

11/788 Missile Forward Drive Test
Reorder # 222531 (Reorder only)
R. S. MORRIS
Box # C-1806-000
82

RD-44-2

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington



PETERS



Distribution:

R. MURPHY

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

"TEST RESULTS ONLY"

RESEARCH TEST and MEASUREMENT REPORT - Report No. 822531

M/788 MUZZLE FORWARD, PENDULUM DROP TEST EVALUATION

Prepared by: *R. HOWE*

Date Prepared: _____

Proofread and Cleared By:

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

Signature Date

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

Signature Date

TEST & MEASUREMENT LAB REPORT

REPORT NUMBER:

REPORT TITLE: *M/788 MUZZLE FORWARD, PENDULUM DROP
TEST EVALUATION*MODEL(S): *788*GAUGE OR CALIBER: *.223*DATE: *FEB. 3, 1983*WORK ORDER NO.: *C-1806-000*PART NAME: *SAFETY DETENT + CAM*DESIGNER/ENGINEER: *R. S. MURPHY (S. FANELLI)*TEST TYPE: *MUZZLE FORWARD PENDULUM DROP TEST.*

1. PHOTO LAB
2. STRENGTH TEST - NO. OF GUNS TESTED _____
3. FUNCTION TEST - NO. OF GUNS TESTED _____
4. ACCURACY TEST - NO. OF GUNS TESTED _____
5. MEASUREMENTS - TYPE: *STATIC* _____
6. ENVIRONMENTAL TEST
7. AMMUNITION TESTING & EVALUATION - TYPE: _____
8. VISUAL EVALUATION - _____ OUT OF _____ GUN SAMPLE
9. ENDURANCE - NO. OF GUNS TESTED: _____

NO. OF ROUNDS PER GUN: _____

TOTAL ROUNDS FIRED IN TEST: _____

AMMO TYPE: MAGS. _____; TARGET: _____

RIM FIRE _____ CENTER FIRE _____

DATE: FEB. 3, 1983

REPORT # 822531

TO: R.E. NIGHTINGALE

FROM: R. HOWE

PAGE 1

TEST TITLE: "TEST RESULTS ONLY"

M/788 MUZZLE FORWARD, PENDULUM DROP TEST EVALUATION

REASON FOR TEST:

TO CONFIRM THAT FIRING PIN WILL NOT FALL
"JAR OFF" WHEN GUN IS DROPPED DIRECTLY ON
MUZZLE FROM DISTANCES OF UP TO SIX FEET.

TEST PROCEDURE:

ON 9-10-82 R.S. MURPHY, CURRENT FIREARMS DESIGN,
REQUESTED THAT A MUZZLE FORWARD, PENDULUM DROP
TEST BE CONDUCTED ON THE REMINGTON MODEL 788
RIFLE EQUIPPED WITH THE REMINGTON CURRENT
PRODUCTION (S. FANELLI) DESIGN SAFETY DETENT & CAM
SYSTEM FIRE CONTROLS.

THIS TEST WAS CONDUCTED IN THE R&D LAB. USING
TWO OF THE ABOVE FIRE CONTROLS. BOTH TEST
VEHICLES WERE MOUNTED IN THE SAME RIFLE, M/788,
.223 CAL. REMINGTON SER # A 6145302 AND DROPPED
AGAINST BOTH A 1" NEOPRENE AND A 3½" HARD WOOD
PAD. AT INCREASING LEVELS OF UP TO SIX FEET.
EACH DROP WAS DONE WITH THE SAFE IN THE "ON" POSITION.
AFTER EACH DROP THE GUN WAS DRY FIRED TO MAKE SURE
THE FIRING PIN HAD NOT FALLEN.

NOTE: THE COPPER CRUSHER METHOD OF TESTING WAS
NOT USED BECAUSE FIRING PIN IS NOT THE INERTIA
TYPE.

TEST RESULTS:

PAGE 2

AT NO TIME DURING THE ENTIRE TEST, AT ANY LEVEL DROP, AGAINST EITHER TEST SURFACE DID THE FIRING PIN FALL UNTIL THE SAFE WAS IN THE "OFF" POSITION AND THE TRIGGER WAS PULLED.

A. FIRST FIRE CONTROL (S. FANELLI DESIGN SAFETY DETENT & CAM)

1. DROPPED AGAINST A 1" NEOPRENE PAD, MUZZLE FORWARD

2 FOOT DROP - FIRING PIN DID NOT FALL

4 " " - " " " " "

6 " " - " " " " "

2. DROPPED AGAINST A 3 1/2" HARDWOOD PAD

2 FOOT DROP - FIRING PIN DID NOT FALL

4 " " - " " " " "

6 " " - " " " " "

B. SECOND FIRE CONTROL (S. FANELLI DESIGN SAFETY DETENT & CAM)

1. DROPPED AGAINST A 1" NEOPRENE PAD, MUZZLE FORWARD

2 FOOT DROP - FIRING PIN DID NOT FALL

4 " " - " " " " "

6 " " - " " " " "

2. DROPPED AGAINST A 3 1/2" HARDWOOD PAD.

2 FOOT DROP - FIRING PIN DID NOT FALL

4 " " - " " " " "

6 " " - " " " " "

NOTE:

DURING THIS TEST PROCEDURE IT WAS NOTED THAT WHILE THE FIRING PIN DID NOT "JAR OFF" THE SAFETY LEVER DID MOVE FROM THE "ON" TO THE "OFF" POSITION WHEN DROPPED AGAINST THE 3 1/2" HARDWOOD PAD AS FOLLOWS

TEST RESULTS (NOTE CONT.)

PAGE 3

A. FIRST FIRE CONTROL

1. $2\frac{1}{2}$ FOOT DROP - SAFE MOVED FROM "ON" TO "OFF" POSITION
2. SAFE "ON"-"OFF" POUND FORCES.

AVERAGE OF THREE MEASUREMENTS, SAFE "ON" - 9.00 LBS.
SAFE "OFF" 4.00 LBS.

B. SECOND FIRE CONTROL

1. 3 FOOT DROP - SAFE MOVED FROM "ON" TO "OFF" POSITION
2. SAFE "ON"-"OFF" POUND FORCES.

AVERAGE OF THREE MEASUREMENTS, SAFE "ON" - 9.33 LBS
SAFE "OFF" - 4.25 LBS

NO PRESENT REMINGTON STANDARDS FOR M/788
SAFE "ON"-"OFF" POUND FORCES.

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☐ Developmental ☒ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> ☒ Safety Related ☐ Litigation ☐ Competitive Evaluation ☐ Warehouse Audit ☐ New Design ☐ Cost Reduction ☐ Design Change ☐ Stake _____ ☐ Plant Assistance ☐ Other _____	
<u>FIREARM STATS.</u> MODEL: <u>788</u> CAL or GAGE: <u>ALL</u> BARREL TYPE: <u>ALL</u> PROOFED: YES ☐ NO ☐	<u>REPORT REQ'D.</u> FORMAL ☒ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>9-10-82</u> DATE NEEDED BY: <u>9-20-82</u> REQUESTED BY: <u>R.S. MURPHY</u> WORK ORDER NO: <u>C-1806-000</u>

TEST TYPE

☐ Strength Test	☐ Ammunition Test	☐ Dry Cycle Test	☐ Photo/Video
☐ Function Test	☐ Environmental Test	☐ Measurements	☒ Other <u>DROP</u>
☐ Accuracy Test	☐ Customer Complaint	☐ Endurance Test	<u>TEST</u>

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

THE DROP TEST SHOULD BE DONE TO
 CONFIRM THAT THE SAFETY WILL NOT JAR
 OFF.

