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FA ltr 25 Mar 1975

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AD-150 875

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AB-58-1
VOLUME II
SMALL ARMS ALUMINUM CARTRIDGE CASES

JANUARY 15, 1958

C-7275
150
ORDNANCE CONTRACT
DA-19-059-ORD-1578
PROJECT NO. TS 1-II AND TS 1-48

BY

J. H. WHIPPLE

Remington Arms Company, Inc.

RESEARCH AND DEVELOPMENT DEPARTMENT

BRIDGEPORT, CONN.

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AD- 150 875

REMINGTON ARMS CO INC BRIDGEPORT CONN

SMALL ARMS ALUMINIUM CARTRIDGE CASES, VOLUME II (U)

JAN 58 1V WHIPPLE, J.H.:

REPT. NO. AB-5B-1 v1 2

CONTRACT: DA19-059-ORD-1578

PROJ: TS1-11, TS1-4B

UNCLASSIFIED REPORT

C-7275

DESCRIPTORS: *CARTRIDGE CASES, *PRIMERS, ALUMINUM, (U)
DESIGN, SMALL ARMS AMMUNITION

IDENTIFIERS: 30-MM ORDNANCE ITEMS, 20-MM ORDNANCE (U)
ITEMS

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40-150875

VOLUME II

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Supplement II	30 MM FA-T15E1 Aluminum Case Product Drawing Process Record Tool Drawings
Supplement III	Wrap-Around-Sealed-Cup Primer Product Drawing Revised Process Record

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9 June 81

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TOOL STEELS AND METALS SPECIFICATIONS AND BRANDS

<u>Spec. No.</u>	<u>Name</u>	<u>Abbreviated Name</u>	<u>Vendor</u>	<u>Brand</u>
3	1.10C Shallow Hardening Car- bon Tool Steel	Car. Tool; Spec. #3	Crucible Steel Co. Bethlehem Steel Co. Firth Ster- ling Steel Co. Carpenter Steel Co. Latrobe Electric Steel Co.	Sanderson Extra 10 $\frac{1}{2}$ Temper Bethlehem XX Tool #11 Temp Special ASV #5 Temper #11 Extra Shallow Hardening Extra Carbon Tool
4	1.10C Shallow Hardening Car- bon-Vanadium Tool Steel	Car.-Van. Tool, Spec. #4	Latrobe Electric Steel Co. Crucible Steel Co. Bethlehem Steel Co. Houghton and Richards, Inc. Jessop Steel Co.	Carbon-Vanadium Alva Extra 10 $\frac{1}{2}$ Temper Bethlehem Van- adium Sp. H & R Vanadium Lion Extra Vanadium
6	Oil Hardening Tool Steel Manganese Type	Oil Hard. Tool Spec. #6	Allegheny Ludlum Steel Co.	Deward <u>ONLY</u>
7	Oil Hardening Tool Steel, Mn.-Chr.-W. Type	Oil Hard. Tool Spec. #7	Bethlehem Steel Co. Firth Ster- ling Steel Co. Crucible Steel Co. Allegheny Ludlum Steel Co. Vanadium Alloys Steel Co. Latrobe Electric Steel Co. Jessop Steel Co.	Bethlehem Tool Room Invaro Ketos Saratoga Colonial #6 Mangano Special Truform

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TOOL STEELS AND METALS SPECIFICATIONS AND BRANDS

Spec. No.	Name	Abbreviated Name	Vendor	Brand
11	Oil Hardening Alloy Chisel Steel	Alloy-Chisel Spec. #11	Bethlehem Steel Co.	Bethlehem #67 Chisel <u>ONLY</u>
15	Machine Steel, Hot Rolled	Machine Steel Spec. #15		
21	18-Tungsten- 9 Cobalt High Speed Steel	18 Tung-9 Cobalt HS Steel, Spec. #21	Firth Sterling Steel Co.	Circle C
22	1.30 Carbon 3.50 Tungsten Tool Steel	1.30C-3.50 Tung.Tool Steel, Spec. #22	Carpenter Steel Co. Crucible Steel Co. Vanadium Alloy Steel Co. Universal Steel Co. Bethlehem Steel Co.	KW Tool Cres. Double Special Colonial #4 Cyclops-Saturn Finishing
25	Cold Rolled or Drawn Machine Steel	C. R. Machine Steel Spec. #25		
68	.55C-2 Silicon Chisel Steel	.55C-2 Sil. Chisel Steel Spec. #68	Bethlehem Steel Co. Crucible Steel Co.	Omega LaBelle Silicon #2
	Timken Graph- itic Steel		Timken Roller Bearing Co.	Graph Tung
103	SAE 4140 Chrome Moly Steel, Heat Treated	SAE 4140 Steel Spec. #103		
VEGA	Carpenter Vega Die Steel	Vega	Carpenter Steel Co.	Carpenter-Vega

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SUPPLEMENT I

20 MM T20 Aluminum Case

Product Drawing

Revised Process Record

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CASE - 20 MM, T-20 ALUMINUM



RESEARCH & DEVELOPMENT

REMINGTON ARMS CO., INC.

DA-1578-2

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MODIFICATION TO 20 MM T20 ALUMINUM CASE PROCESS RECORD

SUPPLEMENT I TO REMINGTON REPORT AB-54-8

1. - 27. No change.

28. Taper

Head-to-shoulder length 3.491" - .006"

29. No change.

30. No change.

31. No change.

32. No change.

33. No change.

33-A Mouth Anneal

Salt Bath - Case rack
Temperature 700° F.

Immerse cases to a depth sufficient to cover the case neck and approximately half the shoulder. Remove after 60 seconds at temperature. Rinse immediately in water to remove excess salt.

33-B Wash and Dry

Same as Operation No. 4.

34. No change.

35. No change.

36. No change.

37. Mechanical Crimp - By Hand

Drill Press
Crimp Groove Diameter .792" - .798"
Bullet Pull 1200 - 2000 lbs.
Standard 20 MM mechanical crimping tool.

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20 MM T20 Aluminum Case Process Record

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Note: Operations 33-A - 37 must be accomplished within a period of not more than 24 hours in order to insure freshly annealed cases for the mechanical crimp operation.

38. No change.

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SUPPLEMENT II

30 MM FA-T15E1 Aluminum Case

Product Drawing

Process Record

Tool Drawings

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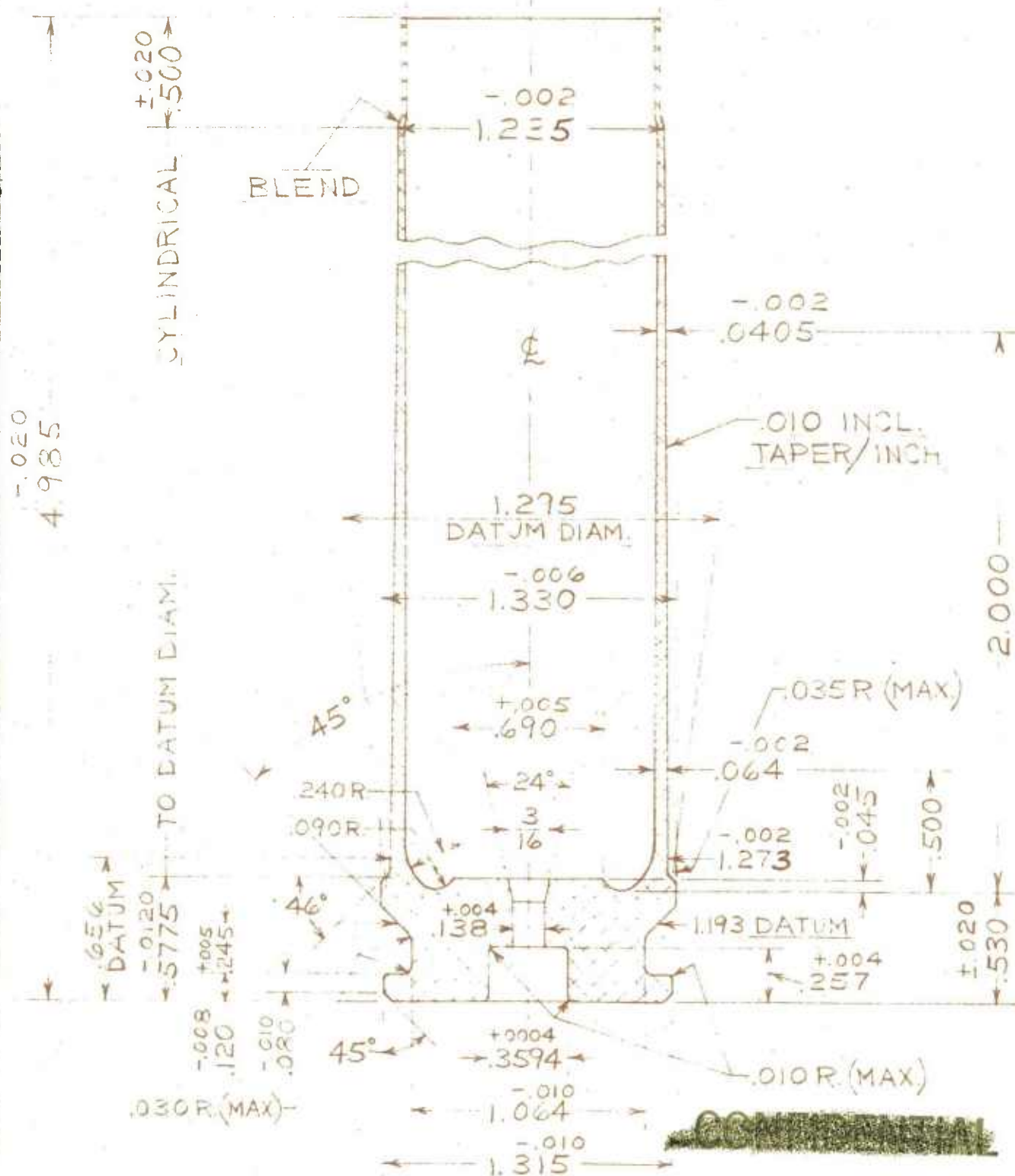
CASE - 30 MM FAT15-E1 ALUMINUM

REVISIONS:

MAX. $\longleftrightarrow$ 1.227 $\longrightarrow$

$\longleftrightarrow$ 1.167 $\longrightarrow$
-0.002
0.028 $\longleftrightarrow$ +0.004

JAN 6 1958



FH.

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30 MM FA-T15E1 ALUMINUM CASE

PROCESS RECORD

1. Purchase Rod

Alloy 75 ST 61 - $1-7/32 \pm .001$ " diameter,
random lengths, cold rolled centerless ground finished.
Hardness 125 - 130 Vickers HN.

2. Shear Slugs

V & O Power Press (50 Ton) - 50/min.

Shear Set BRL-1303
 ERL-1224-1274 inclusive.
 ERL-1301

(Drawings included in Remington
Report AB-51-18).

Modifications for 30 MM

ERL-1231
ERL-1236-1239
ERL-1730

(Drawings included in Remington
Report AB-54-8).

Slug Weight 1300 ± 5 grains

Slug Length $1.575" \pm .008"$
(micrometer measurement at center)

Hardness for Shearing 125 - 140 VHN

The rod as purchased to 75 ST 61 specification has
a tendency to harden with age. An anneal for one hour
at 375° F. before shearing is usually necessary to
bring rod hardness within limits desirable for satis-
factory shearing.

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30 MM FA-T15E1 Aluminum Case Process Record

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3. Inspect

By hand for slug length and surface defects.

4. Wash and Dry

Colt Autosan, Diversey DC No. 36 cleaner.
25 lb./tank water (140 gallons) at 180° F.

5. Anneal

Lindberg furnace, Aluminum Work Basket,
700° F. + 25° F., 30 minutes at temperature.
Air Cool. Hardness maximum 80 Vickers HN.

6. Pre-Coin

Bliss #85 $\frac{1}{2}$ Press - hand feed 5/minute .

Four Pin Die Set	SKRL 4-2144-1 through 22.
Pre-Coining Die	ERL 1740
Pre-Coining Punch	ERL 1741
Pre-Coin Stem	ERL 1742

Lubricate by hand - Singer Soluble Oil

Slug diameter	1.224" + .001"
Depth of cone	.347" $\pm$.010"

The cone depth is not a control dimension, but serves as an additional check on sheared slug uniformity.

Pre-coining is a simple operation that is not critical for lubrication or tool setting.

7. Wash and Dry

Same as Operation No. 4

8. Anneal

Same as Operation No. 5

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30 MM FA-T15E1 Aluminum Case Process Record

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9. Coin Slugs

Bliss #308 Press - hand feed 5/minute.

Four Pin Die Set	BRL 1299 (shown in Remington Report AB-51-18)
Coining Die	DRL 1979
Coining Die Center Plug	ERL 1744
Coining Punch	ERL 1745
Coining KO Stem	ERL 1746

Lubricate by hand - dried on solution of
Oleostearine in carbon tetrachloride 1-38 parts by
weight.

The greatest hazard in this operation is setting
tools too tight. It is advisable to select a maximum
weight pre-coined slug and set tools so that the
profile in the coining die is not quite filled.
Excessive lubrication is to be carefully avoided. The
coined slugs as well as the coining die should not show
a ring of lubricant build-up.

10. Wash and Dry

Same as Operation No. 4.

11. Inspect

By hand for coining defects. i.e., cracks,
partial coining, etc.

12. Anneal

Same as Operation No. 5.

13. Cold Profile Extrude

Bliss #308 Press, hand feed 3/minute.

Four Pin Die Set	BRL 1298 (shown in Remington Report AB-51-18)
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30 MM FA-T15E1 Aluminum Case Process Record

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Extrusion Die	DRL 1981
Extrusion Die	ERL 1748
Center Plug	
Extrusion Punch	ERL 1980
Stripper	ERL 1750

Lubricant-Dried on solution of oleostearine in carbon tetrachloride, 1-38 parts by weight. Lubricate punch with saturated solution of beeswax in carbon tetrachloride.

Extrusion length (head to base of cone)	5-7/8" $\pm$ 1/8"
Wall thickness at closed end	.027" $\pm$.001"
Thickness of residual metal	.170" $\pm$.010"

Lubrication in this operation is a critical factor. Excessive lubrication on the outside of the slug is to be avoided; it is responsible for minute surface cracks. Excessive lubrication left in the slug depression is responsible for minute cracks in the longitudinal direction within the extrusion. Variable amounts of lubrication on slugs is responsible for variable extrusion lengths for a given press setting. Insufficient lubrication is, of course, responsible for scratching.

A sharp junction of nose angle and land on the punch is very important to keep extrusion pressures low. As the punch is used, this corner tends to "wash" or round off. Scratching and eccentric wall thickness are results of this rounding.

In the event of over-setting on the press, an extrusion punch may bend. The first indication of a bent extrusion punch is a non-symmetrical lubrication residue within the mouth of the extruded piece.

When a set of tools is being set up in a press, the extrusions will probably be short and until extrusions are lengthened to nearly usable dimensions, by proper setting of tools, they may stick in the die rather than pulling out with the punch.

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30 MM FA-T15E1 Aluminum Case Process Record

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14. Wash and Dry

By hand in basket. Extreme length of these components prevents use of the Colt Washer.

15. Inspect

By hand for defects, cracks, stretch, scratches, etc.

16. Anneal

Same as Operation No. 5.

17. Invert

75 ton Hydraulic Press-hend operation

Inversion Die ERL 1751

First Inversion Punch ERL 1752

Second Inversion Punch ERL 1753

Lubricate: By hand, Singer Soluble Oil

18. Wash and Dry

Same as Operation No. 14.

19. Cut-Off

As a temporary expedient, inverted pieces are being sawed off by hand.

20. Inspect

By hand for internal defects, cracks, etc.

21. Anneal

Same as Operation No. 5.

22. Head

Bliss 7L Header - hand feed.

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30 MM FA-T15E1 Aluminum Case Process Record

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Heading Die	ERL 1754
Heading Stem	DRL 1982
Heading Bunter Body	ERL 1756
Heading Bunter Teat	ERL 1622

Lubricate by hand-dried on solution of Shell
#520 soluble oil in water.

Bridge thickness $.315 \pm .020"$ *

* The bridge thickness of $.315" \pm .020"$ as well as the mouth wall thickness at the taper operation, $.027"$, are specified because most firing test experience has been obtained with this combination. The last test fired under this contract, 30 FA-T15E1-3, however, indicated that reduction of these dimensions may be possible. This would necessitate adjustment to the sheared slug length and minor tool modifications where needed to compensate for the reduced wall thickness.

