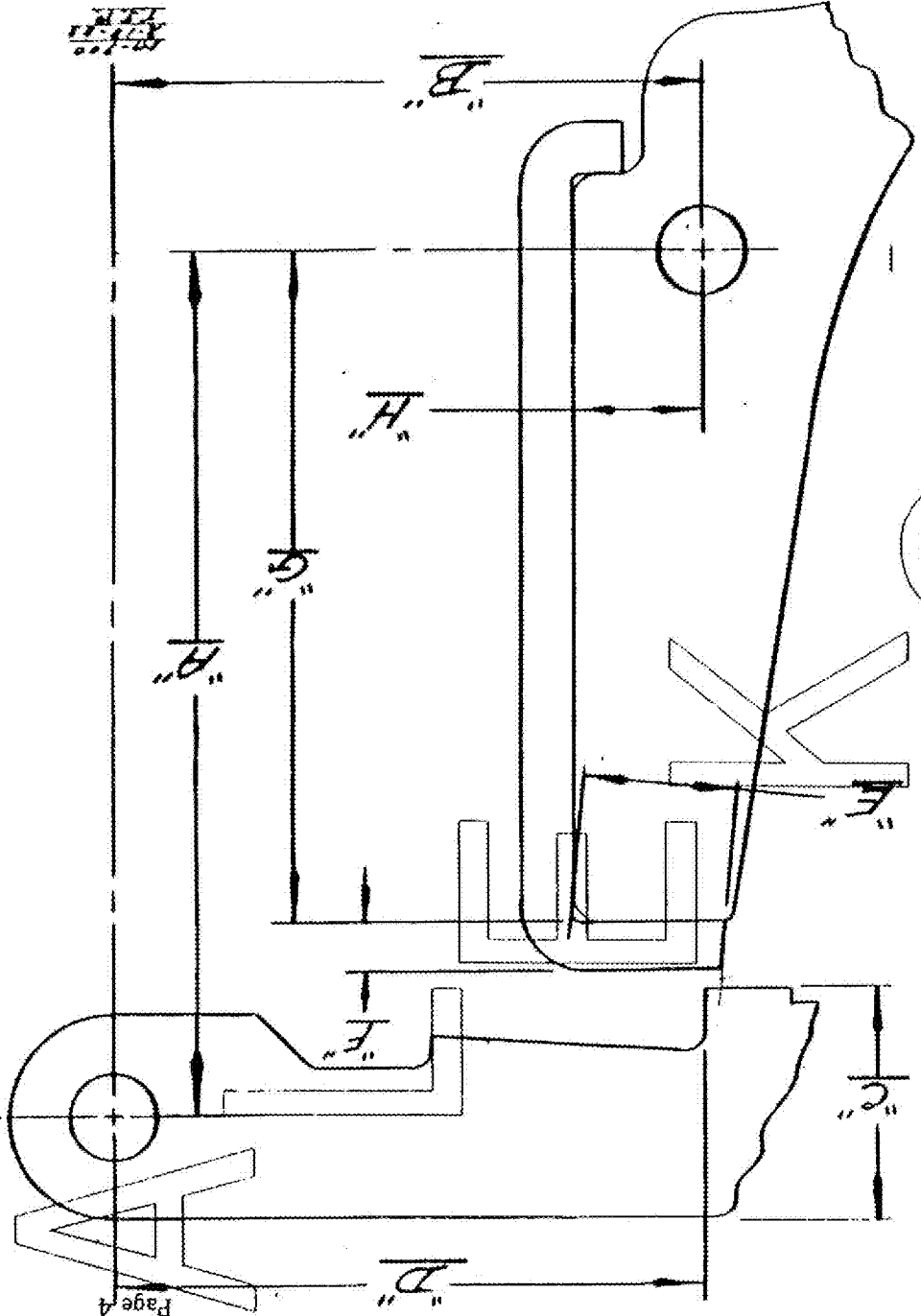
Condition No. 1



AL 0030254

9806

Condition No. 2



Page 4

2-21-8

Report No. 830423
C. E. P. vie

Report No. 830423

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

		AREA OF TESTING	
<input type="checkbox"/> Developmental		<input type="checkbox"/> Safety Related	<input type="checkbox"/> Location
<input type="checkbox"/> Design Assistance		<input type="checkbox"/> Competitive Evaluation	<input type="checkbox"/> Warehouse Audit
<input type="checkbox"/> Pre-Pilot		<input type="checkbox"/> New Design	<input type="checkbox"/> Cost Reduction
<input type="checkbox"/> Pilot		<input type="checkbox"/> Design Change	Scale: _____
<input type="checkbox"/> Production Acceptance		<input checked="" type="checkbox"/> Plant Assistance	<input type="checkbox"/> Other _____

FIREARM STAT'S.		REPORT REQ'D.		DATE REQUESTED: <u>2-11-83</u>	
MODEL: <u>700</u>		FORMAL	<input checked="" type="checkbox"/>	DATE NEEDED BY: <u>2-14-83</u>	
CAL or GAGE: <u>AW4</u>		TEST RESULTS ONLY	<input type="checkbox"/>	REQUESTED BY: <u>J. LINDE</u>	
BARREL TYPE: <u>—</u>				WORK ORDER NO: <u>G0460-000X</u>	
PROOFED: YES <input type="checkbox"/> NO <input type="checkbox"/>					

TEST TYPE					
<input type="checkbox"/> Strength Test	<input type="checkbox"/> Ammunition Test		<input checked="" type="checkbox"/> Dry Cycle Test	<input type="checkbox"/> Photo/Video	
<input checked="" type="checkbox"/> Function Test	<input type="checkbox"/> Environmental Test		<input type="checkbox"/> Measurements	<input type="checkbox"/> Other _____	
<input type="checkbox"/> Accuracy Test	<input type="checkbox"/> Customer Complaint		<input checked="" type="checkbox"/> Endurance Test		

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

- Dry cycle rifles with single Trigger assemblies
⑦, ⑩ and ④, ⑤ to 25,000 cycles
- Shoot 100 rounds in each shooting + check for any Trigger related malfunctions
- Drop test from 3' on the muzzle, Butt, + sides, check for rifle firing.

UNS REQUIRED: 4New trigger connector (mm./max)
conditions.

(Test Results to go to CB Workman immediately)

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: _____

TEST COMPLETED BY: _____

REPORT DATE: 10/7/86

AL 0030255

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington

PETERS

Distribution: C. B. Workman
C. E. Ritchie
J. W. Brooks
J. P. Linde

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

RESEARCH TEST and MEASUREMENT REPORT - Report No. 830423
M/700 MODIFIED TRIGGER CONNECTOR EVALUATION Supplement No. 1

Prepared by: R. Howe
Date Prepared: February 23, 1983

Proofread and Cleared By:

J.H. Hemmings, / R.E. Nightingale,
Foreman-Test Lab / Foreman-Measurement Lab

Signature

Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature

Date

AL 0030256

11/8/36

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 830423

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION
Supplement No. 1

MODEL(S): 700

GAUGE OR CALIBER: .308

DATE: 2/23/83

WORK ORDER NO.: G-0460-000X

PART NAME: Trigger Connector

DESIGNER/ENGINEER: J. W. Brooks

TEST TYPE:

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED 7
4. ACCURACY TEST (NO. OF GUNS TESTED) _____
5. MEASUREMENTS - TYPE: Sear Lift Safe "On-Off", Trigger Pull
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: 7

Dry Cycle Rounds - 25,000

NO. OF ROUNDS PER GUN: 100

Total Dry-Cycle Rounds - 175,000

TOTAL ROUNDS FIRED IN TEST: 700

AMMO TYPE: MAGS. _____; TARGET: _____

RIM FIRE _____ CENTER FIRE X

February 23, 1983

TO: C. B. WORKMAN

FROM: R. W. HOWE

REPORT TITLE: M/700 MODIFIED TRIGGER CONNECTOR EVALUATION
Supplement No. 1

ABSTRACT

Recently R & D Test Lab received seven (7) more M/700's with trigger connectors from the vendor which were slightly (0.001" to 0.003") undersized. Process Engineering through J. W. Brooks, Supervisor, Current Products Design, requested a follow-up test of these assemblies to supplement the original Report No. 830423 of February 12, 1983, to determine whether this dimensional difference would adversely affect the safe operation of the trigger assembly or the M/700 rifle itself.

SCOPE OF TEST

To evaluate the undersized M/700 trigger connector by testing seven (7) specially prepared M/700 rifles. Three (3) rifles would have a minimum stack-up of dimensional tolerances and four (4) would have a maximum stack-up of dimensional tolerances.

Refer to sketches in Appendix "A".

TEST RESULTS

At no time during the entire test of the seven (7) M/700 rifles, with the specially prepared fire controls, did any trigger related malfunctions occur.

REPORT TEXT

1. Sear Lift measurements were taken and recorded on all seven (7) test rifles before dry-cycling.
2. All seven (7) test rifles were dry-cycled to 25,000 cycles each with no trigger related malfunctions.
3. Sear Lift, Safe "On-Off" pound forces and trigger pull measurements were taken at the conclusion of 25,000 each dry-cycle test.

Present Remington Specs are:

Sear Lift - 0.005" to 0.018"

Safe "On-Off" forces - none established

Trigger Pull - 3.0 lbs. to 5.0 lbs.

4. The seven (7) rifles were then Jack Fired 100 live rounds each using Remington 180 grain P.S.P. ammo. with no trigger related malfunctions.
5. All seven (7) rifles were then pendulum drop tested against both a neoprene and a hardwood back stop at the three foot level in the following modes:

Muzzle first with Safe "On" and with Safe "Off"

Butt first with Safe "On" and with Safe "Off"

Left side with Safe "On" and with Safe "Off"

Right side with Safe "On" and with Safe "Off"

NOTE: It was noted that the three ^{minimum} ~~minute~~ condition test rifles had a higher reading on trigger pull, Safe "On-Off" and Sear Lift measurements than the four maximum condition rifles.

Refer to Appendix "A" Data Sheets for individual results.

TEST PROCEDURE

A. Measurements:

1. Sear Lift was measured at the start and the conclusion of the dry-cycle test.
2. Safe "On - Off" forces and trigger pull measurements were taken at the conclusion of the dry-cycle test.

B. Test Conditions:

1. Sear Lift was measured on all seven (7) rifles at the start of the test using the optical comparator in the R & D Model Shop.
2. All seven (7) test rifles were dry-cycle tested on the four cock and fire dry-cycle machines in the R & D Test Lab Dry-Cycle Room. Each rifle was lubricated liberally with DuPont Teflon Wet Lubricant in and around the bolt cocking cam surface, sear safety cam (top) and trigger housing inspection hole every 5,000 cycles starting at 0 cycles.
3. Sear Lift, Trigger Pull and Safe "On - Off" forces were then taken on the seven (7) rifles; Sear Lift—using the above mentioned optical comparator. Trigger pull was taken using a Chatillon Model In-10 Spring Pull Scale. Safe "On-Off" forces were measured using a Chatillon DPP - 25 lb. Push-Pull Scale.
4. After above measurements were taken, all seven (7) rifles were live fire jack tested 100 rounds each with Remington 180 grain P.S.P. Ammunition in the R & D Lab Shooting Room. All rifles were shot 20 rounds each, then allowed to cool (able to touch with the hand) until all 100 rounds had been shot.
5. A Pendulum Drop Test was then conducted on all seven (7) rifles at the three foot test height on both hardwood and neoprene back stops from the muzzle, butt and both sides.

C. Ammunition:

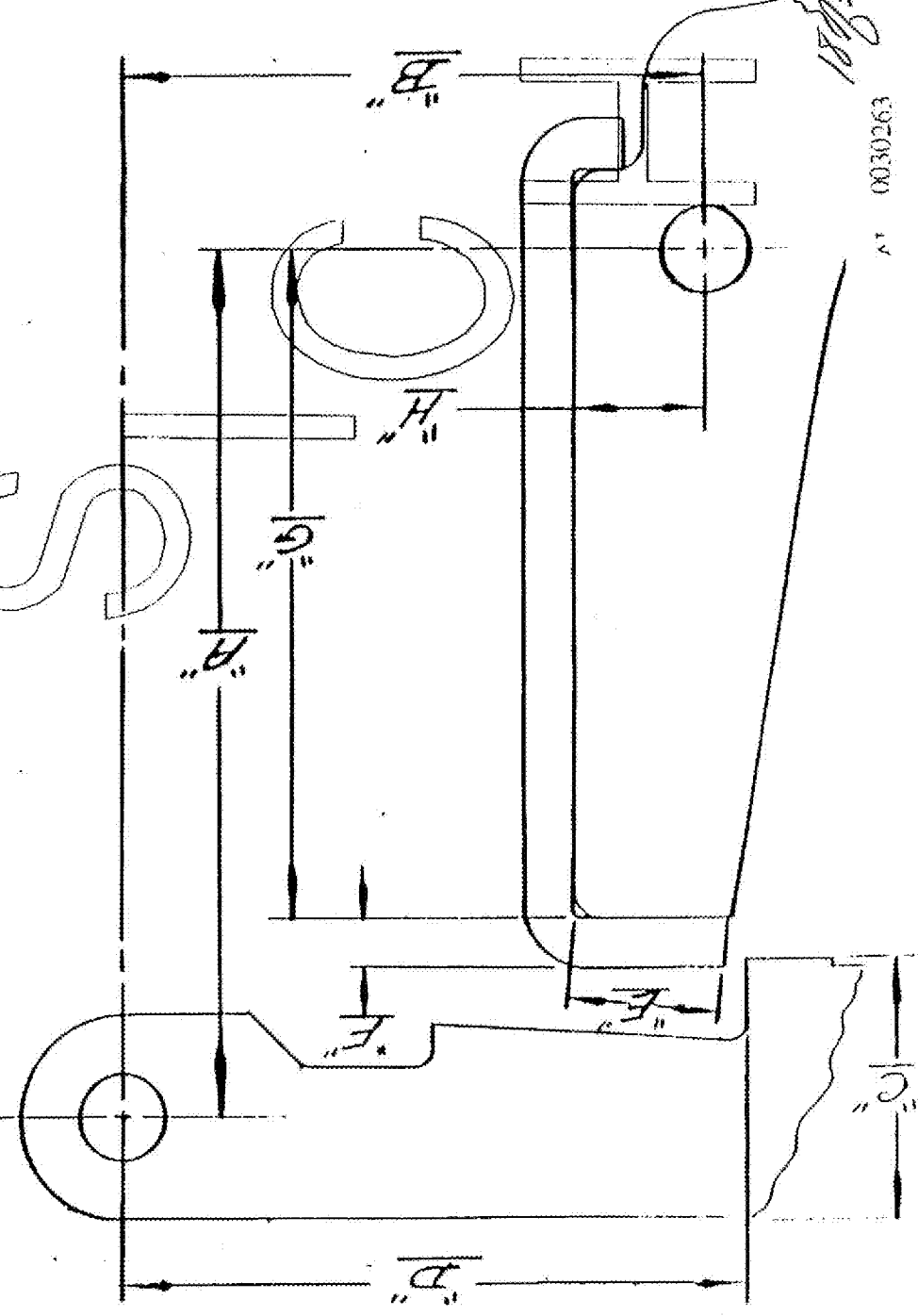
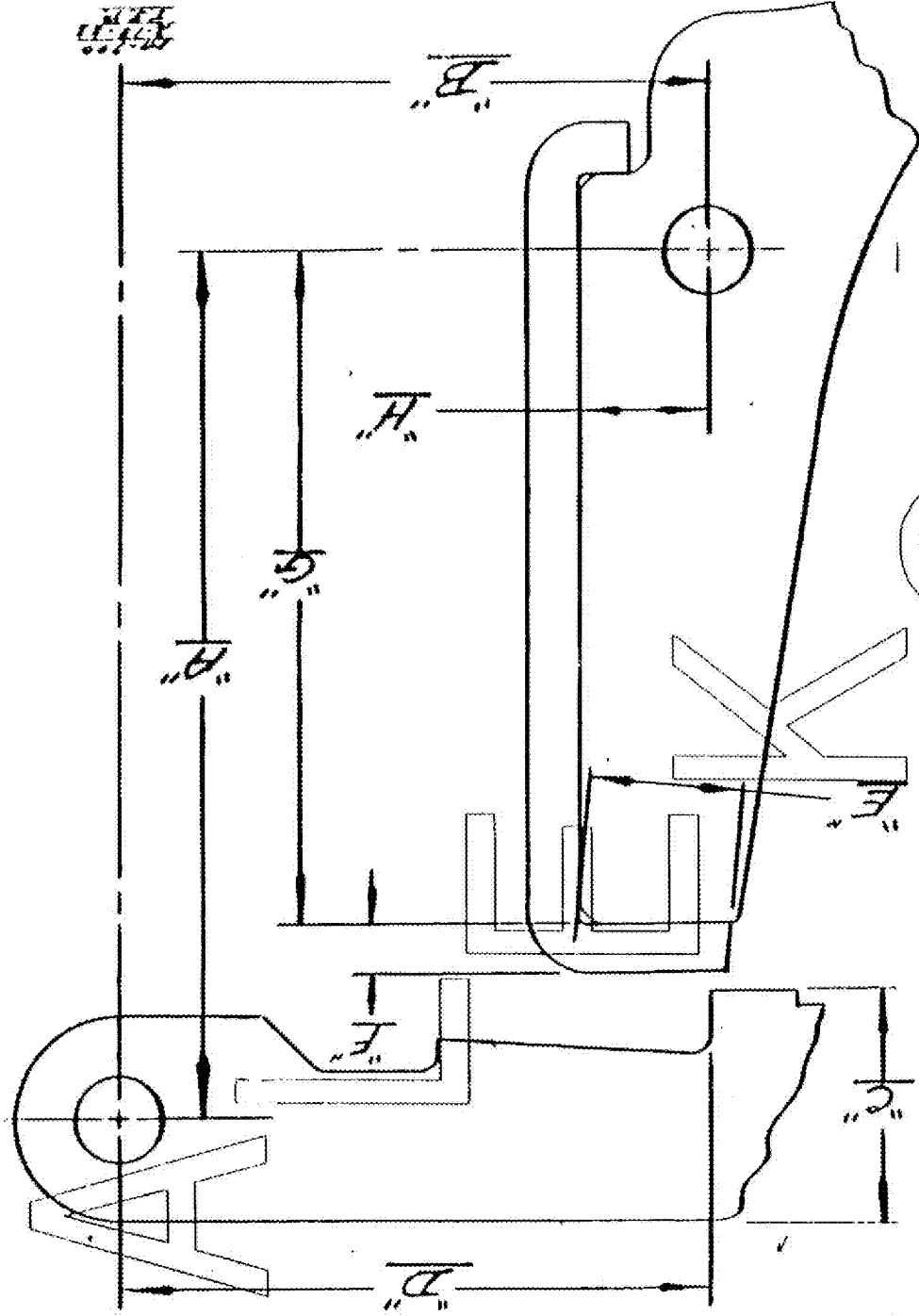
Remington .308 cal. 180 grain P.S.P. Code R-308W3.

