



Test Fixture Manual

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Revision: 9

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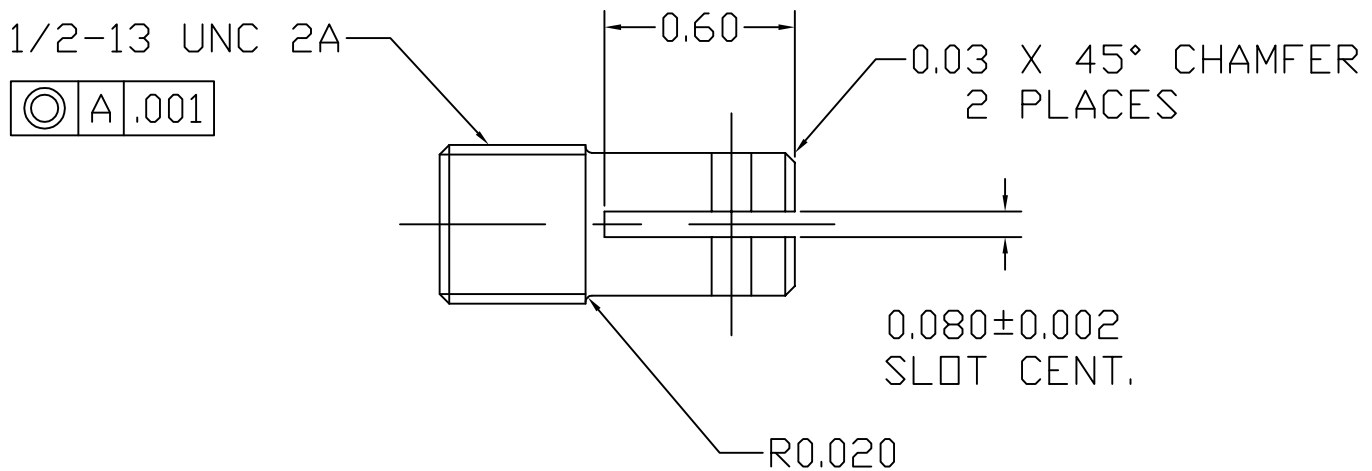
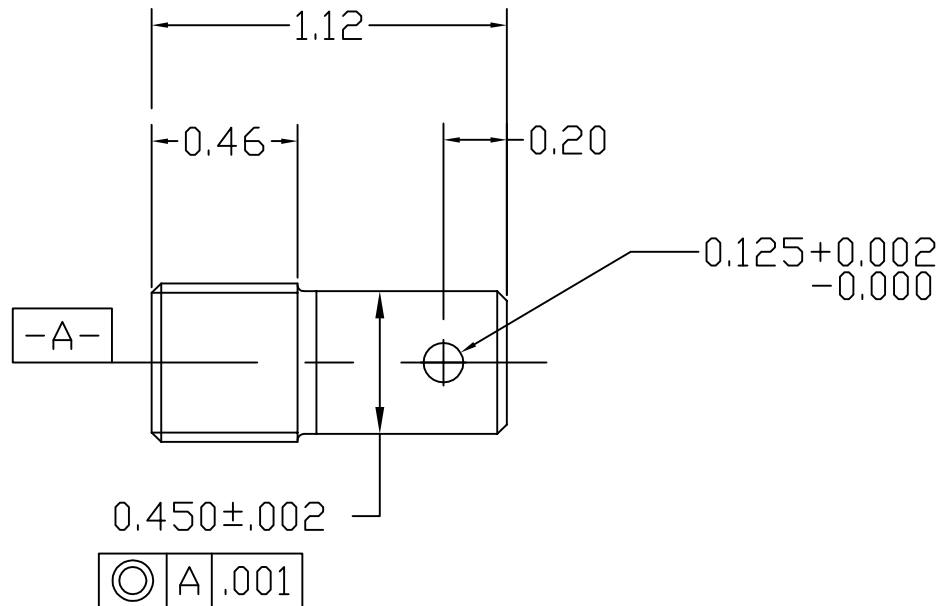
Phi	Manual	Spec Number	Revision Number	Revision Date	Reviewed Date	Title
Ø	TF	TC	9	5/18/2022		Table of Contents
	TF	10	Original	9/14/2011	2/11/2017	Mini-Flay Stress Rupture Test Coupling
	TF	11	Original	10/26/2011	3/14/2017	Stress Rupture Adapters
	TF	11A	Original	10/26/2011	3/14/2017	Stress Rupture Adapters
	TF	12	Original	10/26/2011	3/14/2017	3/4" Diameter Pulling Stud
	TF	13	Original	10/26/2011	3/14/2017	Specimen Knife Edge Clamp
	TF	14	Original	10/26/2011	3/14/2017	Specimen Knife Edge Clamp (Flat Hot Tensile Use)
	TF	15	Original	10/26/2011	3/14/2017	3/8 C/R Adapter Coupling
	TF	15A	Original	4/21/2017	4/21/2017	M9 X 1.25 2A C/R Adapter Coupling
	TF	16	Original	10/26/2011	3/14/2017	5/16 C/R Adapter Coupling
	TF	17	Original	10/26/2011	3/14/2017	1/4-20 C/R Adapter Coupling
	TF	18	Original	10/26/2011	3/14/2017	5-40 C/R Adapter Coupling
	TF	19	Original	10/26/2011	3/14/2017	Mini-Flat Specimen Grips Creep Rupture Detail, 0.600 Dim.
	TF	20	Original	10/26/2011	3/14/2017	Mini-Flat Specimen 1/2-13 Grips Creep Rupture Detail, 0.790 Dim.
	TF	21	Original	10/26/2011	3/14/2017	Locking Test Pin Table
	TF	24	Original	10/26/2011	3/14/2017	1/4" Harness Nut
	TF	25	Original	10/26/2011	3/14/2017	1/4" Harness Bolt
	TF	26	1	9/20/2021	9/20/2021	Crosshead Assembly
	TF	26A	1	9/20/2021	9/20/2021	Crosshead Assembly
	TF	34	Original	10/26/2011	3/14/2017	S/R Tandem Adapter Used with TBM 1106 (RR)
	TF	34A	Original	10/29/2015	10/29/2015	S/R Tandem Adapter Used with TBM 3110
	TF	41	Original	10/26/2011	3/14/2017	Hot Tensile Harness Bracket
	TF	50	Original	10/26/2011	3/14/2017	1/4-20 Tensile Test Adapter (Mini Round Test Material)
	TF	51	Original	10/26/2011	3/14/2017	#5-40 Tensile Test Adapter (Mini Round Test Material)
	TF	52	Original	10/26/2011	3/14/2017	Rupture Flat Bar Adapter
	TF	56	Original	9/14/2011	2/11/2017	New Gauge Length Punch
	TF	56A	Original	9/14/2011	2/11/2017	Re-Sharpened Gauge Length Punch
	TF	57	1	10/26/2011	3/14/2017	1.680" Wide Punch

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Phi	Manual	Spec Number	Revision Number	Revision Date	Reviewed Date	Title
	TF	59	Original	9/14/2011	2/11/2017	1.753" Wide Punch
	TF	60	Original	9/14/2011	2/11/2017	2.000" Wide Punch
	TF	61	Original	9/14/2011	2/11/2017	1.000" Wide Punch
	TF	62	Original	9/14/2011	2/11/2017	0.800" Wide Punch
	TF	63	Original	9/14/2011	2/11/2017	0.720" Wide Punch
	TF	64	Original	9/14/2011	2/11/2017	0.640" Wide Punch
	TF	65	1	4/4/2017	4/4/2017	Caliper Points
Ø	TF	65A	1	5/18/2022	5/18/2022	Caliper Points
Ø	TF	65B	1	5/18/2022	5/18/2022	Caliper Point Adaptor
Ø	TF	66	3	5/18/2022	5/18/2022	Caliper Point Adapter
	TF	66A	Original	1/29/2018	1/29/2018	Digital 6" Caliper
	TF	67	Original	10/26/2011	3/14/2017	1/2" Extensometer Fixture Assembly
	TF	67A	Original	10/26/2011	3/14/2017	1/2" Extensometer Fixture Assembly
	TF	68	Original	10/26/2011	3/14/2017	1" Extensometer Fixture Assembly
	TF	68A	Original	10/26/2011	3/14/2017	1" Extensometer Fixture Assembly
	TF	69	Original	10/26/2011	3/14/2017	S/R Furnace Insulation
	TF	69A	Original	10/26/2011	3/14/2017	Clamp for Furnace Insulation
	TF	70	Original	10/26/2011	3/14/2017	C/R Furnace Insulation
	TF	70A	Original	10/26/2011	3/14/2017	C/R Furnace Insulation
	TF	71	Original	9/14/2011	2/11/2017	0.500" Wide Punch

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: AS-CAST IN 713C

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ADAPTER SIZES & DIMENSIONS

"A" DRILL	"B" TAP	"C" DRILL	"D" TAP	"E" DEEP	"F" LENGTH	CLASS	"G" DIA	MATERIAL
#7 (0.201)	1/4-20	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
#F (0.257)	5/16-18	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
5/16	3/8-16	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
27/64	1/2-13	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
21/32	3/4-10	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
#3 (0.212)	1/4-28	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
21 (0.159)	#10-32	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
#7 (0.201)	#5-40	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
#29 (0.136)	#8-32	0.656	3/4-10NC	1.125	2.19	2B	1.110	IN 713
8mm (60%)	M9 X 1.25		3/4-10NC	1.125	2.25	3B	1.125	MAR 246
7.5mm (60%)	5/16-24NF		3/4-10NC	1.125	2.25	3B	1.125	MAR 246
8.5mm	M10 X 1.5		M10 X 1.5	0.500	2.25	6G	1.125	IN 713
5.25mm	M6 X .75		M6 X .75	0.500	2.25	6G	1.125	IN 713
#U (0.368)	7/16-14NC		1-8NC	1.375	2.25	3B	1.50	IN 713
5/16	3/8-16NC		1-8NC	1.375	2.25	3B	1.50	IN 713
#29 (0.136)	#8-36NF		#8-36NF		2.25	3B		
	5/16-24NF		5/16-24NF					
21/32	3/4-10		1-8NC	1.375	2.375	3B	1.625	IN 718
5mm	M6 X 10		3/4-10NC		2.25	3B	1.125	IN 713
	M18 X 25		3/4-10NC		2.25	3B	1.125	
#U (0.368)	7/16-14NC		3/4-10NC					



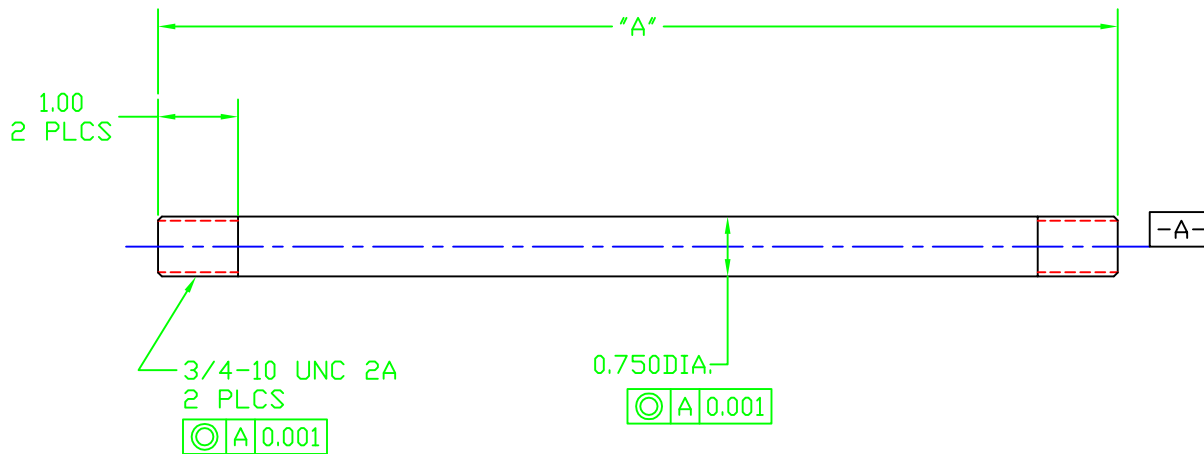
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TF Part #: 0011A
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. THREADS CLASS 2A UNLESS OTHERWISE SPECIFIED.

PART #	"A" LENGTH
TF-13A	12.00
TF-13B	13.00
TF-13C	19.00
TF-13D	21.00
TF-13E	10.75
TF-13F	14.00
TF-13G	

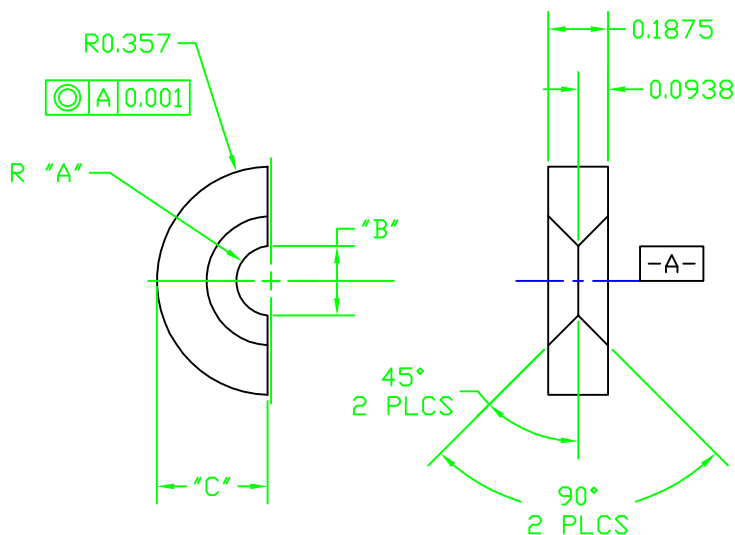


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. TF-14D IS CLAMPED ON GAUGE SECTION, NO GROOVES IN BAR.
4. TOLERANCES TO BE ± 0.002 UNLESS OTHERWISE SPECIFIED.



PART #	TBM #	"A"	"B"	"C"	SHOULDER Ø OF BAR
TF-14A	2004	0.109	0.218	0.346	0.250
TF-14A	2510	0.109	0.218	0.346	0.250
TF-14A	3004	0.109	0.218	0.346	0.250
TF-14A	3009	0.109	0.218	0.346	0.250
TF-14B	3104	0.141	0.282	0.346	0.3125
TF-14B	3109	0.141	0.282	0.346	0.3125
TF-14B	3114	0.141	0.282	0.346	0.3125
TF-14C	3064	0.172	0.344	0.346	0.375
TF-14C	4004	0.172	0.344	0.346	0.375
TF-14C	4014	0.172	0.344	0.346	0.375
TF-14C	4025	0.172	0.344	0.346	0.375
TF-14D	4200	0.1785	0.357	0.346	N/A
TF-14E	HOT TEN	0.125	0.250	0.312	0.375



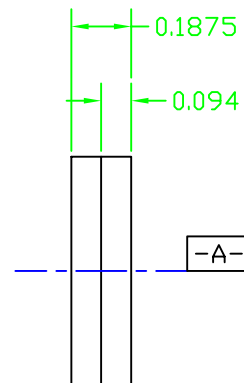
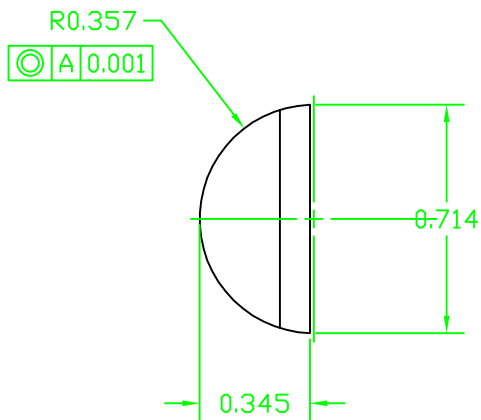
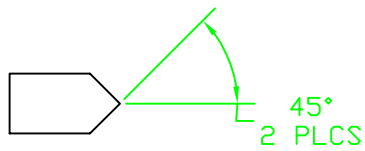
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SPECIMEN KNIFE EDGE CLAMP

TF Part #: 0013
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. THESE INSERTS TO BE CLAMPED ON GAUGE SECTION, NO GROOVES IN BAR.
4. TOLERANCES TO BE ± 0.002 UNLESS OTHERWISE SPECIFIED.