Primer Pocket Diameter	$.3594" + .0004"$ (use Go-No-Go plug for gauging)
Primer Pocket Depth	Greater than $.264"$ to allow for facing at headturn.
Length of Case	$5"$ min.
Datum Diameter on Shoulder	- to bottom of primer pocket - at least $.035"$ above maximum gauge reading so as to allow sufficient metal for forma- tion of 45° shoulder at taper.
Heading Gauge	DRL 1757
Anvil	ERL 1759
Test Plug	ERL 1758

Heading results may be quite variable on a given lot of components due to variation in lubrication. Lubrication within the component must be enough to avoid scratching and not excessive to keep pockets from filling. The amount left on the outside is critical with respect to bridge thickness. The more the lubricant the thinner the bridge resulting.

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It is imperative for primer sealing that the piece be headed far enough so that the mouth of the primer pocket fills enough for complete staking. The bottom of the primer pocket must fill well enough so that flash hole drilling begins at the surface of the bridge.

23. Wash and Dry

Same as Operation No. 14.

24. Anneal

Same as Operation No. 5.

25. Taper

75 ton Hydraulic Press-hand operation

Body Die	ERL 1983
Shoulder Die	ERL 1984
Taper Stop	ERL 1762
Head Space Ring.	ERL 1763

Lubricate by hand - Singer Soluble Oil

Mouth I.D.	1.171" - .004"
Shoulder datum diameter to bottom of primer pocket	.3165" - .012"
Heading Gauge	DRL 1757
Anvil	ERL 1759
Test Plug	ERL 1758

It is necessary to control the distance from the shoulder to the bottom of the primer pocket in this operation in order that the dimension from the shoulder to the face of the head will be within specifications after facing off during head turn. Experience has shown that satisfactory control can be maintained over this dimension by setting the taper stop to regulate the distance the case is forced into the body taper die and using 11 tons force on 6" ram of the hydraulic press.

30 MM FA-T15E1 Aluminum Case Process Record

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26. Wash and Dry

Same as Operation No. 14.

27. Head Turn and Face

Lathe

Head Turn Tool	ERL 1765
Head Turn Sleeve	ERL 1985
Seater Body	ERL 1766
Seater Pilot	ERL 1767

Lubricate - Brush on 50/50 solution of lard oil and kerosene.

Head Diameter	1.315" - .010"
Head Thickness	.120" - .008"
Extractor Groove Diameter	1.064" - .010"
Extractor Groove Width	.245" + .005"
Pocket Depth	.261" - .004"
Shoulder Datum Diameter to face of head	.5775" - .012"

Heading Gauge	DRL 1757
Spacer	ERL 1789
Test Plug (finish dimension)	ERL 1788

28. Wash and Dry

Same as Operation No. 14.

29. Flash Hole Drill

Drill Press 10/minute .
(No. 28 straight flute drill)
Flash hole diameter 0.138" + .004"
Flash hole gauge ERL 1437

Primer sealing is accomplished best with centered flash holes so that care must be taken to keep drilling aligned.

30. Heat Treat

Lindberg Furnace - Aluminum Work Basket - 900° F., 30 minutes at temperature. Rapid cold water quench from furnace. Wash and dry, same as Operation No. 14. Age in Despatch Oven 4 hours at 212° F. followed by 8 hours at 315° F. Hardness, 155 min. Vickers HN.

31. Mouth Trim

Drill Press and special case holding fixture.

Holding Jaws	ERL 1764
Fly Cutter Body and Bit	DRL 1456
Length	4.985" - .020"

32. Anodize

Alumilite No. 210 process.

33. Inspect

By hand for pocket, flash hole, and general case defects.

34. Mouth Anneal

Salt Bath - Case Rack
Temperature 700° F.

Case mouths are immersed to a depth of 3/4" for sixty seconds at temperature. Follow immediately with water rinse to remove excess salt.

35. Prime and Stake

Prime - Arbor Press - hand tools, "Wrap-Around-Sealed Cup" primer - see primer process.

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30 MM FA-T15E1 Aluminum Case Process Record

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Seating Tool	ERL 1416
Priming Stem	ERL 1768

Stake - K.R.Wilson Hydraulic Press (75 ton)

Staking Tool	ERL 1335
Staking Tool Holder	ERL 1417

Stake to pressure of 7-7.5 ton on 6" ram.

Priming an aluminum case is, of course, a very critical operation. The effectiveness of the seal depends on several factors. The primer assembly must have a push fit, but if it fits too tightly, the corner of the adaptor will not seat onto the bridge. It is suggested that primer insertion be checked for this detail of corner seating before proceeding to staking. The examination of a correctly seated primer with a properly centered flash hole will reveal a uniformly turned up center around the flash hole of the primer unit. Staking pressures should not be high enough to bend the bridge of the case. The staking should be heavy enough to complete the wrap of the adaptor and show complete contact with the adaptor for the entire area of the staking lip.

36. Meter

Primer resistance M52A3 -
electric primers - 500 - 1,200,000 ohms

37. Load

By hand. Overall length 7.874" max.

Loading data for all lots are included in the firing test data.

38. Rubber Die Crimp

By hand.
K.R.Wilson Hydraulic Press (75 ton).

Crimping pressure	18 tons on 6" ram.
Bullet Pull	1000 lbs. minimum.

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30 MM FA-T15E1 Aluminum Case Process Record

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Crimper Assembly	ERL 1790
Thrust Sleeve	ERL 1700
Shoulder Die	ERL 1701
Retainer Sleeve	ERL 1698
Reinforce Ring	ERL 1699
Rubber Ring	ERL 1702

Operations 34 through 38 must be completed within a period of not more than 24 hours so as to insure freshly mouth-annealed cases for the crimping operation.

39. Graphite Dag

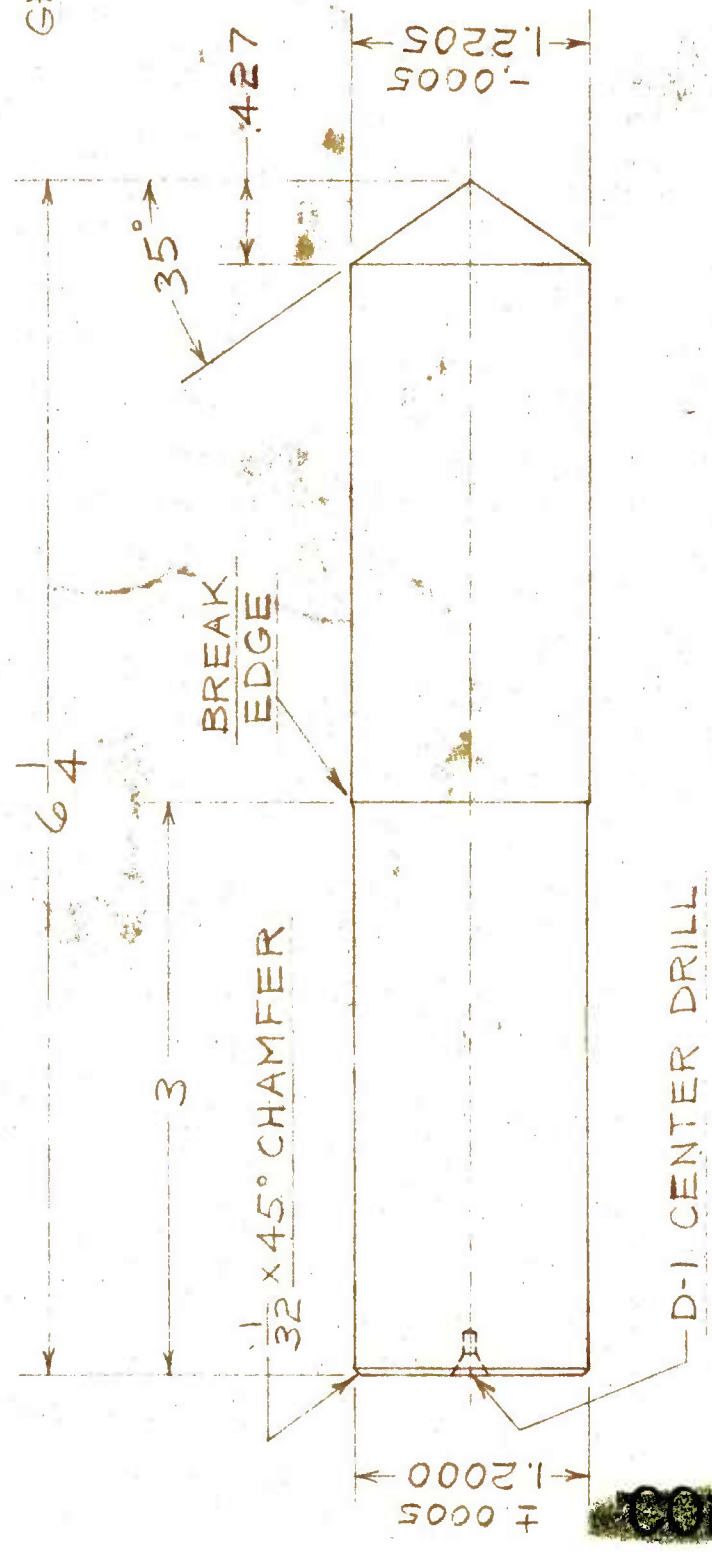
Painted on by hand. Graphite must cover body of case from mouth to extractor groove. Head of case is also dagged to prevent head galling in the T182 gun. Cere must be exercised so as not to coat the primer assembly. Use 1 part Graphite Dag No. 154 to 10 parts alcohol by volume.

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DRAWING NO. ERL-1741		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE PRE-COINING PUNCH		7-2552-6		SKRL-					
SUB TITLE BLISS PRESS NO 85 1/2									
SUB TITLE 30MM FATIS E1 ALUMINUM CASE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN F.H. 91-53		TRACED		APP'D					
CHECKED		APP'D 8/28/53		APP'D					

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE
GRIND ALL OVER



MATL: "GRAPH-TUNG" STEEL
HARDEN & DRAW
RC 63-65

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DRAWING NO. ERL-1742		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALLOCATIONS	
MAIN TITLE PRE-COINING K.O. STEM				SKRL-					
SUB TITLE BLISS PRESS NO. 85 1/2				7-2552-5					
30 MM FATI5 E1 ALUMINUM CASE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN EH		TRACED		APP'D					
CHECKED		APP'D 1/29/53		APP'D					

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MATL.: SPEC. #68
HARDEN & DRAW
RC 54-56

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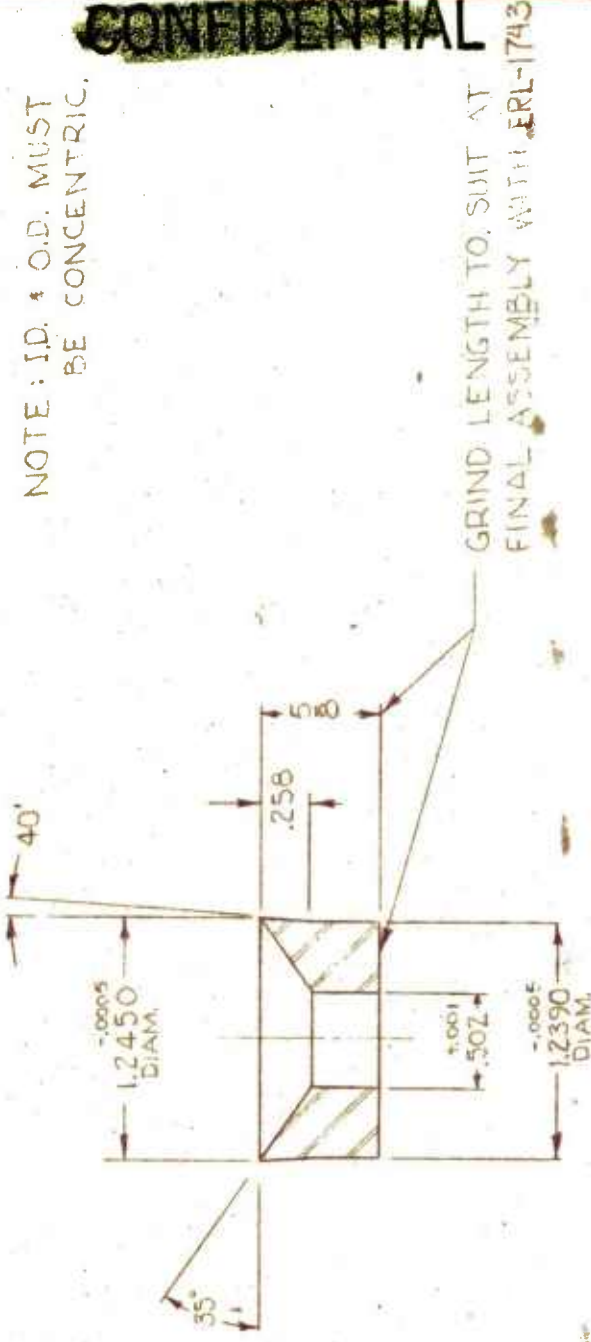
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MAIN TITLE COINING DIE CENTER BUSHING				6-1253-4					
SUB TITLE NO. 308 DIE SET									
SUB TITLE 30 MM FAT-15 E1 ALUMINUM CASE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN VLAK		9-18-53		TRACED		APP'D			
CHECKED		APP'D		14/24/53		APP'D			

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MAT'L: SPEC. # 68
Rc 58-60



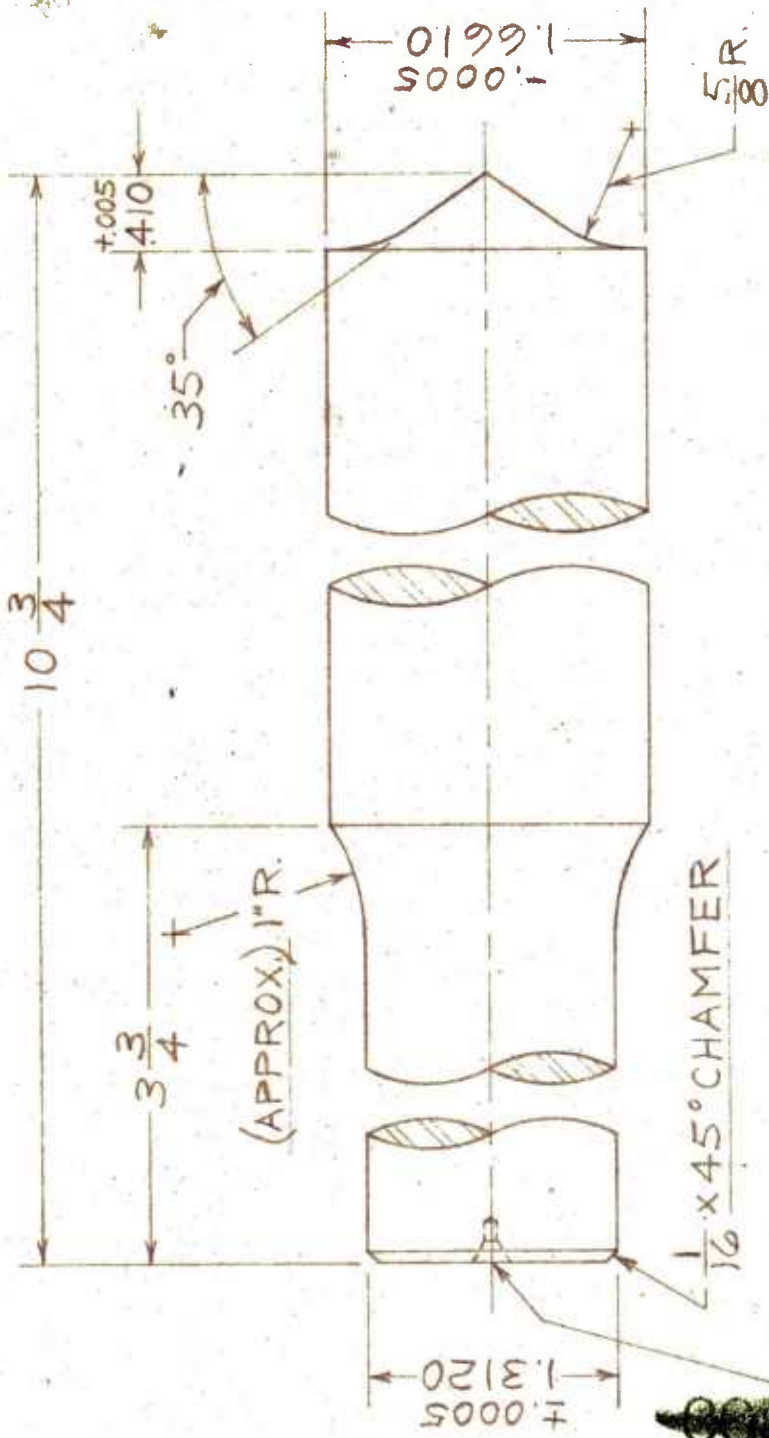
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DRAWING NO. ERL-1745		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		RECORD OF ALTERATIONS	
MAIN TITLE COINING PUNCH				ADDITIONAL USES	
NO. 308. DIE SET				7-2652-5	
SUB TITLE 30 MM FATIS ET ALUMINUM CASE					
SUP'D'S DWG. NO.		SCALE FULL		APP'D	
DRAWN FH 9-2-53		TRACED		APP'D	
CHECKED		APP'D <i>gfw</i> 10/26/53		APP'D	