FIRING PIN

-GUNS REQUIRED:

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: _____

880561 M/24 Accuracy G.F.M. Barrels
881342 M/24 Zinc Phosphate Coated Firing Pins
881343 M/24 Firing Pin Assembly Function Test
870422 M/24 Stem Malfunctions
871351 M/24 Shoulder vs Device Accuracy

REQUESTER: F.E. MARTIN TESTER: J. SELAN DATE: 2/25/88
REPORT NO.: 880561 WORK ORDER NO.: 481011
WRITTEN BY: J. SELAN
TEST TYPE: DEVELOPMENTAL

FIREARM STAT'S : MODEL: M/24. SNIPER CAL or GAUGE: .308 WIN
BARREL TYPE: HVY. PROOFED: YES ☒ NO ☐

REASON FOR TEST : TO DETERMINE ACCURACY OF S-R G.F.M.
BARRELS PRODUCED BY REMINGTON

EQUIPMENT REQUIRED :

REMINGTON AMMO: .308 WIN. 168 GR. H.P. B.T. MATCH
1- FRANKFORD MACHINE REST
1- M-24 SNIPER STOCK
2- BARRELED ACTIONS. .308 WIN - *B6823513 - *B6823512
1- DIGITIZING TABLET & H.P. 9000 COMPUTER

MISC. CLEANING EQUIPMENT

TEST PROCEDURE :

CLEAN BORE OF RIFLES. WIRE BRUSH - PATCH DRY HOPPE'S #9 SOLVENT
MOUNT IN MACHINE & BORE SIGHT
FIRE SIGHTING ROUNDS

FIRE - THREE - 16 SHOT GROUPS ALLOW APPROX. THREE (3) MINUTES
BETWEEN GROUPS AND APPROX. 20 SECONDS BETWEEN SHOTS.

REMOVE RIFLE FROM REST

RECLEAN BORE. FOLLOWING PROCEDURE FROM ABOVE

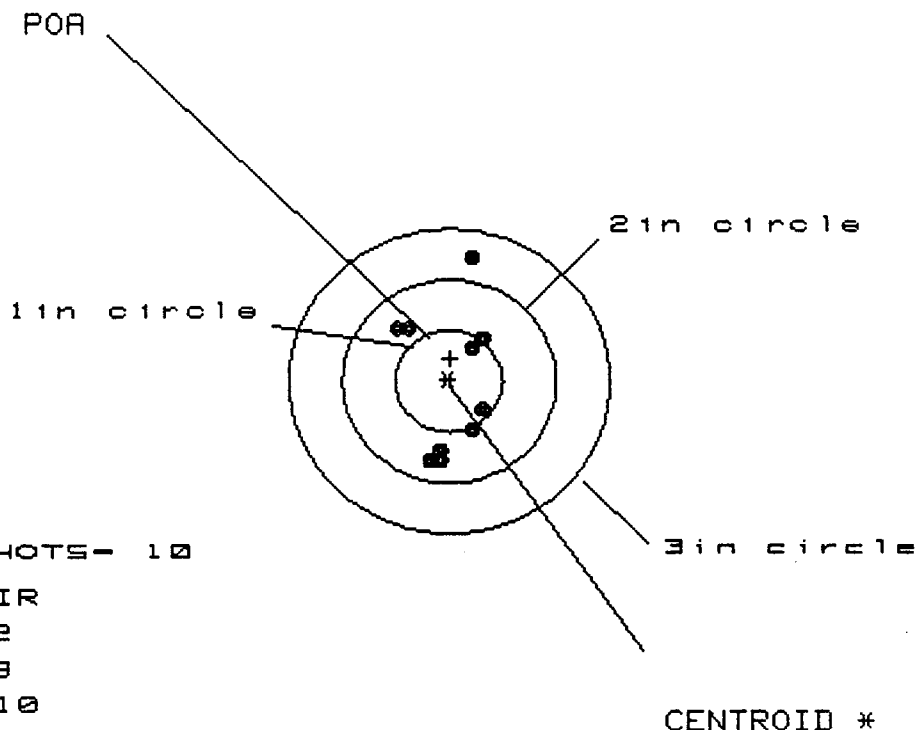
TEST RESULTS :

SEE ATTACHED SHEETS.

26 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3512.1

CENTERFIRE PATTERNS # 1



OF SHOTS- 10

IN CIR

1 in - 2

2 in - 9

3 in - 10

HS- .859

VS= 1.942

GS= 1.966

AVG = 2.237.

AVG M.R. = 0.724

PATTERN #	:	1	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.327	.351	.344
MINIMUM X	:	-.532	-.508	-.515
MAXIMUM Y	:	1.176	.658	.578
MINIMUM Y	:	-.766	-.635	-.703
CENTROID X	:	-.013	-.037	-.030
CENTROID Y	:	-.222	-.353	-.273
POA TO CENTROID in.	:	.222	.355	.275
ANGLE POA CENTROID	:	266.753	263.959	263.686
MIN RADIUS	:	.380	.334	.372
MEAN RADIUS	:	.670	.596	.591
MAX RADIUS	:	1.197	.831	.774
HORIZONTAL SPREAD	:	.859	.859	.859
VERTICAL SPREAD	:	1.942	1.293	1.281
EXTREME SPREAD	:	1.966	1.369	1.338
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		9	
NUMBER IN THREE INCH CIRCLE	=		10	

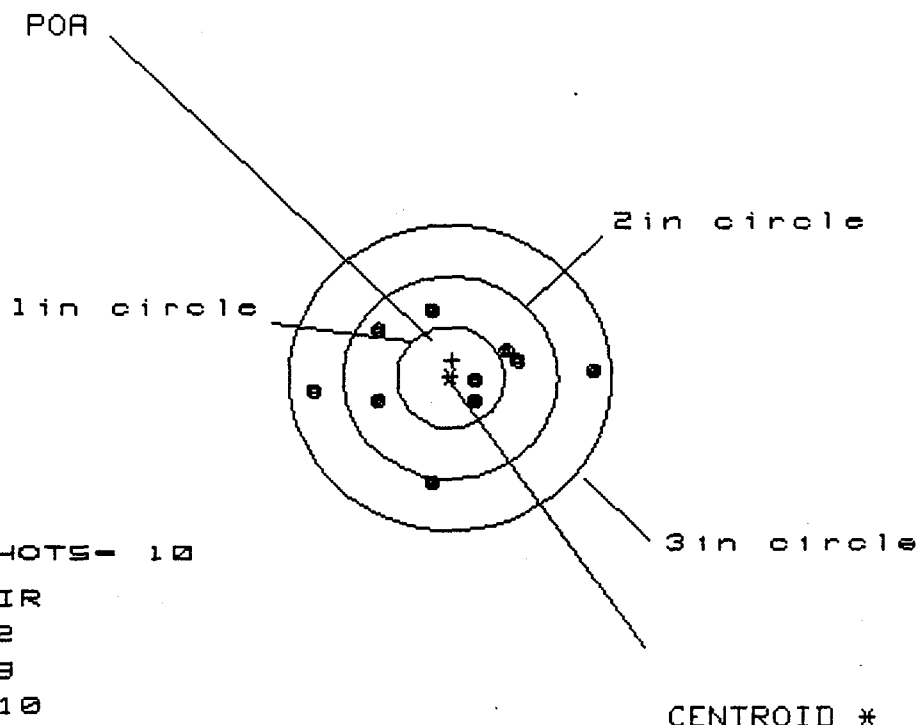
5-R G.F.M. BBL.

