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. Reisinger,
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

PENGAD-Bayonne, N. J.
PLAINTIFF'S EXHIBIT
3000

A L 0013517

1 of 1

COPY

REMINGTON ARMS CO. INC.
RECEIVED
SEP 21 1951
PATENT DEPT.

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

29

PLAINTIFF'S EXHIBIT 3001

VP-10253 C

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, 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.

A L 0013520

2 of 3

80-D

By telephone: 10/29/58
:jmm

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.

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

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

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

ALT0013523

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

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

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

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

A L 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.

A L 00135528

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

ATTEST:

Assistant Secretary

E. I. DU PONT DE NEMOURS AND COMPANY

By _____
Vice President

ATTEST:

Asst. Secretary

REMINGTON ARMS COMPANY INCORPORATED

By _____

RD-49 REV. 6-56

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

RECEIVED
AUG - 8 1973
R. A. PARTNOY

cc: 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/gm

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

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

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.

Your recommendations will be appreciated.

Very truly yours,

JHR

JOHN H. LEWIS, Jr.,
Patent Attorney.

JHL'BH
Encls.

Remington
Mohawk
LONG RANGE
25 PLASTIC SHOT SHELLS
WARNING: KEEP OUT
OF REACH OF CHILDREN
REMINGTON ARMS COMPANY, INC.
Remington
Remington
2¾"
8
2-3/4 DR. EQ. PWDR.
1-1/4 OZ. SHOT
MLR12-6
Remington Arms Company, Inc./Bridgeport, Connecticut 06602
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 2¾ 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
MLR-12
112
1 2

12 **2¾**
GAUGE INCHES SHOT

RXP TARGET LOADS

PETERS

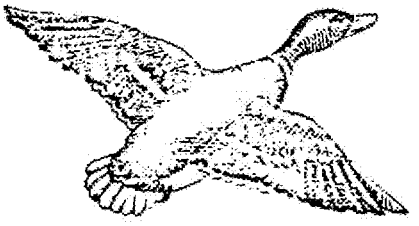
Remington Arms Company, Inc. disclaims any responsibility for any damages or injuries resulting from reloading and the use of reloaded shells.

CAUTION—These shells must not be used in guns having Damascus or twist steel barrels, or chambers shorter than 2¾ 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

WARNING: KEEP OUT OF REACH OF CHILDREN

RXP TARGET LOADS

25 PLASTIC SHOTGUN SHELLS



FINE AMMUNITION SINCE 1887

PETERS

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

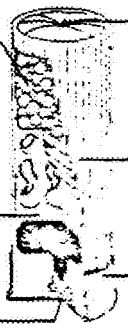
DUPONT

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

Quality polished hard shot for hard hitting performance.

Famous "Power Piston"** one piece plastic wad and shot container that cushions the shot, reduces recoil and results in target breaking patterns at all shooting distances.

A primer that assures greater reliability even in guns with off-center or weak-spring firing pins.



The mouth and crimp have been specially formed in the factory load to make subsequent recrimping easier and more secure.

One-piece* uni-body construction that can really take abuse.

Brass head for easy resizing.

*U.S. Pat. No. 3,103,170
**U.S. Pat. No. 3,217,648

PT12 RXP

A L 0018536

6 of 8

What Every Hunter Should Know

AA-L-0013537

Remington DUPONT MEMBER OF THE SHOOTING SPORTS

Remington

DUPONT

Remington Pension and Retirement Plan

REMINGTON ARMS CO. INC.
RECEIVED
JAN - 7 1971
PATENT DEPT.

A L 0013538

LG-4379 REV. 10-63

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
WILMINGTON, DELAWARE 19898

LEGAL DEPARTMENT

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

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

REM'GTON ARMS CO., INC.
RECEIVED
OCT 19 1973
NS.
PATENT DEPT.

October 17, 1973

JOHN H. LEWIS, JR.
REMINGTON ARMS

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"

PLAINTIFF'S EXHIBIT
3006

A L 0013539

1 of 1

WASHINGTON ABBS CO. INC.
RECEIVED
JAN 20 1983
PATENT DIVISION

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
3007

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.

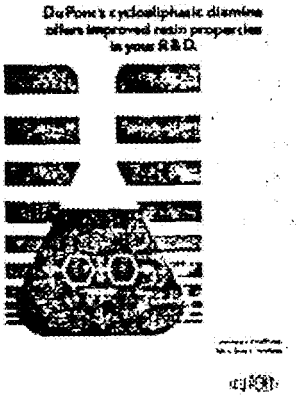
RIGHT

Oval is used alone, well free of other elements.



RIGHT

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



RIGHT

Oval final element. Product identification is separate.



RIGHT

Oval is final element. Brand identification is separate.

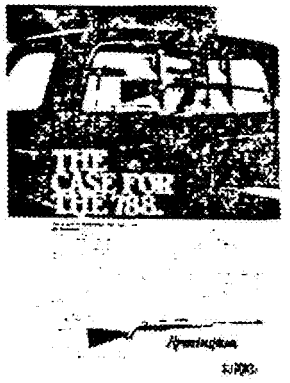


■ The Oval should *not* appear more than once on a page or panel (billboard, exhibit back wall, tent card, etc.), unless the second use is an illustration of a package or label containing the Oval. Repetitive designs or watermarks on bond paper, company checks, etc. are exceptions to this rule.

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-69 REV. 6-58

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

Remington

DUPONT

RONALD A. PARTNOY

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

TELEPHONE
203-366-3151

NOTE OUR REVISED ADDRESS:
REMINGTON ARMS COMPANY INC.
939 BARNUM AVE.
P. O. BOX 1939
BRIDGEPORT, CT 06601

Remington
DUPONT

REMINGTON ARMS COMPANY, INC.

OFFICE OF
THE PRESIDENT

BRIDGEPORT, CONNECTICUT 06602

TELEPHONE 203-333-1112
TELEX 964 201 STRATFORD CT

ATL0013542

3 of 14

Remington.
DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

EXECUTIVE OFFICES

BRIDGEPORT, CONNECTICUT 06602

TELEPHONE 203-333-1112
TELEX 964 201 STRATFORD CT

NOTE OUR REVISED ADDRESS:
REMINGTON ARMS COMPANY INC.
939 BARNUM AVE.
P. O. BOX 1939
BRIDGEPORT, CT 06601

ATL0013543

Remington
DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

939 BARNUM AVENUE
P.O. BOX 1939
BRIDGEPORT, CONNECTICUT 06601

TELEX
964-201
STRATFORD CT

TELEPHONE
203-333-1112

A L 0013544

RO-66 REV. 6-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington
UMC

A L 0013545

NEWS

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

RELEASE

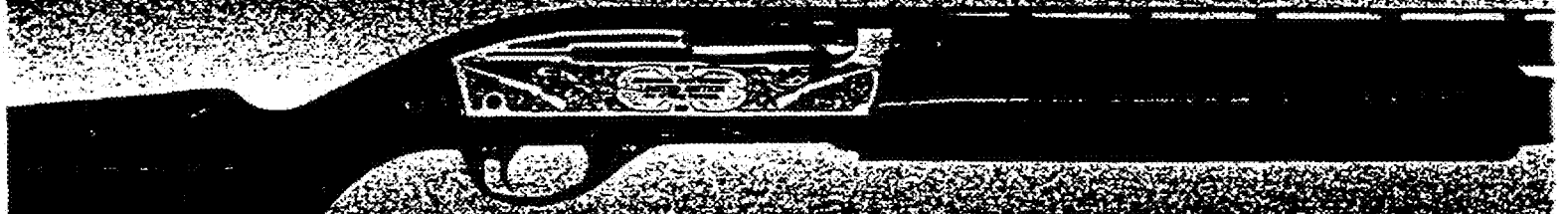
FOR RELEASE _____

ATL0013546

7 of 14

REMINGTON ARMS COMPANY, INC. 1980 PROGRESS REPORT

FIRST IN QUALITY



FIRST IN THE FIELD

AL 0013547

Remington
357 Magnu
123 GR. SEMI-JACK H.P.
High Velocity
Remington.
11RHV
78

A L 00035518

REMINGTON

SPORTING FIREARMS AND AMMUNITION FOR 1981

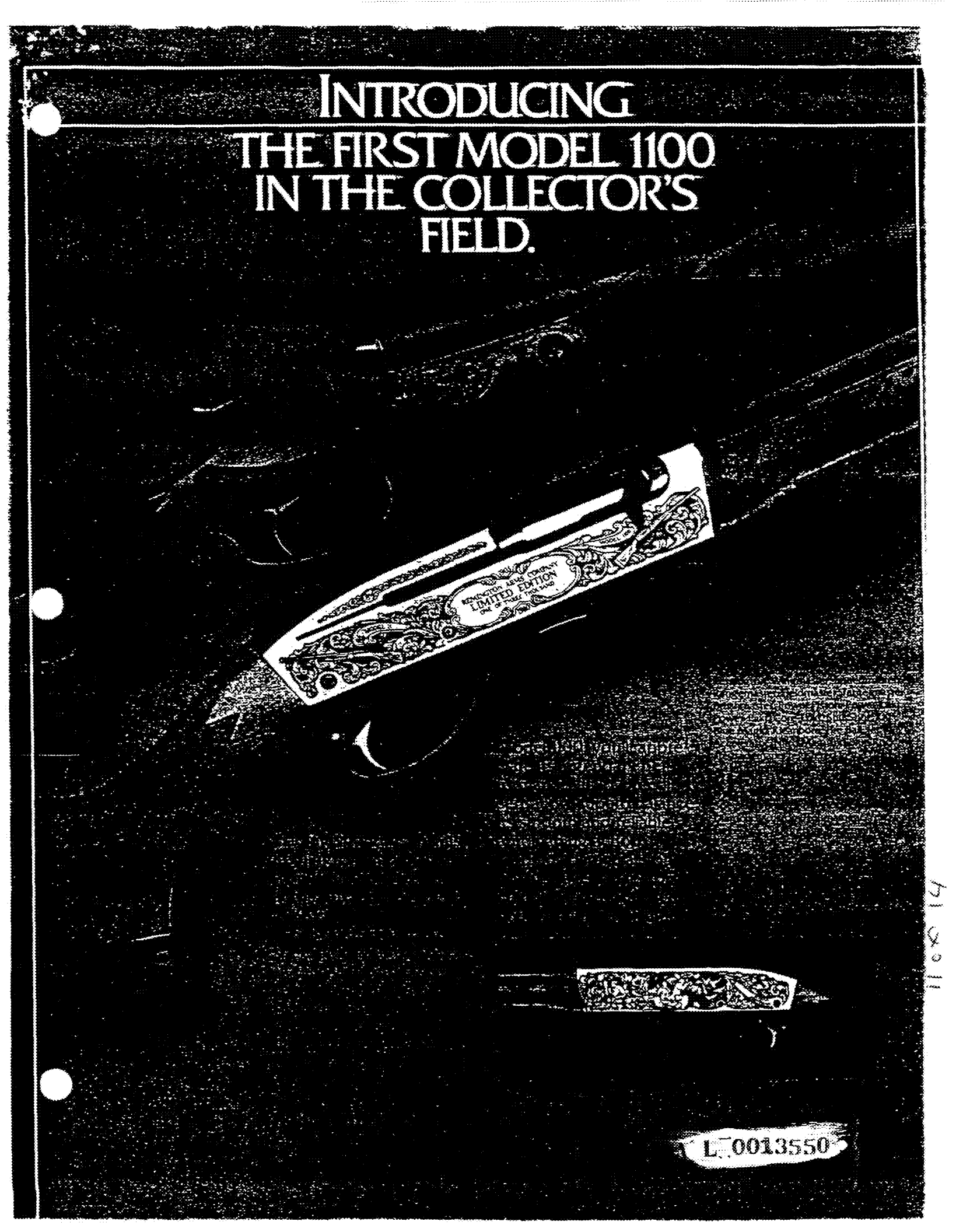


L 0013548

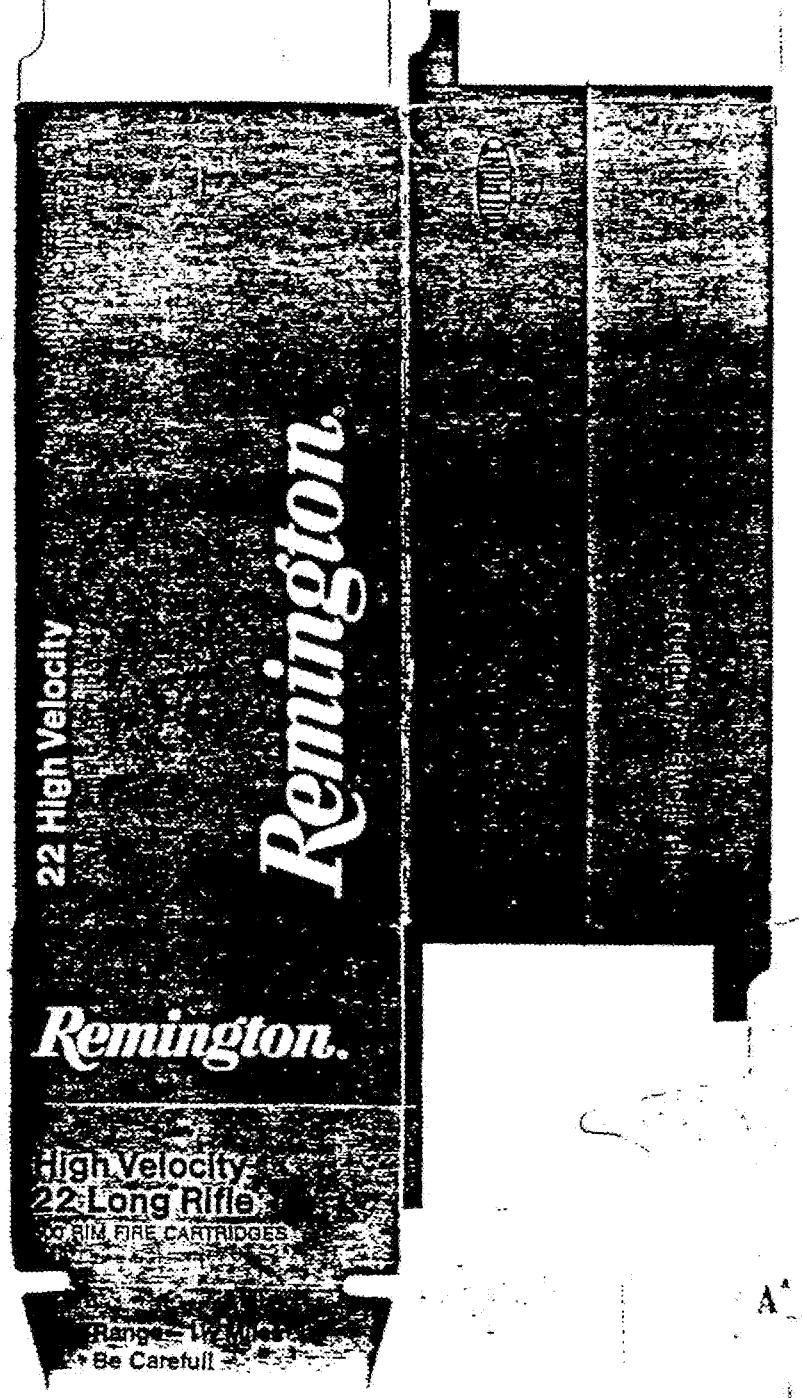
Remington DUPONT

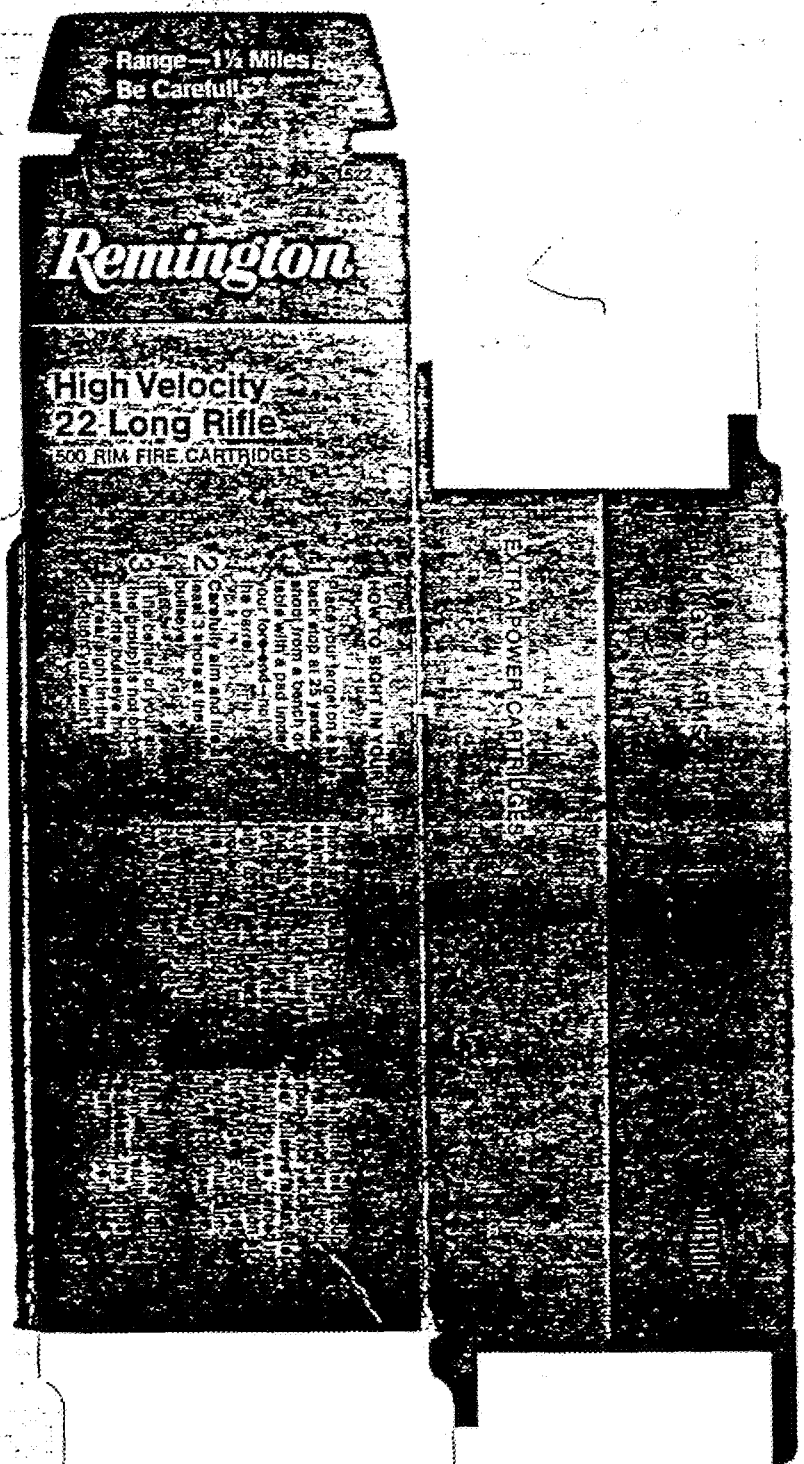
FIRST IN THE FIELD

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



L 0013550


22 High Velocity
Remington.
Remington.
High Velocity
22 Long Rifle
RIM FIRE CARTRIDGES
Be Carefull


Range—1½ Miles
Be Careful!
Remington
High Velocity
22 Long Rifle
500 RIM FIRE CARTRIDGES
EXTRA POWER CARTRIDGES

Remington
.357 Magnu
125 GR. SEMI-JACK H.P.
11RHV
High Velocity
Remington
KLEANBORE PRIMING
78

AL 0013553

RD-49 REV. 6-58

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: JS

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
Director -
Marketing Communications

JGW/y
attach.

PLAINTIFF'S EXHIBIT
3009

A' L 0013556

1 of 2

Remington®

DU PONT

REG U.S. PAT & TM OFF

Remington®

DU PONT

REG U.S. PAT & TM OFF

Remington®

DU PONT

Remington®

DU PONT

Remington®

DU PONT

REG U.S. PAT & TM OFF

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DU PONT

REG U.S. PAT & TM OFF

Remington®

DU PONT

Remington®

DU PONT

A' L 0013557

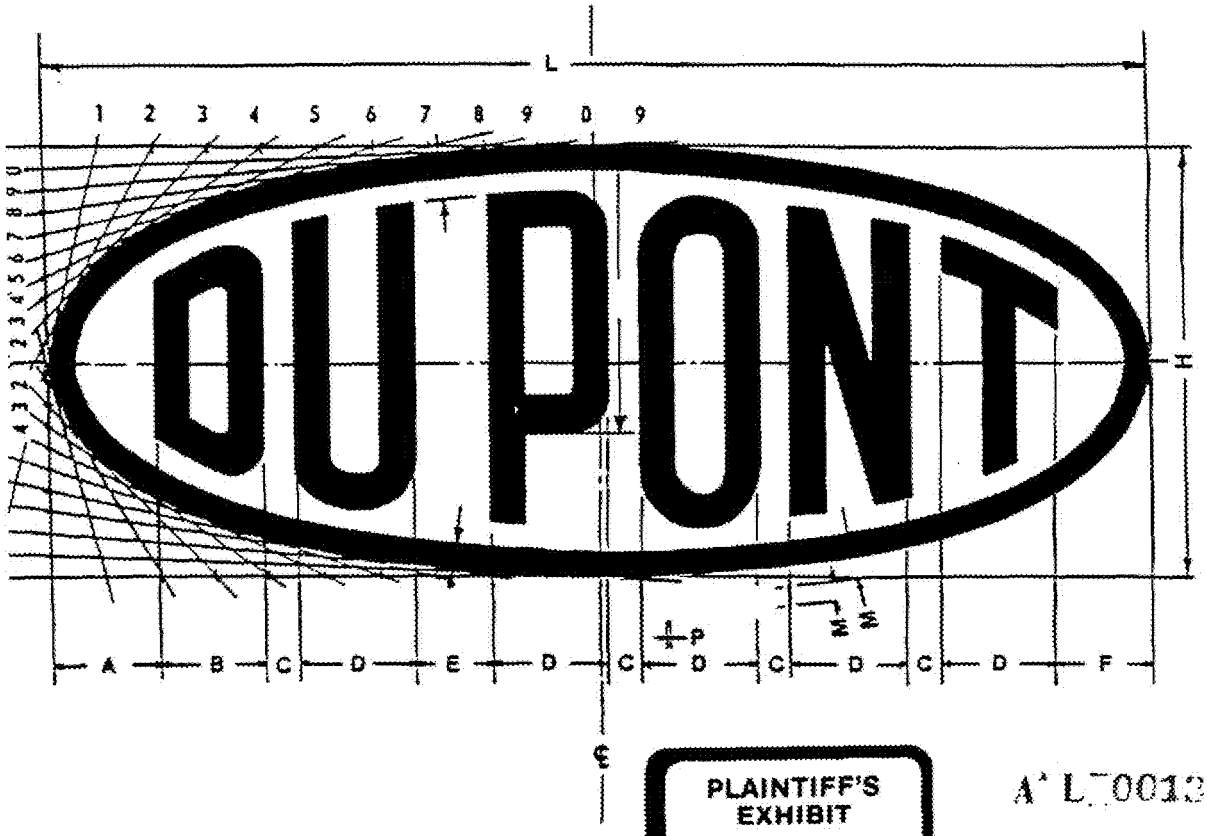
2 of 2

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

W. L. Fuson

CORPORATE IDENTITY

RECEIVED
AUG 9 1989
R.B. SPERLIN

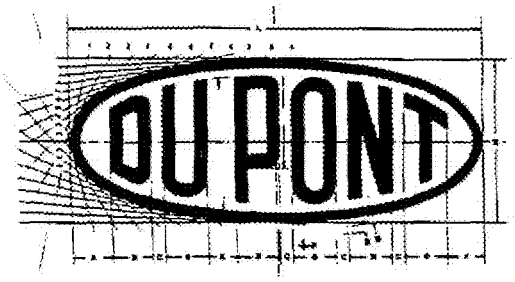


PLAINTIFF'S EXHIBIT
3010

A' L 0013558

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

A' L 0013559



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.

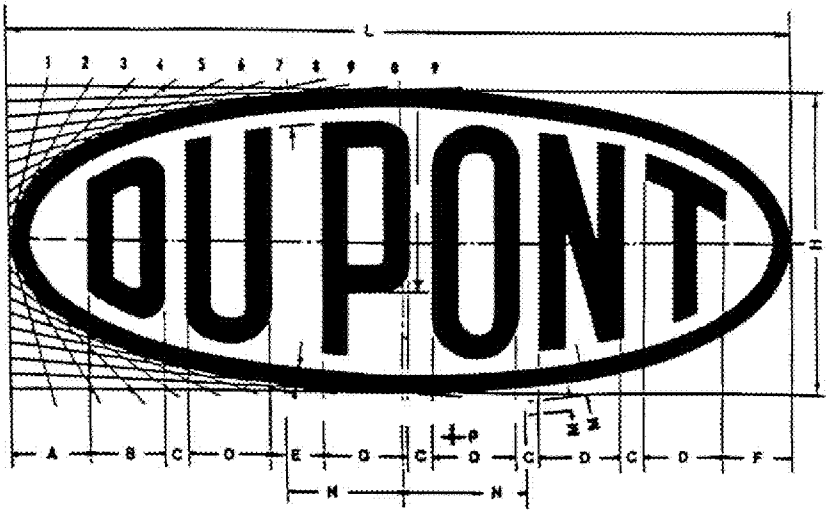
Sincerely,

John R. Malloy
Senior Vice President
External Affairs

Corporate Identity

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

Prepared by External Affairs



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

AL 0013561

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.

5 of 61

ALL 0013562

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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 at the Oval is required (see reproduction sheets for Packaging and Labeling).

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

A L 0013564
7 of 61

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.

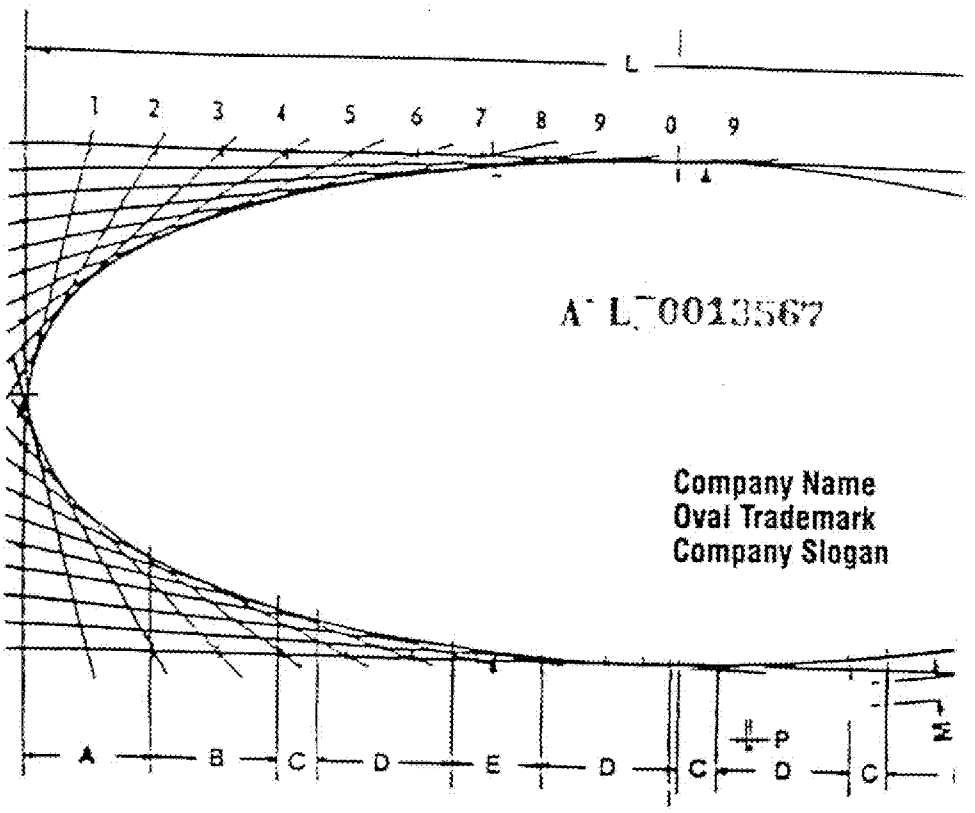
The third section discusses "Applications." Specific design considerations are presented for stationery, business cards, publications, product packaging, advertising, labeling, certification programs, electronic communications, equipment, rolling stock, and other items.

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

A L 0013566
9 of 61

PART 1

CORPORATE ELEMENTS



10.f(1

Company Name

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.**

A L 0013568

11 of 61

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

Oval Trademark

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.

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.

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.

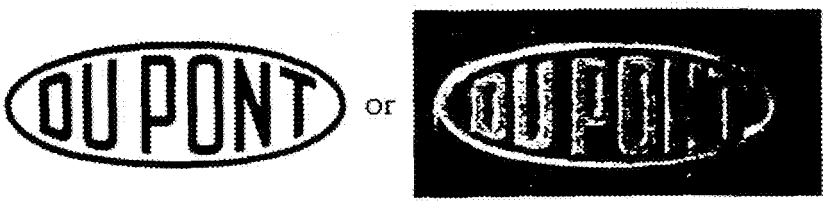
To maintain the integrity of this specific geometric design, corporate standards specify that only official Du Pont reproduction materials may be used when reproducing the Oval. See Appendix B for information on ordering Du Pont reproduction material.

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.



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.

ALT0013572
15 of 6

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.

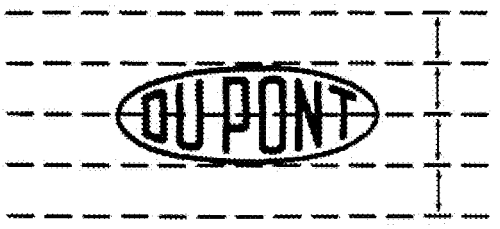
If a business unit, product, or specific campaign has an associated color, the Oval may be produced in a color other than PMS 185 Red. In such cases, the Oval should appear in the same distinctive color.

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.



*Less than 1/2 the depth of the Oval

A_L_00013573
16 of 61

Six Basic Design Standards (cont'd.)

B. POSITION

The Oval may be offset from other text.

DU PONT
CHEMICALS & PIGMENTS
WILMINGTON, DE 19898

C. COLOR

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

DU PONT TEFLON® or DU PONT TEFLON®

EXCEPTION

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

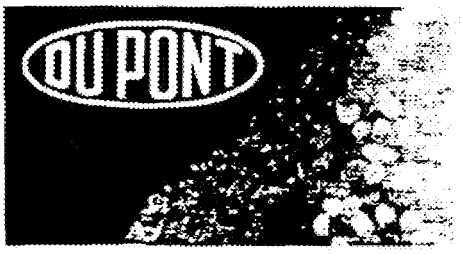
4. **SIZE**

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

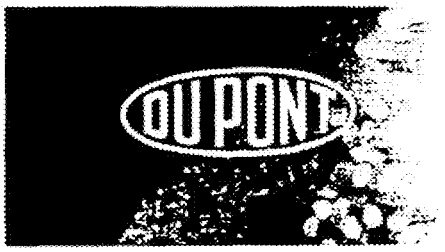
5. **BACKGROUND**

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

Right



Wrong



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.

A L 0013575
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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.



Better Things for Better Living

or



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

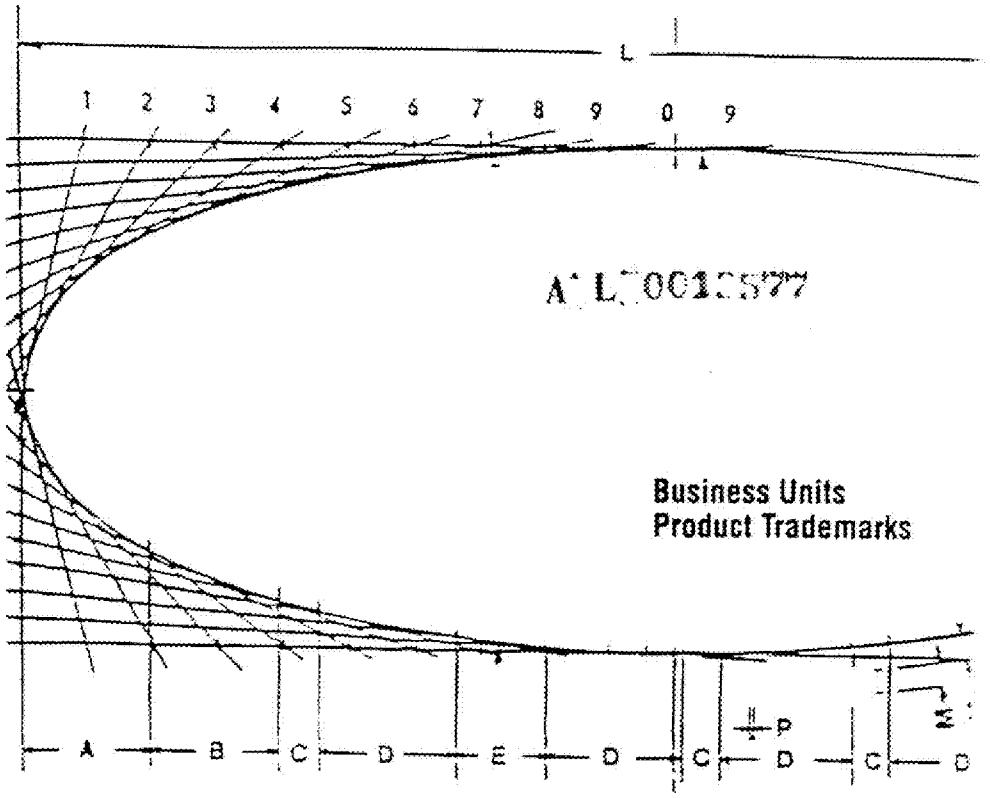
The type style of the Company slogan may change to conform with the type style of the communications piece.

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

A L 0013576
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PART

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

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

Du Pont Electronics or DU PONT Electronics

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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.

A[illegible]L[illegible]0013579
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Product Trademarks

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

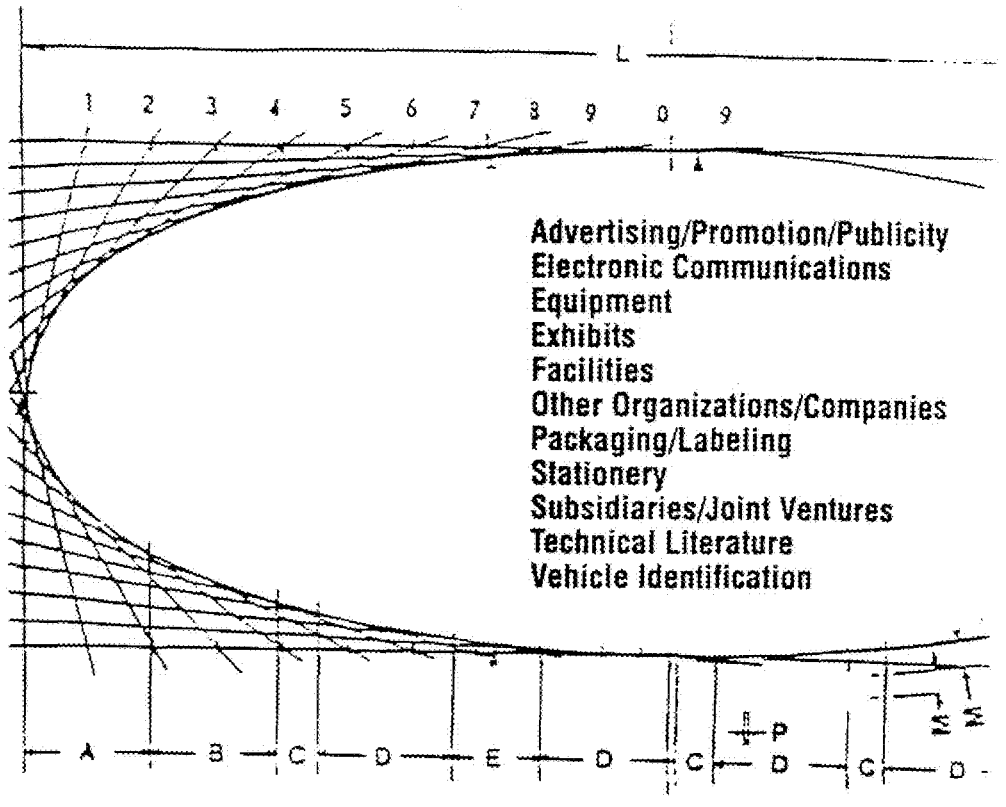
Do **not** use a trademark in a possessive, plural, or hyphenated form.

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PART 5

APPLICATIONS

A' L 0033581



3

Advertising/ Promotion/ Publicity

APPLICATIONS

Advertising and promotion are the most visual forms of communicaton 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.



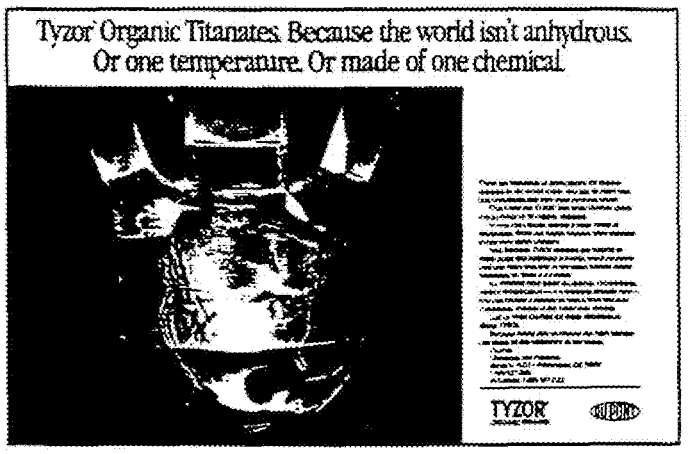
A L 00013582
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Advertising/ Promotion/ Publicity

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.

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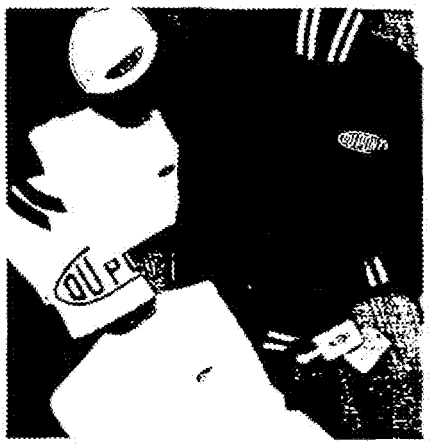
Outdoor Advertising

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.





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Advertising/ Promotion/ Publicity

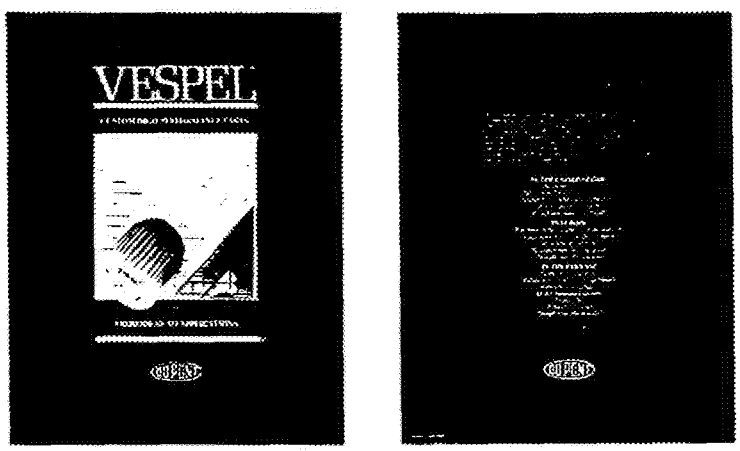
BROCHURES

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.

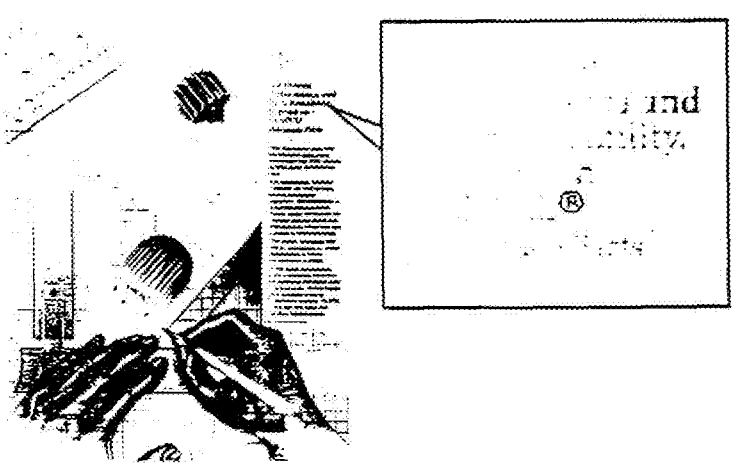
BROCHURE BACK COVER

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.



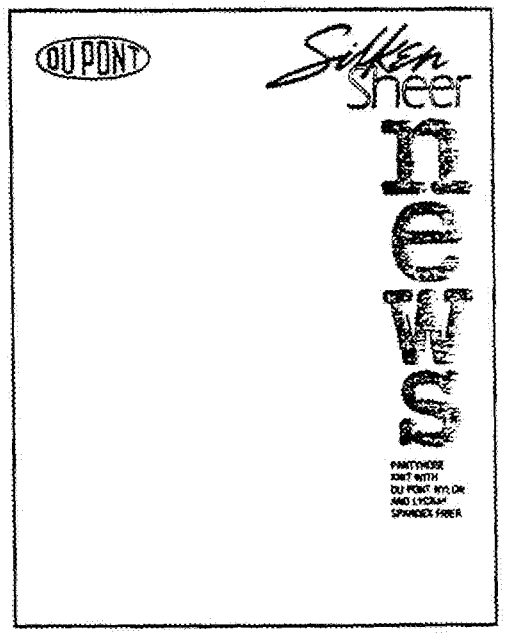
FIRST TEXT PAGE

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.



Promotional Newsletters and Publications

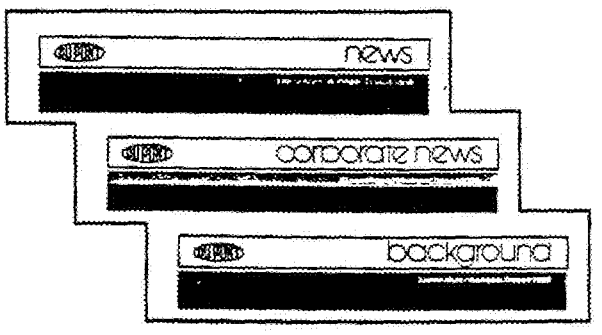
Newsletters and publications for distribution to customers should follow the same standards as promotional materials. The Du Pont Oval should have prominence with the use of color, space, or position.



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.



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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.

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3

Equipment

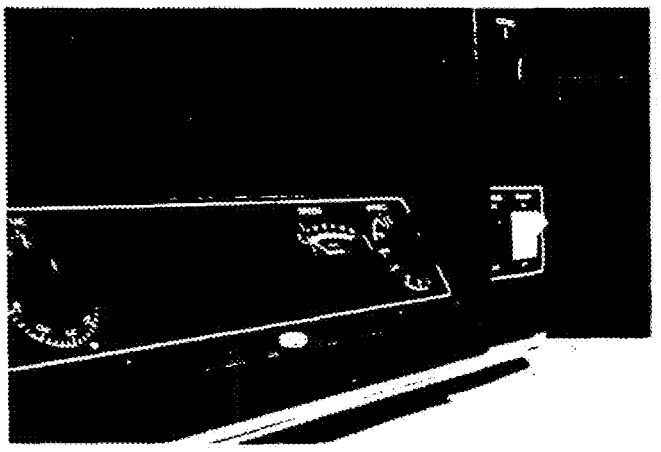
APPLICATIONS

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.

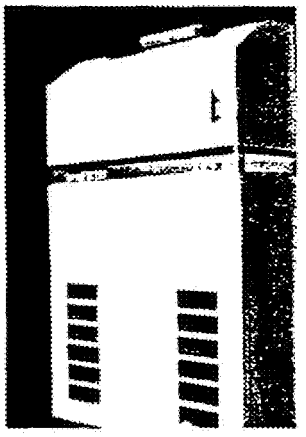
NOTE

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



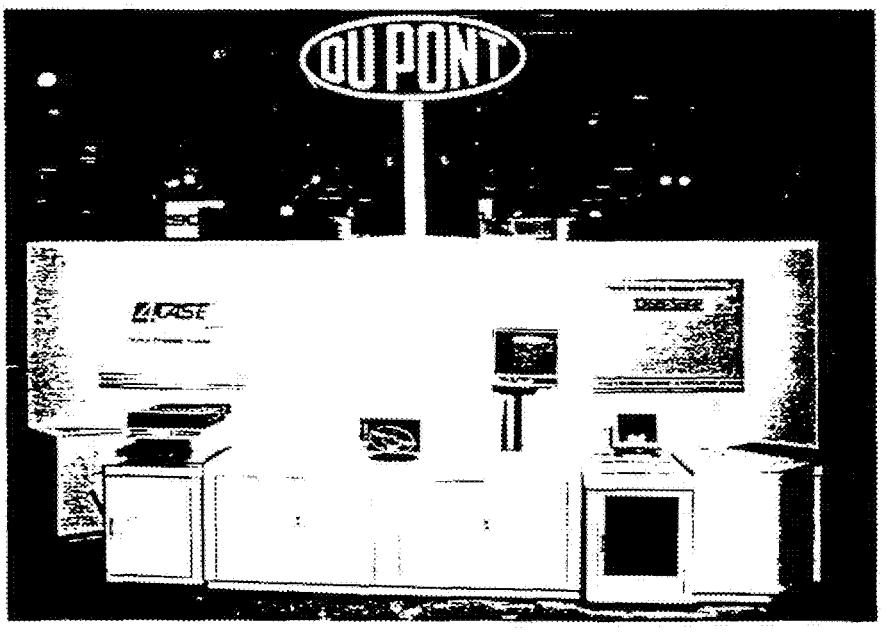
A_L_0013588
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Exhibits

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.





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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.

DUPONT or DUPONT Glasgow Site

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.

DUPONT or DUPONT Automotive Products

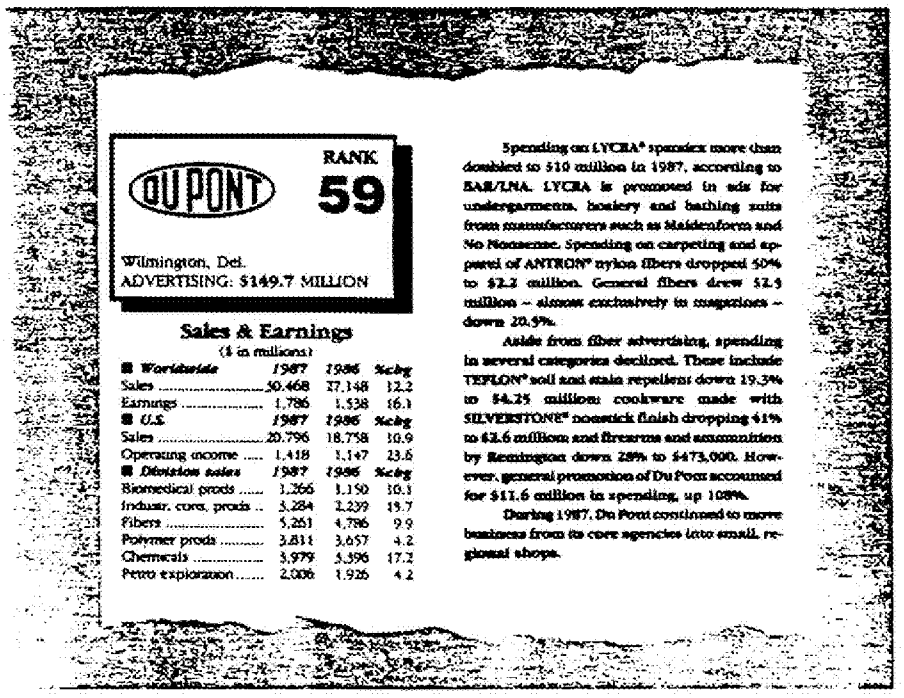
A L C013590
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Other Organizations/ Companies

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.



DUPONT

RANK 59

Wilmington, Del.
ADVERTISING: $149.7 MILLION

Sales & Earnings
($ in millions)

■ Worldwide	1987	1986	%chg
Sales	30,468	27,148	12.2
Earnings	1,786	1,538	16.1
■ U.S.	1987	1986	%chg
Sales	20,796	18,758	10.9
Operating income	1,418	1,147	23.6
■ Division sales	1987	1986	%chg
Biomedical prods	1,266	1,150	10.1
Industr. coms. prods	5,284	2,239	19.7
Fibers	5,261	4,786	9.9
Polymer prods	3,811	3,657	4.2
Chemicals	3,979	3,396	17.2
Petro exploration	2,006	1,926	4.2

Spending on LYCRA® spandex more than doubled to $10 million in 1987, according to BAB/LNA. 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 20.5%.

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.