D. Rifles used in test:

Rifle No. 2	Serial No. B6440199	Max. Condition
Rifle No. 3	Serial No. B6440277	
Rifle No. 11	Serial No. B6440458	
Rifle No. 1	Serial No. B6440172	Min. Condition
Rifle No. 9	Serial No. B6438686	
Rifle No. 4	Serial No. B6438163	
Rifle No. 6	Serial No. B6439730	

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"APPENDIX "A"



CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		①	②	③	④	5	⑥	7	8	⑨	10	⑪	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
GEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186
		B6440172	B6440199	B6440277	B6438163		B6439730			B6438686		B6440458	

AL 0030264

JWR:jn
2/18/83

19836

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☐ FOR ENVELOPE

DATE

2/22

R. Howe

Evau

From	To	Date and	Date and	Forwarded
Initials	Initials	Time	Time	Per Your
Address	Address	To File	In Sender	Request

Pls hold onto
this material
in the file

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DON'T SAY IT-WRITE IT

R30425

***To _____ Location _____
***From _____ Location _____ Phone No. _____
***Subject _____ Date _____

FIRE CONTROL OR PACKET #	# 8	SERIAL # B6440493	PACKET # 8	} DONE
	# 5	# B6438179	# 5	
	# 7	# B6438908	# 7	
	# 10	# B6438658	# 10	
	# 9	# B6438686		
	# 4	# 6438163		
	# 6	# 6435730		
	# 2	# 6440199		
	# 3	# 6440277		
	# 11	# 6440458		
# 1	# 6440172			

S I C H

G-38 82V. 10-67

SECURITY IS EVERYONE'S RESPONSIBILITY

227/236

AL 0030269

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
REAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1855	.1855	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

WR: JA
7/10/03

23036

AL 0030270

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
GEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

WIR: ja
7/10/83

24836

AL (03027)

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
GEAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

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AL 0030272

CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
REAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

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7/10/83

AL 0030273

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CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
REAR	C	.1975-.198	.1975-.198	.1975-.198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975-.198	.1865
	D	.8705-.871	.870-.8695	.8705-.871	.8655	.8655	.8645	.870-.8695	.863	.865	.871	.869-.8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072-.0715	.071-.0705	.071	.071	.071	.074	.071	.071	.074	.072-.0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

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1/18/83

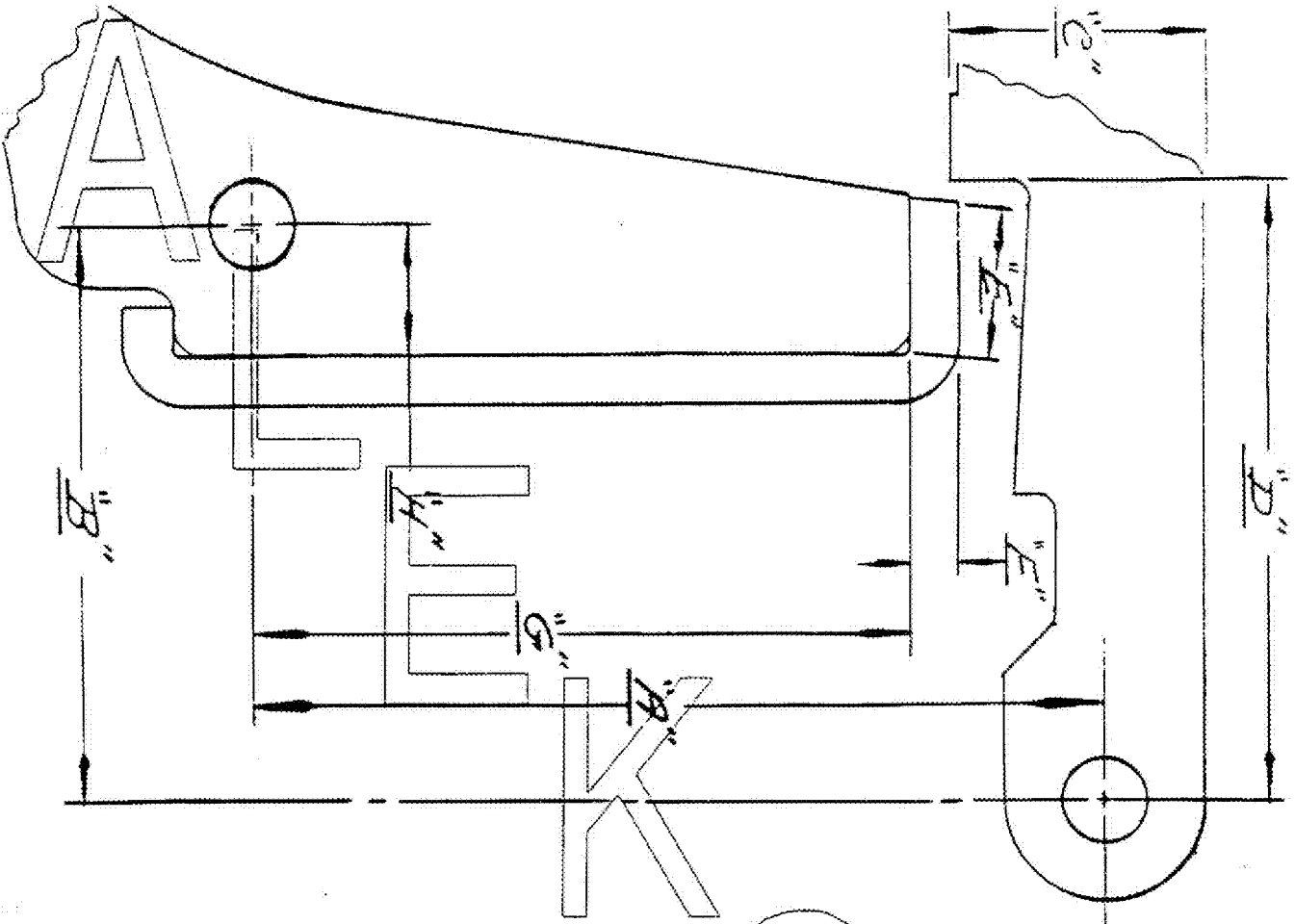
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	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
GEAR	C	.1975- .198	.1975- .198	.1975- .198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975- .198	.1865
	D	.8705- .871	.870- .8695	.8705- .871	.8655	.8655	.8645	.870- .8695	.863	.865	.871	.869- .8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072- .0715	.071- .0705	.071	.071	.071	.074	.071	.071	.074	.072- .0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

AL 0030274

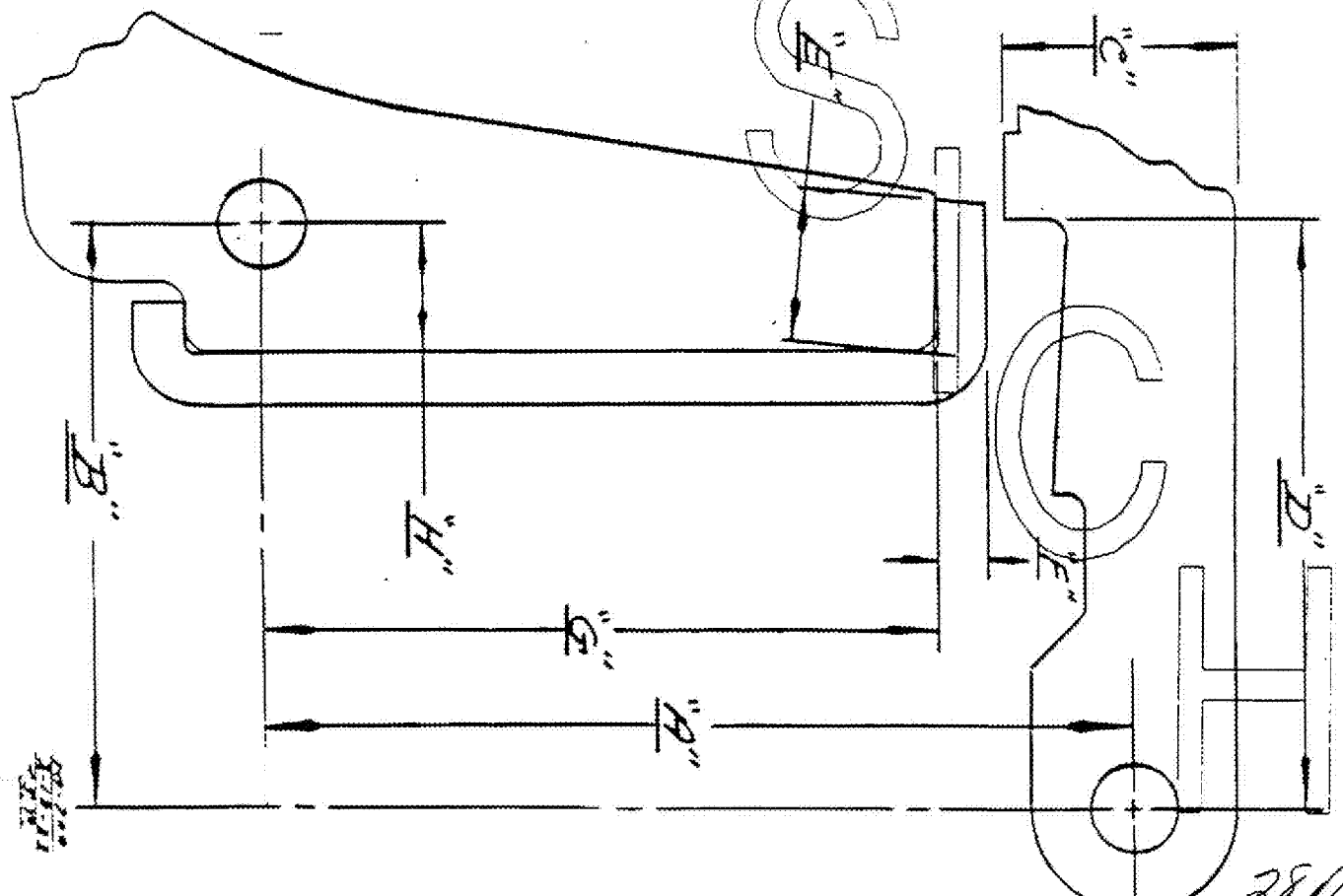
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100-10
1/11/03

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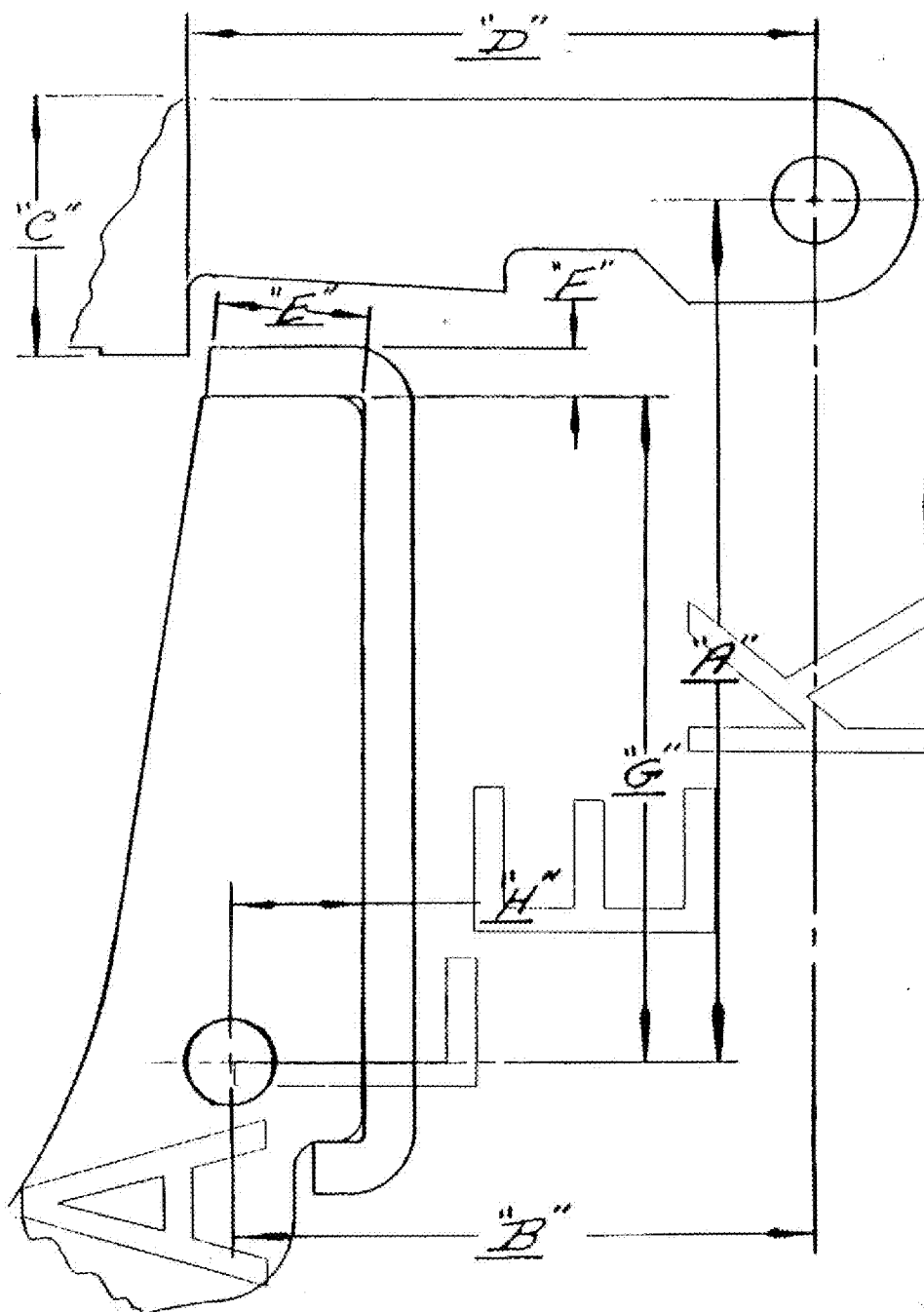


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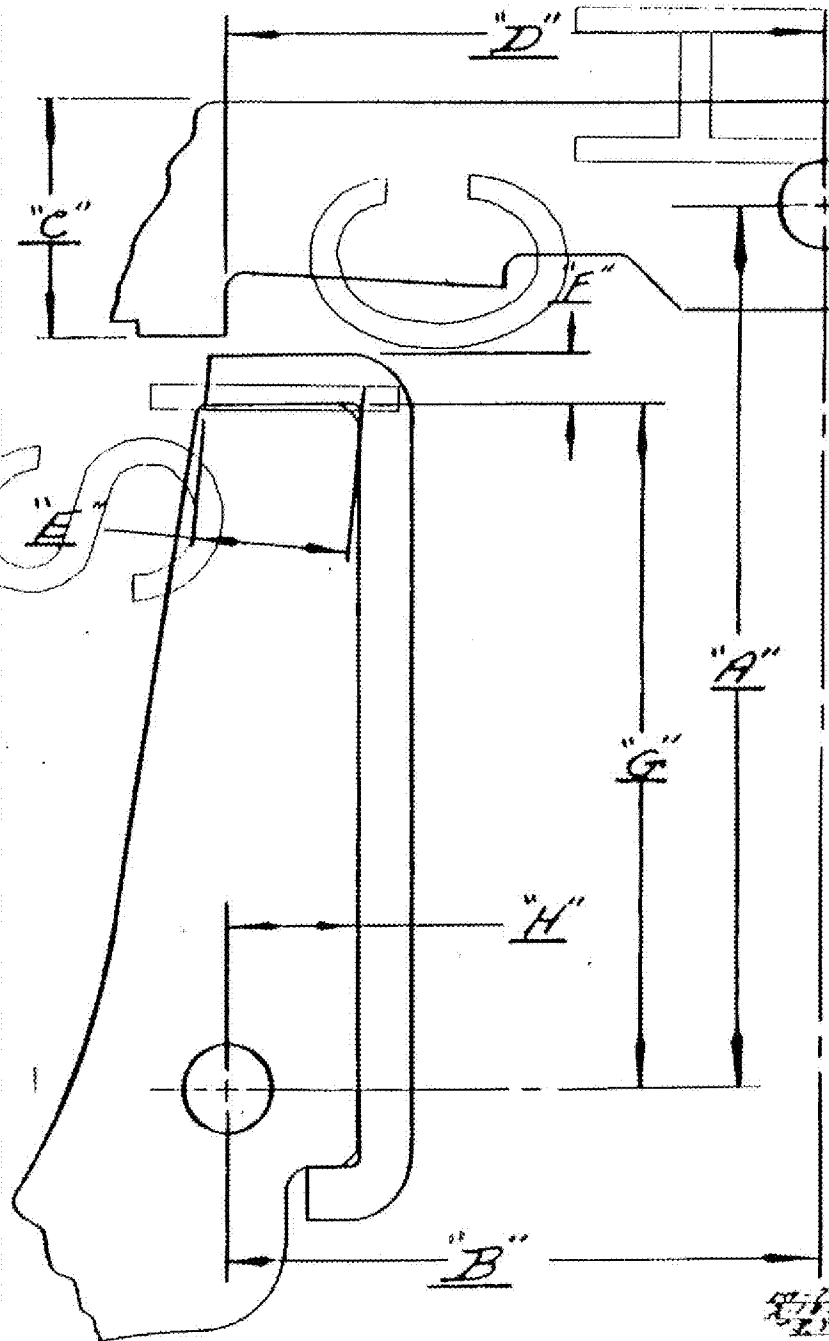


