CONFIDENTIAL

1-1-54
31-12-55
8
AS-1 MOTOR DWGS
PROJ 2045

This document is part of an integrated file. If separated from the file it must be subjected to individual systematic review.

25X1

JOB. NO. 78-03433A
BOX NO. 11
FOLDER NO. 8
TOTAL DOCS HEREIN

DOC 1 REV DATE 25 NOV 1980 BY 069540
ORIG COMP OFF 52 TYPE 12
ORIG CLASS M PAGES 37 REV CLASS C
JUST 22 NEXT REV 2010 AUTH: HR 70-2

AS-1 Motor Drawings

1954 - 1955

25X1

ORIGINAL CL BY 235979
☐ DECL X REVW ON 2010
EXT BYND 6 YRS BY SAME
REASON 3 d (3)

This document is part of an integrated file. If separated from the file it must be subjected to individual systematic review.

CONFIDENTIAL

Declassified in Part - Sanitized Copy Approved for Release 2012/10/16 : CIA-RDP78-03433A001100080001-2

CONTRACT NO. XG-1384

M O T O R - 51601

MAINTENANCE & OPERATION MANUAL

1. BRUSH ADJUSTMENT & REPLACEMENT

Brushes used are of lifetime material and need not be replaced. Adjustment is initially made at assembly and due to lifetime qualities no adjustment should be necessary. If, for any reason due to breakage, etc., brushes are to be replaced, they should be set to 45 grams pressure at the commutator dia. (.281 dia.). Adjustment is made by turning set screw behind brush.
This replacement and adjustment can be made only on disassembling.

2. GOVERNOR ADJUSTMENT

To adjust governor, remove 6-32 set screw in outer case, rotate motor shaft until slotted screw appears in wire groove in housing.
Turn slotted screw, very carefully, in or back out to adjust governor.
(If this adjustment is not sufficient, remove outer cover and bend leaf carefully in direction desired for adjustment.)

3. BEARING LUBRICATION

Bearings are of double shielded type, packed with grease at factory and need no lubrication.

4. DISASSEMBLING MOTOR FOR MAINTENANCE OR PARTS REPLACEMENT

a. Loosen set screw in cover, slip cover from housing.
b. Loosen 1-64 round head machine screw in mounting face of gear box end. Remove terminal block from gear box. Unsolder leads from terminal.
c. Loosen three 2-56 filister head machine screws in mounting face of gear box end. Remove gear box carefully from housing. Note that pinion will come off armature shaft upon removal of gear box. Innermost bearing in gear box should come off armature shaft and remain in gear box.
d. Remove three 1-64 flat head machine screws on perifery of housing at motor shaft end. Remove end cap at motor shaft end.
e. Armature shaft may now be removed from housing.
f. Unsolder leads from resistor at end cap.
g. Loosen two 3-48 set screws in housing and remove magnets.
h. Loosen two 1-64 flat head machine screws in housing end and slide brush holder out end of housing.
i. Loosen two 1-64 flat head machine screws in brush holder on end cap and remove brush holder from end cap.

MOTOR IS NOW DISASSEMBLED

CONTRACT NO. XG-1384

M O T O R - 51601

MAINTENANCE & OPERATION MANUAL (Cont'd)

5. DISASSEMBLING GEAR BOX

Disassemble two halves of gear box by inserting 3-48 screw in mounting hole in solid section. Turn screw down until two halves have parted or become loose enough to part by hand.
Pinion shaft with nylon gear will remain in inner half and gear shaft extension will remain in outer half.
Gear shaft may be pushed out by hand from outer half.
To remove pinion shaft from inner half, push shaft from bearing. This will force off nylon gear at the same time.

GEAR BOX IS NOW DISASSEMBLED

STAT

CONTRACT NO. XG-1384

M O T O R - 51601

MAINTENANCE & OPERATION MANUAL

1. BRUSH ADJUSTMENT & REPLACEMENT

Brushes used are of lifetime material and need not be replaced. Adjustment is initially made at assembly and due to lifetime qualities no adjustment should be necessary. If, for any reason due to breakage, etc., brushes are to be replaced, they should be set to 45 grams pressure at the commutator dia. (.281 dia.). Adjustment is made by turning set screw behind brush.
This replacement and adjustment can be made only on disassembling.

2. GOVERNOR ADJUSTMENT

To adjust governor, remove 6-32 set screw in outer case, rotate motor shaft until slotted screw appears in wire groove in housing.
Turn slotted screw, very carefully, in or back out to adjust governor.
(If this adjustment is not sufficient, remove outer cover and bend leaf carefully in direction desired for adjustment.)

3. BEARING LUBRICATION

Bearings are of double shielded type, packed with grease at factory and need no lubrication.

4. DISASSEMBLING MOTOR FOR MAINTENANCE OR PARTS REPLACEMENT

a. Loosen set screw in cover, slip cover from housing.
b. Loosen 1-64 round head machine screw in mounting face of gear box end. Remove terminal block from gear box. Unsolder leads from terminal.
c. Loosen three 2-56 filister head machine screws in mounting face of gear box end. Remove gear box carefully from housing.
Note that pinion will come off armature shaft upon removal of gear box. Innermost bearing in gear box should come off armature shaft and remain in gear box.
d. Remove three 1-64 flat head machine screws on perifery of housing at motor shaft end. Remove end cap at motor shaft end.
e. Armature shaft may now be removed from housing.
f. Unsolder leads from resistor at end cap.
g. Loosen two 8-48 set screws in housing and remove magnets.
h. Loosen two 1-64 flat head machine screws in housing end and slide brush holder out end of housing.
i. Loosen two 1-64 flat head machine screws in brush holder on end cap and remove brush holder from end cap.

MOTOR IS NOW DISASSEMBLED

STAT

CONTRACT NO. XG-1384

M O T O R - 51601

MAINTENANCE & OPERATION MANUAL (Cont'd)

5. DISASSEMBLING GEAR BOX

Disassemble two halves of gear box by inserting 8-48 screw in mounting hole in solid section. Turn screw down until two halves have parted or become loose enough to part by hand.
Pinion shaft with nylon gear will remain in inner half and gear shaft extension will remain in outer half.
Gear shaft may be pushed out by hand from outer half.
To remove pinion shaft from inner half, push shaft from bearing. This will force off nylon gear at the same time.

GEAR BOX IS NOW DISASSEMBLED

STAT

MAINTENANCE INSTRUCTIONS

This unit has been designed so that it does not require preventive maintenance. The bearings are sealed with lifetime lubricant; the brushes and commutator should not require replacement for the motor's normal life.

It may be necessary to occasionally reset the governor speed. You should proceed with this adjustment in the following order, using the following equipment or its equivalent:

EQUIPMENT NECESSARY TO MAKE ADJUSTMENTS:

1. An Oscilloscope
2. a 6-Volt Battery Power Supply
3. An Ampmeter in the range of 0 to 3 Amp,
4. An accurate Calibrated Strobotac or a tachometer and timer.
5. A Prony Brake or other means of loading the motor under operating conditions, as called for under Spec. # (Motor end = 4-ounce inch).

PROCEDURE:

1. Connect motor with amp meter in series with one lead connected so that it will read on scale.
2. The oscilloscope should be connected with the vertical amplifier across the two motor leads.
3. Set the sweep frequency on the oscilloscope to approximately 35 cycles.
4. Turn the gain of the average oscilloscope to the maximum position.
5. The oscilloscope, when the motor is running with no load, should show no pronounced spikes on the screen.
6. Each commutator bar will give you an indication of 1/9 of the screen length so that you should get 9 inflections showing the commutator of each bar. Any pronounced spikes of greater amplitude than the average inflections will show that you have either a high or a low bar on the commutator. This inflection will not normally affect the power or the running of the motor but will create radio frequency noise. If the motor has these spikes, it should be replaced.
7. If the motor appears uniform with no spikes in the oscilloscope, you can proceed to adjust the governor to the proper speed (2100 rpm on the high speed and 368.4 rpm on the low speed end.)
8. Remove large set screw, which gives you access to the governor adjusting screw.
9. A small screw driver, having a properly ground blade to fit a standard 2-64 round head screw, is used to slowly turn the rotating shaft until this governor screw is accessible through the hole. (This screw will be the natural stainless steel color. Any other screws which might show up as you are rotating the governor will be covered with a gray paint and should not be distrubed.
10. To speed the motor up the screw should be turned in a clockwise direction. Conversely: to slow down the motor, turn in a counter-clockwise direction.
11. Extreme care should be used in making this adjustment as excessive pressure downward on this screw will permanently displace the governor reed. (It is well to get acquainted with this governor arrangement by referring to the drawings showing this particular part).