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NOTE:
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D-1 CENTER DRILL

MATL.: "GRAPH-TUNG" STEEL
HARDEN & DRAW
Rc 63-65

DRAWING NO. ERL-1746		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ITEM		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE COINING K.O. STEM		NO. 308 DIE SET		SKRL-				JAN 6 1958			
SUB TITLE 30 MM FATIS EL ALUMINUM CASE				7-2652-6							
SUPD'S DWG. NO.		SCALE FULL		APP'D							
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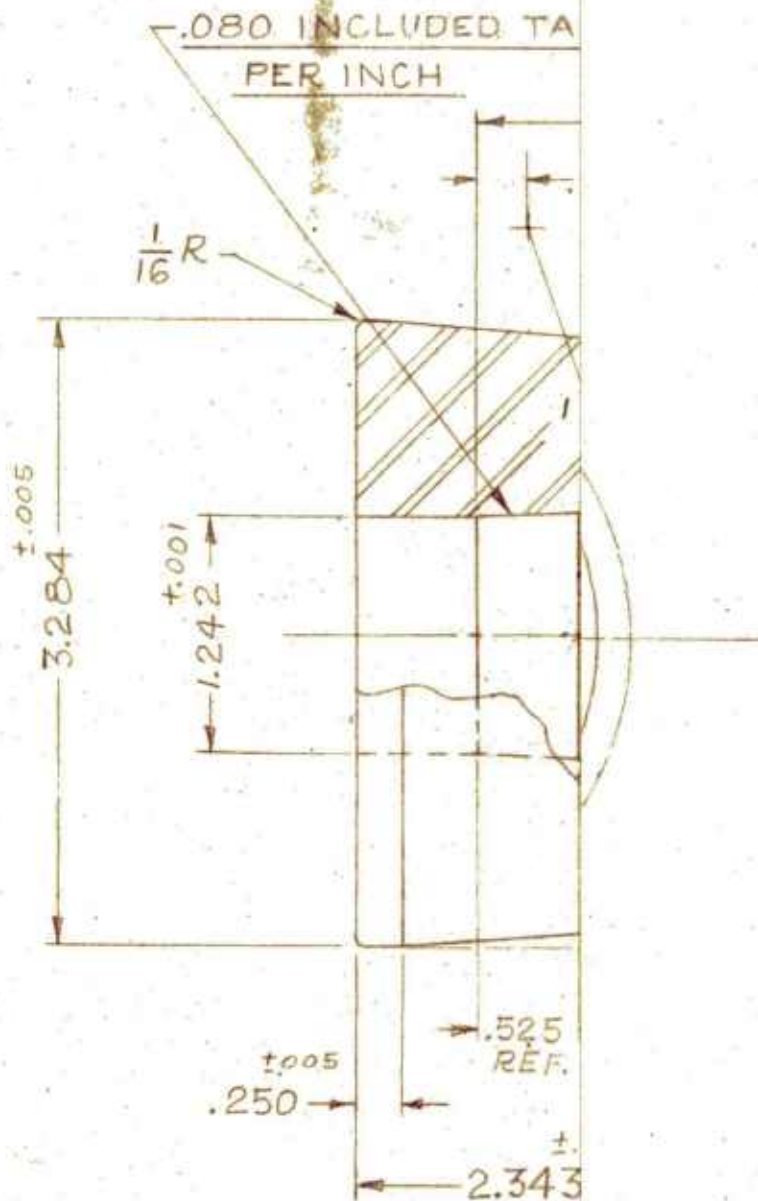
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MATL: SPEC. #68
HARDEN & DRAW
RC 57-59

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JAN 6 1953

DRAWING NO.

RL-1981

REMINGTON ARMS CO. INC.
BRIDGEPORT WORKS

SCALE
FULL

ORDER NO.

EXTRUSION DIE

№ 308 DIE SET

30 MM.FA. T15-E-1 ALUMINUM CASE

RECORD OF ALTERATION BY

APPROVED

APPROVED

UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL FINISHES

APPROVED

APPROVED

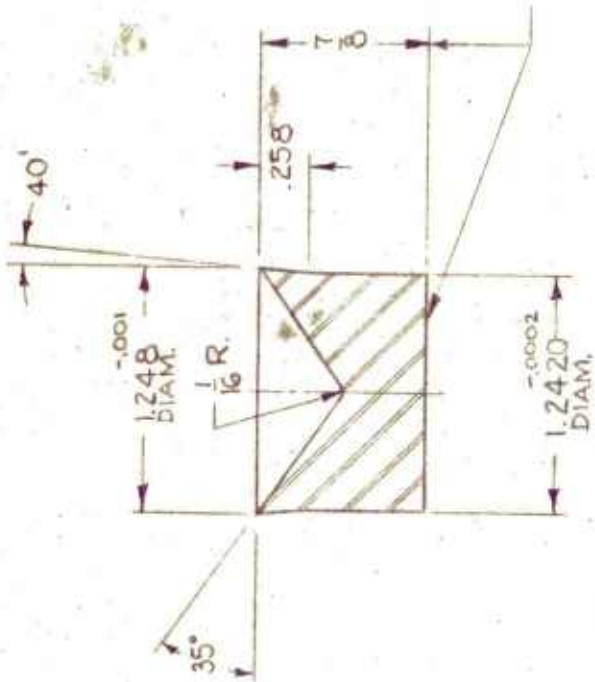
FORM RD-865

K-E ALBANESE 195M 60970
TRADE MARK

DRAWING NO. ERL-1748		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE EXTRUSION DIE CENTER PLUG NO. 30B DIE SET		SCALE FULL		SKRL- 6-1253-2					
SUB TITLE 30 MM FA TIS E-1 ALUMINUM CASE		TRACED							
SUPD'S DWG. NO.		APP'D							
DRAWN CHECKED		9-17-53		APP'D					
		APP'D (80)		11/20/53					

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MAT'L: SPEC. # 11
Rc 48-50



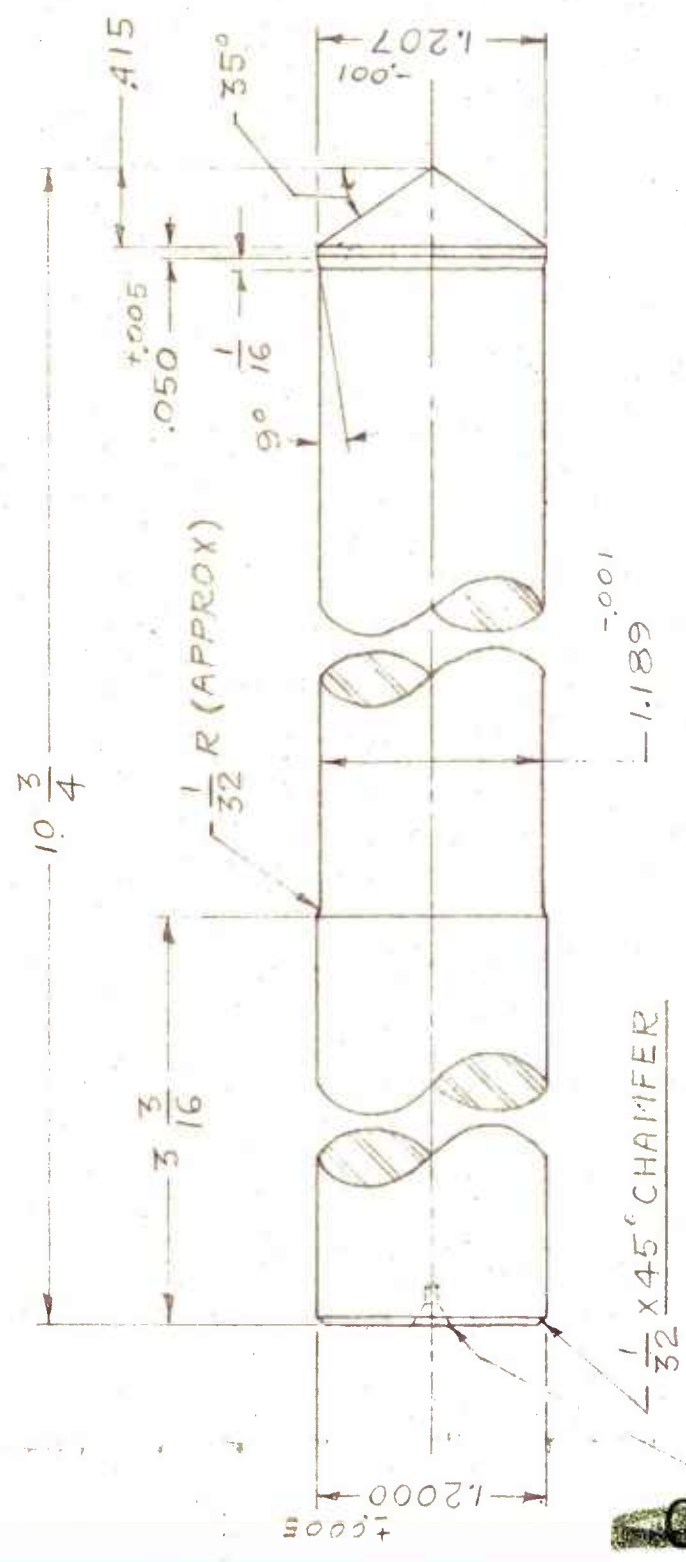
GRIND LENGTH TO SUIT AT
FINAL ASSEMBLY WITH ERL-1747

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DRAWING NO. ERL-1980		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		RECORD OF AL TIONS	
MAIN TITLE EXTRUSION PUNCH							
SUB TITLE NO 308 DIE SET							
SUB TITLE 30MM-FA 15 E1 ALUMINUM CASE						JAN 6 1958	
SUPD'S DWG. NO.		SCALE		APP'D			
DRAWN		TRACED		APP'D			
CHECKED		APP'D		APP'D			

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MAT'L VEGA STEEL
HARDEN & DRAW
ROCKWELL C 63/65

D-1 CENTER DRILL

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DRAWING NO.

ERL-1750

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.CONST. & DETAIL
DRAWINGS

SKRL-

7-2652-10

ADDITIONAL USES

RECORD OF APPROVATIONS

MAIN TITLE

STRIPPER

FOR EXTRUSION OPERATION

SUB TITLE

30 MM FATIS E-1 ALUMINUM CASE

NO. 308 DIE SET

SUPD'S
DWG. NO.

SCALE FULL

APP'D

DRAWN

FH 9-8-53

TRACED

APP'D

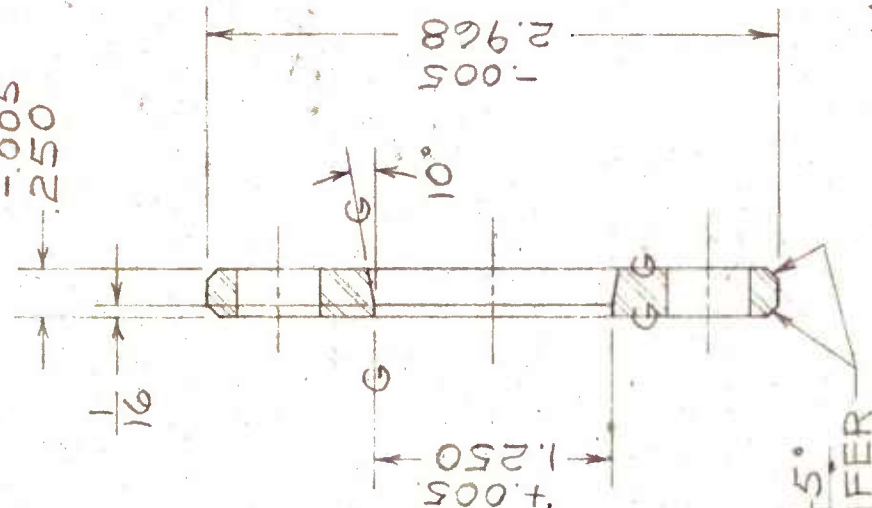
CHECKED

APP'D

1/20/53

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

-0.005
-0.250

MATL.: SPEC. #7

HARDEN & DRAW

RC 54-58

CONFIDENTIAL

CONFIDENTIAL

DRAWING NO.

ERL 1751

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.

RECORD OF ALTERATIONS

ITEM

ADDITIONAL USES

CONST. & DETAIL
DRAWINGS

SKRL -

6-1753-1

MAIN TITLE
INVERSION DIE

HYDRAULIC PRESS (75 TON)

SUB TITLE
30MM FATIS ET ALUMINUM CASESUPD'S
DWG. NO.