28836

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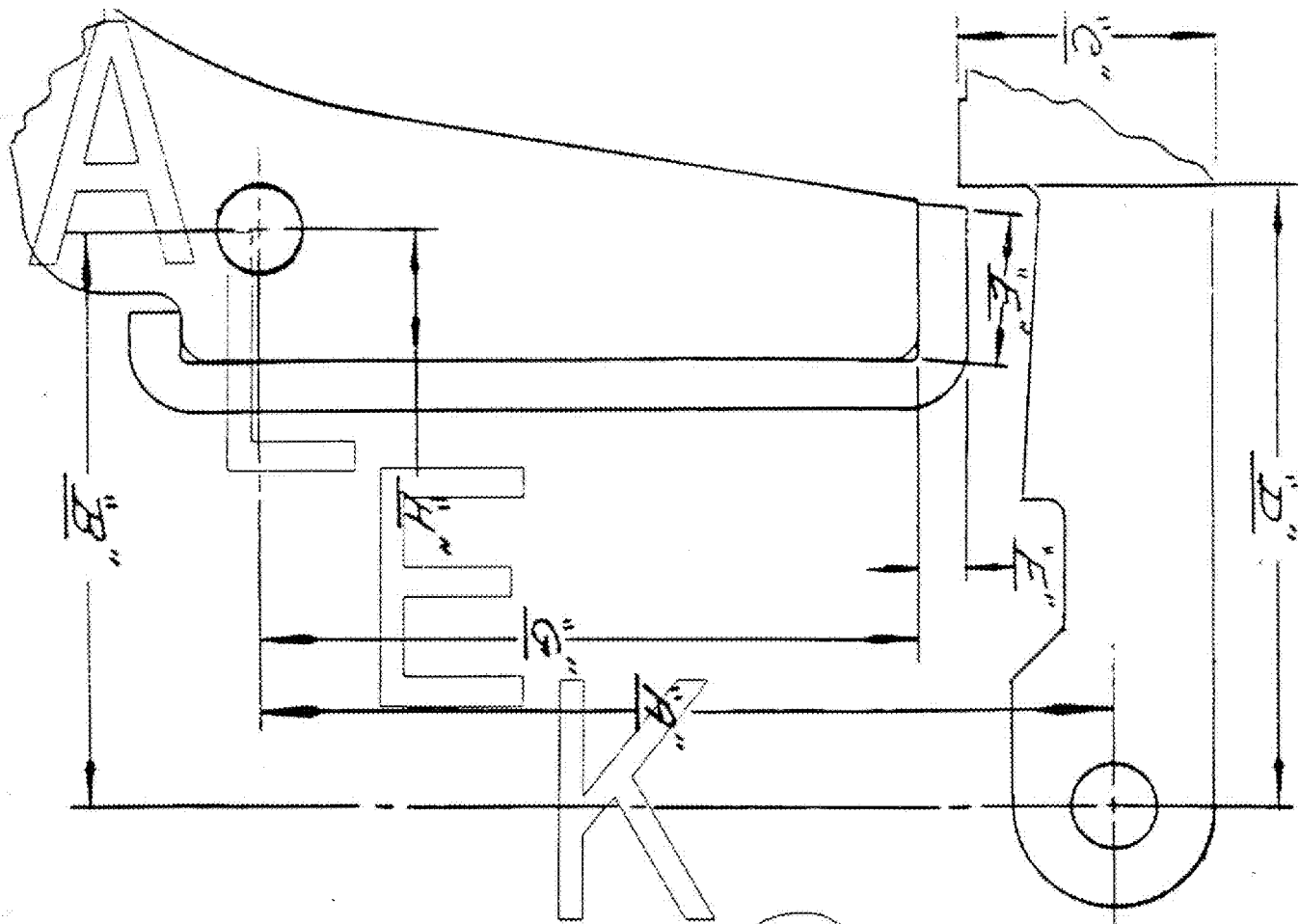
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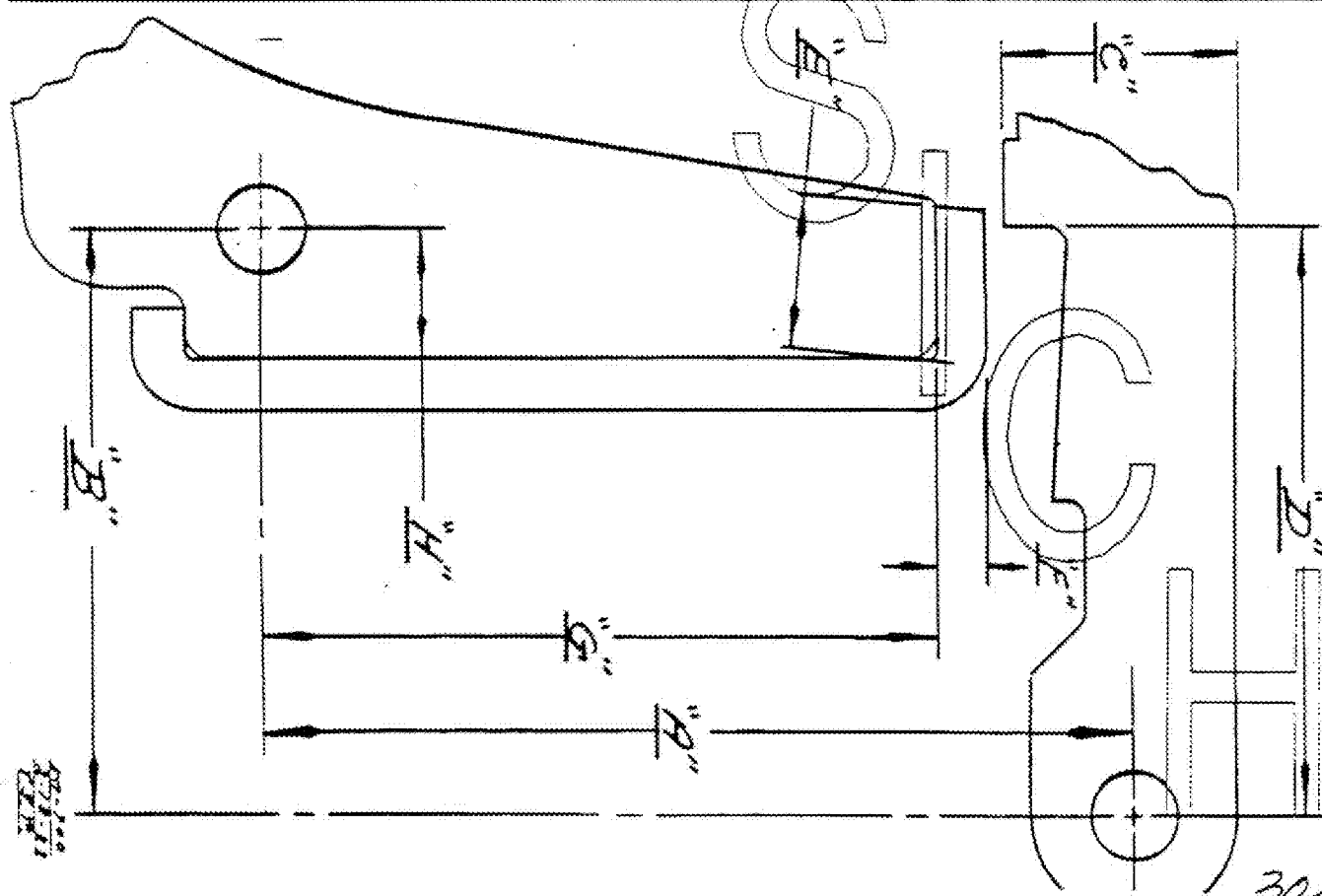
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AL 0030276

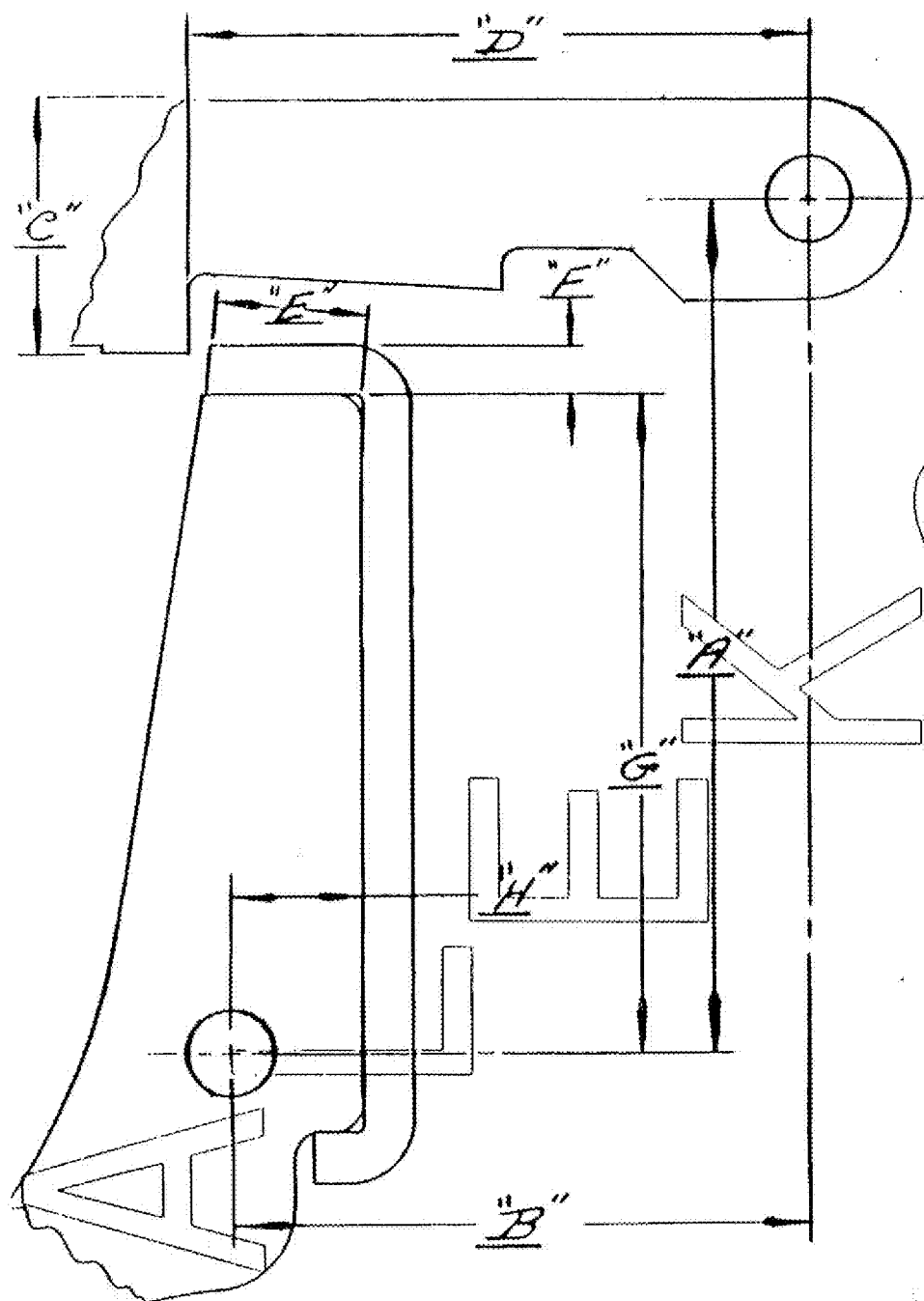
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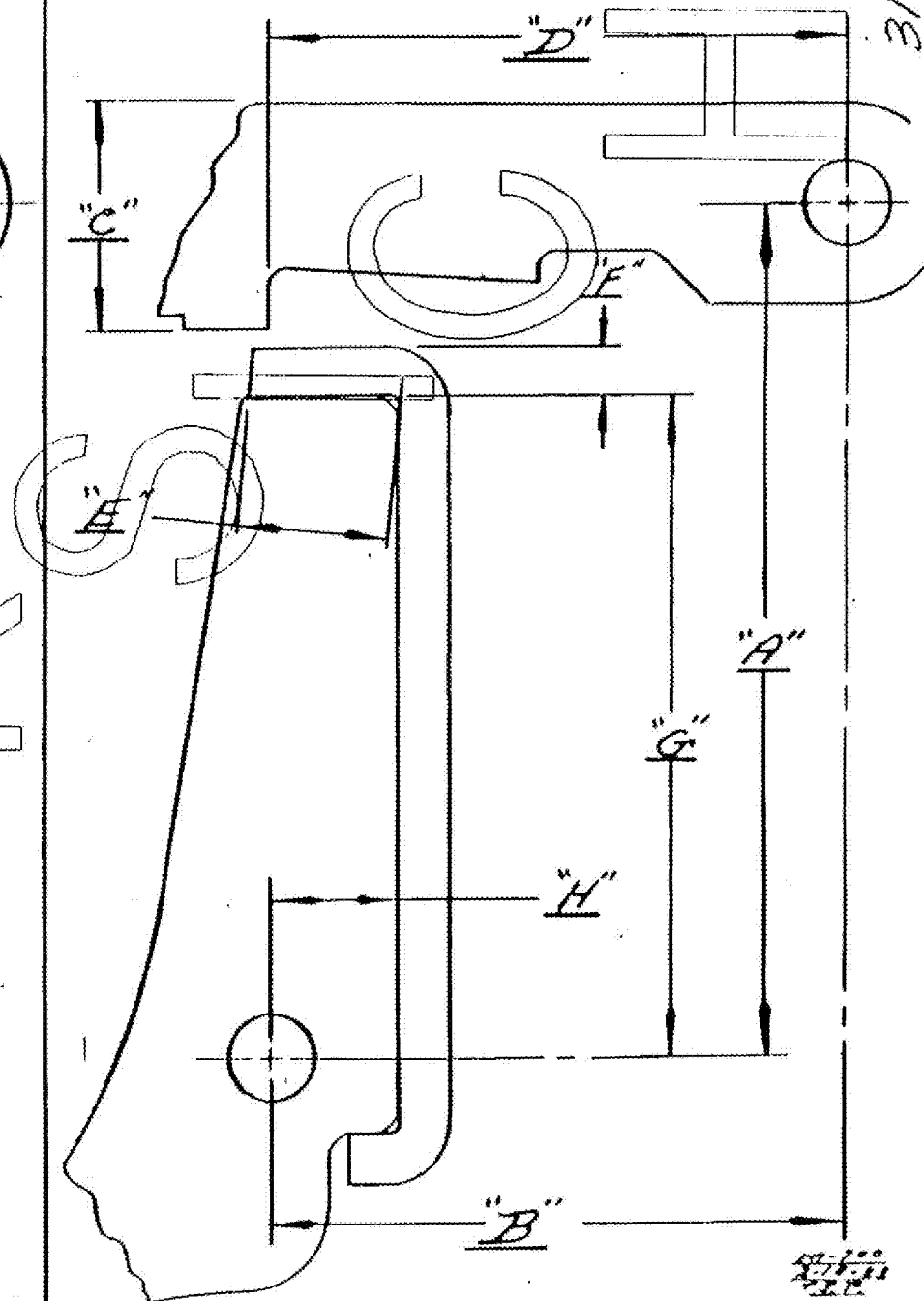
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CONDITION No. 1