12. Check the speed by the use of the strobotac or counter and timer combination. (It is well to let the motor run a few minutes before timing so that the motor and governor will stabilize. The motor should be run a few minutes before checking after any adjustment).

13. The Prony Brake should be connected to the motor shaft so that a normal load is applied when you are checking the speed.

14. Care should be exercised when removing or installing the pin through the motor shaft, as excessive impact on this shaft may permanently harm the bearings.

4. Slowly turn the motor shaft with the [illegible] screw. It should strike hole (this screw will be the natural stainless steel color) other screw that shows up

51601 PARTS LIST

PART NO.	TITLE	QUAN/UNIT
51601-01	PINION	1
-02	GEAR	1
-03	PINION	1
-04	GEAR	1
-05	ARMATURE HOUSING	1
-06	GEAR BOX	1
-07	END CAP	1
-08	TUBE	1
-09	TUBE INGRAVING	1
-010	ARAMTURE SHAFT	1
-011	BRUSH HOLDERS	2
-012	LAMINATION	40 pl.2 Fishpaper-.020"Thick
-013	GOVERNOR ASSEMBLY	1
-014	BODY COVER	1
-015	LEAF CONTACT LONG	1
-016	CONTACT	1
-017	BLOCK WEIGHT	1
-018	TERMINAL BLOCK	1
-019	PIN TERMINAL	2
-020	FIELD MAGNET	2
-021	CLAMP COMMUTATOR	2
-022	CLAMP COMMUTATOR	1
-023	INSULATORS	4 of Each Kind
-024	BRUSH	4
-025	SPRING	4
-026	TENSION WASHER	1
-027	SILVER BAR	9
-028	SLIP RING	2
-029	FISH PAPER BETWEEN SLOTS IN LAMINATION	9

51601 HARDWARE PARTS LIST

PART NO.	QUANTITY	DESCRIPTION	SIZE	MATERIAL
	5 Ea.	R.H.Machine Screws	1-64x3/16 Lg.	S.S.
	1 Ea.	R.H.Machine Screws	2-64x3/64 Lg.	S.S.
	2 Ea.	Contacts	Mallory #233-804	Silver
	2 Ea.	Dowel Pins	3/32 dia. x5/8 Lg.	S.S.
	5 Ea.	Fil.Hd. Machine Screw	2-56x 13/16 Lg.	S.S.
	4 Ea.	Ball Bearings	N.H.Ball Brg.#SFR156PP	S.S.
	2 Ea.	Ball Bearings	N.H.Ball Brg.#SFR1PP	S.S.
	7 Ea.	F.H.Machine Screws	1-64x1/4 Lg.	S.S.
	4 Ea.	R.H.Machine Screws	1-64x1/8 Lg.	Brass
	4 Ea.	Soc.Set Screws	6-32x5/64 Lg.	S.S.
	3 Ea.	Soc.Set Screws	3-48x3/64 Lg.	S.S.
	1 Ea.	Resistor Ohmite	1/2 Watt 82 ohm	
	2 Ea.	Tinned Buss Wires	015 dia.x5/16 Lg.	Copper
	2 Ea.	Lead Wires	#24x2½ Lg.	

ARMATURE WINDING: 9 Coils, 45 Turns, #43 Wire, Double Formex

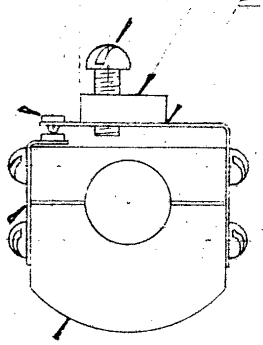
(1) #2-64 RD. HD. SCREW 3/16 LG.

BLOCK #51601-017

.070

LEAF #51601-015

MALLORY CONTACT SILVER

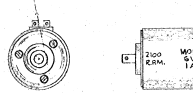


(4) #1-64 RD. HD. SCREW 3/64

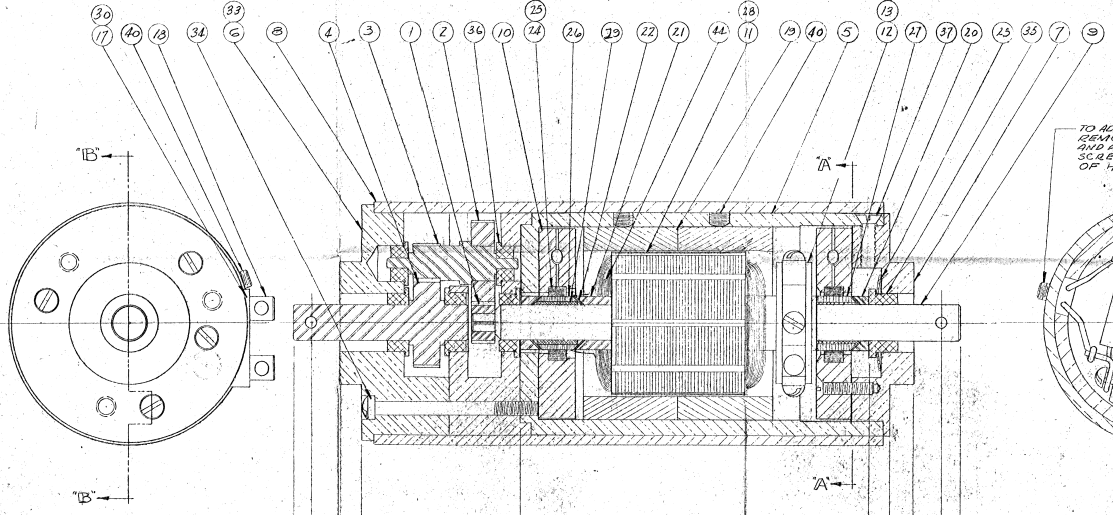
CONTACT #51601-016

BODY #51601-014

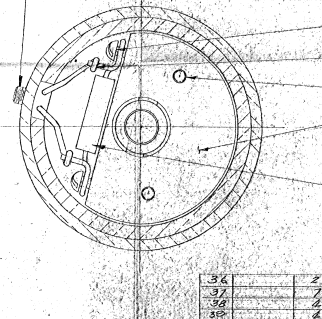
		TOLERANCE: UNLESS OTHERWISE NOTED DECIMAL ±.005 FRACTION = 1/64	
		BY DJS DATE 6-6-65	STAT
		SCALE 2:1	
			TITLE ASSY., GOVERNOR
REVISION BY DATE CHANGE		MAT NOTED	DWG NO 51601-013



FULL SIZE



SECTION 'B-B'



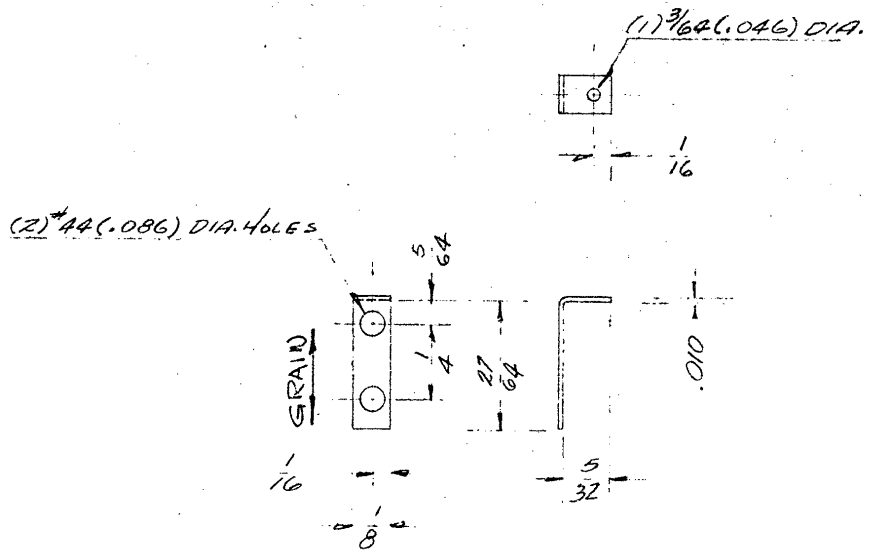
SECTION 'A-A'

TO ADJUST GOVERNOR REMOVE SET SCREW AND ADJUST SLOTTED SCREW IN GROOVE OF HOUSING.