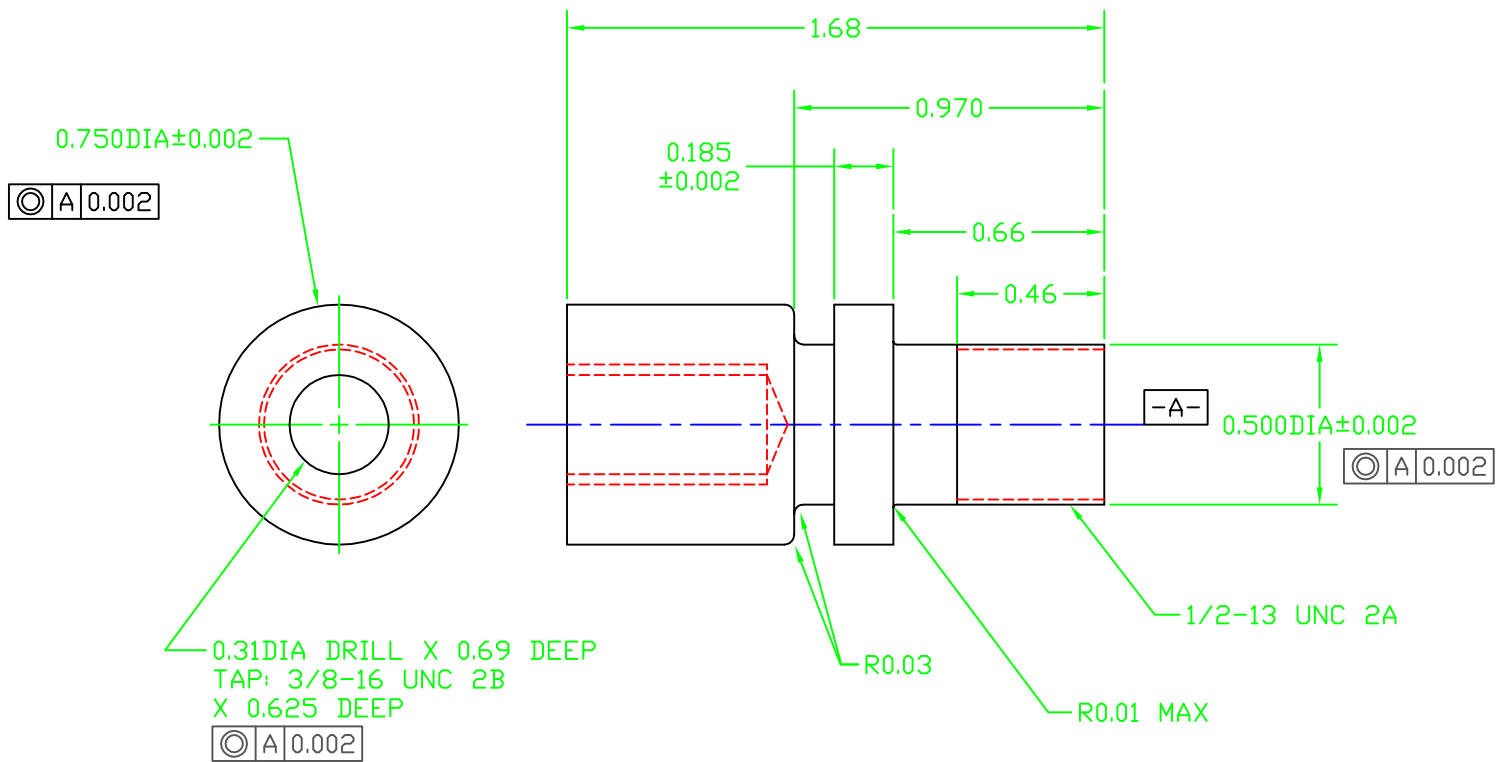


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TF Part #: 0014
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. CHECK 3/8-16 HOLE WITH
GO/NO GO THREAD PLUG.

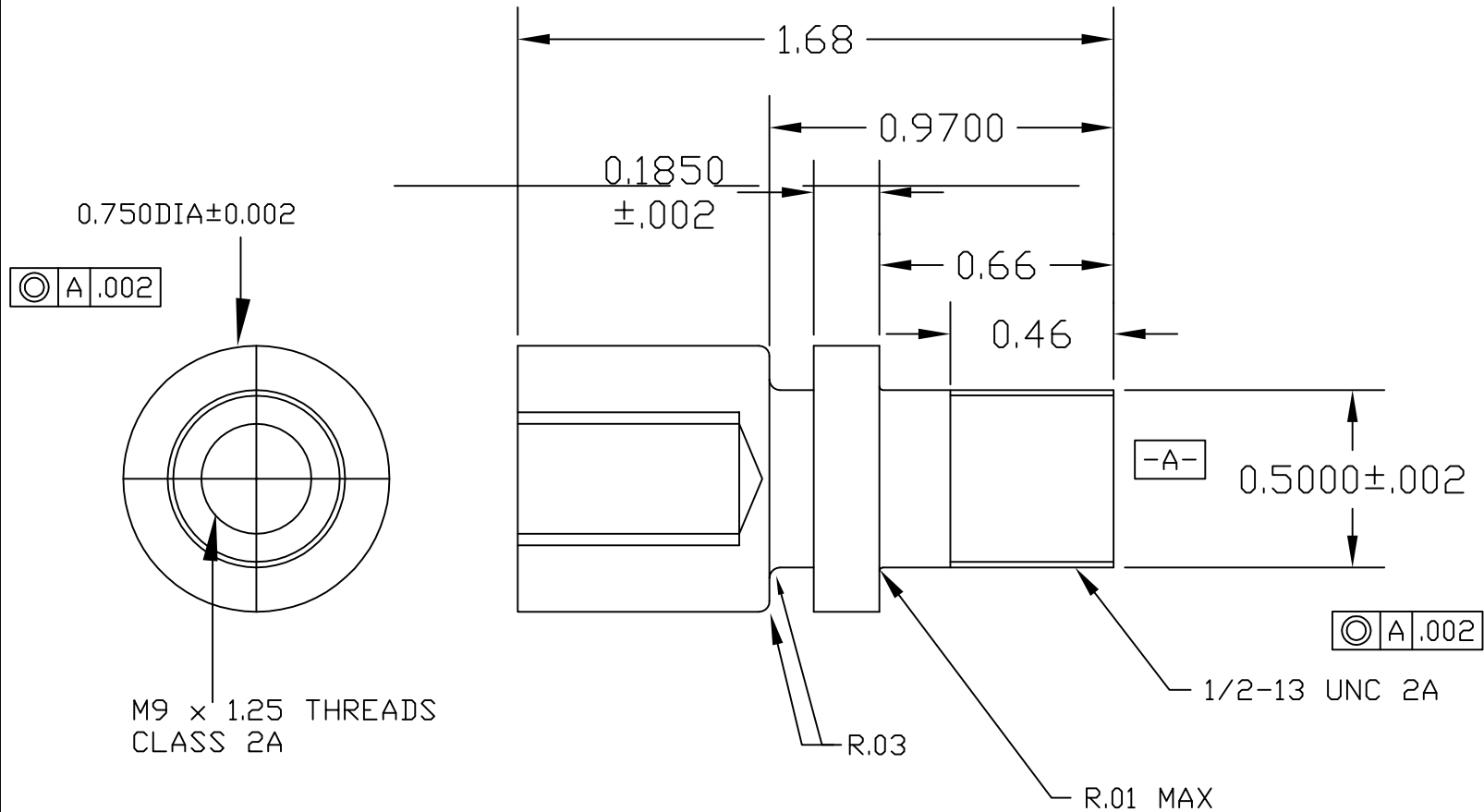


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. NUMBER REQUIRED: 1
5. CHECK M9 x 1.25 2A WITH GO/NO GO THREAD PLUG.

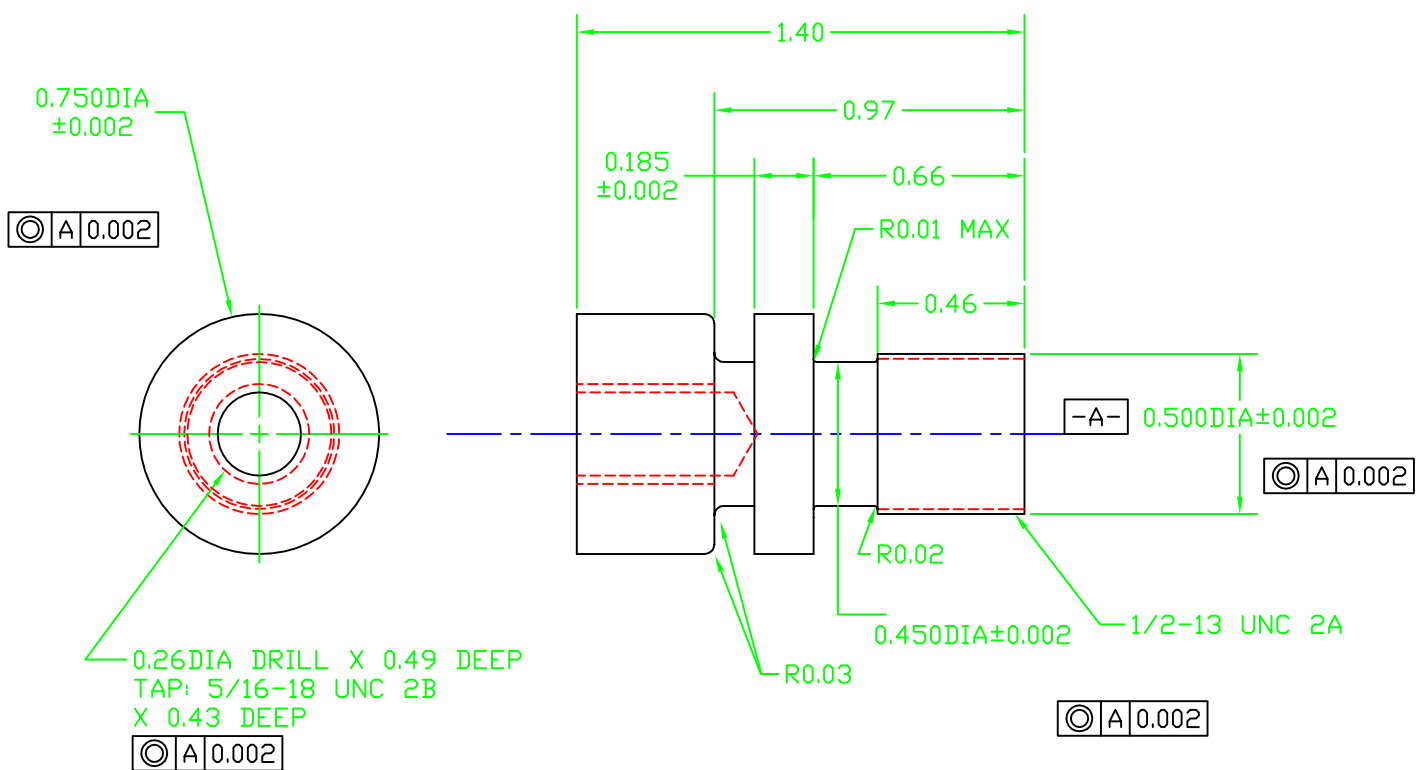


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TF Part #: 0015A
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. CHECK 5/16-HOLE WITH
GO/NO GO THREAD PLUG.

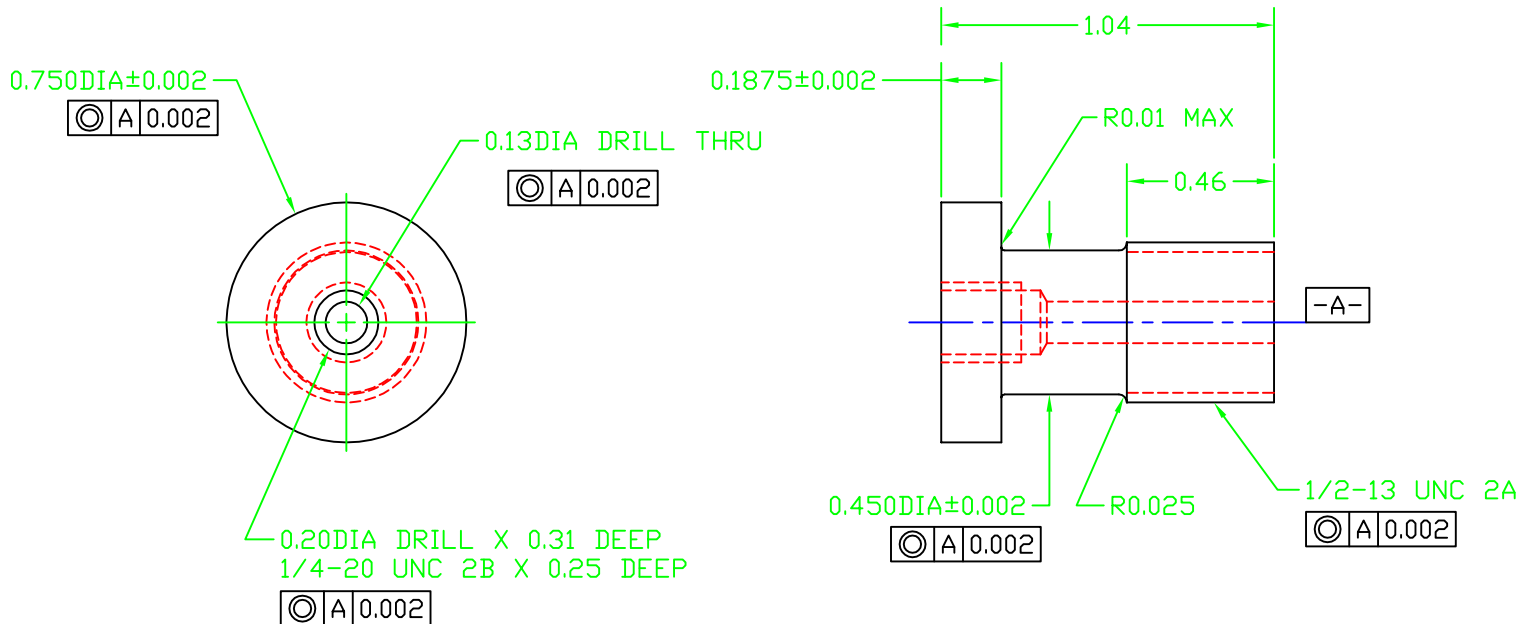


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NOTES:

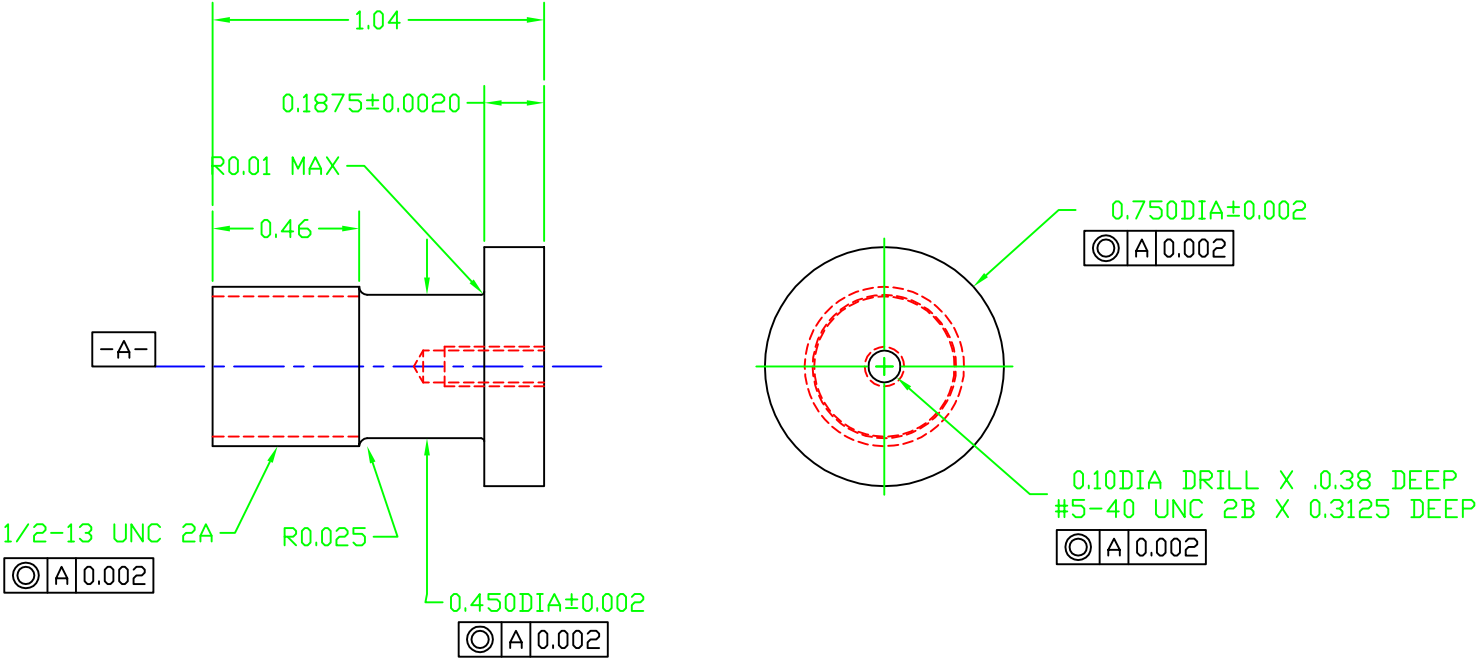
1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL PWA 1480.
4. CHECK 1/4-20 WITH GO/NO GO
THREAD PLUG.