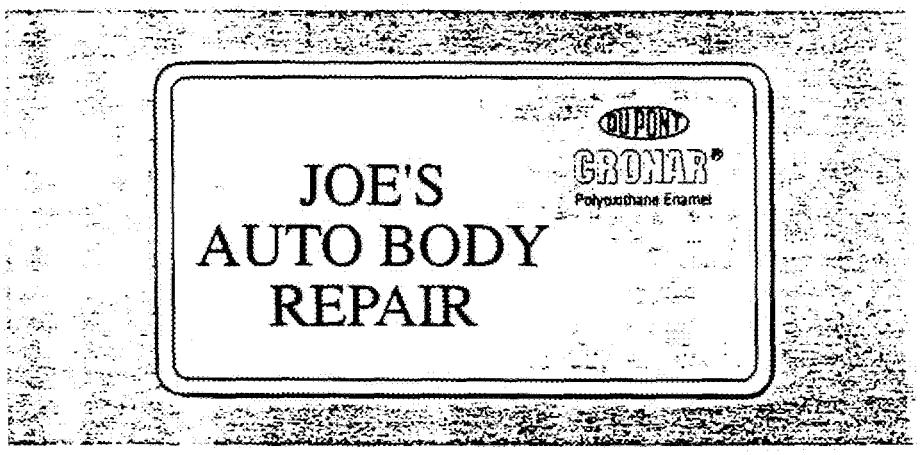


A L 0013591

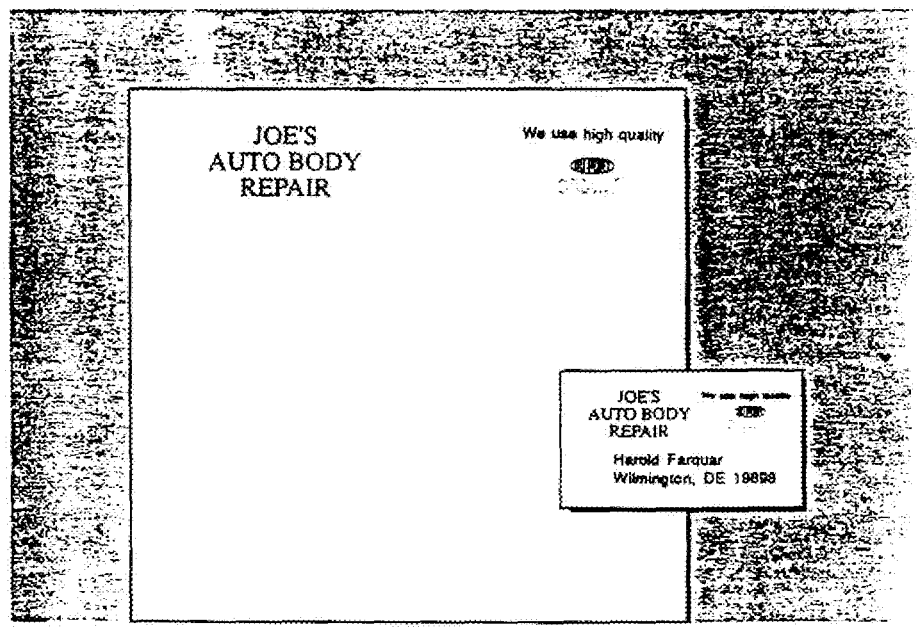
RETAILERS/DISTRIBUTORS

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



A L 0013592

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.

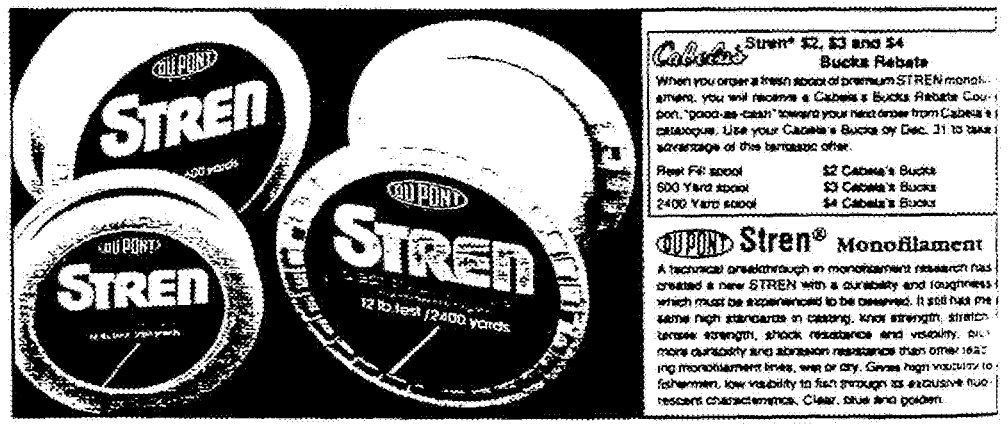
Imprinted Literature

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.



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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

DUPONT

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

DUPONT CORIAN®
SOLID SURFACE PRODUCTS

FOR MORE INFORMATION CALL:

LIVINGWELL CABINETS

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

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Other Organizations/ Companies

Certification Mark Programs

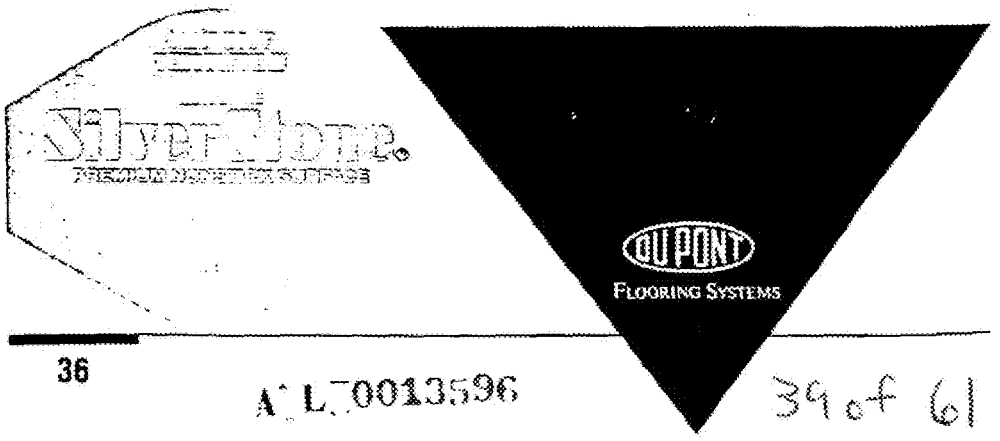
U.S. REGION LEGAL REQUIREMENTS

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, not within, a Du Pont certification mark. There should be no printed border enclosing the certification mark and the Du Pont Oval.

Registered certification mark

Not registered as part of the certification mark.



ATL0013596

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.

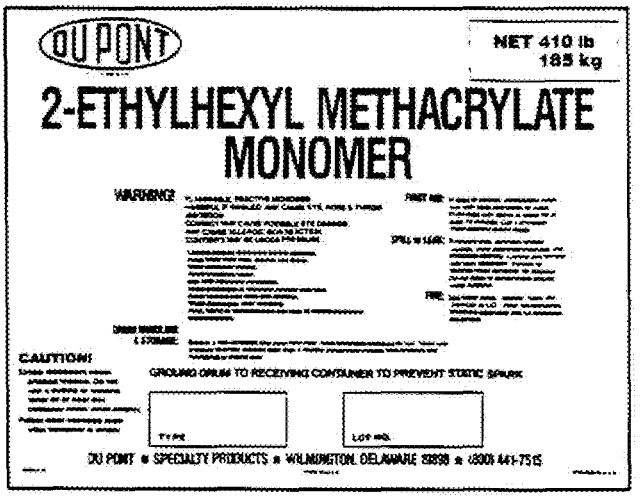
Oval Standards

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.

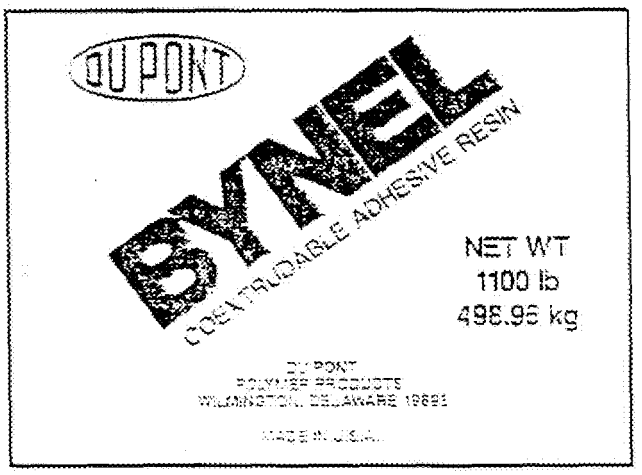
The Du Pont Oval is separated from text by using contrasting colors.



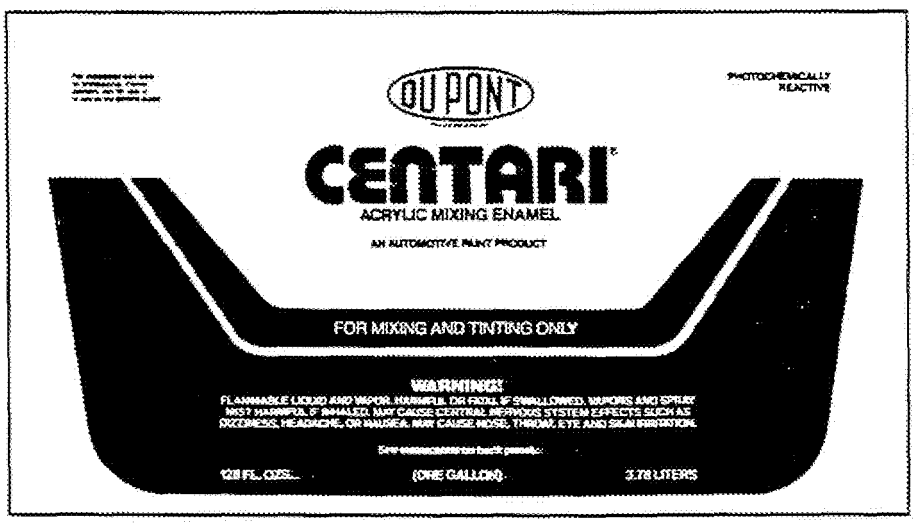
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APPLICATIONS

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.

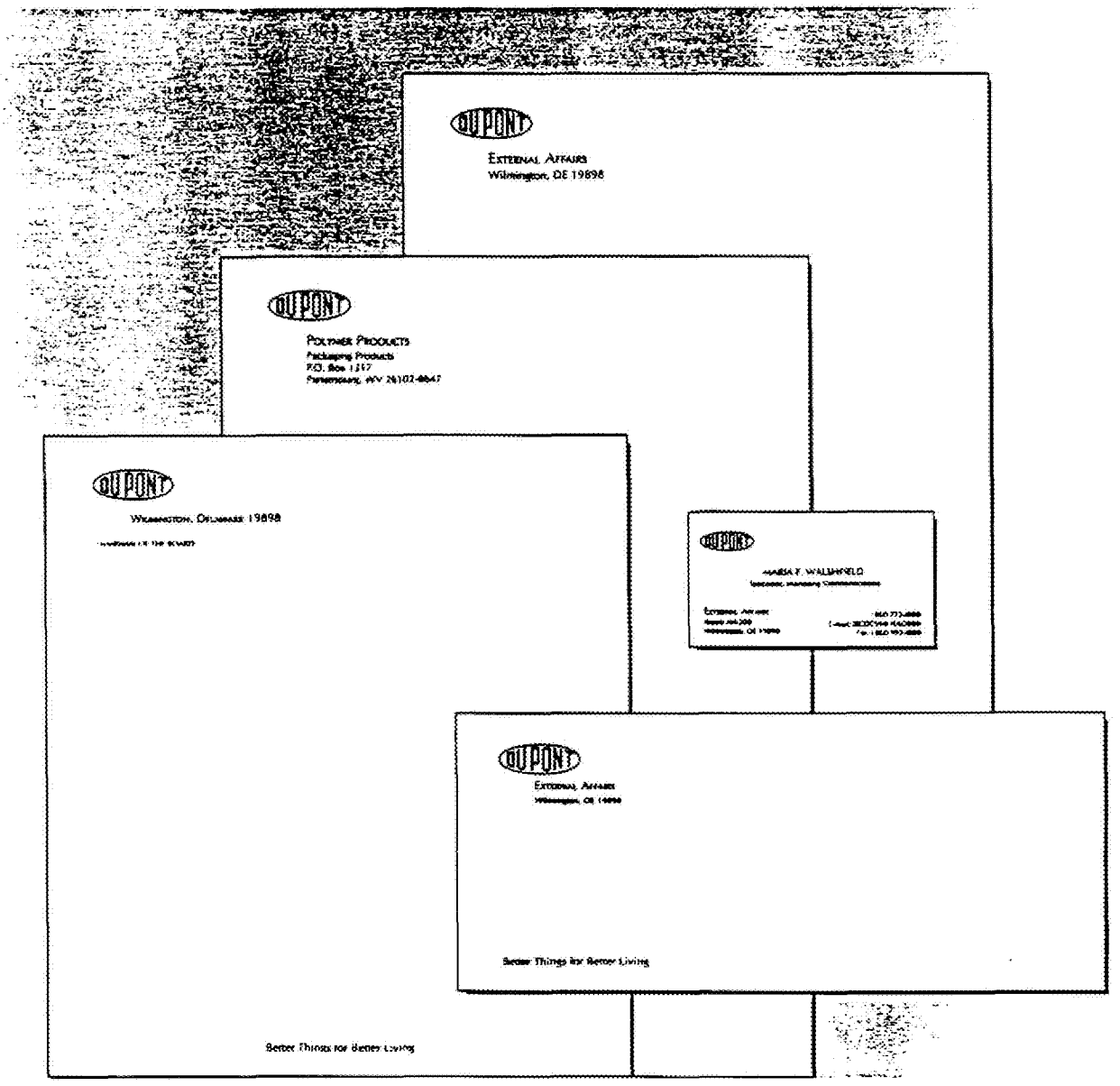


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Stationery

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.

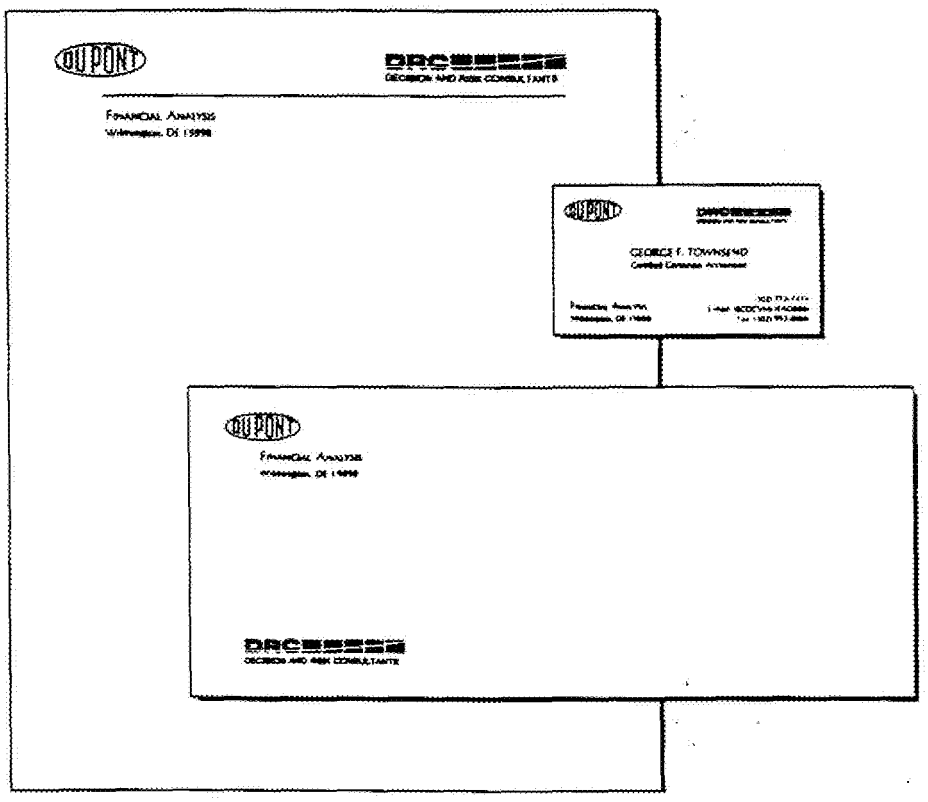
Standard Format



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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.



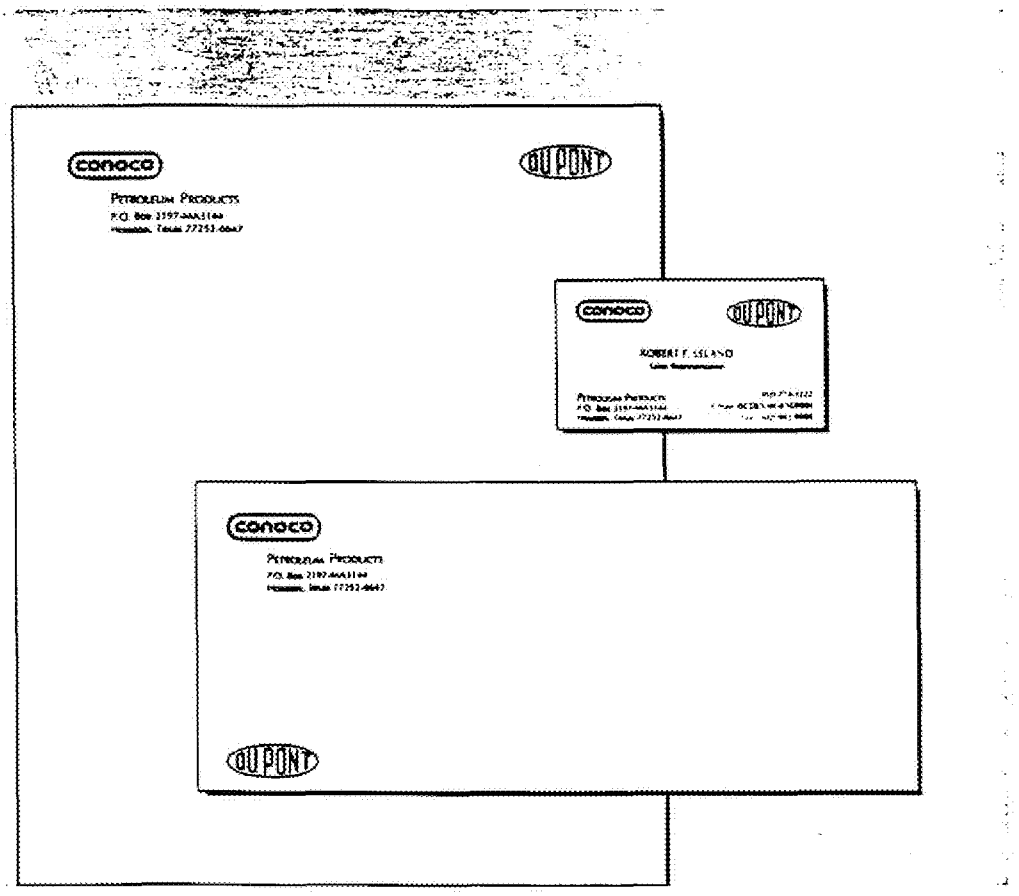
A_L_0013600
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Subsidiaries/ Joint Ventures

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.



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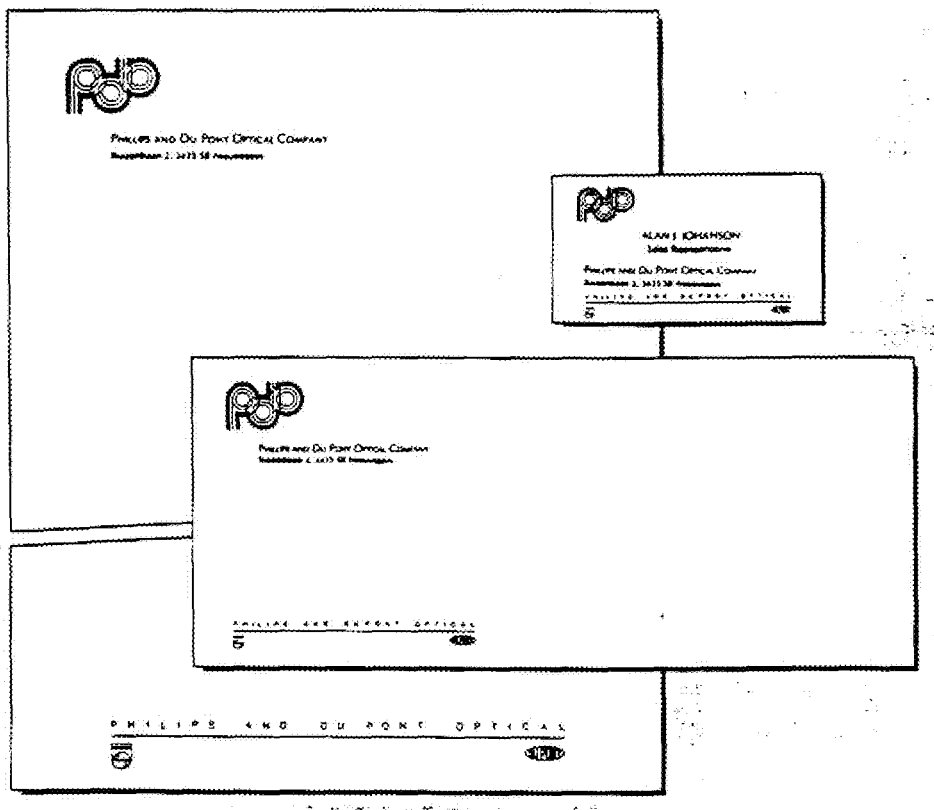
Standard Format for Joint Ventures

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.



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Technical Literature

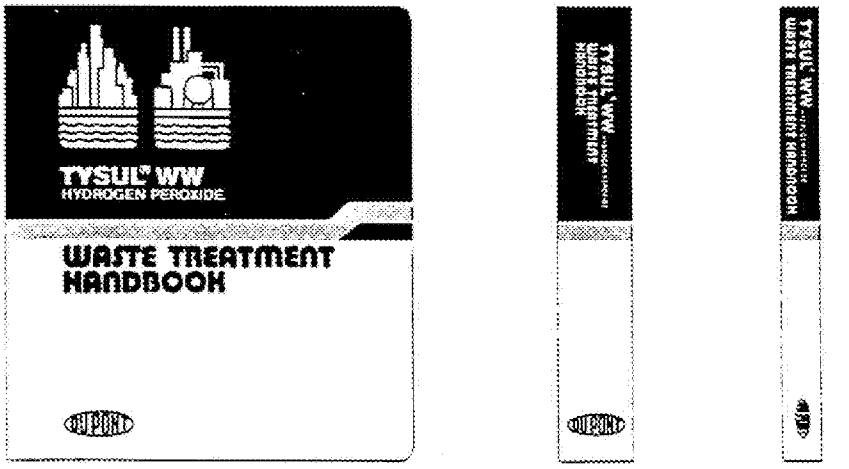
Technical publications share the common elements of the corporate identity program and should always communicate information with a simple, clear design.

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



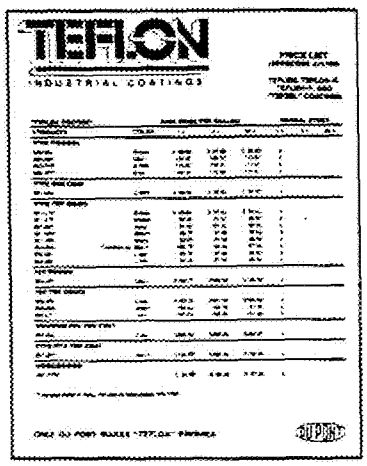
Cover 3" Spine 1" Spine

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.

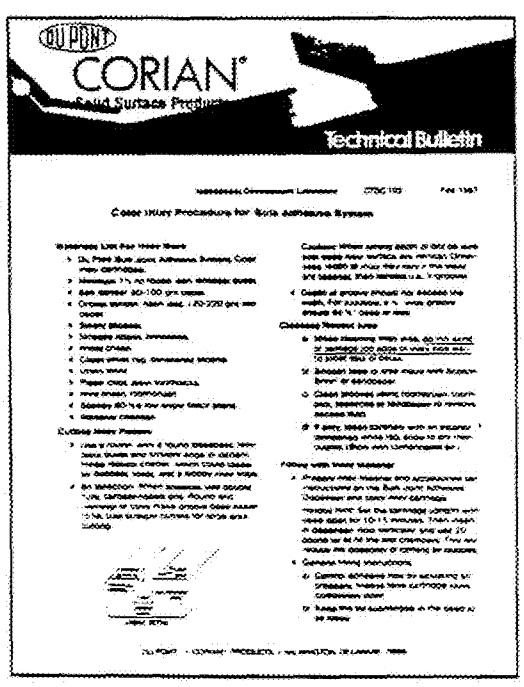
Specification Sheets/Price Lists

The Oval is shown clear of all other elements by at least 1/2 the depth of the Oval.



Technical Bulletins

The Oval is shown close to a product trademark in the same color and in an offset position.

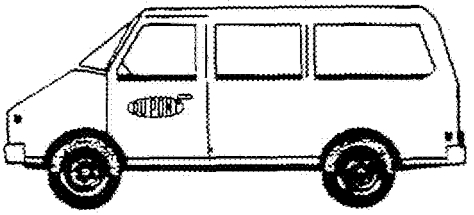


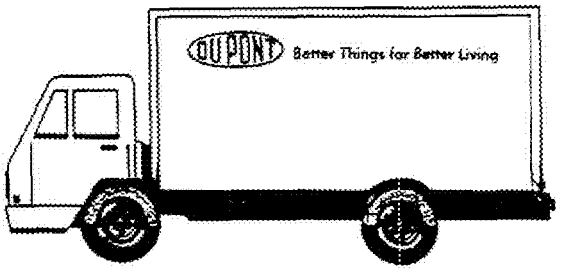
A L 0013604
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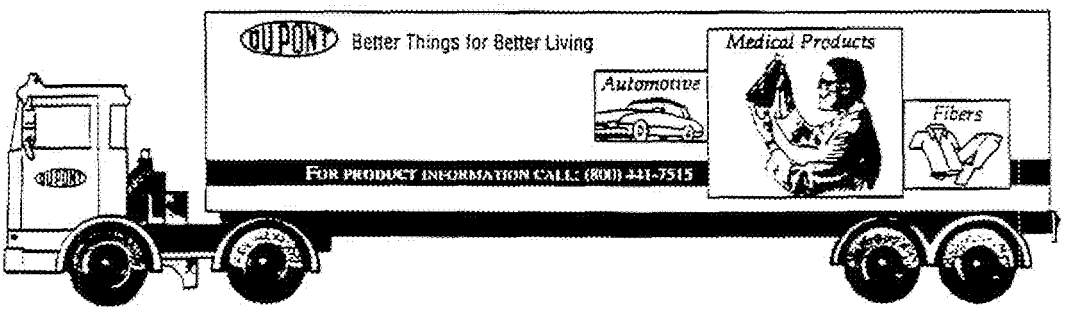
Vehicle Identification

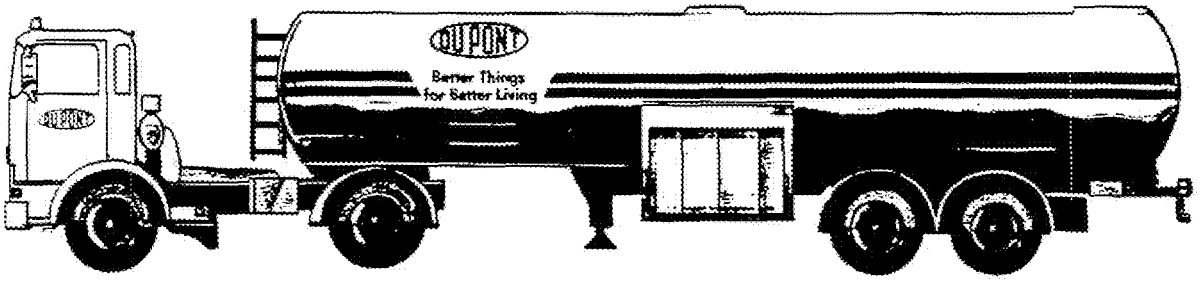
Trucks, vans, and other company vehicles are an important form of advertising with major exposure to the public every day. The Du Pont corporate image is strengthened when the design elements already mentioned are presented advantageously on these large viewing surfaces in a consistent and well-maintained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





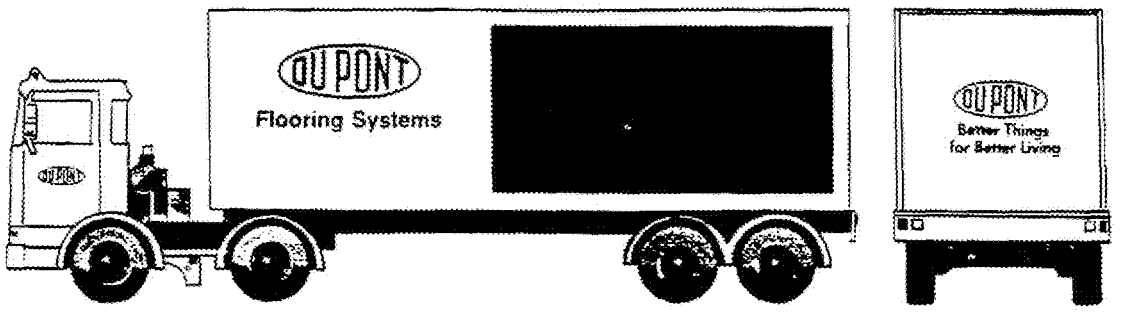


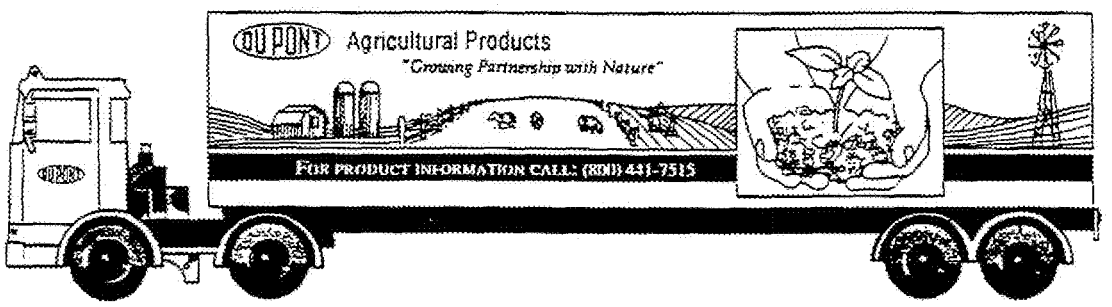


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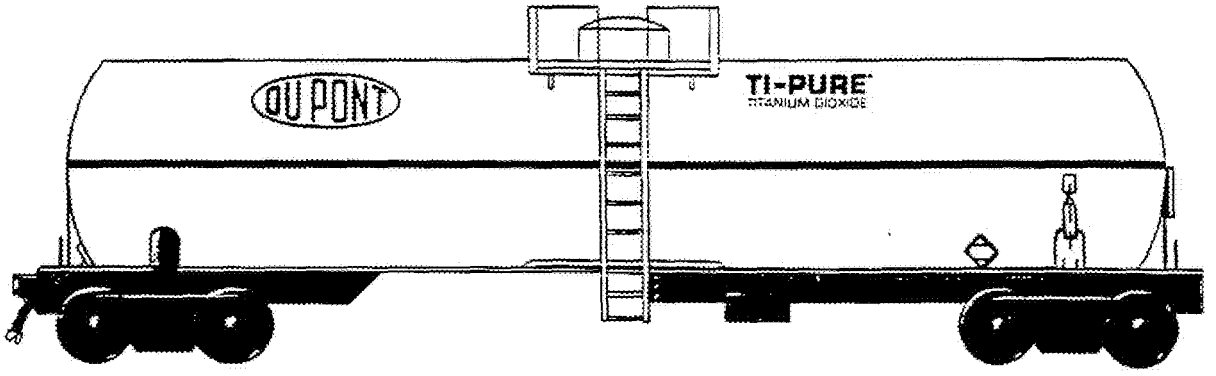
APPLICATIONS

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.





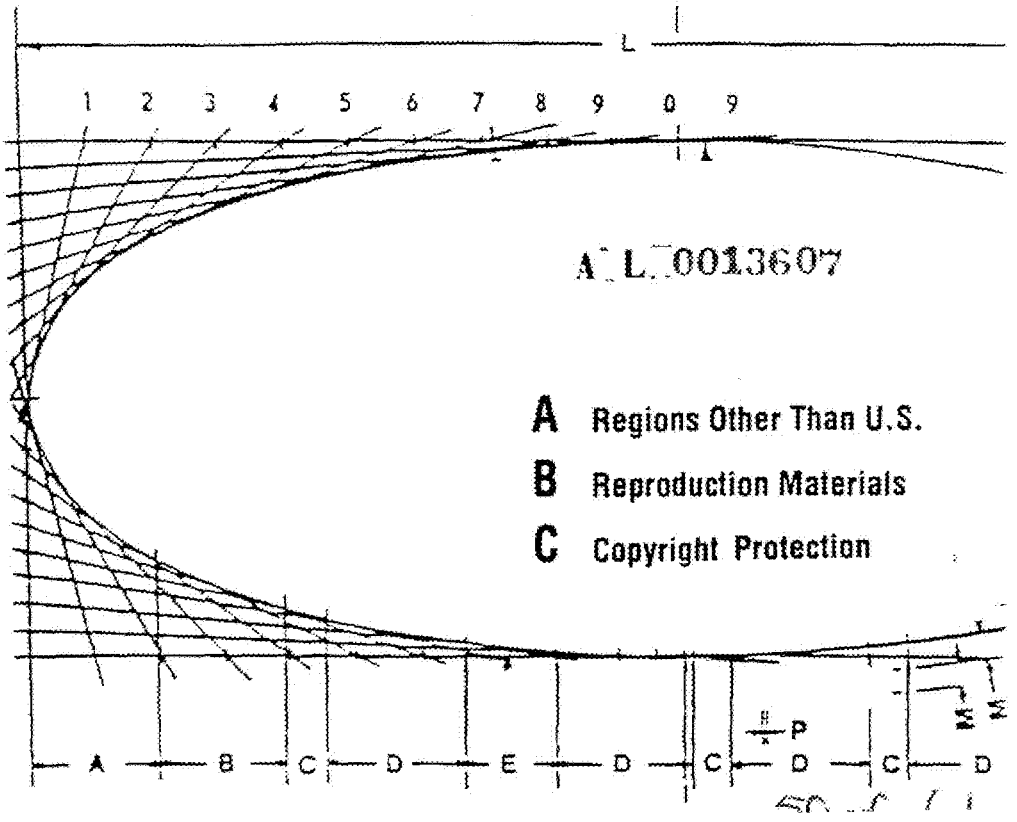
Industrial products may be identified if the vehicle is dedicated to that product and there is value in having our customer see the product name at the point of delivery.



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

A L 0013606
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APPENDIX


L
1 2 3 4 5 6 7 8 9 0 9
A L 0013607
A Regions Other Than U.S.
B Reproduction Materials
C Copyright Protection
A B C D E D C D C D C D
P

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

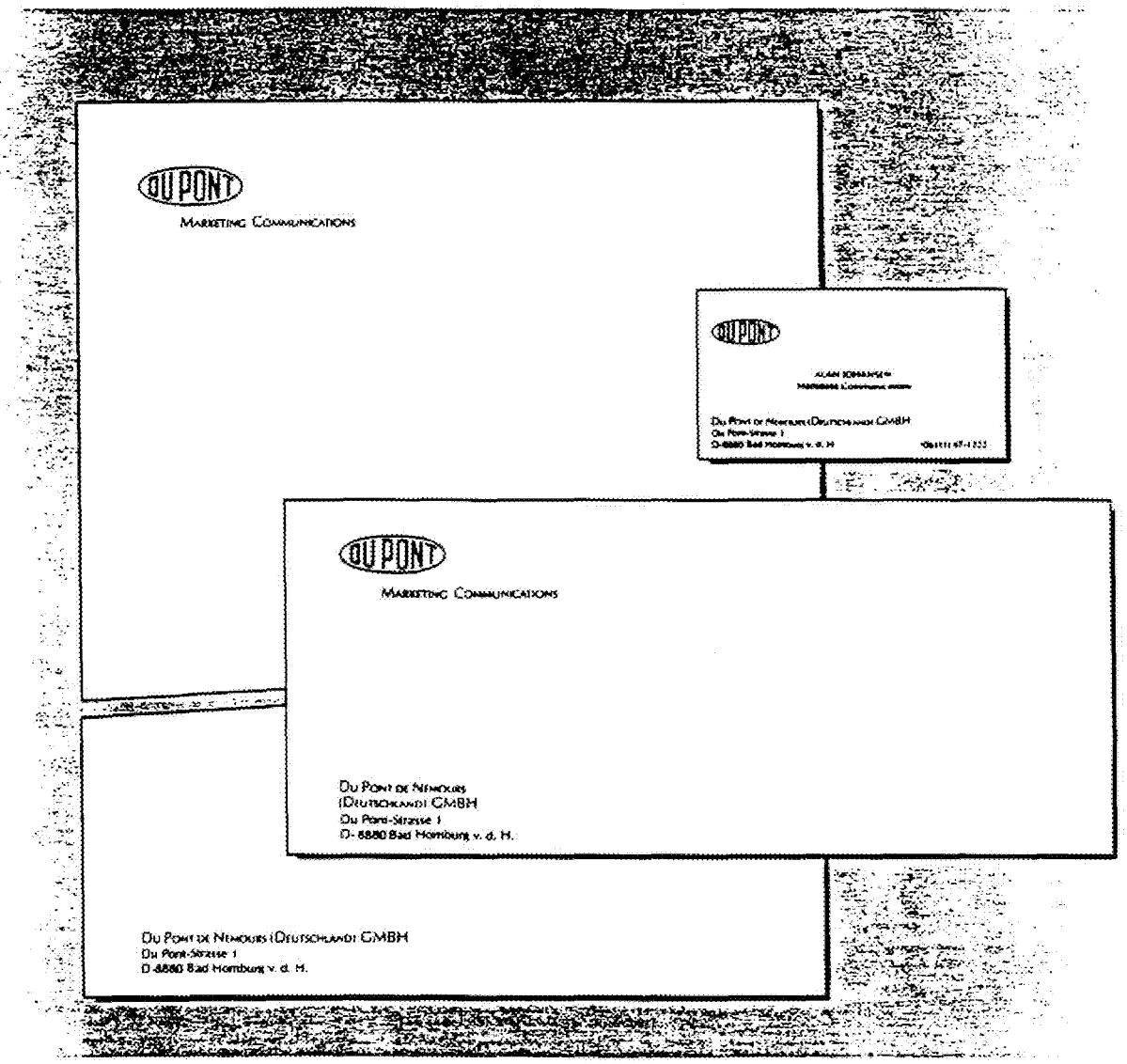
The Oval may be used by sellers or resellers outside the United States if it is registered in the country or countries where the Oval will be used. If the Oval is not registered for the goods sold by the seller or reseller, the Oval may be used only if the seller or reseller enters into a license agreement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

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APPENDIX A

STATIONERY

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



A L 0013629
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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

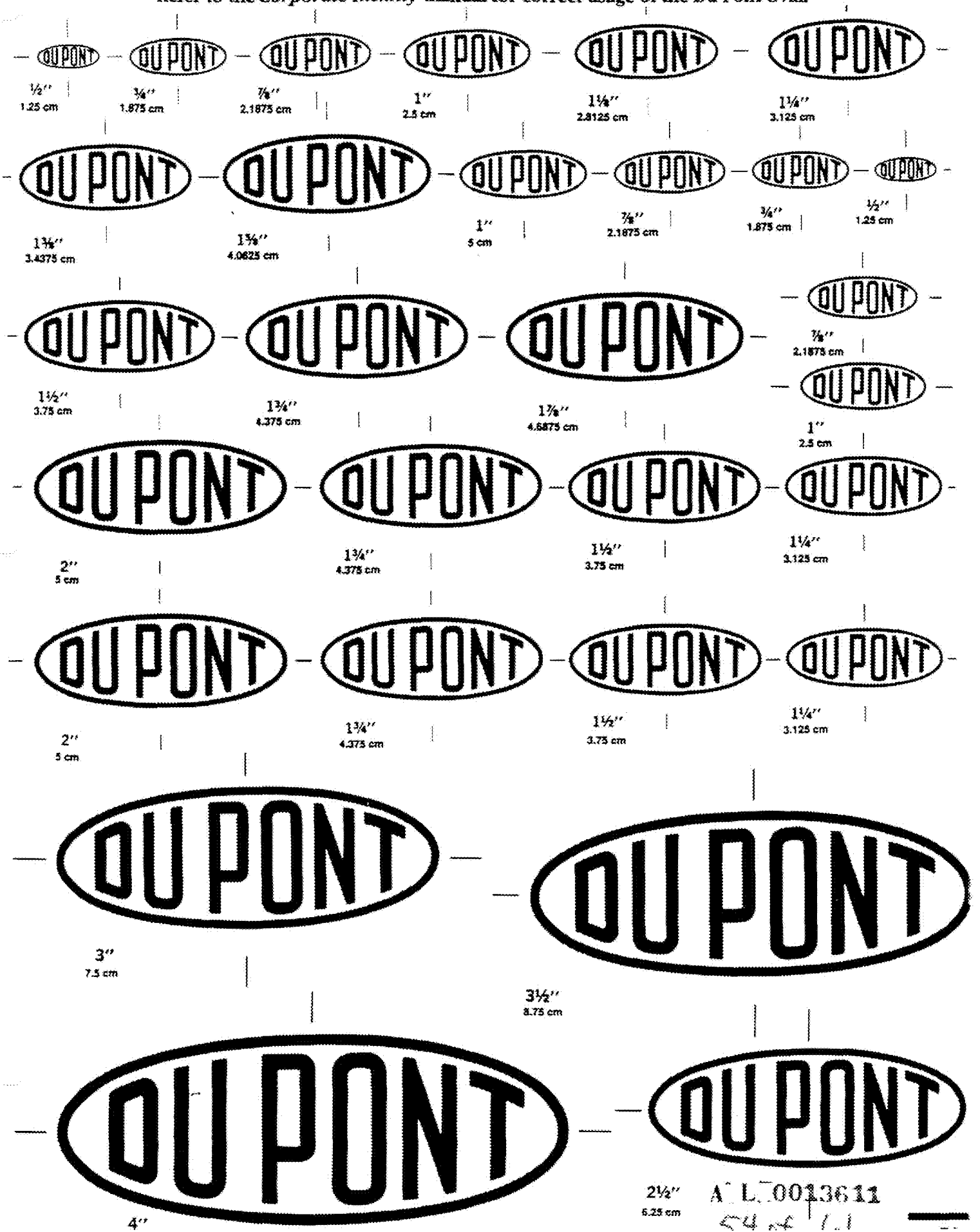
- Complete a G-352 stationery and forms requisition form and send to Du Pont, Stationery and Forms, Eden Park, Wilmington, DE 19898.
- Call order desk: (302) 774-4444.
- Fax order: (302) 774-5643. The voice contact number is (302) 774-8004.

A L 0013610

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.



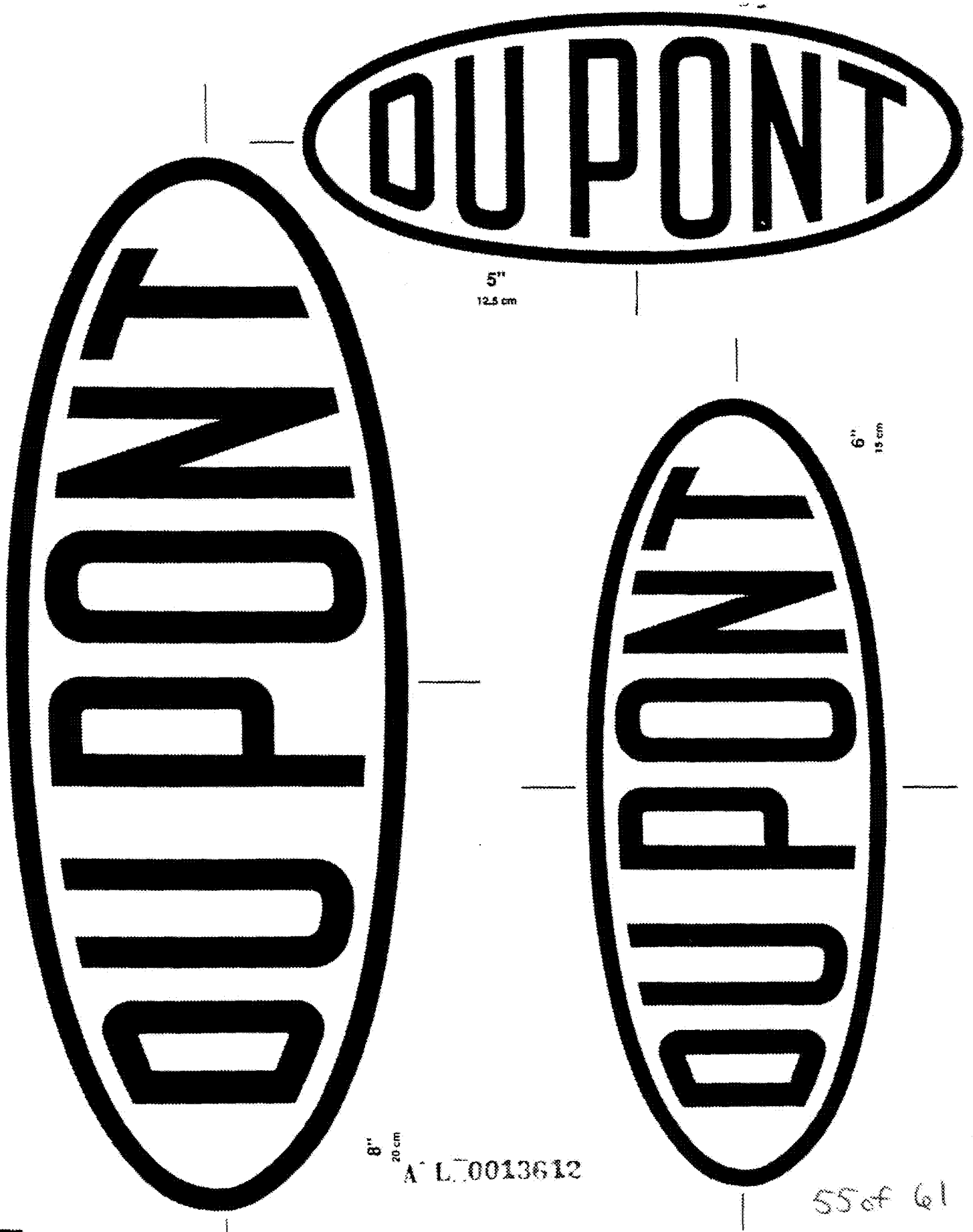
AL 00013611

SAMPLE REPRO SHEET *for Communications Materials*

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 00013612

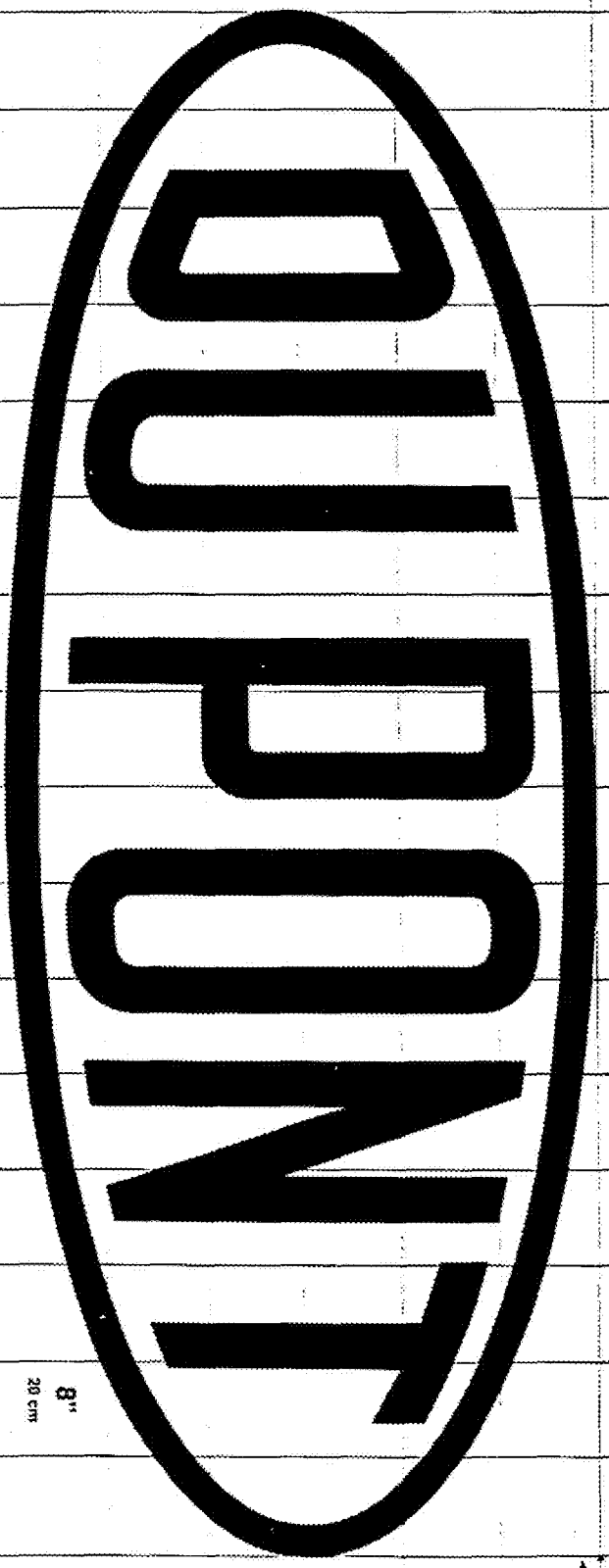
SAMPLE REPRO SHEET *for Fabricated and Painted Signs*

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 001363

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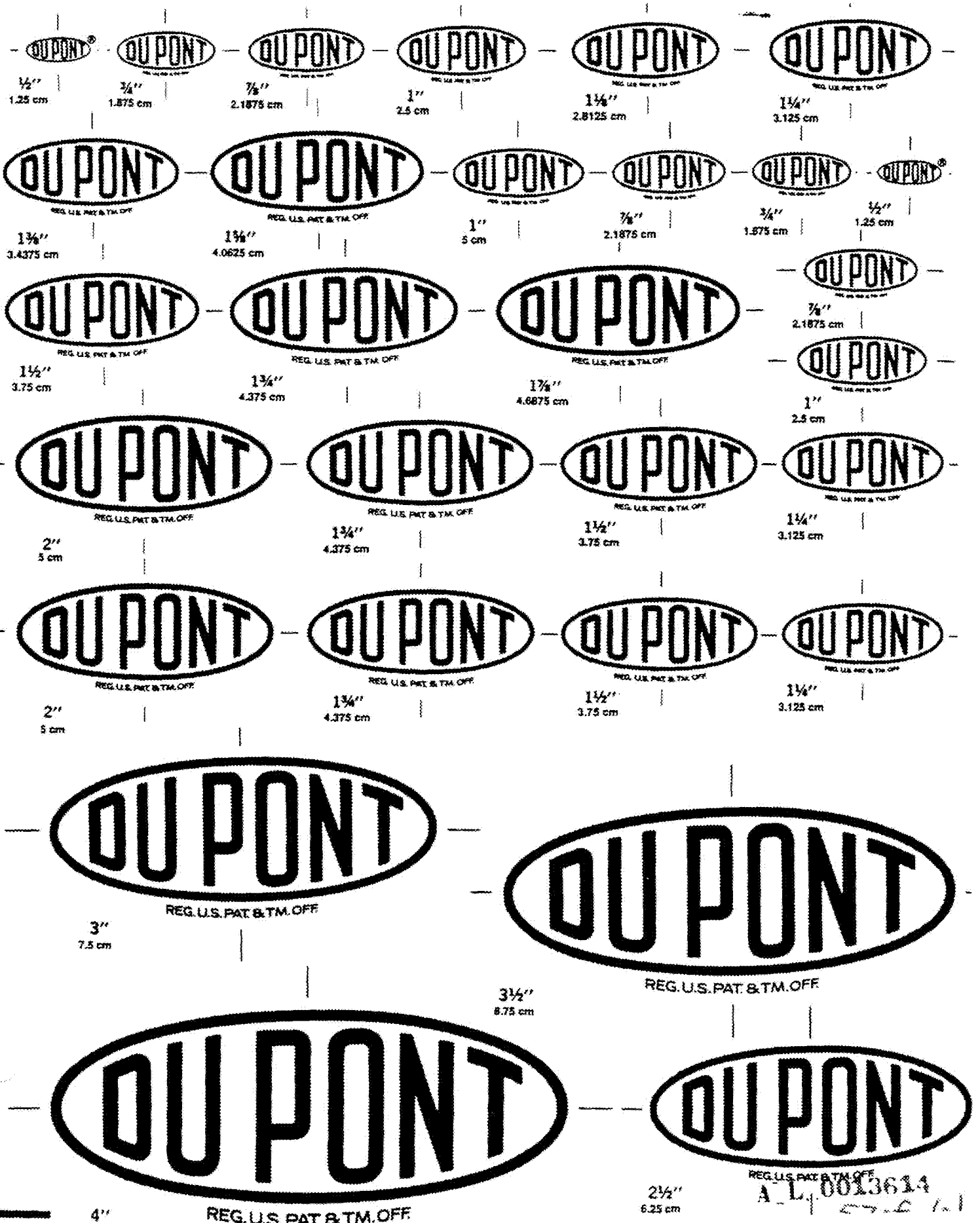
NOTE: The Du Pont Oval is not symmetrical. Therefore a grid should be used with the Oval to produce any fabricated or painted signs

SAMPLE REPRO SHEET *for Packaging/Labeling*

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_0013614

SAMPLE REPRO SHEET *for Communications Materials* H-1970(

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



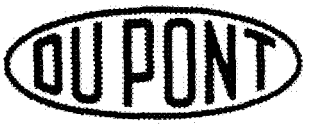
Better Things for Better Living



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

Be ''er Things for Better Living...from Du Pont 58f61

Better Things for Better Living...from Du Pont

A L 0013615

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.