FRANKFORD REST.
100 YDS.M-118 - SPECIAL BALL.
(MILITARY)

26 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3512.1

CENTERFIRE PATTERNS # 2



OF SHOTS- 10

IN CIR

1in = 2

2in = 8

3in = 10

HS= 2.529

VS= 1.637

GS= 2.536

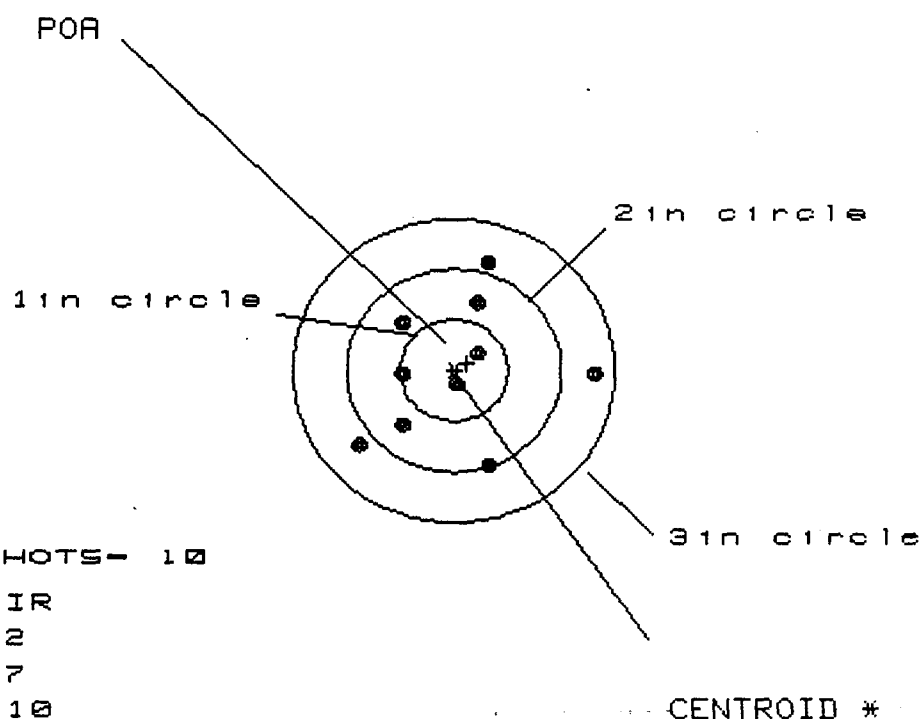
CENTROID *

PATTERN #	2	9	8
SHOTS (BEST OF)	10	9	8
MAXIMUM X	1.275	.737	.598
MINIMUM X	-1.254	-1.112	-.659
MAXIMUM Y	.651	.658	.643
MINIMUM Y	-.986	-.979	-.994
CENTROID X	-.025	-.167	-.028
CENTROID Y	-.171	-.178	-.164
POA TO CENTROID in.	.173	.244	.166
ANGLE POA CENTROID	261.612	226.827	260.325
MIN RADIUS	.215	.351	.220
MEAN RADIUS	.753	.706	.625
MAX RADIUS	1.277	1.118	1.003
HORIZONTAL SPREAD	2.529	1.849	1.257
VERTICAL SPREAD	1.637	1.637	1.637
EXTREME SPREAD	2.536	1.871	1.637
NUMBER IN ONE INCH CIRCLE =	2		
NUMBER IN TWO INCH CIRCLE =	8		
NUMBER IN THREE INCH CIRCLE =	10		

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FILE:/PATTERNING/CENTERFIRE_PATT/3512.1

CENTERFIRE PATTERNS # 3



OF SHOTS- 10

IN CIR

1in = 2

2in = 7

3in = 10

HS= 2.177

VS= 1.962

GS= 2.290

CENTROID *

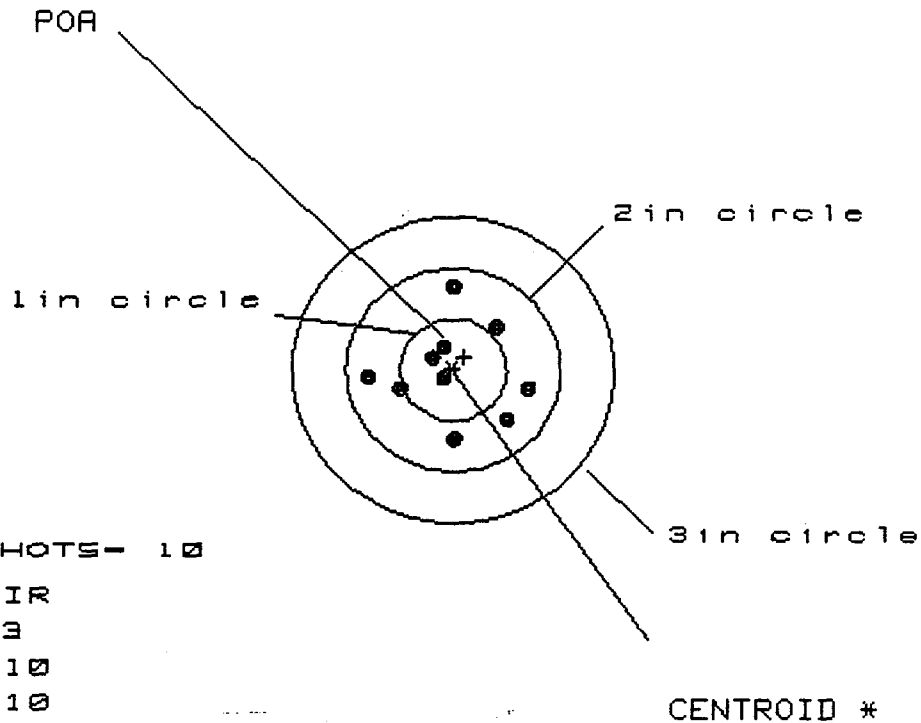
PATTERN #	3	9	8
SHOTS (BEST OF)	10	9	8
MAXIMUM X	1.287	.501	.408
MINIMUM X	-.890	-.747	-.478
MAXIMUM Y	1.071	1.066	.972
MINIMUM Y	-.891	-.896	-.990
CENTROID X	-.117	-.260	-.167
CENTROID Y	-.068	-.063	.031
POA TO CENTROID in.	.135	.268	.170
ANGLE POA CENTROID	209.934	193.668	100.508
MIN RADIUS	.122	.184	.224
MEAN RADIUS	.749	.680	.626
MAX RADIUS	1.288	1.178	1.054
HORIZONTAL SPREAD	2.177	1.248	.886
VERTICAL SPREAD	1.962	1.962	1.962
EXTREME SPREAD	2.290	2.208	1.963
NUMBER IN ONE INCH CIRCLE =		2	
NUMBER IN TWO INCH CIRCLE =		7	
NUMBER IN THREE INCH CIRCLE =		10	

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FILE:/PATTERNING/CENTERFIRE_PATT/3513.1

CENTERFIRE PATTERNS

1



OF SHOTS- 10

IN CIR

1 in = 3

2 in = 10

3 in = 10

HS= 1.511

VS= 1.554

GS= 1.555

AVG = 1.778

AVG - M.R. = .589

PATTERN #	:	1	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.703	.708	.607
MINIMUM X	:	-.808	-.803	-.554
MAXIMUM Y	:	.853	.561	.565
MINIMUM Y	:	-.701	-.607	-.603
CENTROID X	:	-.100	-.105	-.004
CENTROID Y	:	-.125	-.219	-.223
POA TO CENTROID in.	:	.160	.243	.223
ANGLE POA CENTROID	:	231.279	244.513	268.941
MIN RADIUS	:	.140	.073	.170
MEAN RADIUS	:	.557	.519	.494
MAX RADIUS	:	.854	.804	.627
HORIZONTAL SPREAD	:	1.511	1.511	1.161
VERTICAL SPREAD	:	1.554	1.168	1.168
EXTREME SPREAD	:	1.555	1.514	1.224
NUMBER IN ONE INCH CIRCLE	=		3	
NUMBER IN TWO INCH CIRCLE	=		10	
NUMBER IN THREE INCH CIRCLE	=		10	

5-R. G.F.M. BBL.

FRANK FORD REST.