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- NOTES:
- 1. DO NOT SCALE THIS DRAWING.
 - 2. ALL DIMENSIONS ARE IN INCHES.
 - 3. MATERIAL PWA 1480.
 - 4. CHECK #5-40 WITH GO/NO GO THREAD PLUG.

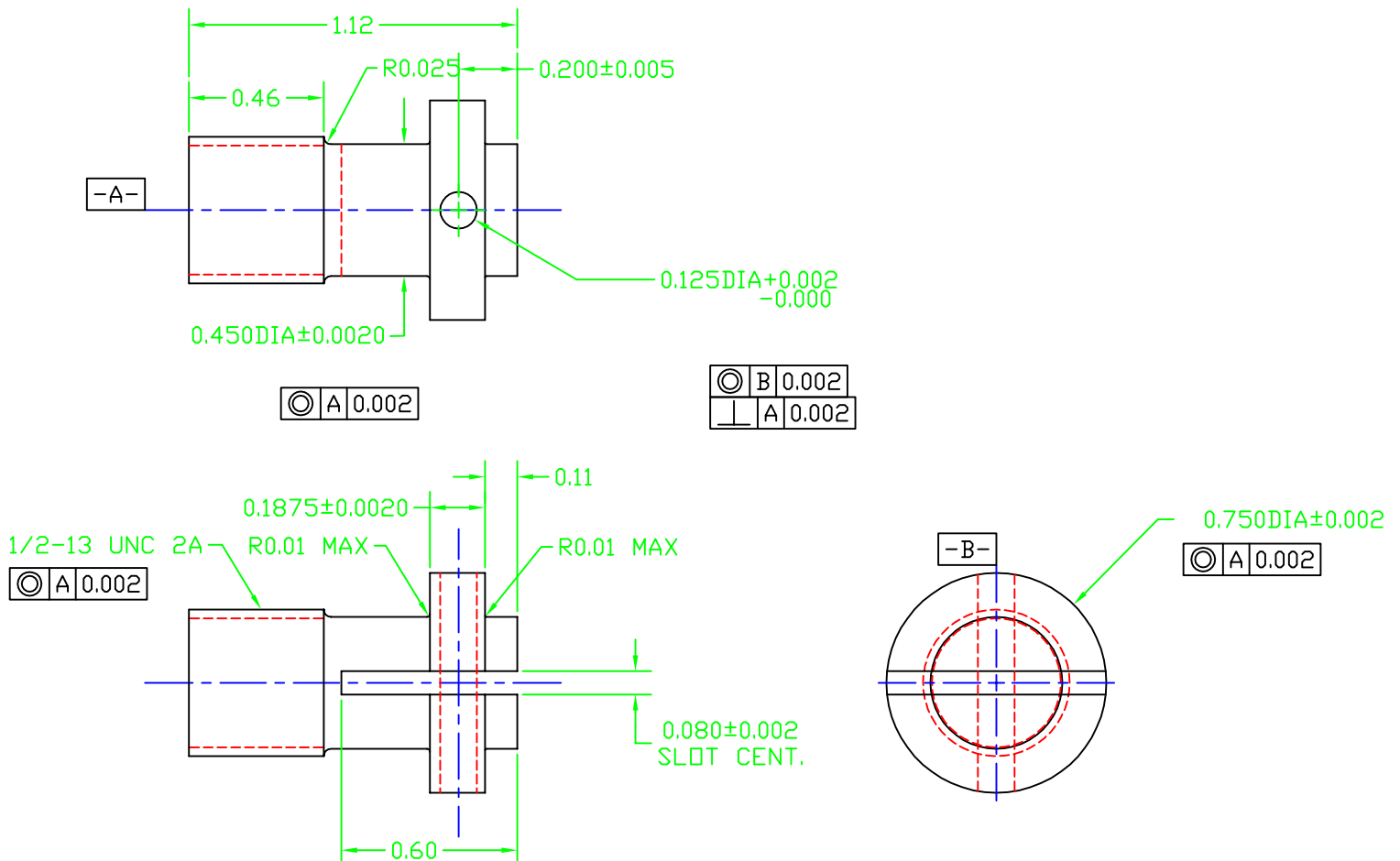


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.

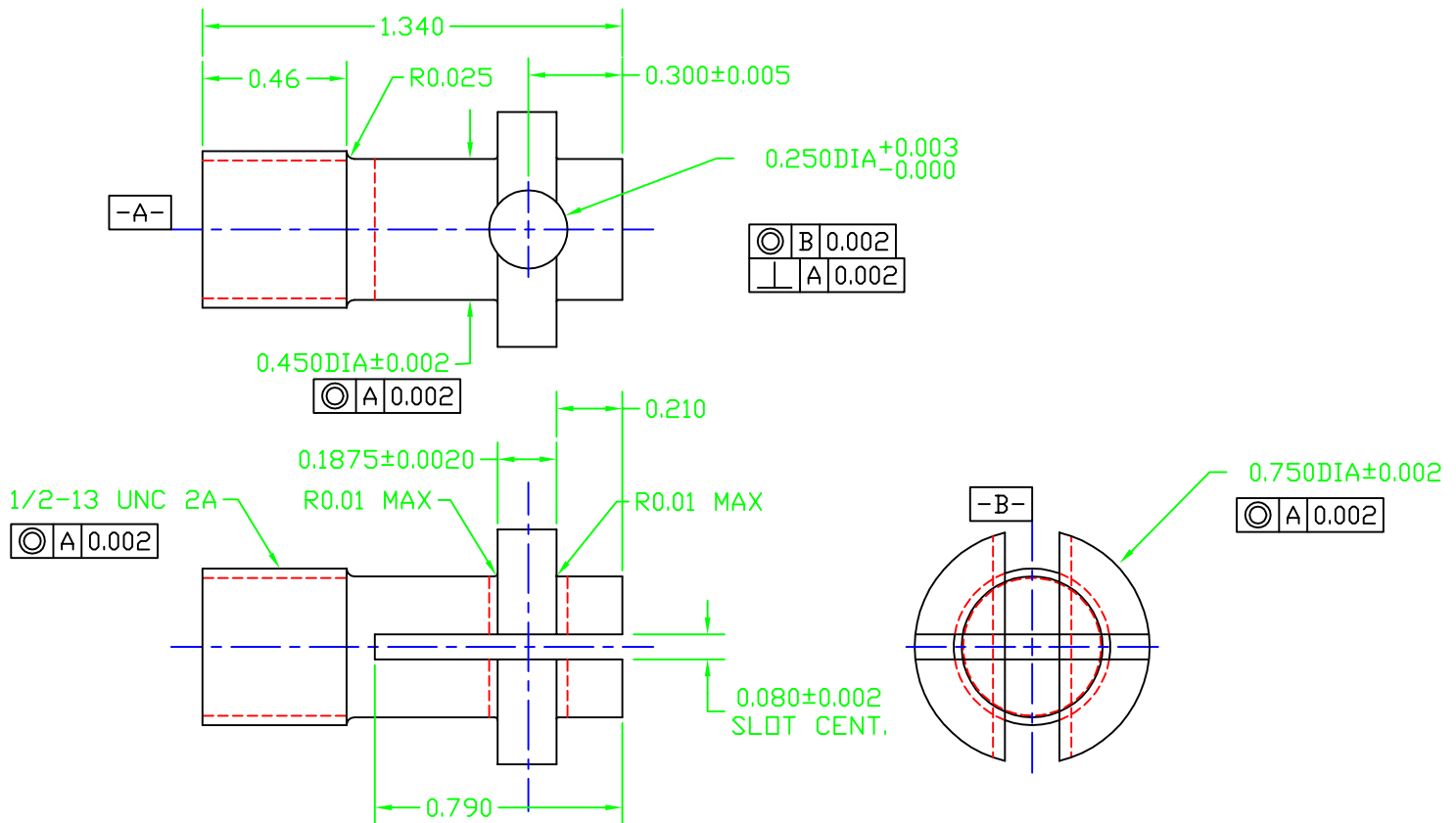


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. NUMBER REQUIRED: 2 PER.



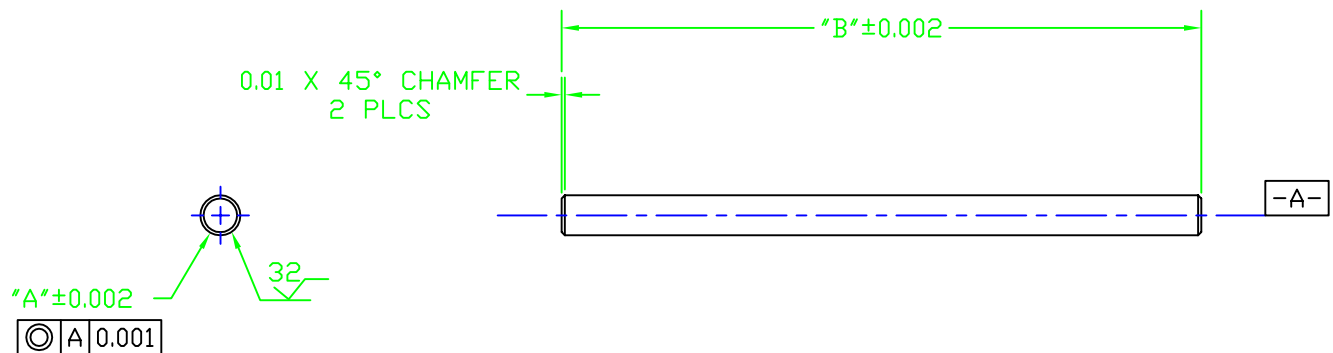
TEST FIXTURE MANUAL

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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.

P/N	"A"	"B"	MAT'L
23A	0.125	2.00	MM246
23B	0.1875	1.50	MM246
23C	0.246	1.30	IN 713
23D	0.370	1.30	IN 713
23E	0.248	1.00	IN 713
23F	0.310	1.20	RENE 80
23G	0.730	1.20	IN 713
23H	0.246	.350	IN 713
23I	0.120	.760	IN 713

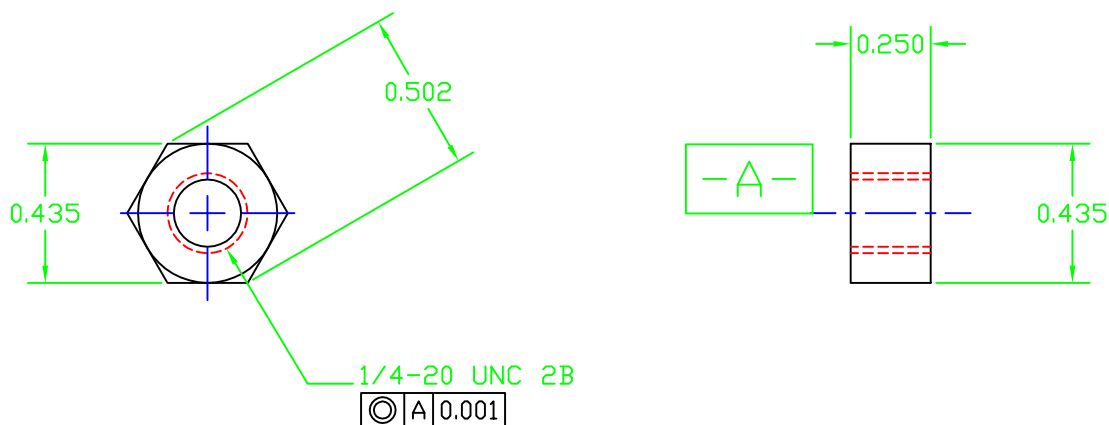


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TF Part #: 0021
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.
5. CHAMFER O.D. TOP & BOTTOM
6. BREAK I.D. TOP & BOTTOM.
7. NUT TO FIT STANDARD $7/16"$ WRENCH.

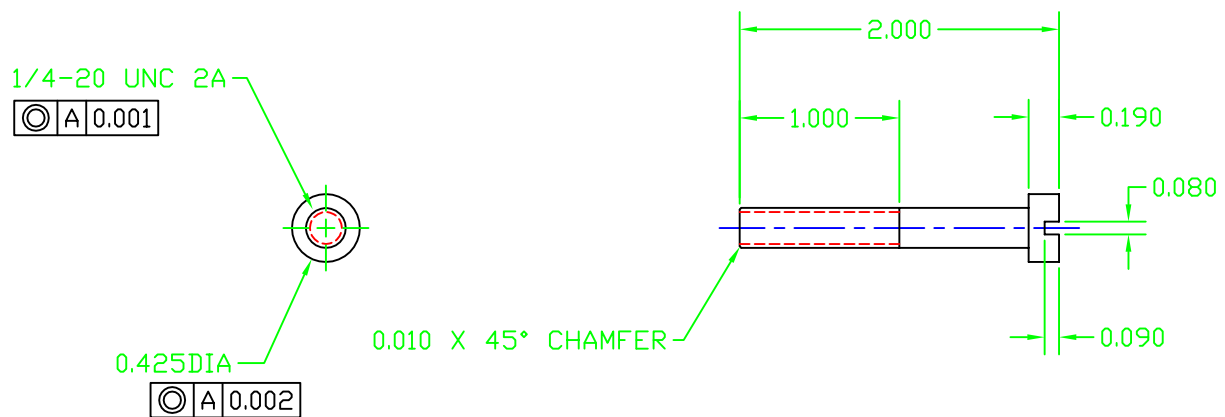


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.