SCALE

HALF

APP'D

DRAWN FH

9-4-53

TRACED

APP'D

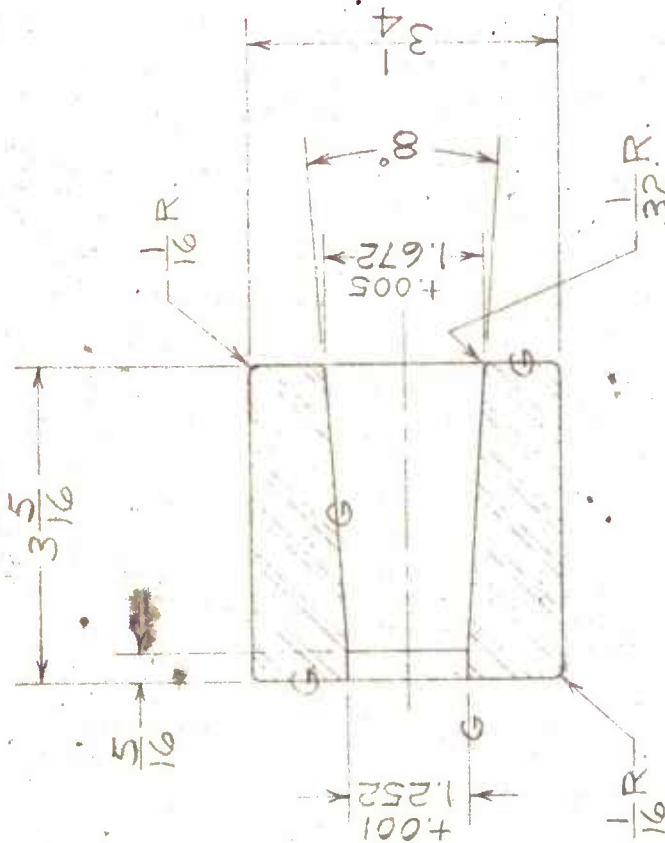
CHECKED

APP'D

140653

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES



MATL.: SPEC. #4
HARDEN & DRAW - SPOUT QUENCH HOLE
Rc 63-65 AROUND HOLE

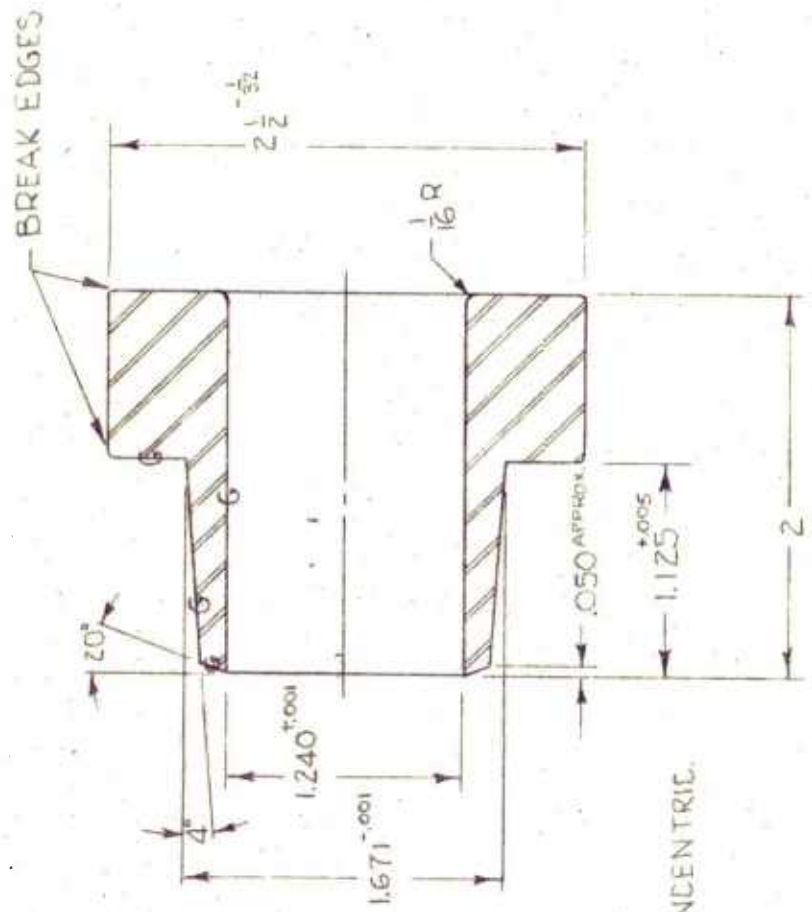
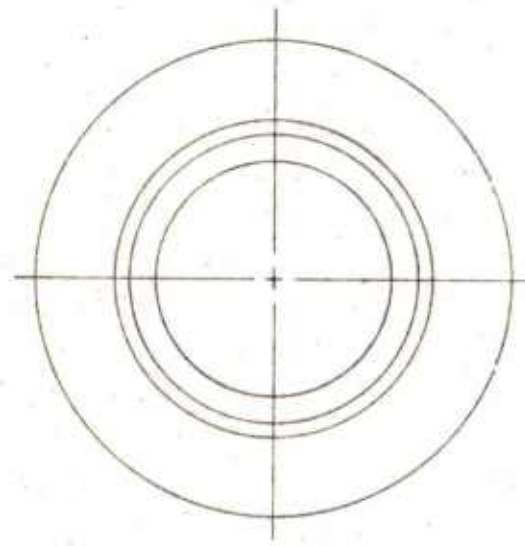
CONFIDENTIAL

CONFIDENTIAL

DRAWING NO.		SCALE		SUPD'S DWG. NO.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
DRAWN		TRACED		APP'D		SKRL					
ERL-1752		FULL		FULL		2-2653-8					
MAIN TITLE		HYDRAULIC PRESS (75 TON)		HYDRAULIC PRESS (75 TON)							
SUB TITLE		30 MM F A T 15 E-1 ALUMINUM CASE		30 MM F A T 15 E-1 ALUMINUM CASE							
DRAWN		9-16-53		APP'D							
CHECKED		APP'D		APP'D							
		9/20/53		APP'D							

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC. #7
HARDEN & DRAW
Rc 60-62



NOTE: ID. # O.D. MUST BE CONCENTRIC.

CONFIDENTIAL

~~CONFIDENTIAL~~

ERL-753

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.

CONST. & DETAIL DRAWINGS

ADDITIONAL USES

RECORD OF ALLEGATIONS

MAIN TITLE	SECOND INVERSION PUNCH FOR HYDRAULIC PRESS (75 TON)
GUB TITLE	30 MM FAT 15 EI ALUMINUM CASE

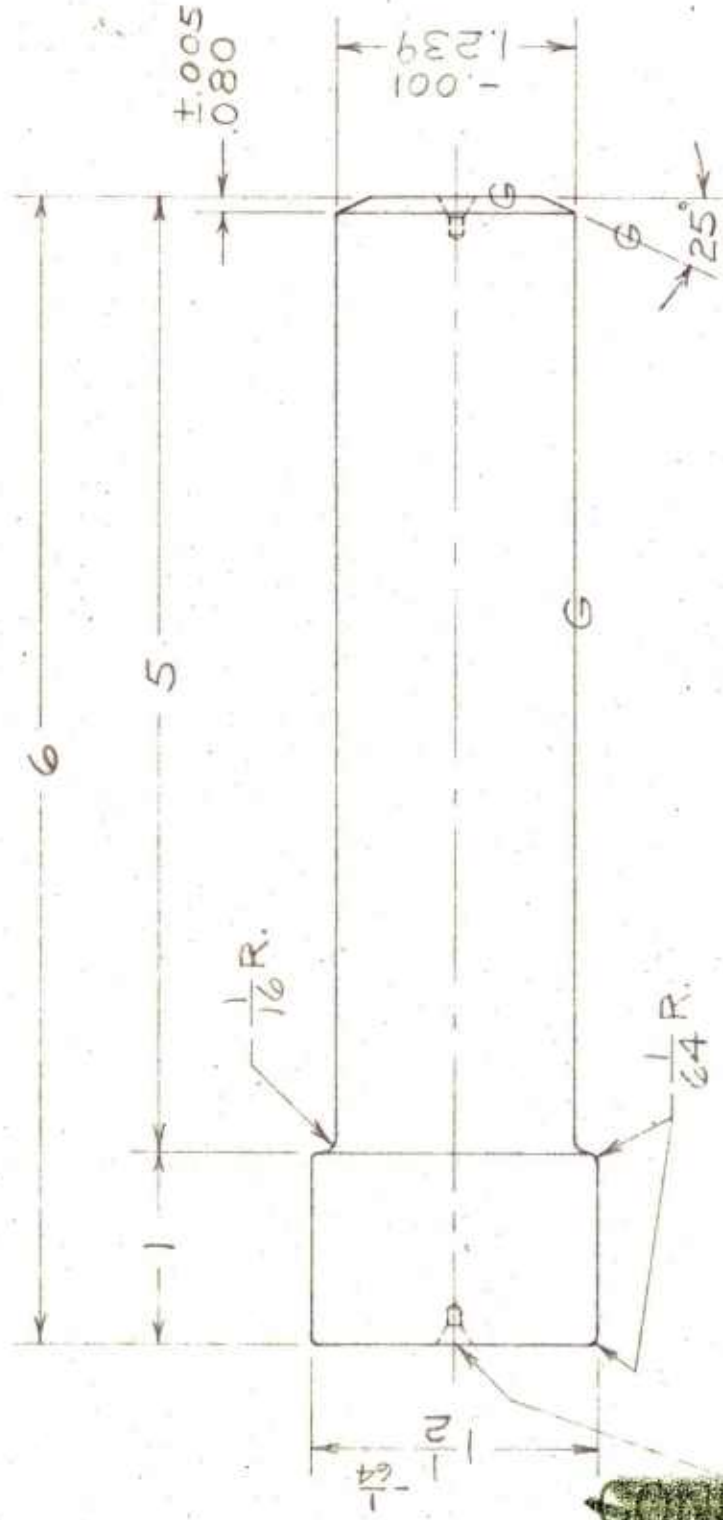
SUPD'S DWG. NO.	SCALE		FULL	APP'D
DRAWN F.H.	9-9-53	TRACED		APP'D
CHECKED		APP'D	<i>pas</i>	APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

Jan 6 1958

MATL. SPEC. #7
HARDEN & DRAW
RC60-62

D-1 CENTER DRILL
EACH END



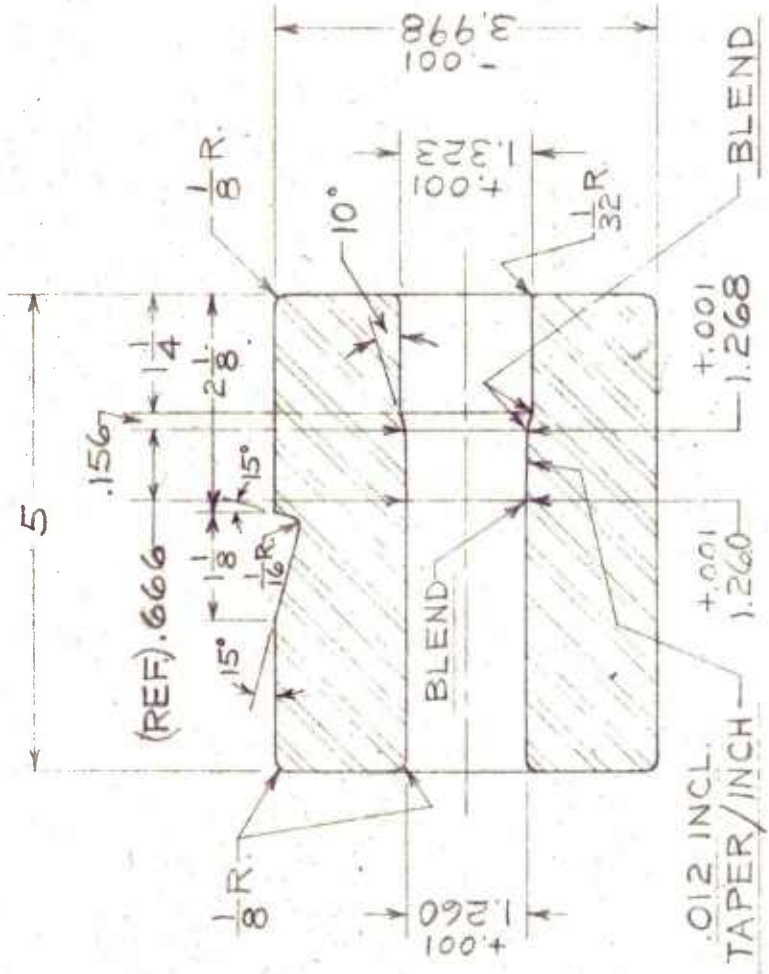
~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

DRAWING NO. ERL-1754		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE FOR 7-L HEADER		SCALE HALF		SKRL-					
SUB TITLE 30 MM FATIS E-ALUMINUM CASE		TRACED		10-1353-1					
SUPD'S DWG. NO.		APP'D							
DRAWN FH 9-1-53		APP'D							
CHECKED		APP'D		10/24/53					

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTES
GRIND ALL OVER
LAP INSIDE DIAMETERS



MATL: SPEC #22 (CROSS FORGED)
HARDEN & DRAW - SPOUT QUENCH HOLE
RC 64-65 AROUND HOLE
RC 33-35 ON O.D.

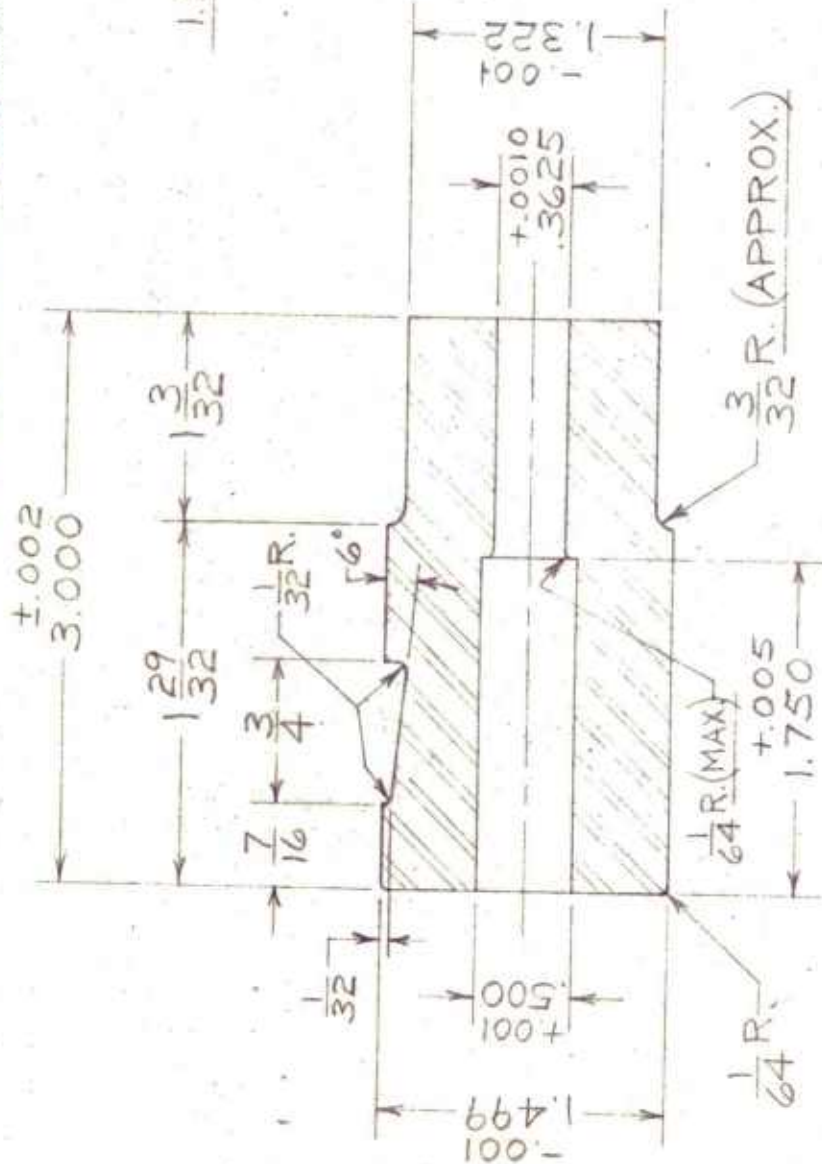
CONFIDENTIAL

CONFIDENTIAL

DRAWING NO. ERL-1756		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ITEMS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE HEADING BUNTER BODY FOR 7-L HEADER				SKRL-						A REVISSED SET SCREW FLAT 5-17-55	
SUB TITLE 30 MM FA T15 E-1 ALUMINUM CASE											
SUPD'S DWG. NO.		SCALE FULL		APP'D							
DRAWN FH 9-14-53		TRACED		APP'D							
CHECKED		APP'D (11/14/53)		APP'D							

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE
GRIND ALL OVER.
LAP INSIDE DIAMETERS.
I.D. & O.D. MUST BE CONCENTRIC.



MATL.: SPEC. #68
HARDEN & DRAW
RC 57-59

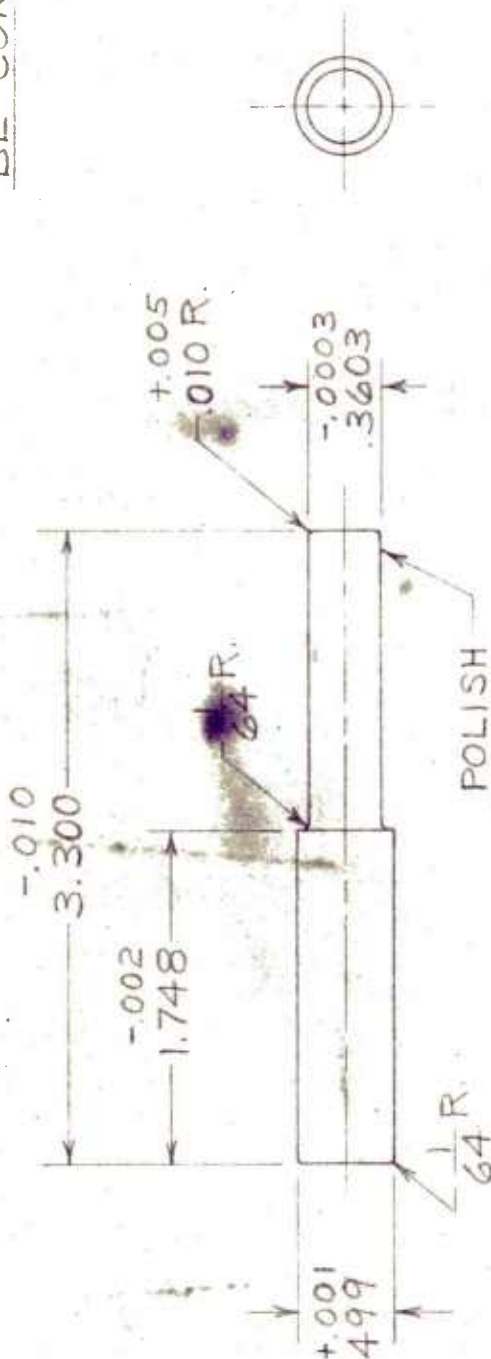
DRAWING NO.		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF APPROVATIONS	
ERL-1622				SKRL-					
MAIN TITLE		BUNTER TEAT		6-2751-5					
		FOR 7-L HEADER							
SUB TITLE		CAL..60, 30MM, 20MM T20 AND 20MM-FAT2 ALUMINUM CASE				JAN 6 1958			
SUPD'S DWG. NO.		SCALE FULL							
DRAWN F.H.11-23-53		TRACED							
CHECKED		APP'D		APP'D		APP'D			
		RATU							

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

四十一

GRIND ALL OVER.
BOTH DIAMETERS MUST
BE CONCENTRIC.