A L 0013616
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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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A L 0013618



LEASE

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:

Location	Area	Yearly Rental
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.

ALT0013619

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.

A L 0013622

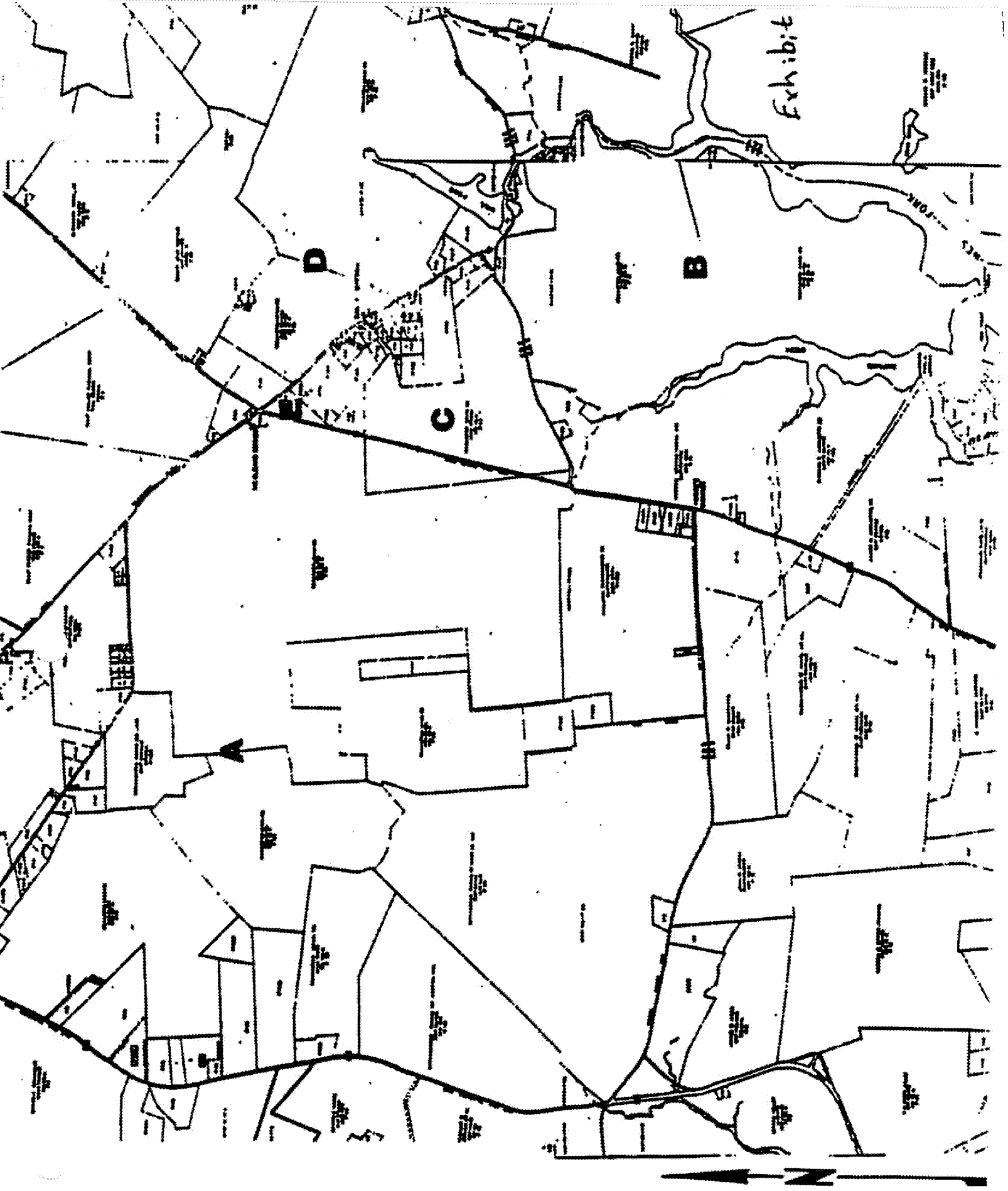
WITNESS:

Joseph L Jones, III

E. I. DU PONT DE NEMOURS AND COMPANY

Fredrick R Ay

HHS5


Exhibit
D
B
C
A
N

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		96,991
Plants and Properties (Note 1 & 4)	3,445	
Less: Accum. Deprec., Depletion, and Amort.	(1,964)	
Total Plants and Properties		1,481
Other Noncurrent Assets (Note 5)	11,077	
Total Other Assets		11,077
TOTAL ASSETS		109,549

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

PLAINTIFF'S EXHIBIT
3012

ALT0013625
1 of 6

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		813
Deferred Noncurrent Income Taxes (Note 1)		
Federal	(15,459)	
State	76	
Total Deferred Noncurrent Income Taxes		(15,383)
Other Noncurrent Liabilities (Note 6)		43,650
TOTAL LIABILITIES		29,080
TOTAL LIABILITIES & STOCKHOLDERS EQUITY		109,549

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

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

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

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

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 accquired 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.

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

ALEKSICH

PLAINTIFF'S EXHIBIT 3013

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

File w/ 600 trigger work 6-12-79 P. 1 OF
copy and file w/ 700

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 DECIDED FROM & CONSISTENT WITH MODEL DRAWINGS.

C. SPECIFICATIONS.

1. SEAR LIFT.

a. REVISE ON M600 TRIGGER ASS'Y DRAWING TO ELIMINATE THEORETICAL GEOMETRIC POSSIBILITY OF TRAPPING CONNECTOR FORWARD OF SEAR.

b. ADD ABOVE TO M200 TRIGGER ASS'Y DRAWING.

2. "SCREWDRIVER" TEST SIGNIFICANCE. THIS IS CURRENTLY PART OF M200 FINAL INSPECTION PROCESS. IT IS NOT BEING DONE.

a. DIMENSIONAL IMPLICATIONS AND/OR

b. FONCTIONAL IMPLICATIONS

PLAINTIFF'S EXHIBIT 3015

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

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

III. SAFETY ASSEMBLY

A. INCOMING PART INSPECTION OF SAFETY. ADD LOCATING 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

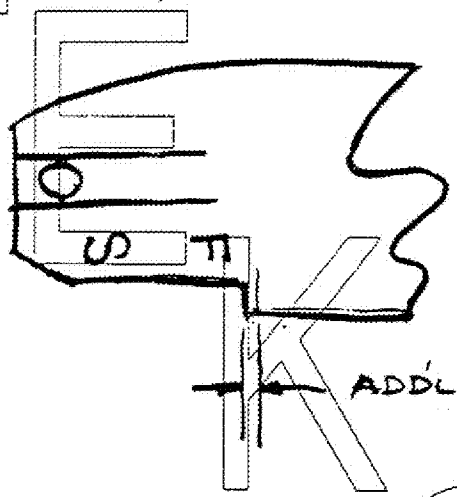
2. MORE TO CLEAR STOCK

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

AL 0014710

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

II. C. 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.

AL 0014711

M600 & 700 TRIGGER ASSEMBLY IMPROVEMENTS

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

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

VI 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.

AL 0014712

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.

EKSICH

AL 0014713

RD-49 REV. 4-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

File M1600

RECEIVED

APR 10 1979

J. A. STEKL

April 6, 1979

cc: Doyle Long
R. G. Sherman

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

EGL:lb
Encl.

PLAINTIFF'S EXHIBIT 3016

AL 0014714

1 of 3

TO: ~~G.J.~~ HILL

FROM: BILL WARREN

5-17-79

I RETURNED ~~MAGOO~~ 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

AL 0014715

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 SEAR~~ 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.

ASICH

AL0014716

RO-69 REV. 8-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

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

C.C. To J.J. Burns
S.J. Hill
P. Johnson

File M600

cc: J.H. Carter
J. P. Linde

April 12, 1979

To: ~~R. 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

1 of 2

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 reamifications 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

EGL:lb

AL 0014720

FILE

March 12, 1979

~~To~~ J. J. Bell

~~From~~ J. L. Linde

~~Subject~~ M1600 - XP-100

XP-100

X Check with vendor on safety lever detent? 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 Sample due 3/16.

X Has the trigger hole and trigger slope been corrected? Trigger Hole - yes Trigger slope - NO

X Is there tooling and cutter available to mill the clearance on the sear safety cam Has the process record been updated? yes

X Status of the three new sear lift gages? Have they been modified as the eight screws does not have to be used? One 6/29 from Printfast.

X Status of the comparator setup for customer repair? Fixture due 3/5 - Purchasing Control

X Have J.J. Burns audit the guns being converted in customer repair, yes assembled in production, yes and the modified M1600 trigger assemblies (yes only 2 units to make this run)

X Have the old style parts been scrapped? Please ~~attach~~ forward scrap ticket (Copy).

Y — Ticket for ...

PLAINTIFF'S EXHIBIT 3018

AL 0014723

1 of 2

M1600

- X Have the M1600's being reassembled audited. Yes - by [illegible]
- X Contact Jim Stekl on the returned trigger assemblies with the light pulls? Can we identify why they were light. Let up with smaller weight, [illegible] than the [illegible] in Saves & Bennett.
- X Do we have a process to locate the trigger engagement screw? No. If not should we develop a process? - Potential problem on [illegible] before inspected or completed.
- X Do we have a process to stop the trigger assemblies from receiving engagement after they are fired in a rifle?
- X Are we presently checking the sear of left with a shim on the M1600? Yes - on Safe [illegible]
- X Do the trick test in the process for all model effected with the trick condition.

Yes.

→ Problem minimized as operator had [illegible]

AL 0014724

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

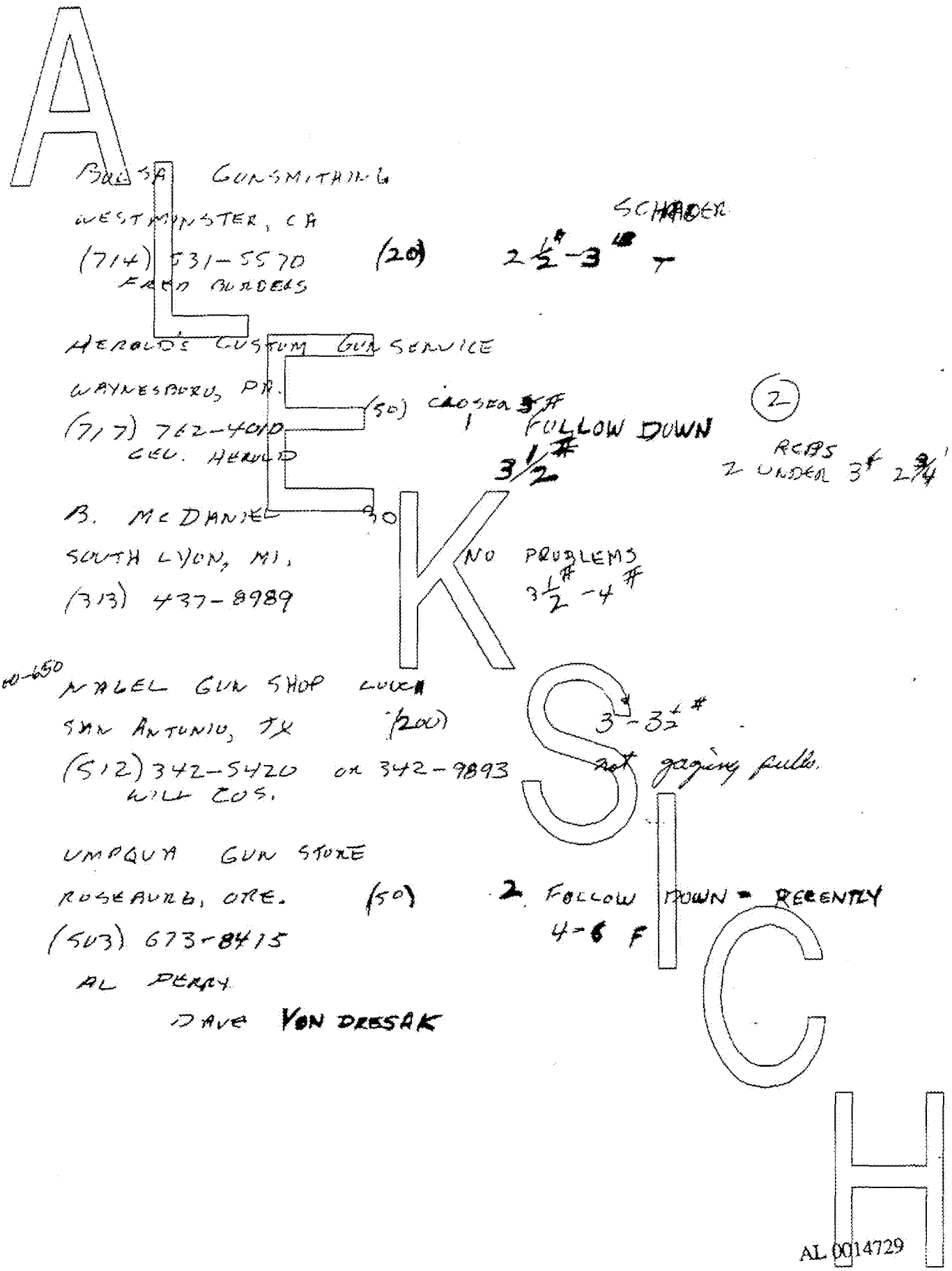
A RANDOM SAMPLING OF GUNSMITHS WERE CALLED (FIVE IN JANUARY AND IN FEBRUARY) INCLUDING THOSE RECEIVING SHIPMENTS THAT WERE SENT ON THE SAME DAY AS RUSK GUN SHOP, WHO CONTACTED US WITH THE LIGHT TRIGGER PULL PROBLEM.

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 .5% WITH PROBLEMS.

GUNSMITHS CONTACTED THAT HAVE RECEIVED AND INSTALLED TRIGGERS RECEIVED IN FEBRUARY REPORTED 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 @ 2½# (METHOD OF ANGLE PULL IS UNKNOWN. PULSA GUNSMITHING IN WESTMINSTER, CA, CLAIMS MOST TRIGGER PULLS MEASURE 2½ - 3#. HOWEVER, THESE MEASUREMENTS WERE TAKEN WITH A SCHRADER TRIGGER PULL GUAGE WHICH HAS A FLEXIBLE BEAM.

ALEKSICH

PLAINTIFF'S EXHIBIT 3019


ALASKA
BRASS GUNSMITHING
WESTMINSTER, CA
(714) 531-5570
FRED NUDERS
(20) 2½-3" SCHRADER
HERALD'S CUSTOM GUN SERVICE
WAYNESBORO, PA.
(717) 762-4010
CEC. HERALD
(50) CLOSER 3" FOLLOW DOWN
3½"
(2)
RCBS
2 UNDER 3" 2¾" OAL
B. McDANIEL
SOUTH LYON, MI.
(313) 437-8989
30
NO PROBLEMS
3½"-4"
600-650
NAGEL GUN SHOP LOCK
SAN ANTONIO, TX
(200)
3"-3½"
(512) 342-5420 OR 342-9893
WILL COS.
not gaging bulk.
UMPQUA GUN STORE
ROSEBURG, ORE.
(50)
2 FOLLOW DOWN - RECENTLY
4-6 F
AL PERRY
DAVE VON DRESAK
SEARCH

AL 0014729

G-48

DON'T SAY IT — WRITE IT

To J. P. LINDE

Date December 12, 1978

From R. L. HALL RLH

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. (M700)

RLH:ah

SAFETY IS A WISE INVESTMENT

PLAINTIFF'S EXHIBIT 3020

AL 0014745

1 of 2

P. L. H.
12/12/78

1. M 1700

Ask final inspector if in their memory if they have ever rejected any MPDs for the trick test

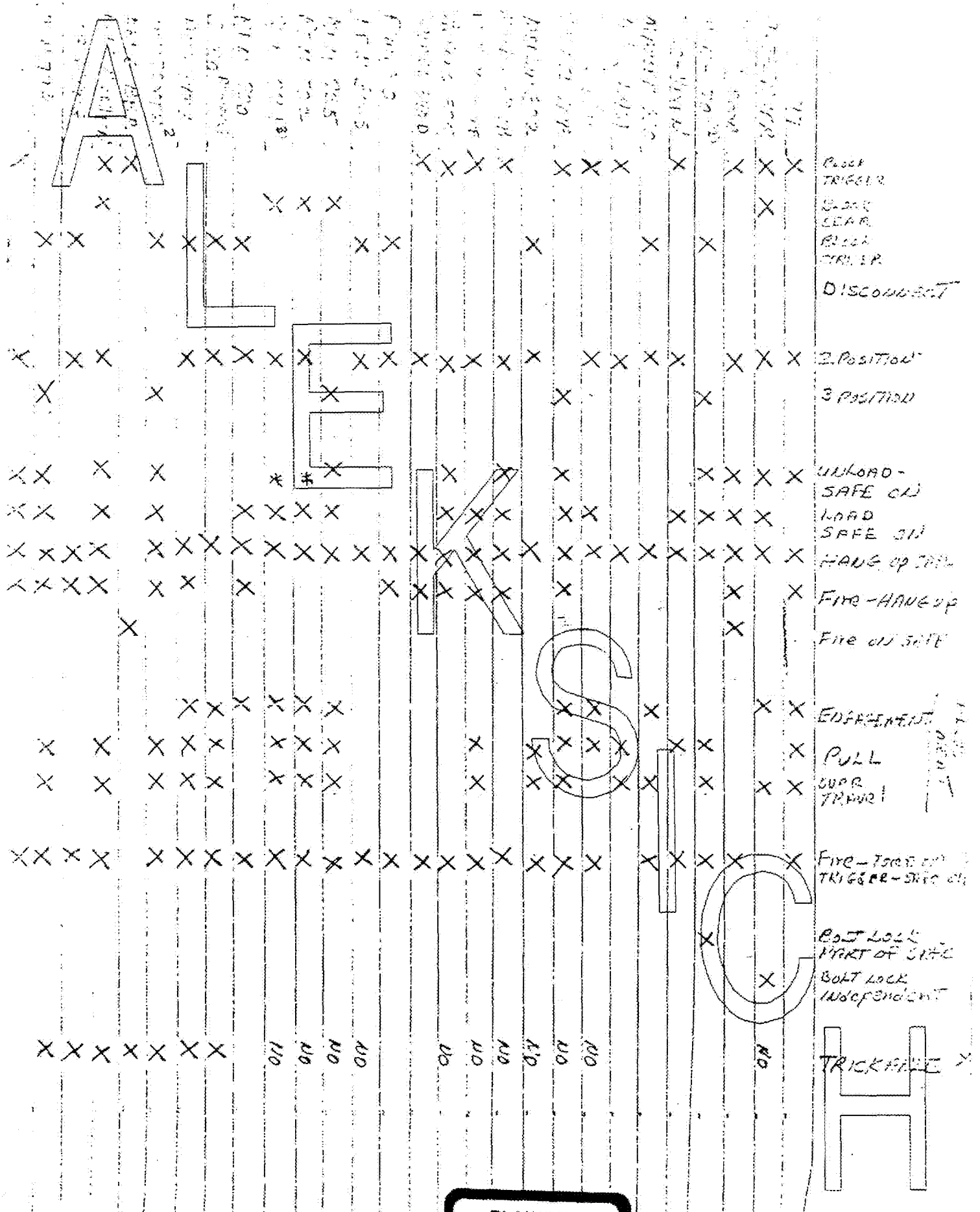
If they rejected did they reject the first, second or third try.

Thanks

Ben. T. Boyle

ALEKSICH

AL 0014746



PLAINTIFF'S EXHIBIT
3021

AL 0014758

1 of 1

XC: File

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DEPEND ON IT | PETERS DEPEND ON IT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

File 1600

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 tricking (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. 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 3023

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

ALEKSICH

11/3/94

Attitude

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

John Burnside

EXHIBIT H

PLAINTIFF'S EXHIBIT 3024

AL 0014777

• 600 Recall

• Safety Programs - M700

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

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

RBS:hss

AL 0014947

PLAINTIFF'S EXHIBIT 3025

1 of 1

ALEKS

FORM 49 REV. 8-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

CC: I P GLAS

BRIDGEPORT, CONNECTICUT

FEBRUARY 8, 1982

REMINGTON ARMS CO.
RECEIVED
FEB 9 1982
FIREARMS RESEARCH DIVISION

TO: C. B. WORKMAN

FROM: W. L. ERICSON

RE: PATENT REVIEW MEETING OF JANUARY 28, 1982

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

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

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 or 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.

PLAINTIFF'S EXHIBIT 3027

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 R.S. Murphy
- o J.A. Lawrence
- 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.

7/11/91
2

M/7 DESIGN SPECIFICATION

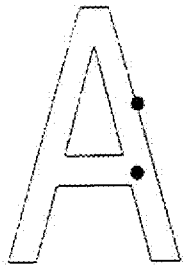
This is a composite listing of features provided on the M/7 proto-type and those desired by Research:

- 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



- Classic Calibers
- Limited Production 3,000 - 4,000 per year

F. E. Martin:ws
September 11, 1981

ALEKSICH

AL 0016247

ALEKSCE

– Bolt Action Fire Controls

PLAINTIFF'S
EXHIBIT
3029

DON'T SAY IT — WRITE IT

File Copy

To Joe Glas

Date 5/22/80

From Clark Jorkman

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

SKETCH

AL 0016386

1 of 80

DON'T SAY IT—*WRITE IT*

To C.B. WORKMAN ✓ Location

From J.P. GLAS Location Phone 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

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RD 778

STOP, LOOK, AND LIVE

AL 0016387

3 of 80

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 retrofitable.

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.

JPGlas:jl

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MAY 20 1980
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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
C.B. WORKMAN
R.B. SPERLING
W.E. LEEK
J.P. LINDE
J.S. MARTIN
A.A. HUGICK

FROM: E.P. DARRELL

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.

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

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RD-41-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington PETERS

Xc: E.F. Barrett
A.A. Hugick

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, 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.

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.

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

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.

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.

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 spirol 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

AL 0016396

DO NOT DISTRIBUTE

September 7, 1977
Rev. September 9, 1977
Rev. October 11, 1977

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.

AL 0016397

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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.

AFSICH

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.

4. The safety lever can be positioned in a convenient location.

5. 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 curcumstances 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.

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

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

The safety should have two clearly defined positive positions; "ON SAFE" and "OFF SAFE". The safety should require 3 to 10 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.

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.

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 doesnot 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.

AKSICH

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.

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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
Ilion Research Division
Manual Firearms Design

AL 0016409

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 telerance conditions existing. The parts found to be out of telerance 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 maching 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.

ALSCH

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

ALEKSICH

M/79C BOLT LOCK (NEW DESIGN) 3/18/81
ERO

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	~~.540~~ .150
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
	*127225.00	~~.853~~ * .467

AL 0016412

* INCLUDES 7½% EQUIPMENT COST ** BASED ON SIMILAR PART COSTS

11,790 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	40,000.00
8-Drilling Heads @ $5,000.00 Each *	40,000.00
2-Milling Heads @ $7,500.00 Each *	15,000.00
8-Fixtures And Tooling	17,000.00
	$112,000.00

Gages

3-Plug Gages @ $40.00 Each	120.00
1-Pinning Gage (Hole Location)	2000.00
1-Race Gage (Milled Cuts)	4000.00
	$6120.00

Total 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 Uncovers Part While Waiting) 11.455/144 = .0795/Part
7½% Of $118,120.00 = $8859.00
$8859.00/100,000 = .0886/Part
Total — .1681/Part

Note: Design Cost Included

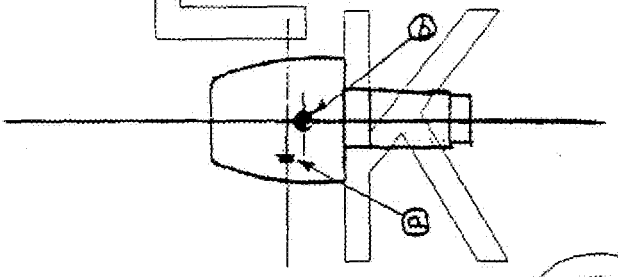
* Includes Mounts ** Includes Load Time

M/700 Bolt Lock (New Design) 3/18/61
EFS

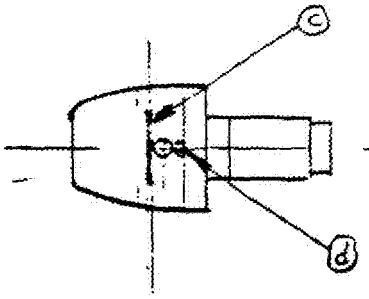
Bolt Plug (New)
Operation - 26 - Description

8 - Station Dial Type ~~Transfer~~ Machine. (Load at Sta. 1)

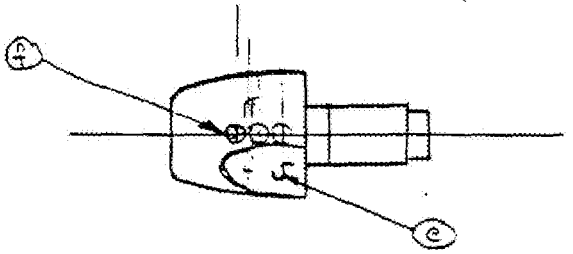
Sta. 2 - Ⓑ Butt Drill Bolt Latch Pivot Hole & Ⓐ Rough Drill Latch Slot (Center)



Sta. 3 - Ⓒ Drill B.L.P.H & Ⓓ Rough Drill Latch Slot (Front)



Sta 4 - Ⓔ Mill Right Side (M/Doc B.A.C.) & Ⓕ Rough Drill Latch Slot (Rear)



ALERSTECH

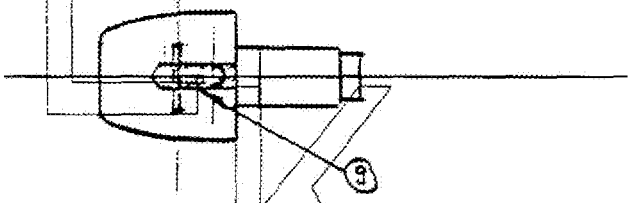
M/700 BOLT LOCK (NEW DESIGN) 3/18/81

ECO

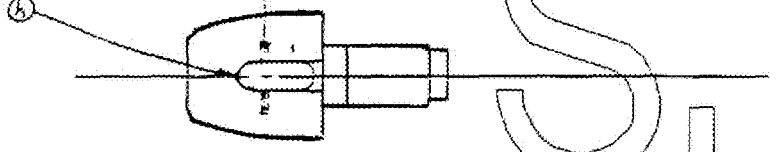
BOLT PLUG (NEW)

OPERATION 20 - DESCRIPTION CONT'D.

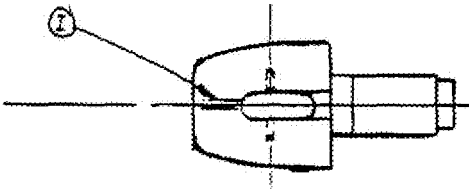
STA. 5 - ⑨ MILL LATCH SLOT



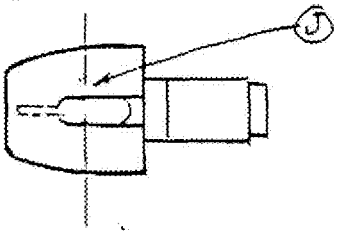
STA. 6 - ⓗ BUTT DRILL SPRING PLUNGER HOLE



STA. 7 - ⓘ DRILL SPRING PLUNGER HOLE



STA. 8 ⓙ REAM B.L.P.H.



ALTASTICH

n/700 Bolt Lock (New Design) 3/18/81
ECO

Bolt Ass'y. (Added Operation)
Operation - 238

Machine - 0-12 CNN

Tooling - Special T-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/Hr. Capacity
Employee Rate/hr. 7.90 + 45% (Fringe) = 11.455

Based On 8 Sec. Employee Time Added Cost = .025/Part

$3600/11.455 = 8/x \quad x = \frac{8(11.455)}{3600}$

7½% of $3920.00 = $294.00

294.00/100,000 = .0029/Part

Total — .0279

ALLEN KSC

M/700 Bolt Lock (New Design) 3/13/81
ERO

Firing Pin Assembly (Assm. Latch In Bolt Rua)
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

7½% of $785.00 = 58.875
58.875/100,000 = .0006/Part
Total — .0722/Part

ALEKSICH

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"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.

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
Ilion Research Division

ALKSICH

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

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

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
Ilion Research Division

SKETCH

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.

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

ALEKSICH

DON'T SAY IT—*WRITE IT*

700 BDL

	w/o Buttock	w/ Buttock	Δ
Std Depth -	25.17	25.81	.64
Std Width -	39.49	39.92	.43
			1.07

"SAFETY RULES ARE PERFECT TOOLS"

AL 0016423

L. D. Kleman

Copies to: R. L. Hall
R. A. Morris
H. K. Boyle
G. E. Fletcher
J. H. Sweeney
J. P. Linde
L. B. Bosquet
Z. J. Kowalski
Est. No. 4197

October 24, 1980

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

40 of 80

AL 0016425

	1982 Line Before	Alternative I Without Price Adjustment	Alternative II With Price Adjustment	Alternative III With Sling Deleted From BDL
		1982 Line After		
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	36.80	33.93	37.51	38.87
Line	$ 5,123 M	$ 4,723 M	$ 5,221 M	$ 5,410 M
% of Net Selling	16.7%	15.4%	16.7%	17.6%
Project Results				
Pretax Earnings				
Full Allocation	--	($400M)	$ 98M	$ 287 M
Incremental	--	($310M)	$223M	$ 275 M
Net Earnings				
Full Allocation	--	($204M)	$ 52M	$ 150 M
Incremental	--	($158M)	$117M	$ 144 M
Net Return on Investment				
Full Allocation	--	Negative	8.6%	202.7%
Incremental	--	Negative	19.7%	187.0%

M/700 Line Before - 1992

T20
10/21/92

	M/700 ADL	M/700 BDL	M/700 Classic	Line Before (M$) Book	Line Before (M$) Incremental	Weighted Ave
Quantity	66,636	99,398	4,176	139,210	139,210	139,210
Retail Selling Price	$358.14	$439.72	$402.55	57,254		$411.28
Net Selling Price	$192.05	235.80	215.97	30,702	30,702	$220.55
Standard Material	$ 31.46	$ 39.49	$ 32.89	5,096	5,096	
Material Variance	3.93	4.88	4.08	627	627	
Standard Labor	22.36	25.17	23.55	3,366	3,366	
Labor Variance	13.27	15.12	13.21	2,011	2,011	
Direct Expense	2.47	25.60	25.24			
Gas & Power	2.24	2.52	2.36			
Industrial Relations	17.06	19.30	17.61			
Gratus Repairs	.85	.91	.95			
Total Direct Chgs.	$ 42.59	$ 48.83	$ 46.06	6,461	6,431	
Supervision	2.16	2.42	2.30			
Industrial Relations	1.03	1.16	1.09			
Factory Clerks	.27	.30	.29			
Industrial Engineering	.30	.33	.32			
Depreciation	3.16	3.58	3.35			
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 Mfg O/H	$ 10.64	$ 11.94	$ 11.28	1,599	—	
Sub-Total	$124.14	$144.93	$131.77	18,150		
Plant Overhead	21.87	25.35	23.60	3,359	—	
Unadjusted Factory Cost	$146.01	170.28	$154.77	22,509	17,551	
Factory Cost (Adj. for Cost Red)	$142.73	$166.43	$151.29	20,002	17,156	159.05
Selling & Administrative	14.60	17.92	16.41	2,334	921	16.76
Technical	2.69	3.30	3.02	430	154	3.09
Distribution	3.65	4.48	4.10	583	363	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.	29.38	43.65	41.05		12,103	
Less: Admin Exp	1.22	1.88	1.77	230	520	1.66
Pretax Earnings	$ 27.16	$ 41.77	$ 39.28	5,123	11,583	36.80
Less: Tax						
plus: Amortized ITC						
Net Earnings						
Pretax Margin	14.1%	17.7%	18.2%			16.7%

AL 0016426

M/700 Line After with Bolt Latch - 1982

Without Price Adjustment

	M/700 ADL	M/700 BDL	M/700 Classic	Line After (MSS) Book	Line After (MSS) Incremental	Weighted Ave.
Quantity	46,636	89,398	4,176	139,210	139,210	139,210
Retail Selling Price	$359.14	$439.72	$402.53	57.25%		$411.29
Net Selling Price	$192.05	$235.80	$215.87	30.702	20.702	$220.55
Standard Material	$ 31.89	$ 39.92	$ 33.42	5,156	5,156	
Material Variance	3.98	4.93	4.13	634	634	
Standard Labor	23.00	25.82	24.20	3,456	3,456	
Labor Variance	13.52	15.37	13.46	2,046	2,046	
Direct Expense	22.74	25.90	25.54			
Gas & Power	2.20	2.58	2.42			
Industrial Relations	17.49	19.73	18.04			
Gratus Repairs	.07	.93	.87			
Total Direct Chgs	43.49	49.14	46.37	6,564	6,564	
Supervision	2.22	2.48	2.36			
Industrial Relations	1.06	1.18	1.12			
Factory Clerks	.28	.31	.30			
Industrial Engineering	.31	.34	.32			
Depreciation	3.29	3.71	3.48		18	
PE & C Direct	.21	.23	.22			
Floor Space	2.41	2.69	2.55			
Project Cost	.93	1.04	.97			
Other Direct	.29	.32	.30			
Total Mfg O/H	11.00	12.30	11.64	1,649	18	
Sub-Total	126.69	141.48	133.72	19,505	17,874	
Plant Overhead	22.32	25.80	24.05	3,422	-	
Unadjusted Factory Cost	149.01	173.28	157.77	22,927	17,874	
Factory Cost (Adj. for Cost Dev)	145.73	169.45	154.29	22,426	17,479	161.05
Selling & Administrative	14.60	17.92	16.41	2,334	921	16.76
Technical	2.69	3.30	3.02	430	154	3.09
Distribution	3.65	4.48	4.10	583	369	4.19
Cost Before Admin. Exp	166.67	195.15	177.82		18,922	
Total Cost	$167.76	$196.90	$179.46	25,977	18,429	$196.62
Earning Before Admin. Exp	23.38	40.65	38.05		11,780	
Less: Admin Exp	1.09	1.75	1.64	212	507	11.53
Pretax Earnings	$ 24.29	$ 38.90	$ 36.41	4,723	11,273	$ 32.93
Less: Tax						
plus: Amortized ITC						
Net Earnings						
Pretax Margin (% of Net Selling)	12.6%	16.5%	16.9%			15.4%

AE 0016427

M-700 Line After with Bolt Latch - 1982

Prices Adjusted to Maintain % Margin

	M/700 ADL	M/700 BDL	M/700 Classic	Line After (M 5's) Book	Line After (M 5's) Incremental	Weighted Ave
Quantity	44,436	99,398	4,176	139,210	139,210	139,210
Retail Selling Price	$365.95	$447.53	$410.36	58,341		$419.09
Net Selling Price	$196.24	239.99	220.06	31,295	31,285	$224.74
Standard Material						
Material Variance						
Standard Labor						
Labor Variance						
Direct Expense						
Gas & Power						
Industrial Relations						
Gratus 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						
Unadjusted Factory Cost						
Factory Cost (Adj. for Cost Red)	$145.73	$169.45	$154.29	22,420	17,479	$161.05
Selling & Administrative	14.91	18.24	16.72	2,378	939	17.08
Technical	2.74	3.36	3.08	439	156	3.14
Distribution	3.73	4.56	4.18	594	375	4.27
Cost Before Admin. Exp	167.11	195.61	179.27		18,949	
Total Cost	$168.36	$197.52	$180.07	26,064	19,479	$187.23
Earning Before Admin. Exp	29.13	44.38	41.79		12,336	
Less: Admin. Exp	1.25	1.91	1.80	234	530	1.69
Pretax Earnings	$27.88	$42.47	$39.99	5,221	11,806	$37.51
Less: Tax						
plus: Amortized ITC						
Net Earnings						
Pretax Margin (% of Net Selling)	14.2%	17.7%	18.2%			16.7%

Same As Line After Without Price Adjustment

AL-0016428

M700 Line After with Bolt Catch

Without Price Adjustment

Sling & Swivels Deleted from BDL Grade

	M700 ADL	M700 BDL	M700 Classic	Line After (MS's) Book	Line After (MS's) Incremental	Weighted Ave
Quantity	46,136	88,388	4,176	139,210	139,210	139,210
Retail Selling Price	$259.14	$439.72	$402.55	57,354		$411.20
Net Selling Price	$192.05	$235.80	$215.87	30,702	30,702	$220.55
Standard Material	$31.89	$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	13.53	15.37	13.46	2,046	2,046	
Direct Expense	22.74	25.85	25.54			
Gas & Power	2.30	2.58	2.42			
Industrial Relations	17.49	19.72	18.04			
Gratus Repairs	.87	.93	.87			
Total Direct Chgs.	43.40	49.12	46.87	6,562	6,562	
Supervision	2.23	2.48	2.36			
Industrial Relations	1.06	1.18	1.12			
Factory Clerks	.28	.31	.30			
Industrial Engineering	.31	.34	.33			
Depreciation	3.29	3.71	3.48		18	
PE & C Direct	.21	.23	.22			
Floor Space	2.41	2.69	2.55			
Project Cost	.93	1.04	.98			
Other Direct	.29	.32	.30			
Total Mfg O/H	11.00	12.30	11.64	1,649	18	
Sub-Total	126.69	140.41	133.92	18,880	17,249	
Plant Overhead	22.32	24.56	24.05	3,312	—	
Unadjusted Factory Cost	149.01	164.97	157.97	22,192	17,249	
Factory Cost (Adj. for Cost Dev)	145.73	161.33	154.29	21,702	16,869	155.89
Selling & Administrative	14.60	17.92	16.41	2,334	921	16.76
Technical	2.69	3.30	3.02	436	154	3.09
Distribution	3.65	4.49	4.10	583	368	4.19
Cost Before Admin. Exp	166.67	187.03	177.82		18,311	
Total Cost	$167.76	$189.13	$179.46	25,392	18,844	$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	11,958	$39.87
less: Tax						
plus: Amortized ITC						
Net Earnings						
Pretax Margin (% of Net Selling)	12.6%	19.8%	16.9%			17.6%

AL 0016429

Copies to: R. L. Hall
R. A. Morris
H. K. Boyle
G. E. Fletcher
J. H. Sweeney
J. P. Linde
L. B. Bosquet
Z. J. Kowalski
Ist. No. 4197

October 24, 1980

C. 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.

	1982 Line Before	Alternative I Without Price Adjustment	Alternative II With Price Adjustment	Alternative III With Sling Deleted From BDL
		1982 Line After		
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	36.80	33.93	37.51	38.87
Line	$ 5,123 M	$ 4,723 M	$ 5,221 M	$ 5,410 M
% of Net Selling	16.7%	15.4%	16.7%	17.6%

Project Results

Pretax Earnings

Full Allocation	--	($400M)	$ 90M	$ 287 M
Incremental	--	($310M)	$223M	$ 275 M

Net Earnings

Full Allocation	--	($204M)	$ 52M	$ 150 M
Incremental	--	($150M)	$117M	$ 144 M

Net Return on Investment

Full Allocation	--	Negative	8.6%	202.7%
Incremental	--	Negative	19.7%	187.0%

ALTERNATIVE 2

M/700 LINE AFTER WITH BOLT LATCH 1982

WITHOUT PRICE ADJUSTMENT

	M-700 ADL	M/700 BDL	M/700 CLASSIC	LINE AFTER (M&S) BOOK	LINE AFTER (M&S) INCREMENTAL	WEIGHTED AVE
QUANTITY	46,636	89,298	4,176	139,210	139,210	139,210
RETAIL SELLING PRICE	$358.14	$439.72	$402.55	571,254		$411.28
NET SELLING PRICE	$192.05	$235.80	$215.87	301,702	301,702	$201.55
STANDARD MATERIAL	$31.89	$39.92	$33.43	5,156	5,156	
MATERIAL VARIANCE	3.88	4.93	4.13	634	634	
STANDARD LABOR	21.90	25.82	24.20	3,456	3,456	
LABOR VARIANCE	13.52	15.37	13.46	2,046	2,046	
DIRECT EXPENSE	29.94	25.90	25.54			
GAS & POWER	3.30	2.58	2.42			
INDUSTRIAL RELATIONS	17.49	19.73	18.04			
GRATUS REPAIRS	.87	.93	.87			
TOTAL DIRECT CHGS.	43.40	49.14	46.87	6,564	6,564	
SUPERVISION	2.22	2.48	2.36			
INDUSTRIAL RELATIONS	1.06	1.18	1.12			
FACTORY CLERKS	.28	.32	.30			
INDUSTRIAL ENGINEERING	.31	.34	.33			
DEPRECIATION	3.38	3.71	3.48		19	
PE & C DIRECT	.21	.23	.22			
FLOOR SPACE	2.41	2.69	2.55			
PROJECT COST	.93	1.04	.98			
OTHER DIRECT	.29	.32	.30			
TOTAL MFG O/H	11.00	12.30	11.64	1,649	19	
SUB-TOTAL	126.69	141.48	133.72	19,505	17,374	
PLANT OVERHEAD	22.32	25.80	24.05	3,422	-	
UNABSORBED FACTORY COST	149.01	173.28	157.77	22,927	17,814	
FACTORY COST (EXT. FOR COST REP)	145.73	169.45	154.29	22,426	17,479	161.05
SELLING & ADMINISTRATIVE	14.60	17.92	16.41	2,394	921	16.76
TECHNICAL	2.69	3.30	3.02	430	154	3.09
DISTRIBUTION	3.65	4.48	4.10	583	369	4.19
COST BEFORE ADMIN. EXP	166.67	195.15	177.82		18,822	
TOTAL COST	$167.76	$196.90	$179.46	25,979	19,429	$186.62
EARNING BEFORE ADMIN. EXP	25.38	40.65	35.05		11,788	
LESS: ADMIN EXP	1.09	1.75	1.64	213	507	1.53
PRETAX EARNINGS	$24.29	$38.90	$36.41	4,723	11,273	$33.92
LESS: TAX						
PLUS: AMORTIZED ITC						
NET EARNINGS						
PRETAX MARGIN (% OF NET SELLING)	12.6%	16.5%	16.9%			15.4%

AL 0016433

Alternative II

Line After with Bolt-Ons - 1982

Prices Adjusted to Maintain 7% Margin

	M/100 4DL	M/100 3DL	M/100 Classic	Line After (MSS) 300K	Incremental	Weighted Avg
Quantity	46,436	89,395	4,176	139,210	139,210	139,210
Retail Selling Price	$365.95	$447.33	$4101.36	58,341		$419.09
Net Selling Price	$196.24	239.99	220.06	31,285	31,285	$224.74
Standard Material						
Material Variance						
Standard Labor						
Labor Variance						
Direct Expense						
Gas & Power						
Industrial Relations						
Gratus 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						
Unabsorbed Factory Cost						
Factory Cost (Amt. for Cost Red)	$45.73	$169.45	$154.29	22,429	17,479	$161.05
Selling & Administrative	14.91	18.24	16.72	2,375	339	17.05
Technical	2.74	3.36	3.08	438	156	3.14
Distribution	3.73	4.56	4.18	594	375	4.27
Cost Before Admin. Exp	167.11	195.61	178.27		18,949	
Total Cost	$168.36	$197.52	$180.07	26,064	19,479	$187.23
Earning Before Admin Exp	29.13	44.38	41.79		12,336	
Less: Admin. Exp	1.25	1.91	1.80	234	330	1.69
Pretax Earnings	$27.88	$42.47	$39.99	5,221	11,806	27.51
Less: Tax						
plus: Amortized ITC						
Net Earnings						
Pretax Margin (% of Net Selling)	14.2%	17.7%	18.2%			14.7%

> Same As Line After Without Price Adjustment

AL 0016434

ALTERNATIVE II

M/100 LINE AFTER WITH BOLT LATCH

WITHOUT PRICE ADJUSTMENT

SLING & SWIVELS DELETED FROM BDL GRADE

	M/100 ADL	M/100 BDL	M/100 CLASSIC	LINE AFTER (M's) BOOK	LINE AFTER (M's) INCREMENTAL	WEIGHTED AVE
QUANTITY	-5,236	38,398	4,174	139,210	139,210	139,210
RETAIL SELLING PRICE	$258.14	$439.72	$402.53	37,254		$411.28
NET SELLING PRICE	$192.05	$335.80	$215.89	30,702	30,702	$220.53
STANDARD MATERIAL	$31.89	$33.65	$33.42	4,601	4,601	
MATERIAL VARIANCE	3.88	4.16	4.13	566	566	
STANDARD LABOR	23.00	29.81	24.20	3,456	3,456	
LABOR VARIANCE	13.52	15.37	13.46	2,046	2,046	
DIRECT EXPENSE	22.74	25.89	25.54			
GAS & POWER	2.30	2.58	2.42			
INDUSTRIAL RELATIONS	17.49	19.72	18.04			
GRATUS REPAIRS	.87	.93	.87			
TOTAL DIRECT CHGS	43.40	49.12	46.87	6,563	6,563	
SUPERVISION	2.23	2.48	2.36			
INDUSTRIAL RELATIONS	1.06	1.18	1.12			
FACTORY CLERKS	.28	.31	.30			
INDUSTRIAL ENGINEERING	.31	.34	.33			
DEPRECIATION	3.29	3.71	3.49		18	
PE & C DIRECT	.21	.23	.22			
FLOOR SPACE	2.41	2.69	2.55			
PROTECT COST	.93	1.04	.98			
OTHER DIRECT	.29	.32	.30			
TOTAL MFG O/H	11.00	12.30	11.64	1,649	18	
SUB-TOTAL	126.69	140.41	133.72	8,080	17,249	
PLANT OVERHEAD	23.32	24.56	24.05	3,312	—	
UNADJUSTED FACTORY COST	149.01	164.97	157.77	23,192	17,249	
FACTORY COST (EST. COR COST DED)	145.73	161.33	154.29	21,702	26,565	155.59
SELLING & ADMINISTRATIVE	14.60	17.92	16.41	2,334	821	16.76
TECHNICAL	2.69	3.30	3.02	430	154	3.09
DISTRIBUTION	3.65	4.48	4.10	593	368	4.19
COST BEFORE ADMIN. EXP	166.67	187.03	177.82		19,311	
TOTAL COST	$167.76	$189.13	$179.46	25,392	19,946	$191.68
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	$39.87
LESS: TAX						
PLUS: AMORTIZED ITC						
NET EARNINGS						
PRETAX MARGIN (% OF NET SELLING)	12.6%	19.8%	16.9%			17.6%

AIL 0016435

M/200 Bar-Latch Mechanism
Cost Breakdown

Standard Material	$ .43	(Estimated)
Material Variance	.05	(@ 12.2% - historical ratio)
Standard Labor	.65	(Estimated)
Labor-Variance	.23	(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 rental repair and gas & power ratios)
Additional Depreciation	.13	(@ 7.5% of project estimate)
Other Manufacturing Overhead	.23	(Calculated based on historical ratios)
S-b-Total	2.55	
Plant Overhead	.45	(@ 17.5% of subtotal - historical ratio)
Total Cost	$ 3.00	

AL 0016436

M/700 Bolt Latch Mechanism
Cost by Component

T.R. Andrews
12/11/80

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part 2 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 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

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

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

April 8, 1981

To: T. L. Capeletti

From: L. W. Bower JWB

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.