100 YDS.

M-118 SPECIAL BALL

(MILITARY)

26 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3513.1

CENTERFIRE PATTERNS

2

POA

1in circle

2in circle

3in circle

CENTROID *

OF SHOTS- 10

IN CIR

1in = 4

2in = 7

3in = 10

HS= 1.048

VS= 2.053

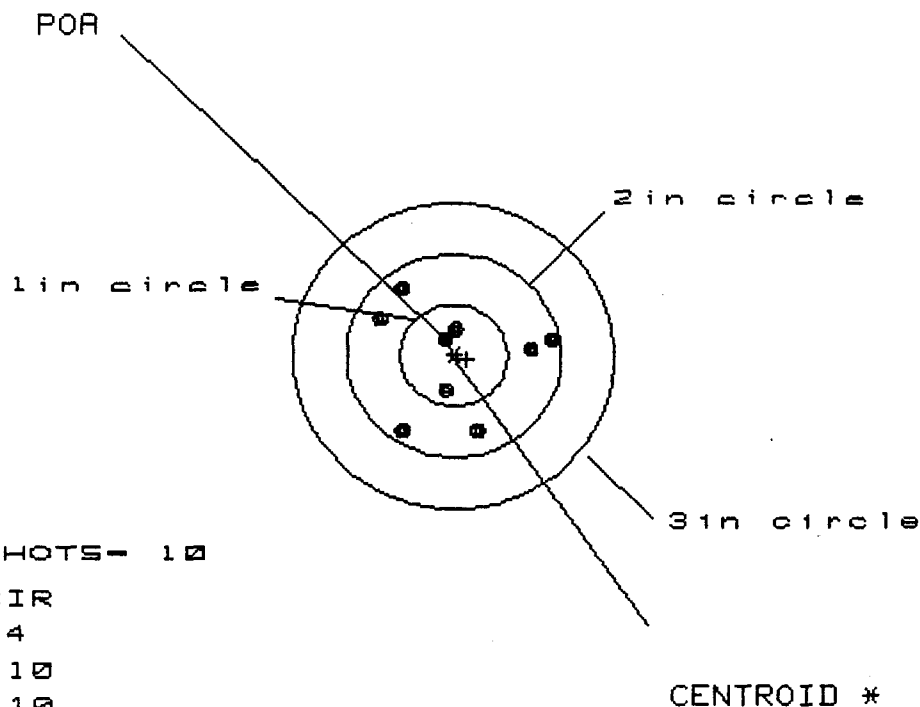
GS= 2.069

PATTERN #	:	2	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.466	.485	.519
MINIMUM X	:	-.582	-.530	-.496
MAXIMUM Y	:	1.001	.884	.995
MINIMUM Y	:	-1.052	-.786	-.675
CENTROID X	:	-.025	-.077	-.111
CENTROID Y	:	.098	.215	.104
POA TO CENTROID in.	:	.101	.228	.152
ANGLE POA CENTROID	:	165.482	160.232	133.135
MIN RADIUS	:	.183	.255	.146
MEAN RADIUS	:	.647	.603	.534
MAX RADIUS	:	1.150	.925	1.038
HORIZONTAL SPREAD	:	1.048	1.015	1.015
VERTICAL SPREAD	:	2.053	1.670	1.670
EXTREME SPREAD	:	2.069	1.744	1.741
NUMBER IN ONE INCH CIRCLE	=	4		
NUMBER IN TWO INCH CIRCLE	=	7		
NUMBER IN THREE INCH CIRCLE	=	10		

26 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3513.1

CENTERFIRE PATTERNS # 3



OF SHOTS- 10

IN CIR

1 in = 4

2 in = 10

3 in = 10

HS= 1.601

VS= 1.322

GS= 1.712

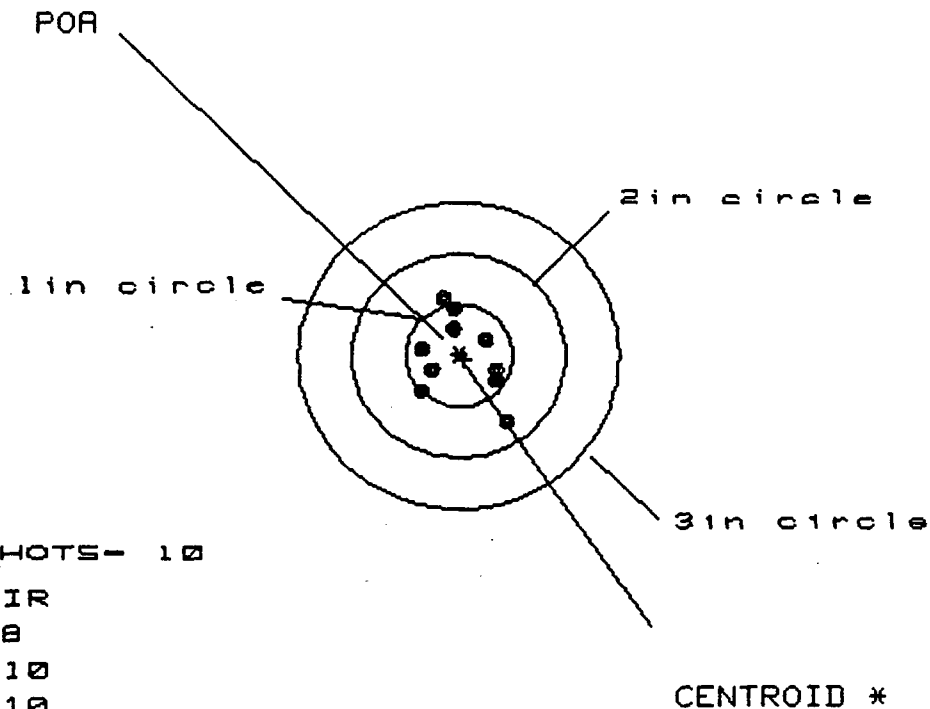
PATTERN #	:	3	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.967	.782	.734
MINIMUM X	:	-.634	-.527	-.575
MAXIMUM Y	:	.615	.636	.550
MINIMUM Y	:	-.708	-.686	-.755
CENTROID X	:	-.118	-.225	-.177
CENTROID Y	:	.037	.016	.102
POA TO CENTROID in.	:	.124	.226	.204
ANGLE POA CENTROID	:	107.672	94.066	119.840
MIN RADIUS	:	.162	.146	.074
MEAN RADIUS	:	.563	.511	.450
MAX RADIUS	:	.986	.786	.797
HORIZONTAL SPREAD	:	1.601	1.309	1.309
VERTICAL SPREAD	:	1.322	1.322	1.305
EXTREME SPREAD	:	1.712	1.472	1.472
NUMBER IN ONE INCH CIRCLE	=		4	
NUMBER IN TWO INCH CIRCLE	=		10	
NUMBER IN THREE INCH CIRCLE	=		10	

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FILE:/PATTERNING/CENTERFIRE_PATT/3513

CENTERFIRE PATTERNS

1



OF SHOTS- 10

IN CIR

1 in - 8

2 in - 10

3 in - 10

HS- .763

VS- 1.211

GS- 1.335

AVG = 1.112

AVG. M.R. = .340

5-R GFM BBL.

PATTERN # :

1

SHOTS (BEST OF)	10	9	8
MAXIMUM X	.398	.399	.385
MINIMUM X	-.365	-.321	-.336
MAXIMUM Y	.556	.483	.417
MINIMUM Y	-.655	-.368	-.307
CENTROID X	-.041	-.085	-.071
CENTROID Y	.037	.110	.049
POA TO CENTROID in.	.055	.139	.086
ANGLE POA CENTROID	131.926	142.105	125.006
MIN RADIUS	.257	.176	.238
MEAN RADIUS	.417	.366	.350
MAX RADIUS	.767	.498	.455
HORIZONTAL SPREAD	.763	.720	.720
VERTICAL SPREAD	1.211	.851	.724
EXTREME SPREAD	1.335	.909	.778
NUMBER IN ONE INCH CIRCLE	= 8		
NUMBER IN TWO INCH CIRCLE	= 10		
NUMBER IN THREE INCH CIRCLE	= 10		

FRANKFORD REST
100 YDS.