~~CONFIDENTIAL~~



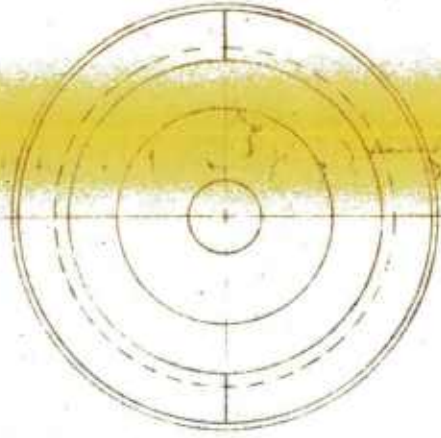
MATL: SPEC. # 600

HARDEN & DRAW

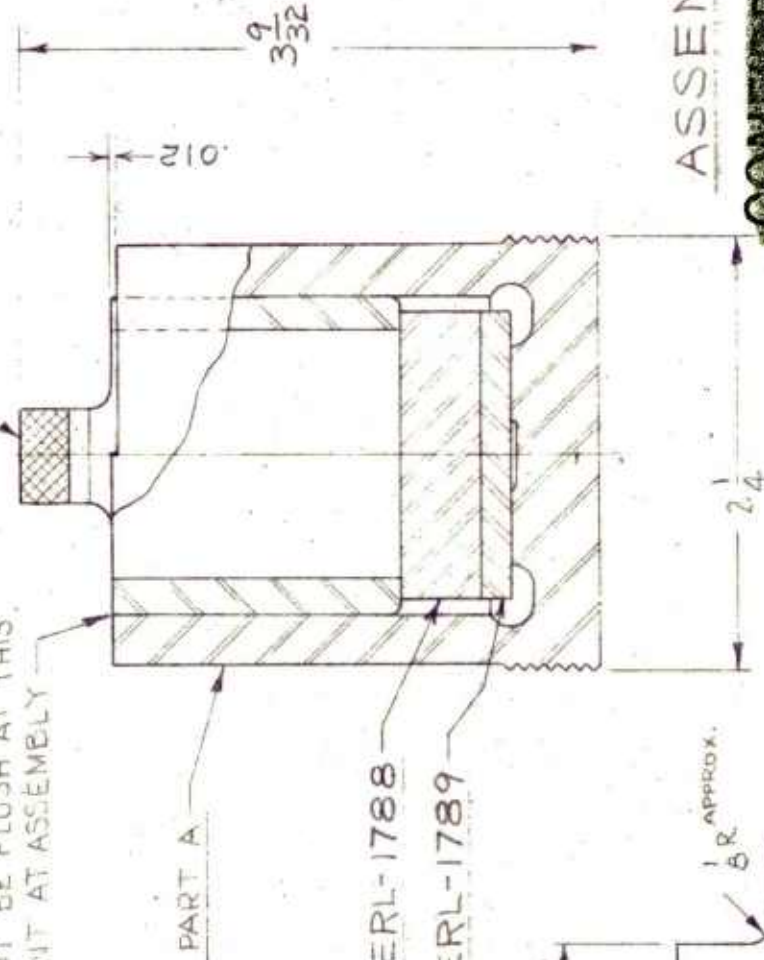
AC 59-61

~~CONFIDENTIAL~~

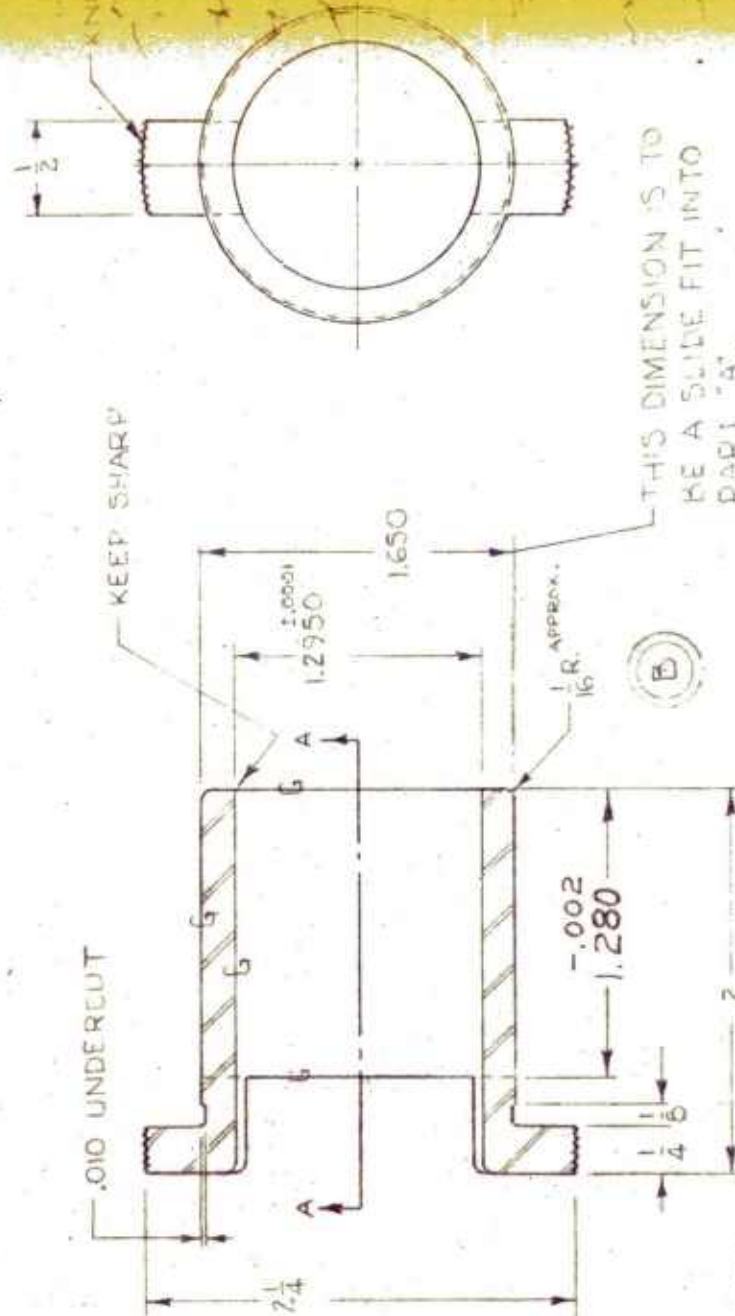
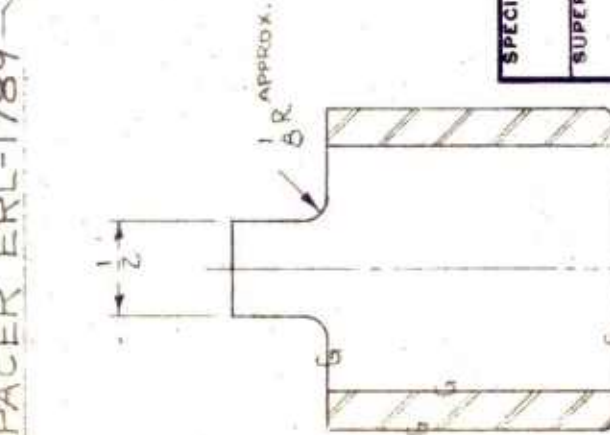
CONFIDENTIAL



PART 'A' AND PART 'B' MUST BE FLUSH AT THIS POINT AT ASSEMBLY



TEST PLUG ERL-1788
SPACER ERL-1789



THIS DIMENSION IS TO
BE A SLIDE FIT INTO
DAPL "A"

ASSEMBLY

MAT'L: SPEC. #7 (ALL PARTS)

U. 60-62 JAN 6 1962

SPECIFICATION NO.	DRAWING NO.	REMINGTON ARMS CO. INC.	
SUPERSEDES DWG.	DRL-1757	BRIDGEPORT WORKS	
		SCALE	ORDER NO.
		FULL	
CONST. DWG.	MAIN TITLE	HEADING GAGE	
SKILL-B-2552-1		T-L HEADER	
	SUB TITLE	35 MM FATIŞEL ALUMINUM CASE	
DESIGN BY	TRACED BY	APPROVED	APPROVED
DRAWN BY	CHECKED BY	APPROVED	APPROVED
VLACK			1/29/53
	7-25-53		

RECORD OF ALTERATIONS		ADDITIONAL USES
UNLESS OTHERWISE SPECIFIED ALL FRACTIONAL FINISH DIMENSIONS	+ .01 - .01	+ .001 - .001
DO NOT SCALE THIS DRAWING WORK TO FIGURES		

657-759

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.

**CONST. & DETAIL
DRAWINGS**

SKRL-

3-1053-4

ADDITIONAL USES

RECORD OF ALLOCATIONS

MAIN
TITLE

HEADING GAGE

SUB TITLE 30 MM FA TIS E-1 ALUMINUM CASE

SUPD'S
OWA. NO.

SCALE FULL

APP'D

DRAWN

0.99.55

TRACED

App'D

CHECKED

APP'D	10/10/10	10/10/10
-------	----------	----------

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC. #7
Rc 60-62

~~CONFIDENTIAL~~

BREAK EDGES-7

— $\frac{1}{2}$ UNDERCUT

SMALL CENTERS PERMISSIBLE-

GRIND ALL OVER

SLIP FIT INTO GAGE DRL-1757

REDUCE .500 LENGTH BY GRINDING THIS SURFACE:
DETERMINE AMOUNT TO BE REMOVED BY ASSEMBLING
WITH TEST PLUG ERL-1758 IN HEADING-GAGE
DRL-1757. GAGE SHOULD BE FLUSH WHEN
PROPER LENGTH IS OBTAINED.

~~CONFIDENTIAL~~

DRAWING NO.

ERL-1758

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.CONST. & DETAIL
DRAWINGS

SKRL

ADDITIONAL USES

RECORD OF ALTERATIONS

MAIN
TITLETEST PLUG
HEADING GAGESUB
TITLE

30 MM PA TIS BR ALUMINUM CASE

EUPD'S
DWG. NO.

SCALE

FULL

APP'D

DRAWN
BLACK

TRACED

APP'D

CHECKED

APP'D

APP'D

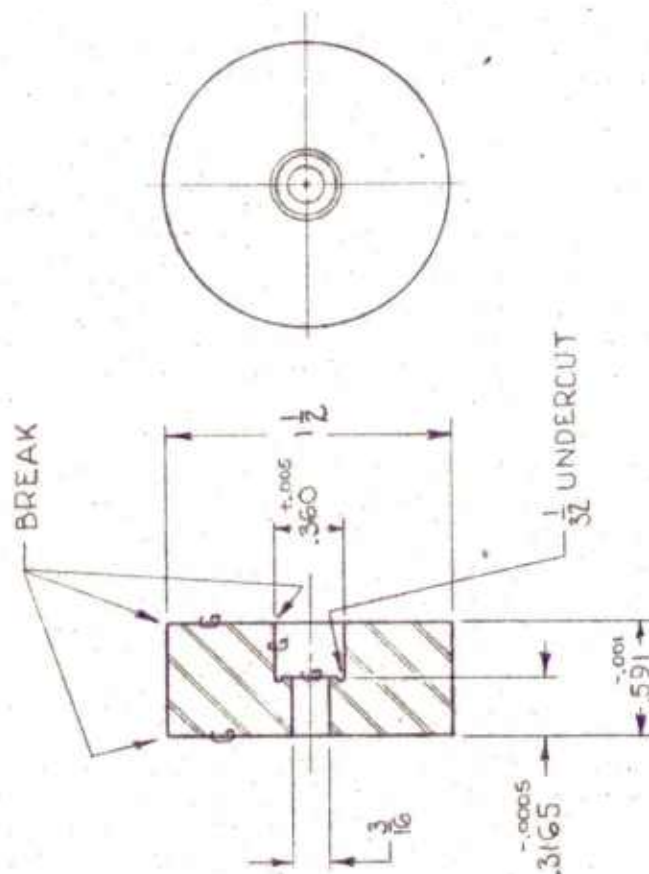
9-21-53

APP'D

APP'D

1420/53

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC. # 7
R₂ 60-62

CONFIDENTIAL

CONFIDENTIAL

DRAWING NO.

ERL-1983

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.CONST. & DETAIL
DRAWINGS

ADDITIONAL USES

RECORD OF ALLOCATIONS

MAIN
TITLE

BODY DIE

SUB
TITLETAPER OPERATION
30 MM FA-TISEI ALUMINUMSUPD'S
DWG. NO.

CASE

DRAWN

SCALE FULL

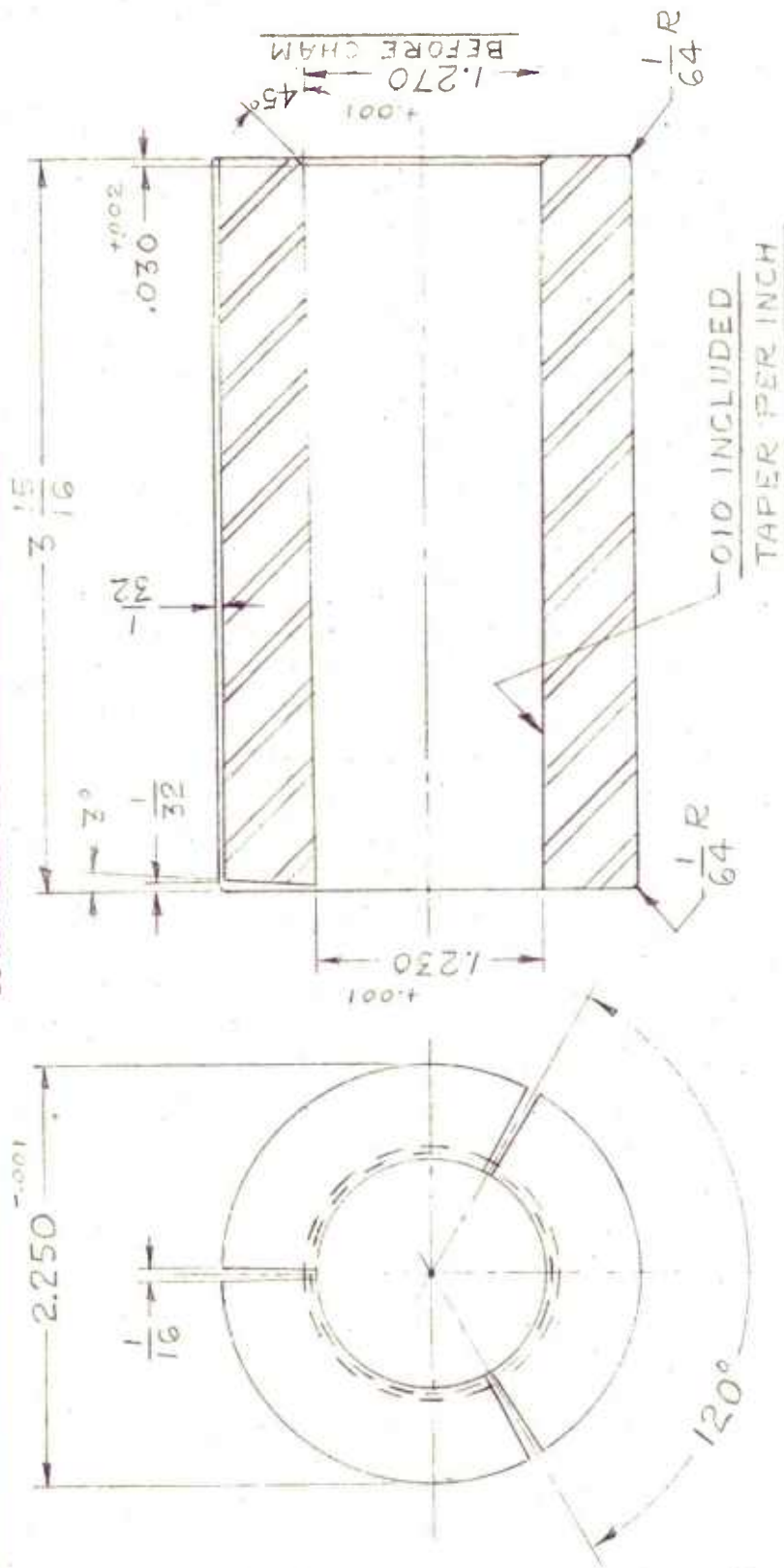
APP'D

CHECKED

TRACED

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES



NOTE ÷
GRIND ALL OVER
I.D. & O.D. CONCENTRIC

MAT'L SPEC # 7
ROCKWELL C 60/62

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DRAWING NO.