Exhibit 1

M/700 BOLT LOCK

MANUFACTURING COSTS

	PE&C	R&D	BEST CASE
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

AL 0016439

54 of 80

DON'T SAY IT—*WRITE IT*

To T.L. CAPELETTI Date 12/22/80

From G.D. CAMPBELL

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"

AEKSICH

A

4/700 Bolt Latch Mechanism
Cost by Component

T R Andrews
12/19/80

Component	Standard Material	Standard Labor	Direct Changes
Bolt Latch (new part, 2 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 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 0016441

4/700 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	.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 fixture 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 sub-total - 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

RE: M/700 BOLT LATCH MECHANISM - Costs

Attached are T.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

Billings

4/700 Bolt Latch Mechanism
Cost by Component

T. R. Andrews
12/17/80

Component	Standard Material	Standard Labor	Direct Charges
Bolt Latch (new part 3 drill press operations heat treat & plate)	$ .168	$ .115	$ .228
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	.0091
Detent Plunger (new part heat treat & plate)	.234	.0064	.0064
Detent Plunger-Spring (new part)	.013	—	—
Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	$ .426	$ .6514	$ .3095

AL 0016444

4/700 Bolt Latch Mechanism
Cost Breakdown

T.R. Andrews
2/17/80

Standard Material	$.43	(Estimated)
Material Variance	.05	(@ 13.2% - historical ratio)
Standard Labor	.65	(Estimated)
Labor Variance	.55	(38.4% - 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 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

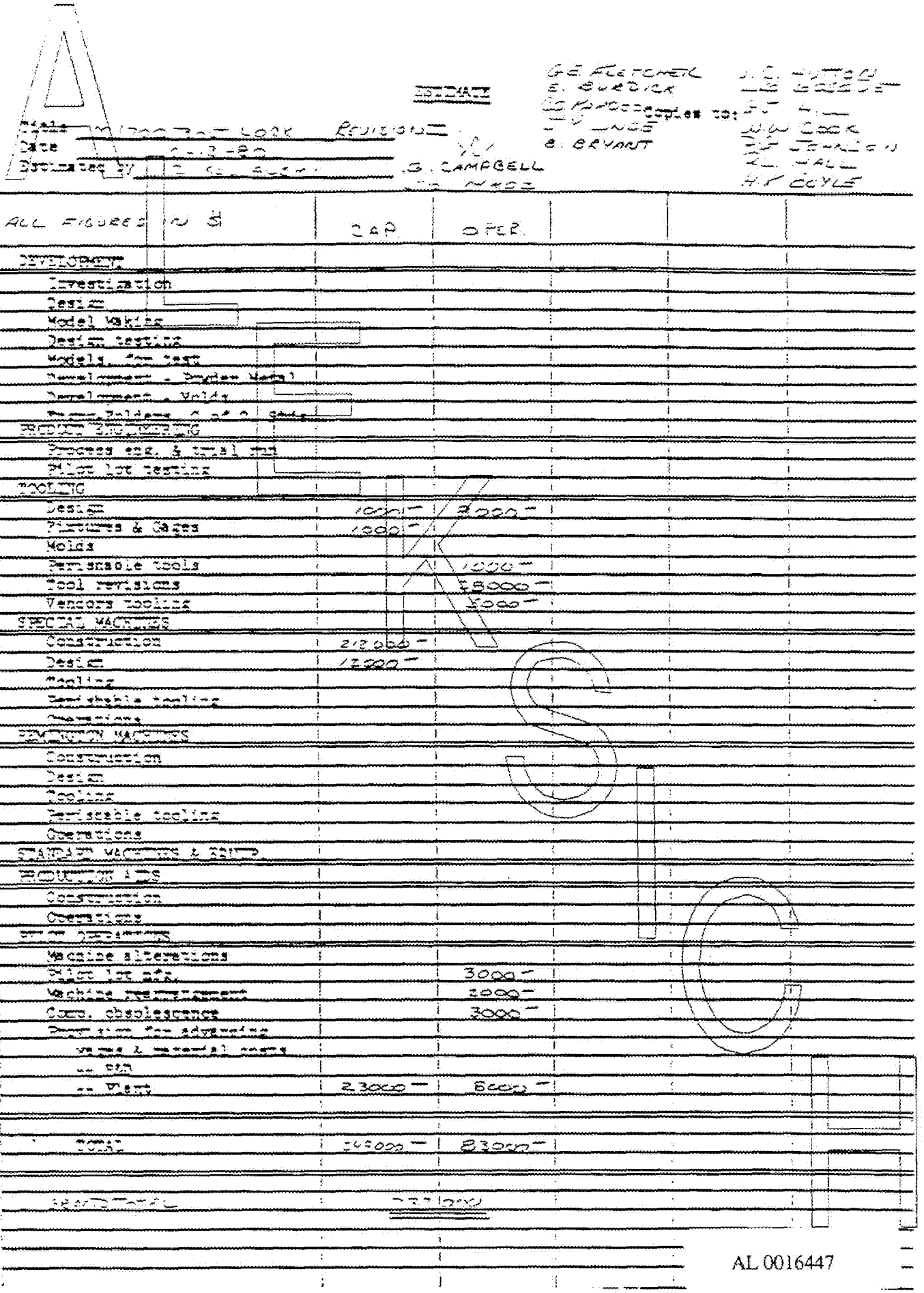
Title: BAC BOLT LOCK
Date: 5-2-80
Developed by: Z. KOWALSKI

ALL FIGURES IN $

	CAP.	OPER.
1 Construction		
Investigation		
Design		
Model Making		
Design Testing		
Model Prototype		
Improvements & Design Work		
Improvements & Tooling		
Prototype Evaluation		
2 Production Engineering		
Purchase Tool & Tool Mfg		
Plant Lay Out		
3 Tooling		
Design	2000	14000
Fixtures & Jigs	7000	44000
Molds		
Perishable Tools		1000
Tool Repairs		18000
Tenders Tooling		5000
4 Special Machines		
Construction	100000	
Design		
Machine		
Perishable Machine		
Conversions		
5 Equipment Purchase		
Construction		
Design		
Tooling		
Perishable Tooling		
Conversions		
6 Building Machines & Equip		
Foundation Line		
Construction		
Conversions		
7 Plant Layout		
Machine alterations		
Plant Lay Out		4000
Machine Improvements		1000
Plant obsolescence		
Depreciation New Additions		
Taxes & Insurance		
-- Bldg		
-- Plant	10900	8700
Total	119900	95700
GRAND TOTAL	215600	

AL 0016446

61 of 80



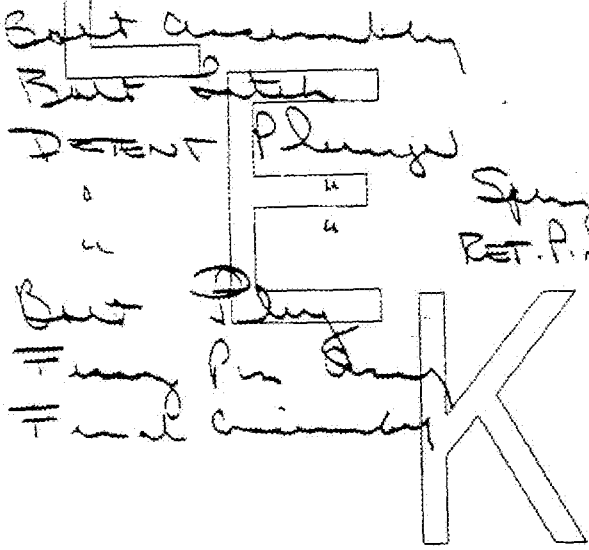
	ALL FIGURES IN $	CAP.	OPER.
1	DEVELOPMENT		
	Investigation		
	Design		
	Model Making		
	Design testing		
	Models, for test		
	Development - Engine Model		
	Development - Vehicle		
	Proto. Builders - 2 of 2 each		
2	PROTOTYPE ENGINEERING		
	Process eng. & trial run		
	Pilot lot testing		
3	TOOLING		
	Design	10000 -	3000 -
	Fixtures & Gages	1000 -	
	Molds		
	Permanable tools		1000 -
	Tool revisions		50000 -
	Vendors tooling		5000 -
4	SPECIAL MACHINES		
	Construction	213000 -	
	Design	12000 -	
	Tooling		
	Perishable tooling		
	Operations		
5	CONVENTIONAL MACHINES		
	Construction		
	Design		
	Tooling		
	Perishable tooling		
	Operations		
6	STANDARD MACHINES & EQUIP.		
	Depreciation time		
	Construction		
	Operations		
7	Other Expenditures		
	Machine alterations		
	Pilot lot mfg.		3000 -
	Machine rearrangement		2000 -
	Conv. obsolescence		3000 -
	Depreciation for engineering		
	- Plant & material costs		
	- Tool		
	- Plant	23000 -	8000 -
	TOTAL	245000 -	83000 -
	GRAND TOTAL	328000	

AL 0016447

John M.

5-24-80

M1003 Belt Detent Cylinder Estimate



SK-C-3550
SK-B-3549
—
—
SK-D-3551

Gary,

This is the estimate for the Belt Lock detent assembly we discussed for the M/900. Let me know separately if I can do this on the M-16 Lifting Cylinder estimate.

Tim
7/31/80

John —
Work this up & issue to IE for estimate on its own. Trey can add to BAC as separate item.
Thanks
GC

M700 Bar-Latch Mechanism
Cost Breakdown

T R Andrews
2/10/80

Standard Material	$ .43	25	(Estimated)
Material Variance	.05	03	(@ 13.3% - historical ratio)
Standard Labor	.82	60	(Estimated)
Labor Variance	.25	18	(30.6% - calculated by department based on 1979 experience)
Direct Charges	.20	30	(Estimated)
Industrial Relations	.63	40	(@ 47.9% of Labor + Labor Variance)
Other Direct Expense	.08	07	(Calculated based on historical setup repair and gas & power ratios)
Additional Depreciation	.13	14	(@ 7.5% of project estimate)
Other Manufacturing Overhead	.23	24	(Calculated based on historical ratios)
Sub Total	2.55	2.63	
Plant Overhead	.45	10	(@ 17.5% of subtotal - historical ratio)
Total Cost	$3.00	2.67	
	2.62		
	-3%		

AL 0016449

M1000 Bolt Latch Mechanism

Cost by Component

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 oper. and slot in bolt mill)	—	.053	.101
Firing Pin Assembly (existing part + assem. oper.)	—	.092	.0001
Detent Plunger (new part, heat treat & color)	.234 .050 .179	.0004	.0004
Detent Plunger Spring (new part)	.013	—	—
Detent Retaining Pin (new part)	.011	—	—
Final Assembly (added inspection element)	—	.014	—
Total	$ .426 - .179 = .247	$ .6514	$ .2985

AL 0016450

65 of 80

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL 5AR BINE (Bolt Action) COMPONENT FINAL ASSEMBLY PART NO. —

DATE 5-28-82 COMPUTER KOWALSKI 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				
197	ASSEMBLE ACTION				
	14 - TRY SAFETY -				
	— ADD - CHECK BOLT LOCK -				
	CLOSE BOLT - LOCK DOWN -				
	MUST STAY IN LOCK				
	POSITION - RELEASE				
	BOLT LATCH TO OPEN				
	BOLT -				
	CLOSE BOLT - LOCK DOWN				
	FIRE - BOLT LATCH				
	MUST OPEN -				
	TOTAL				

AL 0016451

RD-6568 1-15-63

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL AZ-3NE COMPONENT FIRING PJ ASSEMBLY PART NO. —

DATE 5-24-73 COMPUTER KOWALSKI SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	NOTE				
	SAME AS PRESENT 41600 FIRING PJ				
	ASSEMBLY * 28600 PROCESS				
	EXCEPT FOR THE ADDITIONAL OPERATION				
25	INSERT DETENT PLUNGER	BENCH			
	SPRING, DETENT PLUNGER				
	WITH BOLT LATCH TO	ASSEMBLY FIXTURE	VEW	30	60
	BOLT PULL & PIN (.203 PIN)				
	NOTE: TRY BOLT LATCH				
	FOR FREEDOM				
	TO DEBURR AREA				
	TOTAL				

AL 0016452

RD-6566 1-18-63

67 of 80

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL MACHINE COMPONENT Detent Plunger Spring PART NO. —

DATE 3-14-83 COMPUTER KOWALSKI SHEET 1 OF 1

OPER NO	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE FROM SPRING VENDOR				
	EST PIECE PRICE - $1.\frac{5}{2}$ M				
	PURCHASING INSPECTION	BENCH			
	TO DISTRIBUTION AREA				
	TOTAL				

RD-6568 1-18-83

AL 0016453

Bolt Lock

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

4173 Bolt Action

MODEL Marlin COMPONENT Detent Plunger Retaining Pin PART NO. —

DATE 3-12-81 COMPUTER Kowalski SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE DRIVE-LOCK TUBE 6" PIN				
	1/16 x 3/8"				
		B			
		COST: - 8.6¢ M			
	5/16				
	PURCHASE INSPECTION	MISC STK		—	—
	DISPATCH AREA				
	TOTAL				

AL 0016454

RD-4568 1-18-63

BOLT LOCK
MODEL MACHINED

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL LDD COMPONENT Bolt Plug PART NO. S<D. Seal

DATE 6-24-69 COMPUTER NOWALSKI SHEET 1 OF 2

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	RELEASE SCREW MACHINE BLANK FROM VENDOR				
	EST	RE PIECE - .52¢ EACH			
		TOOLING $150.00			
	PERFORM INSPECTION	GAGES	STD	AN	— —
		GAGES	DEV	AN	2 —
12	MILL FIRING PIN HEAD SLOT & FLATS ON BOTTOM	SAME AS PRESENT M1700 PT# 17012			
15	MILL FIRING PIN HEAD SLOT & 2 FLATS ON BOTTOM AND SAFETY CLEARANCE	SAME AS PRESENT M1600 PT# 15676 NOT REQUIRED ON M1700			
22	HAND REAM FIRING PIN HEAD HOLE TO REMOVE BURR IN SLOT & BURR BOTH SIDES OF FIRING PIN HEAD SLOT	SAME AS PRESENT M1700 PT# 17012			
25-5	BUTT, SPOT-DRILL-REAM RETAINING PIN HOLE	6 STA - SPEC MACHINE INDEX TYPE			
	GOAL: 100 PARTS/HOUR	MACHINE (COST)	WEEKLY	000	52 000
	DELIVERY: 30-34 WKS	(FIXTURE-HOLDERS CUTTING TOOLS ETC)			
		GAGES	DEV	25	25
	TOTAL				

AL 0016455

RD-6568 1-18-63

(Bolt Lock - Special Machines)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL 30 COMPONENT Bolt Plug PART NO. SK D 3004

DATE 0-26-60 COMPUTER KOWALSKI SHEET 2 OF 2

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
(NEW) 25-8	LOAD & UNLOAD	6 STA. SPEC. MACHINE			
	DRILL STAGGER HOLE - 1ST POS	INDEX TUPS			
	BUTT DRILL " " - 2ND "				
	DRILL " " - 2ND "	MACHINE	(NEW)	—	120 000
	ROUGH MILL SLOT (2 DEPTH)	(FIX - HOLDER - CUTTING TOOLS)			
	FINISH MILL SLOT (2 DEPTH)	GAGES		30	200
	MACHINE CYCLE - 36 SEC (APPROX)				
	DELIVERY - 30-34 WKS				
(NEW) 26	BUTT - DRILL TO DEPTH	PREM. STD. LINE MACHINE			
	DETENT PLUNGER HOLE				
		MACHINE		4000	20 000
	MACHINE CYCLE - 40 SEC (APPROX)				
		FIXTURE	(NEW)	50	1000
	DELIVERY - 30-34 WKS	TOOLS	STD (NEW)	2	15
	(APPROX)	GAGES	(NEW)	40	110
27-X	DEBURR	BENCH			
28	SUPERFINISH	SAME AS M1700			
31	DEGREASE	" " "			
32	NITRO BLAST & PLACE IN TRAYS	" " "			
34	INSPECT PER CHART				
	** SUB-ASSEMBLY				
	TOTAL				

RD-6568 1-19-63

AL 0016456

71 of 80

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE · TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL M1700 (Bolt Action) COMPONENT Bolt Plug PART NO. SK-D-8551

DATE 5-27-80 COMPUTER Kowalski SHEET 1 OF 3

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
	Purchase Screw Machine Blank From Vendor.				
		Est Piece - .58¢ Each			
		Est Tooling - $150.00			
	Fire Knife Inspection	Gages	Std	AV	—
		Comp. Screen	Insp	9	—
12	Mill Firing Pin Head Slot 2 Flats on Bottom	Same as present M1700			
(New) 13	Mill Flat on Side	Horizontal Mill	Op. Engr.	7¢	
		Fixture	New	25	125
		Cutter	"	5	$100.00
		Arbor	Std	—	—
		Gage	New	50	120
14	Hand Ream Firing Pin Head Hole to Remove Burr in Slot & Burr) Both Sides of Firing Pin Head Slot	Same as present M1700 DT # 17012			
	TOTAL				

AL 0016457

RD-6368 1-18-63

Bolt Lock

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL N/700 & Boat Action Panels COMPONENT Bolt Plug PART NO. 3K-D 2351

DATE 5/27-60 COMPUTER KOUAL ST. SHEET 2 OF 3

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
(NEW) 25	LOAD & UNLOAD	7 STA SPEC MACHINE - INDEX TYPE			
	MILL FINISH END OF BOLT LATCH SLOT			9	
	PROFILE REMAINING " " "	MACHINE COST	NEW		100,000
	DRILL 1ST STARTING HOLE	FIXTURE (TREES)	"	70	7 000
	" 2ND " "	PERISHABLE TOOLS	"	6	525
	MILL SMALL SLOT	TOOL HOLDERS	"	20	1760
	MILL REAR IN CENTER SECTION	GAGES	"	190	550
	CYCLE TIME - 45 SEC (ASSUM)				
(NEW) 26	BUTT & DRILL TO DEPTH	2 SPOOLS DRILL HEADS			
	DETENT PLUNGER HOLE				
		DRILL JIG	JBW	60	120
		TOOLS	STD "	4	315
		GAGES	"	40	110
(NEW) 27	BUTT SPOT DRILL - REM	4 SPOOL DRILL HEADS			
	ESTABLISH DIA HOLE				
		DRILL JIG	JBW	60	120
		TOOLS	STD "	6	425
		GAGES	"	35	95
(NEW) 27.5	DEBURR	BENCH			
28	SUBASSEMBLY	(SAME AS N/700)			
	TOTAL				

AL 0016458

RC-4568 1-13-63

(Bat Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL Passive COMPONENT Bat Plug PART NO. SK-D-3551

DATE 5/27-93 COMPUTER KOWALSKI SHEET 2 OF 3

OPER. NO.	OPERATION NAME	MACHINE	DEPT. NO.	HOURS DESIGN	HOURS BUILD
21	Degrease	Same as M1700			
22	Under Black Paint in Tanks	" " "			
23	Inspect for Defects	" " "			
	To Sub-Assembly				
	TOTAL				

AL 0016459

RD-6568 1-18-63

BOLT LOCK - POWDER METAL

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

* SEQUENCE OF OPERATIONS *

MODEL 130 COMPONENT BOLT LATCH PART NO. 55-C-2023

DATE 12-11-62 COMPUTER KOWALSKI SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE FROM HI-DENSE DIVISION				
	POWDER METAL BLANK				
	QUOTATION #1-2322				10-13-401
		153.51M - 25 000 QTY			
		$103.91M - 50 000 "			
		TOOLING 4400.00			
20	DRILL CROSS PIN HOLE	1 SPOT DRILL PRESS			
		DRILL #16	DPRJ	90	120
		#52 JOBBER DRILL	SD	—	—
		GAGES	DEW	30	45
30	COUNTER BORE HOLE (FRONT SIDE)	1 SPOT DRILL PRESS			
		C'SINK	SD	—	0.20
40	CLINCH HARDEN				
50	LINDBERG DEBUR				
60	INSPECT FOR RACKWELL				
70	BLACK OXIDE COAT				
	TO MRP CB'S.	TOTAL			

AL 0016460

RD-6568 1-18-63

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

• SEQUENCE OF OPERATIONS •

MODEL M-28 & Bolt Action) COMPONENT Bolt Latch PART NO SK-C-3550

DATE 5-23-80 COMPUTER Kowalski SHEET 1 OF 1

OPER NO	OPERATION NAME	MACHINE	DEPT NO	HOURS DESIGN	HOURS BUILD
	Purchase Investment Casting from Vendor				
	50 - Pieces - 1.10 EA				
	Est Tooling - $4200.00				
	Purchase Inspection	Bench			
		Comparator Stand	NEW	10	—
		Fixture	STD	—	—
		Gages	STD	—	—
10	Drill Cross Pin Hole	Indexing Drill Press			
		Drill Jig	NEW	40	90
	.52 Drill	Drill .52 (.0033)	STD	—	—
		Gages	NEW	25	1.05
20	Deburr	Bench			
30	Buff - Top	Polishing Jack			
40	Carbide Harden				
50	Lapping & Draw				
60	Inspect for Roundness				
70	Black Oxide				
	To Dispatch Area TOTAL				

RD-6568 1-18-63

AL 0016461

(Bolt Lock)

PROCESS ENGINEERING ESTIMATE - TRIAL AND PILOT SHEET

(1700 Ser - Action)

• SEQUENCE OF OPERATIONS •

MODEL 1700 SERIES COMPONENT Detent Plunger Spring PART NO. —

DATE 5-[illegible]-70 COMPUTER KOWALSKI SHEET 1 OF 1

OPER NO.	OPERATION NAME	MACHINE	DEPT NO.	HOURS DESIGN	HOURS BUILD
	PURCHASE FROM SPRING VENDOR				
	EST PURPRICE - 11¢ EA				
	PURCHASING INSPECTION	BENCH			
	TO DEPT # 4660				
	TOTAL				

RD-6358 [illegible]-63

AL 0016462

ALEKSICH

Tool Chg 17012 } 11.957 labor } 69.357
57.400 material
129.855 full factory

Rev Acct
4/15/81

AL 0016463

78 of 80

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

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

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

G-88

DON'T SAY IT—*WRITE IT*

cc Fred Martin

To Jim Martin

From Tami C ✓

Date 2/16/82

E-12

re: M/200 Fire Control Program

We should schedule an early review of our plans with Warehouse, Marketing, and Legal (+ Production ?) to make sure they are aware of our direction for this design. To be completed by Sept. 1, 1982 means that we must have a specific design concept in mind by March 1st with at least one contingency. Therefore, we should be prepared to review by mid-March.

"SAFETY RULES ARE PERFECT TOOLS"

AL 0016465

ALEK SICH

DON'T SAY IT—WRITE IT

copy to → T. Capelletti ← R. Sassone

To Joe Glas — Location

From Clark Workman Location Phone No.

Subject Gunned Triggers — Lehgon's memo of Oct 3, 80 Date 10/13/80

I have referred this to T Capeletti's Group for action. To answer Larson'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.

RD 778 STOP, LOOK, AND LIVE

PLAINTIFF'S EXHIBIT 3630

AL 0017502

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT

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

ALASKA

DON'T SAY IT—*WRITE IT*

To E. LARSON - BDPT.

From J. P. LINDE - ILION

Date 9-30-80

RECEIVED
OCT 1 1980
E. 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.

ALEKSICH

"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

RECEIVED
APR 21 1980
ARMS SERVICE

From John Olivieri

Remington Arms Company, Inc
Ilion, N.Y. 13357

Att: Mr. Vic Rostokar

Dear Vic —

While I am 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

He had pulled the Trigger when the safety was on, the gummy WD-40 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 preventatives.

Please inform your engineering people.

Sincerely

Daniel I. Dwyer, Sr.

Daniel I. Dwyer, Sr.
Remington recommended gunsm.

AL 0017506

Form FA 1800 Ref. #

REMINGTON ARMS COMPANY, INC.

Trigger Assembly
Special Replacement Program

(A) **GUNSMITH**

Name Sportsmen's Equip
Street 915 W. Washington St
City, State, Zip San Diego CA 92103
Telephone ____ (Area Code)
Control No. 1 5 9 1 6 (For Rem. Use Only)

GUN OWNER

Name Robert Cole
Street 7925 Pioneer Way
City, State, Zip Oceanside Ca. 92035
Telephone 724-461-1413 (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. 3 9 7 8 3

(C) MODIFICATION INFORMATION

Method Gun Received From Owner: (Check One)
- ☑ Hand Delivered
- ☐ UPS
- ☐ U.S. Mail
- ☐ Other ____ (Specify)

	Month	Day	Year
Date Gun Received From Owner	9	23	80
Estimated Completion Date	9	28	80

This gun was very badly gummed up through use of a gummy preservative. A warning should be put out against the use of such. There are several brands I could suspect the sear to rise properly in such a condition.

(D) INVOICE DATA

Date Work Completed 9 23 80

Charges:

Modification Charge	$5.00
Transportation	
Other (Detail Below) Cleaning & Overhaul	10.00
Total	$ 15.00

Gunsmith Signature ____ Date 9/23/80

INVOICE COPY
(To be mailed for payment upon completion of work)

PLAINTIFF'S EXHIBIT 3031

AL 0017508

1 of 1

REMINGTON ARMS COMPANY, INC.

Bridgeport, Connecticut

April 30, 1982

TO: C. B. [illegible]

FROM: [illegible] B. PURSOM, JR.

SUBJECT: MODEL REQUIREMENTS — MODEL 700 RESTYLE

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

Model 700 ADL - 6 calibers: 222, 22-250, 221, 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.H., Varmint Special

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

WHF:daf

REMINGTON ARMS CO.
RECEIVED
MAY 1 1982
ILION RESEARCH DIVISION

PLAINTIFF'S EXHIBIT 3032

AL 001755

1 of 1

E.C. # 34

cc: R.L. Hall
H.K. Boyle
G.E. Fletcher
J.C. Hutton
J.H. Sweeney
T.A. Capeletti
J.P. Linde) 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 Assembly
Present 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.

$0.15/gun increase based on volume of 110,300.

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

A.E. Desmond

By: A.E. Desmond

AED/kc
Attached

PLAINTIFF'S EXHIBIT 3033

AL 0017610

1 of 1

cc JCH

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington (DUPONT) PETERS (DUPONT)

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

October 27, 1993

TO: BILL ERICSON

FROM: KEVIN CORNELL

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:tpp

xc: K.D. Green

PLAINTIFF'S EXHIBIT 3034

AL 0017826

131

JONES, GILBREATH, JACKSON & MOLL
ATTORNEYS AT LAW
401 NORTH 7TH STREET
POST OFFICE BOX 2023
FORT SMITH, ARKANSAS 72902-2023

ROBERT L. JONES JR.
C. C. GILBREATH
ROBERT L. JONES III
RANDOLPH E. JACKSON
KENDALL B. JONES
MARK A. MOLL
CHARLES R. GARNER JR.
CONNIE GILBREATH
OF COUNSEL

AREA CODE 501
FACSIMILE 782-9460
TELEPHONE 782-7203
*ALSO LICENSED IN OKLAHOMA

March 22, 1991

RECEIVED
MAR 25 1991
PRODUCT SERVICE

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 3035

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 Lundeen, 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

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)
) ss.
FOURTH JUDICIAL DISTRICT)

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 THORSNESS GANTZ POWELL & BRUNDIN ATTORNEYS AT LAW 550 UNIVERSITY AVENUE SUITE 200 FAIRBANKS ALASKA 99701 TELEPHONE (907) 479-5181

AL 0017829

Exhibit E
3822

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 THORSNESS
GANTT POWELL & BROWN
ATTORNEYS AT LAW
[illegible]

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SUBSCRIBED AND SWORN TO before me this 4th day of March, 1991.

(SEAL)

Grace E Ewan
Notary Public in and for Alaska
My Commission Expires: 3/10/91

LEL:SMO
206

ALEKSICH

HUGHES THORSNESS
GANTZ POWELL & BRUNDIN
ATTORNEYS AT LAW
550 UNIVERSITY AVENUE
SUITE 200
FAIRBANKS, ALASKA 99709
TELEPHONE: (907) 474-1515

ALLEGED FILES

ENGINEERING EVALUATION

FAILURE MODES OF REMINGTON BOLT ACTION RIFLES UTILIZING FIRE CONTROL SYSTEMS BUILT UNDER U.S. PATENT NUMBER 2,514,981

ECI FILE NO. 6477

ALLEGED

6722

Engineering Consultants INC
1938 TOWNHURST DRIVE SUITE G • HOUSTON, TEXAS 77043 • (713) 468-7215

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 inadvertant 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

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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 M. 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

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 adherance 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

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

AL 0017839
10/22

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.

EXHIBIT

It is obvious that whatever name is given to the occurrence, the inadvertent discharge of the firearm 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

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 62:

"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

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. Sutters, P.E.

JTB/jh

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Exhibit 3

MINUTE #1 - 1979

LIMITED DISTRIBUTION

PRODUCT SAFETY SUBCOMMITTEE MEETING
JANUARY 2, 1979

PRESENT:

SUBCOMMITTEE	OTHER
E. F. BARRETT, CHAIRMAN	R. B. SPERLING, ACTING SECRETARY
J. G. WILLIAMS	
E. HOOTON, JR.	
R. A. PARTNOY	

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.

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

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

product. Consequently, a notice warning or a series of warnings against abnormal use or misuse, and highlighting safe 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 2,000,000 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

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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.

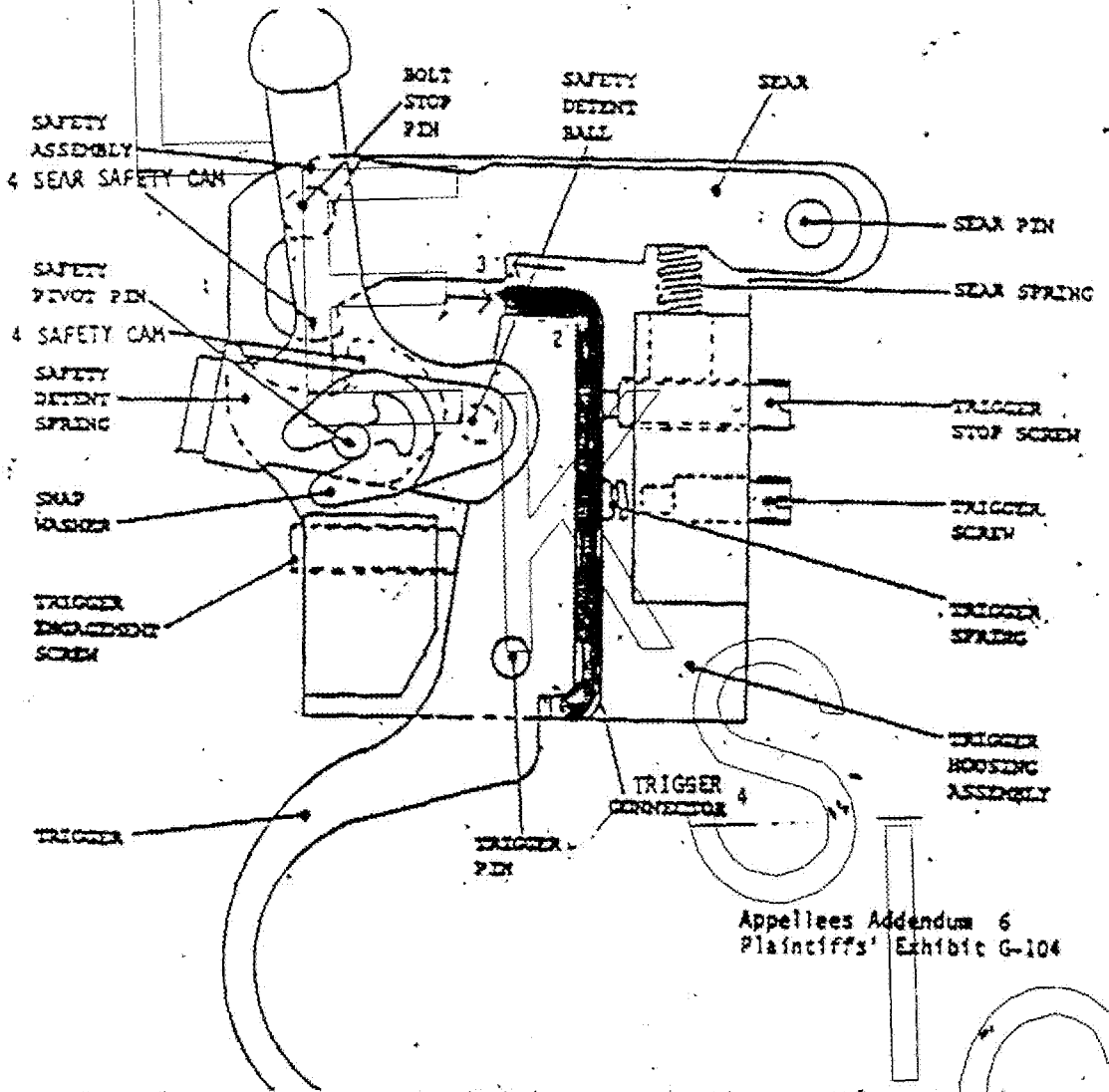
(Secretary's Note: The President approved these recommendations on January 2, 1979.)

R. B. Sperling
Acting Secretary

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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 FSRs to the Court.

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2' PENDULUM DROP TEST
DATA SHEETS

PLAINTIFF'S
EXHIBIT
3036

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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	E	S	F	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													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 = 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	F	
B 6439312	11								X					1
B6439427	12								X					2
B 6439303	13													3
B6440068	14													4
B6440047	15								X					5
B6440044	16								X					6
B6439446	17								X					7
B 6439467	18													8
B 6439926	19								X					9
B 6439302	20													10

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3 of 17

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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	S	F	
B6439317	21													1
B6439427	22								X					2
B6439303	23								X					3
B6440062	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 POS. →	S	F	S	F	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	F	
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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6 of 17

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- HARD WOOD BACK STOP - 2' PENDULUM DROP TEST -

MODEL 700 DATE 2-23-54

REPORT NUMBER 840321 (6)

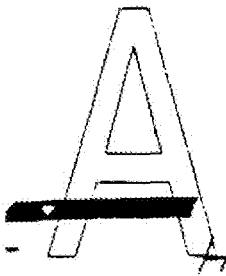
X = JAR OFF

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	F	
B6439317	51								X					1
B6439427	52								X					2
B6439303	53								X					3
B6440068	54													4
B6440047	55								X					5
B6440044	56													6
B6439446	57													7
B6439467	58													8
B6439976	59													9
B6439302	60													10

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- HARD WOOD BACK STOP - 2' PENDULUM DROP TEST -

MODEL 700 DATE 2-23-84

REPORT NUMBER 840321 (7)

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	F	
B6439317	61								X					1
B6439427	62													2
B6439303	63													3
B6440068	64													4
														5
														6
														7
														8
														9
														10

SKSC

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8/17

ALEKSICH

4' PENDULUM DROP TEST
DATA SHEETS

AL 0018479

9/17

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4' HARD WOOD BACK STOP PENDULM DROP TEST

MODEL 700 DATE 2-20-84

REPORT NUMBER 840321

X = JAR OFF

(1)

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	F	
B 6439317	1								X					1
B6439427	2						X		X					2
B6439303	3						X							3
B 6440068	4								X					4
B 6440047	5					X			X				X	5
B 6440014	6								X				X	6
B 6439446	7								X					7
B 6439467	8								X					8
B 6439976	9								X					9
B 6439302	10								X					10

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VOL 17

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4' HARD WOOD BACK STOP PENDULM 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 POSITION →	S	F	S	F	S	F	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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11 of 17

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4' HARD WOOD BACK STOP PENDULM DROP TEST

MODEL 700 DATE 2-21-84

REPORT NUMBER 840221

X = JAR OFF

(3)

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	F	
B6439317	21								X					1
B6439427	22								X					2
B6439303	23								X					3
B6440068	24								X					4
B6440047	25								X					5
B6440044	26								X		X			6
B6439446	27								X					7
B6439467	28						X		X					8
B6439976	29								X					9
B6439302	30								X					10

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4' HARD WOOD BACK STOP PENDULM DROP TEST

MODEL 700 DATE 2-21-84

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	S	F	S	F	
B6439317	31								X					1
B6439427	32								X					2
B6439303	33								X					3
B6440067	34								X					4
B6440047	35						X		X					5
B6440044	36								X				X	6
B6439446	37								X					7
B6439467	38						X		X					8
B6434976	39								X					9
B6439302	40						X		X					10

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4' HARD WOOD BACK STOP PENDULM DROP TEST

MODEL 700 DATE 2-21-84

REPORT NUMBER 840321

X - JAR-OFF

(5)

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	F	
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 Pendulm 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	S	F	S	F	
B6439317	51								X		X			1
B6439427	52								X					2
B6439303	53								X					3
B6440068	54						X		X					4
B6440047	55								X					5
B6440044	56						X		X					6
B6439446	57								X					7
B6439467	58								X					8
B6439976	59								X					9
B6439302	(60)													10

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15 of 17

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4' HARD WOOD BACK STOP PENDULM DROP TEST

MODEL 700 DATE 2-22-84

REPORT NUMBER 840321

(7)

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	F
B6439317	61								X				
B6439427	62								X				
B6439303	63						X		X				
B6440068	64								X				

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Report No. 840321

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

___ Developmental	✓ Safety Related	___ Litigation
___ Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	___ New Design	___ Cost Reduction
___ Pilot	___ Design Change	Stake ___
✓ Production Acceptance	✓ Plant Assistance	___ Other

FIREARM STATS

MODEL: m/700

CAL or GAGE:

BARREL TYPE:

PROOFED: YES ___ NO ___

REPORT REQ'D.

FORMAL ___

TEST RESULTS ONLY X

DATE REQUESTED: 2/1/83

DATE NEEDED BY: ASAP

REQUESTED BY: JAC

WORK ORDER NO: 6-0960

TEST TYPE

___ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	X Other Drop Test
___ Accuracy Test	___ Customer Complaint	___ 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 controles
aprox 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: ___

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Report No. 82 3371

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

April 13, 1982

TO: J.H. Hennings

FROM: F.J. 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".

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.

LUBRICANT	AVERAGE CYCLE LIFE (5 Samples)
1. Du Pont – Synthetic Diester	21,181 cys.
2. Sprayon – 711	17,646 cys.
3. CRC – 3-36	14,382 cys.
4. Houghton – HLP	8,333 cys.
5. Krylon – Ten-4	2,830 cys.

PLAINTIFF'S EXHIBIT 3037

AL 0018672

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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".

AL 0018673

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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 approximataly 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.

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APPENDIX A

(Data Sheets)

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M700 BOLT FREE SIMULATION — 7.62

LUBRICANT EVALUATION — 2-5-92

FIRST SAMPLE OF EACH LUBRICANT

			TRIGGER PULL	SEAR LIFT	SEAR ENGAGEMENT	SAFE ON	SAFE OFF	PULL-LIFT LOCKED	PULL-LIFT FIRED
	REM-	SPECS →	3½-6½ lbs	.005"-.058"	.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 = 711								
3	3 = CRC								
4	4 = HLP								
5	5 = TEM 4								
6		1	6.25	.005	.020	7.5	6.50	3.00	7.00
7	0	2	6.50	.006	.015	6.75	4.25	2.00	6.50
8	cycles	3	5.50	.005	.016	5.25	4.25	3.00	6.00
9		4	6.00	.008	.017	7.00	5.75	3.00	6.50
10		5	6.50	.008	.016	6.75	4.50	4.50	7.50
11		1	6.00	.0055	.020	5.50	4.00	2.50	6.50
12	5000	2	6.00	.0065	.0175	6.00	5.50	3.50	6.50
13	cycles	3	6.00	.006	.020	6.00	4.50	2.00	6.00
14		4	5.75	.010	.017	7.50	5.00	3.00	7.25
15		* 5	6.50	.010	.020	7.25	5.50	5.00	9.00
16		1	5.75	.008	.020	5.75	4.0	2.25	7.00
17	10,000	* 2	5.75	.008	.018	5.25	3.75	2.50	10.50
18	cycles	3	5.25	.008	.022	4.50	3.75	2.0	7.00
19		4	6.25	.0095	.029	7.25	4.75	3.0	13.00
20		5	—	—	—	—	—	—	—
21		1	6.00	.009	.0205	6.00	4.00	2.00	8.50
22	15,000	2	—	—	—	—	—	—	—
23	cycles	3	5.50	.0091	.024	5.00	5.50	2.00	8.50
24		* 4	6.00	.0105	.019	6.50	4.50	3.00	18.00
25		5	—	—	—	—	—	—	—
26		* 1	6.00	.0095	.021	6.00	4.00	2.00	9.00
27	20,000	2	—	—	—	—	—	—	—
28	cycles	* 3	5.50	.0105	.027	4.50	4.00	2.00	9.00
29		4	—	—	—	—	—	—	—
30		5	—	—	—	—	—	—	—
31		1	—	—	—	—	—	—	—
32	25,000	2	—	—	—	—	—	—	—
33	cycles	3	—	—	—	—	—	—	—
34		4	—	—	—	—	—	—	—
35		5	—	—	—	—	—	—	—
36		* 1	FAILED	15594	CYCLES				
37		* 2	FAILED	6228	cycles				
38		* 3	FAILED	16359	cycles				
39		* 4	FAILED	10400	cycles				
40		* 5	FAILED	1990	cycles			DATA SHEET	

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M700 BOLT & FIRE SIMULATION

LUBRICANT EVALUATION

SECOND SAMPLE OF EACH LUBRICANT

			TRIGGER PULL	SEAR LIFT	SEAR ENGAGEMENT	SAFE ON	SAFE OFF	SAFETY FORCED	SAFETY FIRED
		REMINGTON →	3½ - 6½ 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	711							
3	3	IPS							
4	4	HLP							
5	5	TEN 4							
6		1	6.00	.009	.0185	6.00	4.50	4.00	8.00
7	0	2	5.00	.006	.018	7.50	4.75	3.00	6.00
8	cycles	3	6.00	.012	.012	7.00	4.50	3.00	7.00
9		4	6.75	.0095	.016	7.50	6.75	2.50	7.00
10		5	5.50	.008	.016	7.50	5.50	3.50	7.00
11	5000	1	5.25	.0095	.0215	6.00	4.50	3.50	7.00
12	cycles	2	5.00	.0065	.019	5.75	4.00	3.50	6.00
13		3	5.75	.013	.020	5.00	4.00	3.00	8.00
14		4	6.25	.0095	.020	6.75	6.25	2.50	8.00
15		* 5	5.00	.009	.020	5.75	4.00	3.50	13.00
16	10,000	1	5.50	.0111	.025	5.75	4.25	3.50	7.00
17	cycles	2	4.75	.0065	.019	5.25	4.00	2.50	6.50
18		* 3	6.00	.013	.023	6.25	3.75	3.00	15.00
19		* 4	6.00	.0095	.021	6.50	5.75	3.00	25.00
20		5	—	—	—	—	—	—	—
21	15,000	1	5.50	.011	.026	5.50	4.25	4.00	7.25
22	cycles	2	4.75	.0075	.019	5.00	4.00	3.00	7.00
23		3	—	—	—	—	—	—	—
24		4	—	—	—	—	—	—	—
25		5	—	—	—	—	—	—	—
26	20,000	1	5.50	.011	.0265	5.50	4.00	4.00	9.25
27	cycles	2	4.75	.009	.019	5.25	4.50	3.00	6.50
28		3	—	—	—	—	—	—	—
29		4	—	—	—	—	—	—	—
30		5	—	—	—	—	—	—	—
31	25,000	* 1	5.25	.011	.0295	5.50	3.75	4.00	14.00
32	cycles	* 2	4.50	.0095	.021	5.25	4.00	2.50	7.00
33		3	—	—	—	—	—	—	—
34		4	—	—	—	—	—	—	—
35		5	—	—	—	—	—	—	—
36		* 1	COMPLETED 25,000 cycles						
37		* 2	COMPLETED 25,000 cycles						
38		* 3	FAILED	8317	cycles				
39		* 4	FAILED	6115	cycles				
40		* 5	FAILED	2788	cycles			DATA SHEET 2	

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M700 COCK & FIRE SIMULATION — FL3

LUBRICANT EVALUATION — 3-8-82

THIRD SAMPLE OF EACH LUBRICANT

			1 TRIGGER PULL 2+-6½ lbs	2 SEAR WIPE .005"-.018"	3 SEAR ENGAGEMENT .015"-.020"	4 SAFE ON (lbs)	5 SAFE OFF (lbs)	6 BOLT LIFT COCKED (lbs)	BOLT LIFT FIRED (lbs)	
1		LUBRICANT	(AVG OF 3)			(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	(AVG OF 3)	1
2		TW1								2
3		CRC								3
4		MLP								4
5		TEN 4								5
6		1	5.75	.007	.015	7.25	4.50	2.50	6.50	6
7	0	2	6.00	.008	.015	7.50	7.50	2.50	8.25	7
8	cycles	3	6.25	.008	.017	6.75	5.50	3.00	7.00	8
9		4	5.75	.0125	.0195	8.00	5.50	3.00	7.00	9
10		5	5.50	.008	.015	8.00	5.00	2.50	6.00	10
11	5000	1	6.25	.009	.019	6.50	4.25	2.00	6.00	11
12	cycles	2	5.25	.009	.021	5.25	7.50	3.50	6.50	12
13		3	6.25	.0105	.0175	7.25	4.00	3.00	9.00	13
14		4	5.75	.0125	.021	7.00	5.00	3.00	10.00	14
15		* 5	5.50	.013	.021	6.00	3.75	2.50	18.00	15
16	10000	1	6.00	.0110	.020	6.00	3.75	2.00	5.50	16
17	cycles	2	5.25	.009	.021	7.00	6.00	3.50	7.00	17
18		3	6.00	.015	.0195	6.75	4.75	3.00	10.00	18
19		* 4	5.75	.0125	.0225	6.50	4.50	3.50	57.00	19
20		5	—	—	—	—	—	—	—	20
21	15000	1	5.25	.0115	.020	5.75	4.00	2.00	6.50	21
22	cycles	* 2	5.50	.0095	.022	6.50	5.50	4.00	14.00	22
23		* 3	6.50	.015	.0195	6.75	4.00	3.00	15.00	23
24		4	—	—	—	—	—	—	—	24
25		5	—	—	—	—	—	—	—	25
26	20000	1	5.75	.0115	.020	6.00	4.00	2.00	6.00	26
27	cycles	2	—	—	—	—	—	—	—	27
28		3	—	—	—	—	—	—	—	28
29		4	—	—	—	—	—	—	—	29
30		5	—	—	—	—	—	—	—	30
31	25000	* 1	6.00	.0115	.021	6.25	3.75	2.00	12.00	31
32	cycles	2	—	—	—	—	—	—	—	32
33		3	—	—	—	—	—	—	—	33
34		4	—	—	—	—	—	—	—	34
35		5	—	—	—	—	—	—	—	35
36		* 1	COMPLETED	25,000	cycles					36
37		* 2	FAILED	15,140	cycles					37
38		* 3	FAILED	10,410	cycles					38
39		* 4	FAILED	6788	cycles					39
40		* 5	FAILED	2484	cycles			DATA SHEET 3		40

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APPENDIX B

(Graphic Presentation)

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APPENDIX C

(Previous Evaluation)

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

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11938

Test # 14

Product: Sprayon #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 - 5

    Avg - 5.5

17. Reason for Elimination: Continue testing

AL 0018688
12938

Test # 15

Product: CRC - 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

AL 0018689
13938

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, 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

AL 0018690
14938

Test # 13

Product: Krylon - Ten 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

ALKSLICH

ALEKSICH

APPENDIX D

(Pictorial Presentation)

1. Lubrication procedures.
2. Individual components at the start and completion of test. (Available upon request.)

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington — PETERS

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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, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

Signature — Date 5.26.82

C.E. Ritchie,
Sr. Supervisor - Testing,
Meas. & Mech. Analysis Lab

Signature — Date 5/28/82

AL 0018693
17038

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER: 82 0331 - Supplement No. 2

REPORT TITLE: Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M700 and M1100)

MODEL(S): M/700 and M/1100

GAUGE OR CALIBER:

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 _____

AL 0018694
18938

REMINGTON ARMS COMPANY, INC.
Firearms Research Division

May 25, 1982

TO: J.H. Hennings

FROM: F.L. Supry

REPORT TITLE: Evaluation of Lubricants on Firearms
Environmental / Cold Tests (M/700 and M/1100)

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

AL 0018695
19938

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. Bolt 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.