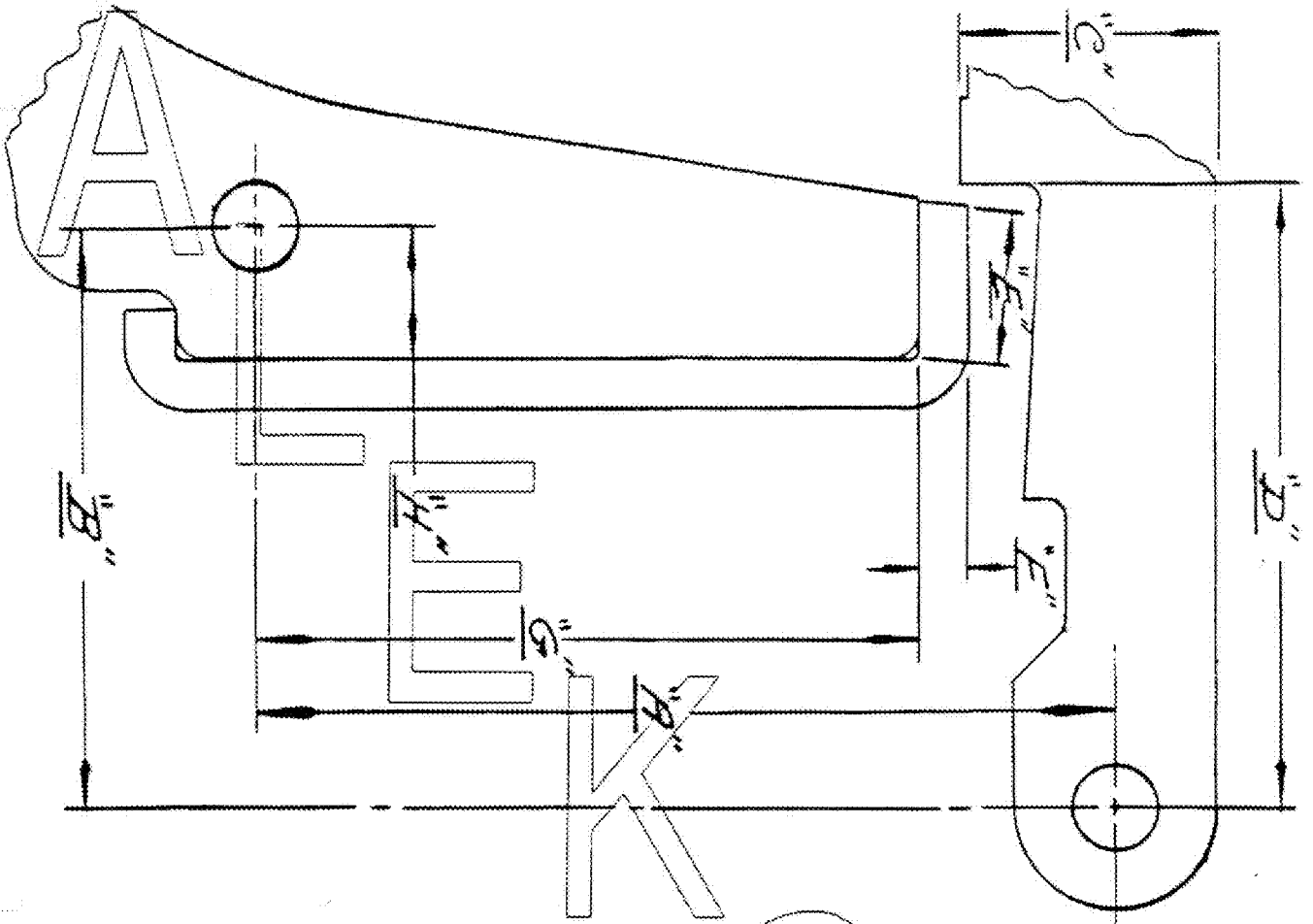
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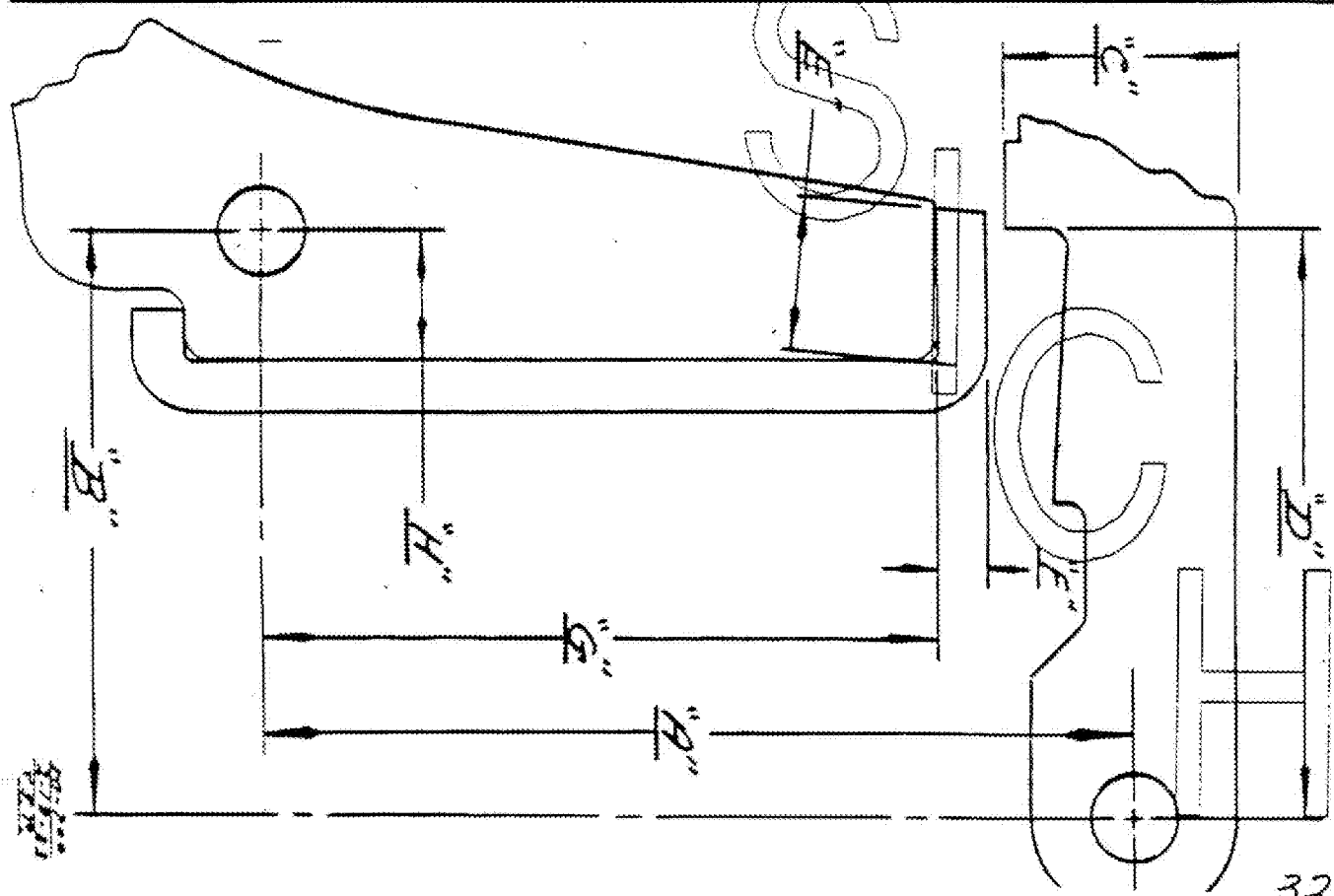
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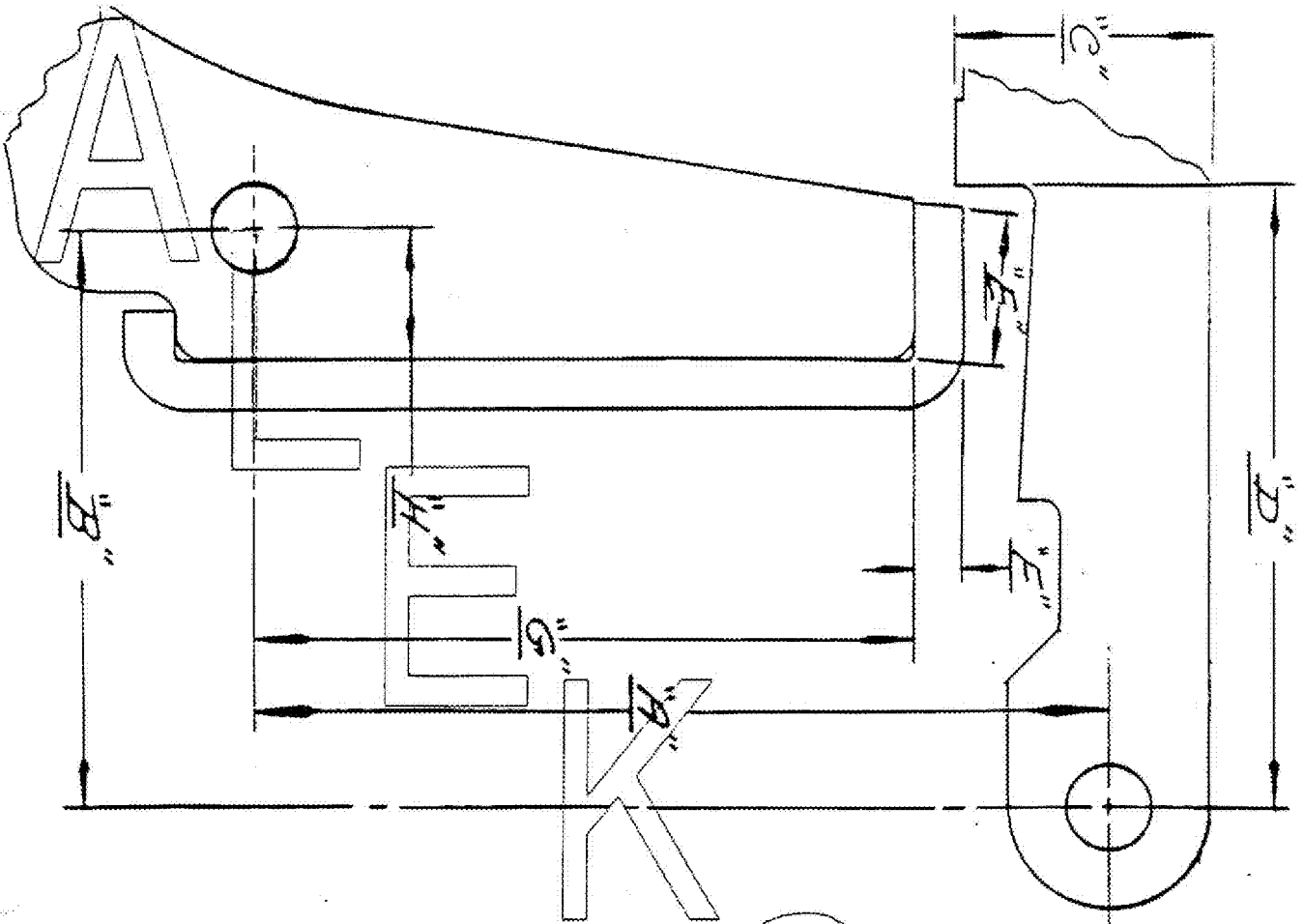


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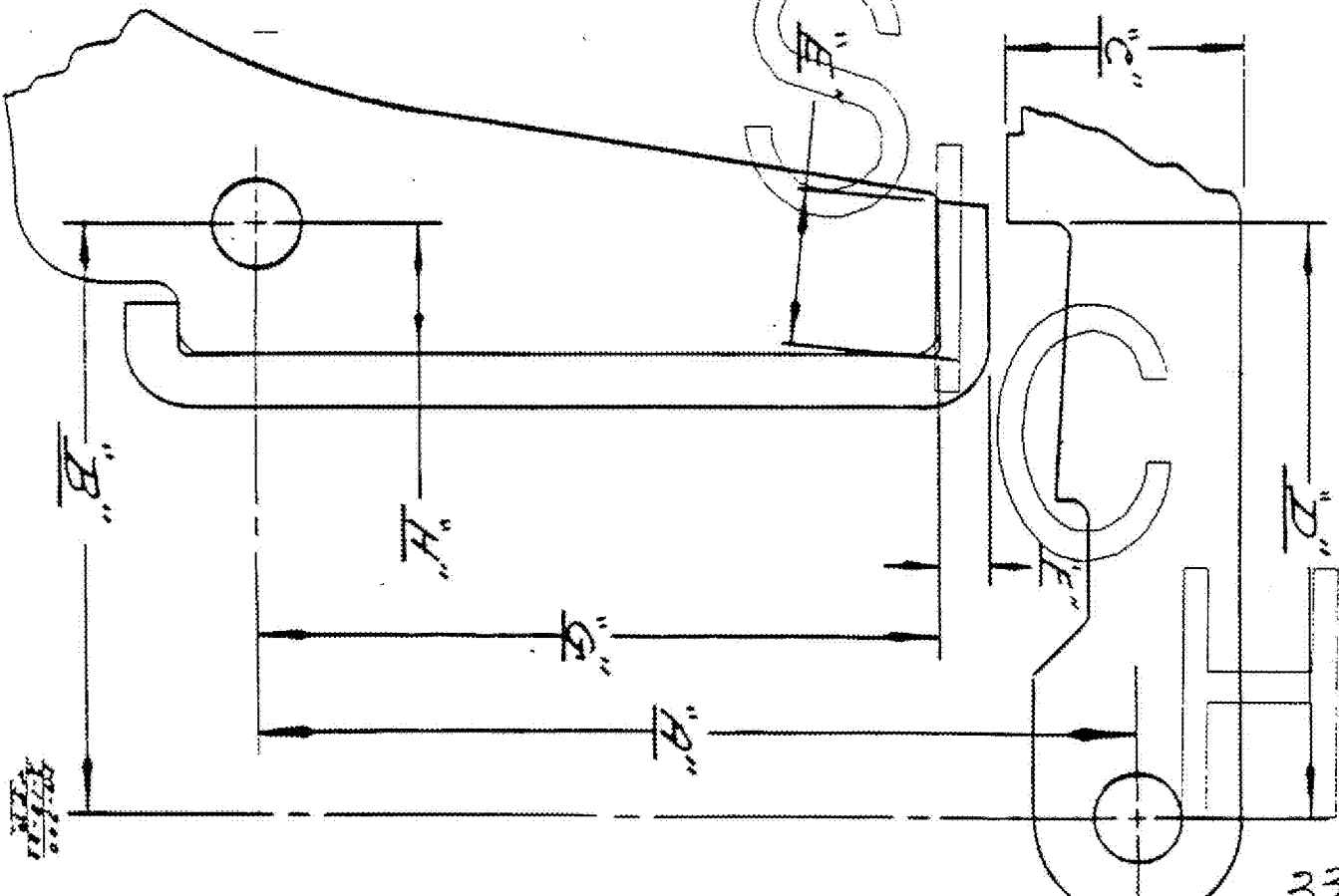


32834

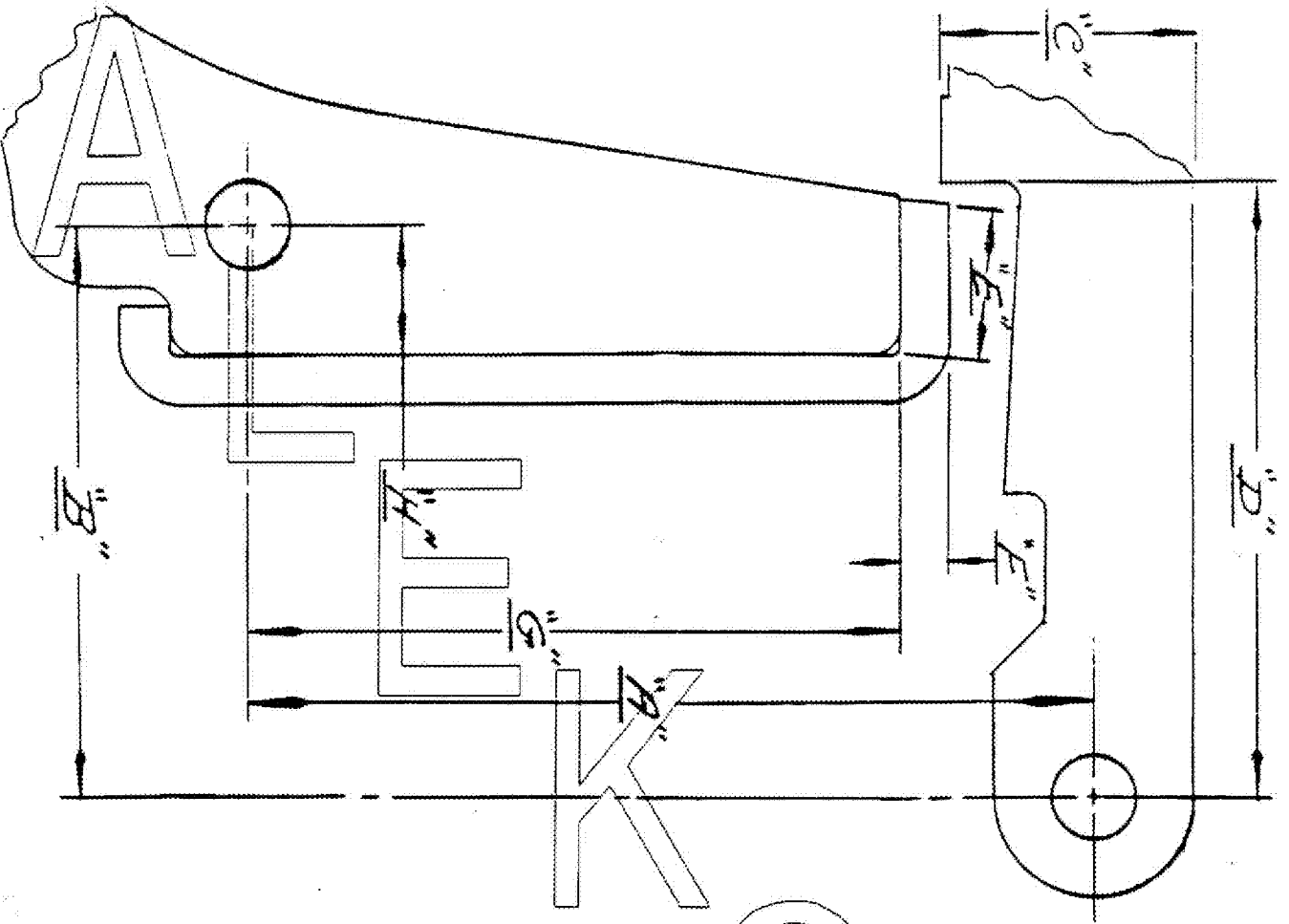
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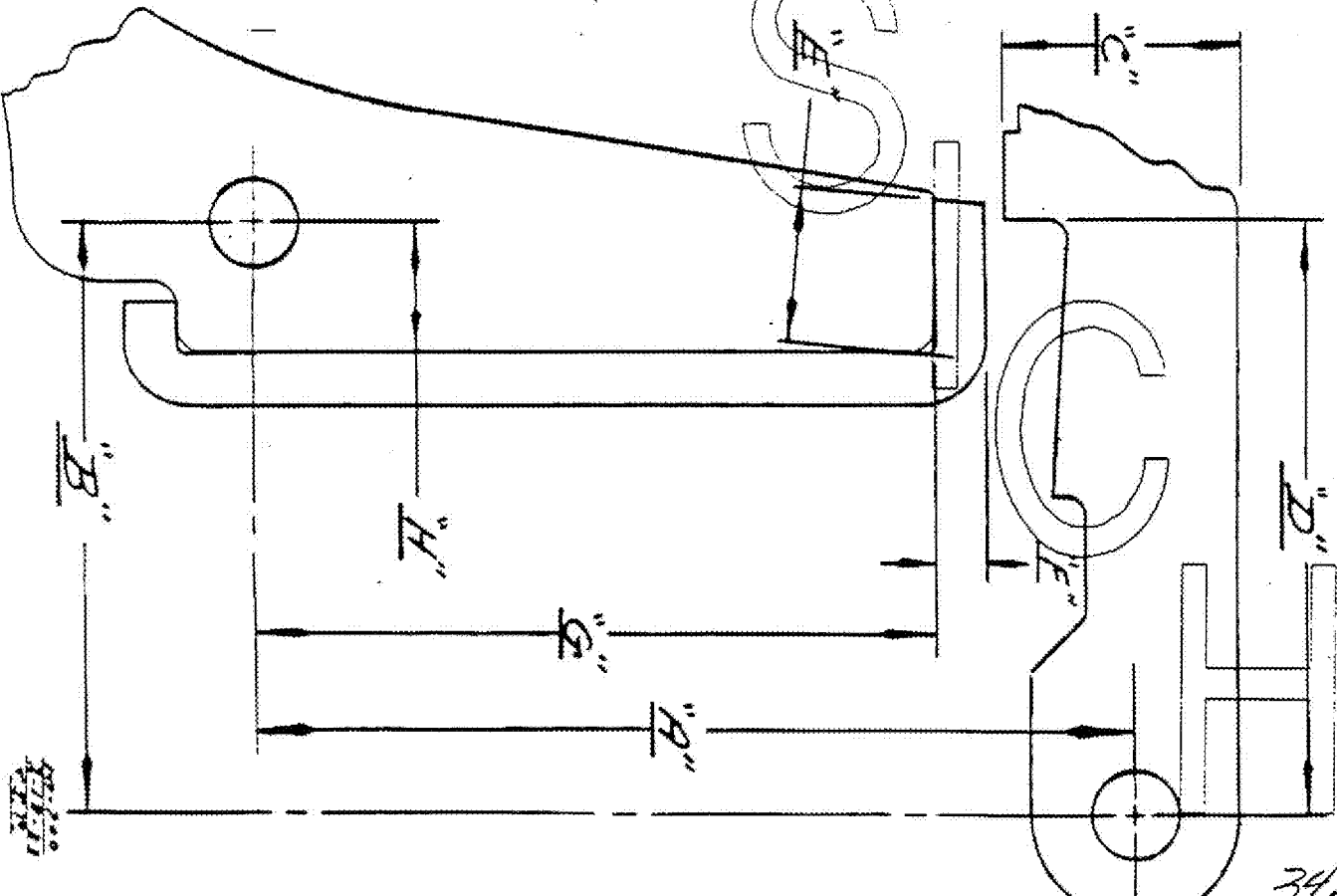
Condition No. 2