ERL 1984

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.CONST. & DETAIL
DRAWINGS

ADDITIONAL USES

RECORD OF APPROVATIONS

MAIN TITLE

SHOULDER DIE
TAPER OPERATION

SUB TITLE

30 MM FA T15E-1 ALUMINUM

CASE

SUPD'S
DWG. NO.

SCALE FULL

APP'D

DRAWN

TRACED

APP'D

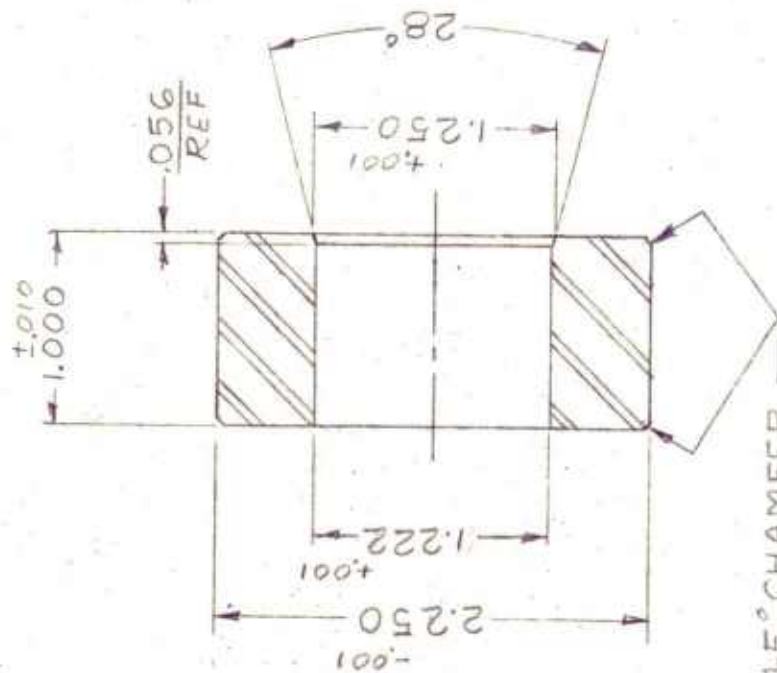
CHECKED

APP'D

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE
GRIND ALL OVER



$\frac{1}{32}$ X 45° CHAMFER
EACH END

MAT'L SPEC #7
HARDEN & DRAW
ROCKWELL C 60/62

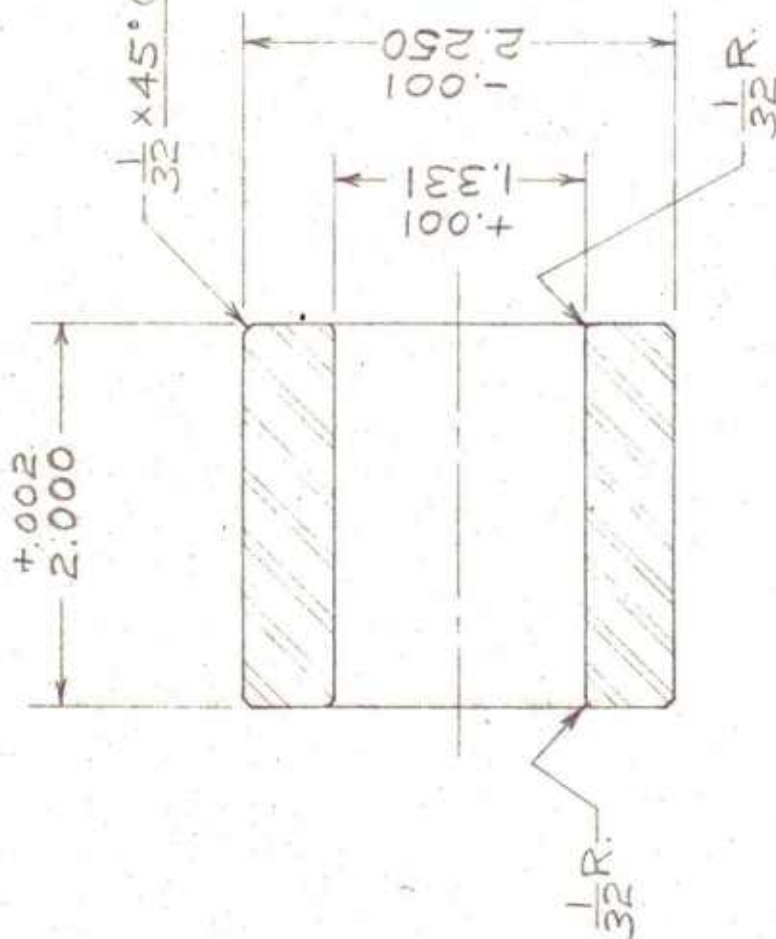
~~CONFIDENTIAL~~~~CONFIDENTIAL~~

DRAWING NO. ERL-1763		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF APPROVATIONS	
MAIN TITLE HEAD SPACE RING		9-1952-3		SKRL-					
SUB TITLE TAPER OPERATION									
SUB TITLE 30 MM FATIS E-1 ALUMINUM CASE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN FH, 9-10-53		TRACED		APP'D					
CHECKED		APP'D <i>phw</i>		APP'D					
		APP'D <i>phw</i>		APP'D					

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE
GRIND ALL OVER

$\frac{1}{32} \times 45^\circ$ CHAMFER EACH END



MATL.: SPEC. #7
HARDEN & DRAW
RC 60-62

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500-1-1

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.

RECORD OF OPERATIONS

MAIN HEAD TURNING SLEEVE

SUB TITLE 30 MM FATI5 EI ALUMINUM CASE

JAN 6 1958

SUPD'S
DWG. NO.

SCALE

APP'D

DRAWN

TRACED

App'D

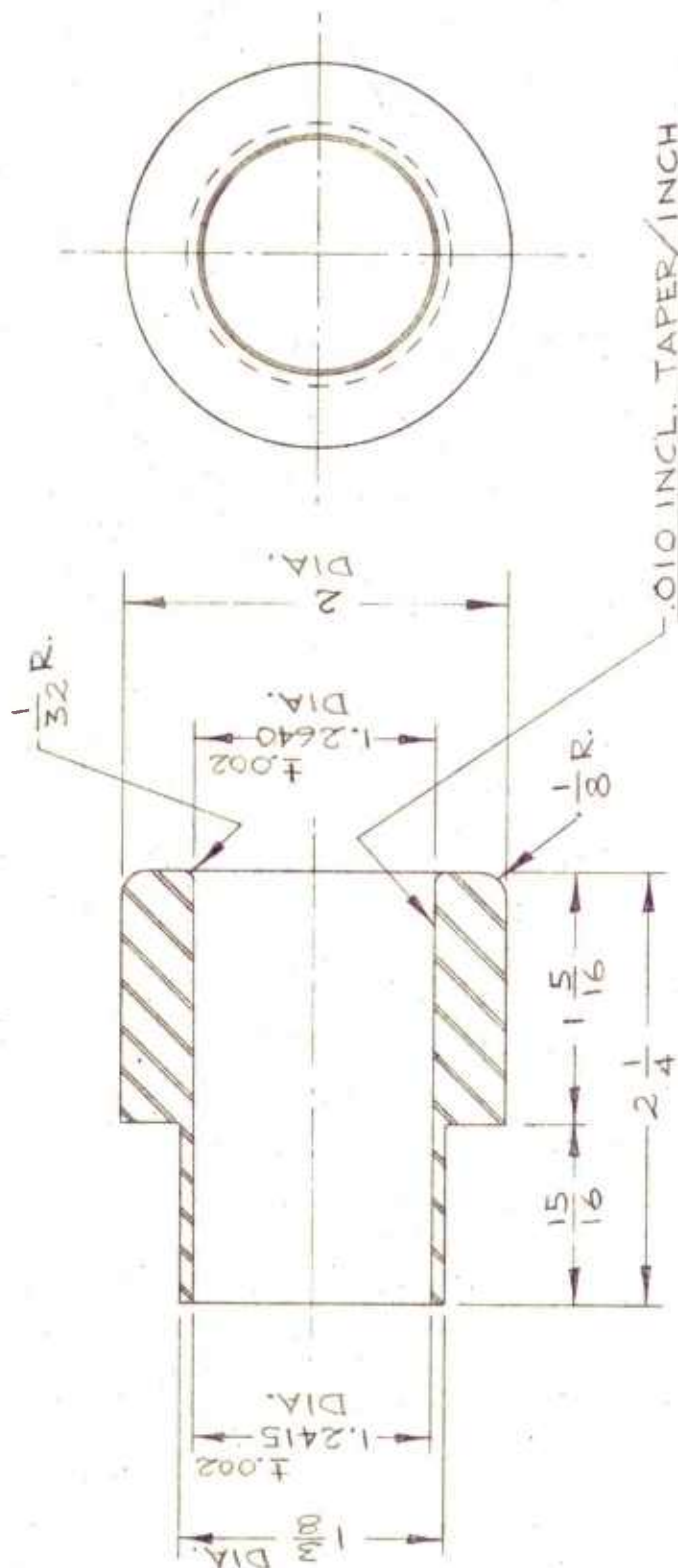
ЧЕБЫСКЕО

APP'D

APP'D

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

~~CONFIDENTIAL~~



CONFIDENTIAL

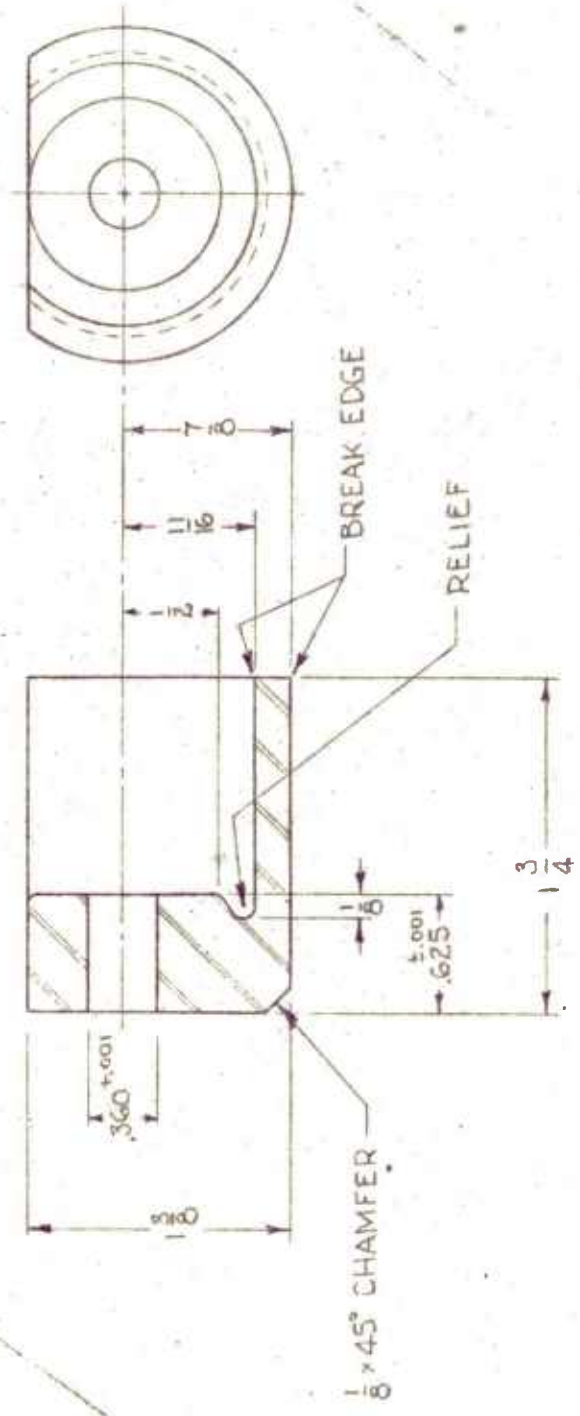
MAT'L: SPEC. #15

NOTE: REMOVE ALL SHARP
EDGES

DRAWING NO. ERL-1766		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		RECORD OF AL TIONS	
MAIN TITLE SEATER BODY FOR HEAD- TURNING OPERATION		SUB TITLE 30 MM FA T15 E-1 ALUMINUM CASE		CONST. & DETAIL DRAWINGS SKRL	
SUPD'S DWG. NO.		SCALE FULL		APP'D	
DRAWN V. LOCK		TRACED		APP'D	
CHECKED		APP'D <i>fw</i> 1/24/53		APP'D	
				JAN 6 1958	

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC # 15 OR # 25



CONFIDENTIAL

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DRAWING NO. **ERL-1788**

REMINGTON ARMS CO., INC.
BRIDGEPORT, CONN.

MAIN TITLE **TEST PLUG (FINISH DIMENSION)
FOR HEADING GAGE DRL-1751**

SUB TITLE **30 MM FATIS E-1 ALUMINUM CASE**

SUPD'S
DWG. NO.

DRAWN FH 12-17-53

CHECKED

SCALE FULL

TRACED

APP'D *RW* 12/17/53

APP'D

APP'D

APP'D

CONST. & DETAIL
DRAWINGS

MS

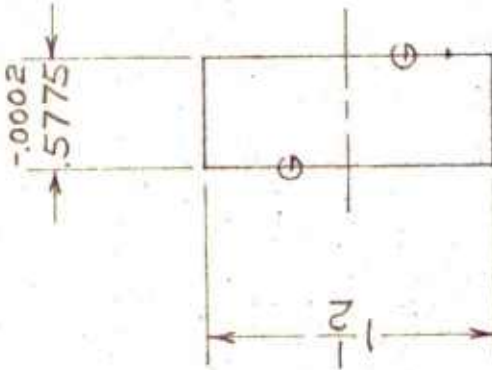
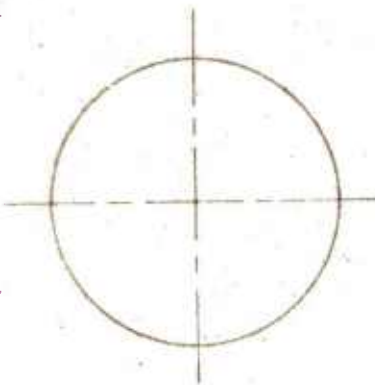
ADDITIONAL USES