REM.: 308 WIN

168 GR H.P. BOAT TAIL
MATCH

25 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3513

CENTERFIRE PATTERNS

2

POA

1 in circle

2 in circle

3 in circle

CENTROID *

OF SHOTS- 10

IN CIR

1 in = 7

2 in = 10

3 in = 10

HS= .885

VS= 1.018

GS= 1.113

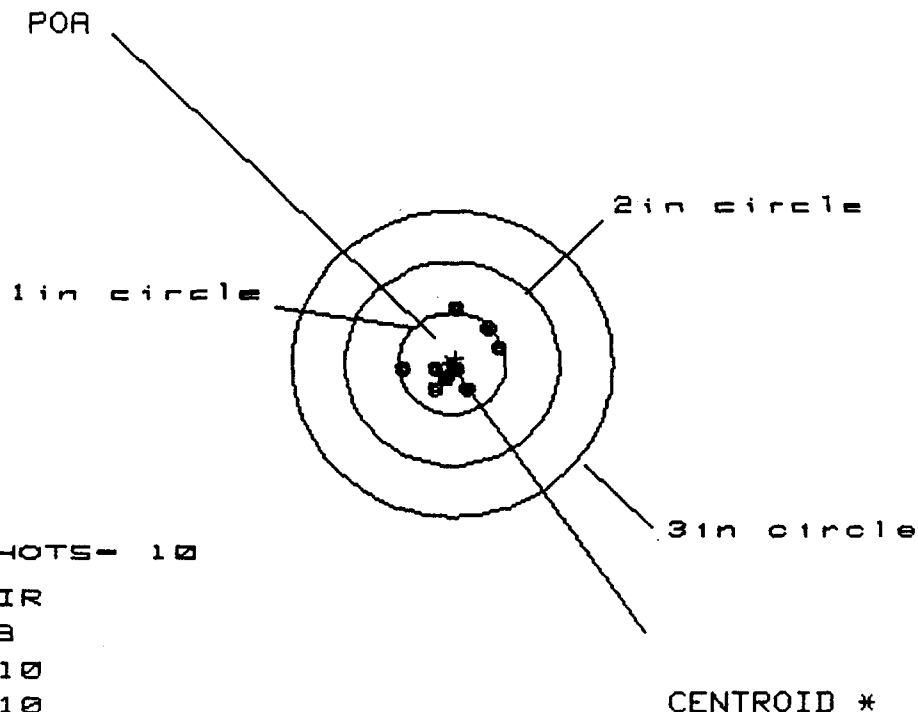
PATTERN #	:	10	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.518	.559	.554
MINIMUM X	:	-.367	-.326	-.331
MAXIMUM Y	:	.475	.252	.191
MINIMUM Y	:	-.543	-.490	-.234
CENTROID X	:	-.010	-.051	-.046
CENTROID Y	:	-.048	-.101	-.040
POA TO CENTROID in.	:	.049	.113	.061
ANGLE POA CENTROID	:	258.598	243.284	220.896
MIN RADIUS	:	.100	.033	.075
MEAN RADIUS	:	.303	.256	.227
MAX RADIUS	:	.602	.575	.558
HORIZONTAL SPREAD	:	.885	.885	.885
VERTICAL SPREAD	:	1.018	.742	.425
EXTREME SPREAD	:	1.113	.937	.937
NUMBER IN ONE INCH CIRCLE	=		7	
NUMBER IN TWO INCH CIRCLE	=		10	
NUMBER IN THREE INCH CIRCLE	=		10	

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FILE:/PATTERNING/CENTERFIRE_PATT/3513

CENTERFIRE PATTERNS

3



OF SHOTS- 10

IN CIR

1 in = 9

2 in = 10

3 in = 10

HS= .844

VS= .809

GS= .888

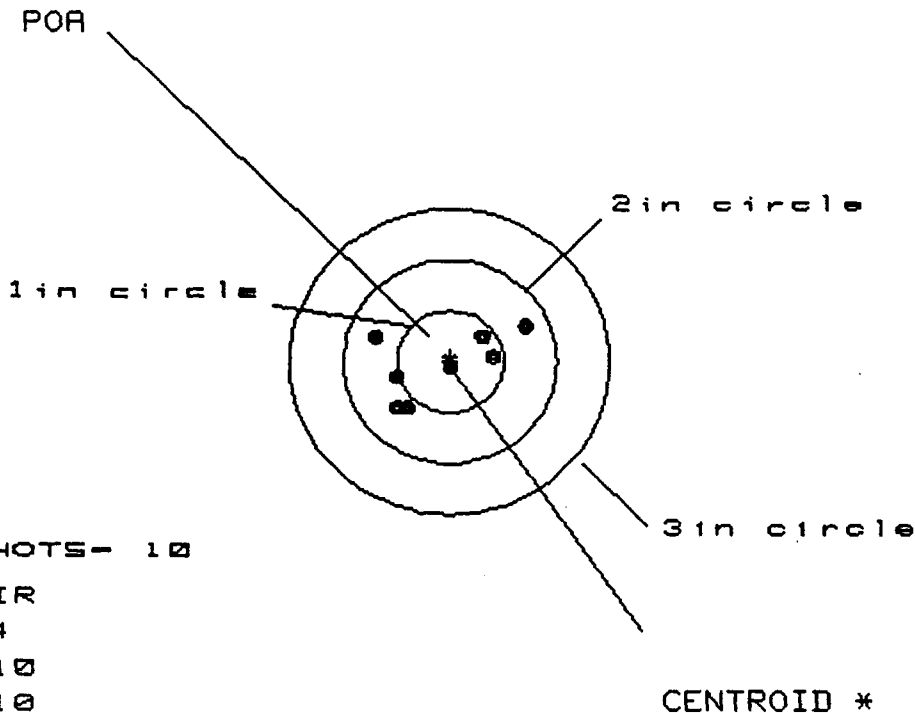
PATTERN #	3	9	8
SHOTS (BEST OF)	10	9	8
MAXIMUM X	.405	.404	.442
MINIMUM X	-.439	-.440	-.402
MAXIMUM Y	.517	.443	.226
MINIMUM Y	-.292	-.235	-.179
CENTROID X	-.040	-.039	-.077
CENTROID Y	-.050	-.107	-.163
POA TO CENTROID in.	.064	.114	.180
ANGLE POA CENTROID	231.495	250.031	244.573
MIN RADIUS	.046	.011	.006
MEAN RADIUS	.301	.256	.201
MAX RADIUS	.517	.539	.497
HORIZONTAL SPREAD	.844	.844	.844
VERTICAL SPREAD	.809	.678	.405
EXTREME SPREAD	.888	.888	.869
NUMBER IN ONE INCH CIRCLE	= 9		
NUMBER IN TWO INCH CIRCLE	= 10		
NUMBER IN THREE INCH CIRCLE	= 10		

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FILE:/PATTERNING/CENTERFIRE_PATT/3512

CENTERFIRE PATTERNS

1



OF SHOTS - 10

IN CIR

1 in - 4

2 in - 10

3 in - 10

HS - 1.480

VS - .847

GS - 1.483

AVG = 1.344

M.R. AVG = .437

PATTERN #	:	1	2	3
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.744	.751	.669
MINIMUM X	:	-.736	-.654	-.536
MAXIMUM Y	:	.347	.357	.394
MINIMUM Y	:	-.500	-.461	-.424
CENTROID X	:	-.004	-.086	-.004
CENTROID Y	:	-.049	-.088	-.125
POA TO CENTROID in.	:	.049	.123	.125
ANGLE POA CENTROID	:	265.824	225.548	267.934
MIN RADIUS	:	.023	.097	.013
MEAN RADIUS	:	.505	.475	.424
MAX RADIUS	:	.821	.832	.777
HORIZONTAL SPREAD	:	1.480	1.405	1.205
VERTICAL SPREAD	:	.847	.818	.818
EXTREME SPREAD	:	1.483	1.406	1.382
NUMBER IN ONE INCH CIRCLE	=	4	10	10
NUMBER IN TWO INCH CIRCLE	=	10	10	10
NUMBER IN THREE INCH CIRCLE	=	10	10	10

5-R G.F.M. BBL.

FRANK FORD REST
100 YDS.

REM.: 308 WIN.