Condition No. 1

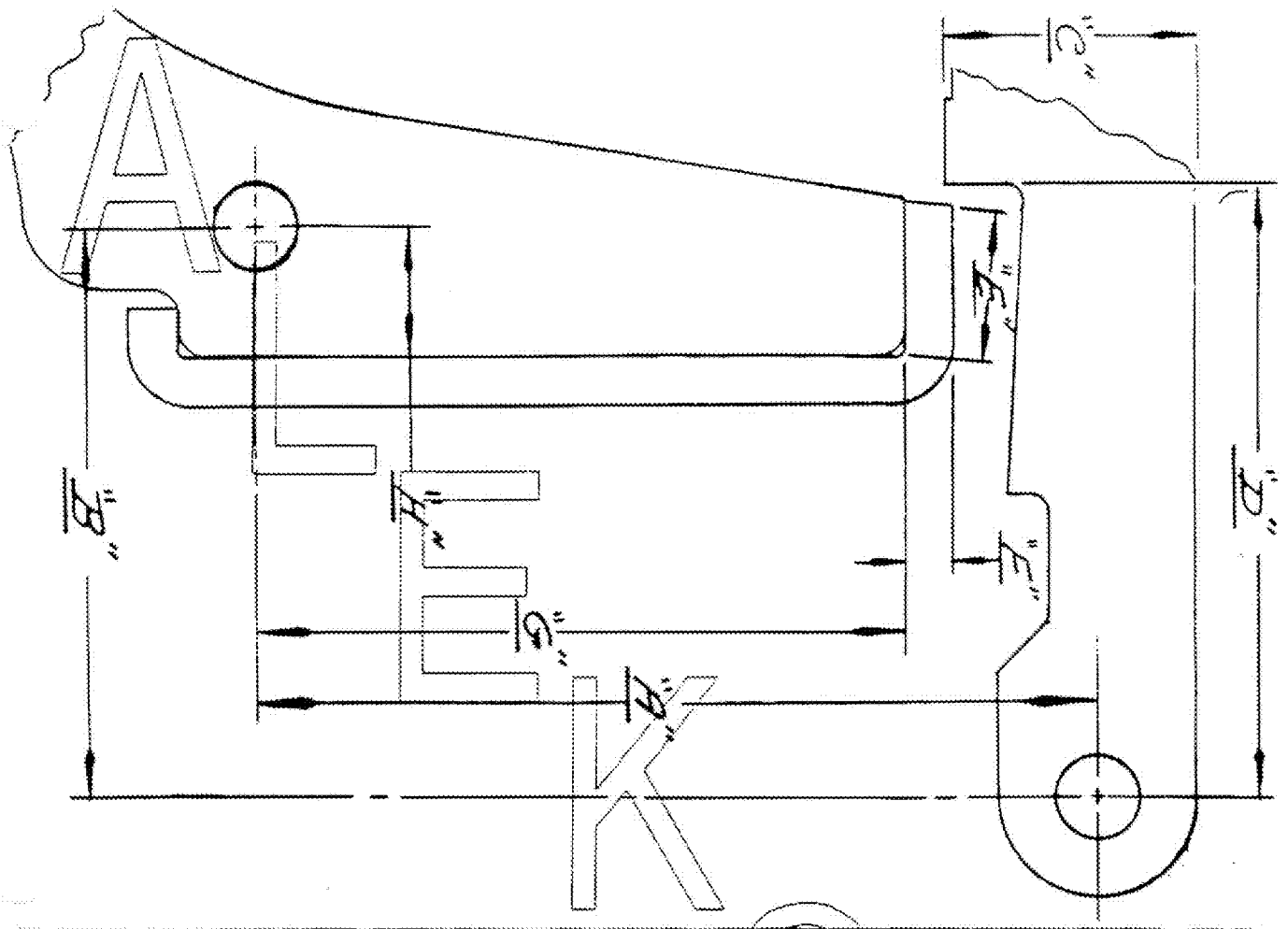


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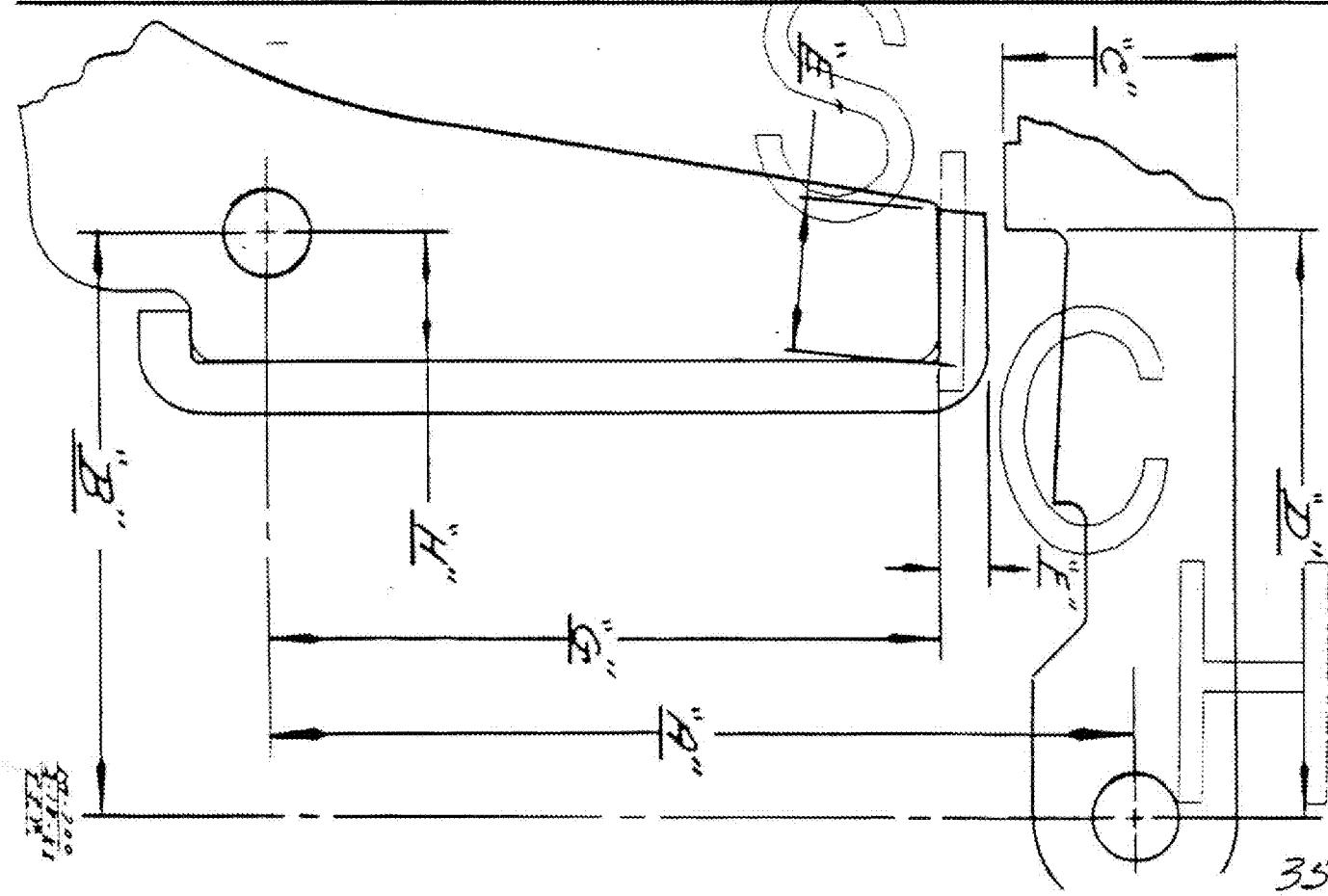


34/1/36

Conditioed No. 1



Conditioed No. 2



CONDITION NO.		1	1	1	2	2	2	1	2	2	1	1	2
TRIGGER HOUSING ASSEMBLY NO.		1	2	3	4	5	6	7	8	9	10	11	12
	Dim.												
HOUSING	A	1.2395	1.2385	1.2395	1.241	1.2405	1.240	1.2385	1.2385	1.2405	1.240	1.238	1.2395
	B	.8395	.839	.8395	.841	.8415	.841	.840	.8405	.8405	.8385	.839	.842
REAR	C	.1975- .198	.1975- .198	.1975- .198	.186	.1865	.1865	.1975	.1855	.1855	.1975	.1975- .198	.1865
	D	.8705- .871	.870- .8695	.8705- .871	.8655	.8655	.8645	.870- .8695	.863	.865	.871	.869- .8695	.8645
CONNECTOR	E	.215	.215	.215	.225	.225	.225	.215	.225	.225	.215	.215	.225
	F	.074	.072- .0715	.071- .0705	.071	.071	.071	.074	.071	.071	.074	.072- .0715	.071
TRIGGER	G	.972	.975	.975	.967	.967	.967	.9725	.967	.967	.9725	.975	.967
	H	.190	.190	.190	.186	.186	.186	.190	.186	.186	.190	.190	.186

OWN: js
5/18/83

AL 0030283

36836

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SAFORDPETERS
SAFORDcc: W.E. Leek
J.S. Martin - J.C. Hutton
File

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
July 19, 1973

TO: C.B. WORKMAN
FROM: A.A. HUGICK
DATE: JULY 13, 1973
SUBJECT: MODEL 700 - 30/06 (SERIAL NO. 6630859)
1000 ROUND PROOF EVALUATION TEST
WORK ORDER: C-1404
TEST PERIOD: JUNE 7, 1973 through JUNE 21, 1973

INTRODUCTION:

One Warehouse Model 700 - 30/06 Caliber Rifle was submitted to the Ilion Research Proof Test Technique. Min. proof specifications ammunition was fired in the first 25% of testing and max. proof specifications ammunition was fired in the balance of testing. Engineering and test data obtained is to be used for comparison with the new design center fire rifle.

TEST OBJECTIVE:

Evaluate the Model 700 - 30/06 bolt action rifle performance when submitted to the Ilion Research Proof Test Technique.

PLAINTIFF'S
EXHIBIT

3355

1003
AL 0030417

TEST OBSERVATIONS:

1. Headspace increased from min. + .001 to min. + .004 in the first five hundred rounds of testing and remained constant throughout the balance of testing.
2. Magna-Flux of the barrel and locking system at each inspection cycle showed no areas of failure.
3. Checks for safety mechanism function at each inspection cycle proved to be satisfactory.
4. Check for primer marking and disconnect system for function do not apply to the bolt action rifle design.
5. This test rifle had out of specifications firing pin indent and the stock crack near end of test.

INSPECTION:

1. Headspace
2. Firing pin indent - trigger pull
3. Visual inspection
4. Check "safety" for function
5. Design area inspection (magna-flux barrel and locking system)

INSPECTION CYCLE:

- | | | |
|----|------|-------------------------------|
| 1. | 0 | Total fired proof test rounds |
| 2. | 50 | |
| 3. | 100 | |
| 4. | 250 | |
| 5. | 500 | |
| 6. | 750 | |
| 7. | 1000 | Total fired proof test rounds |

CHECK "SAFETY" FOR FUNCTION:

1. With safe on -- gun closed on empty chamber -- pull trigger -- release trigger -- check for hammer fall (three trials)
2. With safe on -- gun closed on empty chamber -- pull trigger -- release trigger -- move safe to off position -- check for hammer fall (three trials)
3. With safe on -- bolt open -- hold trigger back -- let gun close on empty chamber -- release trigger -- check for hammer fall (three trials)

CHECK "DISCONNECT SYSTEM" FOR FUNCTION:

1. With safe off -- bolt open -- hold trigger back -- let gun close on empty chamber -- release trigger -- check for hammer fall (three trials)
2. Set adjustable headspace gage at min. + .100 -- place in chamber -- manually and slowly allow bolt to rest on headspace gage -- pull trigger -- check for hammer fall (three trials).

CHECK "PRIMER MARKING" ON CLOSING (CRUSHER):

Safe on -- allow bolt to close on copper crusher -- measure primer marking (three trials)

AAH

A.A. Hugick:sp
Measurement/Test Lab
Illion Research Division
Attach.



TROPHY POINTERS

By BOB HAGEL

Hunting Rifle Safeties

Aug - 9 1970

E. F. ONIENIEWICZ OPINIONS OF WHICH type of hunting rifle are as varied as the designs themselves. Many opinions are based on use of a certain type of safety and the fact that the hunter is familiar with it. Long association with a rifle and its safety may blind the owner to any drawbacks it may have. If it has performed well, and he is used to operating it, he may never become aware of faults it may have under some severe weather conditions, or other rigorous use to which it has never been subjected.

If you use a rifle long enough, a poorly located safety becomes so familiar that you never give a thought to the fact that other locations may be handier and faster. And if it has never malfunctioned or given you any other mechanical problem, you may never realize how much trouble it can give under certain hunting conditions, or that it is far from safe.

I won't attempt to cover the mechanical function of the intricate parts of some modern safety systems, because space does not permit. So we'll stick to convenience and reliability under various hunting conditions.

In thinking of reliability and looking back at some of the older safety designs found on both military and sporting rifles made up to 85 years ago, I'm not convinced that we have made much progress as far as safe safeties are concerned. Starting with the original Mauser-type safety found on foreign-made military rifles, and also on our own Krag and Springfield, you'll find a safety that was safe when in the ON position. When the activating lever was rolled over it placed about a quarter-inch of steel through a notch in the striker, at the same time pulling it back so that the sear was disengaged — leaving the trigger free of contact with the striker. There was no way the rifle could fire unless the striker had broke forward of the safety — something somewhat less likely than winning the Irish Sweepstakes.

While the old Mauser-type military safety, which was also used on a number of Mauser sporting actions as well as the Model 34 Winchester, was as safe as a safety could be made, it was neither handy

nor fast. Neither was it practical when a scope sight was mounted low over the bridge. FN solved this problem by extending the finger lever out and curving it down under the scope eyepiece, and some U.S. rifle accessory makers followed suit.

These replacement safeties had a number of disadvantages; they had only two positions, ON and OFF, so in order to open the bolt the safety was completely off even though it did lock the bolt in the ON position. But the biggest problem arose from the fact that the lever movement between ON and OFF was very short. If the rifle was carried on a sling with the safety lever toward the hunter, it was probable that it would soon be moved to the OFF position by rubbing against the clothing. (Some were on the left, some on the right side.)

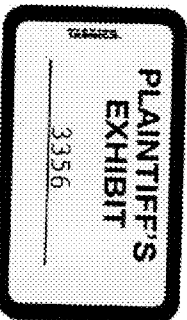
When Winchester replaced the Mauser

34 with the Model 70, the safety was changed for the better. The Model 70 safety has been revamped since that day, and has evolved into what is perhaps the most reliable safety used on a modern bolt action rifle. Often called the "wing" safety, it is in a handy location on the right side of the cocking piece. It is a three-position safety that blocks the striker and locks the bolt in the full ON position, but when pushed to the center position it allows the bolt to be opened while still locking the striker — an excellent feature.