RECORD OF OPERATIONS

Jan 6 1958

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE:
REMOVE SHARP EDGES



MATL.: SPEC. #7
HARDEN & DRAW
Rc 60-62

CONFIDENTIAL

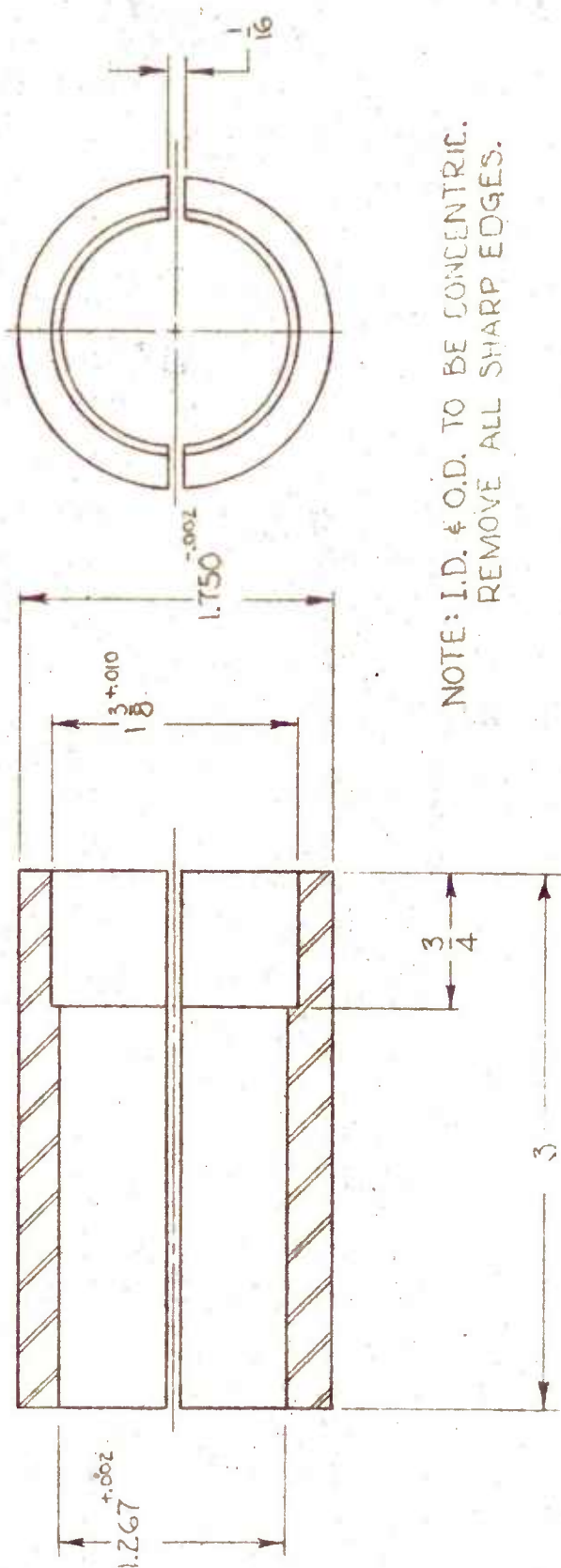
CONFIDENTIAL

DRAWING NO. ERL-1764		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		RECORD OF ALTERATIONS	
MAIN TITLE HOLDING JAW'S-MOUTH TRIM		CONST. & DETAIL DRAWINGS SKRL		ADDITIONAL USES	
SUB TITLE 30 MM - FATHS E-1 ALUMINUM CASE		DATE JAN 6 1958			
SUPD'S DWG. NO.	SCALE FULL	APP'D			
DRAWN BLACK	TRACED	APP'D			
CHECKED	APP'D	APP'D			

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC #15 OR #25.

CONFIDENTIAL



NOTE: I.D. & O.D. TO BE CONCENTRIC.
REMOVE ALL SHARP EDGES.

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CONFIDENTIAL

JAN 6 1953

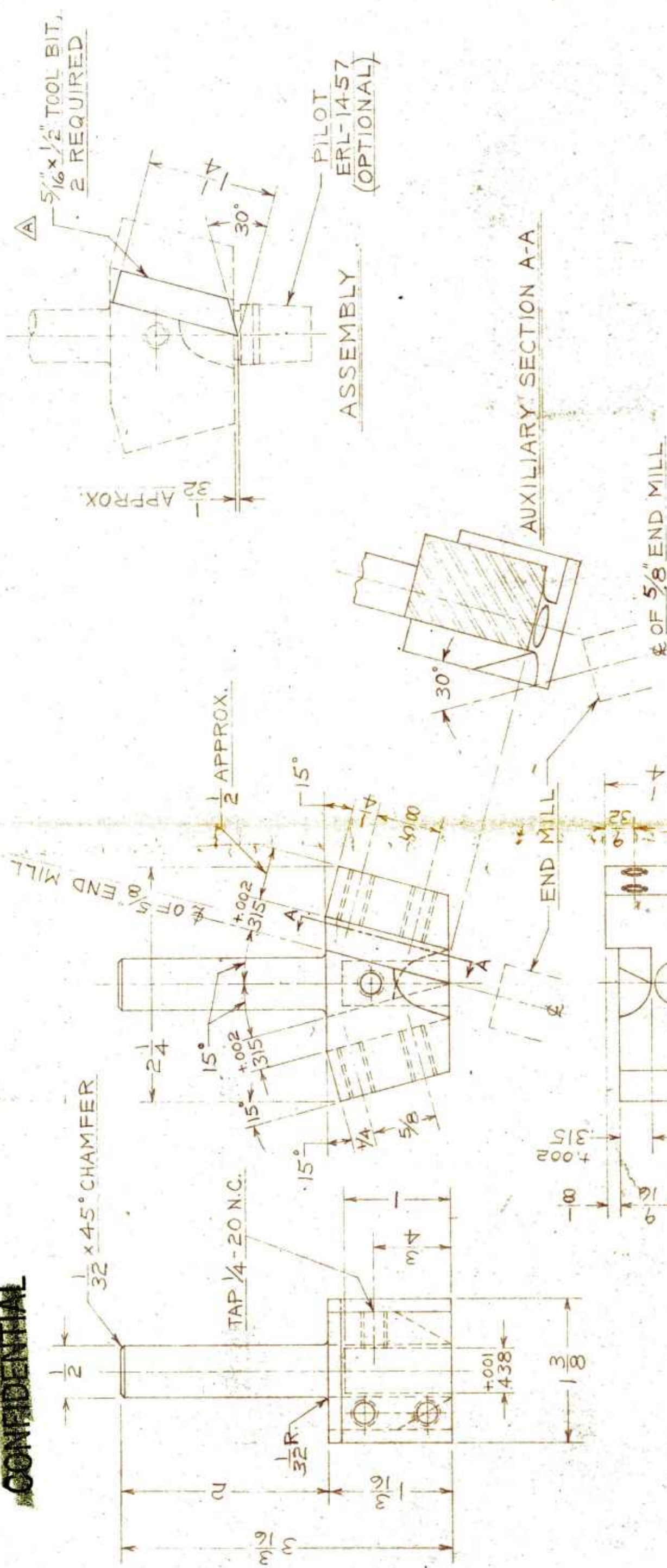
REMINGTON ARMS CO. INC.
BRIDGEPORT WORKS

SCALE FULL	ORDER NO.
---------------	-----------

MAIN TITLE FLY CUTTER BODY & BIT
FOR TRIMMING OPERATION

SUB-TITLE CAL..50, CAL..60, 30"MM,
20MM T20 & FAT2 ALUMINUM CASES

TRACED BY		APPROVED		APPROVED
CHECKED BY		APPROVED	5-17-51	APPROVED

"ALBANY" NO. 155L K&L CO., N.Y.
SEE U.S. PAT. OFF.

TAP 1/4-20 N.C.
4 HOLES

MATL.: SPEC. #15

A 5/16 x 1/2 TOOL BIT WAS 5/16 TOOL BIT

6-11-53

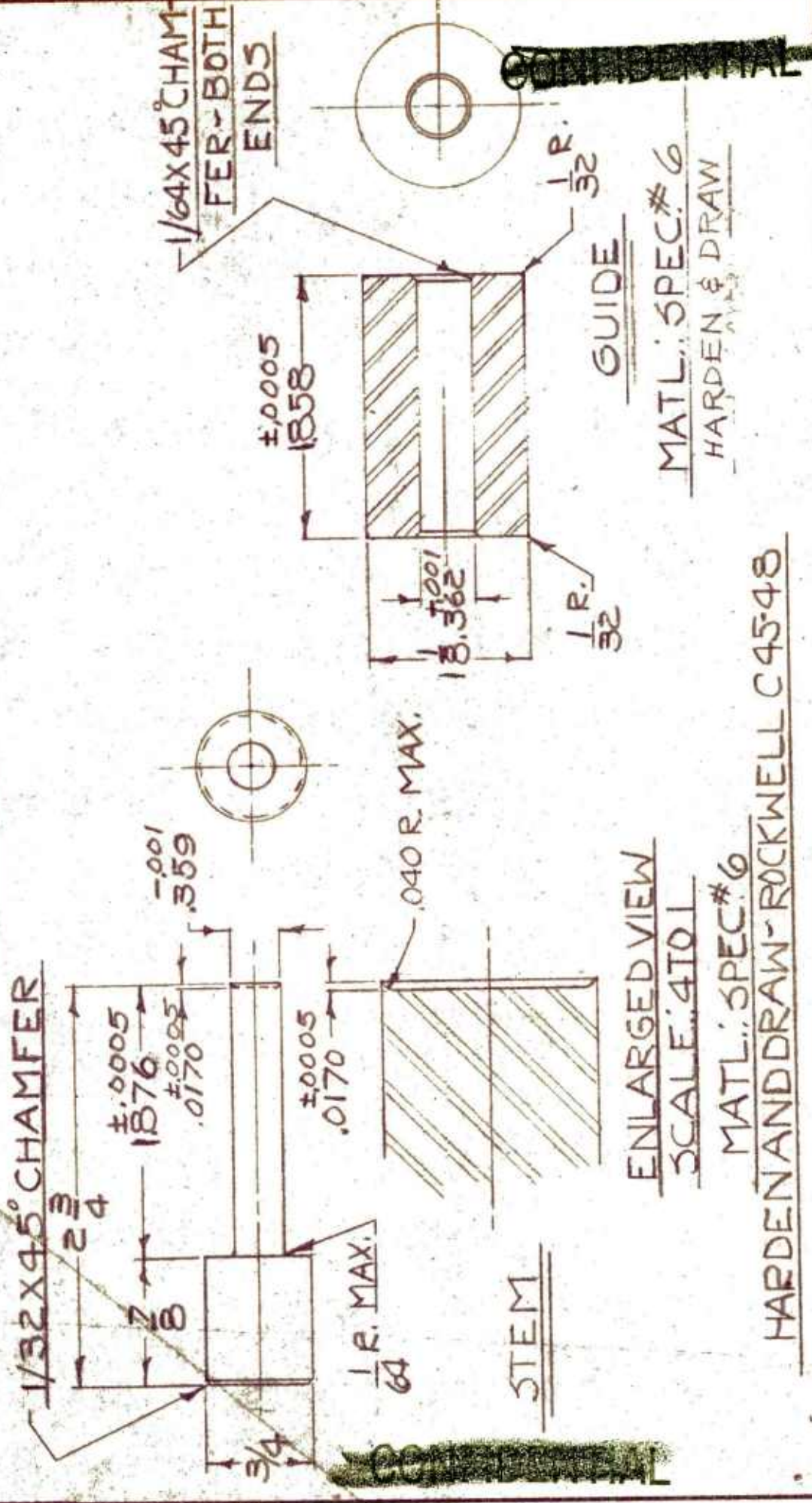
RECORD OF ALTERATIONS

UNLESS OTHERWISE SPECIFIED	ALL FRACTIONAL FINISH DIMENSIONS	± .01	ALL DECIMAL DIMENSIONS	± .001	DO NOT SCALE THIS DRAWING* WORK TO FIGURES

Form AD-885

DRAWING NO. ERL-1416		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES JAN 6 1938		RECORD OF ALTERATIONS	
MAIN TITLE SEATING TOOL									
SUB TITLE FOR PRIMER INSERTION									
SCALE FULL		APPRO'D <i>[Signature]</i>							
SHEET NO. 1		DATE 7-12-51		APPRO'D					
DRAWN GC		TRACED		APPRO'D					
CHECKED TH		DATE 7-12-51		APPRO'D					

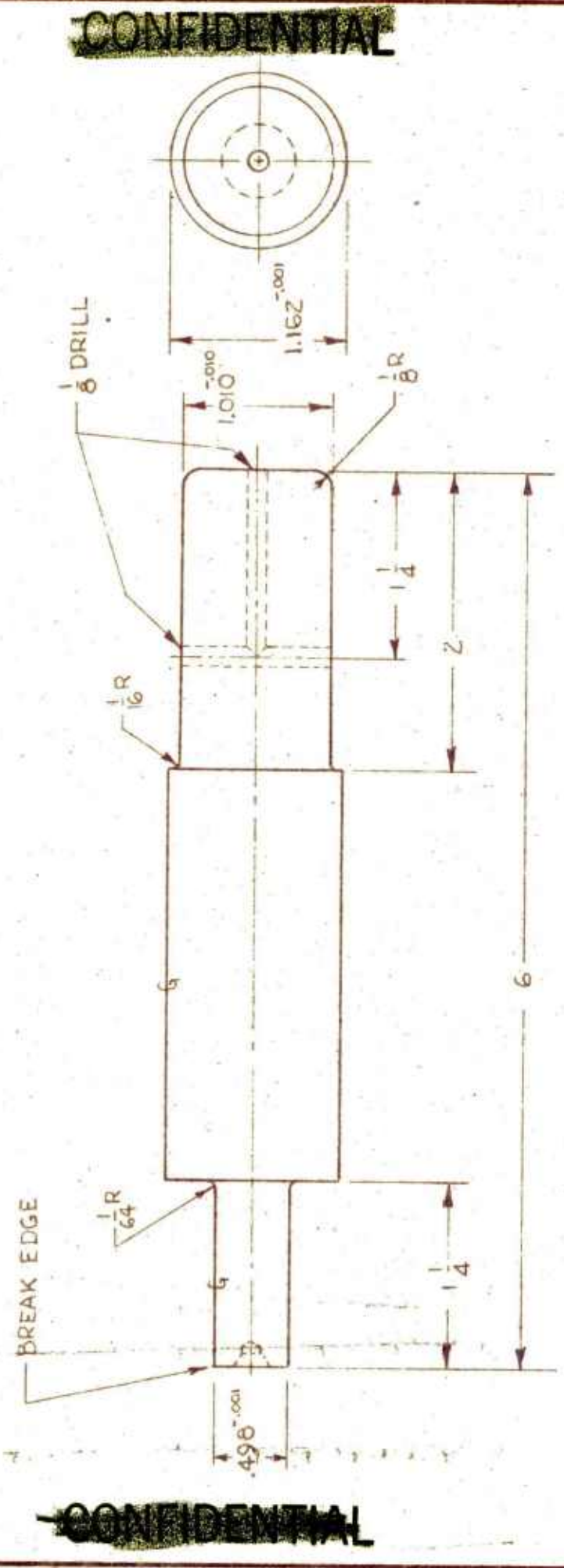
DO NOT SCALE THIS DRAWING: WORK TO FIGURES



DRAWING NO. RL-1768		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS SKRL-		ADDITIONAL USES		RECORD OF A	
MAIN TITLE PRIMING STEM				11-1152-5				JAN 10 1953	
SUB TITLE 30 MM FATISEI ALUMINUM CASE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN BLOCK		TRACED		APP'D					
CHECKED		APP'D		1/24/53		APP'D			