ASSIC

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.	3 hours exposure each day.
4/1	Flurries 30° F.	
4/2	Sunny, windy 35° F.	
4/3	Rain, freezing rain 38° F. to 20° F.	Week-end exposure
4/4	Snow 20°F. to 15° F.	

AL 0018697
21838

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.

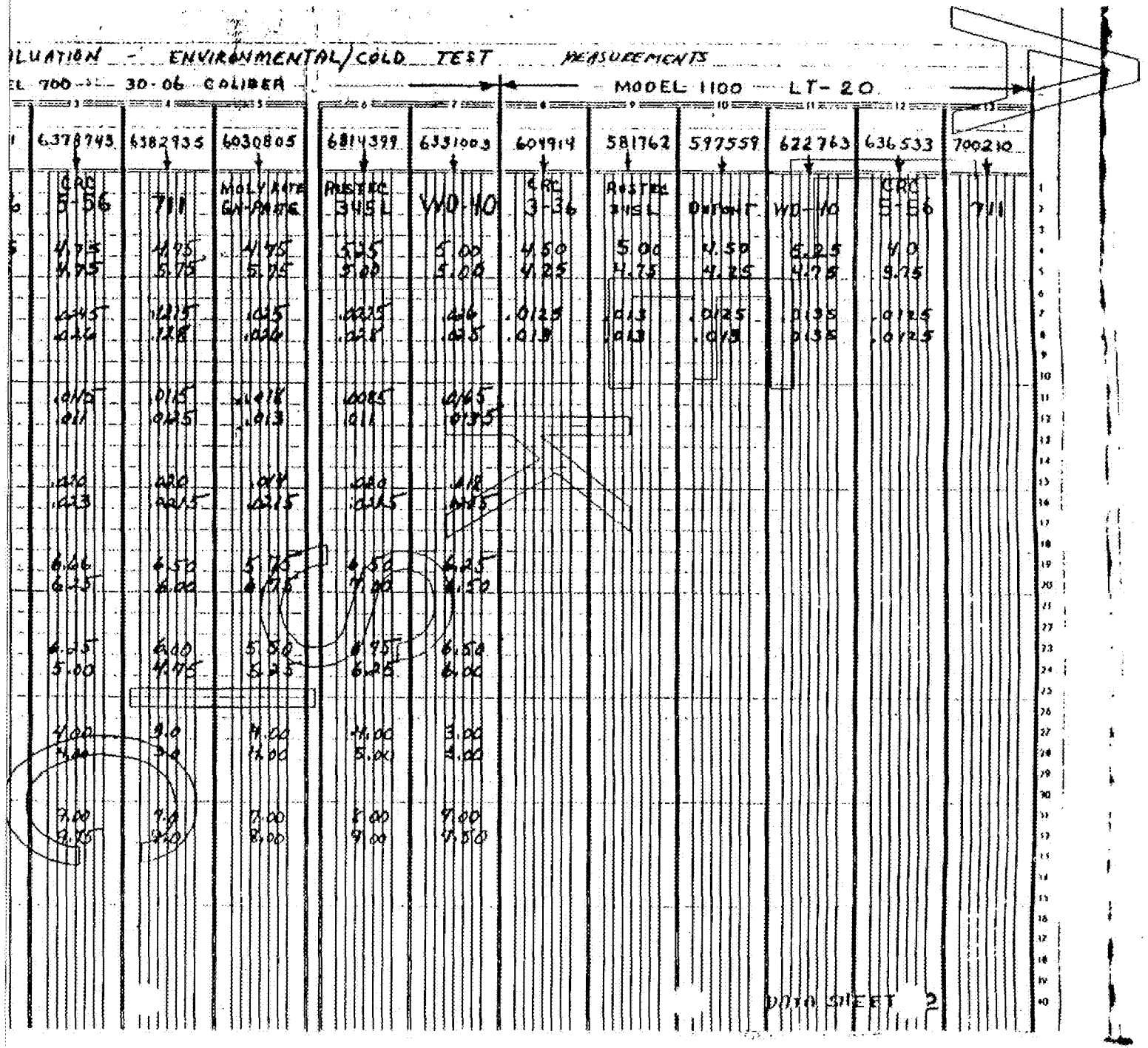
The guns were then placed on the roof over the week-end. At 8:00 A.M. Monday they were removed and bolt velocity measurements were taken.

The guns were then placed in a dry cabinet for 24 hours.

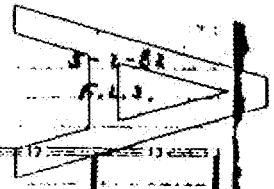
The guns were removed from the dry cabinet and bolt velocity measurements were taken.

At the completion of the test all the guns were disassembled and examined for rust.

ASSIGNED


LUATION - ENVIRONMENTAL/COLD TEST MEASUREMENTS
L 700 - 30-06 CALIBER
MODEL 1100 - LT-20
6378745
6382935
6030805
6814399
6331009
6099114
581762
597559
622763
636533
700210
CRC
5-56
711
MOLYKOTE
GN-PASTE
RESTEK
345L
WD-40
CRC
3-36
RESTEK
345L
Detroit
WD-40
CRC
5-56
711
DATA SHEET 2

PULLS AND FIRING PIN INDENT
ARE REMOVED FROM FREEZER
3 Hours @ −20° F



3/30/82 TRIGGER PULL	3/30/82 F.P. INDENT	3/31/82 TRIGGER PULL	3/31/82 F.P. INDENT	4/1/82 TRIGGER PULL	4/1/82 F.P. INDENT	4/2/82 TRIGGER PULL	4/2/82 FP INDENT
4.25	.017	4.25	.018	5.75	.0245	6.250	.0275
4.00	.0205	4.25	.018	6.00	.0270	6.000	.021
5.75	.0175	5.50	.017	5.25	.0215	5.75	.017
5.50	.0215	5.25	.027	5.5	.0260	5.75	.0215
4.75	.026	4.75	.0265	4.50	.0240	5.00	.0260
5.00	.024	4.75	.024	4.75	.0235	5.00	.0265
5.00	.0275	5.00	.0175	5.25	.0175	5.00	.0175
5.00	.021	5.25	.0215	5.25	.0275	5.25	.0215
4.75	.025	5.25	.0215	4.75	.0155	5.25	.025
4.75	.026	4.75	.0255	5.00	.0210	5.25	.026
5.25	.028	5.00	.028	4.75	.028	4.75	.0275
5.00	.028	4.75	.0275	4.50	.0275	4.75	.0275
4.50	.025	4.50	.0235	5.00	.0235	4.75	.0245
4.50	.0245	4.25	.0245	5.50	.0245	4.50	.024
4.25	.012	4.00	.013	4.00	.010	4.25	.0125
4.00	.012	4.25	.0125	4.00	.015	4.25	.018
4.50	.0135	4.75	.012	5.00	.012	(9.00)	.013
4.75	.014	4.50	.0125	4.75	.014	4.50	.0135
4.25	.013	4.75	.0125	4.25	.011	4.25	.012
4.00	.013	4.50	.0125	4.25	.010	4.25	.0125
4.75	.014	5.00	.0135	4.75	.014	4.25	.013
4.50	.015	4.50	.014	4.50	.0135	4.50	.014
3.75	.0125	3.75	.0125	3.00	(0)	4.50	.013
3.25	.0125	3.00	.013	(0)	(0)	3.25	.0135
4.00	.013	4.00	.0125	3.75	(0)	(0)	.013
4.25	.013	4.25	.0125	4.25	(0)	(0)	.014

(Pull to Comment)
(Pull to Comment)
(Pull to Comment)
(Pull to Comment)

DATA SHEET 3

ATION - ENVIRONMENTAL / COLD TEST (START 3-29-82) E-1-82

EL 1100 LT-20 BOLT VELOCITY MEASUREMENTS

2nd DAY INITIAL	2nd DAY TERMINAL		3rd DAY INITIAL	3rd DAY TERMINAL	4th DAY INITIAL	4th DAY TERMINAL	5th DAY INITIAL	5th DAY TERMINAL	AFTER WEEK-END ON ROOF INITIAL	AFTER WEEK-END ON ROOF TERMINAL
314	353		316	343	321	375	315	341	304	352
277	241		283	254	290	278	277	269	274	260
									319	360
									290	372
295	332		298	329	299	336	304	343	279	321
259	238		246	245	269	245	246	247	248	238
									285	326
									255	235
299	324		307	328	315	337	305	332	295	316
203	212		178	244	218	244	200	229	254	222
									294	3
									263	236

PLACED IN A DAY CABINET IMMEDIATELY AFTER PREVIOUS BOLT VELOCITY
GUNS WERE NOT WIPED DOWN AFTER BEING WET FROM WEEK-END
HOURS AFTER THE UNITS WERE REMOVED FROM CABINET
AL BOLT VELOCITY MEASUREMENTS WERE TAKEN.

TEST THRU THE 5TH DAY BOLT VELOCITY MEASUREMENTS
AT 0900 HR EACH DAY. THE START GUNS WERE PLACED IN
CHAMBER AT 1200 F FOR 16 HOURS EACH NIGHT.

DATA SHEET 1

REMINGTON ARMS COMPANY, INC.

INTERDEPARTMENTAL CORRESPONDENCE

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Petroleum Lab
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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, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

Signature Date

C.E. Ritchie, Sr. Supervisor - Testing, Meas. & Mech. Analysis Lab

Signature 6/10/82 Date

AL 0018702

26 of 38

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: _____

RIM FIRE _____ CENTER FIRE _____

27038 AL 001870

TEST PROCEDURE

A. On March 12, 1982, sixteen M/1100 shotguns were selected from the Ilion Fish and Game Club to be used in this evaluation. These guns are:

Labeled No.	Serial No.	Gauge
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 Ilion 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 Ilion 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 Ilion 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 visable 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.

AL 0018707
29938

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APPENDIX "A"

(Data Sheets)

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).

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington (IBM) — Dayton (IBM)

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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. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab — Signature — Date 5.20.82

C.E. Ritchie, Sr. Supervisor - Testing, Meas. & Mech. Analysis Lab — Signature — Date 5/26/82

AL 0018710

32 of 38

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: _____

RIM FIRE _____ CENTER FIRE _____

AL 0018711

33938

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.

ALEKSICH

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.

AL 0018714

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APPENDIX "A"

(Data Sheets)

WEATHER CONDITIONS DURING TEST

Date	Condition	Degree	
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.	
4/3	Rain, freezing rain	38°F. to 20° F.	Week-end Exposure
4/4	Snow	20° F. to 15° F.	

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REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington LETTERS

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Distribution: C. B. Workman
C. E. Ritchie
J. W. Brooks

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. Hennings, Foreman-Test Lab / R.E. Nightingale, Foreman-Measurement Lab

Signature Date

C.E. Ritchie,
Sr. Supervisor - Testing,
Mass. & Mech. Analysis Lab

Signature Date

PLAINTIFF'S EXHIBIT 3038

AL 0020199

1916

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. Sullis

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 _____

April 6, 1983

TO: C. E. RITCHIE

FROM: R. W. HOWE

REPORT TITLE: M/SEVEN LWT PENDULUM DROP TEST 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".

SAMPLE

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".

SK

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. A6341922

EXHIBIT

ALEKSICH

APPENDIX "A"

M/7 NEW STYLE TRIGGER EVALUATION

4/5/83
#830941

DROP/JAR-OFF TEST ON HARDWOOD SURFACE FROM 3' DROP EVALUATION		TEST #1				TEST #2			
		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
Serial #		#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.	3.0lb.	3.0lb.	3.0lb.	3.0lb.
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
BUTT 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	- Ok	- Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok
	18"	- 3 J/O4	- 1 J/O4	- Ok	Ok Ok	Ok 1 J/O4	Ok 3 J/O4	Ok 2 J/O4	Ok 4 J/O4
	24"	- 4 J/O4	- 2 J/O4	- 1 J/O4	Ok Ok	Ok 2 J/O4	Ok 4 J/O4	Ok 4 J/O4	Ok 4 J/O4
	36"	Ok 4 J/O4	Ok 4 J/O4	Ok 2 J/O4	Ok Ok	Ok J/O	Ok J/O	Ok J/O	Ok J/O
TOP SIDE	12"								Ok Ok
	18"								Ok Ok
	24"								Ok Ok
	36"	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok Ok	Ok J/O

NOTE: J/O means Jar-Off (i.e. 3 J/O 4 means 3 Jar-Offs out of 4 tries)

CERitchie:ja
4/10/83

AL 002025

Report No. 830941

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

AREA OF TESTING

___ Developmental	___ Safety Related	___ Litigation
✓ Design Acceptance	___ Competitive Evaluation	___ Warehouse Audit
___ Pre-Pilot	✓ New Design	___ Cost Reduction
___ Pilot	___ Design Change	Stake ___
___ Production Acceptance	___ Plant Assistance	___ Other

FIREARM STATS.

MODEL: 7 LWT

CAL. or ~~GAGE~~: 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: Buddie

WORK ORDER NO: C-1809-000

TEST TYPE

___ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	___ Environmental Test	___ Measurements	✓ Other DROP
___ Accuracy Test	___ Customer Complaint	___ Endurance Test	___

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 - RELIVED BOTH SIDES.

GUNS REQUIRED:

#1 760185 + ANY 3RD ENGAGEMENT .015"

#2 760292 " 3RD " .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: ___

AL 0020206

8816

(1ST SECOND TEST [redacted] 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"

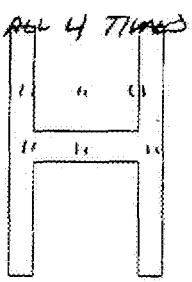
M/7 LWT GUN #14 - JARRED OFF 4 TIMES IN 4 DROPS AT 24"
(BOTTOM DROP ONLY) 3 " " 4 " " 18"
0 " " 4 " " 12"

(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 DROPPED [redacted] ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK ALL 4 TIMES
18" OK " " "
12" OK " " "



AL 0020207
9816

M/7 LWT - NEW STYLE TRIGGER - 3' DROP TEST (HARD WOOD STOP ONLY)

4-5-83

AL 0020208 10 of 16

	NEW STYLE TRIG.		NEW STYLE TRIG.		CONTROL GUN.		CONTROL GUN.	
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 (SEAR)

M16A1 "NEW STYLE TRIGGER - 5' DROP TEST (HARD WOOD STOP ONLY)

4-5-85

AL 0020209

GUN + SER#	NEW STYLE TRIG. 13 SER# 7601285		NEW STYLE TRIG. 14 SER# 7601292		CONTROL GUN. 12 SER# 7601289		CONTROL GUN. M/M40 SER# A635 1001	
SEE 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 (SEAR)

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"
1 " " 4 " " 18"
(BOTTOM DROP ONLY) 0 " " 4 " " 12"

M/7 LWT GUN #14 - ~~JARRED~~ OFF 4 TIMES IN 4 DROPS AT 24"
3 " " 4 " " 18"
(BOTTOM DROP ONLY) 0 " " 4 " " 12"

(CONTRIL GUN)
M/7 LWT GUN #12 JARRED OFF 4 TIMES IN 4 DROPS AT 24"
2 " " 4 " " 18"
(BOTTOM DROP ONLY) 0 " " 4 " " 12"

M/700 (CONTROL GUN) JARRED OFF 4 TIMES IN 4 DROPS AT 24"
4 " " 4 " " 18"
(BOTTOM DROP ONLY) 0 " " 4 " " 12"

NOTE:
M/700 CONTROL ALSO ~~DROPPED~~ DROPPED ON TOP AT
12"-18" & 24" LEVELS 4 TIMES AT EACH LEVEL

RESULTS 24" OK ALL 4 TIMES
18" OK " " "
12" OK " " "

AL 0020210

12/16

ALEKSICH

(NEW STYLE TRIGGER) FIRST TEST 4/4/83

M/D LWR - 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER# 7601285		14 SER# 7601292	
	SAFE ON	SAFE OFF	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	*J.O.	OK	*J.O.

J.O. = JARRED OFF (FIRING PIN FELL)

#13 TRIG PULL 3.25 3.75 3.50 AVG 3.5 LBS.

#14 " " 3-3-3 AVG. 3 LBS

CONTROL " " 4.50-4.75-5.00 AVG 4.75 LBS

W/300 " " 5.50 6.00 5.75 AVG 5.75 LBS

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4-4-83

HARD WOOD STOP

A - SAFE OFF ONLY
B - BOTTOM ONLY

ALL DROP TEST. (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 CONTROL

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

M/700

REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
M/700 TRIG PULL AVG OF THREE 5.25 LBS.

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4-4-83

ALEKSIC (NEW STYLE TRIGGER)

M/7 LUT 3' DROP TEST (HARD WOOD STOP ONLY)

GUN #	13 SER# 7601285		14 SER# 7601292	
	SAFE ON	SAFE OFF	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	*J.O.	OK	*J.O.

J.O. = JARRED OFF (FIRING PIN FELL)

#13 TRIG PULL 3.25 3.25 3.50 AVG 3.5 LBS.

#14 " " 3-3-3 AVG. 3 LBS

* CONTROL " " 4.50-4.75-5.00 AVG 4.75 LBS

M/700 " " 5.50 6.00 5.75 AVG 5.75 LBS.

AL 0020214

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4-4-83

A

HARD WOOD STOP

A - SAFE OFF ONLY
LOT DROP TEST. B - BOTTOM ONLY
(4 DROPS AT EACH LEVEL BELOW)

M/7 LWT GUN #14 JARRED OFF 2 TIMES IN 4 AT 24"
" " " " " 1 " " 4 AT 18"
#14 " " " OK — 4 " " 4 AT 12"
#14 TRIG PULL AVG OF THREE = 3 LBS

M/7 LWT GUN #13 JARRED OFF 4 TIMES IN 4 AT 24"
" " " " " 3 " " 4 AT 18"
#13 " " " 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"
4/7 " " " " OK — 4 " " 4 AT 18"
CONTROL " " " " OK — 4 " " 4 AT 12"
CONTROL TRIG PULL AVG OF THREE 4.75 LBS

REG M/700 DID NOT JAR OFF UNTIL 4' DROP.
M/700 TRIG PULL AVG OF THREE 5.75 LBS.
M/700

TEST

C

H

EXPERIENCES
IN THE
DESIGN & MANUFACTURE
OF
SHOTGUNS & RIFLES

REMINGTON

DUPONT

Bridgeport, Connecticut, U.S.A.

October 1945

PLAINTIFF'S EXHIBIT 3039

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
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

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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.

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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 skeet 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.

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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.

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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 promoted 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

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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 assembly 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

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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 slip~~ 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

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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.

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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, testing and perfecting model, production of samples for field tests, perfecting 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.

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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 blowout 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.

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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.

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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

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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

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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

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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.

Final 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 513T 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.

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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?

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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?

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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?

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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?

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?

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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:

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, disconnector and sear adjusted properly?
Is the front sight slot out of position?
Is the sear pin loose?

HOSKEL

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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

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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.

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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.

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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 sear 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 foreigh-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 1938, when part of the Parker personnel and most of the machinery were moved to Ilion,

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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 (Hepburn 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 98, an improved Model 5, was produced from 1898 to 1912.

The Model 99 was produced from 1898 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.

AL 0020755

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.

AL 0020756

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. A 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.H. Barnes. The rifle was similar in appearance to an autoloading shot gun, excellent in balance and weight. It was made to compete with

AL 0020757

29831

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.

AL 0020758 30831

AIR RIFLE:

The Model 26 Air Rifle first produced in 1926, was discontinued in 1934.

W. L. Clay
Manager of Quality

WLC:VPD
10/1/45

AL 0020759
31831

Remington.

DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ILION, 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.

PLAINTIFF'S EXHIBIT 3040

AL 0021176

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: _____

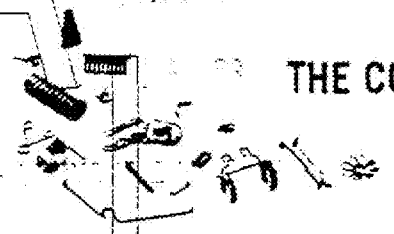
xc: J.F. Winske
R.S. Dobzelecki, Jr.
W.H. Coleman
H.C. Munson
J.M. Simpson
K.D. Green
R.J. Orf
L.B. Ferreira

cap

AFFIDAVIT SKETCH

Alternate 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
President

JG/cam

cc: Simpson
Ferreira
Dobzelecki
Coleman
Munson

ALESICH

". . . . make a good spring . . . . make it better than the competition . . . . be the best spring-maker in the industry . . . ."

AL 0021178

389

7/6: Conn. Spring

Remington.

DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ILION, NEW YORK 13357

TELEPHONE (315) 894-9961

REMINGTON ARMS CO
RECEIVED

FIREARMS RESEARCH DIVISION

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 S, 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.

In order to ensure continuity of supply as we evaluate manufacturing alternatives, Remington elects to release Connecticut Spring unconditionally from product liability or damages 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 0021179

489

In witness whereof, please signify your acceptance of the above by signing in the space provided below and returning one original to P. R. Harter, Remington Arms Company,Inc., 14 Hoefler Ave., Ilion, NY 13357.

The Connecticut Spring & Stamping Corp.	Remington Arms Co., Inc.
By: _____	By: _____
Title: _____	Title: _____
Date: _____	Date: _____

xc: J.F. Winske
R.S. Dobzelecki, Jr.
W.H. Coleman
W.C. Munson
J.M. Simpson
K.D. Green
R.J. Orf
L.B. Ferreira

mav

ALEKSICH

716
REMINGTON ARMS CO
RECEIVED

Remington.

DUPONT

xcc: 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

FIREARMS RESEARCH DIVISION ILION, NEW YORK 13357

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, Ilion

PRH:bb

AL 0021181

699

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. G. MUNSON

CONNECTICUT SPRING & STAMPING CO.
RISK ANALYSIS OF MAKING A CLAIM FOR TRIGGER CONNECTOR COMPENSATION

Background

- Cracked trigger connectors manufactured by Connecticut Spring may have been assembled into some M/700 rifles. This resulted in a trigger assembly replacement program with an estimated cost of $1.81MM.
- 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.
- 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.

Recommendations

- 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).
- Continue increasing our activity with Connecticut Spring through Engineering work on new parts and resolution of problems on existing parts.
- Consider a gradual build-up of inventory of a few very difficult parts
- Assess our position monthly to determine the best time to make a claim.
- 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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899

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:

	Coil Springs	Specials
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.)
	Elapsed Time: Weeks	Elapsed Time: Months
Total Cost 63 ($750) =	$47,250	27 ($8000) = $216,000
Total Time Invested:	630 Hrs.	540 Hrs.

Total	$250,000 in Tooling
Our Engineering Time	1,200 Hrs. @ $25/Hr. = $30,000
Elapsed Time	6-8 Months

AL 0021184

939

G.H.H.

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
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:

- 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.

- 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.

- 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.

PLAINTIFF'S EXHIBIT 3041

2-V-182

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 philosphy. This siutation would arise only when the trigger assembly is replaced, since the receiver is a restricted part.

F. T. Millener

FTM:fms

HOYSHELL

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TO REMINGTON ARMS COMPANY, INC.

ASSEMBLY AND INSPECTION PROCEDURE
MOHAWK 600 TRIGGER ASSEMBLY

1. Clean and prime Trigger Engagement Screw hole. (see figure 1)

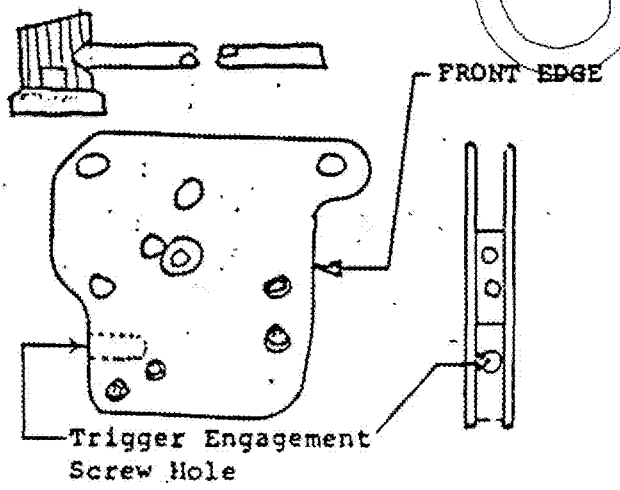
   a. Position Housing on its front edge.

   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)

AL 0021786

PLAINTIFF'S EXHIBIT 3042

1810

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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

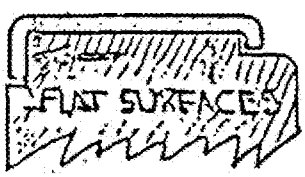


Fig. 2. GOOD



Fig. 3. TEST LIGHT GAP WITH SHIM

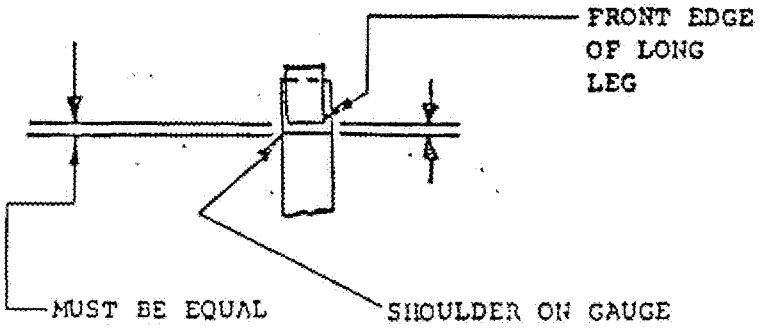


Fig. 5

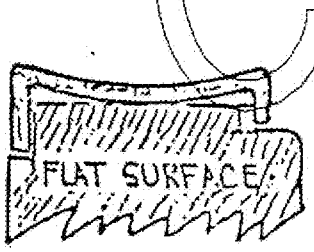


Fig. 4. REJECT

2g10

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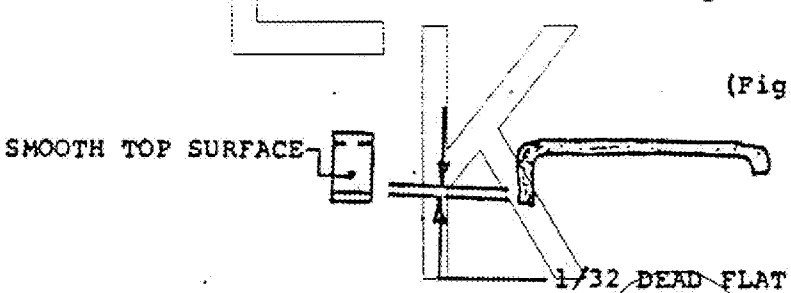
b. Check connector for maximum width over full length. Reject parts over 0.172. Use receiving gauge C-44522.

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.

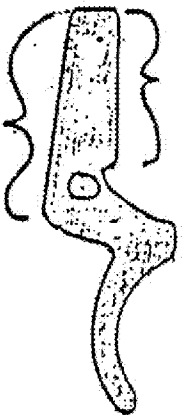
(Fig. 6)



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)

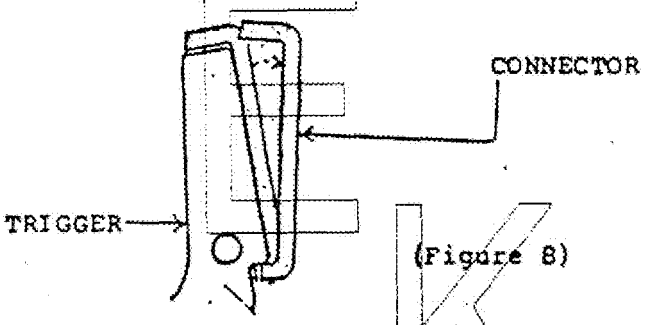
SAMPLE

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TO REMINGTON ARMS COMPANY, INC.

4. Check Connector to Trigger Fit - 100%

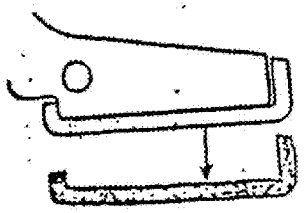
a. Fit passed connector to passed trigger and check for minimum working clearance (slipfit).

. Connector must rotate freely around bottom (short) leg without binding on top of trigger (see Figure 8).



(Figure 8)

. Connector must fall off trigger when trigger is held horizontally (see Figure 9).



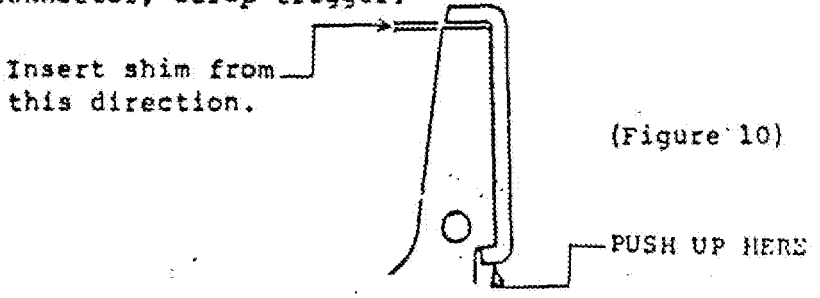
(Figure 9)

. 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.



(Figure 10)

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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.

AL 0021790

5910

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TO REMINGTON ARMS COMPANY, INC.

6. Adjust Trigger Sub-Assembly on Comparator 100%.

a. Pick Trigger Sub-Assembly and position in comparator fixture and clamp.

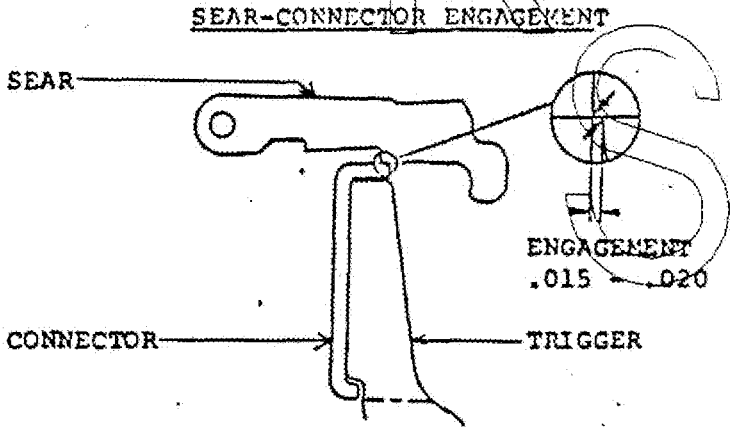
(~~Comparator fixture~~ E-42271)
(Comparator ~~screen~~ A-600-CL25)

. Houning ~~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 2¼ lbs. M600 only).

e. Adjust Trigger pull by turning Trigger Adjusting Screw counter-clockwise slowly until Sear just disengages (fires).

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TO REMINGTON ARMS COMPANY, INC.

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.

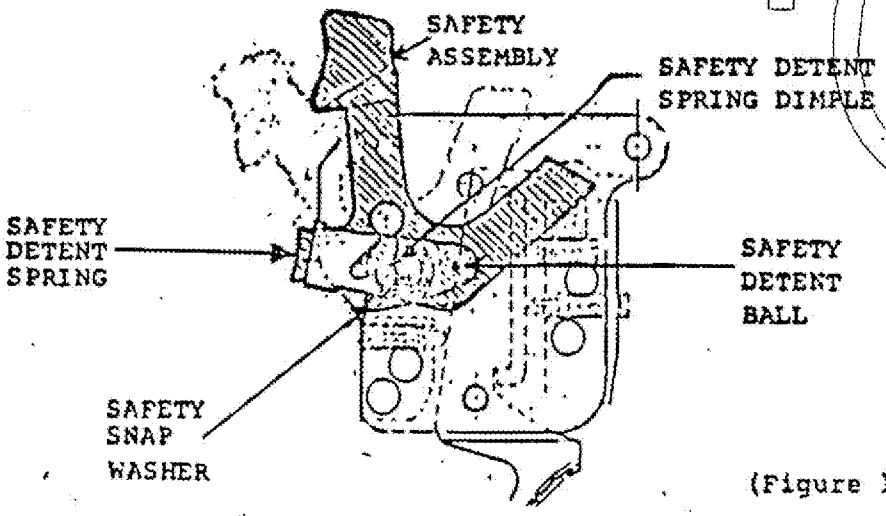
b. Assemble (see Figure 13).

- 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)

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TO REMINGTON ARMS COMPANY, INC.

8. Lubricate Connector and Sear with "Molykote" dry powder.

   a. Pick Trigger Assembly.

   b. 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%.

   a. 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.

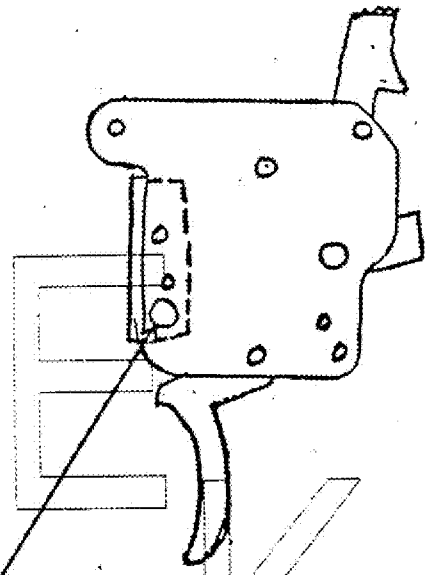
10. Mark correctly assembled and checked Trigger Assembly with Assembler's identification. (See Figure 14)

    a. Locate Trigger Assembly in stamping fixture.

    b. Stamp lower left front corner, as shown in Figure 14, with correct assembler identification. Use 1/16" size character.

8/10

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(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.

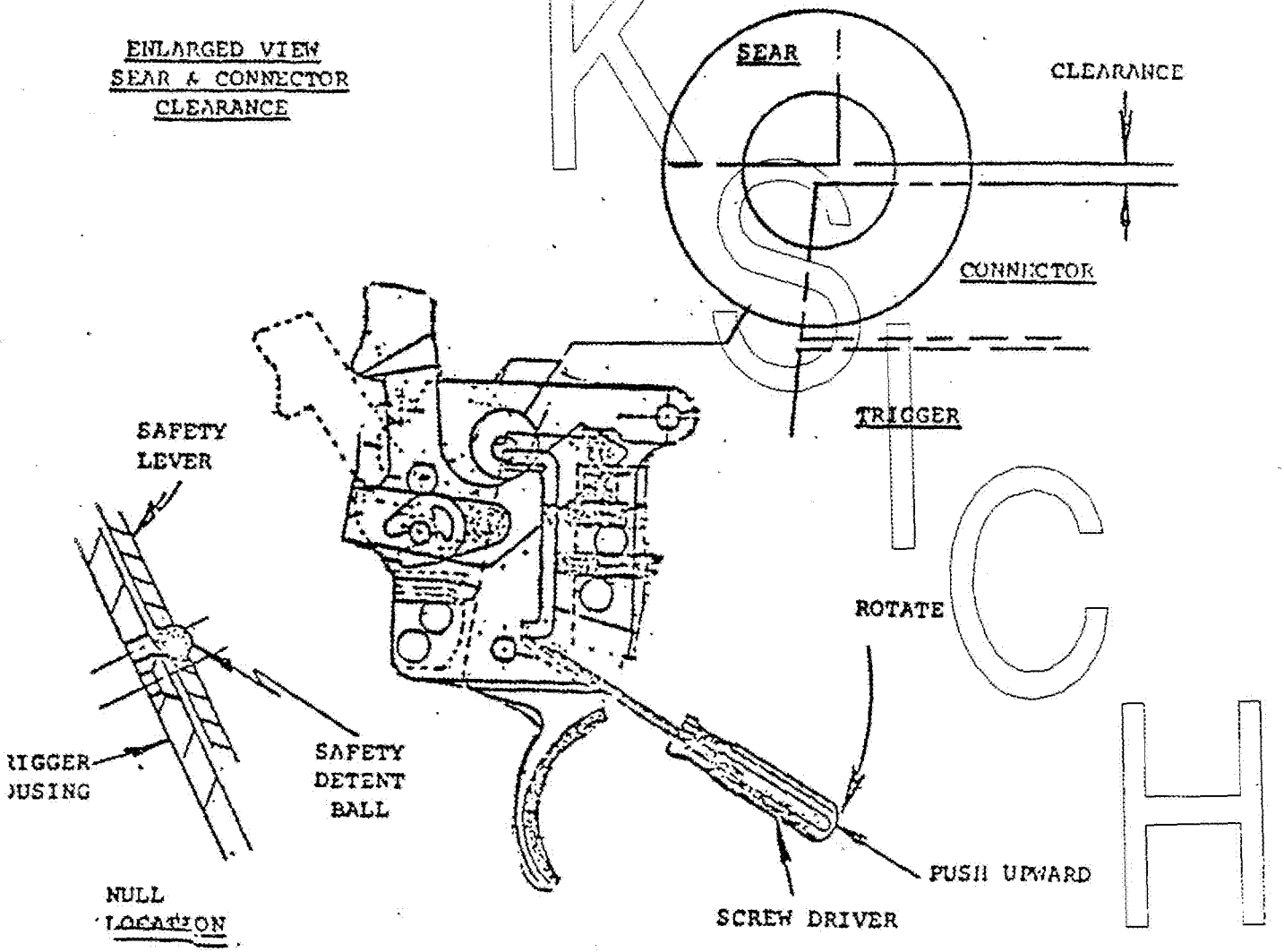
b. While pushing downward on the Sear and pushing upward on the Connector, use the screwdriver to rotate the Trigger front to rear (see Figure 15).

. 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.



10/10

DON'T SAY IT—WRITE IT

TO C. B. WORKMAN

FROM J. W. BROOKS

RECEIVED
OCT 30 1978

DATE September 12, 1978

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

PLAINTIFF'S EXHIBIT 3043

AL 0021838

191

Remington

REMINGTON ARMS COMPANY, INC.

PETERS

MANUFACTURERS OF
SPORTING FIREARMS, AMMUNITION

SPORTING FIREARMS, TRAPS, ILION, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT
LONOKE, ARKANSAS
CABLE—HARTLEY, BRIDGEPORT
TELEX: 964-201 STRATFORD, CONN.

TRAPS TARGETS

BRIDGEPORT, CONNECTICUT 06602

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT
TARGETS, RINDLAY, OHIO
ADA, OKLAHOMA
ATHENS, GEORGIA

February 13, 1979

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

RAP:CK

AL 0021874

PLAINTIFF'S EXHIBIT 3044

181

Remington

REMINGTON ARMS COMPANY, INC.

PETERS

MANUFACTURERS OF
SPORTING FIREARMS, AMMUNITION

SPORTING FIREARMS, TRAPS, ILION, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT
LONOKE, ARKANSAS
CABLE—HARTLEY, BRIDGEPORT
TELEX, 964-201 STRATFORD, CONN.

TRAPS TARGETS

BRIDGEPORT, CONNECTICUT 06602

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT
TARGETS, FINDLAY, OHIO
ADA, OKLAHOMA
ATHENS, GEORGIA

January 15, 1979

bcc: P.H.Burdett
J.P.McAndrews
E.S.McCawley

Dun's Review
Editorial Office
666 Fifth Avenue
New York, New York 10019

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

PLAINTIFF'S EXHIBIT 3045

AL 0021875

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
Ilion Research Division

ALEKSICH

PLAINTIFF'S EXHIBIT 3046

RECEIVED
NOV 24 1952
ARMS
DEVELOPMENT DIVISION

CC: W. L. Clay - Bdpt.
J. E. Pinckney - "
G. M. Calhoun - "
J. B. Maupin
S. E. Kelly - In
Wm. Heiser - Turn
A. D. Gordon - In
W. A. Best - Turn
E. Sapp

Ilion, New York
November 21, 1952

TO: H. A. Brown - Bridgeport

FROM: H. J. Hankmann

We regret very much the delay in replying to your penciled inquiry on copy of letter from G. E. Pinckney to G. M. Calhoun dated October 29, 1952. This inquiry concerned the statement in the "Brief Quarterly Complaint Report" issued by W. L. Clay, October 23, 1952 to the effect that "the M/721 jars 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) jar off complaints received on this model.

7 in the 1st Quarter — 1 in the 3rd Quarter
4 in the 2nd Quarter — 0 in the 4th Quarter

In 1951, there were no jar off complaints received on this model. To date in 1952 there have been two (2) jar off complaints received.

1 in the 1st Quarter — 1 in the 3rd Quarter
0 in the 2nd 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 Final Inspection by incorporating a special Action Test. This test requires that with the Bolt Handle raised halfway, the engagement of the Sear 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 jar off incidents have been found in final gun audit tests during the years 1951-52 to date.

PLAINTIFF'S EXHIBIT 3047

AL 0022407

193

You can be certain that the importance of eliminating jar off incidents has been stressed in our contact with all personnel concerned at Ilion.

H. J. Hackman, Supt.
Product Eng. & Control Section

HJH:HK

ALEKSICH

M-600, 660
M-700

Guns Returned with Causes Related to Trigger Assembly - Connector

Cause Code: Description	1975 600	1975 700	1974 600	1974 700	1973 600	1973 700	1972 600	1972 700	1971 600	1971 700	5 Yr. Total
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 -											
18 -											
3219 -											
3220 -											
YEARLY TOTALS	3	0	6	13	0	3	1	6	2	14	48

Rec'd F. MARTIN (A-O)
by G Bullis
6/4/76

AL-0022409

LIMITED DISTRIBUTION

JPLinde:T
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.

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.

AL 0022439

3200 COMPETITION SKEET and TRAP GUNS

I. 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

AL 0022440

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.

AL 0022442

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.

AL 0022443

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.

AL 0022444

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.

AL 0022445

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

AL 0022446

Azte Consumer Corp.

COPIES TO:

C.K. DAVIS	H.K. FAULKNER
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W.O. REISINGER	H.A. BROWN
B.E. STRADER	R.H. GRACE
F.K. CRAIG	H.J. HACKMAN (6
G.O. CLIFFORD	D.S. FOOTE
M.R. WARDEN	O.E. MILLER
G.E. PINCKNEY	S.W. ROSE
A.L. FRENCH	R.A. WILLIAMSON
W.L. CLAY	A.J. BROWN
W.F.H. MATTLAGE BRIDGEPORT.	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
LAST 12 MONTHS RUNNING AVERAGE ON GUNS PRODUCED WITHIN ONE YEAR.	203

SHEET NO. 1.

L 0022477

PLAINTIFF'S EXHIBIT 3049

1 of 8

COMPLAINTS ON FIREARMS FOR MONTH ENDED OCTOBER 31, 1948.

		PRODUCED WITHIN ONE YEAR	TOTAL
	MODEL 81		
#	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
	RUST SPOT IN BARREL	1	1
O	JAMS (EXTRACTOR LOOSE)	1	1
	DEFECTIVE RECOIL SPRING (HAS SPLIT)	1	1
	DEFECTIVE RECEIVER	1	1
	MAIN SPRING BROKEN	5	5
	TAKE DOWN SCREW THREADS STRIPPED	1	1
	INDICATOR BINDS	1	1
		21	26
	SPORTSMAN - 12 GA.		
X	CARRIER CATCH 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 COUNTER SUNK TOO DEEP.		1
	TAKE DOWN SCREW THREADS DAMAGED	1	1
	BOLT CRACKED	1	1
	CARRIER DOG WORN	1	1
		6	9
	SPORTSMAN - 16 GA.		
	BARREL LOOSE IN RECEIVER		1
			1
	SPORTSMAN - 20 GA.		
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
		5	5
	MODEL 11 - 12 GA.		
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(

AL 0022478

		PRODUCED WITHIN ONE YEAR	TOTAL
	MODEL 11 - 12 GA. (CONTINUED)		
	STOCK SPLIT	1	2
O	JAMS	1	1
X	FAILS TO OPERATE	1	1
	GUIDE RING LOOSE (POOR BRAZING)	1	2
	SEAR SPRING PLUNGER BINDS IN TRIGGER GUARD	1	1
	DEFECTIVE SAFETY	1	1
	HAMMER FILED THIN	1	1
	OPERATING SLIDE CAMS PAST LINK		1
		18	21
	MODEL 11 - 16 GA.		
X	CARRIER DOG FILED TOO MUCH		1
O	SHELLS STEM CHAMBER		1
	EXTRACTOR BROKEN		1
			3
	MODEL 11 - 20 GA.		
O	SHELLS STEM CHAMBER	1	2
O	FAILS TO FEED	1	1
	BARREL DOES NOT FIT	1	1
	BARREL EXTENSION LOOSE		1
	TRIGGER SPRING BROKEN	5	7
	EXTRACTOR SPRING AND PLUNGER STUCK IN BREECH		1
		8	13
	MODEL 121		
	FIRING PIN BROKEN	1	1
X	FIRING PIN STRIKES INSIDE RIM	6	6
O	STEM CHAMBER	6	6
O	RETAINER LOOSE		1
O	TAKES MAX. PLUG	1	2
O	FAILS TO EJECT	4	4
X	NOT ACCURATE	1	1
	EXTRACTOR BROKEN		1
O	FAILS TO FEED	1	1
O	CARRIER OUT OF ADJUSTMENT		1
	ACTION BAR BROKEN	1	1
X	DEFECTIVE BARREL	1	1
O	STEMS RETAINER		1
X	JAMS (SHELLS CATCH BY CARTRIDGE STOP)	1	1
O	BLOCK UNEVEN AT FACE	2	2
	TRIGGER GUARD BROKEN	1	1
	WEAK CARRIER DOG SPRING	1	1
O	GUARD AND RECEIVER LOOSE	1	1
	BURR IN CHAMBER	2	2
	CARTRIDGE STOP FALLS OUT	1	1
	RECEIVER THIN AT WELL SMALL HOLE		1
	BROKEN RETAINER	1	1
	FALL OF BREECH BLOCK NOT GOOD	1	1
		33	39

AL 0022479

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 141			
O	SEAR AND SEAR LOCK OUT OF ADJUSTMENT	1	1
O	SEAR AND TRIGGER OUT OF ADJUSTMENT	1	1
O	SHELLS STEM CHAMBER		1
O	FAILS TO FEED	1	2
O	JARS OFF		1
O	UNLOCKS HARD	1	1
O	FAILS TO EXTRACT	1	1
	CARTRIDGE STOP BROKEN	1	1
X	NOT ACCURATE	2	2
	ACTION BINDS	1	1
X	TRIGGER PULL CREEPY	1	1
X	JAMS		1
	CARTRIDGE STOP CHIPPED OR BROKEN	1	1
O	TAKES MAX. PLUG		1
	CARTRIDGE STOP NOT FITTED TO GUN	1	1
	ACTION BAR COVER BROKEN	1	1
	MAGAZINE PLUG SCREW, THREADS NOT TAPPED OUT		1
		13	19
MODEL 241			
O	FAILS TO DISCONNECT	1	2
X	POOR NOTCH ON FIRING PIN	22	23
X	BARREL LOCK DOES NOT QUALIFY	2	2
O	FAILS TO EJECT	6	7
X	SIGHTS OUT OF LINE	3	3
X	NOT ACCURATE	2	2
O	TAKE DOWN LOOSE	1	1
	STOCK CHECKED OR BROKEN		1
O	ACTION SPRING PLUNGER BINDS	1	1
O	FAULTY TRIGGER PULL	1	1
X	GUARD LOOSE	1	1
X	JAMS (POOR CLAW ON EXTRACTOR)	3	3
	TOOL MARKS AROUND BARREL 1" FROM MUZZLE	1	1
	DEFECTIVE BARREL	1	1
O	FAILS TO COCK	17	18
	RECEIVER CRACKED	1	1
	CASES SPLIT	1	1
	FRONT SIGHT MISSING	1	1
	FIRING PIN NOTCH BROKEN OR CHIPPED	4	4
		69	74
MODEL 31 - 12 GA.			
O	CARRIER BINDS	1	1
O	CARTRIDGE STOP OUT OF ADJUSTMENT	1	1
X	BARREL LOOSE (SIDE PLAY IN BUSHING)	1	1
	STOCK CHIPPED OR BROKEN	2	2
	BARREL BORED OFF CENTER	1	1
		6	6

AL 0022480

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 31 - 16 GA.			
	STOCK CHECKED	1	1
0	FAILS TO FEED	1	1
		2	2
MODEL 31 - 20 GA.			
	MAGAZINE TUBE LAYS TO THE EXTRACTOR	1	1
		1	1
MODEL 37			
0	REAR SIGHT ELEVATING SCREW NOT ADJUSTED PROPERLY		2
X	TRIGGER PULL NOT PROPERLY ADJUSTED		1
0	TAKES MAX. PLUG	1	1
X	PEEP DISC LOOSE		1
X	NOT ACCURATE	5	6
	SIGHT BLOCKS OFF CENTER	1	1
	POOR BOLT HANDLE	1	1
		8	13
MODEL 510			
N	BARREL BENT	1	1
	TRIGGER SPRING PLUNGER BROKEN	1	1
X	BOLT DOES NOT CLOSE PROPERLY	2	2
0	SEAR DAMAGED	1	1
	TAKES MAX. PLUG	1	1
X	BOLT BROKEN	1	1
		6	7
MODEL 511			
N	NOT ACCURATE	2	2
0	FAILS TO FEED	1	1
X	BARREL NOT STRAIGHT	7	7
0	BOLT PULLS OUT	3	3
	SMALL HOLE IN REAR SIGHT SCREW HOLE	1	1
		14	14
MODEL 512			
0	CARTRIDGE RETAINER OUT OF ADJUSTMENT	7	7
	BOLT BROKEN	1	1
	BOLT HANDLE BROKEN		2
0	FIRING PIN FOLLOWS DOWN	1	1
0	FAILS TO EJECT	4	4
	SEAR BROKEN	1	1
X	BARREL BENT	9	9
#	BOLT PULLS OUT	14	14
N	NOT ACCURATE (SIGHTS OUT OF LINE)	2	2
0	DROP SHELLS	3	3
X	FIRING PIN CAM PIN OUT OF POSITION	1	1
0	OUTER MAGAZINE LOOSE	1	1
0	SEAR AND BOLT UPSET	1	1
X	BOLT BINDS	1	1
0	REAR SIGHT LOOSE	1	1
	SEAR STUD BROKEN	1	1
		46	50

AL 0022481

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 513			
O	FAILS TO EJECT	2	2
X	KEY HOLES (POOR RIFLING	7	7
X	BOLT HANDLE HITS TOP OF RECEIVER	1	1
	BOLT HANDLE BROKEN		1
O	BOLT PULLS OUT	1	1
	FIRING PIN CAM PIN SHORT		1
		11	13
MODEL 514			
X	TRIGGER BENT	5	5
X	SAFETY OUT OF ADJUSTMENT	3	3
	BOLT HANDLE BROKEN	2	2
X	BARREL BENT	5	5
	NOT ACCURATE	1	1
	TAKE DOWN SCREW TIGHTENS TOO HARD	1	1
	FIRING PIN BINDS	1	1
	TRIGGER BROKEN AT PIN HOLE	1	1
	BOLT AND HANDLE CAME APART	2	2
	SIGHTS NOT ALIGNED PROPERLY	1	1
		22	22
MODEL 521			
O	FAILS TO EJECT	2	2
X	NOT ACCURATE	1	1
	STOCK DAMAGED	1	1
X	BARREL BENT	3	3
	MAGAZINE OUT OF ADJUSTMENT	1	1
	BOLT BROKEN	1	1
	BOLT PULLS OUT	1	1
	RING IN BARREL	1	1
O	TAKES MAX. PLUG	1	1
		12	12
MODEL 550-1			
O	FAILS TO FED	2	2
X	NOT ACCURATE	1	1
X	JAMS (INSERT ROUGH)	6	6
O	FAILS TO EJECT	6	6
	BROKEN EXTRACTOR	1	1
O	NO CHAMFER ON FRONT END OF RECOIL CHAMBER	5	5
	MISFIRES	1	1
X	NO RIFLING IN BARREL	1	1
X	CONNECTOR PIN LOOSE	2	2
X	TOOL MARKS AROUND RIFLING	1	1
	SHELLS STEM CHAMBER	2	2
	DEFECTIVE BARREL	1	1
	FIRING PIN MISSING	1	1
	BROKEN CONNECTOR	1	1
	RECOIL CHAMBER BOTTOM SIDE UP	1	1
O	CONNECTOR SPRING WEAK	3	3
	STOCK SPLIT AT TIP	1	1

(CONTINUED)

AL 0022482

		PRODUCED WITHIN ONE YEAR	TOTAL
	MODEL 550-1 (CONTINUED)		
X	THREADS IN MAGAZINE RING HOLE IN BARREL POOR	2	2
X	DEFECTIVE BOLT	1	1
X	SIGHTS NOT ALIGNED PROPERLY	1	1
O	CARRIER AND CARTRIDGE STOP BINDS	1	1
X	BARREL BENT	3	3
	STOCK MARRED	1	1
X	NO NOTCH ON REAR SIGHT	1	1
	FRONT SIGHT MISSING (NEVER FITTED)	1	1
O	SAFETY GROUND TOO MUCH	1	1
O	DEFECTIVE RECOIL CHAMBER	1	1
		49	49
	MODEL 721		
#	STOCK CRACKED AT GRIP	7	7
O	FAILS TO EJECT	1	1
	DEFECTIVE BOLT	2	2
O	FAILS TO EXTRACT	1	1
	FAULTY SAFETY	1	1
X	SIGHTS NOT PROPERLY ALIGNED	1	1
	BOLT HITS STOCK	1	1
	EXTRACTOR STICKS OUT NEAR EJECTOR	1	1
	FIRING PIN FOLLOWS THROUGH	1	1
	BOLT STOP LOOSE	1	1
	BOLT CRACKED NEAR LUGS	2	2
		19	19
	MODEL 722		
O	FAILS TO FIRE	1	1
X	REAR SIGHT CROOKED	1	1
O	POOR EXTRACTOR	1	1
		3	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.