PARTS LIST

SYM.	DWG. NO.	QTY.	NAME	
1	51601-01	1	PINION	
2	51601-02	1	GEAR	
3	51601-03	1	PINION	
4	51601-04	1	GEAR	
5	51601-05	1	ARMATURE HOUSING	
6	51601-06	1	GEAR BOX	
7	51601-07	1	END CAP	
8	51601-08	1	TUBE	
9	51601-09	1	ARMATURE SHAFT	
10	51601-011	2	BRUSH HOLDER	
11	51601-012	42	LAMINATION	
12	51601-013	1	GOVERNOR	
13	51601-014	1	BOOK	
14	51601-015	1	LEAF CONTACT ASS.	
15	51601-016	1	CONTACT	
16	51601-017	1	BLOCK, WEIGHT	
17	51601-018	1	TERMINAL BLOCK	
18	51601-019	2	PIN, TERMINAL	
19	51601-020	2	FIELD MAGNET	
20	51601-021	2	CLAMP COMMUTATOR	
21	51601-022	1	CLAMP COMMUTATOR	
22	51601-023	4	INSULATORS	
23	51601-024	4	BRUSH	
24	51601-025	4	SPRING	
25	51601-026	1	TENSION WASHER	
26	51601-027	3	SILVER BAR	
27	51601-028	2	SLIP RING	
28	51601-029	3	FISH PAPER	IN LAMINATIONS
29	51601-030	2	TUBE INSULATION	
30		4	R.H. MACH. SW. SS	1-64 x 3/16 LG
31		1	R.H. MACH. SW. SS	2-64 x 3/16 LG
32		2	CONTACTS #233-B	MALLORY
33		2	DOWEL PIN SS	1/32 x 3/16 LG
34		3	FIL. H. MACH. SCREWS	2-56 x 3/16 LG
35		4	BALL BEARING SS	1/4 x 1/2 x 1/8
36		2	BALL BEARINGS SS	1/4 x 1/2 x 1/8
37		1	RH. MACH SW. SS	4-40 x 3/16 LG
38		4	FIL. MACH SW. BRASS	4-40 x 3/16 LG
39		4	SOC. SET SW. SS	6-32 x 3/16 LG
40		3	SOC. SET SW SS	8-32 x 1/4 LG
41		1	RESISTOR 1/2W 82 Ω	
42		2	WIRE, TINNED BUSS	24 AWG x 3" LG
43		1	WIRE, LEAD	22 AWG x 6" LG
44		20 LBS	WIRE, DOUBLE FORMEX	23 AWG SIZE

BY	DATE	SCALE 4:1	TITLE	DRAWING NO.
			ASSY. MOTOR	51601-200



STAT

REVISION	BY	DATE	CHANGE

TOLERANCES: UNLESS OTHERWISE NOTED:
DECIMAL ± .005 FRACTION ± 1/64

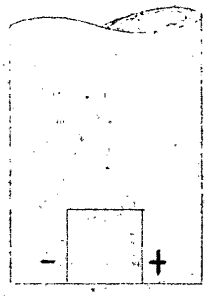
BY DJG DATE 6-7-55

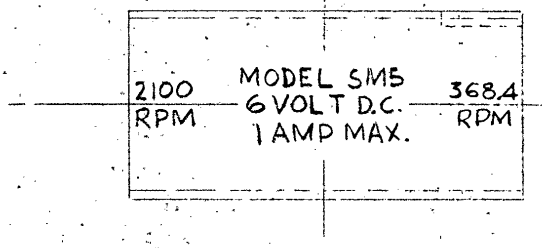
SCALE 2/1

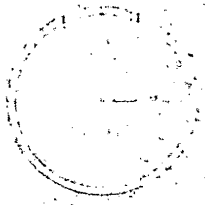
TITLE CONTACT

MAT .010 BERYLLIUM COPPER

DWG 51601-016







ALL LETTERING TO BE 7/64 HIGH, GOTHIC BOLD. 1/16 SPACE BETWEEN LINES.
LETTERING TO BE FILLED WITH WHITE PAINT.
LETTERING CENTERED AS SHOWN.

TOLERANCE FRAC. ± 1/64

BY DTS DATE 7-20-55 | CHECKED DATE | SCALE 1:1

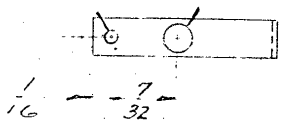
STAT

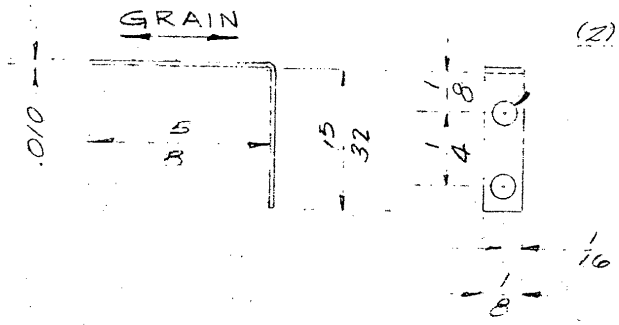
TITLE ENGRAVING, TUBE

MAT. ALUM. TUBE DWG.# DWG NO. 51601-09

(1) 3/64 (.046) DIA.

(1) 3/32 DIA. HOLE





(2) #44 (.086) DIA. HOLES

NOTE:
SMOOTH ALL OVER.

STAT

TOLERANCE UNLESS OTHERWISE NOTED
DECIMAL ±.005 FRACTION ±1/64

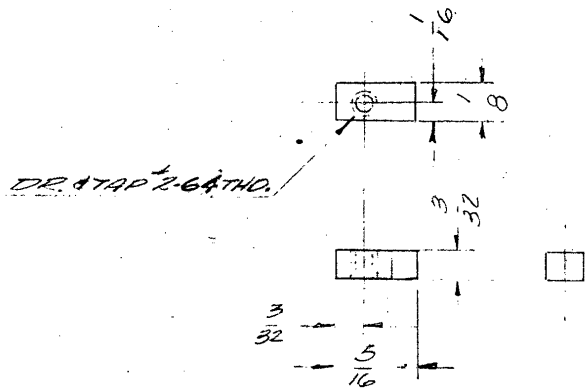
BY 1915 DATE 6-7-53

TITLE LEAF CONTACT, LONG

REVISION	BY	DATE	CHANGE

MAT. .010 BERYLLIUM COPPER

DWG NO. 51601-015



TOLERANCES: UNLESS OTHERWISE NOTED
DECIMAL ±.005 FRACTION ±1/64

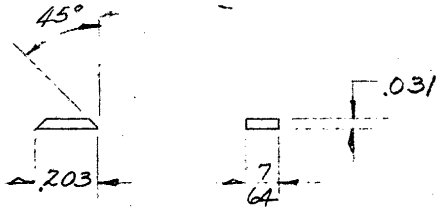
BY D/L DATE 6-7-55

SCALE 2:1

TITLE BLOCK

MAT. BRASS

DWG NO 51601-017



TOLERANCE DEC. ±.005 FRAC. ±1/64

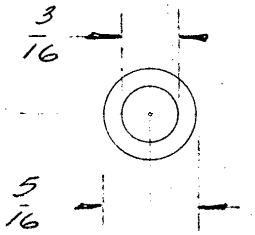
BY JJ DATE 7-21-55

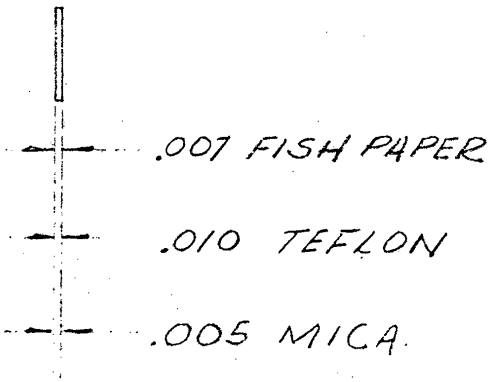
SCALE 2:1

TITLE BAR, SILVER

MAT. COINED SILVER

DWG NO 51601-027





(4) INSULATORS OF EACH MAT. REQ'D. PER. UNIT.