Another very reliable military safety that was adapted to low scope mounting, along with a handy, fast location just behind the bolt handle, was found on the Model 1917 Enfield. That safety rocked forward to FIRE position by a simple push of the thumb, and when it was rocked back to the OFF position a hook grabbed a notch in the side of the cocking piece on the striker and pulled it to the rear to disengage the sear and leave the trigger free. Remington carried this design over to the Model 30 sporter based on the Enfield action. Few modern safeties are as fast and reliable.

The modern version as found on the newer Model 700 Remington has the same handy location and is fast to operate, but it does not lock the striker; it simply blocks release of the trigger. Should something happen within the trigger

(Continued on page 63)



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Winchester Western

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the bedding the next time around? Not doing so would allow pulling down on a part of the action that has no support directly under it and would seem to impart bending stresses on the action detrimental to accuracy.

Dr. James J. Venier
Southfield, Michigan

The Sako Vixen is nothing but a baby Answer, and the bedding should be approached in the same manner as any Mauser action. Dave Hull, a punter bench rest shooter, and holder of many world records and National Championships, once told me that there are two ways to bed a Mauser so it would shoot. One is to bed it loose everywhere except at the normal bearing points, and the other is to bed it so tight that it can't move at all. He also said he hadn't been able to figure out how to get one that right.

I would bed the Sako exactly as the Ruger bedding described in the article in Rifle No. 55; that is, contact should be allowed only on the back side of the recoil lug, the flat back of the recoil lug, and the bottom of the rear tang. Also, the back one inch or so of the barrel should be bedded for about one-third of its diameter. All other areas should be taped to allow clearance so the guard screw tension is applied only to the bedding points. I have a Sako Vixen with a fairly heavy match grade barrel that was bedded in this manner several years ago. I used it for a couple of years as a bench rest rifle, and it still shoots very well.

You mentioned the possibility of stressing the action with the front guard screw if the bedding is relieved under the recoil lug. This doesn't seem to happen, but it is important that this relief be provided. I've seen this proven too many times to be a doubter any longer.

Finally, even the short, stiff rear tang on the Vixen can be warped if the guard screws are used to horse the action down into the bedding compound. Leave enough room around the edges so the compound can squeeze out and the action can be pressed into place without a lot of pressure. If a Sako is properly bedded in this manner, and it still won't shoot, then I'd start looking for some other cause.

Bob Brackney

ANSWERS POLICY

We will be pleased to ask the members of the staff to answer your questions. However, due to their heavy volume of correspondence we must ask that you enclose two dollars and a stamped, self-addressed envelope to partially defray the cost of researching and writing each answer. Please limit each letter to one specific question, for many general questions require a lengthy article to answer adequately, and cannot possibly be answered in a letter. Questions should be addressed to Answering for Answers, Rifle Magazine, P.O. Box 3630, Prescott, Arizona 86302.

Trophy Pointers

(Continued from page 58)

mechanism to cause the safety device to malfunction, the striker is free to fall with the safety in the ON position. Nearly all of the adjustable triggers found on Mauser-type actions, as well as most of the custom adjustable triggers, function on the same principle. They are handy; they are fast; they are quite reliable and cause few accidental discharges — but they do not lock the striker.

Trigger guard safeties, either at the front or rear of the guard, become handy with a little practice and use, but completely safe they are not. I prefer the button located at the front of the guard because there is less danger the trigger finger will accidentally push it to the release position when holding the gun at "ready" position. But even if this does not occur, there is a fair chance that the button will be pushed to OFF by pressure from the arm, clothing or what have you. It is also possible that if the gun is accidentally dropped solidly onto the butt, the jar will cause the safety to release and activate the trigger at the same time, causing an accidental discharge. This will not happen with all actions, either rifle or shotgun with trigger guard safeties, but it will happen with some, especially after extended use. This is not just theory; I've experimented with unloaded guns and found that at least some will release the striker when banged down hard on the butt with the safety on.

As far as speed of operation is concerned, many hunters prefer the shotgun-type tang safety to all others. I agree that they are fast, but to me no faster than the location on the right side just to the rear of the bolt handle. They really shine for the left-handed hunter, regardless of the type of action used. But there are a couple of disadvantages to the tang safety that are not always apparent under certain conditions. To be quick and sure, the tang safety should have a release button that is rough and high enough to afford a sure grip even during cold weather with heavy gloves. But if this feature is present, as on the Model 77 Ruger, and the rifle is chambered for a magnum cartridge, the recoil can tear hell out of your bare thumb if you wrap it around the grip. Some tang safeties are located far enough forward that this does not happen, the Savage Model 99 for example, but that safety button is low and quite smooth, not easy to release with gloves on.

Then there is the safety on the Savage Model 110 that snuggles down in the grooved tang. No danger of bumping your thumb on that one, but there is a great deal of danger you will not be able

to release it when wet snow or rain forms ice on and around it, or with gloves on even if there is no ice.

There is also the type of safety found on a few bolt actions that do not lock the bolt. This can put you in a bad position if the bolt is raised fully or partially when you are hunting with a chambered cartridge. You release the safety, pull the trigger and nothing happens, except that the game may vanish before you figure out what's wrong. It could also prove fatal when hunting dangerous game!

There are other types of safeties not covered here, but most work along the same lines. This does shed some light on the good and bad features of those that are most commonly used, and why they are or are not reliable under certain conditions.

There are some rather startling ideas advanced by various hunters concerning the use of rifle safeties — some hunters apparently have no use for one, while others depend on them when they shouldn't. And after you spend enough time watching hunters in the hunting country, some of their ideas on rifle safety, as well as safeties, make you a little nervous. Some of them can lead them, and you, into plenty of trouble. We'll look at these in another column.

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REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
SUPER

PETERS
SUPER

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

Ilion, New York
October 26, 1978

RECALL OF MOHAWK 600 RIFLES

UPDATED STATUS

Trigger Assembly

The main consideration on the Trigger Assembly is that they are assembled, and safety checks are performed to insure that a safe reliable Trigger Assembly is shipped to the gunsmith. Presently, the Trigger Assembly is a separate operation and the unit is transferred to the Final Assembly area, where the final assembler assembles it to the Barrel Action.

A series of safety checks are performed at this step and the Stock is installed. Another set of checks are made - The rifle is then taken into the Gallery where the gun is tested and the safety is again checked. At the final inspection, the safety procedure is rechecked and a certain percent are audited, again checking the safety function.

In the recall of the Mohawk 600 guns, the Trigger Assemblies will be shipped directly to the gunsmiths and the subsequent safety operations that we perform at present, will have to be incorporated into our sub-assembly operation.

The Process Record and Industrial Engineering sheets have been reviewed, operation by operation. This review was performed with representatives of Research and Process Engineering who are familiar with this model. The Process Record was also clarified. Any statements in the Process Record which could be misread or misinterpreted are being rewritten and pictures and illustrations are being included.

PLAINTIFF'S
EXHIBIT

3357

184
AL 0030506

There were a number of areas where answers were not known in the meeting on Wednesday, October 25. By today, October 26, a number of considerations have been resolved and there are very few items which have yet to be answered.

Items Covered in the Discussion:

The fit of the Connector to the Trigger was analyzed in great detail. Specifications were determined on the correct fit, with a tentative .005" max. clearance established between the Connector and the Trigger. Fitting procedure was also analyzed and the correct method to fit the Connector was determined.

Two gages (one to be made and one now being made) will check the straightness and squareness of the Connector to insure that is correct before being assembled to the Trigger.

A fixture designed and built to measure the clearance between the Sear and Connector is going to be utilized on the job, such that the clearance can be analyzed when the Safety is put in the middle or null position. In this way, every Trigger Assembly shipped to a gunsmith, will be checked for the null position, to make sure that it is on Safe and cannot be tricked. The amount of clearance when the Safety lever is in the null position, is being determined and should be completed later this afternoon.

The assembler, as with the common Trigger Plate Assembly, will identify his work with a stamp. The Trigger Assemblies will be marked with a stamp (alpha or numerical) on the back of the Trigger. In this way, any Model 600 or XP-100, can readily be checked without disassembly, to verify that it has the new Trigger Assembly.

The comparator check wasn't analyzed and the Trigger pull section of it will be revised. The correlation will be determined between what the operator gets on the assembly bench as far as Trigger pull, and what the sub-assembler gets in adjusting the Trigger pull screw. This correlation will be done so that the sub-assemblies should require no adjusting by the gunsmith.

RECALL OF MOHAWK 600 RIFLES - UPDATED STATUS

3.

Process for Retrofitting Customer Guns in the Field by
Recommended Remington Gunsmiths:

To make sure that the new Trigger Assemblies are assembled to the rifle in the correct procedure, a complete Process Record is being developed to give the gunsmiths step-by-step instructions on the proper disassembly and assembly procedures.

Trigger Assemblies of the revised process including additional safety inspections, will be taken to Customer Repair and fitted to Model 600's, to verify the revised process.

The following considerations have come to light and answers are being determined:

On the original Trial and Pilot, the Stock reinforcing screw was interfering with the redesigned Trigger Assembly. Research is digging out all records on the Trial and Pilot on the interference, and have stated that the situation can be corrected by adjusting the soft brass screw. They are working up the process that the individual using the gun would use, that is, upsetting the screw slightly, to give the additional clearance required. They will also take pictures of the operations so that we can include them in the write-up that goes to the gunsmiths.

The Safety lever on the original Trial and Pilot also had an interference with the wood on the Stock. The levers now have been redesigned to give more clearance with the wood, but there is a potential for wood interference. Research is checking to make sure that there is an interference on a number of models, and if there is, the gunsmith will be instructed on how to rout out or clean out the area where there is an interference. It is an easily executed operation, which should not affect the program.

It should also be noted that the Mohawk 600's for a period of years, were fitted with a gold Trigger - the replacement assemblies will have the black Triggers. The original Remington 600 and 660's did not have gold Triggers, however, so the gold Triggers are definitely in the minority. This should not be a problem.

RECALL OF MOHAWK 600 RIFLES - UPDATED STATUS

4.

When the gunsmiths repair the recalled rifles, we will insist that they send all of the Trigger Assemblies back which are replaced. We do not want these assemblies left out in the field where the parts can be scavanged off these and cause the old Safety levers and incorrect Sears to be put into rifles which can cause problems in the future. The assemblies will be scrapped and accounted for when they are returned to Ilion.

The gunsmiths will be requested to stamp a letter or alphabetical character on the Receiver externally, where it can be seen, to identify without ~~Stock~~ disassembly, that the rifle has been converted to the new Trigger Assembly. Also, it would be our recommendation that the gunsmith put another stamp on the rifle, indicating at what repair station or what repairman actually modified the rifle.

To insure that all the rifles of this type in the plant, meet the required specifications, all the final assemblers, Gallery personnel, inspectors, Customer Repair checkers, Customer Repair gunsmiths, Customer Repair final inspector, 40XR or Custom Shop assemblers and XP-100 assemblers are being reinstructed on the trick test.

JPLinde:eb

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424
AL 0030509

Remington.

REMINGTON ARMS COMPANY, INC. • PUBLIC RELATIONS • BRIDGEPORT, CONNECTICUT 06602

NEWS RELEASE

FOR RELEASE

IMMEDIATELY

BRIDGEPORT, Ct., October 25, 1978 -- On October 23, 1978, a product liability case against Remington Arms Company, Inc., and one of its dealers was settled for \$6,800,000 by Remington's insurance carriers. The case involved an alleged accidental discharge of a Mohawk Model 600 rifle manufactured by Remington. Injuries to the plaintiff were extremely serious, leaving him partially paralyzed. The plaintiff alleged that at the time the gun fired the trigger was not pulled. Remington's investigation indicated that this was unlikely but possible due to the fact that under certain unusual circumstances the safety selector and trigger could be manipulated in such a way that subsequently moving the selector to the fire position could result in accidental discharge. Settlement costs are substantially covered by the Company's liability insurance.

A recall program has been initiated in connection with Mohawk Model 600 rifles and Remington Model 600 and 660 rifles and XP-100 pistols manufactured prior to February 1975.

###

PLAINTIFF'S
EXHIBIT

3358

187
AL 0030517

October 24, 1978

via tele/phone call

Today, the Remington Arms Company, Inc., announced the recall of Models 600, 660, Mohawk 600, ~~and~~^{XP-160} bolt action guns, produced prior to February, 1975, because of a possible safety problem.

As a Remington Recommended Gunsmith, your shop has been listed with an 800 Enterprise message receiving center in Atlanta, Georgia. Upon receipt of a call from an owner of one of the guns involved, the message receiving center will direct him to the Remington Recommended Gunsmith located geographically nearest to him, for repair of the gun. We estimate you may receive up to 200 of these guns for repair.

To provide the simplest and most positive repair, you will be supplied with new trigger assemblies for replacement of the original. The repair will be done at no charge to the gun owner.

Our Arms Service section reports that the replacement of the trigger assembly can be made in 7-1/2 to 10 minutes. Based on this, we plan to allow you a \$5.00 bench charge for this work. Where transportation or other special handling costs are involved, we will reimburse you.

While full details have not been developed, we did want to give you this advance notice, and we will contact you in the very near future, covering all details.

Meanwhile, should any guns be returned to you, please record the date, name, address, zip code, and serial number and caliber of the gun, and hold until you have our instructions.

C.

287
AL 0030518

This went to participating Jew as well.

TELEGRAM

Thank you for agreeing to assist us in the installation of a new trigger assembly in Remington 600, Model 660 and Mohawk 600, and XP-100 pistols, covered by our recall.

Our toll free Message Center is advising customers in your area of your availability to make this installation.

We are sending you under separate cover special repair and information forms, plus an initial supply of replacement trigger assemblies.

For your information, Remington will assume full and complete responsibility for any and all claims that may arise out of the design or manufacture of the trigger assembly provided to you by Remington for this modification.

The ^{only} guns included in the recall are all Remington Model 600 and 660 rifles, and all Mohawk Model 600 rifles, except those with a serial number starting with an "A". Also included in the recall are any XP-100 pistols with a serial number between 0001 and 7,507,983.

If you have any questions, please call Ed Sienkiewicz collect at (315) 894-9961.

REMINGTON ARMS COMPANY, INC.

10/27/73

D.

387
AL 0030519

Person calls in on 800 numbers, asks for Operator 61 or Remington
recall information.

Operator asks for Model No. _____ & Serial Number _____

Checks Model and Serial Number blocks for recalled guns -

if gun is not involved, inform caller
and thank him.

if gun is part of recall, operator will ask for

Name _____

Address _____

Phone Number _____

The operator will say:

"Remington recommends prior to any further usage of your gun
that you bring it directly to a selected gunsmith in your
area for inspection and modification which will be done free
of charge. If you have a pencil and paper handy, the closest
gunsmith is* _____

If you have any further questions you should write to:

Remington Arms Company, Inc.
Box EGL
Bridgeport, Ct. 06602"

*The phone number will be used to determine the nearest Remington
gunsmith (out of 179).

If there is more than one gunsmith in the area, the caller will be
given a name and address. The gunsmiths will be rotated after each
call to assure a balance of customers per gunsmith.

REMINGTON ARMS COMPANY, INC. Trigger Assembly Special Replacement Program

(A)

GUNSMITH

GUN OWNER

Name _____

Name _____

Street _____

Street _____

City, State, Zip _____

City, State, Zip _____

Telephone _____

Telephone _____

(Area Code)

(Area Code)

Control No. _____

Control No. _____

(For Rem. Use Only)

(For Rem. Use Only)

(B) FIREARMS INFORMATION

Model (Check One)

- ☐ 1. Rem 600
- ☐ 2. Rem 660
- ☐ 3. Mohawk 600
- ☐ 4. XP-100

Caliber (Check One)

- ☐ 1. 222 Rem.
- ☐ 2. 6mm Rem.
- ☐ 3. 243 Win.
- ☐ 4. 308 Win.
- ☐ 5. 6.5mm Rem. Mag.

Caliber (Check One)

- ☐ 6. 350 Rem. Mag.
- ☒ 7. 35 Rem.
- ☐ 8. 223 Rem.
- ☐ 9. 221 Rem. "Fireball"
- ☐ 10. Recambered

Serial No.

--	--	--	--	--	--	--	--

(C) MODIFICATION INFORMATION

Method Gun Received From Owner:

(Check One)

- ☐ Hand Delivered
- ☐ UPS
- ☐ U.S. Mail
- ☐ Other _____

(Specify)

Date Gun Received From Owner

Estimated Completion Date

Month Day Year

--	--	--	--	--	--	--	--

--	--	--	--	--	--	--	--

IMPORTANT — This Copy Must Be Completed and Mailed Immediately Upon Receipt of Gun.

PARTS CONTROL COPY

(completed form to be mailed immediately upon receipt of gun)

AL 0030521

A

We have set up toll free numbers to handle gun owner complaints. These numbers will be in operation beginning Saturday, October 28:

In Connecticut 800-972-9379

Outside Connecticut 800-243-9275

We are doing everything possible to expedite shipment of replacement trigger assemblies; however, the initial supply will be limited. Because these trigger assemblies are the only ones approved for this replacement program, please do not use trigger assemblies you may have in stock.

If you have Model 600 series trigger assemblies in inventory, return them to us freight collect and we will credit your account.

G.

S

I

C

H

687

AL 0030522

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	<u>Rem. M/600</u>	<u>Rem. M/660</u>	<u>Mohawk 600</u>	<u>Total</u>
1963	100	--	--	100
1964	25,279	--	--	25,279
1965	24,851	--	--	24,851
1966	22,307	--	--	22,307
1967	19,061	87	--	19,148
1968	2,488	24,373	--	26,861
1969	--	14,196	--	14,196
1970	2	7,694	--	7,696
1971	--	3,993	4,979	8,972
1972	--	193	4,961	5,154
1973	--	--	8,739	8,739
1974	--	--	12,110	12,110
1975	--	--	13,120	13,120
1976	--	--	13,318	13,318
1977	--	--	17,631	17,631
1978	--	--	16,927	16,927
			(as of 10/18)	
TOTAL	94,088	50,536	91,785	236,409

HDA/ap
10/23/78

H.