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TF Part #: 0025
Issued: 10/26/11
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PART OF ASSEMBLY: E_1:

MATERIAL: IN600:

QUANTITY: 2

CAD SYSTEM: SOLIDWORKS

AUTHOR: JENNIE WANG

DRAWING DATE: 7/16/18

NOTES:

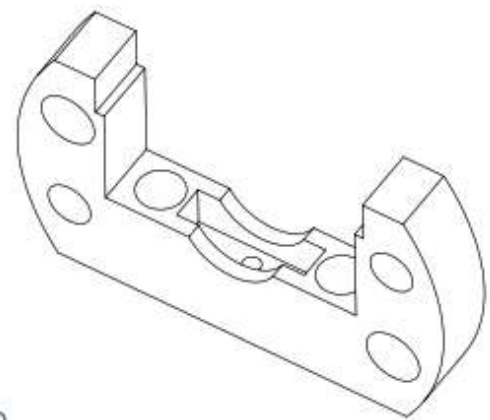
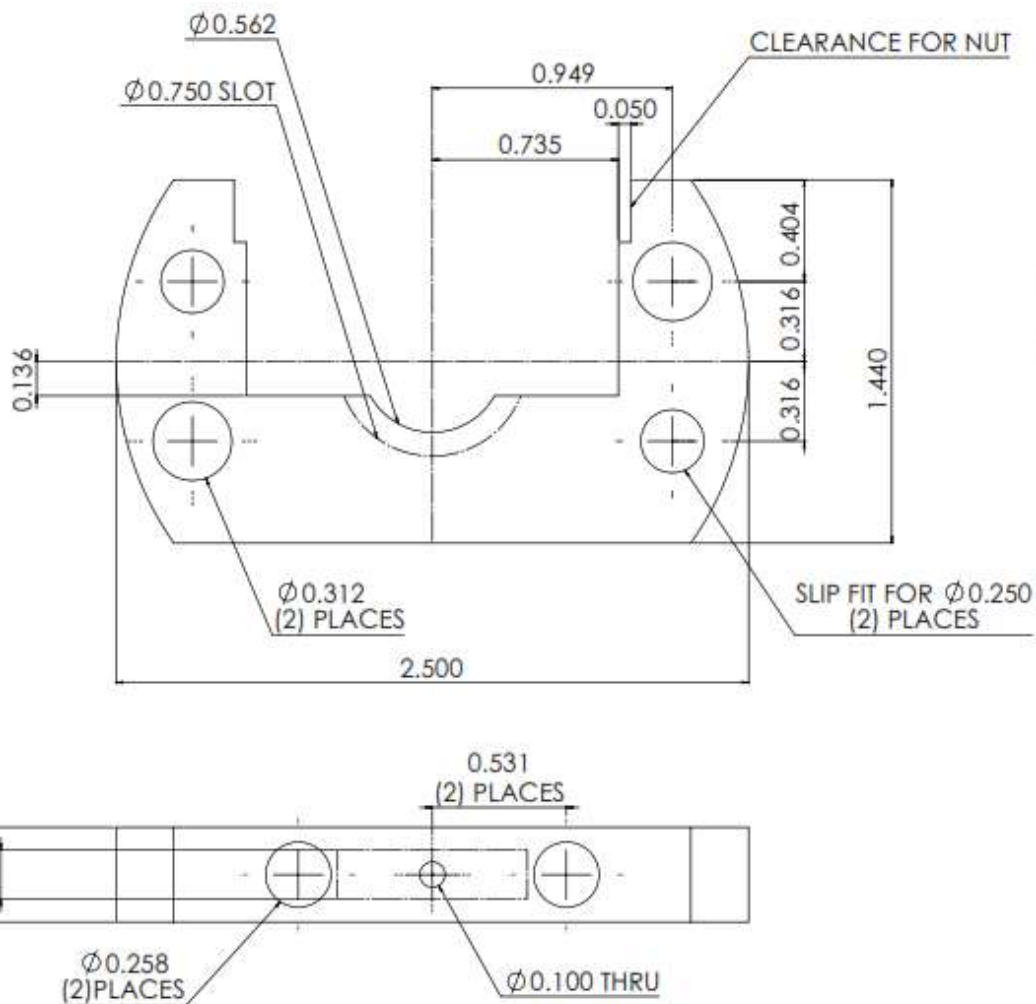
1. DIMENSIONS ARE IN INCHES UDS.
2. BREAK CORNERS R.031 TYPICAL

TOLERANCES:

.XX = +/- 0.02

.XXX = +/- 0.05

.XXXX = +/- 0.0005



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TF Part #: 0026
 Issued: 09/20/21
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PART OF ASSEMBLY: E_2

MATERIAL: IN600

QUANTITY: 2

CAD SYSTEM: SOLIDWORKS

AUTHOR: JENNIE WANG

DRAWING DATE: 7/16/18

NOTES:

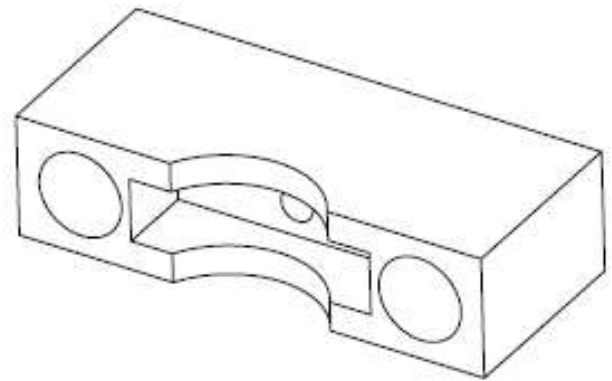
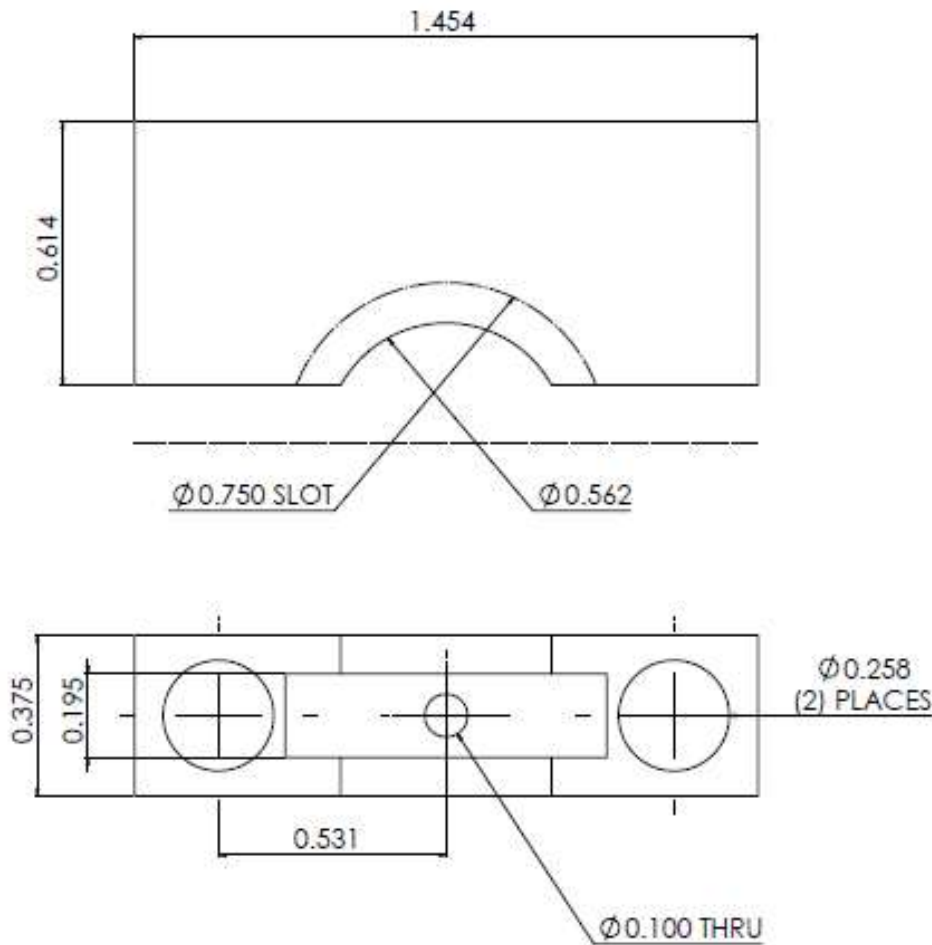
1. DIMENSIONS ARE IN INCHES UDS
2. BREAK CORNERS R.031 TYPICAL

TOLERANCES:

.XX = +/- 0.02

.XXX = +/- 0.05

.XXXX = +/- 0.0005



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TF Part #: 0026A

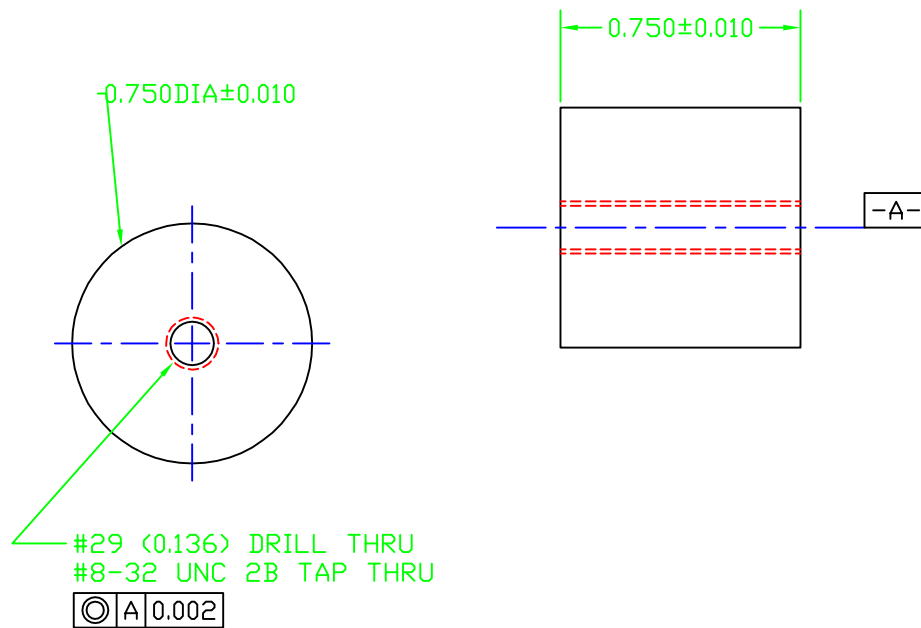
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. FOR TANDEM TESTING.

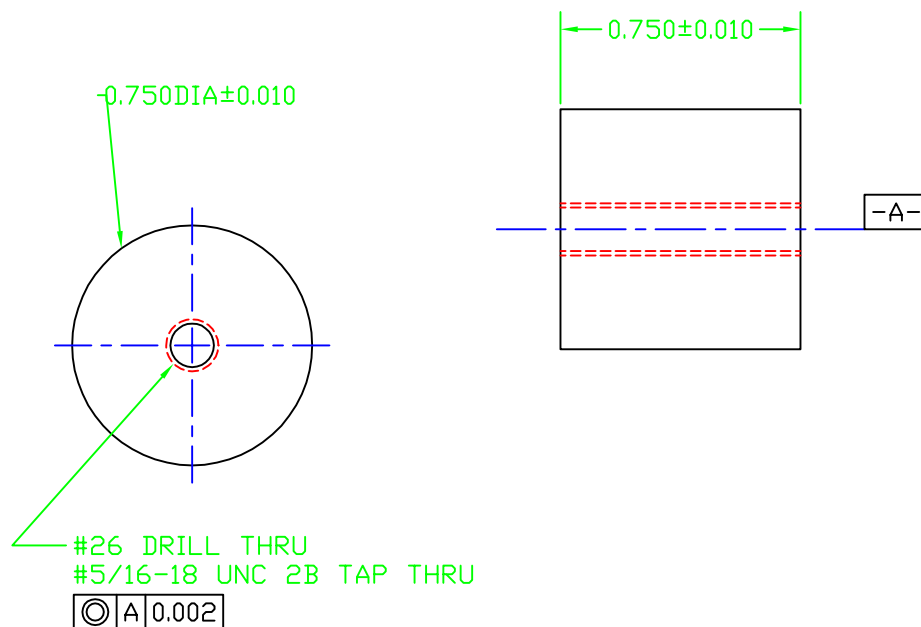


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.
4. FOR TANDEM TESTING.

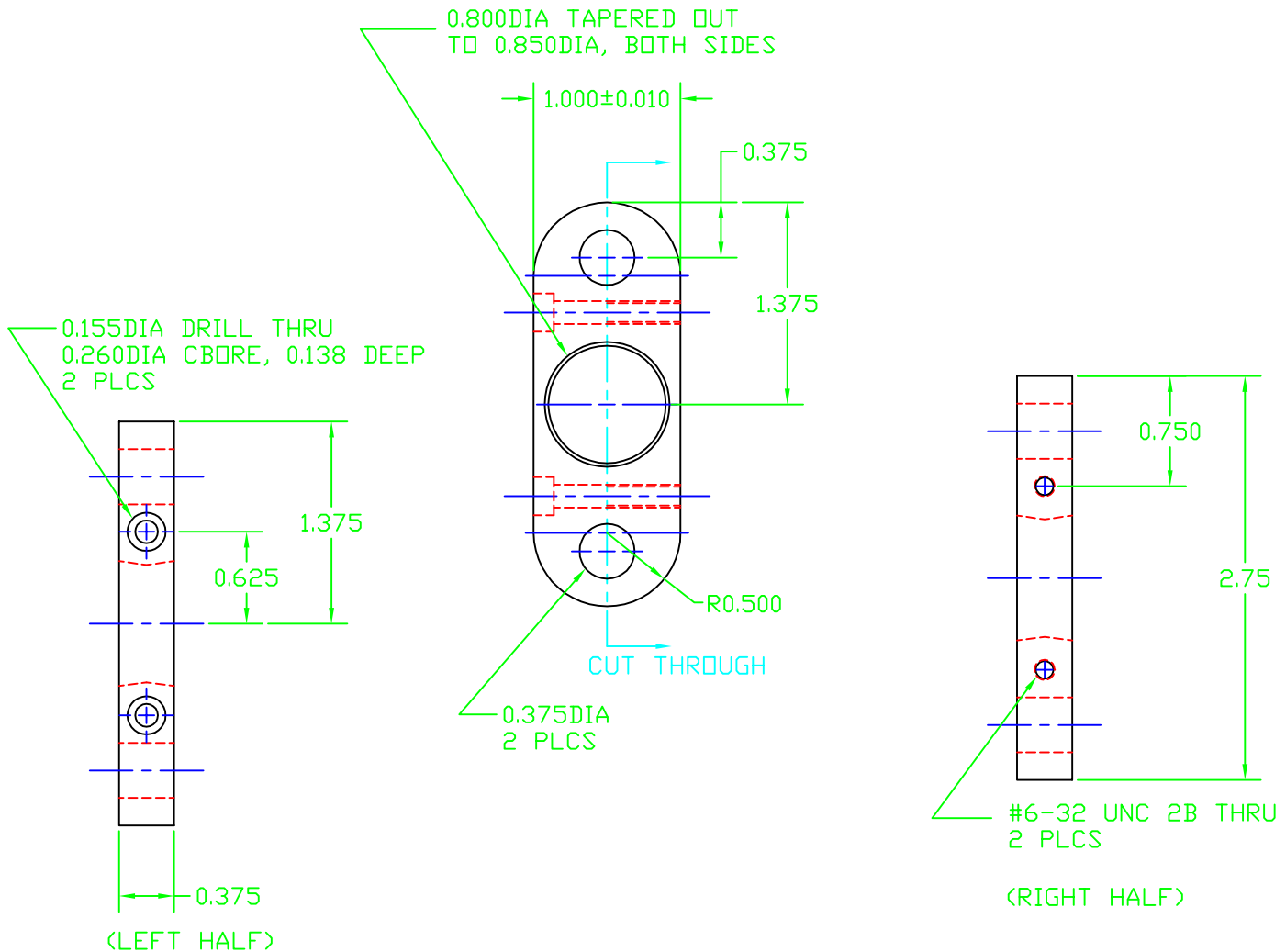


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: T6 ALUMINUM PLATE.
4. TOLERANCE TO BE ± 0.005 , UNLESS OTHERWISE SPECIFIED.

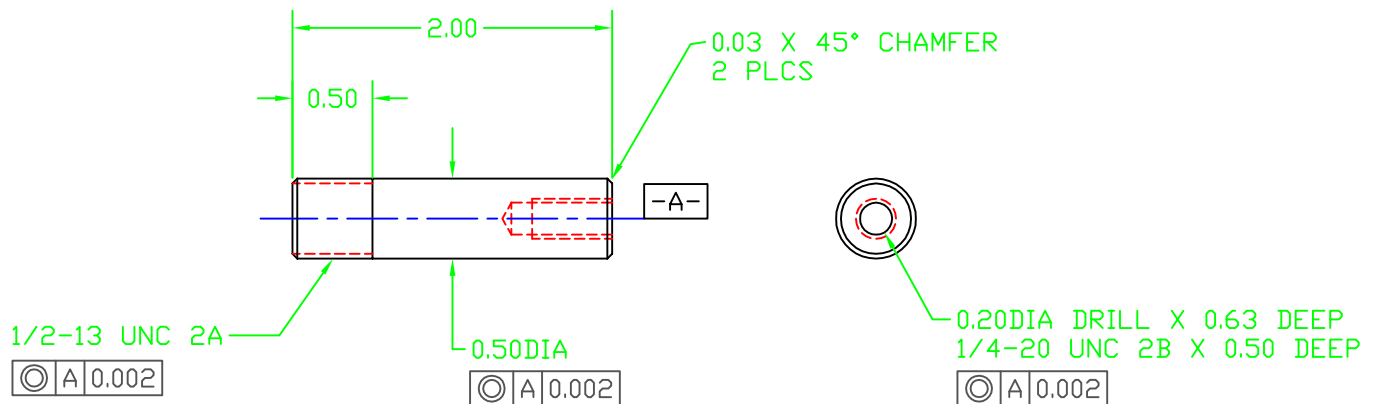


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: 8620 HOT ROLLED STEEL.