TOLERANCE FRAC ± 1/64

BY DTH DATE 7.21.51

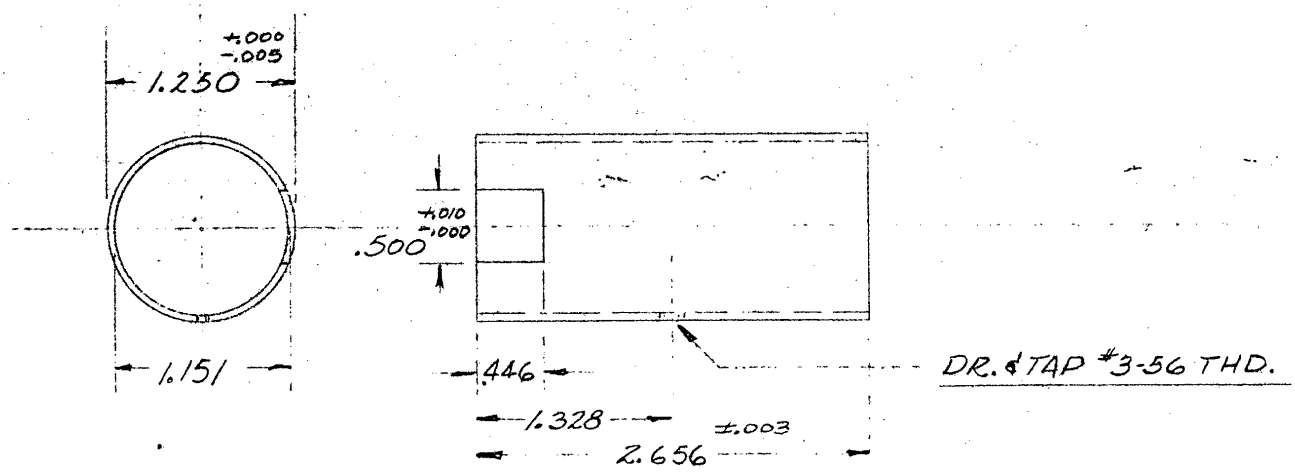
SCALE 2:1

STAT

TITLE INSULATORS

MAT. NOTED

DWG NO 51601-023



ENDS MUST BE PERPENDICULAR TO SURFACE OF TUBE.

TOLERANCE UNLESS NOTED
DEC. ±.005 FRAC. ± 1/64 ANG. ± 1/2°

BY DHB DATE 7-22-53 | CHECKED DATE | SCALE 1:1

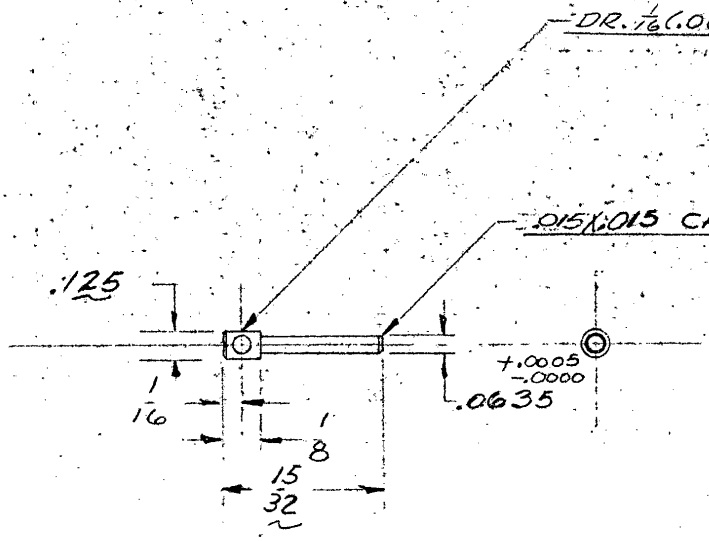
STAT

TITLE TUBE

FIN. BLACK ANODIZE

MAT. 24ST ALUM.

DWG. NO. 51601-08



TOLERANCE UNLESS NOTED OTHERWISE:
DEC. ±.005 FRAC. ± 1/64 ANGULAR ± 1/2°

REV.	BY	DATE	CHANGE
B	JE 2719	7-15-55	15/32 WAS 35/64
A	JE 514	6-8-55	.125 WAS .093

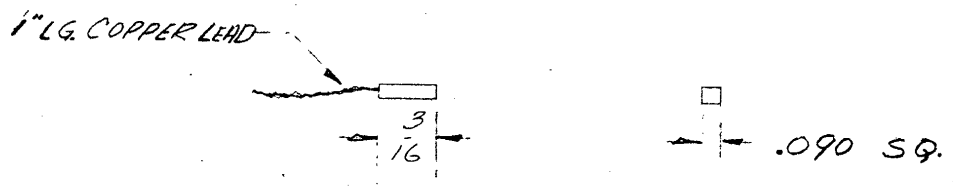
DWN. BY 2719 DATE 7-5-55 | CHECKED | DATE | SCALE 2:1

MAT. BRASS, FREE TURNING

TITLE PIN, TERMINAL

DWG NO 51601-019 B

STAT



#SA10 MORGANITE
85% SILVER
15% GRAPHITE

TOLERANCE
DEC. ±.005 FRAC. ±1/64

BY JJ DATE 7-21-55

SCALE 2:1

STAT

TITLE BRUSH

MAT. NOTED

DWG NO 51601-024

5/32

6 TURNS .008 DIA. COPPER WIRE.

TOLERANCE
DEC. ± .005 FRAC. ± 1/64

DV DTY DATE 7-21-55

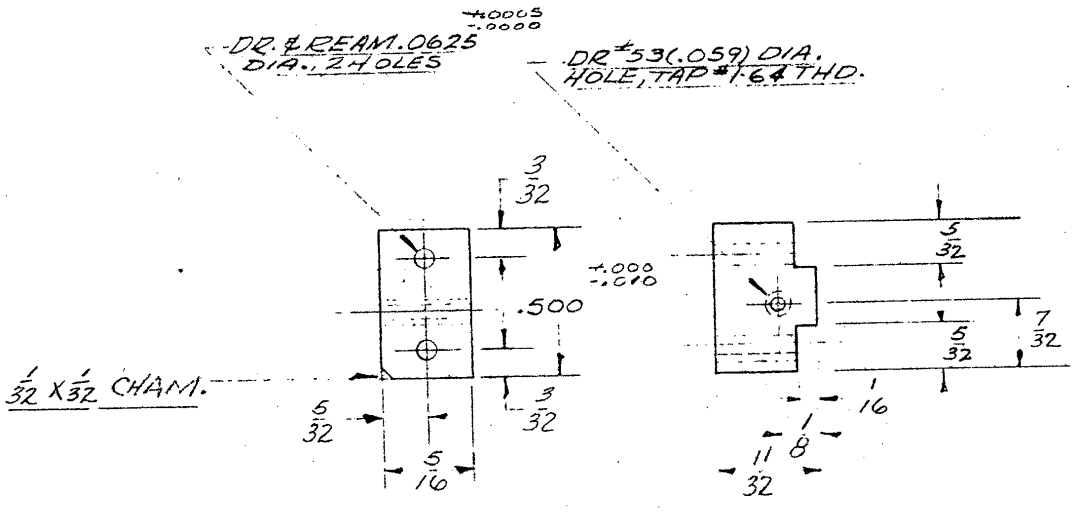
SCALE 2/ONE

TITLE SPRING

STAT

MAT NOTED

DWG NO 5160-025



TOLERANCE UNLESS NOTED OTHERWISE
DEC. ± .005 , FRAC. ± 1/64 ANGULAR ±'