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.			3		
MODEL 11 - 20 GA.	8				
MODEL 121	30	3	6		
MODEL 141	11	2	6		
MODEL 241	60	9	5		
MODEL 31 - 12 GA.	6				
MODEL 31 - 16 GA.	2				
MODEL 31 - 20 GA.	1				
MODEL 37	3	5	5		
MODEL 510	6		1		
MODEL 511	11	3			
MODEL 512	40	6	4		
MODEL 513	7	4	2		
MODEL 514	22				
MODEL 521	10	2			
MODEL 550-1	36	13			
MODEL 721	19				
MODEL 722	3				

H.E.WEKS:FH
11/5/48.

AL 0022484

COPIES TO:

C.K. DAVIS	H.K.
D.E. CARPENTER	W.H.
W.O. REISINGER	H.A.
B.E. STRADER	R.H.
F.K. CRAIG	H.J.
G.O. CLIFFORD	D.S.
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	2
TO DATE 1947	1
FOR 12 MONTHS ENDING SEPTEMBER 30, 1948	2
FOR 12 MONTHS ENDING SEPTEMBER 30, 1947	1
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	1
SEPTEMBER 1947	
SEPTEMBER 1946	
FOR 12 MONTHS ENDING SEPTEMBER 30, 1948	21
LAST 12 MONTHS RUNNING AVERAGE ON GUNS PRODUCED WITHIN ONE YEAR.	1

SHEET NO. 1

AL

PLAINTIFF'S EXHIBIT 3050

1 of 6

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 11 - 16 GA.			
O	EXTRACTOR OUT OF ADJUSTMENT		1
X	OPERATING SLIDE FILED OUT OF SHAPE	1	1
		1	2
MODEL 11 - 20 GA.			
O	SHELLS STEM CHAMBER		1
			1
MODEL 121			
	FIRING PIN BROKEN	1	1
X	FIRING PIN STRIKES INSIDE RIM	4	4
O	STEMS CHAMBER	4	4
O	TAKES MAX. PLUG	1	2
O	FAILS TO EJECT	3	4
O	FAILS TO EXTRACT	1	1
X	ACTION BAR MACHINED WRONG		1
	FIRING PIN NOT UP TO STANDARD	1	1
X	FACE OF BLOCK ROUGH	1	1
O	STEMS RETAINER	2	2
	ACTION DOES NOT LOCK UP	1	1
X	JAMS (SHELLS CATCH BY CARTRIDGE STOP)	1	1
O	BLOCK UNEVEN AT FACE	1	1
O	BOLT PULLS OUT	1	1
X	BARREL PITTED	1	1
	WEAK CARRIER DOG SPRING	1	1
	HAMMER ROD GUIDE BENT	1	1
		25	28
MODEL 141			
O	SEAR AND SEAR LOCK OUT OF ADJUSTMENT	2	2
O	JARS OFF	1	2
O	FAILS TO EXTRACT	2	2
O	FEEDING PLUG GOES BY CARTRIDGE STOP (JAMS)	1	1
X	CARTRIDGE WAYS IN BAR NOT TO STANDARD		1
O	ACTION BINDS	1	1
	FIRING PIN EXTENSION LOOSE FROM FIRING PIN	1	2
	ACTION BAR LOCK WORN	1	1
	TAKES MAX PLUG		1
		9	13
MODEL 241			
O	FAILS TO DISCONNECT	3	3
X	POOR NOTCH ON FIRING PIN	6	9
O	FAILS TO EJECT	7	8
O	FAILS TO EXTRACT	1	1
X	SIGHTS OUT OF LINE		1
X	NOT ACCURATE (MUZZLE UPSET)	3	3
O	CARTRIDGE STOP OUT OF ADJUSTMENT	2	2
	STOCK CHECKED OR BROKEN	1	1
O	BARREL TAKE UP IS LOOSE	1	1
X	BARREL LOOSE	2	2

(CONTINUED)

AL 0022487

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 241 CONTINUED			
O	STEMS CHAMBER	1	1
O	FAILS TO COCK	7	7
	SAFETY OPERATES HARD	1	1
		35	40
MODEL 31 - 12 GA.			
O	SHELLS STEM CHAMBER		1
O	TRIGGER LOCK OUT OF ADJUSTMENT	1	1
O	FAILS TO EJECT	1	1
	FORE-END BROKEN	1	2
	BARREL DAMAGED AT MUZZLE	1	1
	BARREL ASSEMBLED HARD	1	1
	BURST BARREL (THIN WALL)		1
		5	8
MODEL 31 - 16 GA.			
	SEAM IN BARREL	1	1
		1	1
MODEL 31 - 20 GA.			
X	TRIGGER BINDS	1	1
		1	1
MODEL 37			
X	TRIGGER PULL NOT PROPERLY ADJUSTED	1	1
X	FAILS TO COCK	1	1
	ELEVATION PLATE DAMAGED		1
	RECEIVER HAS SHARP EDGE NEAR BOLT HANDLE	1	1
		3	4
MODEL 510			
	BOLT HANDLE BROKEN		1
O	FAILS TO EJECT	2	2
N	BARREL BENT	1	1
X	EJECTOR TOO LOW	1	1
N	SIGHTS NOT PROPERLY ALIGNED	1	1
	DEFECTIVE BARREL	1	1
	FAULTY ACTION	1	1
	BROKEN EJECTOR		1
	BOLT BINDS ON SEAR	1	1
		6	10
MODEL 511			
	STOCK CHECKED	1	1
N	NOT ACCURATE	2	2
N	FAILS TO EJECT	2	2
X	BARREL NOT STRAIGHT	2	2
X	CARTRIDGE STEMS CHAMBER	1	1
O	BOLTS PULL OUT	3	3
#	BOLT AND SEAR DAMAGED	1	1
O	THREADS IN PEEP SIGHT HOLE IN RECEIVER STRIPPED	1	1
	MAGAZINE FOLLOWER BROKEN	1	1
		14	14

AL 0022488

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 512			
O	CARTRIDGE RETAINER OUT OF ADJUSTMENT	8	9
O	FAILS TO FEED	3	3
	STOCK CHECKED	2	2
	BOLT HANDLE BROKEN	2	2
O	FAILS TO EJECT	5	5
N	NOT ACCURATE	1	1
X	CARTRIDGE STOP PLUNGER BINDS		1
	SEAR BROKEN	3	3
X	BARREL BENT	2	2
#	BOLT PULLS OUT	12	13
N	NOT ACCURATE (SIGHTS OUT OF LINE)	2	2
O	DROP SHELLS	3	3
	MAGAZINE RING THREAD BAD	2	2
	BOLT HANDLE LOOSE		1
	JAMS	1	1
	BOLT BINDS	1	1
	TAKE DOWN SCREW HOLE IN RECEIVER TOO LARGE	1	1
	CARRIER BINDS ON CARTRIDGE STOP PLUNGER	1	1
		49	53
MODEL 513			
	STOCK CHECKED	1	1
O	FAILS TO EJECT	1	2
X	POOR TRIGGER PULL	1	1
X	KEY HOLES	1	1
	DEFECTIVE BOLT HANDLE		1
	SIGHT SCREW BROKEN	1	1
		5	7
MODEL 514			
X	TRIGGER BENT	9	9
X	SAFETY OUT OF ADJUSTMENT	1	1
	BOLT HANDLE BROKEN	1	1
X	POOR RIFLEING	2	2
X	BARREL BENT	3	3
	LOOSE BOLT HANDLE	1	1
X	POOR FINISH	1	1
	NOT ACCURATE	1	1
	BOLT COMPLETE MISSING	1	1
		20	20
MODEL 521			
	STOCK CHECKED	2	2
	BOLT HANDLE BROKEN	3	3
O	THREADS STRIPPED ON REAR SIGHT ELEVATING SCREW	1	1
O	REAR SIGHT MOUNTING SCREW BROKEN IN RECEIVER	1	1
	REAR SIGHT MISSING	1	1
	SEAR AND BOLT DAMAGED	1	1
	TRIGGER AND SPRING PLUNGER MISSING	1	1
X	BARREL BENT	1	1
		11	11

AKSICH

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 550-1			
O	EXTRACTOR OUT OF ADJUSTMENT	1	1
O	FAILS TO FEED	4	4
X	ROUGH ACTION	1	1
X	NOT ACCURATE	1	1
X	JAMS (INSERT ROUGH)	7	7
O	FAILS TO EJECT	13	13
O	FAILS TO CONNECT	2	2
O	FAILS TO EXTRACT	2	2
O	MISFIRES	1	1
	CONNECTOR SPRING WEAK	3	3
X	BOLT BINDS	1	1
X	CONNECTOR PIN OUT OF POSITION	1	1
	STOCK SPLIT AT TIP	1	1
	THREADS IN MAGAZINE RING HOLE IN BARREL POOR	2	2
	SHELLS SWELL	1	1
	DEFECTIVE BOLT	1	1
	FIRING PIN DAMAGED	1	1
	CARRIER AND CARTRIDGE STOP BINDS	1	1
	BROKEN SAFETY	1	1
	INNER MAGAZINE TUBE FAILS TO CLOSE FULL MAG.	1	1
	BARREL BENT	1	1
		47	47
MODEL 721			
#	STOCK CRACKED AT GRIP	11	11
X	BOLT CLOSES HARD	3	3
	BOLT DAMAGED	1	1
	DEFECTIVE BOLT	4	4
O	FAILS TO EXTRACT	1	1
	BOLT HANDLE CRACKED	1	1
	FAULTY SAFETY	1	1
	TRIGGER BINDS	1	1
	MAGAZINE FOLLOWER BINDS	1	1
	MAGAZINE OUT OF ADJUSTMENT	1	1
		25	25
MODEL 722			
	SAFETY AND TRIGGER OUT OF ADJUSTMENT	1	1
		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

AL 0022490

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	5	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

RD-41 REV. 8-58

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:

A. Safety was placed in "mid" position, trigger was then pulled, and then the safety was released.

B. Safety was placed in "mid" position, trigger was pulled, safety was then placed on safe, and the safety was next released.

C. 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
	349
	+ 5
	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
	350

RECEIVED
MAR 31 1975
OFFICE - E. F. BARRETT

(continued)

PLAINTIFF'S EXHIBIT 3051

AL 0022637

cc: R.B. Hall
C.B. Workman
W.E. Leek

RD-49 REV. 3-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

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, Supervisor
Firearms Product Service

GWM:tpp

AL 0022638

DRAFT RBS:CK 4/3/75

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

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

ALESICH

returned the following weapon to
JOHN RALSTON Texas Killers
10-19-78
GUN COMPLT '75 Sandy

April 1, 1975

AIR MAIL

Mr. John Ralston
3026 Larknolls
Houston, Texas 77018

Dear Mr. Ralston:

Enclosed is pur 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 yournew 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. 50 329
CERTIFIED NO.
INSURED NO.

SIGNATURE OR NAME OF ADDRESSEE (Must always be filled in)
Lynn Ralston
SIGNATURE OF ADDRESSEE'S AGENT, IF ANY

DATE DELIVERED APR 3 - 1975

SHOW WHERE DELIVERED (Only if requested, and include ZIP Code)

PLAINTIFF'S EXHIBIT 3053

AL 0022672

1 of 13

Return Two Copies to
A. Reichmann

cc: Credit Department
Cashier - With che
H. L. Hendrix
(For your info)
file

Date March 17, 1975

AM-86493
E/D Ltd

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

QUANTITY	ORDER #	DESCRIPTION	SPECIAL PRICE
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.

J. H. Chisnall
Supervisor, Product Service

RECEIVED
MAR 16 1975
PRODUCT SERVICE

AL 0022673

2 of 13

ALEKSICH

Jack -

Attached is our check to John Ralston. Do you want to write a letter to accompany the check?

P

RECEIVED
75 MAR 17 PM 3:47
ORDER SALES

John Ralston
Gun Complet...

REMINGTON ARMS COMPANY, INC. BRIDGEPORT, CONN. 06602 M 85473

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-1341

"IF IT'S REMINGTON - IT'S RIGHT"

REMINGTON ARMS COMPANY, INC. M 85473 1-23/210

Remington
DUPONT

SPORTING FIREARMS · AMMUNITION · TRAPS · TARGETS

BRIDGEPORT, CONN. 03/25/75

PAY REMINGTON ARMS CO. INC. 63 AND 29 CTS $ 63.29

TO THE ORDER OF

MR. JOHN RALSTON
3026 LARKNOLLS
HOUSTON, TEXAS 77018

REMINGTON ARMS COMPANY, INC.

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) - 676- 3400
Houston, Texas

AL 0022676

5 of 13

ALEKSICH

AL 0022677

March 17, 1975

J. H. CHISNALL

XX

XXX 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

ALEKSICH

AL 0022678

7 of 13

ALEKSICH

AL 0022679

8 of 13

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 sight 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 gratefull for the co-operation shown me by you after I could get no co-operation from Carter's in Houston.

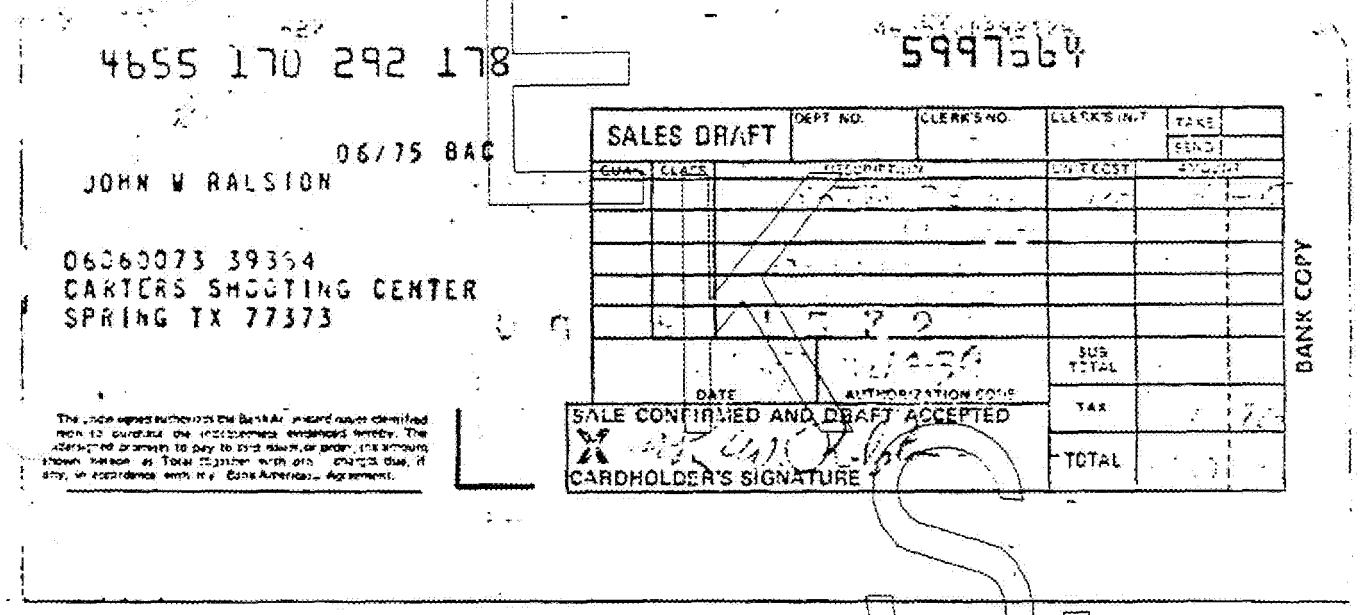
If anything else is needed, please contact me.

John W. Ralston

John W. Ralston
3026 Larknolls
Houston, Texas 77018
Area Code 713 686-3400

RECEIVED
FEB 18
PRODUCT SERVICE

AL 0022680



4655 170 292 178

5997564

06/75 BAC

JOHN W RALSION

06060073 39364
CARTERS SHOOTING CENTER
SPRING TX 77373

SALES DRAFT

DEPT NO.

CLERK'S NO.

CLERK'S INIT.

TAKE

SEND

QUAN.

CLASS

DESCRIPTION

UNIT COST

AMOUNT

SUB TOTAL

TAX

TOTAL

DATE

AUTHORIZATION CODE

SALE CONFIRMED AND DRAFT ACCEPTED

CARDHOLDER'S SIGNATURE

BANK COPY

ALESICH

Tailored Seat Covers
Automobile Upholstery
Furniture Upholstery
Auto Glass Installed
Convertible Tops

ESTIMATE

TEMPLE COVER CO.

816 EAST ADAMS — P. O. BOX 244
PHONE 778-8369
TEMPLE, TEXAS 76501

Nº 7073

Date [illegible] 19[illegible]

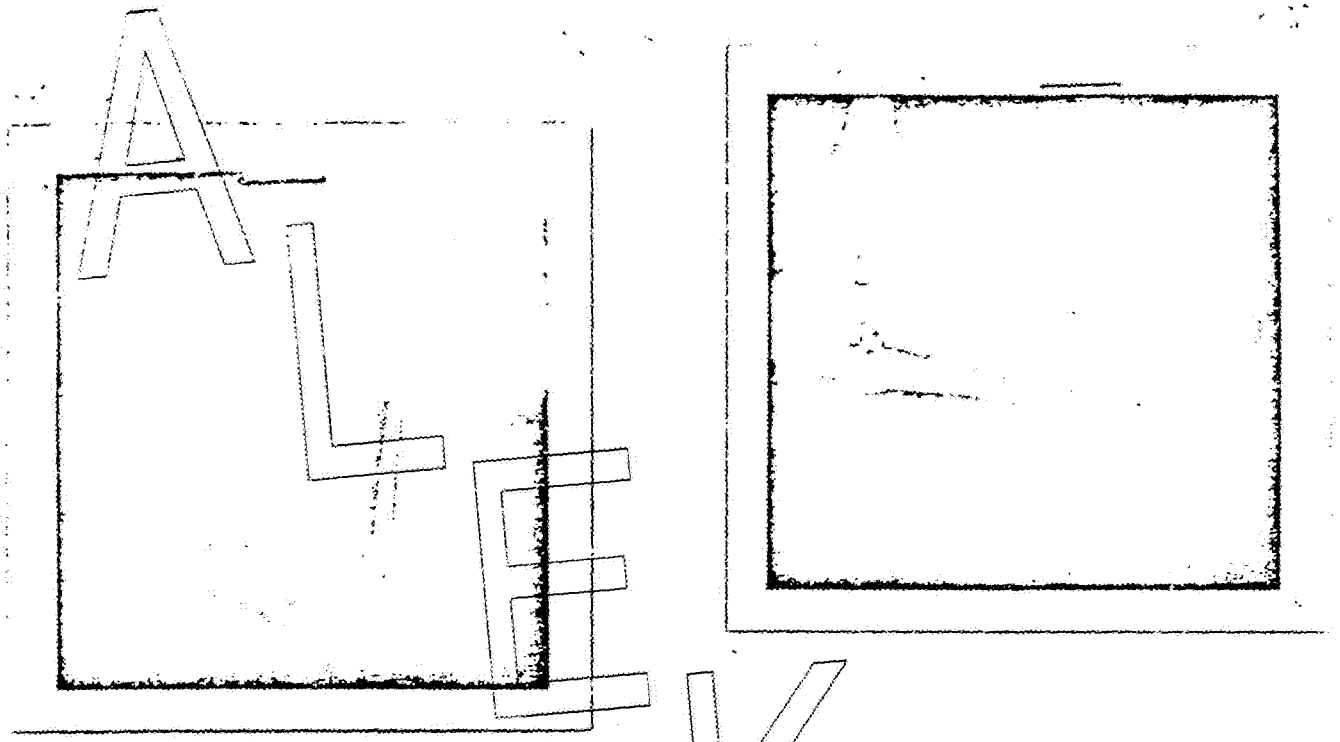
Name [illegible] Address

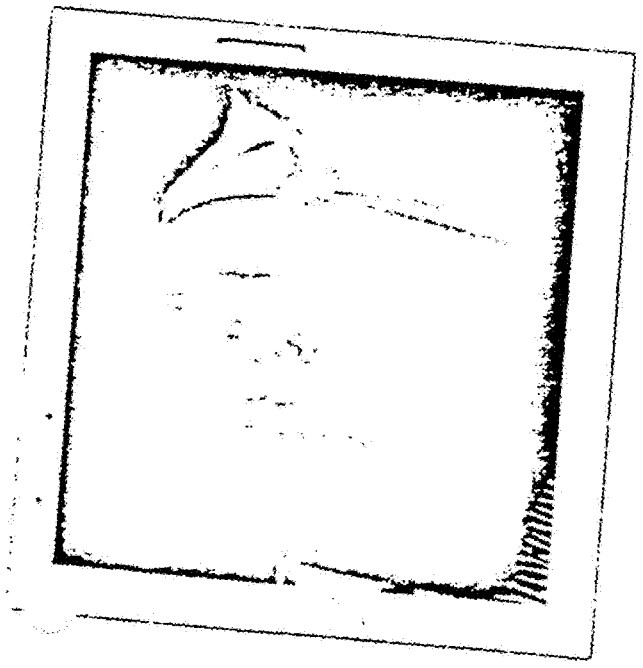
Car No. [illegible] Make [illegible] Model [illegible]

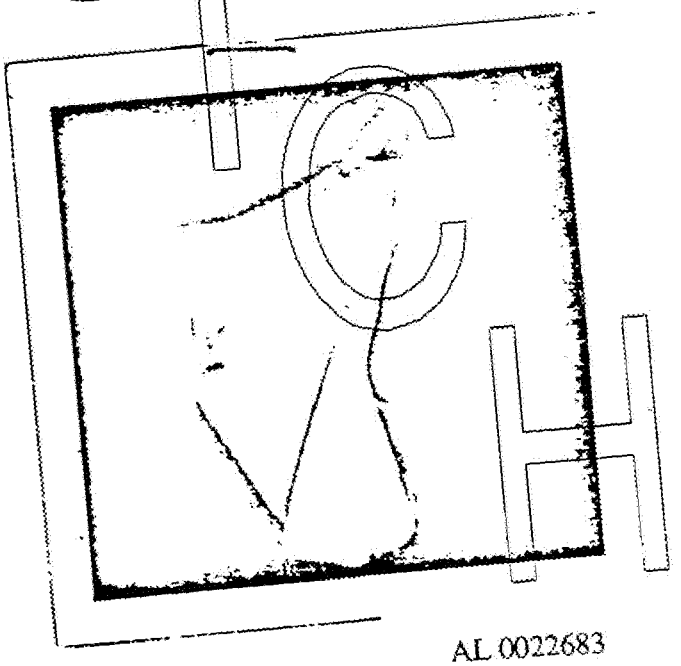
36	[illegible]	
48	[illegible]	
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	
	[illegible]	
	[illegible]	[illegible]
		[illegible]
	[illegible]	
	TOTAL	[illegible]

AL 0022682

11 of 13


ALEKS




TECH

Fred Lich.

Lotus Relation 2-4-75

Tex 25

w/ 600 - Find when Safety Relieved. Damaged seat, & Clock. Almost Killed Young.

Agreed to refer w/ w/ 700 - FOC. 25-06 + Car refused

RECEIVED
FEB 18 1975
PRODUCT SERVICE

Rik Commings

NOTIFIED
REC. 2-5-75

ALEXAS

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: E. J. Carrity
G. A. Quinn

October 23, 1978

TO: E. S. McCAWLEY

FROM: R. A. BALDWIN

SUBJECT: MODEL 600/660 RECALL AD

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.

RAB/ecc

PLAINTIFF'S EXHIBIT 3054

AL 0022686

1 of 1

RD-42 REV. 6-58

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

cc: R. B. Sperling
R. G. Sherman

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

1 of 1

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

1 of 1

REMINGTON ARMS COMPANY, INC.
Bridgeport, Connecticut

c: E.B. Beattie
A.W. Bell
H.K. Boyle
E.G. Larson
N.S. Olenik
J.E. Preiser
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

1 of 3

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.

ALEKSICH

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/500 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:tpp
attch.

RECEIVED
FEB 5 1980
E. G. LARSON

80 779 STOP, LOOK, AND LIVE

A SKETCH

PLAINTIFF'S EXHIBIT 3058

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Simmons Hdwe.
(Geo. McCarthy)

Ilion, New York
January 17, 1980

TO: ~~J. H. GHISNALL~~ J. A. STEKL
BRIDGEPORT, CONN.

FROM: D. J. SANITA

RECEIVED
FEB - 1 1980
J.A. STEKL

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

Supervisor, Arms Service Division

attach.

RECEIVED
JAN 16 1980
PRODUCT SERVICE
BRIDGEPORT

PLAINTIFF'S EXHIBIT 3059

AL 0022715

1 of 4

7-6542-1 Rev. 2-15-61

P.I. MFS GUN EXAMINATION REPORT NUMBER: 185 MODEL: 600

GENERAL CONDITION: FAIR R #: 3467

OUTSIDE WORK: REC'D O.D + SLING STRAP DATE: 11-29-79

STUDS ADDED - Stock refinished on side FROM: SIMMS MFG WAREH

FIRED AMMO TYPE: NOT KNOWN Remington 2801-S-97 SACRAMENTO

& CONDITION: GUN #: 73633

PROOF: REP INSP.: M TEST: 114 CODE: BP 1-67

HEADING: OK GA./CAL.: 30C

BREECH OPENING: OK CHECKED BY: M-H + PW

RECOIL SHOULDERS: OK APPROVED: GHH 12/21/79

CHAMBER: OK APPROVED: [illegible]

TEST: APPROVED: R.J.B. 12-21-79

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: [illegible] 12/21/79 WALDO 12-21-79 [illegible]

BRIGHT METAL CH REC. & BBL. BOLT MOVES FREELY

RE FINISHED TRIGGER & GUARD AND ALL

4½ LB TRIG PULL

COMPLAINT: FIRED WHEN UNLOADING

INCIDENT:

COMMENTS: Passed Trick test. Trigger Pull 4½ #

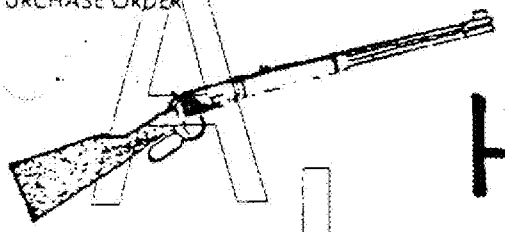
Gun involved in recall program.

AL 0022716

Replace fire control. Under recall program

2 of 4

PURCHASE ORDER



SIMMS HARDWARE CO.

RT: 2553
2244

2801 J STREET
(916) 442-3894
SACRAMENTO, CALIF. 95816

TO Rem. Arms Attn: James Stekl DATE 11-19 19 79

ADDRESS Service Dept WHEN SHIP ASAP

CITY Ilion New York 13357 HOW SHIP B/U

	QUANTITY	PLEASE SUPPLY ITEMS LISTED BELOW	PRICE	UNIT
1		Subject 600 308 Win.		
2		S/N # 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 an		
11		A Recall I checked The S/N and told		
12		Him it was. We 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 ~~fell~~ went off The		
16		bullet went Through a Laundry Room		
17		Causing about $250.00 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

AE 0022717

PURCHASING AGENT

PLEASE PUT PURCHASE ORDER NUMBER ON ALL PACKAGES

MOORE BUSINESS FORMS, INC.

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. 4½ LB TRIG PULL, TRIG CLEAR OF TRIG GUARD WHEN RECEIVED.
RIFLE APEARS TO BE UP TO RFM SPEC.
OLD STYLE FIRE CONTROL
NO. PI MARKED ON [illegible] LETTER STATES THAT IT IS.

Marshall Hinds

SAFETY IS A WISE INVESTMENT

AL 002718

4 of 4

D-41-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

Snapping Necessities
Michael Harris

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

RECEIVED
FEB - 1 1980

Ilion, New York
January 17, 1980

TO: J. A. STEKL
~~J. H. GHISNALL~~
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

Kalispell, Mont.
Nov. 3, 1979.

Remington Arms Co.

Dear Sirs:

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 Harvey
3005 Foot Hills Rd.
Kalispell, Mont. 59901

AL 0022720

SPEED MESSAGE

TO REMINGTON ARMS COMPANY
Arms Service Division
Ilion
New York 13357

Attn: Jim Stekl

FROM Snappy ServiSenter
1400 HIWAY 2 EAST — PHONE 406-257-7525
KALISPELL, MONTANA 59901

SUBJECT Warranty Repair of Remington Model 600, serial # 71789

DATE November 19, 19 79

Dear Mr. Stekl:

Please find enclosed subject ~~firearm~~ which I am returning for my customer, Mr. Michael [redacted] 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 accidently 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

Copy Line "SNAP-A-WAY" FORM 43-986 3-PARTS
WILSON JONES COMPANY © 1961 PRINTED IN U.S.A. 1074

RO-6542-1 Rev. 2-15-61

P.I. YES GUN EXAMINATION REPORT NUMBER: 135 MODEL: 600

GENERAL CONDITION: POOR R # : 3124

OUTSIDE WORK: SCOPE SCREW + REAR SIGHT DATE: 11-29-79

REMOVED FROM: 1400 HWY 2 EAST KALISPELL MONT. 59901

FIRED AMMO TYPE: HOT KNOW

& CONDITION: GUN # : 71789

PROOF: REP INSP.: N TEST: 32 CODE: OK=9-63 RN3=11-66

HEADING: OK GA./CAL.: 243

BREECH OPENING: OK CHECKED BY: M-HARDY

RECOIL SHOULDERS: OK APPROVED: JOH 12/21/79

CHAMBER: DIRTY APPROVED: LLS 12/21/79

TEST: APPROVED: C.F.B. 12-21-79

COMPONENT CONDITION: (Damaged, Broken, Old Style) APPROVED: RLG 12-21-79 12/21/79 12/21/79 12-21-79

STOCK BEAT UP BRIGHT METAL ON BBL

BOLT RUSTY RIFLE DIRTY CHAMBER RUSTY

COMPLAINT: DISCHARGED ACCIDENTALLY IN PROCESS OF UNLOADING - "When bolt open & shell coming" per customer

INCIDENT:

COMMENTS: Gun passed trick 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

- 4 of 4

LES FREER GUN SHOP

SERVICE REPRESENTATIVE FOR LEADING MANUFACTURERS

FIELD SERVICE

JUN 17 1979

July 12, 1979

Remington Arms Co.
Att: R. 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 compaints 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 maodel rifle. These reasons are what we have tried to analyze.

The models invloved (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 simultaniously 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

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 geat 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. Puting in (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

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 c f 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 022747

1 of 1

ALEKSIC

Remington
DUPONT

REMINGTON ARMS COMPANY, INC.
SPORTING ARMS · AMMUNITION · TARGETS · TRAPS
BRIDGEPORT, CONNECTICUT 06602

February 8, 1979

RECEIVED
FEB 9 1979
R. B. SPERLING

TO OUR FIREARMS DISTRIBUTORS

SUBJECT: BULLETIN - RIFLE RECALL

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

E. J. Conroy
Director of Sales

EJC/ecc
Attachments

PLAINTIFF'S EXHIBIT
3063

H

AL 0022748

1 of 3

Remington
DUPONT

REMINGTON ARMS COMPANY, INC.

TELEX 964-201 STRATFORD 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

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

Remington

REMINGTON ARMS COMPANY, INC.

MANUFACTURERS OF
SPORTING FIREARMS. AMMUNITION

SPORTING FIREARMS, TRAPS, ILION, NEW YORK
AMMUNITION, BRIDGEPORT, CONNECTICUT
LONOKE, ARKANSAS
CABLE—HARTLEY, BRIDGEPORT
TELEX: 964-201 STRATFORD, CONN.

TRAPS TARGETS

BRIDGEPORT, CONNECTICUT 06602

PETERS CARTRIDGE DIVISION
BRIDGEPORT, CONNECTICUT
TARGETS, FINDLAY, OHIO
ADA, OKLAHOMA
ATHENS, GEORGIA

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

RECEIVED
DEC 15 1978
PHILIP H BURDETT

PLAINTIFF'S EXHIBIT
3064

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/ls
Enclosure
cc: P.H. Burdett

EXHIBIT



The MOOSE — Monarch of Mountain and Water

Orig.-J.Chisnall--To handle J.G.Williams
cc P.H.Burdett
J.P.McAndrews
R.A.Partnoy

November 13th 1978

Remington Arms Company Inc.
Office of the President
Bridgeport, Conn 06602

RECEIVED
NOV 16 1978
PHILIP H BURDETT

RECEIVED
NOV 17 1978
PRODUCT SERVICE
BRIDGEPORT

Mr President.

I own one of the 660 Remington Rifles which are being recalled. I called the watts line number that you have sent 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 is 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 as 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 as these magnetic tapes can fall into the wrong hands. What safeguards does Remington have against the misuse of these computer tapes? For all we know the terminal may be hooked up to the BATF.

I know this sounds like a paranoid gun "freak", 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 Remington 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 repaired or send me one to replace mine. I will send you a sworn, witnessed statement that my rifle is in the recall range if you require proof. Thank you for your time.

I remain

Very truly yours

Charles W. Murray

312 S. Colo

Gunnison, Colo 81230

P.S. Maybe this could be handled through the N.R.A.

AL 0022763

REMINGTON ARMS COMPANY, INC.
Ilion Research Division

May 19, 1964

cc: R. A. Williamson
H. J. Hackman
L. J. Boyle
M. [illegible]er
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.

S. M. Alvis
Ilion Research Division

SMA:T

PLAINTIFF'S EXHIBIT 3065

AL 0022785

1 of 1

MODEL 700 CUSTOMER GUNS RETURNED
BY COMPLAINT-MONTH RECEIVED AND YEARLY TOTAL

	1962 Tot.	1963 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot
Total Guns Returned:	355	81	86											
Total Complaints:	397	83	89											
Total Functional Complaints	130	29	28											
Ejection	6	1	1											
Firing	8	1												
Extraction	10	1	7											
Feeding	31	4	4											
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 Stock in Bolt	6	1	1											
Jams, Repair Etc.	3	2												
Up to Standard (Functional)	4	4	2											
Total Intermediate Complaints	206	47	48											
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-Tiped 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											
isc. Visual Complaints	52	7	11											
Misc. Non-Functional	8													
p to Standard (Non Functional)	1		2											

PLAINTIFF'S EXHIBIT 3066

Model 700 Total Complaints (except up to Std.)

Month Produced	Month Returned 1962											1963										
	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October
No. Code			1				2	2	3			2	3									
1961																						
1961 January									1	2	1	1										
1961 February																						
1962 March			2	4		2	2		5	2	1		3									
1962 April			2	2	6	4	11	7	14	6	3	5	4									
1962 May					6	8	5	10	17	6	6	7	3									
1962 June						12	13	15	20	14	8	6	10									
1962 July							10	10	12	12	7	7	4									
1962 August								2	6	17	11	5	8									
1962 September									8	17	12	11	13									
1962 October									3	7	16	18	17									
1962 November											2	8	4									
1962 December											1	3	9									
1963 January																						
1963 February																						
1963 March																						
1963 April																						
1963 May																						
1963 June																						
1963 July																						
1963 August																						
1963 September																						
1963 October																						
1963 November																						
1963 December																						

KEUFFEL & ESSER CO. 339-11G 10 X 10 TO THE INCH

Model 700 - Functional

Month Purchased	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
No Code						2	1	2		1	1													
1962																								
Jan.						-																		
Feb.																								
Mar.						2			2	1			1											
Apr.				1	1	2	3	2	2	1	1	2												
May					4	4	3	4	10	2	5	3	1											
June						2	1	3	5	4	3		4											
July							4	3	5	3	1	4	2											
Aug.								2	2	5	5	1	2											
Sept.									2	8	4	4	6											
Oct.										1	2	3	6	5										
Nov.												1	2											
Dec.												1	1	2										
1963																								
Jan.																								
Feb.																	1							
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

359-11G

Model 700 Feeding 222-222 M. Cal.

Month Produced	Month Returned																							
	1962												1963											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Old Code																								
1961																								
1962 Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
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1963 Jan.																								
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Apr.																								
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June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

359-11G
10 X 10 TO THE ½ INCH
KEUFFEL & ESSER CO.

Model 700 - Feeding 7mm-264 Cal.

Month Produced	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	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No. Made																																			
1961																																			
1962 Jan.					3	1																													
Feb.						1																													
Mar.																																			
Apr.																																			
May																																			
June																																			
July																																			
Aug.																																			
Sept.																																			
Oct.																																			
Nov.																																			
Dec.																																			
1963 Jan.																																			
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May																																			
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July																																			
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Sept.																																			
Oct.																																			
Nov.																																			
Dec.																																			

KEUFFEL & ESSER CO. 359-11G 10 X 10 TO THE ½ INCH

Model 700 Feeding All Others

Month Produced 1962 — Month Returned 1963

	J a n	F e b	M a r	A p r	M a y	J u n e	J u l y	A u g	S e p t	O c t	N o v	D e c	J a n	F e b	M a r	A p r	M a y	J u n e	J u l y	A u g	S e p t	O c t	N o v	D e c
No Code																								
1961																								
Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
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1962																								
Jan.																								
Feb.																								
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May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								
1963																								

10 X 10 TO THE INCH 359-11G KEUFFEL & ESSER CO.

Model 700 Ejector Binds or Stuck in the Bolt

Month Produced	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
No Code													1											
1961																								
Jan.																								
Feb.																								
Mar.								1																
Apr.																								
May							1	1					F											
June																								
July																								
Aug.									1															
Sept.									1				1											
Oct.																								
Nov.																								
Dec.																								
1963 Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
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Oct.																								
Nov.																								
Dec.																								

10 X 10 TO THE ½ INCH 359-11G
KEUFFEL & ESSER CO.

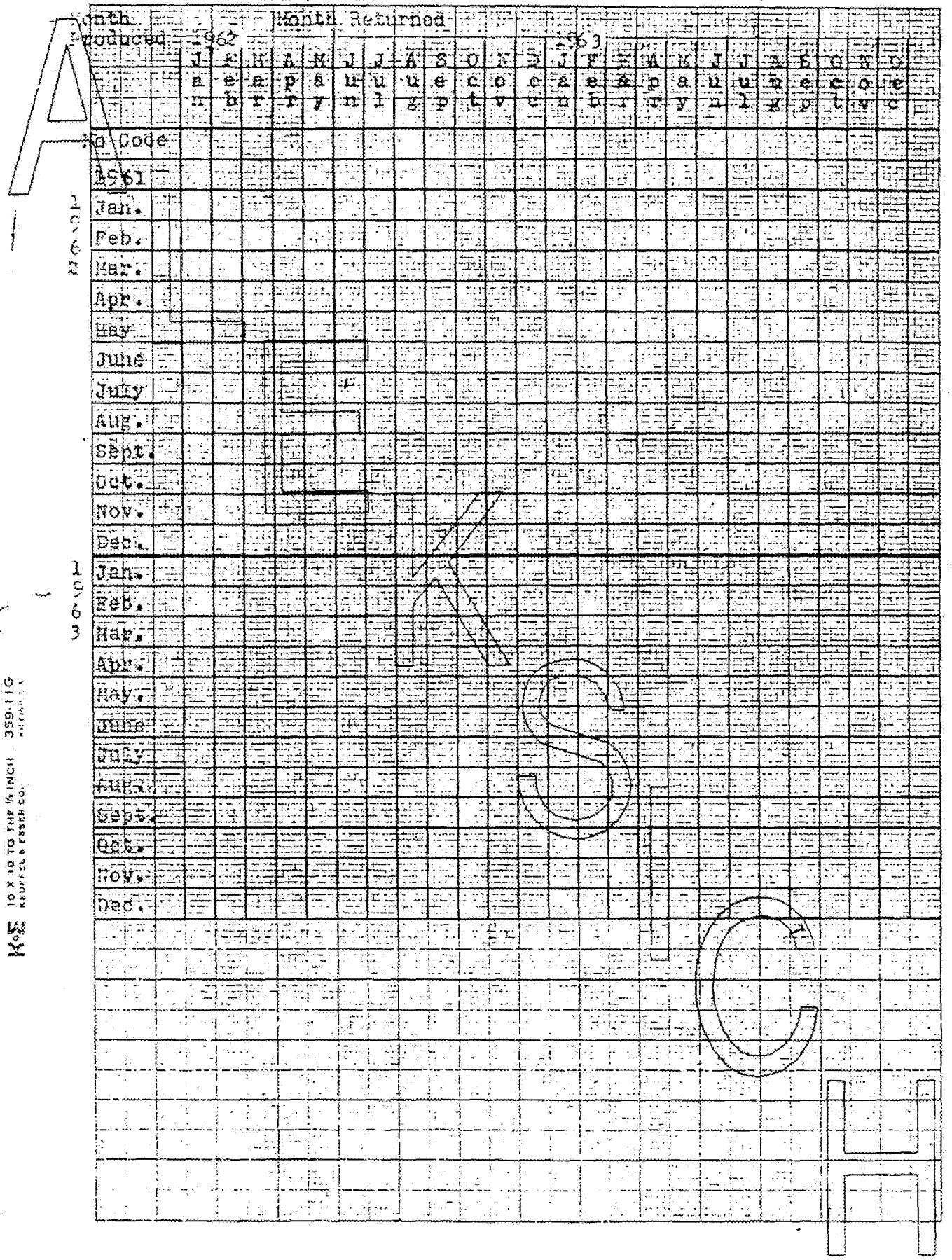
AL 0022793

Model 700 Stock Broken Stock Finish & Checkering

Month Produced	Month 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
No Code																							
1961																							
1962 Jan.									1	1		1											
Feb.													1										
Mar.						1																	
Apr.					2	2	1	2	1	2	1	3	1										
May						2	2	1	2	1	1	2	3										
June							3	5	4	4	2	1	1										
July								4	1	3	2	1	1										
Aug.								1	3	2	1	3	2										
Sept.									2	2	2	2	3										
Oct.									1	1	2	2	4										
Nov.											1	1	1										
Dec.													1										
1963 Jan.																							
Feb.																							
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Dec.																							

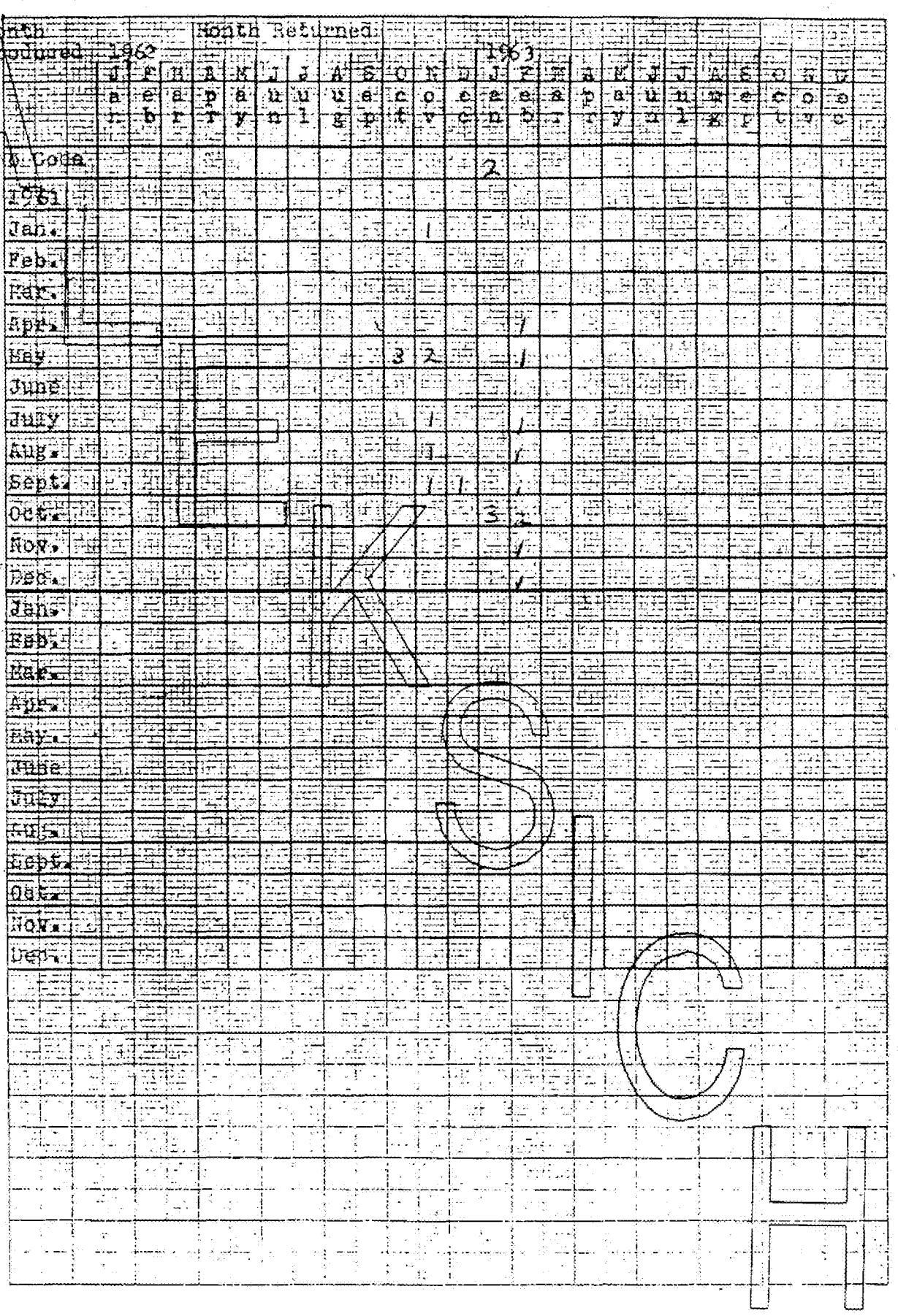
KEUFFEL & ESSER CO. 359-11G 10 X 10 TO THE ½ INCH

Model 700 Stock Cracked at Barrel Groove



AL 0022795

MODEL 700 - BROKEN STEEL PARTS



K&E 10 X 10 TO THE INCH 359-11G KEUFFEL & ESSER CO.

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
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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-Tiped 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												
otal Visual Etc.-Complaints	61	7												
Misc. Visual Complaints	52	7												
Misc. Non-Functional	8													
Up to Standard (Non-Functional)	1													

Model 700 Total Complaints (except up to Std.)