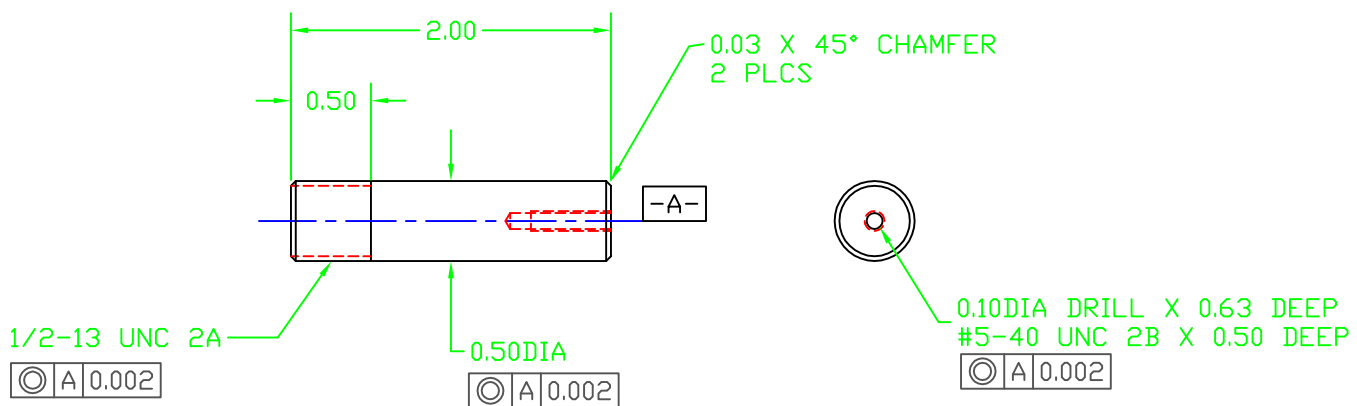


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: 8620 HOT ROLLED STEEL.

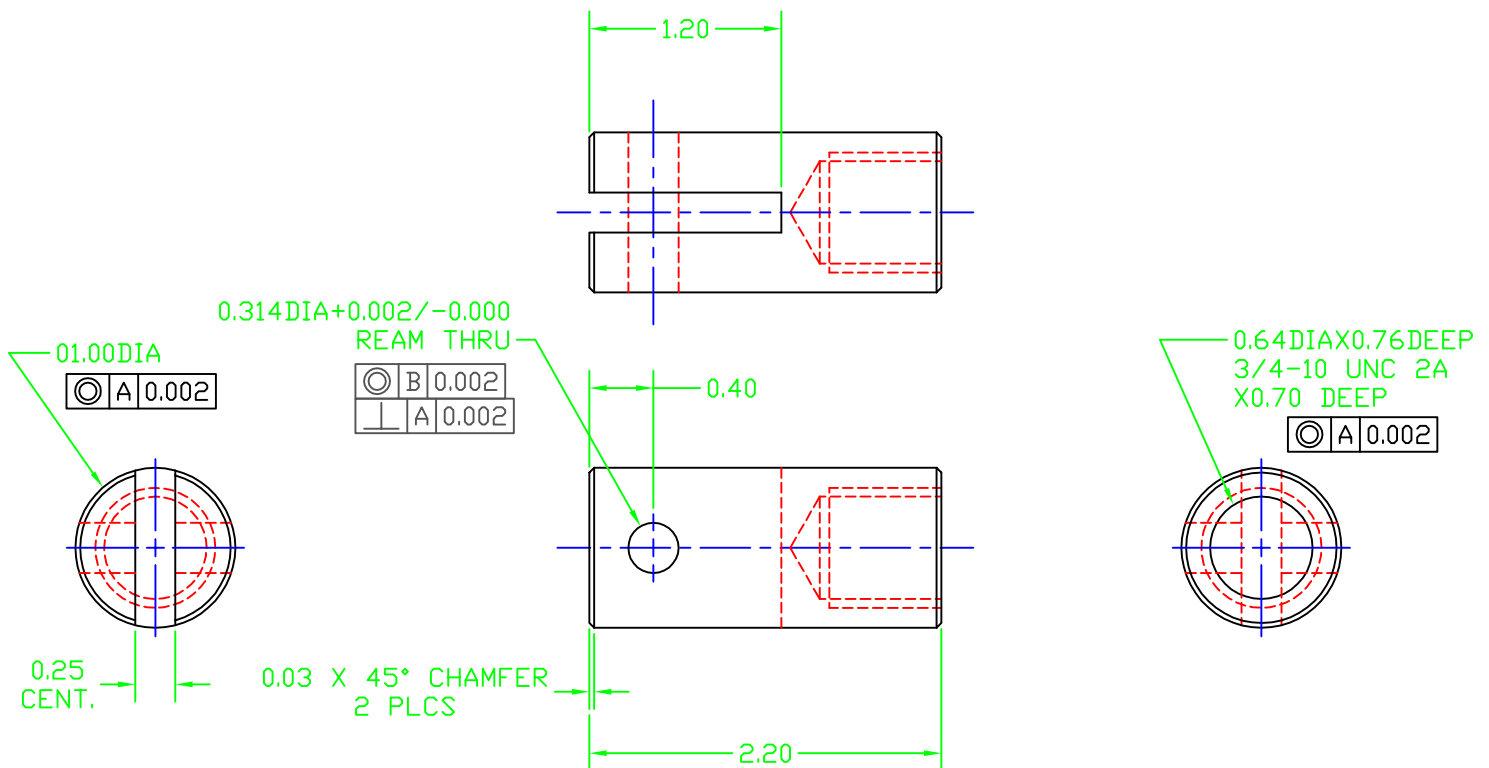


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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL IN713.

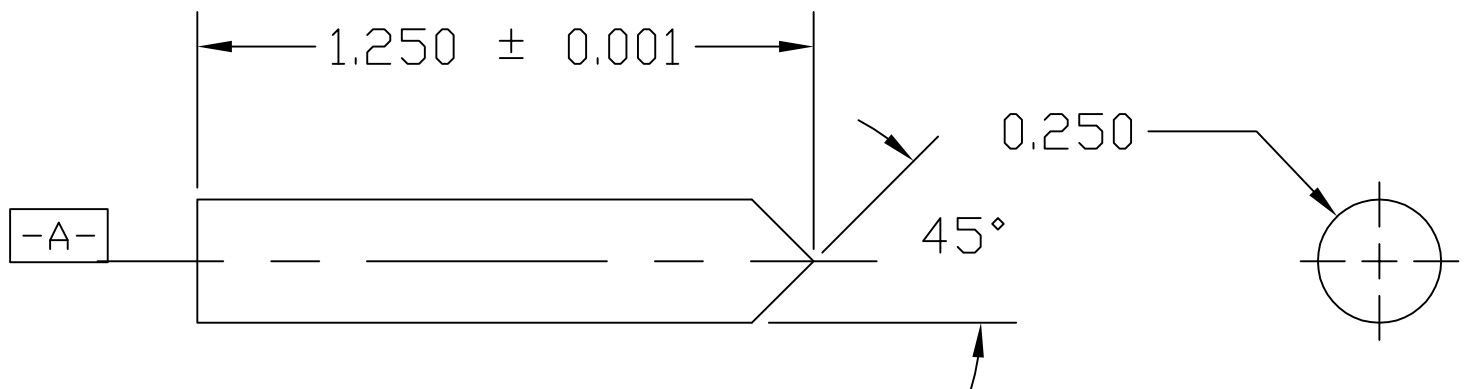


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NOTES:

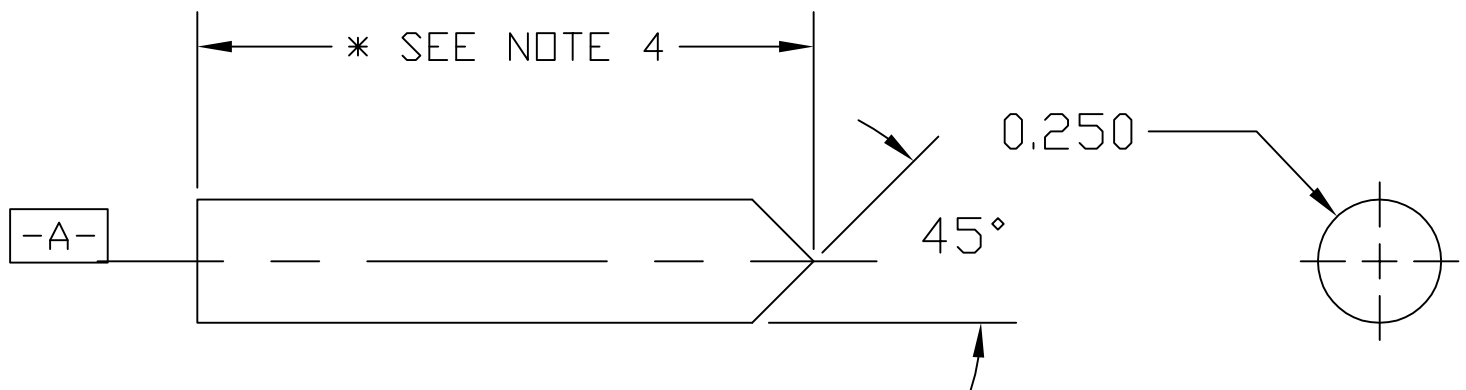
1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: HSS DRILL BLANKS 0.250"
3. TIP SHALL BE CONCENTRIC WITH "A" AXIS WITHIN 0.00025" DIAMETER
4. LABEL PACKAGING WITH THE FINISHED LENGTH DIMENSIONS

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NOTES:

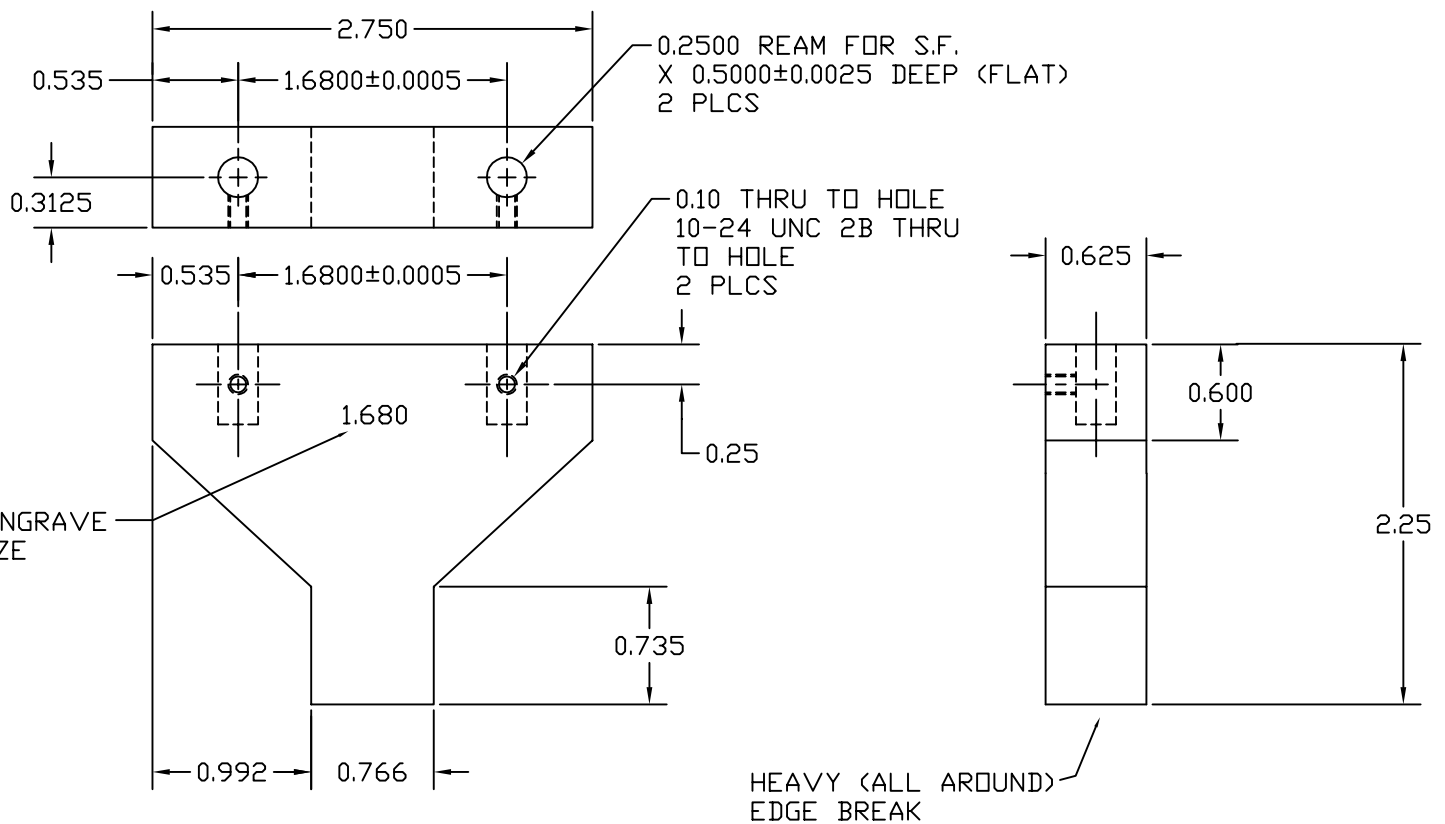
1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: HSS DRILL BLANKS 0.250"
3. TIP SHALL BE CONCENTRIC WITH "A" AXIS WITHIN 0.00025" DIAMETER
4. - RE-SHARPEN ALL USED PUNCHES SUPPLIED IN A BATCH TO THE SAME LENGTH WITHIN 0.001"
 - THE LENGTH SHALL BE NOTATED ON THE PACKAGING SUPPLIED WITH THE USED PUNCHES
 - THE MINIMUM RE-SHARPENED PUNCH LENGTH SHALL BE NO LESS THAN 1.000"
 - LABEL PACKAGING WITH THE FINISHED LENGTH DIMENSION OF THE RE-SHARPENED PUNCHES

**TEST FIXTURE MANUAL**

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NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL