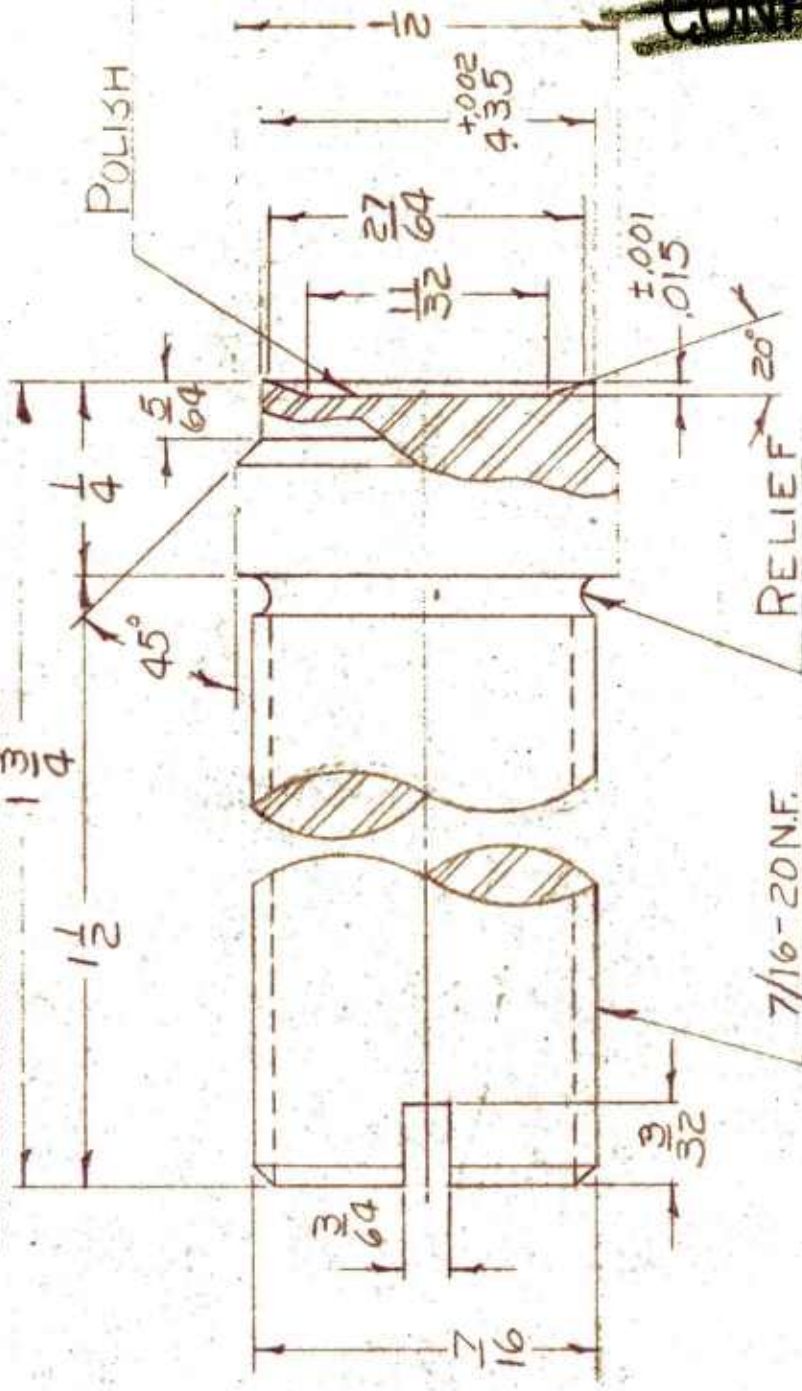
DO NOT SCALE THIS DRAWING: WORK TO FIGURES

MAT'L: SPEC. #7
HARDEN & DRAW
Rc 50-55



DRAWING NO. ERL-1335		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS SKRL		ADDITIONAL USES		RECORD OF ALLOCATIONS	
MAIN TITLE STAKING TOOL				12-549-12		JAN 6 1958			
SUB TITLE CAL. 60 ALUMINUM CASE									
20 MM; 20 MM T20, 20 MM FAT2, 30 MM FAT15 E									
SUPD'S DWG. NO. GC 5-151		SCALE 4-1		APR'D R. R. Canby		5-23-51			
DRAWN GC 5-151		TRACED		APP'D					
CHECKED GC 5-23-51		APP'D		APP'D					

DO NOT SCALE THIS DRAWING: WORK TO FIGURES



MATL.: SPEC #68

HARDEN AND DRAW- ROCKWELL C 54-56

CONFIDENTIAL

CONFIDENTIAL

DRAWING NO. ERL-1790		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE RUBBER CRIMPER ASSEMBLY						JAN 6 1958			
SUB TITLE 30 MM ALUMINUM CASE FA T15 E-1									
SUPD'G DWG. NO.	SCALE	HALF	APP'D						
DRAWN F.H. 12-17-53	TRACED		APP'D						
CHECKED			APP'D 1/4/58						

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

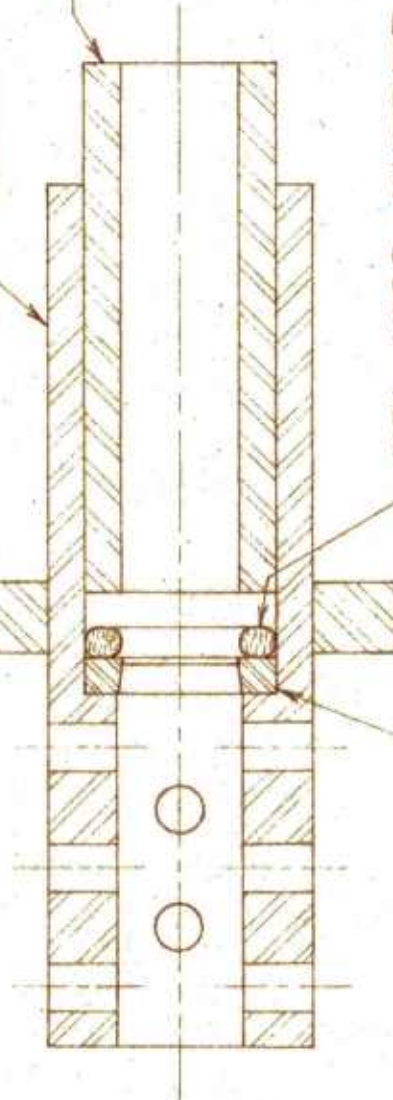
ERL-1699 REINFORCE RING

ERL-1698 RETAINER SLEEVE

ERL-1700 THRUST SLEEVE

ERL-1702 RUBBER RING

ERL-1701 SHOULDER DIE



~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

DRAWING NO. ERL-1700		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF APPROVATIONS	
MAIN TITLE THRUST SLEEVE				SKRL-					
SUB TITLE FOR RUBBER CRIMPER				11-1552-3					
SUB TITLE 30 MM ALUMINUM CASE									
SUB TITLE FATIS E-1									
SUPD'S DWG. NO.		SCALE		HALF		APP'D		JAN 6 1958	
DRAWN F.H. 16-4-53		TRACED				APP'D			
CHECKED		APP'D		12/12/53		APP'D			

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTES:

GRIND ALL OVER

I.D. AND O.D. MUST
BE CONCENTRIC.

REMOVE SHARP EDGES

5.2



+0.002
-1.235
-1.001
1.999



MATL: SPEC. #7
HARDEN & DRAW
RL 54-57

CONFIDENTIAL

CONFIDENTIAL

DRAWING NO. ERL-1701		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ITEMS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE SHOULDER DIE				SKRL-							
SUB TITLE FOR RUBBER CRIMPER				11-1552-2							
30 MM ALUMINUM CASE											
FAT 15 E-1											
SUPD'S DWG. NO.		SCALE FULL		APP'D							
DRAWN F.H. 6-4-53		TRACED		APP'D							
CHECKED		APP'D 12/19/53		APP'D							

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTES:

GRIND ALL OVER
I.D. AND O.D. MUST
BE CONCENTRIC.
REMOVE SHARP EDGES

-.001
-.375
-.005
.005



MATERIAL SPEC. #7
HARDEN & DRAW
RC 55-60

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DRAWING NO. ERL-1698		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ITEMS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE RETAINER SLEEVE		SUB TITLE FOR RUBBER CRIMPER		11-1552-1							
SUB TITLE 30MM ALUMINUM CASE		FA T15 E1									
SUPD'S DWG. NO.		SCALE HALF		APP'D							
DRAWN FH 6-1-53		TRACED		APP'D							
CHECKED		APP'D <i>gfw</i>		12/17/53							

JAN 6 1958

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE
REMOVE ALL CHAMP EDGES

9

3.690
1/2 DRILL
10 HOLES

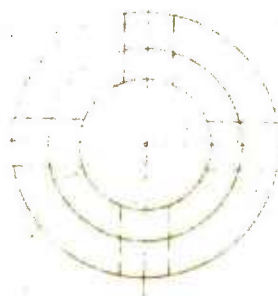


+0.01
1.332

+0.02
2.000

2.752

PRESS FIT IN
ERL-1699



MATL SPEC # 15 OR # 25

5.8
5.8
5.8
5.8
5.8

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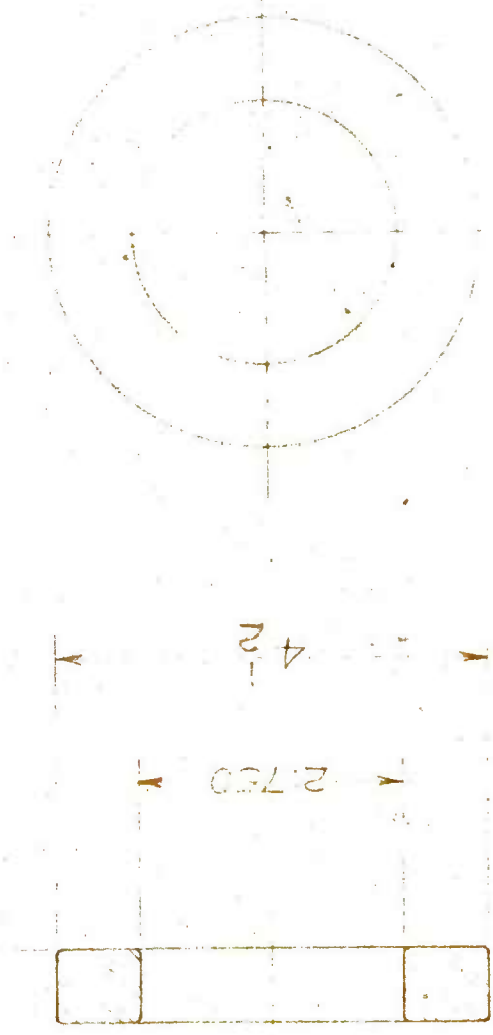
DRAWING NO. ERL-1699		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ITEM		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE REINFORCE RING FOR RUBBER GRIMPER				SKRL-							
SUB TITLE 30 MM ALUMINUM CASE				11-1552-4							
FA T15 E-1											
SUPD'S DWG. NO.		SCALE		HALF		APP'D					
DRAWN BY 6-2-53		TRACED				APP'D					
CHECKED		APP'D		11/11/53		APP'D					

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NOTE:
REMOVE ALL SHARP EDGES

PRECIS FIT ON ERL-1678



MATL: SPEC. #15

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SUPPLEMENT III

Wrap Around Sealed Cup Primer (Electric)

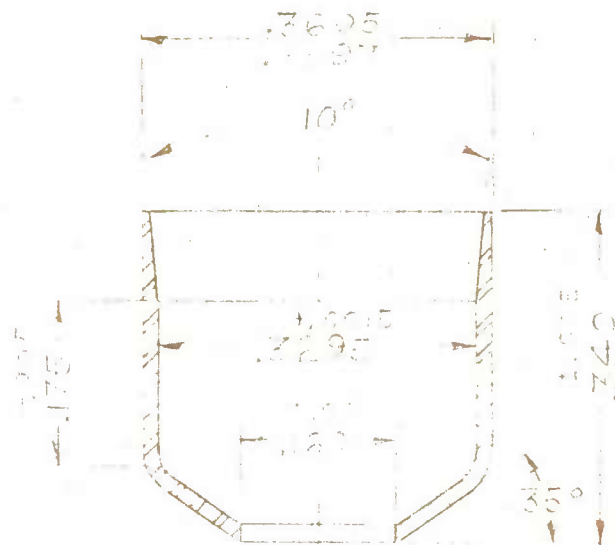
Product Drawing

Revised Process Record

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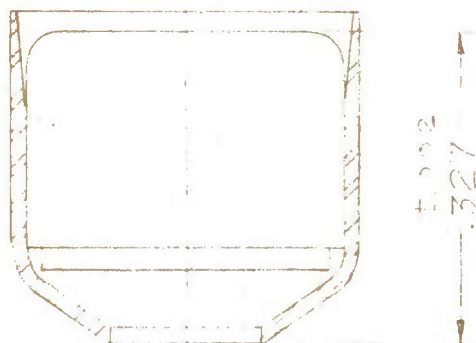
WRAP AROUND SEALED CUP PRIMER
WITH M52 A3 ELECTRIC PRIMER



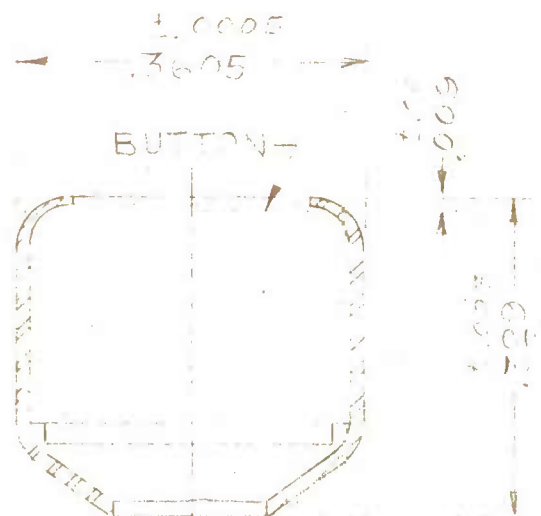
ADAPTER AFTER
COPPER PLATING



M52 A3
ELECTRIC
PRIMER



ADAPTER
& PRIMER
ASSEMBLED



CRIMPED
ASSEMBLY

~~CONFIDENTIAL~~

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MODIFICATION TO
"WRAP AROUND SEALED CUP" PRIMER (ELECTRIC) PROCESS
SUPPLEMENT V TO REMINGTON REPORT AB-54-8

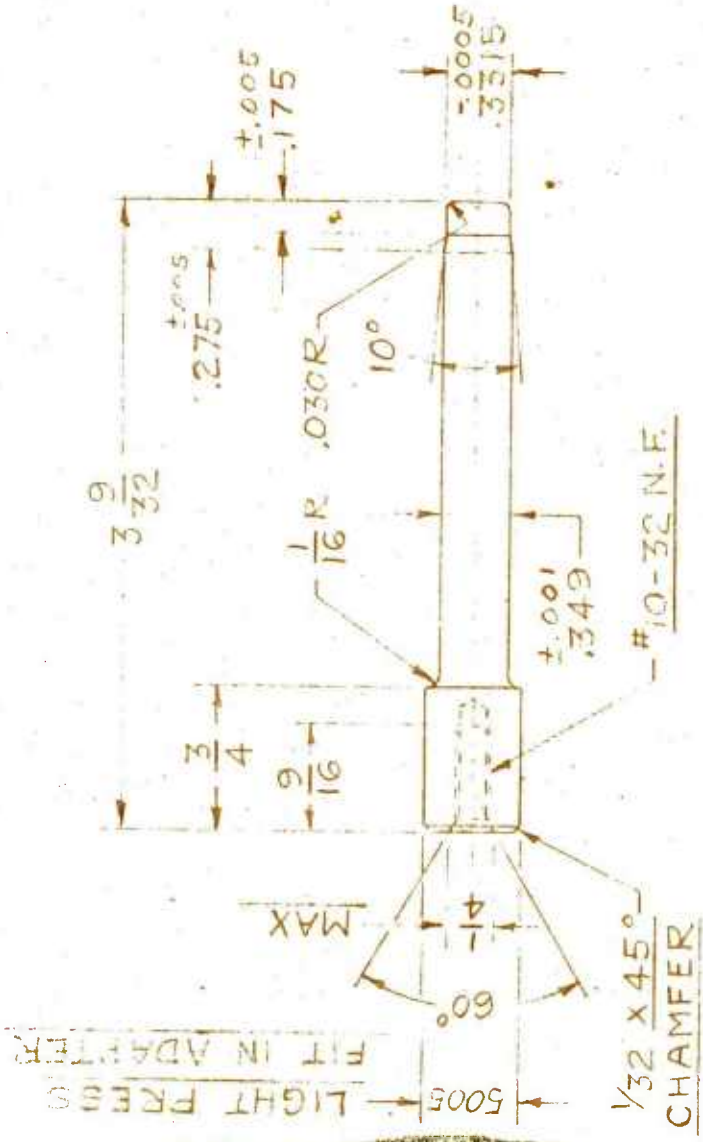
1. No change.
2. Form Adaptor Cups
Second Draw Punch ERL 1986
(replaces ERL 1678)
3. No change.
4. No change.
5. No change.
6. No change.
7. No change.
8. No change.

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DRAWING NO. ERL 1986		REMINGTON ARMS CO., INC. BRIDGEPORT, CONN.		CONST. & DETAIL DRAWINGS		ADDITIONAL USES		RECORD OF ALTERATIONS	
MAIN TITLE #1Q8 W.F. EYELET WAD.									
SUB TITLE M52A3ELEC PRIMER ADAPTER						JAN 10 1958			
ALUMINUM CAGE									
SUPD'S DWG. NO.		SCALE FULL		APP'D					
DRAWN		TRACED		APP'D					
CHECKED		APP'D		APP'D					

DO NOT SCALE THIS DRAWING: WORK TO FIGURES

NOTE ÷
GRIND ALLOVER



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MAT'L SPEC # 6
HARDEN & DRAIN
ROCKWELL C50/61

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