AL 0030523

787

A
L
E

DON'T SAY IT—WRITE IT

c: E. Hooton, Jr.

To ~~R. L. HALL~~
J. R. AYERS Location _____
From H. K. BOYLE *HKB* Location _____ Phone No. _____
Subject MODEL 600 TRIGGER ASSEMBLIES Date 11/30/78

In talking with Red Sherman about the Model 600 recall status, Red gave me the following statistics and opinions:

- 1) 5,000 forms have been turned in by gunsmiths to indicate receipt of guns in their shops.
- 2) 1,441 requests for payment to gunsmiths have been paid, averaging \$7.39/gun.
- 3) Red was of the opinion that about 10,000 guns would be repaired through the end of January 1979, and an adequate bank of Trigger Housings at Ilion would be 5,000, excluding plant needs for warehouse M/600 Trigger Housing replacement.
- 4) Red said that in talking with Les Freer in Dallas, Texas, Les had received 33 calls on M/700 accidental discharges and Red, himself, had received 18 letters on this subject. Les expressed concern about what appears to be growing public concern over bolt action rifle safety in general.

HKB:iw

RD 779

STOP, LOOK, AND LIVE



AL 0030534

H

181

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
UMC

PETERS
UMC

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
February 12, 1979

R. L. HALL

STATUS OF XP-100 PISTOL

Monday, Feb. 5: Meeting held to organize actions to be taken to start production and conversion of customer repair pistols.

Tuesday, Feb. 6: All pistols on production disassembled and parts separated. Production to latest design initiated.

Wednesday, Feb. 7: Pistols from production and customer repair ready for R & D. A hold was put on production until R & D could determine what engagement requirements were necessary to meet drop test specifications - Process Record called for .020 engagement with no creep - which was impossible to hold. Samples delivered to R & D had .010 - .016 engagement, with no creep.

Thursday, Feb. 8: Production and Customer Repair continued to assemble pistols up to the adjustment of engagement, which is a screw adjustment, and one of the last assembly steps.

Friday, Feb. 9: R & D after testing, stated they want .015 min. engagement and will accept some creep.

Monday, Feb. 12: R & D to supply specification for how many revolutions screw should be turned to obtain proper adjustment. Production to start; R & D testing complete.

JPL:eb



J. P. Linde, Supt.
P E & C Section

J P Linde 181

AL 0030535

11/2/78

COMMON PARTS -

M/700-600 FIRE CONTROLS

	<u>M/700</u>		<u>M/600</u>
Trigger Assembly	26345	Separate	91469
Bolt Stop Release	15478	Separate	None
Safety Assembly (Safety Lever)	26585	Separate	91468
Safety	15370	Separate	91467
Safety Button	14578	Separate	
Safety Thumbpiece		Separate	15453
Safety Detent Ball	23222	Same	23222
Safety Detent Spring	15368	Same	15368
Safety Pivot Pin	17043	Same	17043
Safety Snap Washer	17044	Same	17044
Sear Safety Cam	15666	Process Common	91470
Sear Spring	17047	Same	17047
Trigger	15280	Process Common	15435
Trigger Adjusting Screw	17053	Same	17053
Trigger Engagement Screw	91128	Same	91128
Trigger Connector	19461	Process Common	15436
Trigger Housing Assembly	26655	Same	26655
Trigger Housing Rivet			
Trigger Housing Spacer Front			
Trigger Housing Spacer Rear			
Trigger Side Plate Left			
Trigger Side Plate Right			
Trigger Pin			
Trigger Spring			
Trigger Stop Screw			

GJH/bdm

PLAINTIFF'S
EXHIBIT

3361

121
AL 0030544

A

R.L. Hall

STANDARD TIME

MOH. 600

CHANGE FIRE CONTROL & DRY FIRE.

RW FARRINGTON'S (EST.)

7.5 - 10.0 MINS.

H.L. HENDRIX (EST.)

7.0 - 10.0 "

OUTSIDE GUNSMITH 50% LONGER

H. BOYLE SAID HE WOULD USE 15 MINS.

R.H. Brown
10/24/78

C

H



AL 0030553

181

cc: J.L. Lusk
C.H. Morris
R.H. Walker
J.W. Brooks
R.D. Westerman
R.P. Kelly

Illion, New York
June 23, 1966

MEMORANDUM

TO: C. B. Verboom

FROM: A. L. Hagish

DROP TESTING OF MODEL 600 POWDER METAL SEARS

The enclosed drop test procedure was appraised and conducted using the N/600 with one piece powder metal sears. Drop testing at ten inches corresponds to the test manual standard and waist high drop testing (45") was included for increasing drop test severity. A sample of chrome plate powder metal sears produced to date was included for drop test purposes. Sears numbered 1 thru 5 are old style sears with the large .003 inch radius at the connector surface edge. Sears numbered 6 thru 8 are new sears with .001 inch radius at the connector surface edge.

Fire control adjustments were made by production prior to drop testing.

Listed below are N/600 powder metal sear drop test observations:

1. The measured RC hardness of the new N/600 samples was 45 RC average versus 50 RC average for old samples.
2. No malfunctions were experienced at the normal drop height of 10".
3. Page 2 contains listed jar-off malfunctions encountered during the waist high N/600 drop testing. These high drop malfunctions are similar to prior test results of May 1964 special "Jar-off" testing.
4. Tight sear pin holes of the new sears were polished out prior to drop testing.
5. Minor chipping of the sear connector edge of the old sear was noticed when examined with a 20X glass.

RECOMMENDATION

Based on N/700 and N/600 chrome plated powder metal sear testing, the new chrome powder metal sears should be considered for use in the N/600.

ALH:G
LNC.

PLAINTIFF'S
EXHIBIT

3363

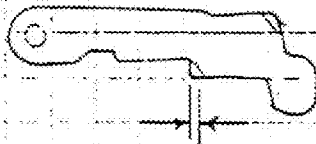
106
AL 0030562

REMINGTON ARMS COMPANY, INC.

ENGINEERING DEPARTMENT (155) COMPUTATION SHEET

M600 Powder Metal Sear
 Chrome Plated Powder Metal Sear
 DATA FOR DROP TESTING CONDUCTED A.A.H. 6-9-66

SEAR NUMBER	TOTAL NUMBER OF DRY CYCLES	SEAR RADIUS AT CONNELLOR EDGE	SEAR COMPONENT WEIGHT & HARDNESS	AVER. TRIG. PULL AT BEGINNING AND END OF TEST
1	0	.0034	9.3900 gr. 48 RC SCALE	5.77 - 5.60
2	0	.0039	9.3705 gr. 51 RC SCALE	6.25 - 5.30
3	0	.0042	9.3655 gr. 53 RC SCALE	5.45 - 5.70
4	0	.0039	9.4176 gr. 51.5 RC SCALE	5.00 - 4.85
5	0	.004	9.4423 gr. 53 RC SCALE	5.50 - 5.05
6	0	.0005	9.5837 gr. 44.5 RC SCALE	5.50 - 5.50
7	0	.000	9.5182 gr. 46.5 RC SCALE	5.90 - 5.70
8	0	.0012	9.4955 grams 45.0 RC SCALE	5.25 - 5.50



SEAR RADIUS AT CONNELLOR EDGE MEASURED ON THE OPTICAL COMPARATOR.

WAIST HIGH IS TAKEN AS .45 INCHES.

286
 AL 0030563

A M 600 POWDER METAL SEAR
 DROP TEST RESULT WITH M600
 P.T. SEAR TESTING AAH. 6-14-66

TYPE OF SEAR TESTED	NUMBER OF FAILURES	DROP TEST SPEC. NO.	NUMBER OF SEARS TESTED	TEST GUN SERIAL NO.	COMMENTS
STANDARD PROD.	1	VI-2	2	20344	
STANDARD PROD.	1	VI-4	2	20344	
FIRST POS.	0		1		
LARGE CON. RAD.	1	VI-4	4	1167	
LAST SHARP SEARS	1	VI-3	3	1167	
LAST SHARP SEARS	1	VI-2	3	20344	

VI - JAR OFF TEST

A. DROP GUN WAIST HIGH ON SOLID WOOD SURFACE WITH SAFETY OFF.

1. BUTT DOWN
2. MUZZLE DOWN
3. TOP SIDE DOWN
4. BOTTOM SIDE DOWN

B. TRIGGER SHALL BE TRIPPED AFTER EACH DROP TO DETERMINE WHETHER THE SAFETY HAS RELEASED ANY MECHANISM WHICH MAY ALLOW FIRING.

C. THREE DROPS PER POSITION.

"WAIST HIGH" IS TAKEN AS 45 INCHES.

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION m/400

Time P.M. saw.

TESTER OF GUNGE

308

21. ~~11.11.46~~

(LATEST - SHARP)

DATE 1-3-46

TEST P.M. Sear Drop Test

(re-test) TESTER

FACE NO.

J. Hennings.

sears were used placing different sears in these three barrels only (3 sears)

Test I - Trigger pulls & firing pin indents (on sep. sheets)

Test II - No malfunctions noticed

Test III - (butt down) sear 2 had a total of 3 drops in which the safety was jarr'd to the "ON" pos.

Test IV - No malfunctions noticed

Test V - (muzzle down) sear 1 had a total of 7 drops in which the safety was jarr'd to the "OFF" pos.

Test VI - (butt down) - sear 1 - on all three drops the safety was jarr'd to the "ON" pos.
(muzzle down) - sear 3 - on second drop gun fired.

Top side down - sear 2 on first drop gun fired

CHRONOLOGICAL RECORD OF TESTING

NOTE & DESCRIPTION M/600 New P.M. sears.

CALIBER OF GAUGE 307 (LARGE RAP. SEAR

DATE 6-2-66 TEST P.M. sear Drop Test

TESTER

PAGE NO.

J. Hennings.

✓ barrels " 1467 & 82344 were used placing different sears in those two barrels only.

Test - I - Trigger pulls + firing pin indents (on sep. sheets)

Test - II - No malfunctions noticed

Test III - (muzzle down) - sears 1+2 had a total of 5 drops in which safety jarred to "ON" position

Test - IV - No malfunctions noticed

Test - V - (butt down) - sears 1,2,3,4,5 had a total of 13 drops in which safety jarred to "OFF" position

Test - VI - (muzzle down) - sears 2,3,4 had a total of 9 drops in which safety was jarred to "ON" position

(top side down) - sear 2 - on third drop bolt jarred open.

(bottom side down) - sear 4 on second drop the jar fired the firing pin.

NOTE! ON BOTH ACTIONS- PIN NOLE WAS TIGHT CAUSING SEAR TO BIND.

586

CHRONOLOGICAL RECORD OF TESTING

MODEL & DESCRIPTION *M/600* *std. man. drop test*
 NUMBER OF GAUGE *318* PRESENT PRODUCTION (2 PISST)

DATE TEST TESTER PAGE NO.

4-12-44 *661.6* # *11674* *20341* *308 cal. M/600*

chopped from various pos. with
std. man. in fire-control.

" *1167* all tests except Test I. muzzle-down

waist high the safe geared to "off" pos. on all 3 dy

" *21544* Tests I-III-OK

Test I - (butt down) *safe geared to "off" pos. on all 3 drops*
 (waist high)

Test II - (muzzle-down) *on 1st drop gun fired*
 (waist high)

Test III - (bottom-side down) *on 3rd drop gun fired*
 (waist high)

Test IV - (butt down) *safe geared to "on" pos. on 3rd drop*
 (waist high)

A

MODEL

TRIGGER PULL

FIRING PIN INDENT

Mohawk 10C	3.5 - 6.5 lbs.	.014" - .016"
40XB Sporter	3.0 - 5.0 lbs.	.019"
40XR Sporter	2.0 - 4.0 lbs.	.019"
Nylon 66	3.5 - 6.5 lbs.	.014" - .016"
540XR & Junior	1.0 - 5.0 lbs.	-----
541-S Custom Spt.	3.0 - 5.0 lbs.	.017" - .025"
552	3.5 - 6.5 lbs.	.014" - .016"
572	3.5 - 6.5 lbs.	.016" - .018"
580-581-582	3.5 - 6.5 lbs.	.017" - .025"
40X C.F.	1.5 - 3.5 lbs.	.018" - .026"
40XC	2.0 - 4.0 lbs.	.018" - .026"
XP-100	1.5 - 2.750 lbs.	.018" - .026"
Mohawk 600	4.0 - 6.0 lbs.	.018" - .026"
700	3.0 - 5.0 lbs.	.018" - .026"
700 Custom	3.0 - 5.0 lbs.	.018" - .026"
700 Classic	3.0 - 5.0 lbs.	.018" - .026"
700 Sniper	3.0 - 3.5 lbs.	.018" - .026"
700 Varmint	2.0 - 4.0 lbs.	.018" - .026"
742, 7400, Four	3.5 - 6.5 lbs.	.019" - .025"
760, 7600, Six	3.5 - 6.5 lbs.	.018" - .018"
788	3.5 - 6.5 lbs.	.013" - .018"
870-Field, Mag., Deer, & Police	3.5 - 5.0 lbs.	.013" - .018"
870 Trap Skeet	3.5 - 5.0 lbs.	.013" - .018"
1100 Field, Mag., and Deer	3.5 - 6.5 lbs.	.013" - .018"
1100 Trap-Skeet	3.5 - 5.5 lbs.	.013" - .018"
3200	3.0 - 5.5 lbs.	.013" - .018"

C.J.S.
June 14, 1982

PLAINTIFF'S
EXHIBIT

3364

AL 0030671

cc: J.P. Linde

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

Remington
SPORT

PETERS
SPORT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

February 26, 1980

TO: E.G. LARSON

FROM: J.A. STEKL

SUBJECT: FRED WOODRICK PHONE CALL - 2/25/80

Fred Woodrick called in yesterday and reported that, during a visit to Cogdell's of Waco, Texas, Bob Ray told him that last year they had eight (8) to ten (10) Model 700 rifles brought to them with trigger complaints.

Ray stated that examination of the fire-controls revealed that they contained a sticky substance that would not allow movement of the internal parts. He also said that flushing the assemblies with a degreaser would not remove the substance, so they disassembled the trigger, in each instance, and thoroughly cleaned the parts before proper operation could be achieved.

Fred told Bob Ray that, in the future, any similar problem guns should be returned to Ilion for examination, since they are safety related.

Fred suggested that I report this to you, as you may want to contact Bob Ray directly.

Jim
Jim



AL 0017509

1 of 1

INTERIM REPORT

9/15/48

SUBJECT: FUNCTIONAL AND ENDURANCE TEST OF STANDARD FIRE CONTROL
AND ALTERNATE SAFETY TYPE #1 FIRE CONTROL FOR M/721-722 RIFLES

INTRODUCTION

Firing of M/721 rifles when the Safety is moved to the "off" position is the complaint received from three customers, which resulted in an investigation of the present fire control. As a result of this investigation an alternate design incorporating a ball bearing between the Trigger and Connector and an extension on the Sear was constructed and submitted for test.

OBJECTIVE

The objective of this test was to determine if the gun will fire when the Bolt is cocked and the Safety is moved to the "off" position by submitting the standard fire control and the alternate Safety Type I Fire Control to a functional and endurance test.

CONCLUSIONS

1. Both fire controls will not fire when the Bolt is cocked and the Safety is moved to the "off" position after 20,000 dry cycles of cocking and firing, and 10,000 dry cycles of functioning of the Safety.
2. That the Trigger Stop Screw in both Fire Controls needed adjusting and cocking during the test.

COMMENTS

Correct adjustment of the M/721 Fire Control is essential in providing a clean, crisp trigger and one with enough Sear engagement to prevent accidental discharge caused by a "jar off" condition. The adjustment in the present fire control is variable and is determined by the assembler, whereas the adjustment in the alternate Safety Type I Fire Control is determined largely by dimensions of the various parts and a control of the adjustment by the limiting dimensions of a ball bearing.

PLAINTIFF'S
EXHIBIT

3366

AL 0031905

1 of 12

RECOMMENDATIONS

It is recommended:

1. That use of the present M/721 Fire Control be continued as results fail to indicate any need for a change.
2. That the Type I Safety (ball bearing between the Trigger and Connector) be considered in any future design change of the M/721 Fire Control as its adjustment characteristics are superior to the Fire Control now used.
3. That the present practice of cementing the Trigger Screws be supplemented with a positive locking mechanism and that this locking mechanism be sealed with a sealing compound before shipment of the gun to the customer.

TESTING DETAILS

1. One of each of the subject fire controls was tested functionally by three individuals of the Test Group. These tests were as follows:
 - a. Drop Test - The gun was dropped and allowed to fall freely for a distance of 10". Repeat 10 times.
 - b. Cock the gun, position the Safety to the "on" position, pull the Trigger, release the pressure exerted by the finger on the Trigger, and position the Safety to the "off" position. Repeat 25 times.
 - c. Cock the Bolt and slam the Bolt forward. Repeat 25 times.
2. Both fire controls were then subjected to 10,000 functions in the dry cycle machine which cocks the Bolt and fires the Trigger. The Safety was then functioned 10,000 dry cycles. Repeat a, b, and c of Test I.
3. Both fire controls were subjected to a standard dust test after which an additional 10,000 dry cycles of Bolt, Trigger and Safety functioning were performed. Repeat a, b, and c of Test I.

RESULTS OF TEST

1. It was not possible in this test to fire either of the fire controls by moving the Safety to the "off" position when the fire controls are in adjustment.
2. Both Fire Controls would not stay in adjustment until after a second application of adjustment was made during the first 10,000 dry cycle period.