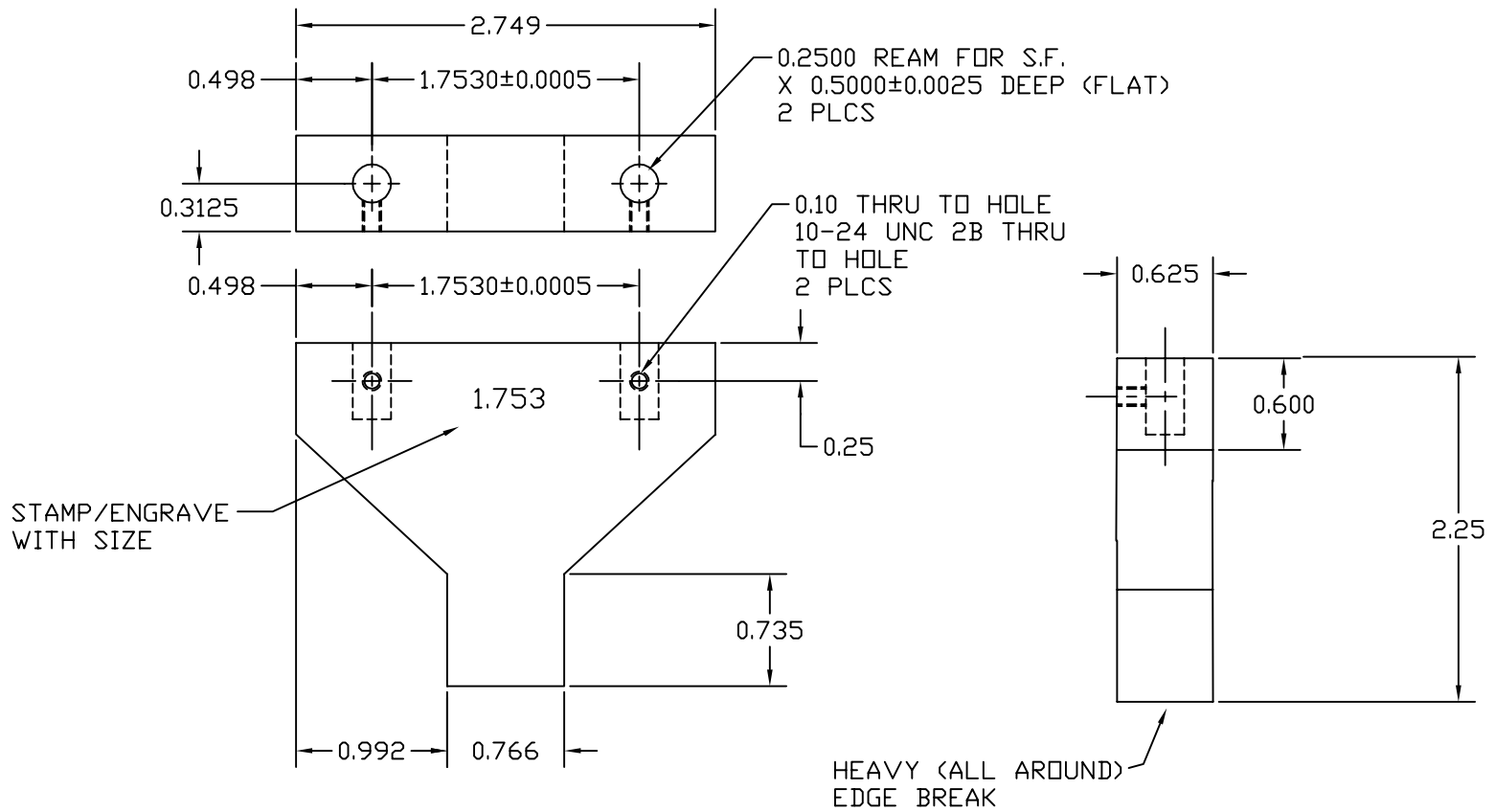


TEST FIXTURE MANUAL

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 Issued: 10/26/11
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NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL

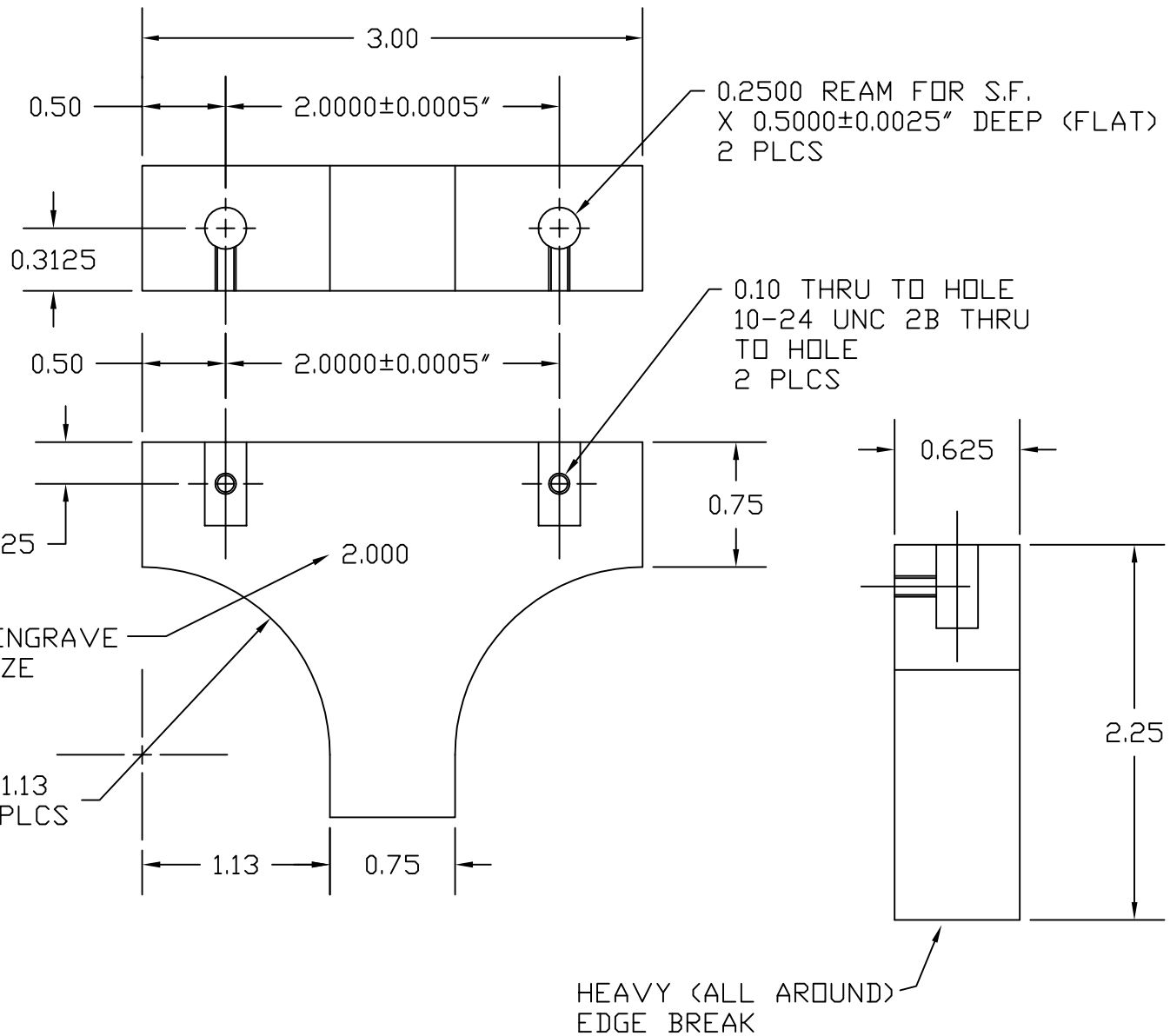


TEST FIXTURE MANUAL

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 Issued: 09/14/11
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NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL



TEST FIXTURE MANUAL

TF Part #: 0060

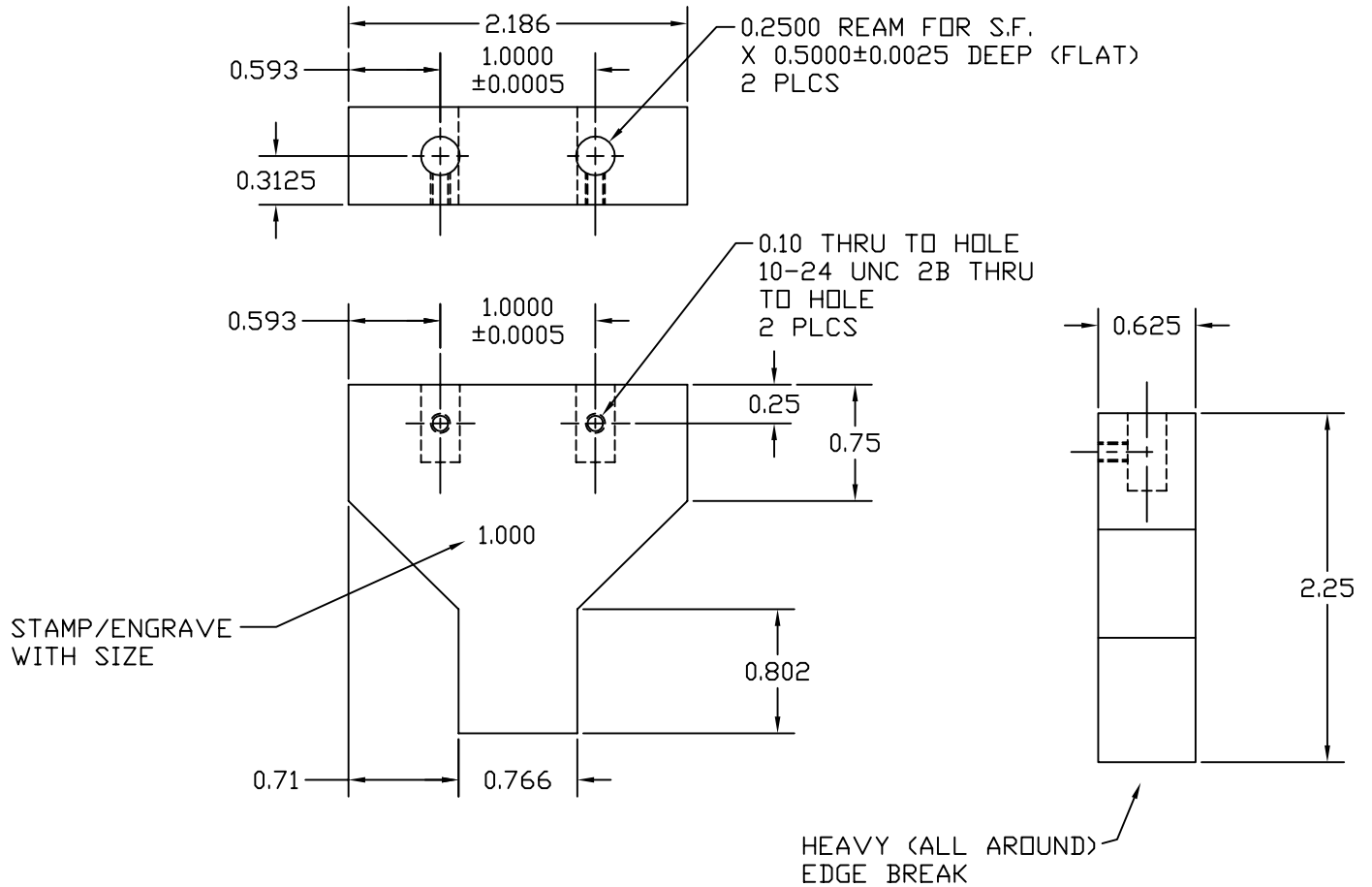
Issued: 09/14/11

Revision: Original

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NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL

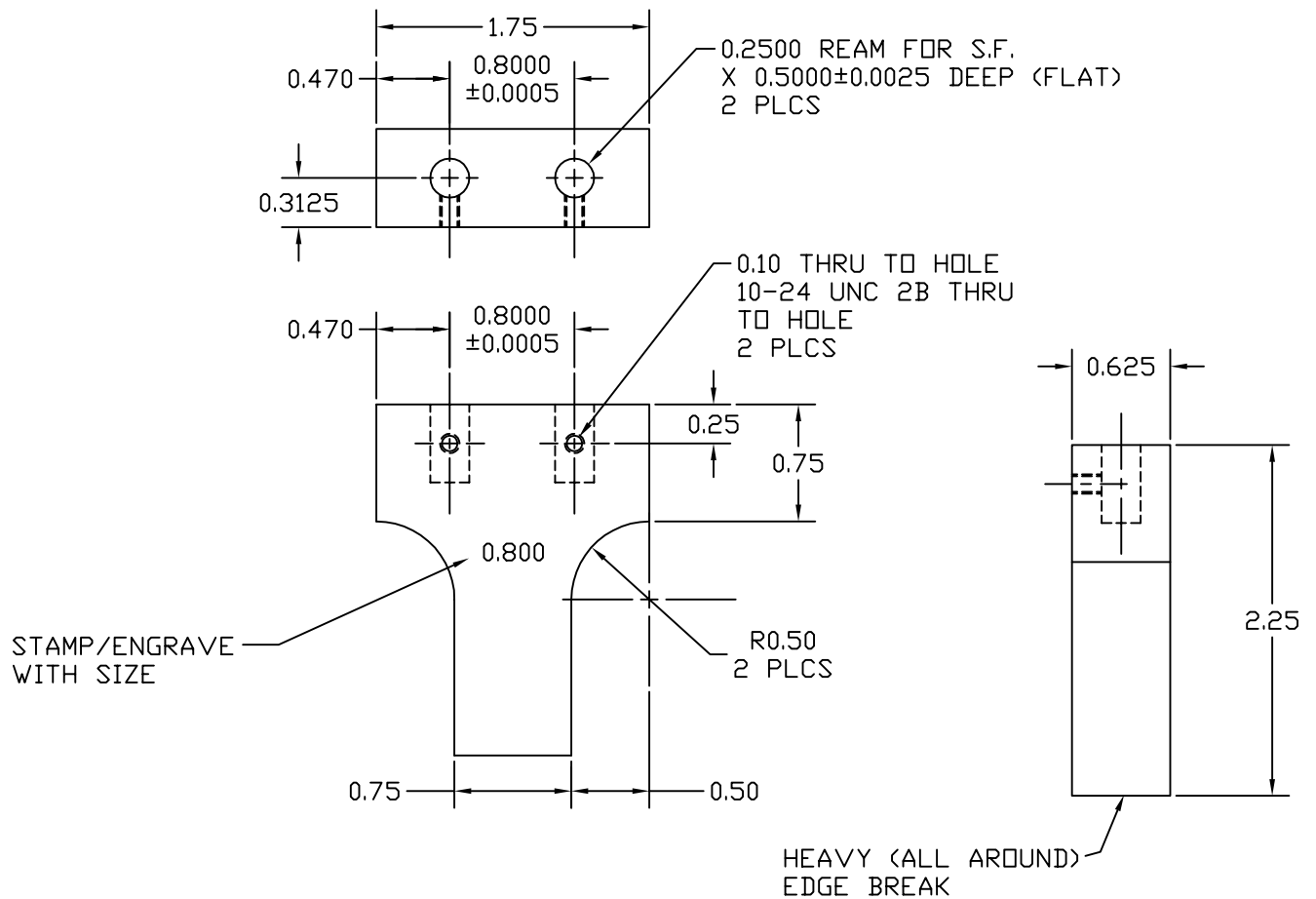


TEST FIXTURE MANUAL

TF Part #: 0061
 Issued: 09/14/11
 Revision: Original
 Page: 1 of 1

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL



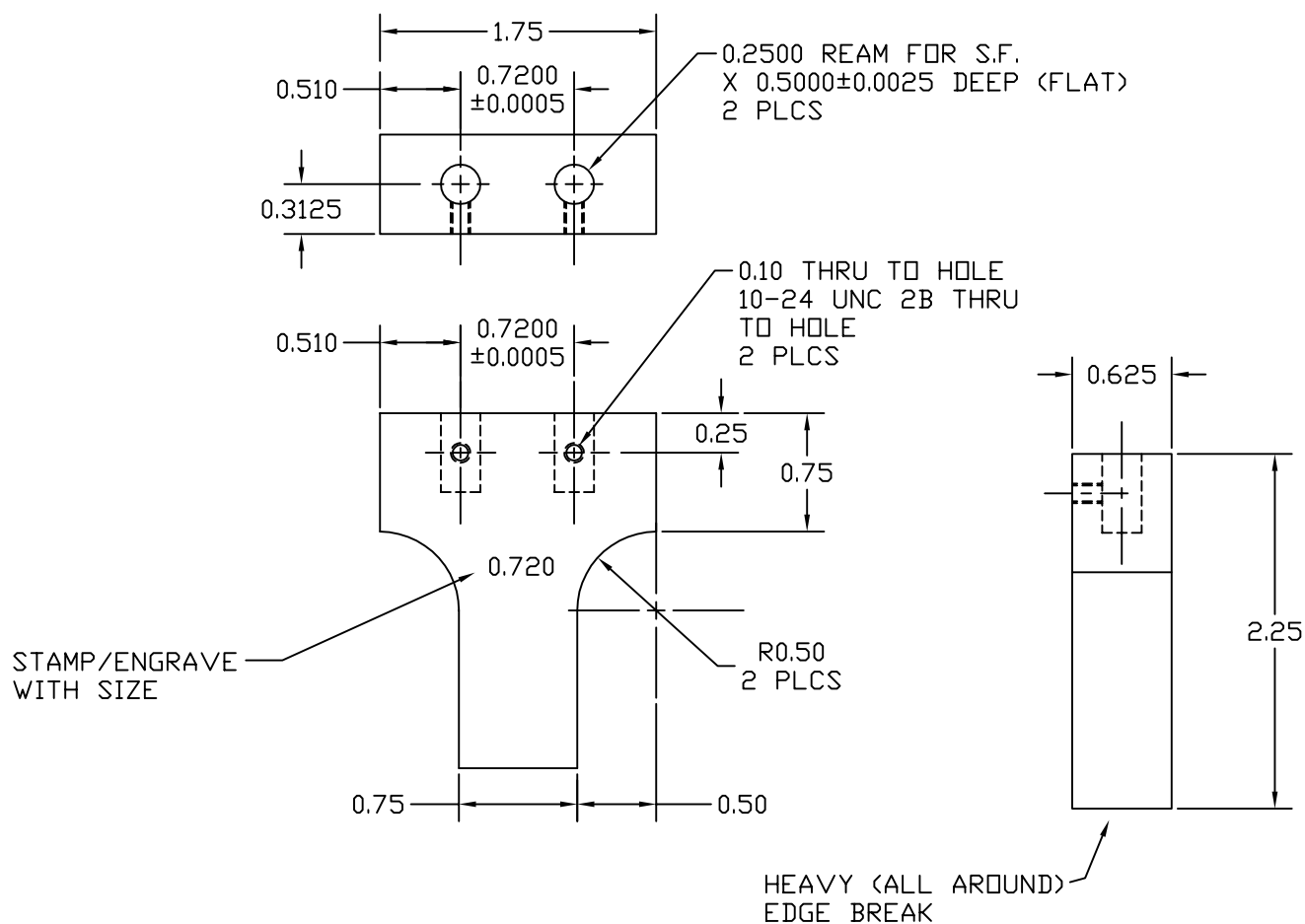
TEST FIXTURE MANUAL

TF Part #: 0062
 Issued: 09/14/11
 Revision: Original
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.800" WIDE PUNCH