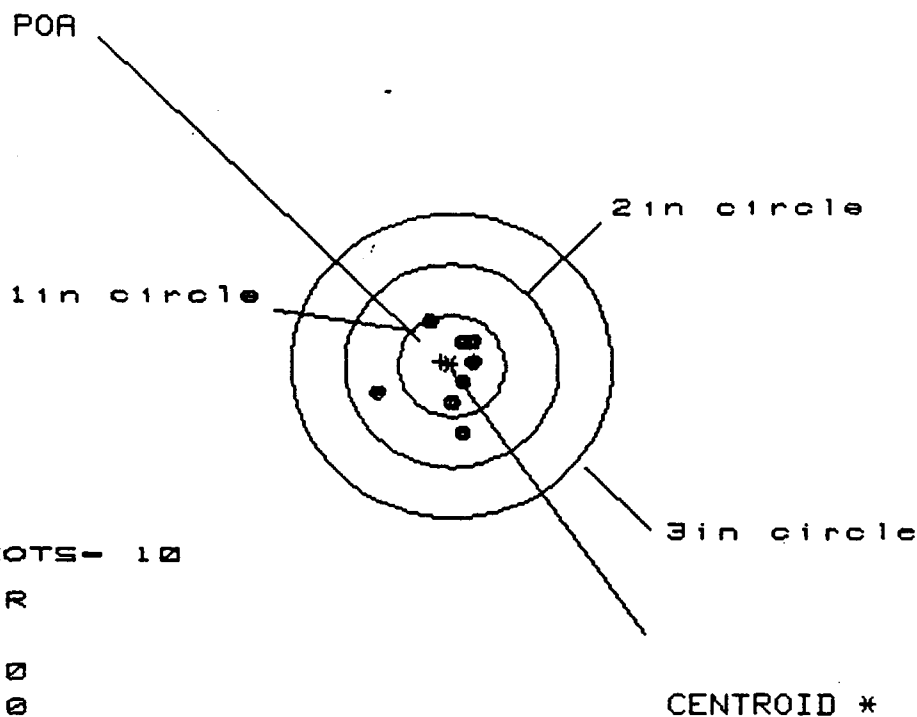
168GR. H.P. BT. MATCH

25 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3512

CENTERFIRE PATTERNS

2



OF SHOTS- 10

IN CIR

1in = 8

2in = 10

3in = 10

HS= .881

VS= 1.088

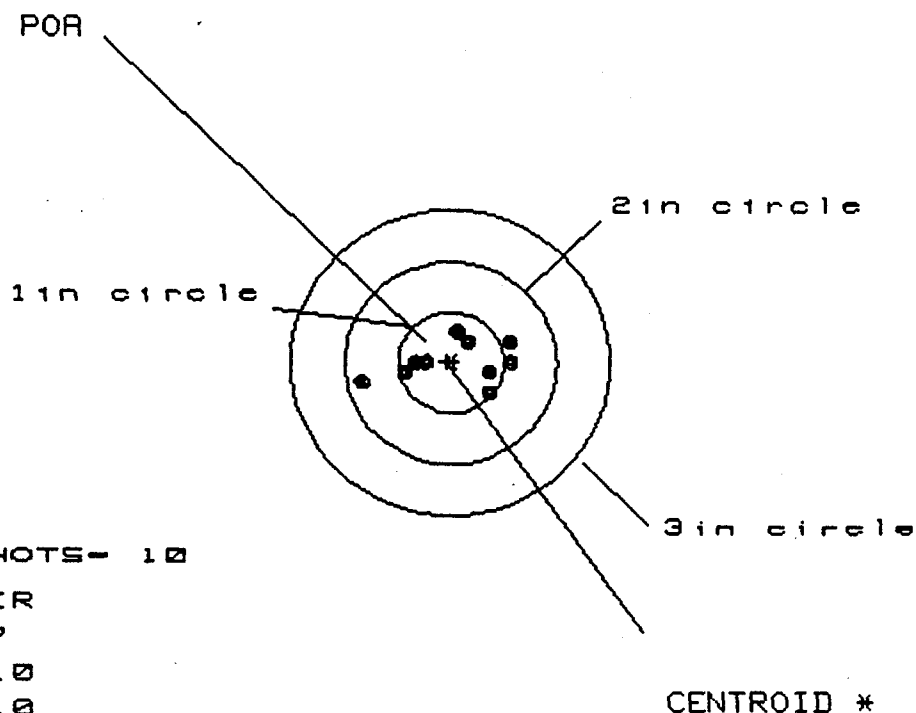
GS= 1.138

PATTERN #	:	10	9	8
SHOTS (BEST OF)	:	10	9	8
MAXIMUM X	:	.203	.128	.134
MINIMUM X	:	-.677	-.285	-.279
MAXIMUM Y	:	.436	.409	.325
MINIMUM Y	:	-.652	-.679	-.444
CENTROID X	:	.100	.175	.169
CENTROID Y	:	-.044	-.017	.067
POA TO CENTROID in.	:	.109	.176	.182
ANGLE POA CENTROID	:	293.663	275.700	21.779
MIN RADIUS	:	.162	.122	.120
MEAN RADIUS	:	.364	.302	.238
MAX RADIUS	:	.717	.680	.453
HORIZONTAL SPREAD	:	.881	.413	.413
VERTICAL SPREAD	:	1.088	1.088	.769
EXTREME SPREAD	:	1.138	1.138	.792
NUMBER IN ONE INCH CIRCLE	=		8	
NUMBER IN TWO INCH CIRCLE	=		10	
NUMBER IN THREE INCH CIRCLE	=		10	

25 Feb 1988

FILE:/PATTERNING/CENTERFIRE_PATT/3512

CENTERFIRE PATTERNS # 3



OF SHOTS- 10

IN CIR

1in = 7

2in = 10

3in = 10

HS= 1.354

VS= .562

GS= 1.411

PATTERN #	3	9	8
SHOTS (BEST OF)	10	9	8
MAXIMUM X	.528	.436	.489
MINIMUM X	-.826	-.576	-.523
MAXIMUM Y	.271	.246	.269
MINIMUM Y	-.291	-.316	-.293
CENTROID X	.041	.133	.080
CENTROID Y	-.012	.013	-.010
POA TO CENTROID in.	.043	.134	.080
ANGLE POA CENTROID	286.111	5.440	276.981
MIN RADIUS	.265	.216	.265
MEAN RADIUS	.443	.382	.374
MAX RADIUS	.855	.587	.530
HORIZONTAL SPREAD	1.354	1.012	1.012
VERTICAL SPREAD	.562	.562	.562
EXTREME SPREAD	1.411	1.045	1.014
NUMBER IN ONE INCH CIRCLE	= 7		
NUMBER IN TWO INCH CIRCLE	= 10		
NUMBER IN THREE INCH CIRCLE	= 10		

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington.



PETERS



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

xc: G.J. Hill
F.L. Supry
[REDACTED]

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881342
MAY 25, 1988

MODEL 24 ZINC PHOSPHATE COATED FIRING PIN ASSEMBLY FUNCTION TEST

TEST AND MEASUREMENT LAB

- TEST REPORT

REQUESTER: G.J. HILLTESTER: LABDATE: 26 MAY 1988REPORT NO.: 881342WORK ORDER NO.: 053022WRITTEN BY: F.L. SUPRYTEST TYPE: 100 ROUND FUNCTIONREASON FOR TEST:

To determine if the ten firing pin assemblies that had been coated with Zinc Phosphate would assemble and function normally in the Model 24 rifle.

EQUIPMENT REQUIRED:

Ten Zinc Phosphate coated firing pin assemblies, 1000 rounds of 7.62 mm NATO ammunition, shooting jack, and personnel.

TEST PROCEDURE:

One Model 24 rifle was used throughout the test. The firing pin assembly was removed from the rifle and replaced with one of the test firing pin assemblies. The rifle was placed in a shooting jack and 100 rounds were fired. The rifle was cooled every 20 rounds, and the indent was checked on one out of every ten rounds. The procedure was repeated until all ten firing pin assemblies were completed.

TEST RESULTS:

In all cases the firing pin assemblies function normally, firing all 100 rounds. All the indents were normal.

All ten samples screwed into the bolt body with no difficulty.

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☐ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance		AREA OF TESTING ☐ Safety Related ☐ Litigation ☐ Competitive Evaluation ☐ Warehouse Audit ☐ New Design ☐ Cost Reduction ☒ Design Change ☐ Stake _____ ☐ Plant Assistance ☐ Other <u> </u>	
FIREARM STAT'S. MODEL: <u>SWS</u> CAL or GAGE: <u>7.62</u> BARREL TYPE: _____ PROOFED: YES <u>X</u> NO _____		REPORT REQ'D. FORMAL _____ TEST RESULTS ONLY ☒	
		DATE REQUESTED: <u>5/13/88</u> DATE NEEDED BY: <u>5/20/88</u> REQUESTED BY: <u>JH/202</u> WORK ORDER NO: <u>053022</u>	

TEST TYPE			
☐ Strength Test	☐ Ammunition Test	☐ Dry Cycle Test	☐ Photo/Video
☒ Function Test	☐ Environmental Test	☐ Measurements	☐ Other _____
☐ Accuracy Test	☐ Customer Complaint	☐ Endurance Test	_____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

• Test 3 FAT SWS GUNS WITH ZNPHOSPHATE COATED FIRING PINS.