AL 0031906

A

A G E N D A

DESIGN MEETING - ELION

September 16, 1948

I - NEW IDEAS FOR RESEARCH & DEVELOPMENT

- (a) C. S. Collier Report
- (b) Accuracy Device - Progress Report
- (c) Mercast Process - Precision Castings
(Orders placed for experimental Tooling)
- (d) Pattern Control Device
(In Model Shop)

II - CENTER FIRE RIFLES

- (a) M/721-722 - Safety
- (b) M/742-762 - Progress Report

III - SLIDE ACTION SHOTGUN

M/870 - Review model and economics

IV - MODEL 521-T

V - MODEL 11-48 & SPORTSMAN 48

VI - BARREL BEDDING DEVICE

(Reports of D. S. Foote & J. H. Lewis)

AL 0031907

Elion, New York
August 25, 1943

PROGRESS REPORT

MODEL 721-722 FIRE CONTROL AND SAFETY

INTRODUCTION

Three field complaints have been received which reported the M721 Rifle firing when the Safety is moved to the "off" position. Two guns representing two of the complaints were tested at Elion without it being possible to reproduce the defect.

It is, however, theoretically possible under very remote conditions to experience this problem and the Elion Design Meeting of July 15, 1943, recommended that an immediate investigation be made to develop an alternate design which would eliminate the hazard.

OBJECTIVE

It has been the objective of this study to prepare alternate designs for the Model 721-722 (fire control and safety) to eliminate any "hazardous" condition of the gun firing when the safety is moved to the "off" position and to maintain as far as practical the present desirable features of the trigger.

The only apparent method of assuring a "fool-proof" design, as shown in U.S. Patent No. 2,331,521 assigned to the Western Cartridge Company, has been the consideration of safeties which positively block the trigger.

SUMMARY AND CONCLUSIONS:

Three alternate designs have been derived from this study as follows:

Type I is an entirely new type of safety with, we believe, potential merit. It operates by blocking the trigger connector with a ball bearing between the trigger connector and an extension on the sear. Easy safety operation is obtained. In the currently manufactured trigger assembly, the present feature of blocking the trigger pin is eliminated and accounts for easy safe operation. A model of this design is available for examination.

Type II maintains the current trigger assembly design and adds the feature of blocking the trigger prior to the operation of blocking the firing pin. A model of this design is available for examination.

AL 0031908

Type III eliminates the current trigger feature of blocking the firing pin and eliminates a blow on the rear of the trigger. This design is a simplification of Type II proposed and has the advantage similar to Type I of eliminating hard safety operation.

The economics of each trigger type are as follows:

	Present Design	Proposed Type I	Proposed Type II	Proposed Type III
Expenditures to Date	---	(\$3,000 on all Proposed Design)		
Expenditures to Complete	---	\$21,380.	\$ 7,800.	\$12,900
Standard Material	\$50.588/100	\$54.105/100	\$34.038/100	\$29.358/100
Standard Labor	\$25.268/100	\$27.262/100	\$29.258/100	\$25.565/100

RECOMMENDATIONS

In view of the lack of additional complaints covering the question of the Model 721 firing when moving the safe to the "off" position and the inability to duplicate the complaints received from the field, we recommend that action be considered as follows:

1. Consideration be given to maintaining the current M/721 trigger "as is".
2. If a change is to be made to eliminate any remote theoretical possibility of the gun firing when moving the safe to the "off" position, we consider type I which in our opinion is the best design. Its disadvantages lay in the high expenditure required to make the conversion.
3. Consideration of the Type III design for the lowest product cost with adequate safety.
4. Last, the consideration of the Type II design. A "hard safety" would always be prevalent in this version as well as high product cost. This design is presented primarily to give Sales an opportunity to maintain their advertising feature of the safety blocking the firing pin.

D. S. Foote
D. S. Foote
Design Unit
Arms Technical Division

DSF:EL
S/6/MS

AL 0031909

MODEL 721-722 ALTERNATE SAFETY DESIGNS
Expenditures Required

	<u>Type #1</u>	<u>Type #2</u>	<u>Type #3</u>
Processing	\$ 750	\$ 375	\$ 500
Design - Fixtures)			
Tools	3,200	950	1,880
Gages			
General Engineering & Adminis- tration (1/3 of Design & Process Cost)	250	125	165
Build - Fixtures)			
Tools	11,100	3,320	6,100
Gages			
Tool Design Revisions (approx 20% Design)	640	190	375
Tool Revisions (Tool Design Revisions x 3.50)	2,240	665	1,300
Trial Run			
Machine Operations)			
Machine Setters	2,200	1,175	1,600
Machine Operator			
Design Cost to Complete	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>
	\$ 21,380	\$ 7,800	\$ 12,920

21
8/25/48

AL 0031910

MODEL 721 MODIFICATION OF SAFETY DESIGN
Material & Labor Cost per 100

Part Name	Present Design		Type #1 Proposed Design		Type #2 Proposed Design		Type #3 One Piece Sear	
	Material	Labor	Material	Labor	Material	Labor	Material	Labor
Trigger Connector	4.200	.016	6.000	.016	4.200	.016	4.200	.016
Trigger Spring	.335	-----	.335	-----	.335	-----	.335	-----
Trigger Adj. Screw	.580	.011	1.500	.020	.580	.011	.580	.011
Trigger Stop Screw	.325	.009	.500	.015	.325	.009	.325	.009
Safety Adj. Scr. Lock Nut	-----	-----	-----	-----	1.500	.010	1.500	.010
Safety Pivot Pin	.588	.006	1.000	.006	.588	.006	.588	.006
Sear Spring	.360	-----	3.000	-----	.360	-----	.360	-----
Sear	3.200	1.329	.900	5.101	3.200	1.329	.900	2.601
Fire Control Housing	2.200	5.308	2.200	5.750	2.200	5.308	2.200	5.308
Safety	2.000	3.559	2.500	3.559	2.500	4.059	2.500	4.059
Trigger	11.300	.015	11.300	.765	12.000	1.765	12.000	1.765
Safety Cam	2.380	2.590	-----	-----	2.380	2.590	-----	-----
Sear Assembly	-----	1.105	-----	-----	-----	1.105	-----	-----
Trigger Adj. Screw Lock Nut	-----	-----	1.500	.010	-----	-----	-----	-----
Safety Ball	-----	-----	.250	-----	-----	-----	-----	-----
Safety Adj. Screw	-----	-----	-----	-----	.75	.010	.750	.010
Trigger Guide Plate	3.120	.020	3.120	.020	3.120	.020	3.120	.020
Trigger Housing Assembly	-----	11.300	-----	12.000	-----	13.000	-----	11.750
	30.588	25.268	34.105	27.262	34.038	29.238	29.358	25.565

AL0031911

2/25/48

TYPE I - CONNECTOR BLOCKING SAFETY

Parts Change Summary

Following is a list of new parts required for the proposed Blocked Connector Safety and the parts obsoleted by their use:

<u>Proposed Parts</u>	<u>Current Parts</u>
A-18498-X Trigger Connector	A-17050 Trigger Connector
A-18499-X Trigger Spring	A-17978 Trigger Spring
A-18500-X Trigger Spring Screw	A-17049 Trigger Adjusting Screw
A-18501-X Trigger Stop Screw	A-17053 Trigger Stop Screw
A-18502-X Safety Pivot Pin	A-17043 Safety Pivot Pin
A-18503-X Sear Spring	A-17047 Sear Spring
B-18504-X Sear	2B-17946 Sear
C-18505-X Fire Control Housing	C-17039 Fire Control Housing
C-18506-X Safety	C-17040 Safety
C-18507-X Trigger	C-18442 Trigger
A-18508-X Safety Ball	

New or revised tooling is indicated on all of these parts, the approximate extent of change being as follows:

Trigger Connector - A-18498-X:

A swaged projection has been added to the lower end of the part, a ground surface provided at 3° to the front face and the location of the hole changed.

Trigger Spring - A-18499-X:

One half turn removed to shorten spring.

Trigger Spring Screw - A-18500-X:

An internal-external threaded bushing replaces one of the current trigger adjusting screws.

Trigger Stop Screw - A-18501-X:

Revision in dimensions of current part.

Safety Pivot Pin - A-18502-X:

Addition of annular groove to current part.

Sear Spring - A-18503-X:

Torsion spring replaces present compression spring.

Sear - B-18504-X:

Contour of lower surfaces modified to provide a downwardly projecting lug at front, a spring support at rear, and suitable ground surfaces to cooperate with connector and ball.

Fire Control Housing - C-18505-X:

Remove tabs that retain current trigger stop screw; provide a single tab at lower position and provide slot in right hand side of housing.

Safety - C-18506-X:

Remove cam on inside leg and provide intumed slotted lug at front.

Trigger - C-18507-X:

Grind revised contour on front end top of present trigger as blank.

Safety Ball - A-18508-X:

Additional.

Trigger Stop Screw Jam Nut - A-18511-X:

Additional.

TYPE II - TRIGGER BLOCKING SAFETY

Parts Change Summary

Following is a list of new parts required for the proposed Trigger Blocking Safety. This design is presented primarily with the idea of maintaining the present sales promotion feature of blocking the firing pin as well as the trigger.

Proposed Parts

Safety
Safety Adjusting Screw
Safety Adjusting Screw Lock Nut
Trigger
Trigger Guide Plate

Current Parts

C-17040 Safety
C-18442 Trigger
B-17055 Trigger Guide Plate

New or revised tooling is indicated on all of these parts, the approximate extent of change being as follows:

Safety - C-17040:

A projection is added with an acting surface which alters the safety contour.

Safety Adjusting Screw:

Additional.

Safety Adjusting Screw Lock Nut:

Additional.

Trigger - C-18442:

A projection is added on the rear of the trigger and a drilled and tapped hole provided in the projection.

Trigger Guide Plate - B-17055:

The trigger slot in the guide plate is lengthened.

TYPE III - SIMPLIFICATION OF TYPE II

Parts Change Summary

Following is a list of new parts required for this proposed design of a Trigger Blocking Safety. The design eliminates the sear and safety cam combination and no longer blocks the firing pin as does the Type II Trigger. The safety operation blocks the trigger only.

<u>Proposed Parts</u>	<u>Current Parts</u>
Safety	C-17040 Safety
Safety Adjusting Screw	B-17945 Safety Cam
Safety Adjusting Screw Nut	B-17946 Sear
Sear	C-18442 Trigger
Trigger	B-17055 Trigger Guide Plate
Trigger Guide Plate	

New or revised tooling is indicated on all of these parts, the approximate extent of change being as follows:

Safety - C-17040:

A projection is added with an acting surface which alters the safety contour.

Safety Adjusting Screw:

Additional.

Safety Adjusting Screw Lock Nut:

Additional.

Trigger - C-18442:

A projection is added on the rear of the trigger and a drilled and tapped hole provided in the projection.

Trigger Guide Plate - B-17055:

The trigger slot in the guide plate is lengthened.

Sear - B-17946:)

Safety Cam - B-17945:)

These two stamped pieces are combined as one machined piece whose outside contour duplicates the present sear.

December 3, 1946

TO: P. B. Rutherford

FROM: M. H. Walker

SUBJECT: THEORETICAL UNSAFE CONDITION OF M/721 SAFETY

Straight calculation of the amount the Safety lifts the Bear off the Trigger gives a max. lift of .0147" and a min. lift of minus .0024". However, fourteen (14) different dimensions are used in the calculation. The actual amount of lift by statistical analysis would be a max. of .009" and a min. of .0032".

Objections have been raised to the above theoretical unsafe condition. According to L. T. Murphy, the necessary dimension changes on the Sear to eliminate this condition can be made without changes to tooling or gaging. With a minimum lap of .026" between Sear and Firing Pin head the change can be made by changing the depth of grind on the Sear notch.

This change will be incorporated in the drawing as soon as tool procurement is completed.

M. H. Walker,
Design Section,
Arms Technical Division

NOTES

AL 0031916

cc: M.H. Walker
W.E. Leek - R.P. Kelly - File

Ilion, New York
February 22, 1972

L. FOX

MODEL 700 FIRE CONTROL - Trigger Adjusting Screw

In working with your people regarding the interrogatory incidental to claim of personal injury by Thomas J. Brown, a suggestion has been made by M.H. Walker. We were examining several different fire controls including one from assembly and believe that the method of sealing can be improved. The present coating that is used over the head of the adjusting screw is relatively easy to remove or loosen. Walker thinks we could go a step further and use the red Loc-tite material, which will more permanently do the job.

As far as I can see there would be no changes necessary to the gun standards, but perhaps you may need to change the material specification if there is one in your process records.

S. M. Alvis, Manager
Ilion Research Division

SMA:T

AL 0031917

PLAINTIFF'S
EXHIBIT

3367

1 of 3

GUN OWNER'S GUIDE

Models 700
Mohawk 600
XP-100

A review of the above and current process and experience in the field indicates desirability of further clarifying information in our Gun Owner's Guide as it applies to adjustments to fire control.

Following the paragraph "TO ADJUST TRIGGER" we have a notice which reads:

IMPORTANT: No adjustment or removal of the trigger engagement screw is recommended unless replacement is necessary. The trigger engagement screw is set at the factory to engage the trigger and provide the correct amount of supporting trigger connector surface beneath the sear (Fig. 4).

We would propose to revise this to read:

IMPORTANT: The sear and trigger connector engagement (Fig. 4) affects the safety of the rifle. The trigger engagement screw has been factory adjusted and sealed.

Following this information in the present Gun Owner's Guide we have instruction in regard to adjustment for "PULL OF TRIGGER" which presently reads:

Is adjusted to the desired weight by turning the trigger adjusting screw clockwise for a heavier weight adjustment and counter clockwise for a lighter weight adjustment.

We would propose to add the following sentence to the above statement:

Safety is compromised if pull of trigger is adjusted below 3 lbs.

SMAlvis:T
2-22-72

AL 0031918

November 9, 1977

1. M/700 - M/600 Fire Control Improvement

The development effort has been divided into two objectives. The first objective is developing a safety mechanism which is easy to understand, reliable and will allow the shooter to unload the rifle in the "ON SAFE" position. Three prototype safety mechanisms have been developed and at least two more will be developed. When completed the various designs will be rated by Marketing to determine the one with the greatest consumer appeal.

The second objective is to improve and simplify the firing mechanism to give a trigger with a better feel and which is externally adjustable within safe limits for pounds pull. The safety development will be completed in the first quarter of 1978; sample prototypes of the proposed new assembly should be complete by April 1978.

2. M/700 Classic - development work complete

3. M/700 Skip Line - development work complete

4. M/600 Carbine

Six prototype carbines have been fabricated and are ready for Marketing and production review. The rifles have design improvements and alterations to the stock, bolt handle, trigger guard, recoil pad, sights and bolt release.

Each of the rifles has design and styling improvements and modifications to the stock, bolt handle, trigger guard, recoil pad, sights and bolt release. The various design and styling combinations will be reviewed by Marketing, Research and Production to determine the optimum combination. The rifle can be

AL 0031919

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

PETERS
OUTPOST

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

February 22, 1979

TO: E.G. LARSON

FROM: E.F. SIENKIEWICZ

SUBJECT: RIFLES RETURNED FOR FIRE ON SAFE RELEASE

Since the Model 600 recall, hundreds of people owning Model 700 and other model firearms have contacted Remington alleging that their guns have fired when pushing the safety from on safe to off safe position without touching the trigger.

To date, all such inquiries have been handled by requesting the rifle be returned to Ilion for examination and repair at no charge.

Examinations of the returned guns received at Ilion have revealed no factory defects. All problems that have been found are due to customers tampering with the trigger adjusting screws, over oiling, (I.E. motor oil, salad oil, etc.) and other unauthorized alterations.

Several models returned are old obsolete Models 721, 722 rifles, some being 30 years old, that are worn from hard use, including the trigger assemblies. We do not have any replacement assemblies for these models; therefore, requiring extensive alterations to present Model 700 trigger assemblies for installation at no charge.

Each firearm returned requires 20 minutes examination time for each of three (3) engineers and \$25.00 to \$30.00 Arms Service charges for time and parts to make the repairs, totaling approximately \$50.00 to \$55.00 per gun on a no charge basis.

I believe that we should review this problem with our Legal Department and, if possible, reword our letters to customers on these alleged incidences to read: "Return your rifle for our examination and, if the rifle is found to be factory defective, the repairs will be made at no charge." If these guns have been tampered with, neglected, or parts are worn because of long usage, the customer should be responsible for the repairs.

In order to put this problem into proper prospective, 500 guns returned, examined and repaired on a no charge basis, is costing our Company between \$25,000 and \$27,000.

PLAINTIFF'S
EXHIBIT

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EFS:tpg

AL 0031429

1 of 1

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



cc: E. F. Barrett
E. F. Sienkiewicz
J. A. Stekl

February 26, 1979

To: J. E. Preiser
From: E. G. Larson
Subject: Returned Bolt Action Rifles

*File
M...
Event at 3/6/79
Prod Safety
C... m...*

Attached is a copy of a memo from Ed Sienkiewicz relative to other than Model 600's returned for allegedly firing on release of safety. Ed makes a point, but several items require some thought:

1. Based on our policy, any gun returned that is found to have a material or workmanship defect, should be repaired at no charge. This has always been our policy.
2. Because we specifically have asked that any bolt action gun, allegedly firing on release of safety, be returned at our expense, more or less obliges us to make a no charge repair.
3. Obsolete guns present another problem because parts are not easily interchanged.

I agree with Ed that worn or misused guns returned should bear a charge for repair. This will require a change in our request for return, and probably involve a management decision.

Any gun received in which we find a safety problem, regardless of cause, should be brought to the attention of the owner. I suggest that in the case of obsolete, worn, or misused guns, we advise the owner of the cause, and send him an estimate of cost of the repair required. Again, this is a management decision.

One thing that bears investigation (I initiated same several months back, but no answer to date) is a cold test, and accelerated storage of the oil-lube-protective materials used by the plant on new guns. Several reports from the field indicate a varnishing effect accrues after a period of time, causing a malfunction of trigger components. Cold temperature would induce a more severe condition.

Let's discuss.

E. G. Larson

E. G. Larson

EGL:lb

**PLAINTIFF'S
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AL 0031452

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