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL

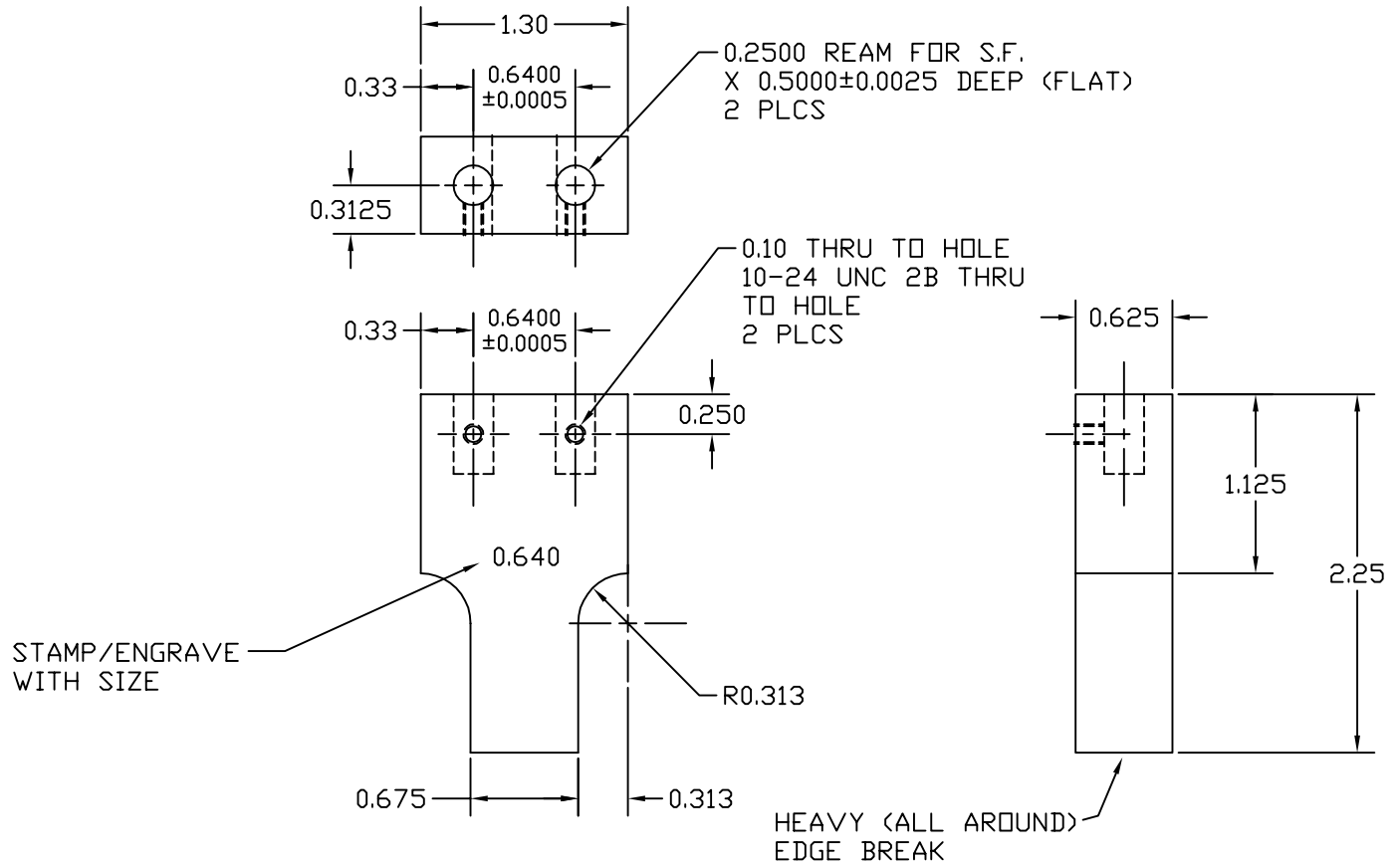


TEST FIXTURE MANUAL

TF Part #: 0063
 Issued: 09/14/11
 Revision: Original
 Page: 1 of 1

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL

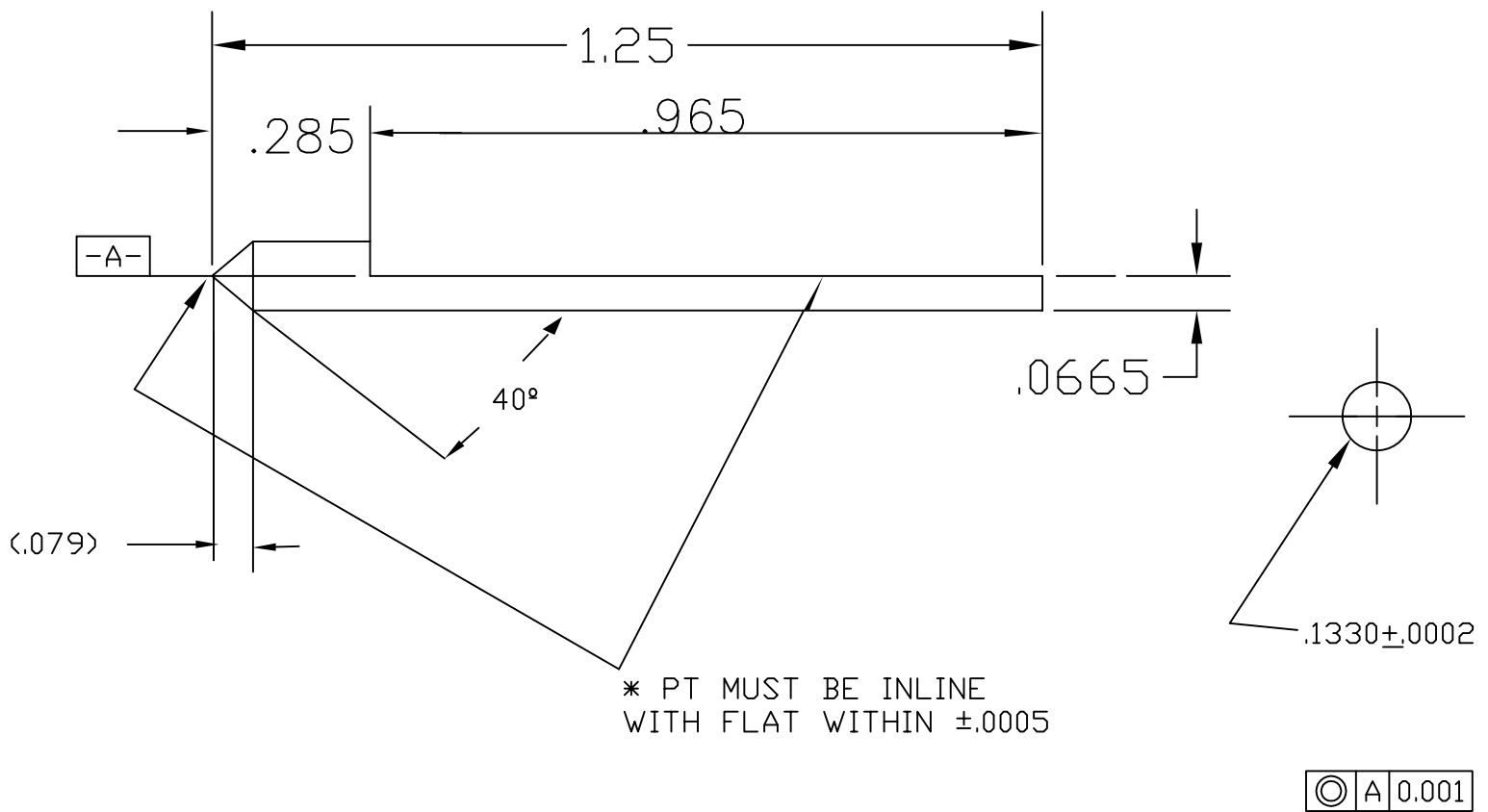


TEST FIXTURE MANUAL

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Issued:	09/14/11
Revision:	Original
Page:	1 of 1

NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: CARBIDE DRILL ROD.

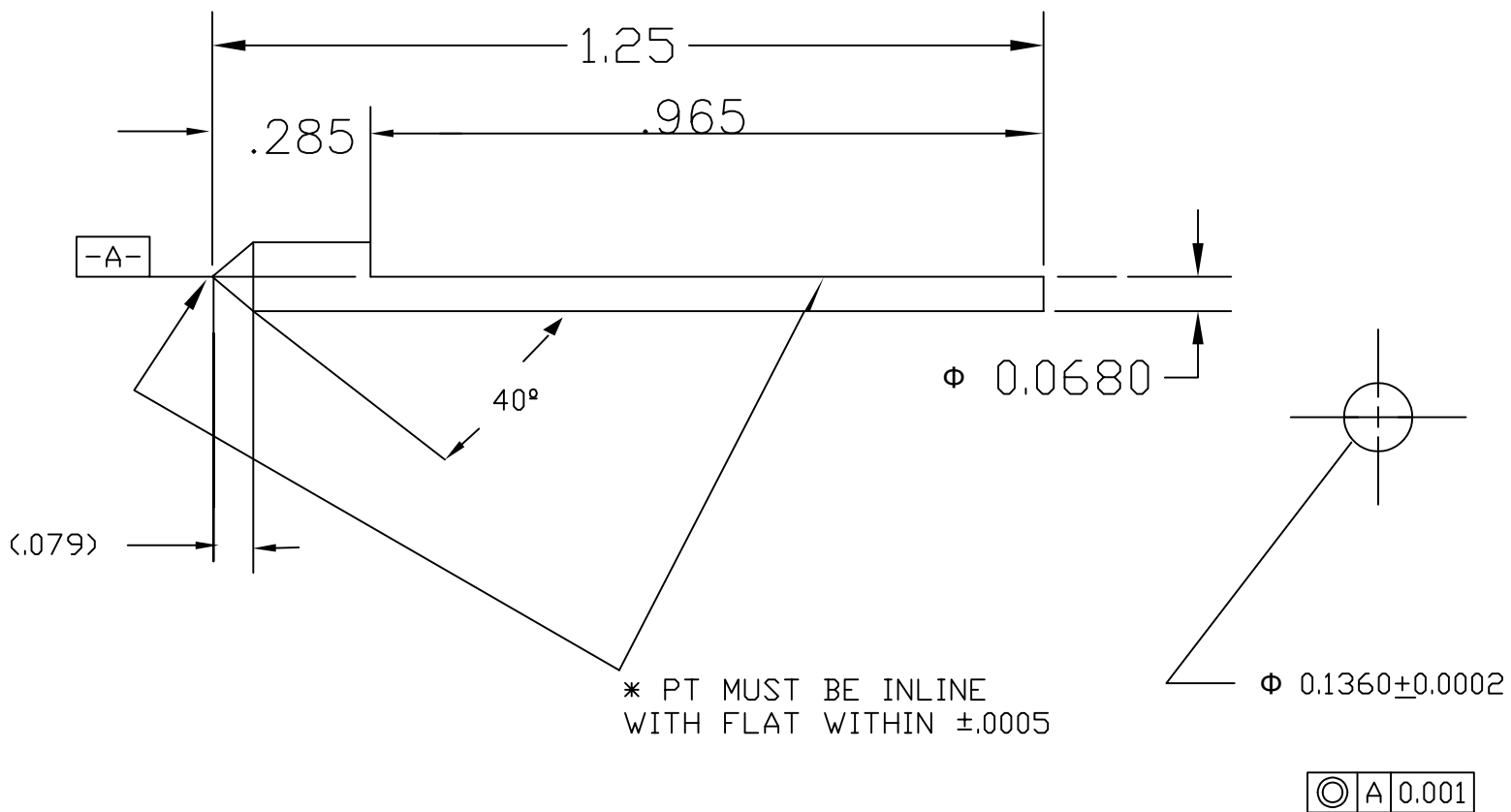


TEST FIXTURE MANUAL

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 Issued: 04/04/17
 Revision: 1
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: CARBIDE DRILL ROD.

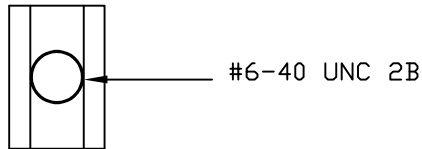


TEST FIXTURE MANUAL

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Issued: 5/18/2022
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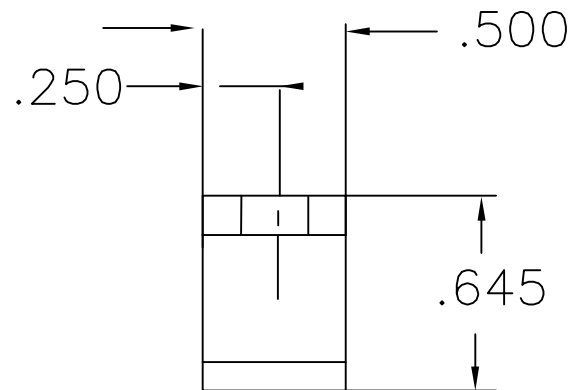
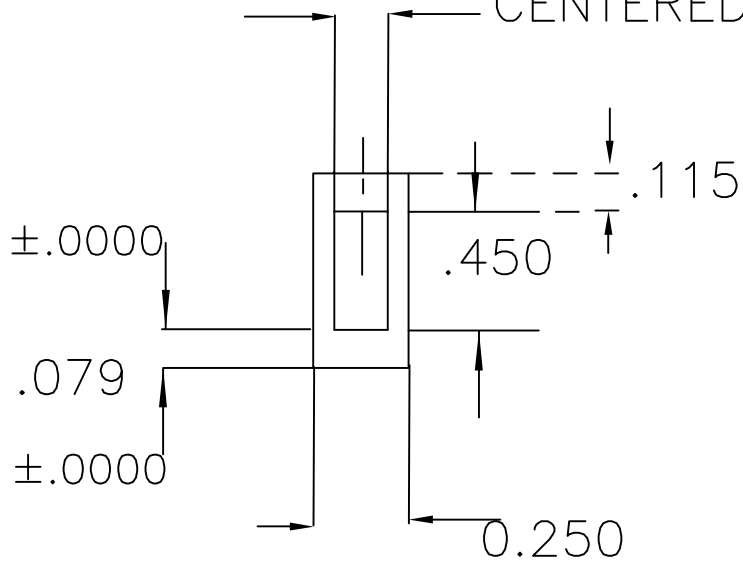
NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: COLD ROLLED STEEL.
4. TOLERANCE TO BE $-0.000/+0.005$.
5. MATERIAL: FOR USE WITH TF-65A.
6. FITS MITUTOYO 500-171-30 DIGIMATIC CALIPER.