DWN. BY	DATE	CHECKED	DATE
[illegible]	7-5-55		

SCALE 2:1

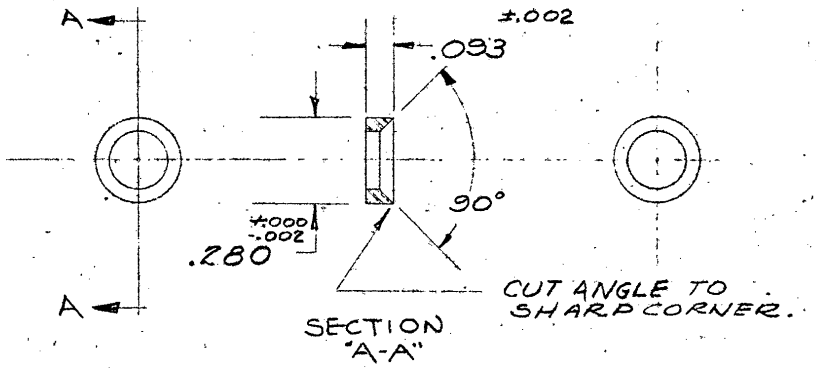
TITLE: BLOCK, TERMINAL

DWG NO. 51601-018

MAT. BAKELITE

REV.	BY	DATE	CHANGE
B	[illegible]	7-11-55	MAT.' WAS NYLON
A	[illegible]	7-8-55	1/32 WAS 1/16

STAT



TOLERANCE UNLESS NOTED:
DEC. ±.005, FRAC. ±1/64, ANGULAR ± 1/2°.

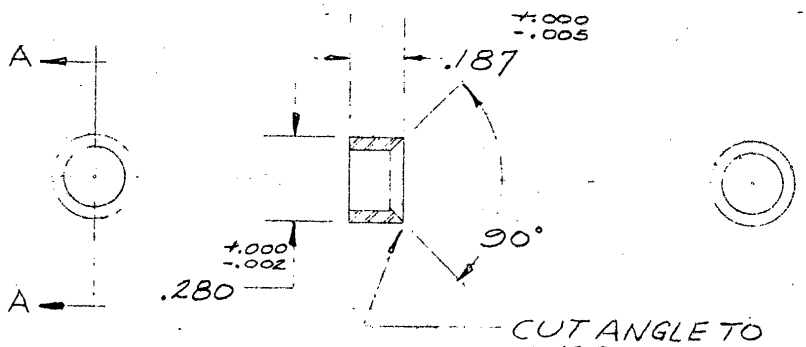
STAT

BY W.T.H.	DATE 7-20-55	CHECKED	DATE
		SCALE 2:1	

TITLE CLAMP, COMMUTATOR

MAT. 303 STAINLESS STL.

DWG NO. 5/601-021



SECTION
A-A

TOLERANCE UNLESS NOTED
DEC. ±.005, FRAC. ±1/64 ANGULAR ±½°

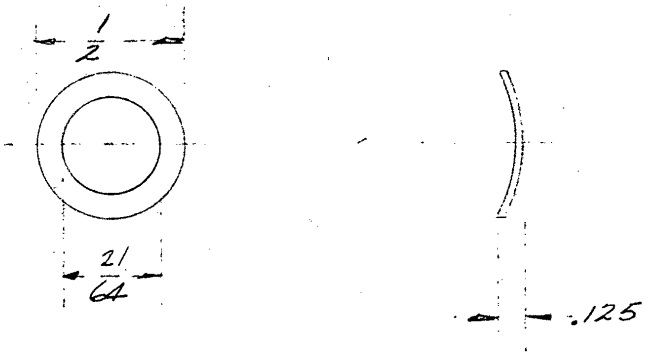
BY DTB	DATE 7-20-55	CHECKED · DATE	
		SCALE 2:1	

TITLE CLAMP, COMMUTATOR

MAT. 303 STAINLESS STL.

DWG NO. 51601-022

STAT



TOLERANCE
DEC. ± .005 FRAC. ± 1/64

BY DTB DATE 7-21-55

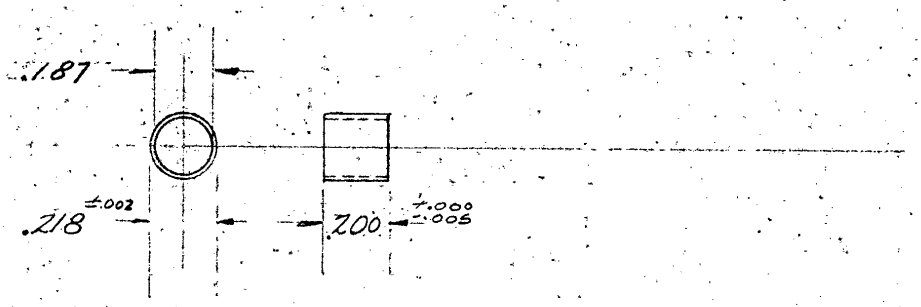
SCALE 2:1

STAT

TITLE
TENSION WASHER

MAT. .008 THK. BERYLLIUM COPPER

DWG NO 51601-026



TOLERANCE
DEC ±.005 FRAC ±1/64

BY DHG DATE 7-21-55

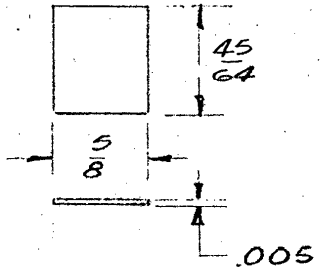
SCALE 2:1

STAT

TITLE TUBE, INSULATING

MAT NYLON G.S.