3 GUNS - 10 FIRING PINS - 100 rounds
 per combination FIRING PIN (ANY GUN)
 JH 5/13/88

- GUNS REQUIRED:

4 SWS provided by PE. & C (USE ANY THREE)

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: _____

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington.



PETERS



"CONFINE YOUR LETTER TO ONE SUBJECT ONLY" _____

xc: J.R. Snedeker
F.L. Supry
File

RESEARCH TEST AND MEASUREMENT REPORT

REPORT# 881343
MAY 25, 1988

MODEL 24 FIRING PIN ASSEMBLY FUNCTION TEST

TEST AND MEASUREMENT LAB

- TEST REPORT

REQUESTER: J.R. SNEDEKERTESTER: LABDATE: 25 MAY 1988REPORT NO.: 881343WORK ORDER NO.: 481104WRITTEN BY: F.L. SUPRYTEST TYPE: 10 ROUND FUNCTIONREASON FOR TEST:

To determine if the three firing pin assemblies that had been subjected to 96 hours of the corrosion test would assemble and function in the Model 24 rifle.

EQUIPMENT REQUIRED:

Three firing pin assemblies (labeled, A: NO OIL First Article sample; B: MIL-C-16173; and C: As Received) 30 rounds of 7.62 mm NATO ammunition, shooting jack, and personnel.

TEST PROCEDURE:

One Model 24 rifle (B6896628) was used throughout the test. The firing pin assembly was removed from the rifle and replaced with one of the test firing pin assemblies. The rifle was placed in a shooting jack and ten rounds were fired. The indent was checked on each round as it was fired. The procedure was repeated until all three firing pin assemblies were completed. Photographs of each firing pin assembly, the label, and a representative sample of a fired round for the respective firing pin assembly were taken at the completion of the test.

TEST RESULTS:

In all cases the firing pin assemblies function normally, firing all ten rounds. All the indents were normal.

Samples B and C screwed into the bolt body with no difficulty.

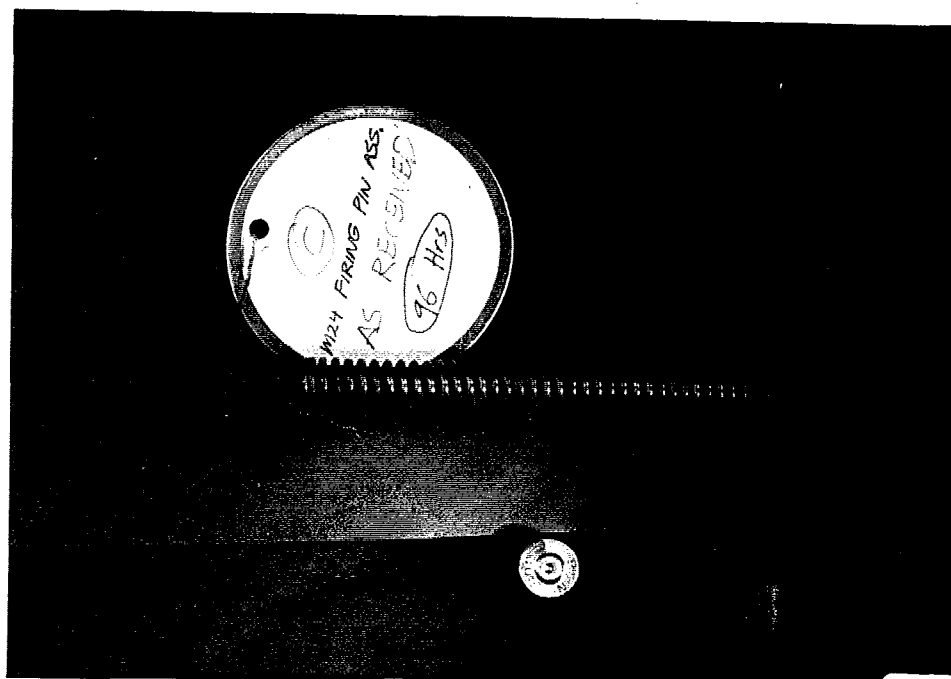
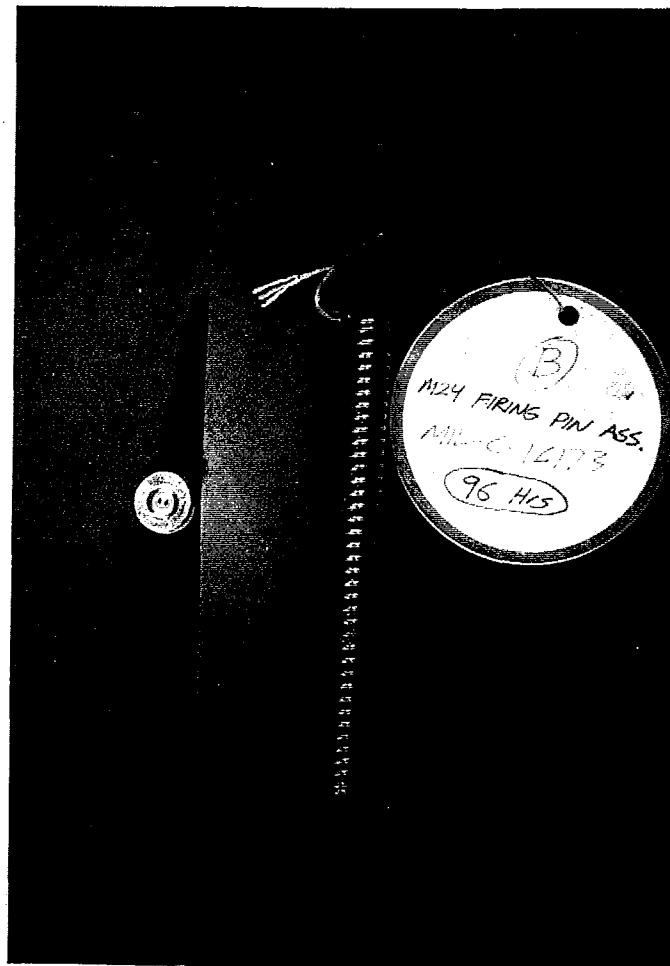
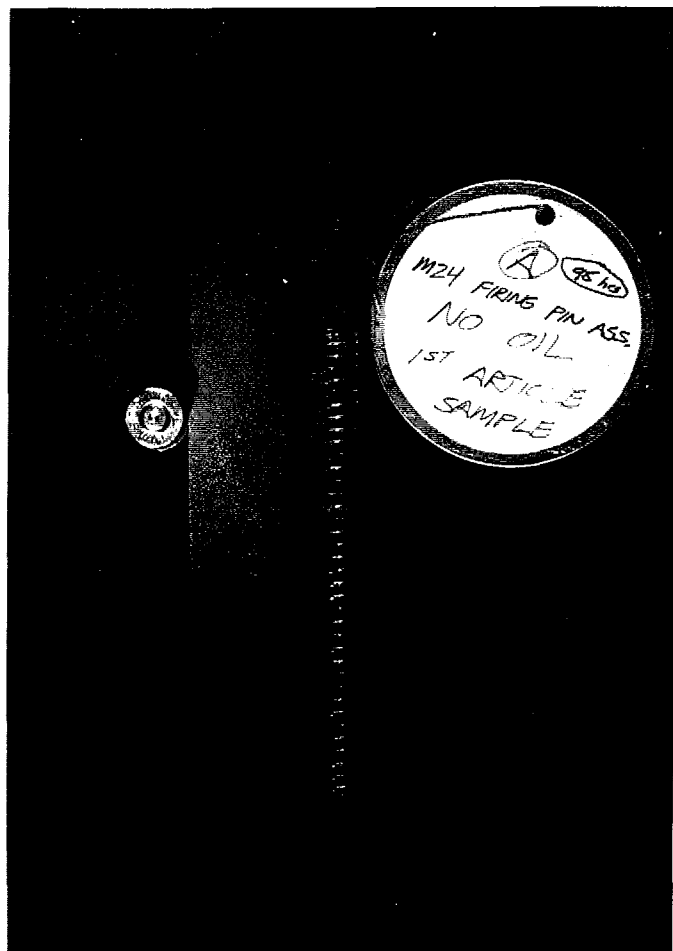
Due to corrosion in the threads of sample A, it was a little more difficult to screw into the bolt body.