Month Produced	Month Returned: 1962 Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	1963 Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
No Date			1			2	2	3		2	3													
1961																								
1961 Jan.								1	2	1	1													
Feb.																								
1962 Mar.			2	4		2	2		5	2	1													
Apr.			2	2	6	4	11	7	11	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	12	11	5												
Sept.									8	17	12	11												
Oct.									3	7	16	18												
Nov.											2	8												
Dec.											1	3												
1963 Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

K&E 10 X 10 TO THE INCH 359-11G KEUFFEL & ESSER CO.

Model 700 - Functional

Month Produced	Month Returned	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1962	Jan.												
	Feb.												
	Mar.						2			1			
	Apr.				1	1		2	3	2	2	1	1
	May					4	4	3	4	10	2	5	3
	June						2	1	3	5	4	3	
	July							4	3	5	3	1	4
	Aug.								2	2	5	5	1
	Sept.									2	8	4	4
	Oct.									1	2	3	6
	Nov.											1	2
	Dec.											1	1
1963	Jan.												
	Feb.												
	Mar.												
	Apr.												
	May.												
	June												
	July												
	Aug.												
	Sept.												
	Oct.												
	Nov.												
	Dec.												

359-110
10 X 10 TO THE ½ INCH
KEUFFEL & ESSER CO.

Model 700 Feeding 222-222 M. Cal.

Month Produced	Month Returned																							
	1962												1963											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
D Code																								
1961																								
Jan.																								
Feb.																								
Mar.																								
Apr.																								
May																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								
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Apr.																								
May.																								
June																								
July																								
Aug.																								
Sept.																								
Oct.																								
Nov.																								
Dec.																								

1962

1963

AL 0022800

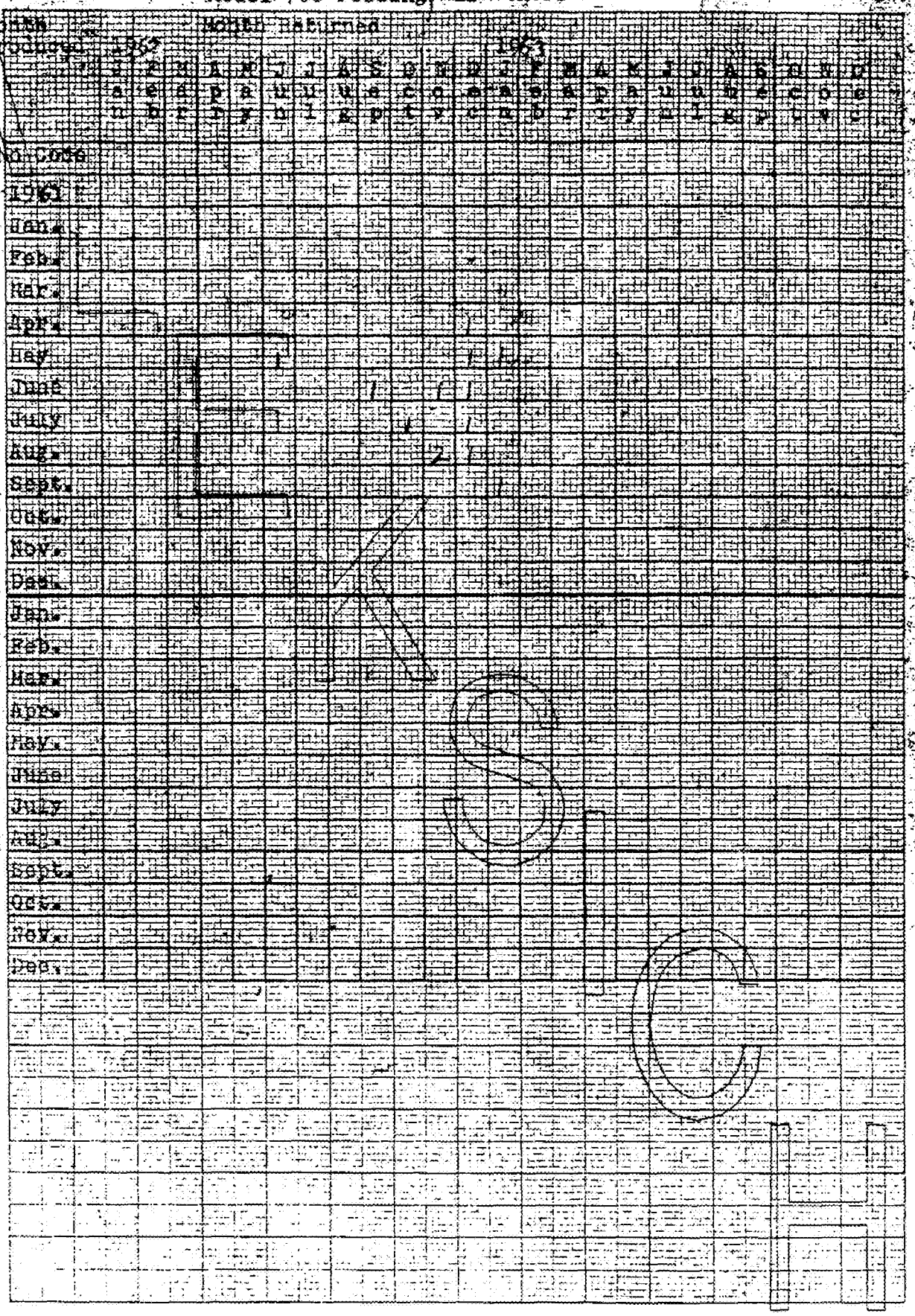
14 of 19

Model 700 - Feeding 7mm-264 Cal.

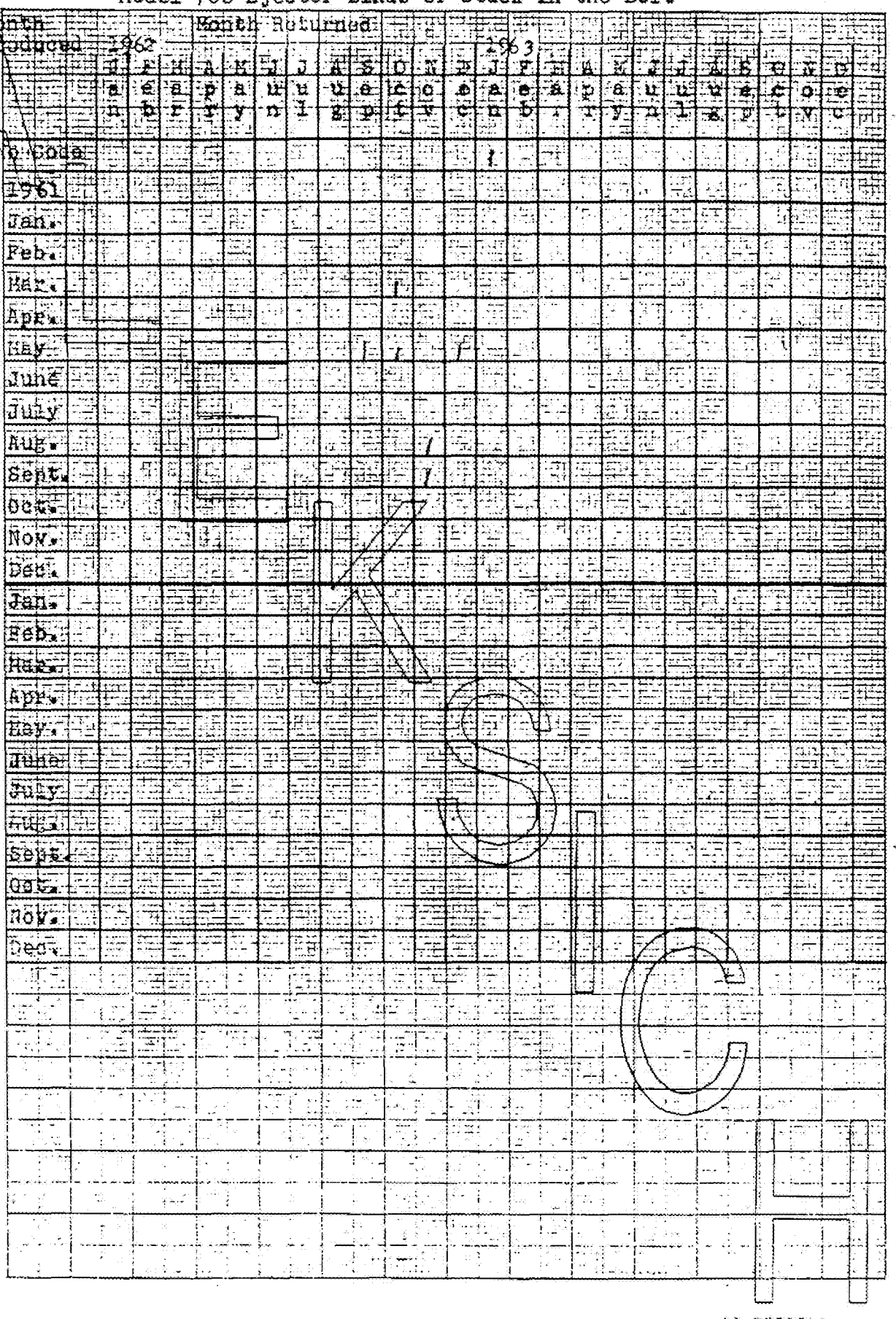
Month Produced — 1962	Month Returned — 1963																					
	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
No Code																								
1961																								
1962 Jan.																								
Feb.																								
Mar.																								
Apr.																								
May					3		1					1												
June				1				1																
July												1	1											
Aug.										1		1												
Sept.											2	1	1											
Oct.											1													
Nov.																								
Dec.																								
1963 Jan.																								
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Nov.																								
Dec.																								

KE 10 X 10 TO THE ½ INCH 339-11G KEUFFEL & ESSER CO.

Model 700 Feeding/All Others

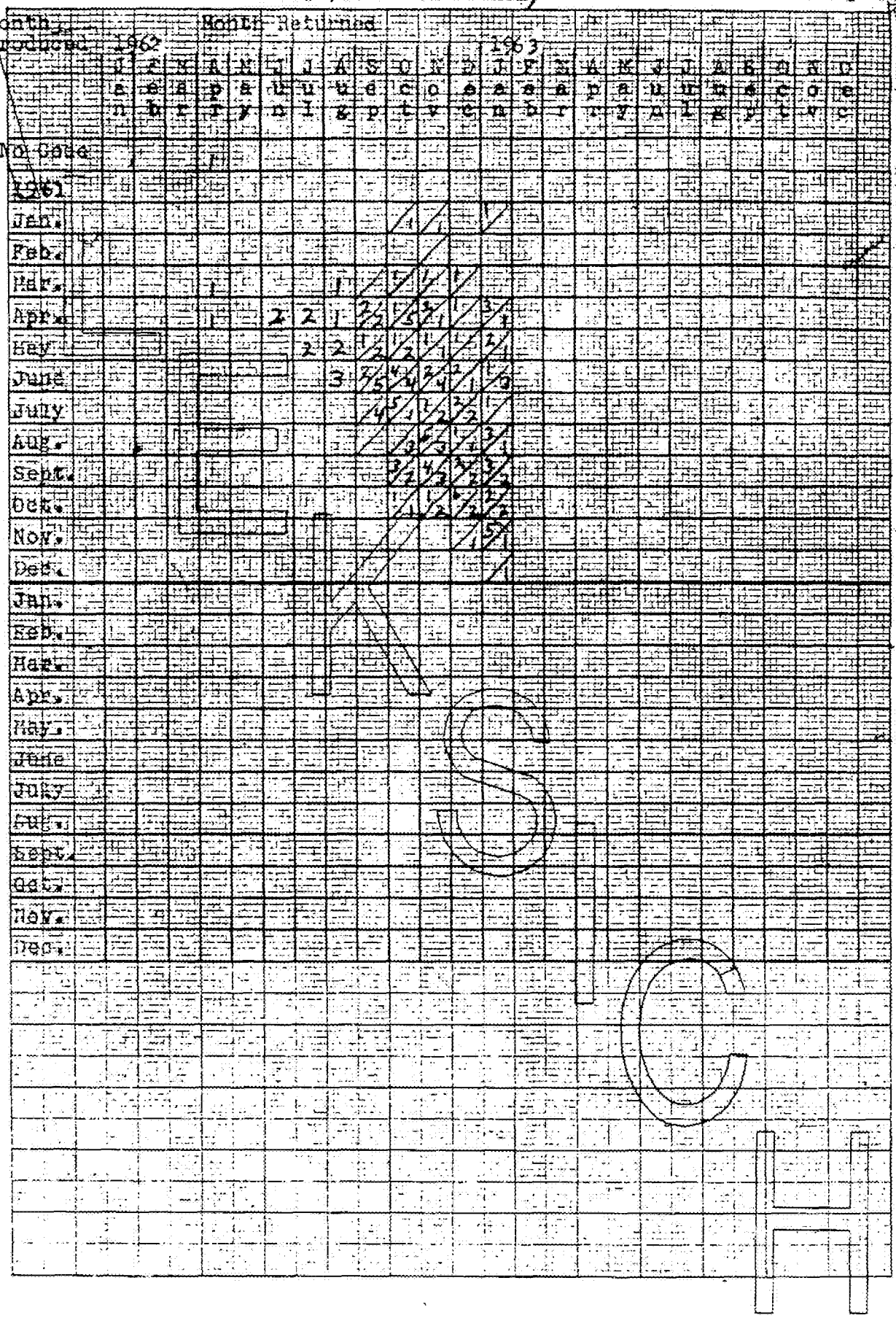


Model 700 Ejector Binds or Stuck in the Bolt



AL 0022803

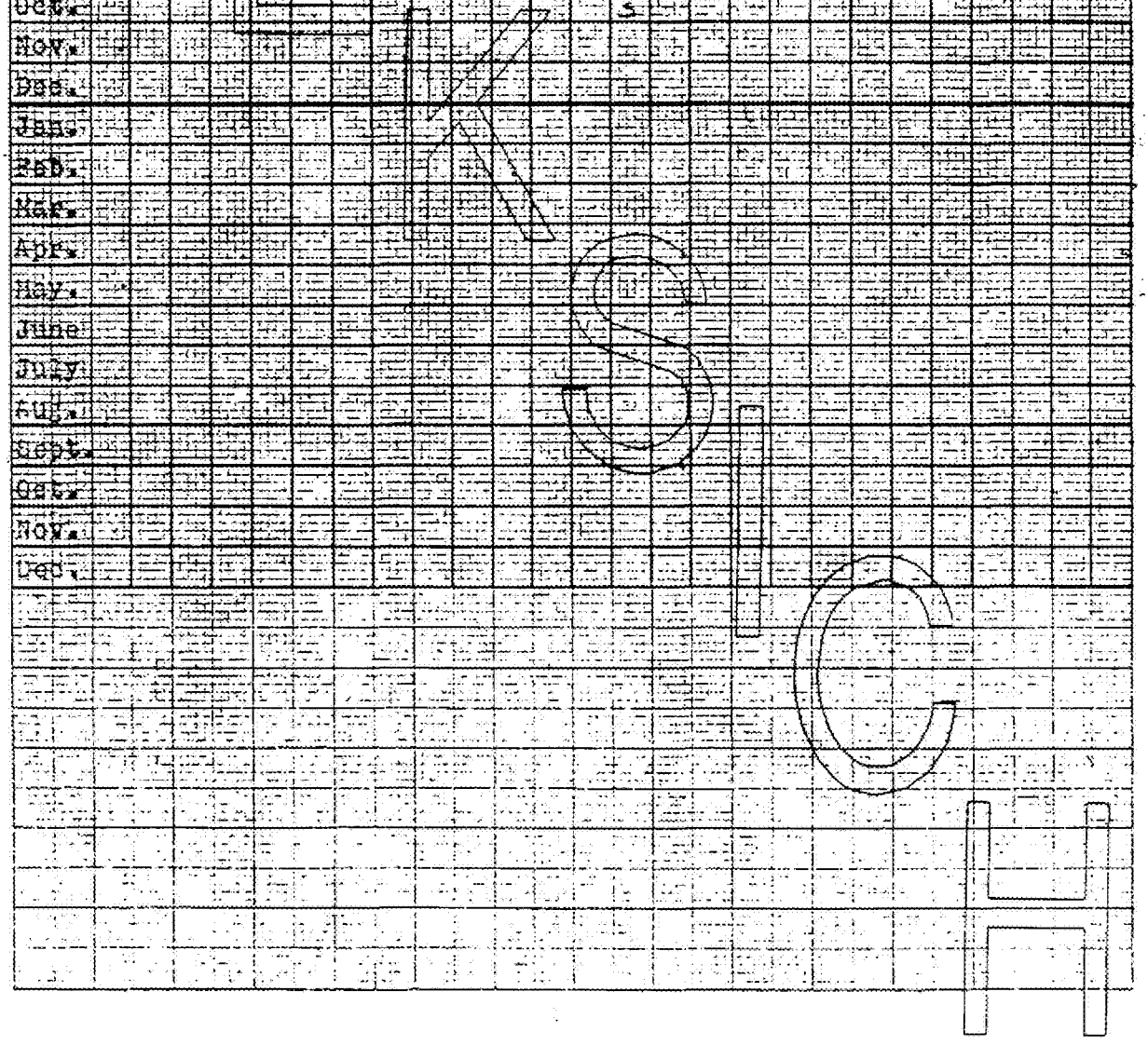
Model 700 Stock Broken Stock Finish & Checkering



AL 0022804

MODEL 700 - BROKEN STEEL PARTS

Month Produced: 1962	Month 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
No. Code													2										
1961																							
1962 Jan.										1													
Feb.																							
Mar.																							
Apr.																							
May									3	2													
June																							
July										1													
Aug.										1													
Sept.										1	1												
Oct.													3										
Nov.																							
Dec.																							
1963 Jan.																							
Feb.																							
Mar.																							
Apr.																							
May																							
June																							
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Aug.																							
Sept.																							
Oct.																							
Nov.																							
Dec.																							



359-11d
10 X 10 TO THE INCH
KEUFFEL & ESSER CO.

AL 0022805

COPIES TO:

C.K. DAVIS	H.K. FAULKNER
D.E. CARPENTER	W.H. DAVIS
W.O. REISINGER	H.A. BROWN
B.E.STRADER	R.H. GRACE
F.K. CRAIG	H.J. HACKMAN (6)
G.O. CLIFFORD	D.S. FOOTE
M.R. WARDEN	D.E. MILLER
G.E. PINCKNEY	S.W. ROSE
A.L. FRENCH	R.A. WILLIAMSON
W.L. CLAY	A.J. BROWN
W.F.H. MATTLAGE BRIDGEPORT.	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

SHEET NO. 1

AL 0022492

PLAINTIFF'S EXHIBIT 3067

1 of 5

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
		6	7
SPORTSMAN - 12 GA.			
	MAIN SPRING BROKEN	1	1
O	TRIGGER BINDS	1	1
	FORE-END SPLIT	1	1
O	FAILS TO EJECT	1	1
		4	4
SPORTSMAN - 16 GA.			
O	TRIGGER BINDS		1
			1
MODEL 11 - 12 GA.			
O	SHELLS STEM CHAMBER	1	2
O	FAILS TO EJECT		1
		1	3
MODEL 11 - 20 GA.			
O	SHELLS STEM CHAMBER		1
X	FRONT SIGHT BASE OUT OF POSITION	1	1
		1	2
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
		2	6
MODEL 141			
O	SHELLS STEM CHAMBER	1	1
	CARTRIDGE STOP BROKEN	2	2
X	FIRING PIN HOLE OUT OF POSITION	2	2
		5	5

AL 0022493

		PRODUCED WITHIN ONE YEAR	TOTAL
MODEL 241			
O	FAILS TO DISCONNECT	1	1
X	POOR NOTCH ON FIRING PIN	2	2
O	FAILS TO EJECT	2	2
X	SIGHTS OUT OF LINE	1	1
X	NOT ACCURATE (MUZZLE UPSET)	1	1
O	CARTRIDGE STOP OUT OF ADJUSTMENT	1	1
X	POOR BLUEING	1	1
X	JAMS (POOR CLAW ON EXTRACTOR)	1	1
O	SHELLS STEM CHAMBER	1	1
	DEFECTIVE BARREL	1	1
O	DISCONNECTOR DAMAGED	1	1
O	FAILS TO COCK	2	2
	RECEIVER CRACKED	1	1
		16	16
MODEL 31 -12 GA.			
	DEFECTIVE BARREL		1
			1
MODEL 510			
O	FAILS TO EXTRACT	1	1
	TAKE DOWN SCREW THREADS BAD IN RECEIVER	1	1
		2	2
MODEL 512			
O	CARTRIDGE RETAINER OUT OF ADJUSTMENT	1	1
O	FAILS TO EJECT	1	1
#	BOLT PULLS OUT	3	3
N	NOT ACCURATE (SIGHTS OUT OF LINE)	1	1
		6	6
MODEL 513			
X	KEY HOLES (POOR RIFLEING)	6	6
		6	6
MODEL 514			
X	DEFECTIVE BOLT	1	1
	BOLT HANDLE BROKEN	1	1
		2	2
MODEL 521			
X	BOLT HANDLE LOOSE	1	1
		1	1

AL 0022494

		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
		16	16
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
		15	15
MODEL 722			
	BOLT HANDLE CRACKED	1	1
	BOLT CRACKED	1	1
X	BARREL LOOSE IN RECEIVER	1	1
		3	3

- CORRECTED IN RECENT PRODUCTION
X - OVERSIGHT IN INSPECTION
O - CLOSE ADJUSTMENT NOT SHOWING UP IN FACTORY TEST RESULTING IN MALFUNCTION THROUGH USABE
N - NOT COVERED BY INSPECTION

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

EXHIBIT

AL 0022496

cc: G.M. Calhoun
M.R. Walker
L. Fox

Ilion, New York
April 18, 1968

W. E. LEEK

MODEL 700 BDL 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 Presnell 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 inletter 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 0022806

1 of 2

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.

S. M. Alvis
Ilion Research Division

SMA:T

AL 022807

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

1 of 1

CC: B. M. Alvis
M H. Walker
V. G DeRous
E R. Carr
E 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 8, 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.
R & C Section

LF:I

PLAINTIFF'S EXHIBIT 3070

AL 0022811

1 of 1

cc: J. E. Dickey
F. E. Morgan
H. D. Albaugh
M. G. 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

PLAINTIFF'S EXHIBIT 3071

J. G. WILLIAMS March 11, 1968

Re: Visit Report - Consumers' Union - Model 700 BDL 22/250

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.

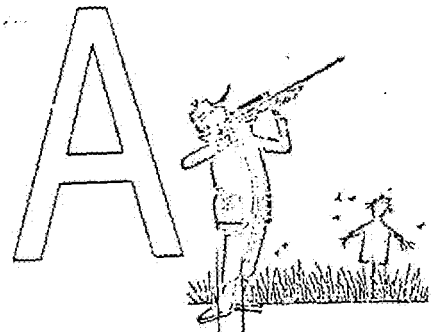
It was agreed, however, that when this rifle was sold to an employee, it would be returned to the writer for repair prior to useage.

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 022813



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 varminter to shoot in their fields.

But while an old .30-30 may still bring home the venison, the varminter 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 anyman'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 tested rifle, the popular *Winchester 70*, was not available in either caliber 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 *Tradewinds*, 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 CU 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 varminter must have. A pull of four or five pounds is about right. A heavier pull may cost you in steadiness; a lighter pull risks accidental discharge.

PLAINTIFF'S EXHIBIT 3072

AL 0022816

1 of 4

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 MOA criterion, at least with hand-loaded ammunition.

The sixth-ranked rifle, the *Remington 700*, exhibited a potentially dangerous flaw as 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.

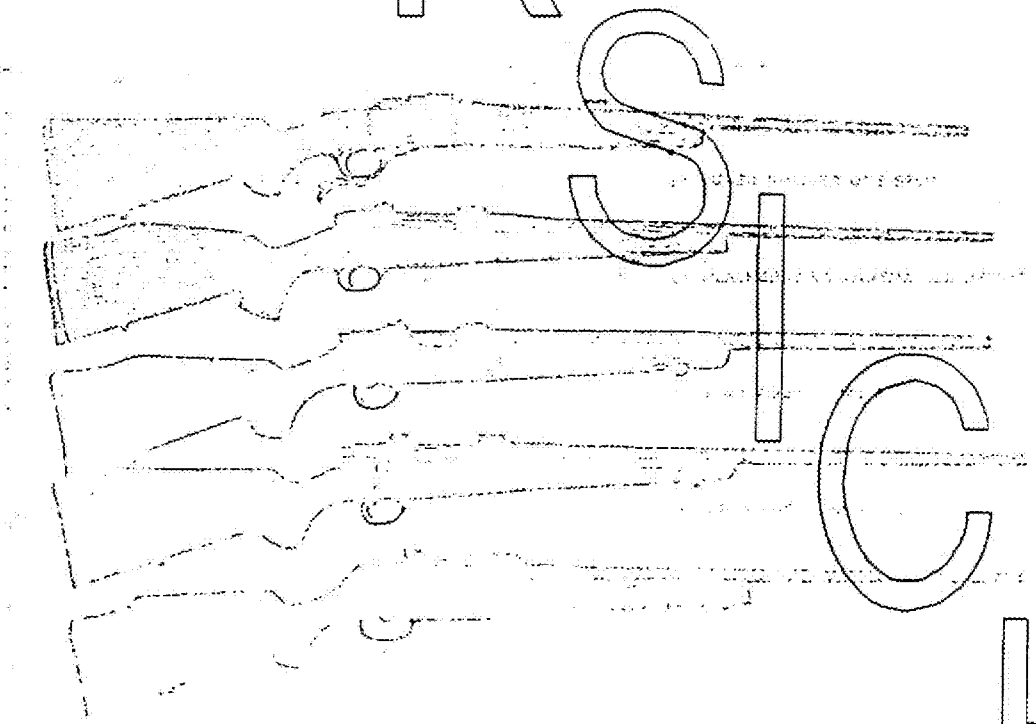
Although we judged the deficiency more a sample defect than a design shortcoming, we nevertheless downrated the *Remington 700* because of it. We would warn anyone buying a rifle to test the safety in the store. If the trigger can be moved with the safety on, make sure it returns to its full forward 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 varminter 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 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.



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

Choosing your varminter

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 788*, listed at $84.95, or the *Savage 110C*, at $127.50, would be good buys.

CHARACTERISTICS AND SPECIFICATIONS OF VARMINT RIFLES

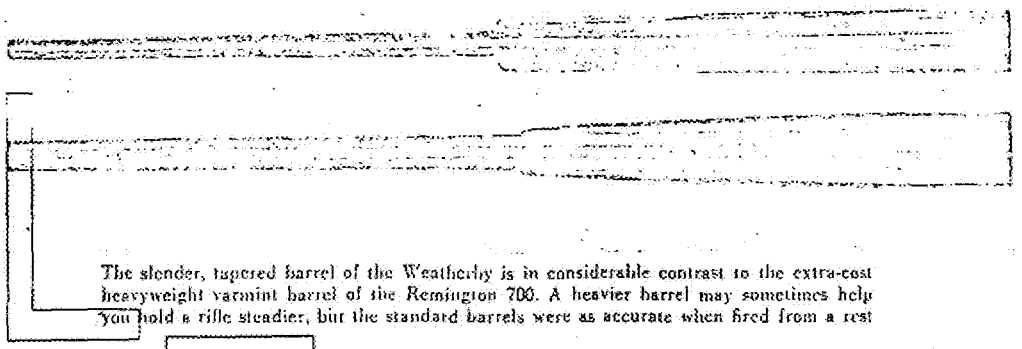
KEY: E, Excellent; VG, Very Good; G, Good; F, Fair

	Mechanical operation	Trigger pull	Finish and workmanship	Weight (nearest ¼ lb.)	Magazine capacity [2]
ACCEPTABLE—Very Good					
✓ RUGER NUMBER ONE S26M	VG	VG	E	8	—
✓ WEATHERBY VARMINTMASTER DELUXE	VG	VG	E	6¼	3
✓ SAKO VIXEN B 141 F	VG	VG	VG	7¼	5
✓ BROWNING SAFARI 160703	VG	VG	VG	7	5
✓ TRADEWINDS 607K	VG	VG	G-to-VG	6½	3
ACCEPTABLE—Good					
REMINGTON 700 BDL #5920	G-to-VG	VG	G	8¾	4
BSA MONARCH DELUXE	VG	G	G-to-VG	7	5
WINCHESTER 70 VARMINT	G	VG	F-to-G	9	5
SAVAGE 110 C	G	G	F-to-G	8½	4
H & R 300 ULTRA	F	VG	G-to-VG	7¼	5
REMINGTON 788, #9736	G	G	F-to-G	7½	3
ACCEPTABLE—Fair					
SAVAGE 340	G	F	F	7½	4
WARDS WESTERN FIELD Cat. No. 714	G	F	F	7	4

[2] *Figures give capacity of magazine only; they do not include cartridge in chamber.*

AL 0022818

3 of 4



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 checkpiece 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 1246M (Sturm, Ruger & Co., Inc., Southport, Conn.), $280. Dropping-block, lever-action, single-shot. Barrel length, 26 in. No raised checkpiece. 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.

SAKO 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 160709 (Browning Arms Co., Morgan, Utah), $207.50. Also available in .222 caliber (not tested).

TRADEWINDS 607K (Tradewinds, Inc., Tacoma, Wash.), $169.50. Barrel length, 23¼ 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 BDL #5926 (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 our sample accidentally when releasing the safety (see story).

ESS MEDALIST DELUXE (J. L. Galef & 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.), $169.95. 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., Emhart Corp., Westfield, Mass.), $124.50. Removable box magazine. Slight trigger creep. No sling attachments or raised checkpiece. Checkering judged of inadequate sharpness for good grip.

H&R 300 ULTRA (Harrington & Richardson, Inc., Worcester, Mass.), $205. Fired with slightly less than MOA accuracy. Barrel length, 22 in. Has iron sights.

REMINGTON 788, #9726 (Remington Arms Co., Inc.), $84.95. Removable box magazine. No trigger-pull adjustment, sling attachments, checkering or raised checkpiece. Has iron sights.

ACCEPTABLE—Fair

The following two models were considerably less accurate than those preceding.

SAVAGE 340 (Savage Arms Div., Emhart Corp.), $73.50. .222 caliber. Removable box magazine. Slight trigger creep. No trigger-pull adjustment, sling attachments, or raised checkpiece. Has iron sights. Checkering judged of inadequate sharpness for good grip. Sometimes jammed when loaded singly.

WARDS WESTERN FIELD Cat. No. 718 (Montgomery Ward), $59.95 plus shipping. Appears similar to *Savage 340*, preceding, except stock made of softer wood. All other comments apply.

AL 0022819

Custom Firearms Development
Action Research Division

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

1 of 1

M. H. Walker - Ilion
R. A. Baldwin
R. P. Kelly - Ilion
Lloyd Fox - Ilion
Field Service File

Bridgeport, Connecticut
April 9, 1973

TO: F. E. 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 022827

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

AL 0022828

TO BE SAFE, FIRST THINK YOU MIGHT NOT BE

1 of 1

DON'T SAY IT—WRITE IT

TO R. P. KELLY

DATE February 21, 1973

FROM S. M. ALVIS

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

LIMITED DISTRIBUTION

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Route: J.P. McAndrews
F.E. Morgan
J. E. Dickey

Ilion, New York
April 24, 1968

TO: G. M. CALHOUN
S. M. ALVIS

FROM: W. E. LEEK

PROPOSED NEW DEVELOPMENT

AUTOMATIC, PUMP AND LEVER CENTER FIRE RIFLES

The 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 Division

WEL:T
Attach.

ALLEN STOCK

PLAINTIFF'S EXHIBIT 3077

AL 0022858

1 of 15

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"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) strength, (2) appearance, (3) functional performance, (4) endurance, (5) weight reduction, (6) handling, (7) trigger excellence, (8) recoil reduction, (9) elegance in magazine design, insertion and removal from the receiver, (10) 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

ALEKSICH

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

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.(1) Extractor design for full support of the cartridge case under load(2) 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(3) and evaluation.

AL 0022861

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

AL 0022862

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 (8) 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 (9). 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 (10). 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.

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.

(11)

AL 0022864

(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

AL 0022866

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.

AL 0022868

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.

AL 0022869

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 accruacy. These features, however, have never been investigated (15) and I suggest that we initiate a research program to investigate these features as well as possibility of process development on GFM 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 be enough to make for comfortable shooting (16). 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.

- 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 022871

cc: S.M. Alvis
R.J. Service

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington UMC PETERS UMC

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
February 6, 1968

MEMORANDUM

TO: W.E. LEEK

FROM: C.W. STEPHAN cs

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

LEKSICH

CC: D. S. Foote
B. H. Alvis
H. W. Young

August 16, 1948

TO: H. A. Brown

FROM: H. H. Walker

SUBJECT: M/72i MODIFICATION OF SAFETY DESIGN

One modification of the M/72i 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 tooled 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

1 of 2

A second modification would eliminate the Safety Cam and provide a gear 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.

MKD

H. K. Walker
Design Unit
Arms Technical Division

HKW:ML

ALEKSICH

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.

ALEKSICH

PLAINTIFF'S EXHIBIT
3079

November 13, 1978

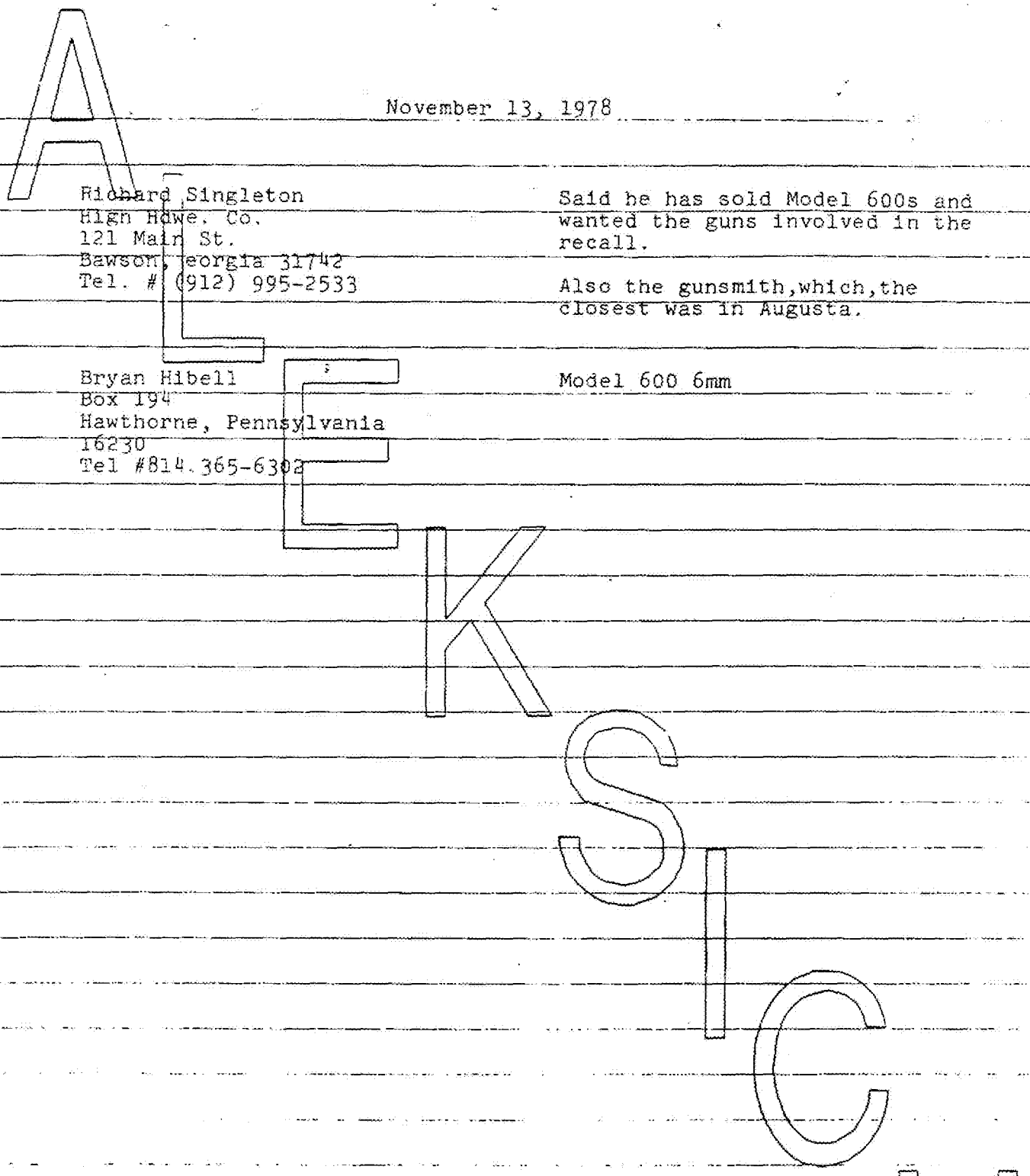
Richard Singleton
High Howe. Co.
121 Main St.
Bawson, Georgia 31742
Tel. # (912) 995-2533

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

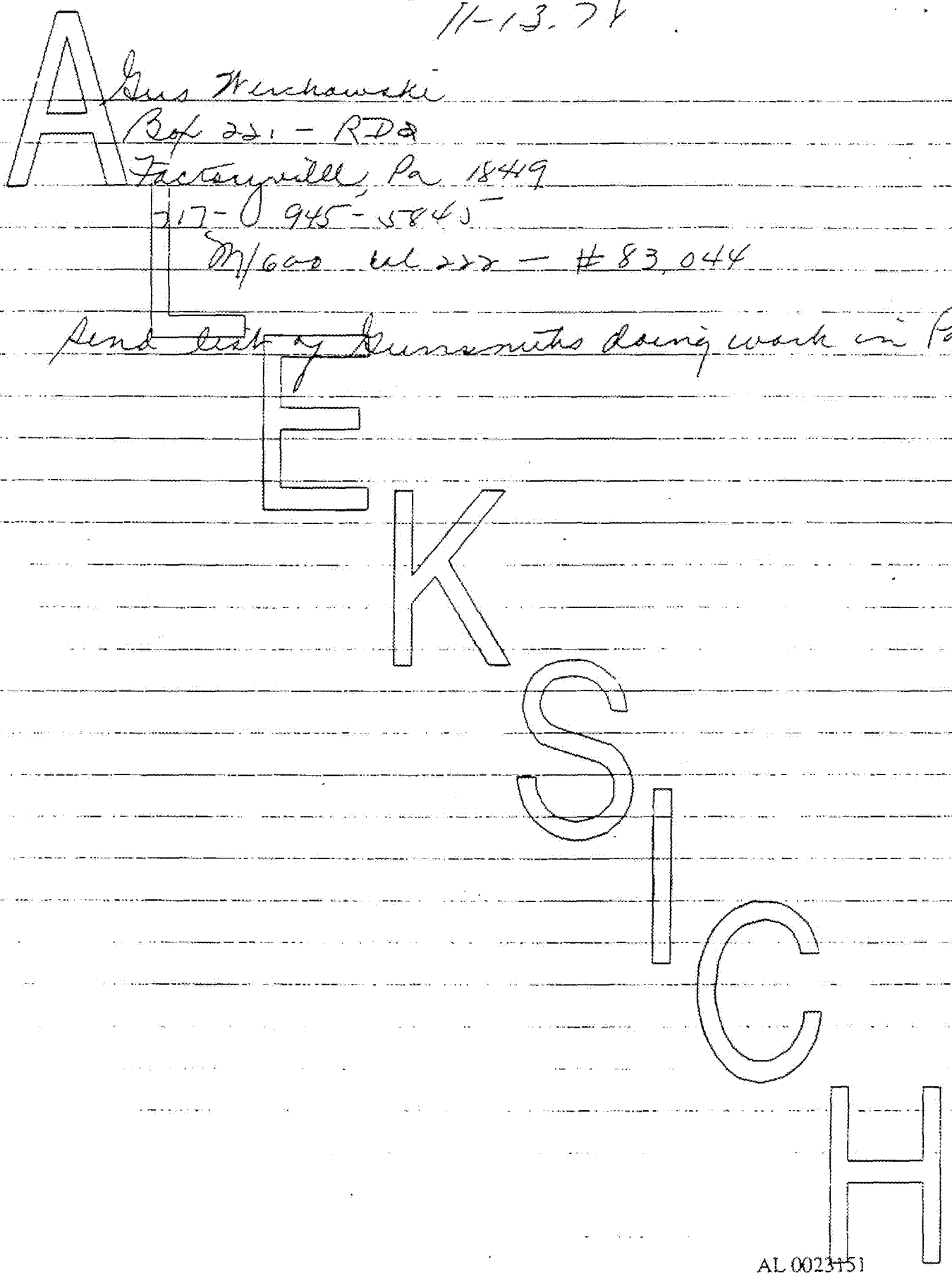


AL 0023150

11-13-75

Gus Kuchawski
Box 221 - RD 2
Factoryville, Pa 18419
717-945-5845
M/600 ml 222 — #83,044

send list of Blacksmiths doing work in Pa



AL 0023151

3 of 43

R Feinbaum

ATTORNEY WORK PRODUCT

AL 0023152

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

EFS:tpp
encl.

RECEIVED

RECEIVED
NOV 9 1978
E. F. SIENKIEWICZ

11-5-78
CLOVER VALLEY
WELLS, NEVADA 89835

DEAR SIR,

IN Aug. OF THIS YEAR I PURCHASED A NEW REM. 300 MAG. MODEL 700 BDL SERIAL NO. A6528703. I INSTALLED A NEW ACCUTRAC 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 SAFTY FROM SAFE TO FIRE AND THE GUN WENT OFF. BEING CAUGHT OFF BALANCE I WAS KNOCKED OFF OF THE 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 ITS VERY FRIGHTENING.

SAMPLE

I HAVE had 2 REM. 870 WINGMASTER shotgun AND HAVE BEEN VERY. HAPPY WITH THEM. I WAS goin TO BUY MY WIFE & SON REMINGTON RIFLES & Shotgun But NOW I DON'T KNOW.

PLEASE RESPONED AS to how you intend to TAKE CARE OF THIS PROBLEM. My PAY IS $660.00 WEEKLY.

THANK YOU

Albert R. Moon

P.S.

PACKERS NO. IS 2107 AC

ORDER NO. IS 5807

THE gun WAS purchased FROM wild Sports ORANGEVALE, CALIF.

AL 0023155

Recall

11-10-78

~~Ruth~~ M/ 600 Mohawk
A-6302786

Joe Bradberry
2526 Ellisdale Ave
Richmond, Va 23234
804-275-7055

Advised us this gun will go off as described with it is not on safe (A)

Told him to return to E7 Sinkiewicz at Shim. He will take Pd as Shim

AL 0023756

Acct 4/9/75

L- 4/700

Fuel when Sets pucker Ft

Boyd in 1971

Robert & Dion

LEKSICH

AL 0023157

ALL PITS

Bill Cordell - 15712 - 24th Ave Quincy Wash. 98848

700-210 6 7600 PIT

Rob Fuller Park & Ride

CUP 330-0726

SITE

AL 0023158

10 of 43

R Dent. 1955 [illegible] Rd SW
Roanoke Va.

600 - 35603

1/2 X A-100 - Luna Mark

ALEKSICH

AL 0023159

11 of 43

ALEK STCH

AL 0023160

STLW
AF3648 1-78

4 —

NIDIA

ALEKSICH

600 - DDL - A6353790

Robert O'Neal Jr
Apt 1
Bath NC.
27808

P Zeb Sanchez
25,45 Apt.
Lee Ct
Sc 715

600 - A - 6429768
A - 6429744

AL 0023161

13 of 43

ALESCO

To 11-3-78

Rob Rayburn
713-834-2380

MK 60-687681
OK wait till gets
Will be at Houston
until 4:00

Just had scope sighted
in — used 4 boxes of
shells. Chisnall is
shooting for 3.5"
Wanted to call his lawyer.

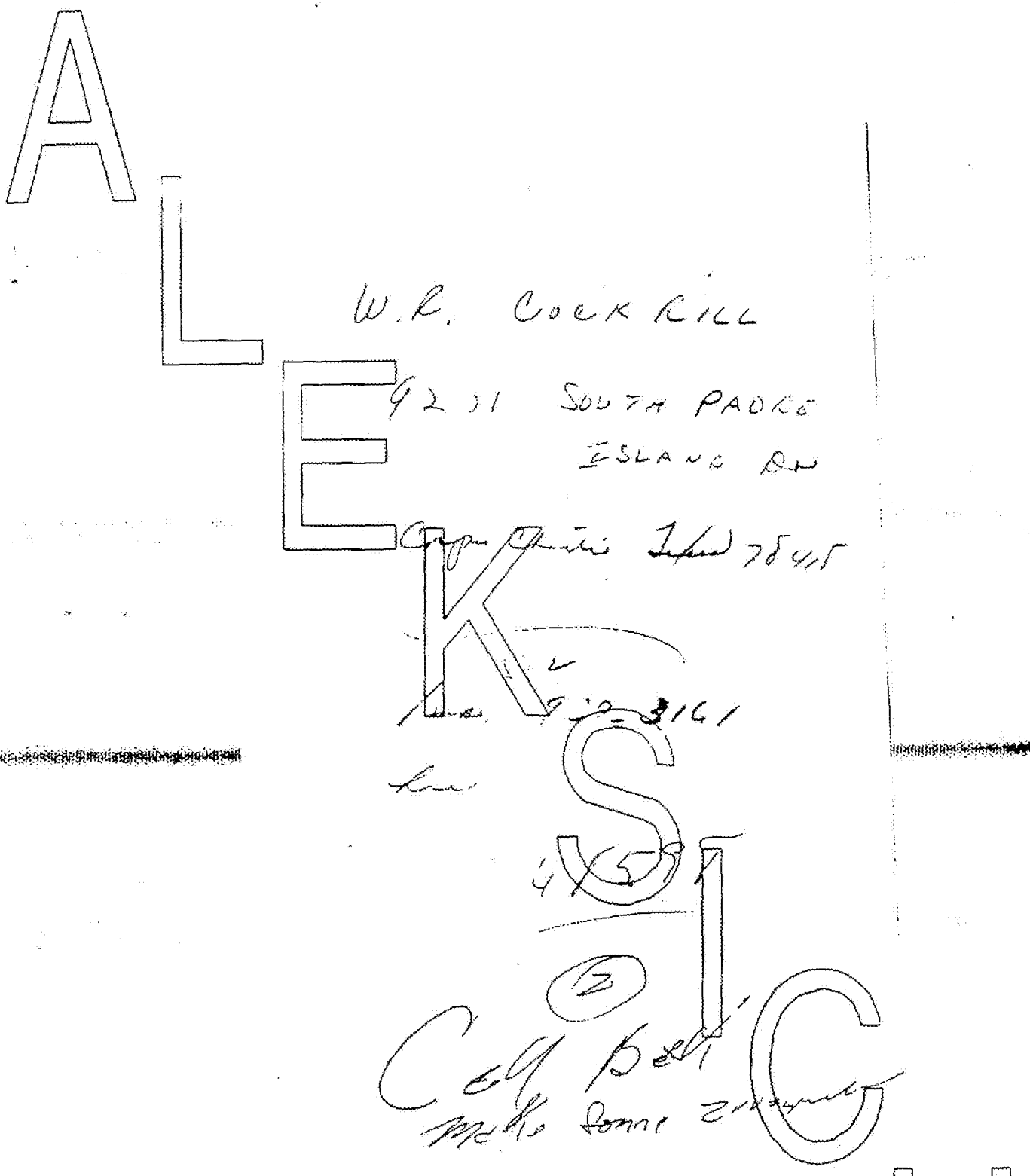
From J. H. Chisnall

ALEKSICH

Explanation on position +
the asked if Rep. would
exchange guns.

Sent 5-1-2
40-243 HP
R 243 W2

AL 0023163

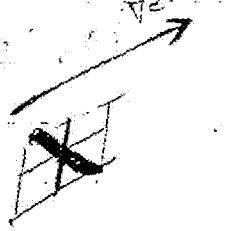

ALEKSIC
W.R. COCKRILL
9231 SOUTH PADRE
ISLAND DR

ALEKSICH

B.4 Robinson
713-694-5505
~~S~~ 4479 ticket-
6569805

600
Mastbt repair
hc tanks

Sfty Offshore
Does No other
emp's work



AL 0023165

11/9/75

A-1 - 2m/700 - 75/12 Hwy.

Russ Henry
Washington N.C.
919-946-4988

Need to get when party release
done by Fred.

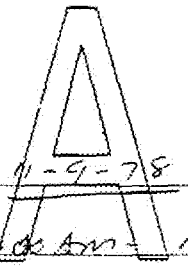
ALEKSICH

11/10

Apk. Em Proc 0 / 25

ALEKSICH

AL 0023167



9-9-78

* 8:00 am - Gordon I call J.C. Self (817) 334-2251. No other info. [817 is Texas - Call Back mid morning]

9:00 Customer R.A. Landis, Swedesford Rd Gwynedd Pa 19434
(215) 699-5888.
Doesn't have S/N. Advised re letter prefix He will work with Paul Yeager at Jenkintown.

10:15 E.L. Goldsmith - Gunsmith - Pa
Client Record only info from us that gives serial nos (which I don't have). In meantime he has already fired an A-4 Leo. He does it while customer waits so will mail spec + what specs together.

10:25 Phil Gunsmith Shop
Lorena (WIS (Gunsmith). Does refinishing + engraving [illegible] etc Some EFS customers of his.

* to Dallas from Lewisville Fly Love Field
J.C. Self (817) 295-9123 (Res) (817) 334-2251 (Bus) To 700 Ada Dr. 243 SN 63-22345
22 Roaring Spring Drive Joshua, Tx. 76058
Pete @ Williamson

Pete re claim # 1464

11-9-78
4:00 P.M.