DWG NO. 31601-028



STAT

TOLERANCE DEC. ±.006 FRAC. ±1/64

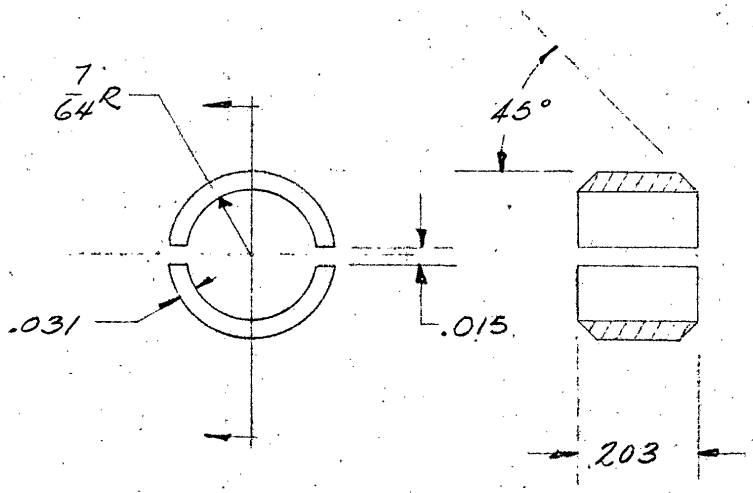
BY DTG DATE 7-21-55

SCALE 1:1

TITLE INSULATION, ARMATURE

MAT. FISH PAPER

DWG. NO 51601-029



TOLERANCE DEC ±.005 FRAC, ±1/64 ANG. ± 1/2°

BY OTB DATE 7-U-55

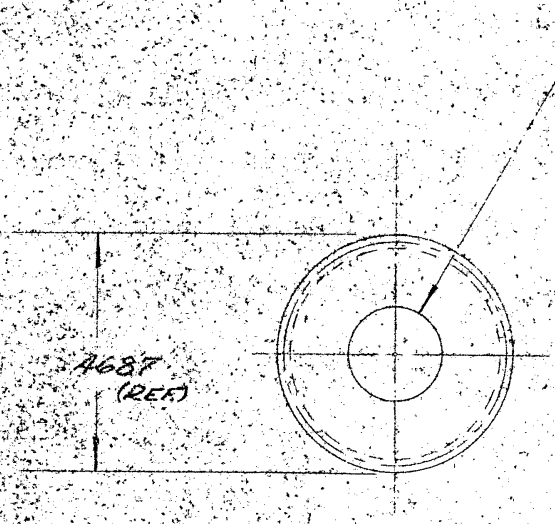
SCALE 4:1

STAT

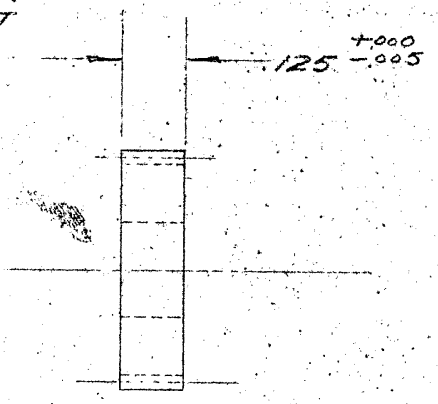
TITLE SLIP RING

MAT. COINED SILVER

DWG NO 5160/028



+.0005
.1875 DIA. (REF.) 1 Cam
MARK PF ON
PINION SHAFT
51601-3

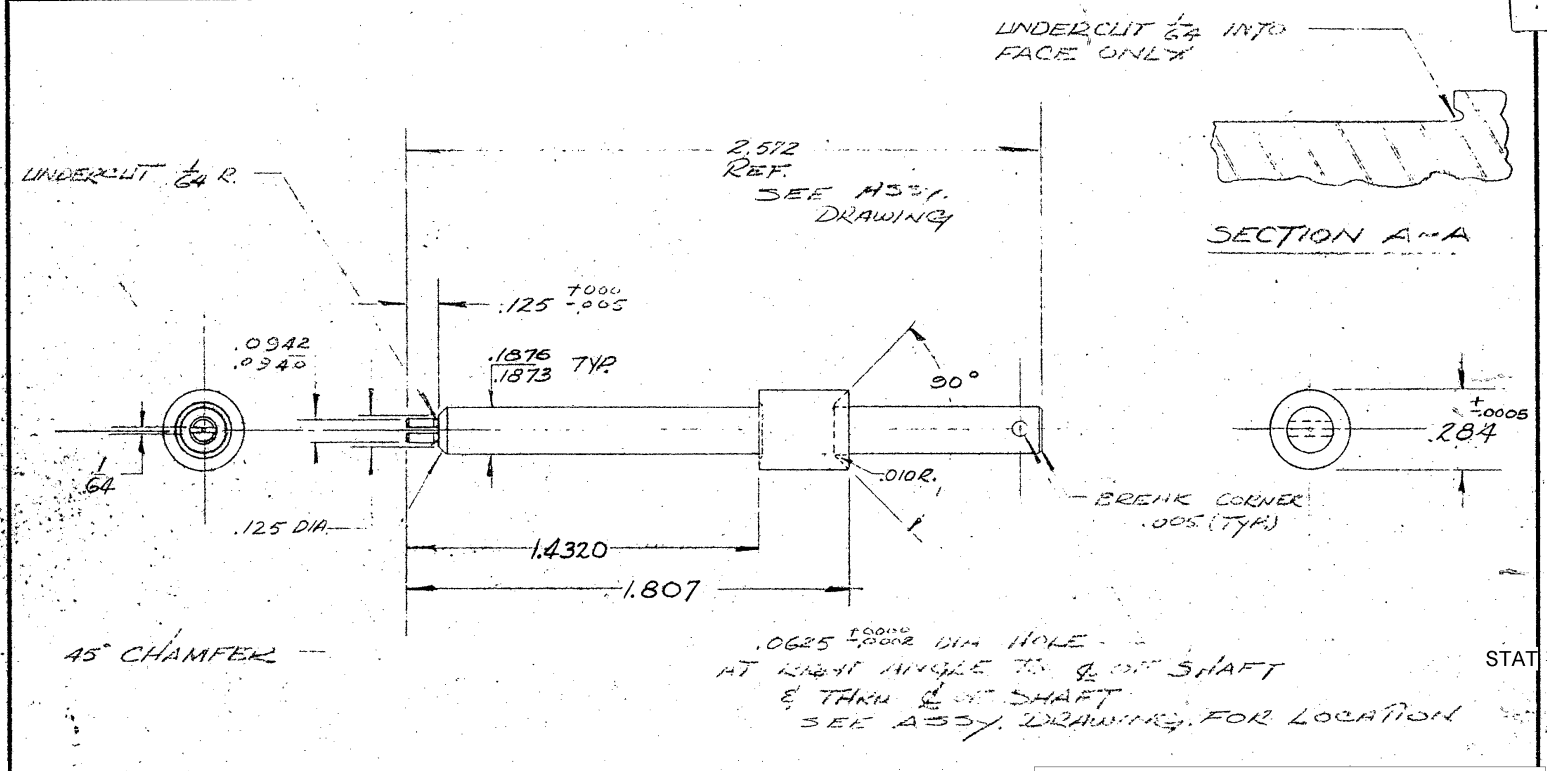


DIAMETRAL PITCH - 96
PITCH DIAMETER .4479
NO. OF TEETH 43
20° PRESSURE ANGLE

STAT

TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ± .005 FRACTIONS ± 1/64

MATERIAL: NYLON GS	HEAT TREATMENT:	SCALE: 4:1	DATE: 11/18/54	TITLE: GEAR	EXP.
PATTERN NO.	ROCKWELL HARDNESS ___ TO ___ ON THE ___ SCALE	DRAWN BY: J.E.	CHECKED BY		No. 51601-2
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		

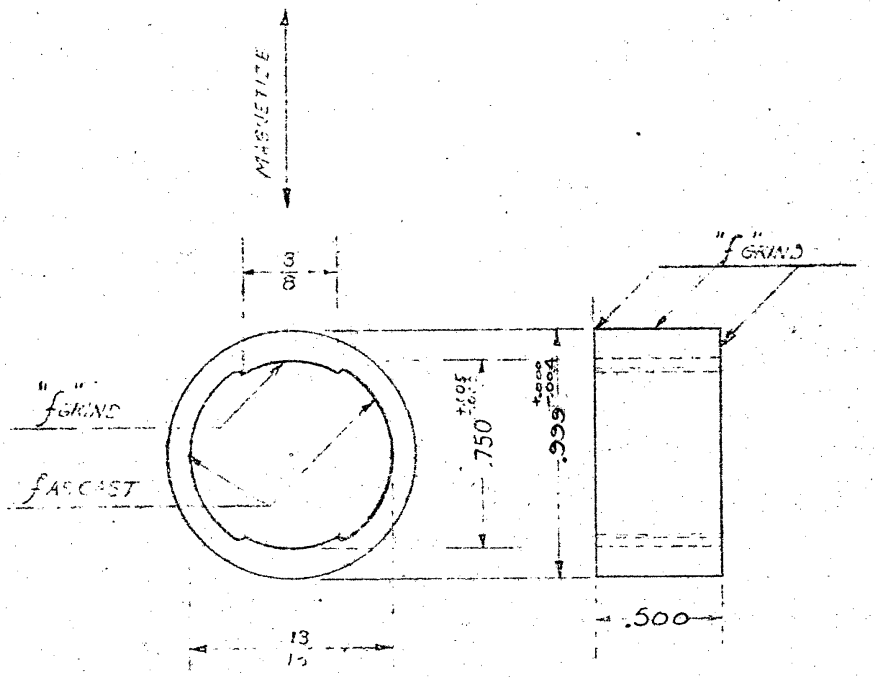


STAT

This document is part of an integrated file. If separated from the file it must be subjected to individual systematic review.