The photographs are included on the following page.

RP# 881343

25 MAY 1988

PHOTOGRAPHIC SUMMARY



TEST AND MEASUREMENT LAB

- TEST REPORT

REQUESTER: F.E. MARTIN
REPORT NO.: 870422
WRITTEN BY: F.L. SUPRY

TESTER: TEST LABDATE: 02/13/87WORK ORDER NO.: B-0504TEST TYPE: 500 ROUND FUNCTION TESTFIREARM STAT'S:MODEL: SWSCAL OR GAGE: 308 WINBARREL TYPE: HEAVYPROOFED: YES X NOREASON FOR TEST:

To verify that the "fix", for a reported problem with stem malfunctions, eliminated or reduced the malfunction to an acceptable malfunction rate.

EQUIPMENT REQUIRED:

SWS rifle #B6824006, 180 grain pointed soft point 308 Win caliber ammunition (Remington R309W3 code C13TC6405), shooting jack, shooting range, and personnel.

TEST PROCEDURE:

The rifle was mounted in a shooting jack, after the bore of the rifle was brushed with Hoppe's No. 9 solvent and patched dry. The chamber of the rifle was loaded, and four rounds were loaded in the magazine, the bolt was closed and one round was fired every 50 seconds. The loading procedure was repeated every five rounds. The rifle was cooled and cleaned every 30 rounds.

NOTE: AT THE START OF THE TEST (THE FIRST 90 ROUNDS) THE FEEDING SPEED WAS SLOW AND DELIBERATE. DURING THIS PORTION OF THE TEST 22 STEM MALFUNCTIONS OCCURRED, A RATE OF 24.4%.

The test was restarted, by the instructions from the Engineer in charge of the test, using a faster feeding stroke. Five hundred rounds were fired, following the procedure outlined above.

TEST RESULTS:

No malfunctions occurred during the firing of the 500 rounds, after the restart. However, the Test Lab feels that the slower feeding cycle speed represents a truer picture of the intended use for this rifle, and questions the validity of the test after the restart.

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

☒ Developmental ☐ Design Acceptance ☐ Pre-Pilot ☐ Pilot ☐ Production Acceptance	<u>AREA OF TESTING</u> ☐ Safety Related ☐ Litigation ☐ Competitive Evaluation ☐ Warehouse Audit ☐ New Design ☐ Cost Reduction ☐ Design Change Stake _____ ☐ Plant Assistance ☐ Other _____	
<u>FIREARM STAT'S.</u> MODEL: <u>SWS</u> CAL or GAGE: _____ BARREL TYPE: _____ PROOFED: YES _____ NO _____	<u>REPORT REQ'D.</u> FORMAL _____ TEST RESULTS ONLY ☒	DATE REQUESTED: <u>5-15-87</u> DATE NEEDED BY: _____ REQUESTED BY: <u>Martin</u> WORK ORDER NO: <u>L-04104</u>

<u>TEST TYPE</u>			
☐ Strength Test ☐ Function Test ☒ Accuracy Test	☐ Ammunition Test ☐ Environmental Test ☐ Customer Complaint	☐ Dry Cycle Test ☐ Measurements ☐ Endurance Test	☐ Photo/Video ☐ Other _____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

Assemble SWS (3) Sem: Works Area
 SHOOT 100 yd Accuracy Shoulder (3x5")
 SHOOT 100 yd Accuracy Device (3x5")
 To Correlate Shoulder Acc & Device
 And Develop Test Procedure
 See Writer Before Starting Test

GUNS REQUIRED:

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: 6-18-87TEST COMPLETED BY: J. SELAN

REPORT DATE: _____

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F.E. MARTINTESTER: J. SELANDATE: 6/18/87REPORT NO.: 871351WORK ORDER NO.: 2-6404WRITTEN BY: J. SELANTEST TYPE: DEVELOPMENTALFIREARM STAT'S : MODEL: S.W.S.CAL or GAUGE: 7.62 N.A.T.O.BARREL TYPE: HEAVYPROOFED: YES ☒ NO ☐REASON FOR TEST :

TO CORRELATE SHOULDER ACCURACY AND DEVICE
TO DEVELOPE TEST PROCEDURE

EQUIPMENT REQUIRED :

4- S.W.S. CAL. 7.62 N.A.T.O. RIFLES. *B-6829734 - *B-6829738 - *B-6829740 - *B-6829732

1- FRANKFORD MACHINE REST

1- DIGITIZING TABLET

LOADING EQUIPMENT: (RCBS DIES) (1-NECK SIZER - 1-SEATER) LOADING PRESS

PRIMER SEATER - POWDER SCALES.

PRIMERS - POWDER - BULLETS.

TEST PROCEDURE :

HANDLOAD AMMO:

L.C. MATCH BRASS.

168 GR. - SIERRA BULLET - H&B.T.

37 GR. - 3031

REM. 1 1/2 PRIMER.

* SEAT BULLET OUT SO AS TO JUST ENGAGE LANDS.

SHOOT- 100 YD. ACCURACY- SHOULDER - (4X5)

SHOOT- 100 YD. ACCURACY- DEVICE (4X5)

MEASURE AND RECORD RESULTS.

TEST RESULTS :

RESULTS - SEE ATTACHED SHEETS.

ACCURACY RESULTS: SHOULDER VS. DEVICE.

S.W.S. 7.62 NATO

SHOULDER:

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>AVG.</u>
B-6829754	1.49	.498	.957	1.172	1.03
B-6829758	1.06	.816	.647	.841	.841
B-6829748	1.32	1.142	.771	.560	.948
B-6829732	.812	.475	.305	1.06	.663

AGGREGATE: .870

DEVICE:

B-6829754	.401	.532	.450	.437	.455
B-6829758	.768	.590	.295	.837	.622
B-6829748	.654	.541	.570	.784	.637
B-6829732	1.12	.166	.667	.218	.544

AGGREGATE: .564

ACCURACY RESULTS: SHOULDER VS. DEVICE.

SWS -7.62

200 YDS.

ACCURACY DEVICE

	1	2	3	4	AVG.
B-6829754	.793	1.272	.907	1.331	1.080
MEAN RADIUS	.341	.503	.267	.455	.3915
B-6829758	1.538	1.650	1.016	.999	1.30
MEAN RADIUS	.514	.534	.271	.327	.412
B-6829748	.606	.904	1.155	.536	.8002
MEAN RADIUS	.273	.422	.492	.200	.3417
B-6829732	.708	.912	.824	1.651	1.023
MEAN RADIUS	.238	.356	.320	.507	.3552

AGGREGATE: 1.05

MEAN RADIUS: .3751

7-17-87

J.E.S.

ACCURACY RESULTS - SHOULDER VS. DEVICE

SWS - 7.62

200 YDS.

SHOULDER

	1	2	3	4	AVG.
B-6829754	.722	.300	1.08	1.098	.8002
MEAN RADIUS	.271	.145	.337	.455	.302
B-6829758	1.244	1.403	.600	1.195	1.110
MEAN RADIUS	.383	.531	.220	.458	.398
B-6829748	1.589	1.095	1.013	1.356	1.263
MEAN RADIUS	.586	.490	.441	.396	.467
B-6829732	1.188	.804	.911	1.549	1.113
MEAN RADIUS	.364	.300	.324	.410	.349

AGGREGATE - 1.07

MEAN RADIUS : .3795