F. E. Davis Gun Repair Inc.	DONE	TO DO
Louisville, Ky.	3	2

Received 5 trigger ass.
Mailed user same mark.

AFTEKSICH

11-8-78

Anthony Tardibuono
66 Church St.
New Rochelle, N. Y.
Tel. No. 914-NE2-3856

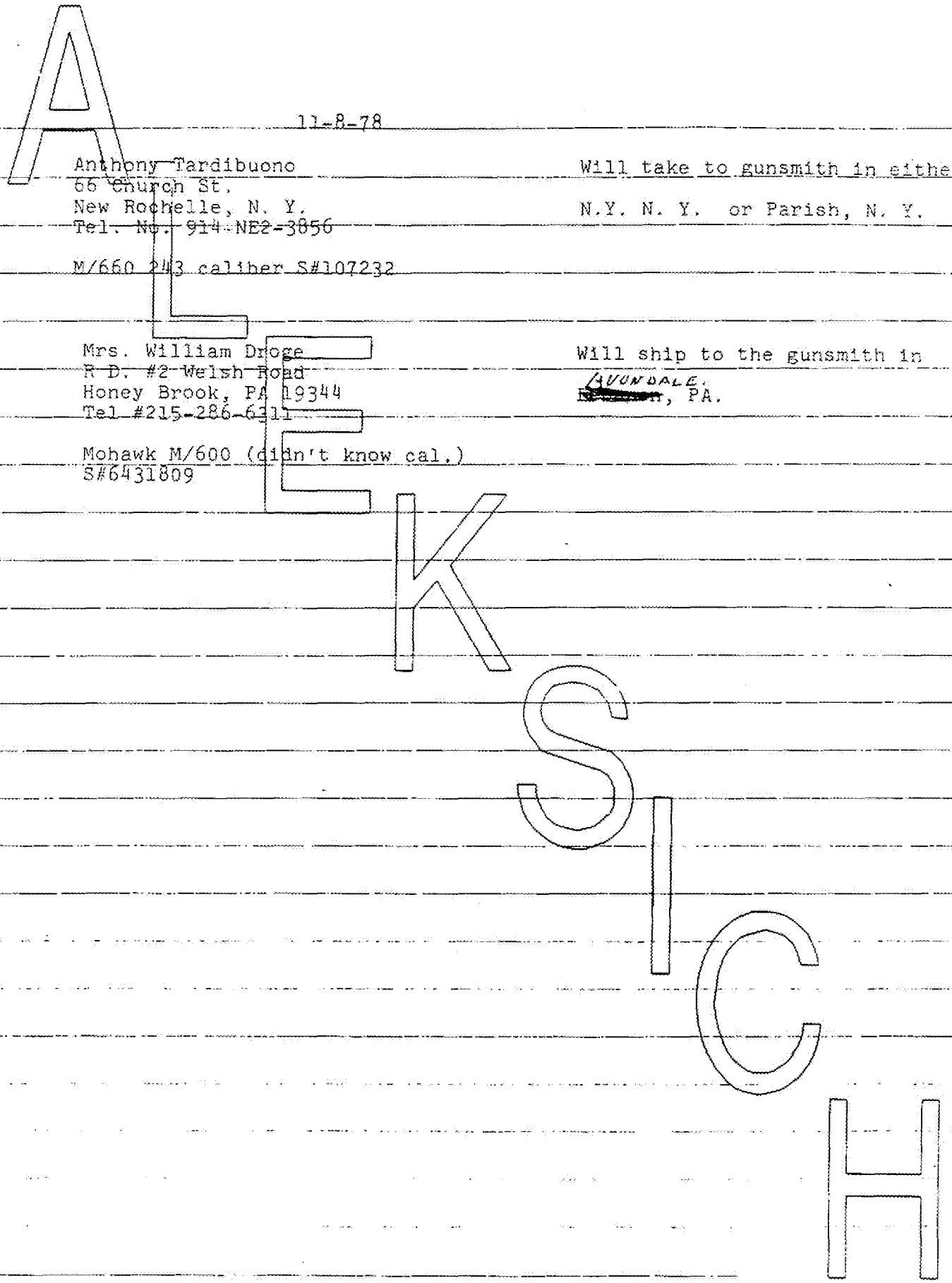
M/660 2¾3 caliber S#107232

Will take to gunsmith in either N.Y. N. Y. or Parish, N. Y.

Mrs. William Droge
R D. #2 Welsh Road
Honey Brook, PA 19344
Tel #215-286-6311

Mohawk M/600 (didn't know cal.)
S#6431809

Will ship to the gunsmith in AVONDALE, PA.



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.

ALEKSICH

AL 0023171

10/30/21

10/[illegible] John Reckford - Lynn Haven
600 - 30F - #29221 - Return Stroke

10/30 Miss Call 10/31 Hills 660 - 30F -

10/30 Miss [illegible] 1110 Brookside Dr. Dunedin 5-1c.
Gunsmith Re- on Gun part.

10/31 - 1 Call [illegible] on #700 1st Inning Ball in Recall

10/31 1-Call Myc. Refer to #600 Morning

Andrew Wise - 813 - 982 1050
Port Tuvan

12/21 Zack Alexander
Shreveport La.

1/1 T Hasun
15 or 350 RB 3
Dunkirk rally Fl
600 - # 6,431,135

AL 00123172

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 _____

AL 0023173

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 _____

AL 0023174

A

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REMINGTON ARMS COMPANY, INC.

By _____
J. G. Williams,
Vice President & Director of Marketing

Dated _____

H

AL 0023175

A

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AGREEMENT

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REMINGTON ARMS COMPANY, INC.

By _____
J. G. Williams
Vice President & Director of Marketing

Dated _____

H

AL 0023176

28 of 43

RD-45 REV. 8-66

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 Trainee 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

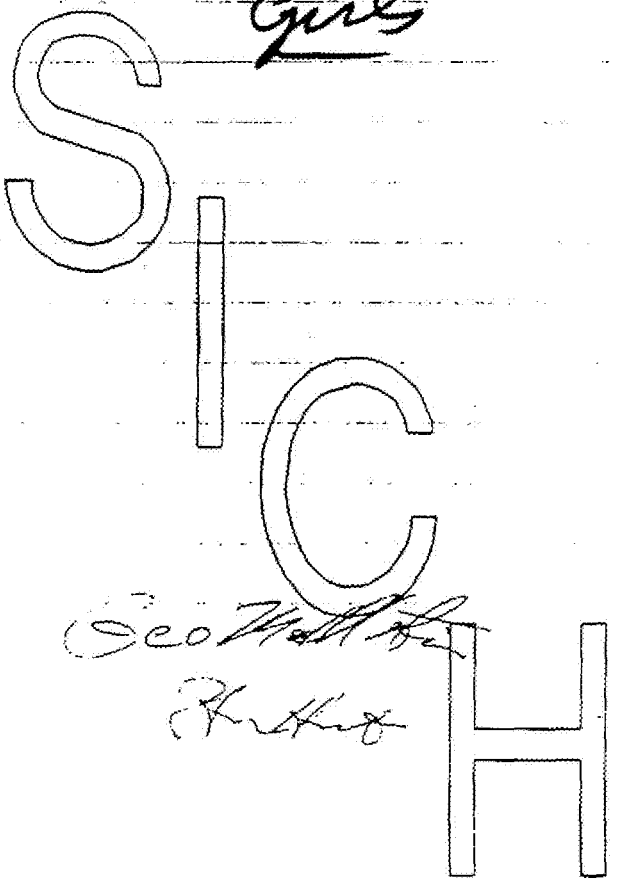
AL 0023177

OK.

A9 Kelly Girls & EGL
Manpower Girls

Solicitors
Kenbrey
Bond Lucas
Hedleman

2 girls
↓
Market Research
Girls



AL 0023178

Ken Recall Cases

Customers

10/30

Greg Brown - who repairs in Alaska
20/660
907-353-5467

Albert Fischer
San Antonio
512-494-5853
512-222-3737

Mrs. Frank Krzyzewski
Bpt.
929-488
Needs box

Tooley
326-1,295
Bpt

Alden Atwater
Wallingford
269-3007

Ernest Ballister
Glendale
303-427-6334

AL 0023179

- 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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RECALLED GUNS

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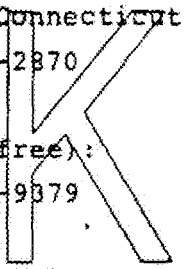
All Remington Model 660's

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.

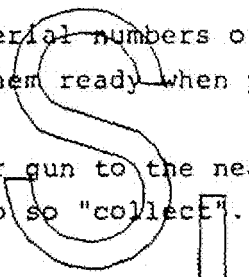
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In all states except Connecticut (toll free):
1-800-243-2870



In Connecticut (toll free):
1-800-972-9879

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 tation 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:

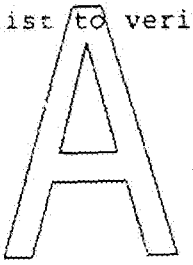


Remington Arms Company, Inc.
Arms Service Division

- R A -

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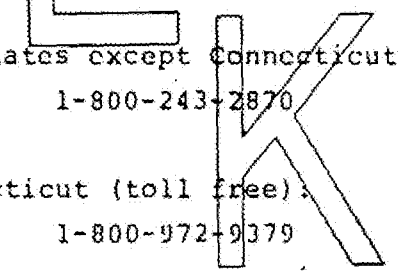
All Remington Model 600's

All Remington Model 660's

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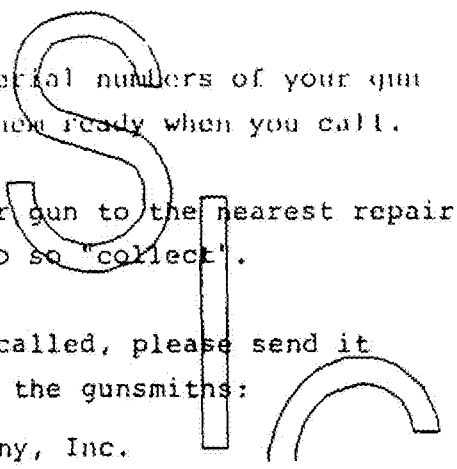
In all states except Connecticut (toll free):

1-800-243-2870

In Connecticut (toll free):

1-800-972-9379

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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.

Vernon A. Mayfield — 11/78.

Tommy Jones — Nov. 1969. gun discharge

741 Wash. Ave. — S/N 21636

Greenville Miss — CA1-243

332-3184 (Gunsmith)

C.A. Tate — Box 117. — Customer shot himself

Elsberry, Mo. 63343

Shot himself in leg. had bone graft. $12,000 medical bills. Has paid 80% of medical.

Mr. Tate is not asking for any damages

ASIC

ATF

Item to be mailed is
to Lt. L. O. Sherman

Mod 660 - Cal 308
S/N 6204877
Mr. Frank Folks
P.O. Box 469
Prairieville, La. 70769
Phone 504-673-3932

Guns fires on closing
when safe is pushed off.
Shot puts up Truck.
Second Hand item

Orig & 1 cy

FISCH

A

11/30/58

Wayland Stubbs
113A Mountain Lake Rd.
Lynchburg, Va 24505
804-239-0138
Mod 700 BDL 30/06

Jakes Camera
Ammo purchased at Kmart.
Gun purchased at J.C. Penny.

Gun Fired on Closing Blew out mans sunglasses & cheek. No personal injury involved. Will ship gun to Bryant with ammo if he can find her

E

K

S

I

C

H

3:30 PM 11/20/78

A

Personal Injury Ruger - 660 Cal 308
S/n 90076

B

Gun owner K.A. Sandburn
N630 South East 68th
Bellevue, Wash. 98006
Home phone 206-797-1757
office 206-237-9253

K

Man injured - Mr. Jack Ruben
7940 122nd Ave S.E.
Renton, Wash 98055
Home phone 206-255-8783
office " 206-573-1069

C

Truck owned by Dick Haynes
206-392-2328

Mr. Sandburn's son was unloading gun in truck (4 wheel dr.) pick up. Gun fired when the boy claimed he pushed the safety forward - Mr. Sandburn claims he has not seen any adults in pickup or TV on the road prior to accident.

H

38 of 43

P. D.

11-4-78

Dewey Godfrey called re:

Jewell Baker
c/o E. Boone
Fairmont, Tex 78355
512-325-~~2397~~ 5279

all 4 calls

Decln: Mr Satyr, Lyndon Co. (Rear)
Fairmont, Tex
512-328-2571

phone out of order will return my call

M/700 17 cal - Has LD 4009 (10/77)

Ethelender Perry Shankle asked Dewey what he should do with the ammo he has in stock.

Called Baker 4 times - line busy - dialed him & return gun & ammo.

ASIC

ALEKSICH

Lance J. McPaid

3000 Win Hwy 1205 - CL 45P

Star

Ran 222 Re. 700

Duke Pick Ahm repair

Pow

Pow

Mark. Seet 1,750

A

11/13 Detroit Bulk Tank Co
Doug Darling
312-397-4070

E

Ventilation

11/13 Geo Landis - K 500 Grates - DGL
2 - Box C-4 2 Mfr
Truck Section

Core
2 Box 1 - Mfr
3 Box 0 Mfr

C

11/13 Lou Alexander - Replaced Fan at Spike Cat Tag
Went Off.
Had D. Thompson take it to Lou Service - Refer
Relay Trigger Board to BCL

F

11-14-78

Mr. Frank Cotton &
Clifton Holmes Law firm
Pelgard, Fax

Their client, R. R. Walker called here Nov. 1
at his 30/30 cal. 270 which fired with safety
on & blew hole in cylinder. Took it to Tonys,
who said he could not fix it.

Needs gun for hunting end of this month.

Advised her to call E. F. A. at Dunn & make
arrangements & then gun repaired.

AL 002319]

A

(Pg 1)

P.J.

11-14-78

Call received from:

Paul Gustafson

Lani Sport Shop

711 10th Ave

Menomonie, Mich. 49858

Sold his customer

David Beal

Rt. 1 - Box 260 A

Porterfield, Wisc.

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 range on it, took one of our shells (that is all he had) & fired it in front of Ty's cut — gun blew up — and a shell is still in gun — gun is gutted & receiver spread. Shooter was cut on arm — several stitches. He sued gun & Lani, who sold him a new gun for $40 more.

Gustafson will return gun & no other shells available.

Got by 11-14-78

H

Restricted-Confidential

cc: S. P. [illegible] Jr.
F. [illegible]/Turn
W. W. Nelson
E. H. Grace
D. [illegible] Foote
H. J. Buchsen
W. C. Lewis
P. B. Mitherford
W. H. Fuller

September 11th, 1947

TO: G. E. Pinckney
Bridgeport

FROM: W. E. Lusk

SUBJECT: M/70 REPORT ON TESTS FOR LOW TEMPERATURE CONDITIONS

In answer to your letter of August 29th, 1947, previous testing has shown the following:

1. The ice will not adhere to the parts in question if they are well waxed with Graphite or Remington 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 average conditions, and the nature of the material prevents a building of ice to the surface.

3. I would not guarantee that the gun would not freeze under 32°F.

4. A M/70 Winchester under similar conditions (-60°F.) will fire the first round. The bolt will not unlock because ice jams between the top locking lug on the bolt and the recess for this locking lug in the receiver.

5. When comparing the triggers and the space between the Guard and Guide Plate in the M/70 and M/70.1 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 M/70 than there is in the M/70.1. It may also be noted that the Trigger Pin in the M/70 is located much higher than the M/70.1, allowing the trigger to shoot low in that section around the trigger slot in the Guard, while in the M/70.1 the trigger and Trigger Guide Plate close the ice to be in compression. In the former case the ice breaks away and allows the shooter to fire, while in the latter case (M/70.1) the ice is in compression and prevents firing.

6. [illegible] would like to stress the fact that this test was made in an ice box at -60°F. [illegible] section in question.

If there is any further information needed, [illegible] to advise us.

W. E. Lusk
Engineering Section
Experimental Department

AL 002321

PLAINTIFF'S EXHIBIT
3080

1 of 1

cc: S. N. Alvis
H. A. Brown
V. G. DeReus
R. H. Grace
F. B. Rutherford
N. H. Walker

Bridgeport, Connecticut
August 29, 1947

TO: W. E. LEEK

FROM: G. E. PLECKEKY

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:hh
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. Leek

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

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

WEL:MC

*The strength of steel decreases at -60°F. The chamber pressure developed by 30-06 ammunition at -60°F. sometimes approximates proof pressures.

ALEKSICH

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 sear 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
3084

AL 0023332

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/88) 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:ep
Attach.

SAMPLE

MODEL	GA. OR CALIBER	SERIAL NO.	COMPUTER OPINION	DISPLACEMENT HI & LO OF THREE READINGS	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 Win.	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.	Pro. 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. Eckerisp
Ilion Research Div.
1-15-70

AL 0023334

MODEL	SERIAL NO.	COMPUTER OPINION	DISPLACEMENT IN & TO OF THREE READINGS	TRIGGER PULL (LBS.)	TYPE
Ithaca 37 12 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	2-200 697	Creep	.118	8.25	
		Creep	.093	7.33	
Savage 330	V25647	Creep	.073	4.66	Hammer Sear
		Creep	.088	4.41	

AL 0023335

4 of 4

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 embarassing 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 (Du Pont 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

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, New York
December 1, 1975

TO: J. P. LINDE

FROM: D. E. 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

BRIGHT SCREWS ON GRIP CAPS:

An investigation was conducted as to why we are getting bright mars 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

CC: D. J. Anderson
L. B. Bosquet
J. W. Bower
H. K. Boyle
J. J. Burns
R. J. Chesebrough
W. W. Cook
A. A. Hugick
C. A. Korba
J. P. Linde
R. J. Long
F. E. Martin
N. W. Menard
C. O. Pardee
C. F. Prosser
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. — D. Anderson

   B. Alter sear-safety cam - 20 complete 1/6/76. — F. Martin

   C. Alter M/700 safety levers. 20 complete - 1/6/76. 250 ready 1/7/76. — F. Martin

   D. Transmit drawings for model drawing changes. — J. Linde

   E. First 20 guns to be ready for test 1/6/76. — J. Bower, C. Prosser

PLAINTIFF'S EXHIBIT 3087

PENGAD-Bayonne, N. J.

AL 0023414

1 of 3

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. — G. Hill
   - Mill thickness of safety .349-.346 — 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

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, Supervisor
for the Committee

GJH/bdm

ASSC

xc: W. E. Leek
G. W. Martin
C. F. Prosser

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

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. 3/25/76
Customer Complaint - Fired When Safe is Released Page 2

It is felt by C. F. Prosser and F. E. Martin that a fires 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 referance.

FEMartin:bd
Ilion Research Division

AEKSICH

RD-49-B

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
Crime file

Ilion, New York
March 4, 1976

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. 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
Ilion 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 compactor. 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.

DRAFT 3/4/76

M/700 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
Ilion Research Division

ALEKSICH

AL 0023424

3 of 3

cc: W.E. Leek
G. Martin

RD-61-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"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. #6858856
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

2 of 3

DRAFT

To: J. P. Linde
From: F. E. Martin
Subject: M/700 L.H. 30/06 #6858856 3/2/76
Customer Complaint - Accidental Discharge 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

EKSICH

AL 0023427

3 of 3

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington PETERS

"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

AL 0023428

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 preperation of guns for N.S.G.A. show.

F E MARTIN

FEM:bd
Ilion Research Division

AFKSICH

RD-44-6

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington UMC PETERS UMC

"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 compatable for the two models involved i.e. M/600 & M/700.

PLAINTIFF'S EXHIBIT 3092

AL 0023438

1 of 2

To: J. P. Linde 9/2/75
From: F. E. Martin
Subject: Monthly Progress Report -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
Ilion Research Division

AL 0023439

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

Ilion, 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 rivited 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
Ilion Research Division

PLAINTIFF'S EXHIBIT 3093

AL 0023440

1 of 1

REMINGTON ARMS COMPANY, INC.
Research Department

c: 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 consenus 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, disconnector, intersector, switch arrester, latch, etc.

MHWalker:bd

PLAINTIFF'S EXHIBIT 3094

AL 0023503

1 of 1

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 telerance conditions existing. The parts found to be out of telerance 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 / .993 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 maching 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 3096

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

ALEKSICH

	BEAD				RAMP		
CALIBER	25751 LOW	25750 MED.	14659 HIGH	REAR SIGHT SET	28512 LOW	28511 MED.	28610 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	

FEM:bd
2-4-77

AL 0023530

3 of 3

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

1 of 2

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 Duco cement. The sear ~~engagement~~ screw, the most important, is also sealed with a Loctite type of adhesive. The Duco 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
Ilion Research Division

ASIC

SYDNEY

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: 497 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 6460238).

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.

...2/

PLAINTIFF'S EXHIBIT 3097

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.

Ted Willick

G. WILLICK,
SALES REPRESENTATIVE.

AEKSICH

AL 0023541

BOUSTEAD WOOD PTY. LTD.

CNR. DAY & EGERTON STREETS, SILVERWATER • PHONE 648 3322
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

DRT:LM
765

22nd March, 1973.

RECEIVED
MAR 27 1973
INTERNATIONAL SALES

Attention Mr. Cipcar.

Remington Arms Co. Inc.,
939 Barnum Ave.,
Bridgeport,
CONNECTICUT. U.S.A.

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/

PLAINTIFF'S EXHIBIT
3098

1 of 2

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.

ALEKSICH

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

cc: C. B. Workman
E. F. Sienkiewicz
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.

1 of 2

PLAINTIFF'S EXHIBIT
3100

cc: C. B. Workman
E. F. Sienkiewicz
File - [illegible]

[illegible]

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
Ilion Research Division

JPL/nl

ALESKSICH

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, Rimfire 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.

PLAINTIFF'S EXHIBIT 3101

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

A SKETCH

AL 0023566

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

AL 0023567

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

AL 0023568

TARGET SHOTGUNS

The 3200 All Gage 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, Perazzi 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.

AL 0023569

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.

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.

AL 0023571

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.

AL 0023572

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.

AL 0023573

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.

AL 0023574

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%

John P. Linde/nl
Ilion Research Division

ALEKSICH

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 Waite 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 6581407, 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.

1 of 3

AL 002378

PLAINTIFF'S EXHIBIT
3102

A

To: C. B. Workman
From: J. P. Linde
Subject: Visit with Lt. C. V. Tompkins - 2 - June 20, 1977
M/700 Firing "Off Safe"

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.

SOH

2 of 3
AL 0023579

To: C. B. Workman
From: J. P. Linde
Subject: Visit with Lt. C. V. Tompkins
M/700 Firing "Off Safe"

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
Ilion Research Division

JPL/nl

AL 0023580

Ilion Research Division

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

1 of 1

AL 0023586

PLAINTIFF'S EXHIBIT 3103

Ilion 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

Allion Research Division

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

Remington Arms Company, Inc.
Ilion Research Division

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 222 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 002359

Ilion, 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 Ilion.

The Fire Control was inspected by the writer and F. R. 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

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

AL 0023595

"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

ALASKA

Remington Arms Company, Inc.
Ilion Research Division

Limited Distribution

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

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.

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

ARSICH

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

2 of 2

AL 0023606

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
Ilion Research Division

JAS/nl

1 of 2

PLAINTIFF'S EXHIBIT 3110

AL 0023608

cc: P.L. Gebrian

J. L. Teal

July 22, 1975

J. S. Martin

We do not intend to change the design of the Trigger Assembly. The one-piece Connector has too many problems in rectrofitting, 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/nl

ALLEGHENY

2 of 2

AL 0023609

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.

1 of 1

PLAINTIFF'S EXHIBIT 3111

AL 0023644

September 29, 1976

Mr. C. V. Tompkins
803 Ave. J
South Houston, Texas 77587

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

JPL/nl

1 of 1

AL 0023653

PLAINTIFF'S EXHIBIT
3112

October 18, 1976

TO: J. P. LINDE

FROM: F. E. 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"

AL 0023654

PLAINTIFF'S EXHIBIT 3113

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.

CC: W.E.Leak-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: S. 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 analyzed 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.

S. M. Alvis
Arms Research & Development Division

SMA:LJ

1 of 1

PLAINTIFF'S EXHIBIT 3114

AL 0023676

ALLEN-SICH

M/721 ENDURANCE TEST — 1952

PLAINTIFF'S EXHIBIT 3115

MODEL 721 30-06

DATE 10-2-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	5440 per rnd														QUALITY AND ENDURANCE TEST ENDURANCE GUN # 199805
Pet 150 M.C.P.	5480														OK
	5520			III											Ext. dropped shell.
150 M.P.	5560														OK
	5600														OK
	5640														OK
110 M.	5680														OK
							9-13-52								
	5720														OK
	5760														OK
					9-15-52										
180 B.P.	5800												OK		
180 S.T.	5840														OK
150 S.T.	5880														OK
120 S.T.	5920														OK
90 S.P.	5960			II											
60 B.P.	5980														OK
	5990														OK
					9-18-52										
					Sub Zero Test (-40°F)										
110 S.P.					Failed to fire first two rounds.										
					Third and fourth rounds fired, with no air dashpot.										
					9-19-52										
					10,000 dry cycles. No broken parts.										
					End of Test										

AL 0023679

2 of 22

MODEL 721 30-06

DATE 9-29-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	4940 previous														QUALITY AND ENDURANCE TEST. ENDURANCE GUN, #199805
				RAIN TEST											
Wet 180 S.T.	4980			III											Ext dropped shell
				DUST TEST											
Pet. 180 P.S.P.	4985	IIII		Gun failed to fire after 4th pet. round. Bolt very sticky and hard to work back and forth. Firing control rod got inside which prevented the trigger from releasing the firing pin.											
				Cleaned and oiled.											
	4990	(5)		Proof rounds											OK
Pet. 180 P.S.P.	5000														OK
Pet. 180 S.P.	5040														OK
	5080														OK
	5120														OK
				Unlocking cam surface on bolt battered over making bolt stiff to unlock.											
Wet 220 S.T.	5160														OK
	5200														OK
				9-2-52											
Rain 150 B.P.	5240														OK
	5280														OK
	5320														OK
Rain 220 S.P.	5360														OK
	5400														OK
	5440													1	Bolt stop pin worked out causing bolt stop to fail to hold bolt

(9)

MODEL 721-3006

DATE 8-15-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	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 B/NDS											
															8-25-52
Rem 150 MC	4280				IIII										EXT DROP SHELL
	4320														" " "
Win 220 ST	4360														OK
	4400														OK
	4440														OK
Win 150 ST	4480														OK
	4520														OK
	4560														OK
Win 150 SP	4560														OK
	4600														OK
						8-29-52									
Rem 150 Exp	4640														OK
"	4680														OK
Rem 150 MC	4720				4	12									EXT drop SHELL + ejection failed
Rem 110 MUSH	4760					1									" " "
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 MC	4960			3	8										" " "

AL 0023681

40 of 22

MODEL 721 30-06

DATE 6-6-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	3240														Quality and Endurance Test #19805 Endurance Gun
Win 110 S.P.	3241-3280														OK
	3290														OK
							6-26-52								
Rem. 180 M.C.	3321-3360				11										Ejector extra
	3400				1111										" " "
Win 180 S.P.	3401-3440				1										" " "
	3450				11										" " "
	3520				1										" " "
							7-8-52								
Win 150 ST	3560														OK
	3600				11										" " "
	3640				1111										" " "
							7-14-52								
Rem 180 SP	3680														OK
	3720														O-K
	3760														O-K
Peter 180 SP	3800														OK
	3840														OK
	3880				1111										Ext. Drop shells
Rem 220 SP	3920				1										Ext. Drop shells
	3960				1										" " "
Rem 150 MC	4000				4										" " "
	1			PROOF ROUND											OK
Rem				# 8											Ext Drop shells
150 MC	4040			1											Failed to Ext

MODEL 721- [illegible]

DATE 5-26-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	2440 Prev														Quality and Endurance Test Endurance Gun 1 105905
Run 220	2480														O/K
SP	2520														O/K
"	2560														O/K
	2600														O/K
							6-2-52								
West 180 S.T.	2601-2640														O/K
	2680					1									fail to eject
	2720					1									" " "
	2760					1									" " "
	2800					1									" " "
							6-3-52								
Wm 180 S.P.	2801-2840														OK
	2880														OK
	2920							1							stem chamber
	2960														OK
	3000														OK
							6-4-52								
Pat. 180 S.P.	3001-3040														OK
	3080													1	bolt stop pin worked out causing bolt stop to fail to hold bolt
L. West 150 S.T.	3081-3120														OK
	3160														OK
Run 150 B.P.	3200													1	bolt stop pin worked out causing bolt stop to fail to hold bolt
	3240														OK

MODEL 20 Gauge

DATE 5-20-52

R.T. No.	Rounds Fired	Malfunctions													Remarks
	20000 Remington	Firing	Hammer Hang	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Quality and Endurance Test Endurance Gun # 199805
		Cold Test							-20° F						
Rem. 180 GP	2020														OK
		ICE Test							-20° F						
Win 110 SP		Had to remove bolt stop. Trigger wouldn't work. Waited until it thawed before I could start it.													
	2040														OK
Rem. 180 GP	2080														OK
"	2120			1											Fail to extract
"	2160				1										" " "
"	2200														OK
"	2220														OK
Win 110 SP	2240														OK
"	2280	Screw at back pin on fire control causing bolt stop to drop allowing bolt to ride past out of the breech.													
Win 110	2320														OK
SP	2360														OK
"	2400														OK
"	2440														OK

MODEL 721 30-06

DATE 5-14-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	1060														QUALITY AND ENDURANCE TEST. ENDURANCE GUN. #199805
2 ft. 150 M.C.P.	1001-1040					1									fail to eject
	PROOF ROUND	SHELL does not mark primer on bolt face													OK
Rem 220 S.P.	1041-1080														OK
"	1120														OK
"	1160														OK
West. 180 S.T.	1141-1200														fail to eject
"					1										fail to extract
"	1240														OK
"	1280														OK
Win 110 SP	1320														OK
"	1360														OK
"	1400														OK
Rem 180 BP	1440														OK
"	1480														OK
"	1520					1									fail to eject.
Vest 150 ST.	1560														OK
"	1600														OK
"	1640														OK
Win 220 ST.	1680					1									fail to eject.
"	1720														OK
"	1760														OK
Rem 150 MC	1800				1	11									fail to extract
"	1840					11									" eject
"	1880					11									" " "
Win 180 SP	1920														OK
"	1960														OK
"	2000														OK
		Replaced bolt assembly with													
		1000 rds on it. Broke other while													
		removing Firing P.													

STANDARD ENDURANCE TEST
CENTER FIRE RIFLES

MODEL 721 30-06

GUN NO. 199805

	0	020	1000	2000	3000	4000	5000
To Be Performed Every 1000 Rnds.							
Clean and Oil		✓	✓	✓	✓	✓	✓
Head Space (Min-Max)		OK	OK	OK	OK	OK	OK
Trigger Pull		4½#	4¾#	5¼#	4¾#	4¾#	4½#
Firing Pin Indentation		.020"	.020"	.025"	.020"	.0215	.020
Bolt Opening-Cocked		4#	4#	2½#	3½"	3½	3½"
Bolt Opening-Cocking		10#	10#	10#	12#	11½	11½
Safety Mech. Test		OK	OK	OK	OK	OK	OK
Jar Off Test		OK	OK	OK	OK	OK	OK
To Be Performed Every 2000 Rnds.							
Main Spring		6.2"		6.2"		6-2	
~~Sear Lock Plunger~~ EJECTOR Spring		1.2"		⅝"		1-3/16	
~~Action Bar Lock~~ SEAR Spring		.55"		.570"		.550	
~~Loading Door Spring~~							
~~Magazine Spring~~							
~~Extractor Spring~~							
~~Trigger Spring~~							

NL 10/29/51

STANDARD ENDURANCE TEST
CENTER FIRE RIFLES

MODEL 721 .30-06

GUN NO. 23848 3

	0	320	1000	2000	3000	4000	500
To Be Performed Every 1000 Rnds.							
Clean and Oil		✓					
Head Space (Min-Max)		OK					
Trigger Pull		5.75#					
Firing Pin Indentation		.020"					
Bolt Opening-Cocked		2.5#					
Bolt Opening-Cocking		10#					
Safety Mech. Test		✓					
Jar Off Test		OK					
To Be Performed Every 2000 Rnds.							
Main Spring		6.25"					
~~Door Lock Plunger~~ EJECTOR Spring		1.15"					
~~Action Bar Lock~~ SEAR Spring		.53"					
~~Loading Door Spring~~							
~~Magazine Spring~~							
~~Extractor Spring~~							
~~Trigger Spring~~							

NL 10/29/51

MODEL 721 30-06

DATE 5-9-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	320														QUALITY AND ENDURANCE TEST AVERAGE GUN. 237412
Rem 220 S.P.	360														OK
	400														OK
West 150 S.P.	440							1							stm chamber.
	480							1							" "
Win 150 S.P.	520														Ejected empty case.
	560														"
															Position of ejected rounds - on right side of shooter at +/- angle to the gun.
Rem 110 M.	600														OK
	620														OK
Win 220 ST.	640							1							stem chamber
	680							1							" "
															5-13-52
Ref. 150 M.C.	680-720														OK
Win 150 S.P.	760														OK
Ref 150 S.P.	800														OK
	840														OK
Rem 150 M.C.	880														OK
	920														OK
West 110 S.P.	960														OK
Rem 150 B.P.	1000														OK

(14)

A

MODEL 721 .270

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	0														QUALITY AND ENDURANCE TEST 23741 2
Win 220 S-P	20			Jack				2							
Rem 180 P.P.	40														G/C
Win 150 S.P.	60														O/K
Rem 110 M.	80														O/K
Win 180	100														G/K
Rem 180 S.P.	120							1							Gun - full load cut
Rem 220 S.P.	140														C/K
Rem 180 P.P.	160														G/K
	180			Failed	Extr.				(Shoulder)						
Win 150 S.P.	200							1							1 Stuck
Win 150 S.P.	220														O/K
Rem 180 P.P.	240														
Win 220 S.P.	260							2 Stuck							Chamber loaded up.
Win 150 S.P.	280														G/K
Rem 180 P.P.	300			Jacket											G/K
	317														Loading up of brush causing lead opening of split picked for continued test
	317														

AL 0023691

A

MODEL 721 30-06

DATE 5-9-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	320														QUALITY AND ENDURANCE TEST AVERAGE GUN. 237412
REM 220 S.P.	360														OK
	400														OK
West 150 S.P.	440							IIII							stm chamber.
	480					I		I							" "
						I		I							Ext. t. wt
Win 150 S.P.	520					I									Blown case
	560														"
						Position of ejected rounds - on right side & short of 45° angle to the gun.									
Rem 110 M.	600														OK
	620														OK
Win 220 S.P.	640							II							stem chamber
	680							IIII							" "
						5-13-52									
Rem. 150 M.C.	681-720														OK
Win 150 H.P.	760														OK
Rem 180 S.P.	800														OK
	840														OK
Rem 150 M.C.	880														OK
	920														OK
West 110 S.P.	960														OK
Rem 150 B.P.	1000														OK
					(14)										

MODEL 721 .22-26

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	0														QUALITY AND ENDURANCE TEST 23741 2
Win 22 S-O	20			Jack				2							
Rem 110 H.P.	40														O.K.
Win 150 S.P.	60														O.K.
Rem 110 M.	80														O.K.
Rem 22 S.R.	100														O.K.
Rem 22 S.R.	120							1							Stem - Adjusted
Rem 22 S.R.	140														O.K.
Rem 180 P.S.P.	200			Jam	Jack				(Shoulder)						O.K.
Win 150 S.P.	220														1 Stem
Win 150 S.P.	240														O.K.
Rem 110 H.P.	260														
Win 220 S-O	280							7	Jack						Chamber finish up
Win 150 S.P.	300														O.K.
Rem 180 P.S.P.	320				Jacks										O.K.
				17	Sticking up of brass causing hard opening of bolt picked for continued test										
							17								

STANDARD ENDURANCE TEST
CENTER FIRE RIFLES

MODEL 721 30-06

GUN NO. 237462

	0	320	1000	2000	3000	4000	500
To Be Performed Every 1000 Rnds.							
Clean and Oil		✓					
Head Space (Min-Max)		OK					
Trigger Pull		4.5#					
Firing Pin Indentation		.020"					
Bolt Opening-Cocked		5#					
Bolt Opening-Cocking		9.5#					
Safety Mech. Test		OK					
Jar Off Test		OK					
To Be Performed Every 2000 Rnds.							
Main Spring		6.3"					
~~Sear Lock Plunger~~ EJECTOR Spring		1.2"					
~~Action Bar Lock~~ SEAR Spring		.5"					
Loading Door Spring							
Magazine Spring							
Extractor Spring							
Trigger Spring							

NL 10/29/51

AL 0023694

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
															QUALITY AND ENDURANCE TEST. K 238076
Win 220 Exp	20														OK
REM 180 SP	40														OK
W in 150 H.P.	60														OK
Rem 110 M.	80														OK
Win 180 SP	100														OK
	120														OK
Rem 220 S.P.	160														OK
Rem 180 SP	200														
Win 180 SP	220														OK
Win 150 S.P.	240														OK
Rem 110 M	260														OK
Win 220 Ex	280	1													Blown case.
Win 150 H.P.	300														OK
Win 180 S.P.	320														OK

Jacks

Firing Jack (Shoulder)

① Locking up of breech causing head opening of bolt

1° 37' 30"

AL 0023695

160 of 22

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
															QUALITY and ENDURANCE TEST. 21432
Win 220 Exp	20				Jack										OK
Rem 180 CP	40														OK
Win 150 HP	60														OK
Rem 110 M.	80														OK
Win 160	100														OK
SP	120														OK
Rem 7205 P	160														OK
Pet 150 PEX	200														OK
		Feed			Jack				(Shoulder)						
Rem 180 SP	220														OK
Win 180 ST	240														OK
Rem 110 M	260														OK
Win 220 Ex	280														Stiff chamber
Win 150 HP	300														OK
[illegible]	320				Jacks										OK

(1) Loading up of bolt causing full opening of bolt.

AL 0023696

17 of 22

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	0														QUALITY AND ENDURANCE TEST. II 2055R7
Win 220 S.P.	1-20				Jack										OK
Rem 180 S.P.	40														OK
Win 150 P.P.	60														OK
Rem 110 H.V.	80														OK
Weat 180 S.P.	120														OK
Rem 220	140														OK
SP	160														OK
Rem PP Ex	200														OK
						Fired Jack (Shoulder)									
Weat 180 S.P.	220														OK
Win 150 P.P.	240														OK
Rem 110 H.V.	260														OK
Win 220 Ex	280														OK
Win 150 P.P.	300														OK
Rem [illegible]	[illegible]														
						Jack									Loading & Unloading Extractor causing hard opening of Bolt.

AL 0023697

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	Gun Failures	Adjustments	Quality and Endurance Test. # 20573 CC
Win 220 Exp	20			Jack											OK
Rem 160 PP	40														OK
Win 150 HP	60														O.K
Rem 110 M.	80														O.K
Hdy 120 SP	100														OK
	120														OK
Rem 220 S.P.	160														O.K
Rel 160 PPEX	200														OK
[illegible] SP	220		Jack (Shoulder)												OK
[illegible] 150 ST	240														O.K
Rem [illegible]	260														OC
Win 220 EX	280														OK
[illegible] 150 HP	300														OK
[illegible] 150 PP	320							Jack							O.K

Loading up of bench causing bind
Opening of bolt

AL 0023698

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
															QUALITY AND ENDURANCE TEST. 2383 23
Win 220 SP	20					Jack									OK
Rem 180 PP	40														OK
Win 150 PP	60														OK
Rem 110 M.	80														OK
Win 180 SP	100														OK
	120														OK
Rem 220 SP	140														OK
Rem 180 PP	160														OK
Win 150 PP	180														OK
						Failed to Eject (Shoulder)									
Win 150 SP	200														OK
Win 180 ST	220														OK
Rem 110 M	240														OK
Win 220 SP	260														OK
Win 150 PP	280														OK
Rem 110 SP	300														OK
	320					Jack									OK
						Loading up of barrel causing bad ejection after 320 shot									

AL 0023699

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	0														QUALITY AND ENDURANCE TEST.
															D 225406
Win 220 S.T.	1-20														OK
Rem 60 G.P.	40														OK
Win 150 HP	60														OK
Rem 110 Mesh	80														OK
West 150 S.P.	120														OK
Rem 220	140														OK
Win SP	160														OK
Rem 150 PSP	200														OK
Rem KO SP	220														OK
Win 150 ST	240														OK
Rem 110 AL	260														OK
Win 220 SK	280														OK
Rem 150 PP	300														OK
Rem 180 SP	320														OK

Jack

Jack

Field Test Shoulder

Jack

Loading up of Trucks causing hard opening of bolt.

AL 0023700

MODEL 721 30-06

DATE 5-7-52

R.T. No.	Rounds Fired	Malfunctions: Firing	Unlocking	Primary Extraction	Secondary Extraction	Ejection	Cocking	Feeding	Loading	Locking	Breakages	Replacements	Gun Failures	Adjustments	Remarks
	0														QUALITY AND ENDURANCE TEST
															237007
Win 220ST	1-20			Jack				1							Stem chamber
Rem 100 BR	40														OK
Win 150 HP	60														OK
Rem 110 Mag	80														OK
West 180 SP	120														OK
Rem 220	140														OK
Rem SP	160														OK
Win 100 PEX	200														OK
				Fired Shot											Shoulder
	240														OK
Rem 110 M	260														OK
Win 220 Ex	280														Stem chamber
	300														OK
	320					Jacks									OK

(6) loading up of truck causing head spacing to shift

AL 0023701

cc: G.K. Calhoun
J.E. Maupin
H.J. Hackman
E. Sapp
W.E. Leak
M.H. Walker

PLAINTIFF'S EXHIBIT 3116

MEMORANDUM OF DISCUSSION

March 23, 1954

SUBJECT: MODEL 721-722 QUALITY
Notes on Discussion Held in Gun Room 3-23-54
Between Messars. Hackman, Sapp, Leak, 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 H&H Mag. caliber and involves "high spots" in the chambers

AL 0023714

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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.

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. M. Alvis, Manager
Arms Research & Development Division

SMA:T
3-24-54

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Quality

May 18, 1954.

TO: H.J. HACKMAN (6)

FROM: QUALITY CONTROL DEPARTMENT

SUBJECT: M/T21-722 TRIGGER PULL

OK STC

Referring to S. N. Alvis' letter of 3/22/54 to H. J. Hackman 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 would 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. A. Bryant
W. A. Bryant

WAB/MAB

H

PLAINTIFF'S EXHIBIT 3117

Ilion, 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 Ilion.

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.

PLAINTIFF'S EXHIBIT 3118

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

"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

ALFRED SICH

Remington Arms Company, Inc.
Ilion Research Division

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

ALEKSICH

GUN TESTING MANUAL

Ilion Research Division
Remington Arms Company, Inc.
Ilion, New York

PLAINTIFF'S EXHIBIT
3120

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 specifications.) If the gun ~~and case~~ withstands this higher pressure, the gun is assumed to be safe for normal shooting.

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.

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.

KSTC

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:

$$\frac{\text{Mean Radius (Mann)}}{\text{Mean Radius (Test)}} \times 100 = \%\ \text{Mann Barrel Accuracy}$$

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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

(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

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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
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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.

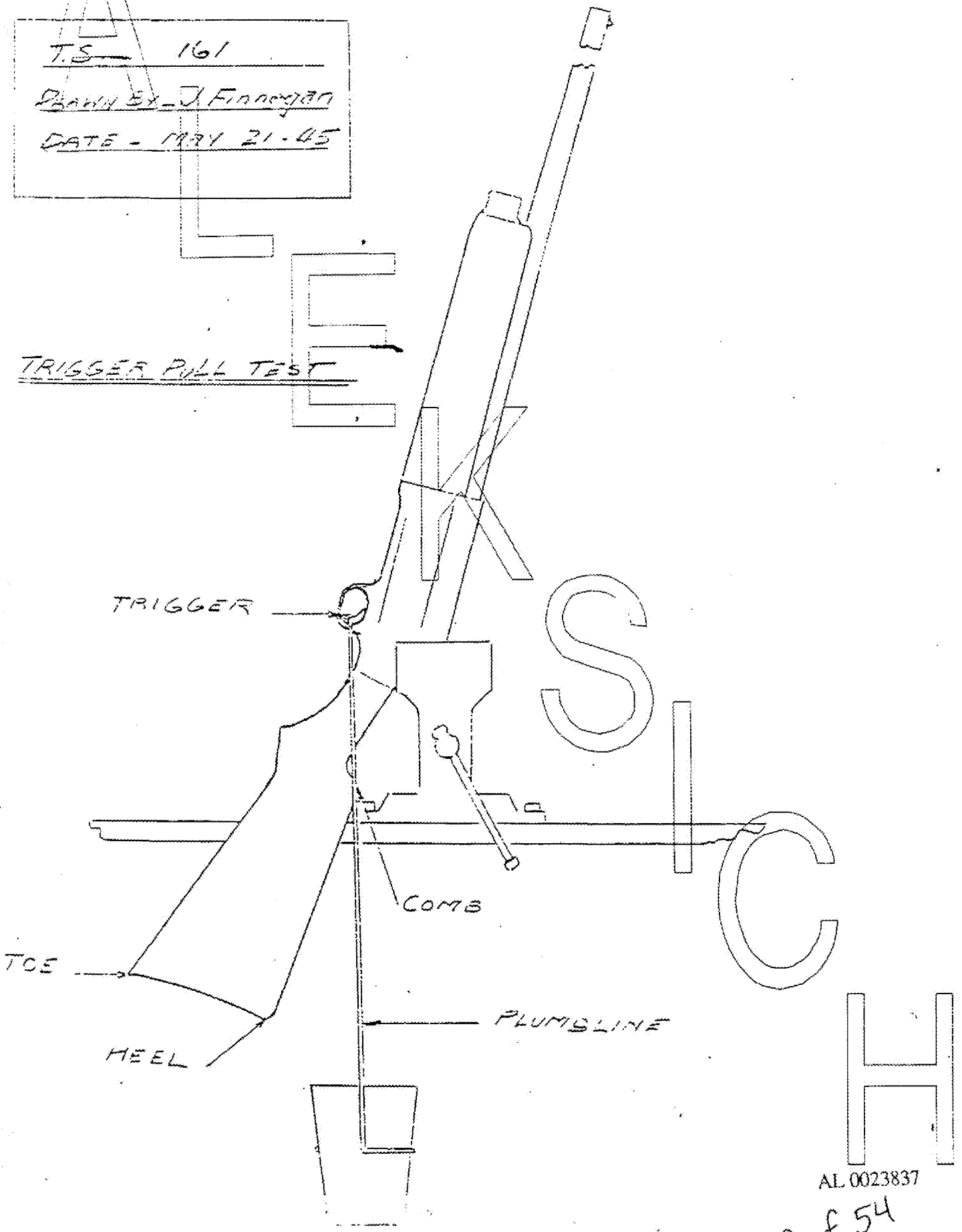
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DRAWN BY - J. Finnegan

DATE - MAY 21-05

TRIGGER PULL TEST



E S C H

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 assemblying 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 componet 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.

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).

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.

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Prepared by: C.J. Kirchen
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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 pen 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.

ALKSC

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; calculated and record average.

STANDARD TEST QUANTITY

One determination.

ALSC

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.

ALASKA

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 commerically 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 malfucntions as:

   a. Failure to extract

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

ALSIC

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

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)

Decription - 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 inset, 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.

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 indentification of malfunctions. Excessively loud explosions may result in failure to eject, as covered in (10) above, chargeable to the ammunition.

STANDARD TEST QUANTITY: 200

ALEKSICH

Prepared by: H.C. Moss
Compiled: 10/10/44 - 2 Pages
Revised: 5/22/45 - 1 Page
Revised: 1/9/69 - 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 mechani

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 practicabl in that each has a different technique, thereby offering greater possibility for disclosinc a peculiarity of the gun, since one person operating the gun is likely to acquire a certa "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 withough 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.

Prepared by: H.C. Moss
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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 usuage.

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 indentical 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

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 indentical 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

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 Varnolene 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 Varnolene or equilalent.
   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

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

ALEKSICH

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.

ALKSICH

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 excaping gages 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.

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.

Prepared by:	H.C. Moss	Gun Test #21	
Compiled:	10/10/44 - 1 Page	Uses: 1.	Center Fire Rifles
Revised:	2/15/45 - 1 Page	2.	Shotguns
Revised:	12/19/45 - 1 Page	3.	Rim Fire Rifles
Revised:	1/9/69 - 1 Page		

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 yeild 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

ALASKA

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.

ALEKSICH

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.

ALKSICH

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 ammuntion will be fired in this test.

ALLEN KSICH

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.

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

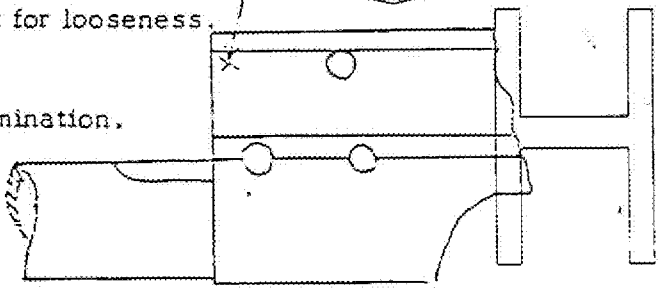
INTRODUCTION:

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.

ALEKSICH

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

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Prepared by: C.J. Kirchen
Compiled: 11/14/45 - 1 Page
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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.

ACCEPTANCE TABLES

HOW MUCH SHOOTING

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.

Prepared by: C.J. Kirchen
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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)

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Prepared by: C.J. Kirchen
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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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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/760 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.

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, ± 10°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.

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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 or action bar and/or Action Bar Assembly.

ALTASTIC

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

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PLAINTIFF'S EXHIBIT 3181