TOLERANCES, UNLESS OTHERWISE SPECIFIED,	DECIMALS ±.002	FRACTIONS ± 1/64	ANGULAR ± 1/2°

MATERIAL: STAINLESS 303	HEAT TREATMENT:	SCALE: 2:1	DATE: 12-17-54	TITLE: REMATE SHAFT	EXP.
PATTERN NO.	ROCKWELL HARDNESS ___ TO ___ ON THE ___ SCALE	DRAWN BY: [illegible]	CHECKED BY: [illegible] 12-17-54		No. 51609-10
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		

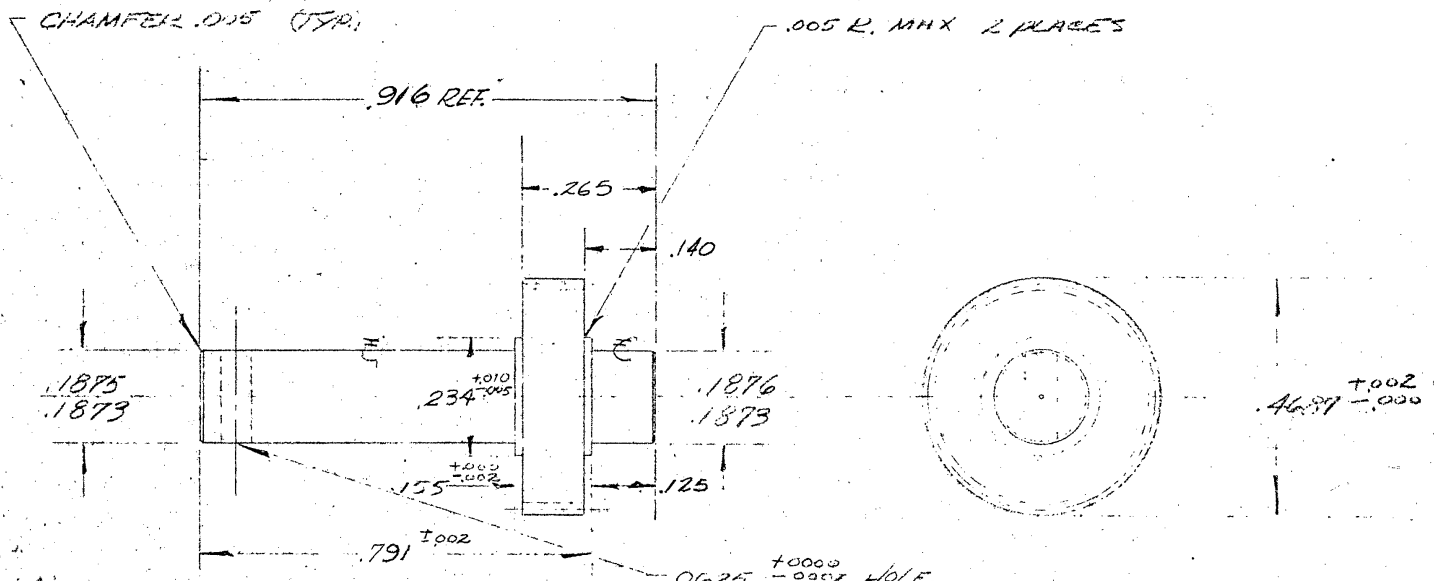


STAT

TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ±.002 FRACTIONS ± 1/32

MATERIAL: ALNICO 5	HEAT TREATMENT: IN FIELD AS SHOWN	SCALE: 1"	DATE: 9-10-57	TITLE: FIELD MAGNET	EXP.
PATTERN NO.	ROCKWELL HARDNESS, ___TO___ON THE___SCALE	DRAWN BY: WE	CHECKED BY		
CORE BOX NO.	FINISH: 75% CLEANUP GRIND "f"	APPR. BY	TRACED BY		No. 5/601-020

Eugene Dietzgen Co., Inc., New York, N. Y. No. 167A Kalcon Tracing Paper

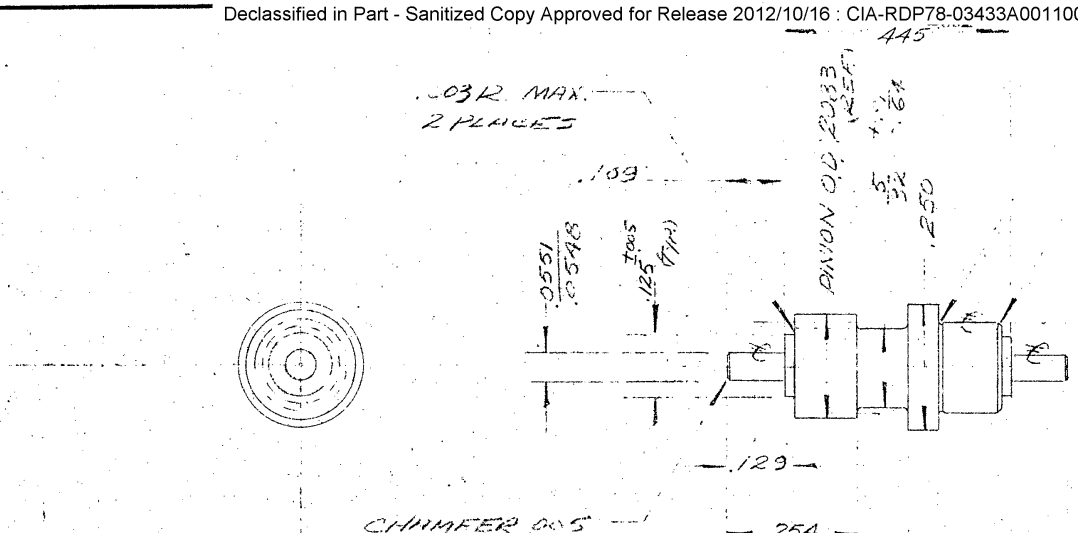


STAT

DIAS. MARKED ℄ TO BE CONCENTRIC WITHIN .0002 T.I.R.
DIAMETRAL PITCH - 96
PITCH DIA. .4479
NO. OF TEETH - 43
20° PRESSURE ANGLE

TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ± .003 FRACTIONS ± 1/64

MATERIAL: STAINLESS STL. 303	HEAT TREATMENT	SCALE: 4:1	DATE: 11/19/54	TITLE: GEAR	EXP.
PATTERN NO.	ROCKWELL HARDNESS ___ TO ___ ON THE ___ SCALE	DRAWN BY: JE.	CHECKED BY		
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		No. 57601-4



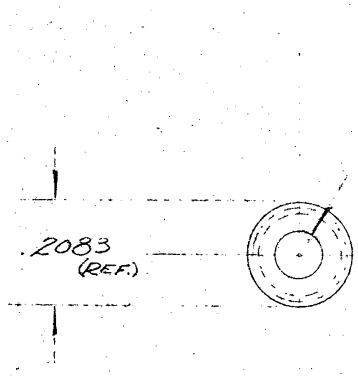
DIAS. MARKED ℄ TO BE
CONCENTRIC WITHIN .002 T.I.R.
DIAMETRAL PITCH - 32
PITCH DIA. .1875
NO OF TEETH - 18
20° PRESSURE ANGLE

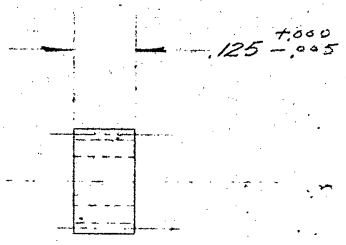
STAT.

TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ± .005 FRACTIONS ± 1/64

MATERIAL: STAINLESS STEEL 303	HEAT TREATMENT	SCALE: 4:1	DATE: 11/18/54	TITLE: PINION	EXP.
PATTERN NO.	ROCKWELL HARDNESS, ___TO___ ON THE___SCALE	DRAWN BY: JE	CHECKED BY		
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		No. 51601-3

Eugene Dietzgen Co., Inc., New York, N. Y. No. 167A Ralton Tracing Paper





DIAMETRAL PITCH - 96
PITCH DIAMETER - .1875
NO. OF TEETH 18
20° PRESSURE ANGLE

STAT

TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ± .005 FRACTIONS ± 1/64

MATERIAL: STAINLESS STZ. 303	HEAT TREATMENT	SCALE: 4:1	DATE: 11/18/54	TITLE: PINION	EXP.
PATTERN NO.	ROCKWELL HARDNESS ___ TO ___ ON THE ___ SCALE	DRAWN BY: J.E.	CHECKED BY		
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		No. 51601-1

Eugene Dietzgen Co., Inc., New York, N. Y. No. 167A Ralton Tracing Paper

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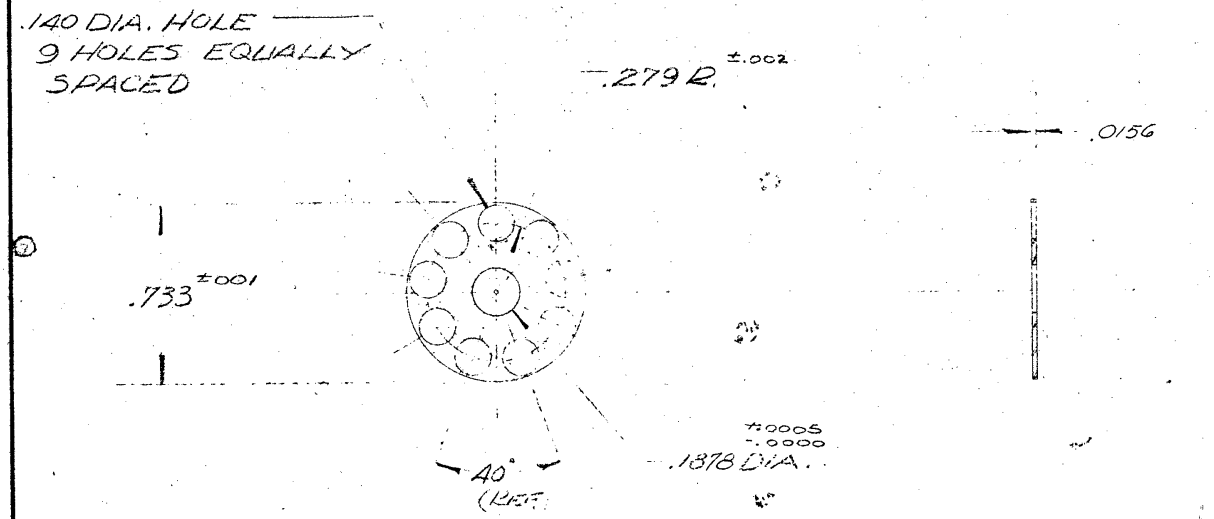
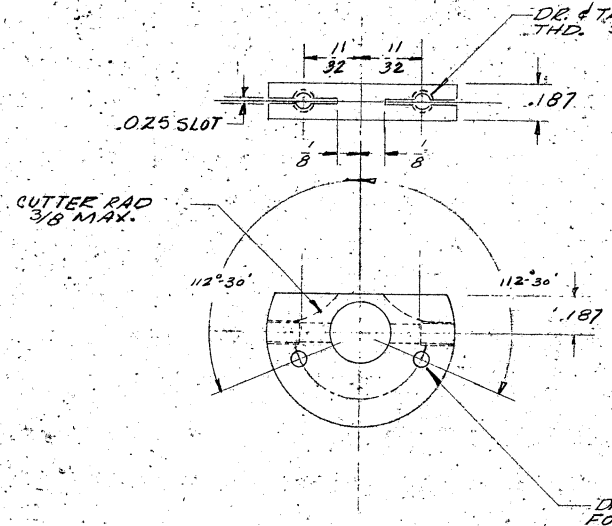


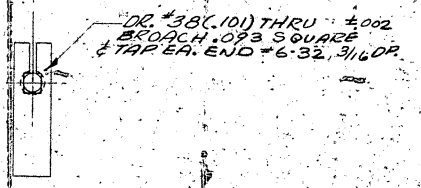
STAT

TOLERANCES, UNLESS OTHERWISE SPECIFIED,	DECIMALS ±.005	FRACTIONS ± 1/64	ANGULAR ±½°

MATERIAL	HEAT TREATMENT	SCALE	DATE	TITLE	EXP.
PERMOLY		2:1	12-2-54	LAMINATION	
PATTERN NO.	ROCKWELL HARDNESS ___ TO ___ ON THE ___ SCALE	DRAWN BY J.C.	CHECKED BY		
CORE BOX NO.	FINISH	APPR. BY	TRACED BY		No. 5160 1-012

Eugene Dietzgen Co., Inc., New York, N. Y. No. 167A Ralph Tessine Paper





DR. #46(.081) C'SINK FOR #1 SCREW IN ONE PIECE & TAP #1-64 THD. IN OTHER PIECE.

STAT

NOTE:
2 REQ'D. PER UNIT
ONE WITH TAP
ONE WITH C'SINK

TOLERANCE
DEC. ± .005 FRAC. ± 1/64

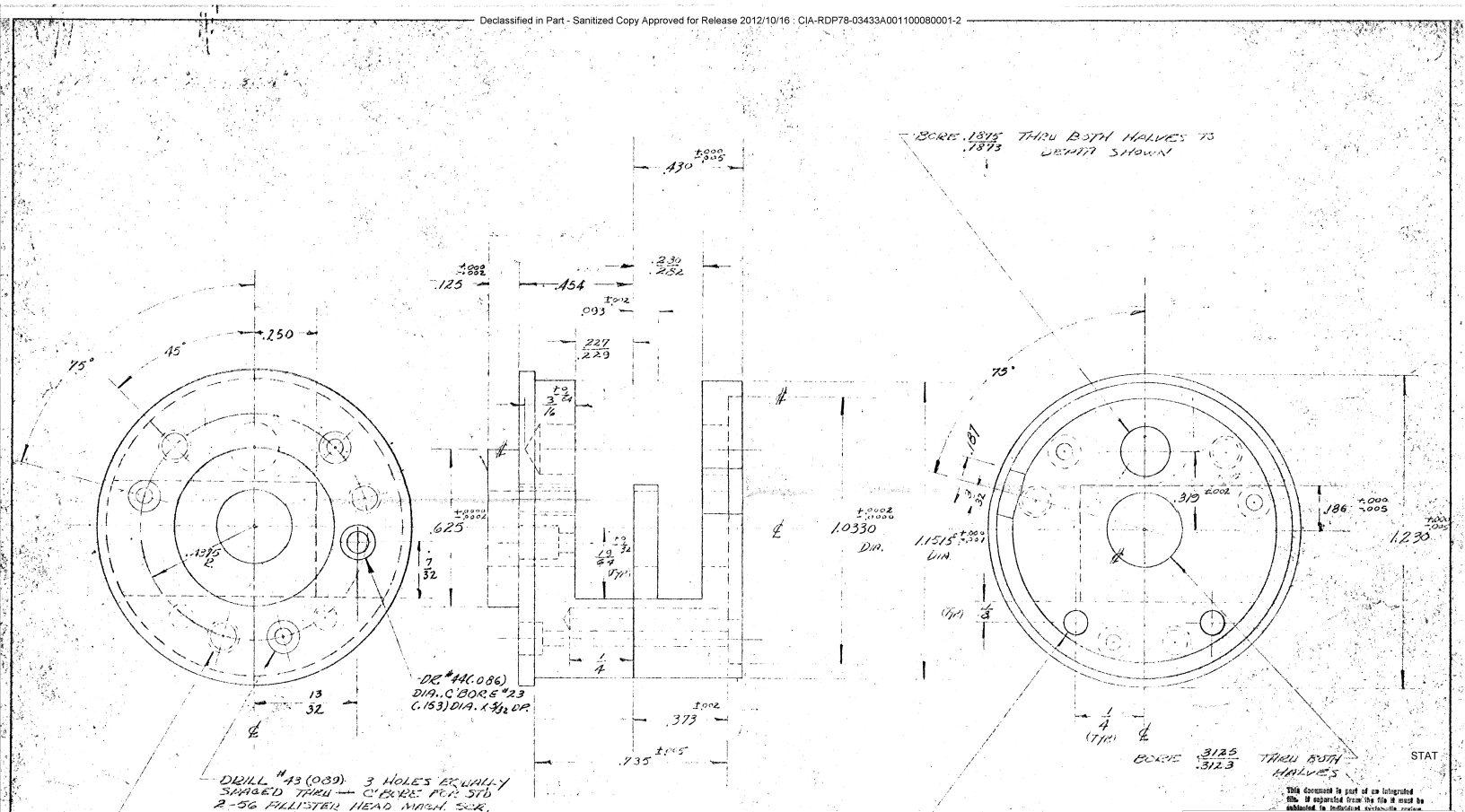
BY [illegible] DATE 7-21-65

SCALE 2:1

TITLE BRUSH HOLDER

MAT. G.S. NYLON

DWG NO. 5164-011



TOLERANCES, UNLESS OTHERWISE SPECIFIED, DECIMALS ± .005 FRACTIONS ± 1/64

MATERIAL: ALUMINUM 11 ST	HEAT TREATMENT	SCALE: 4:1	DATE: 12-15-54	TITLE: GEAR BOX	EXP.
PATTERN NO.	ROCKWELL HARDNESS ... TO ... ON THE ... SCALE	DRAWN BY: J.E.	CHECKED BY: [illegible] 7853		
CORE BOX NO.	FINISH: ANODIZE	APPR. BY	TRACED BY		No. 51601-6