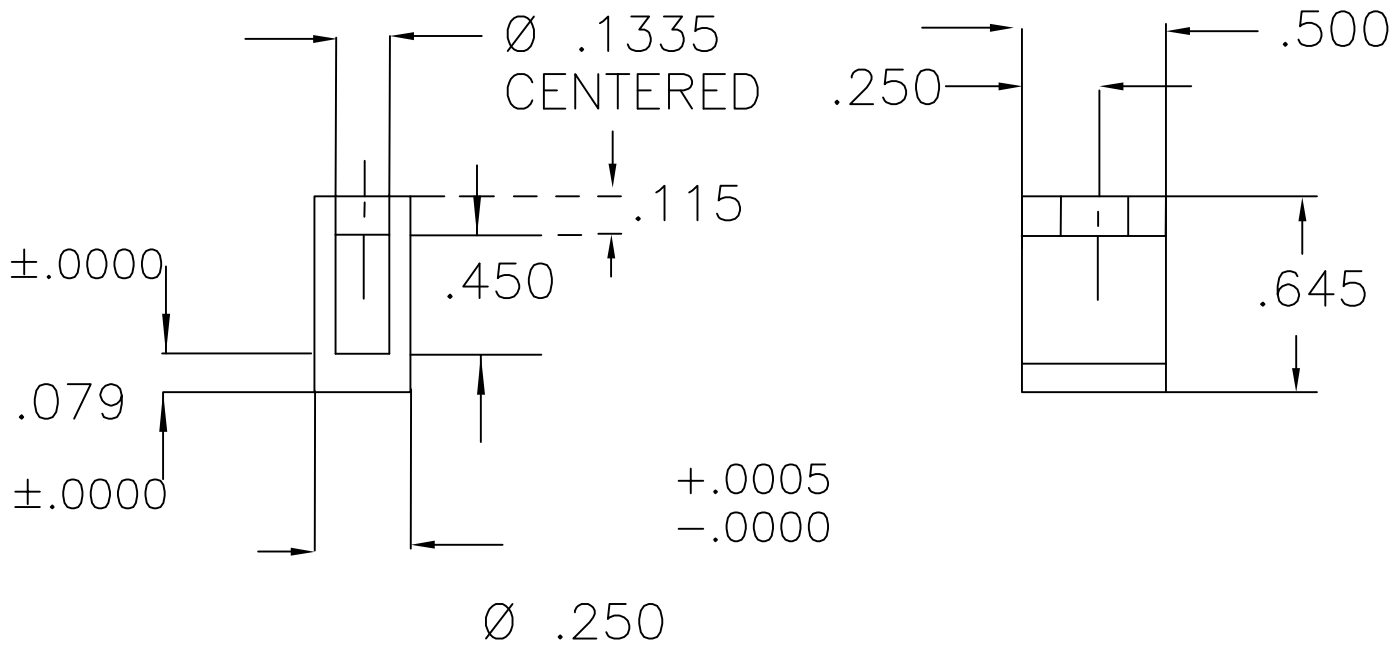
0.1365 $+0.0005$
 -0.0000

CENTERED



TEST FIXTURE MANUAL

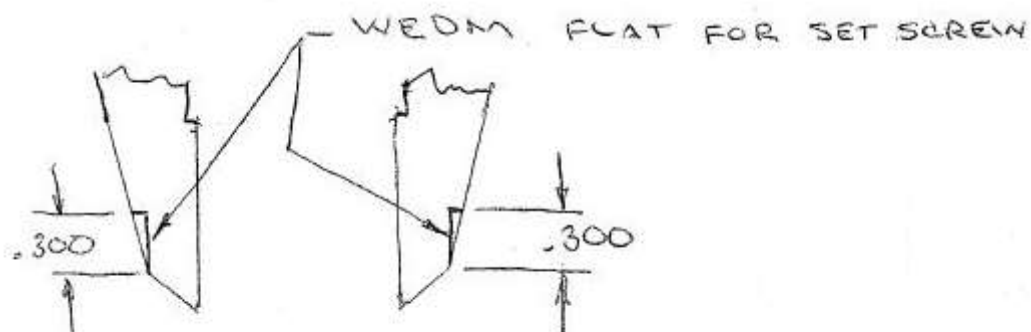
TF Part #: TF 0065B
 Issued: 5/18/2022
 Revision: 1
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NOTES:

1. MACHINE TO MEASURING SURFACE
2. EMC 6JE16

MODIFY CALIPERS

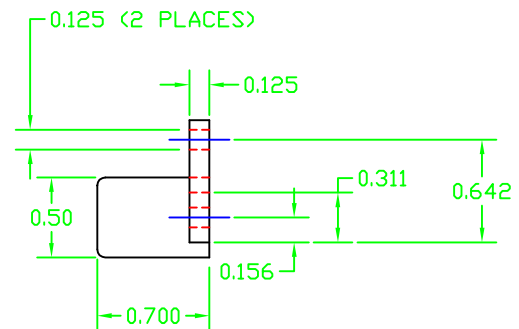
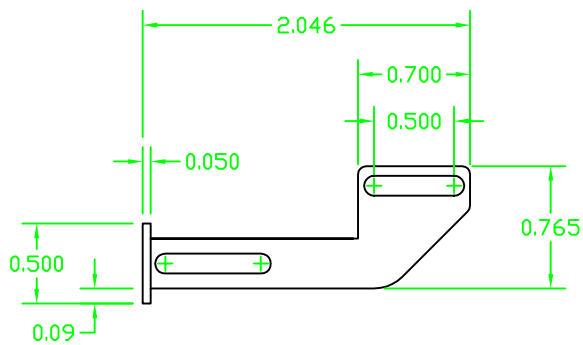
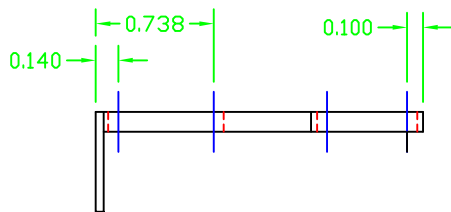


TEST FIXTURE MANUAL

TF Part #: 0066A
Issued: 01/29/18
Revision: ORIGINAL
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.

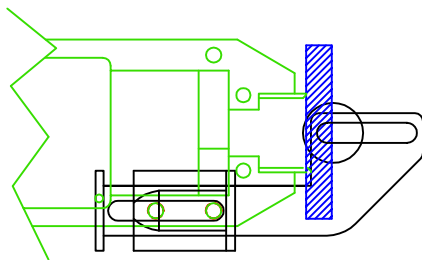


TEST FIXTURE MANUAL

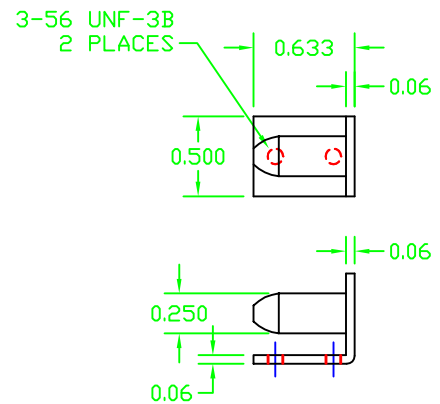
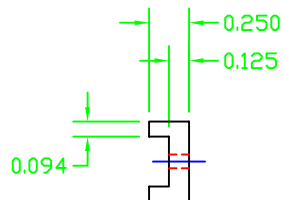
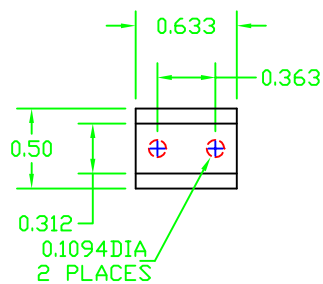
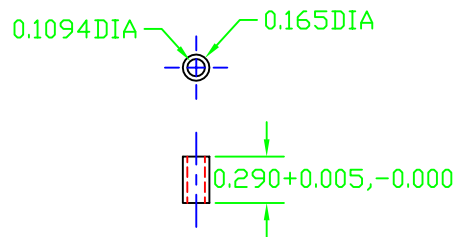
TF Part #: 0067
 Issued: 10/26/11
 Revision: Original
 Page: 1 of 1

NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.



ASSEMBLY VIEW

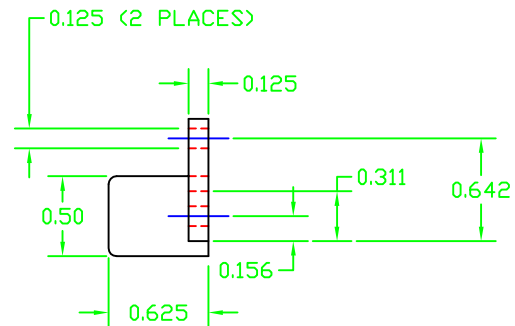
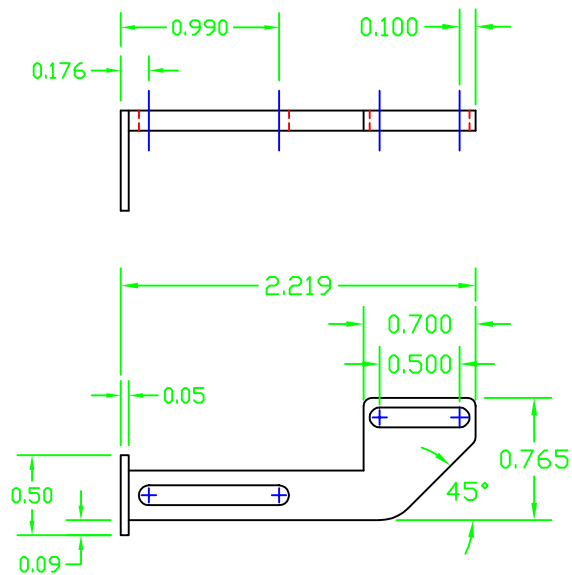


TEST FIXTURE MANUAL

TF Part #: 0067A
 Issued: 10/26/11
 Revision: Original
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NOTES:

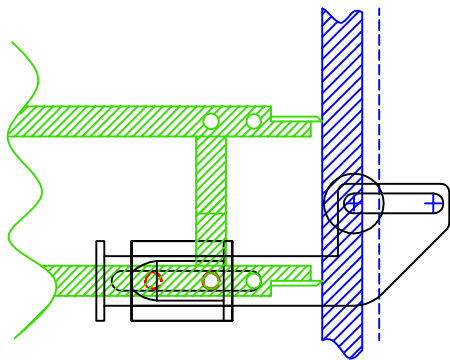
1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.



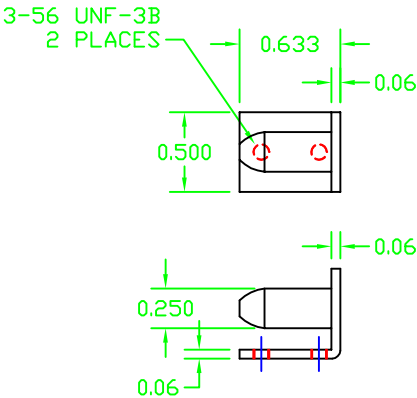
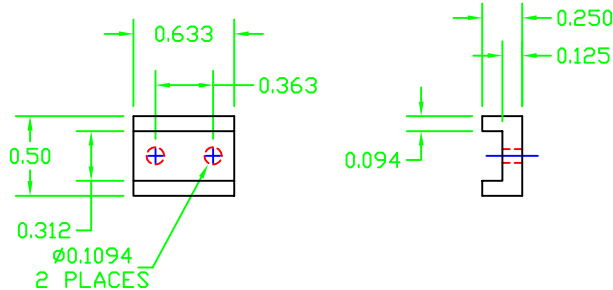
TEST FIXTURE MANUAL

TF Part #: 0068
 Issued: 10/26/11
 Revision: Original
 Page: 1 of 1

- NOTES:
- 1. DO NOT SCALE THIS DRAWING.
 - 2. ALL DIMENSIONS ARE IN INCHES.
 - 3. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.



ASSEMBLY VIEW

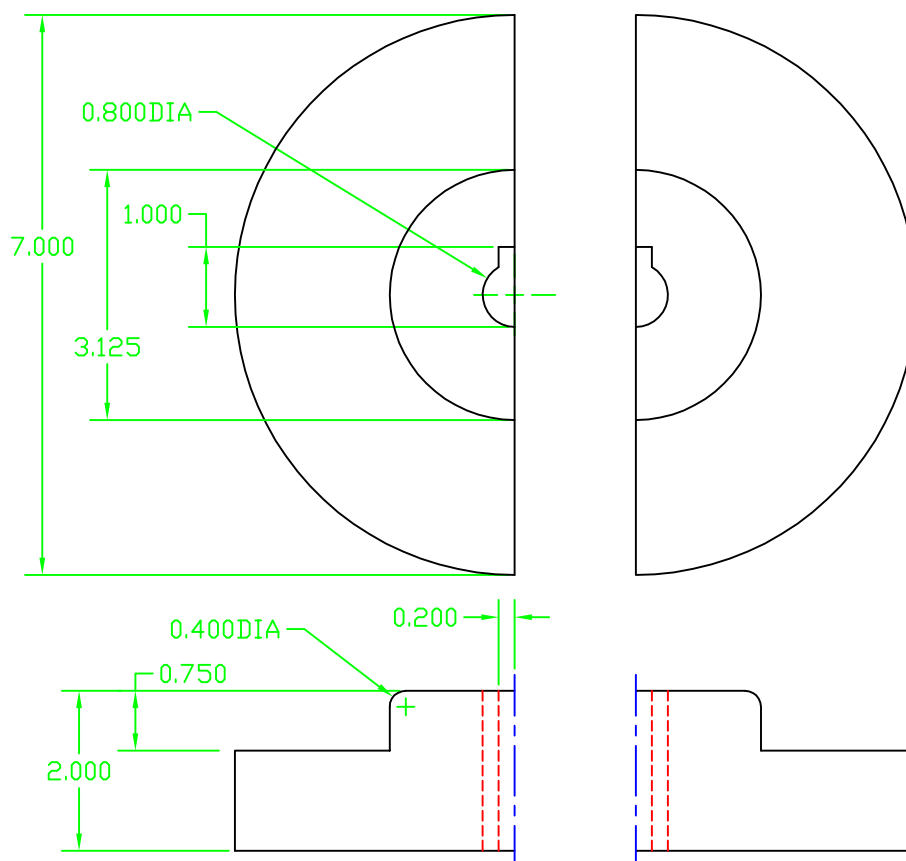


TEST FIXTURE MANUAL

TF Part #: 0068A
Issued: 10/26/11
Revision: Original
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: B3 (PYROTEK)
4. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.

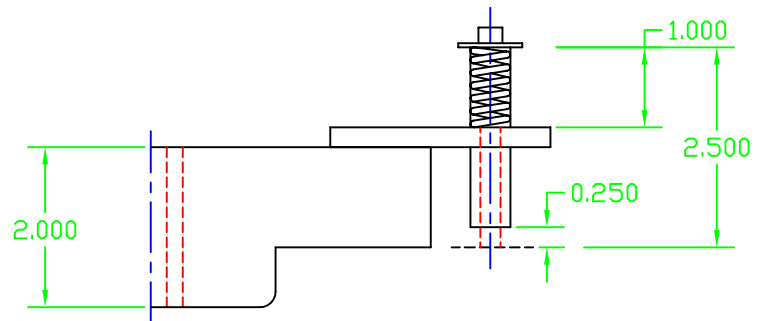
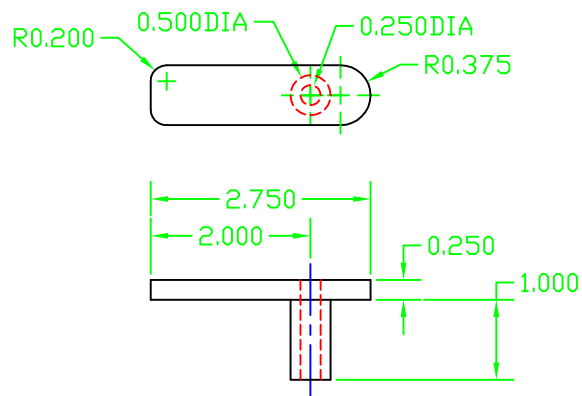


TEST FIXTURE MANUAL

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Issued: 10/26/11
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NOTES:

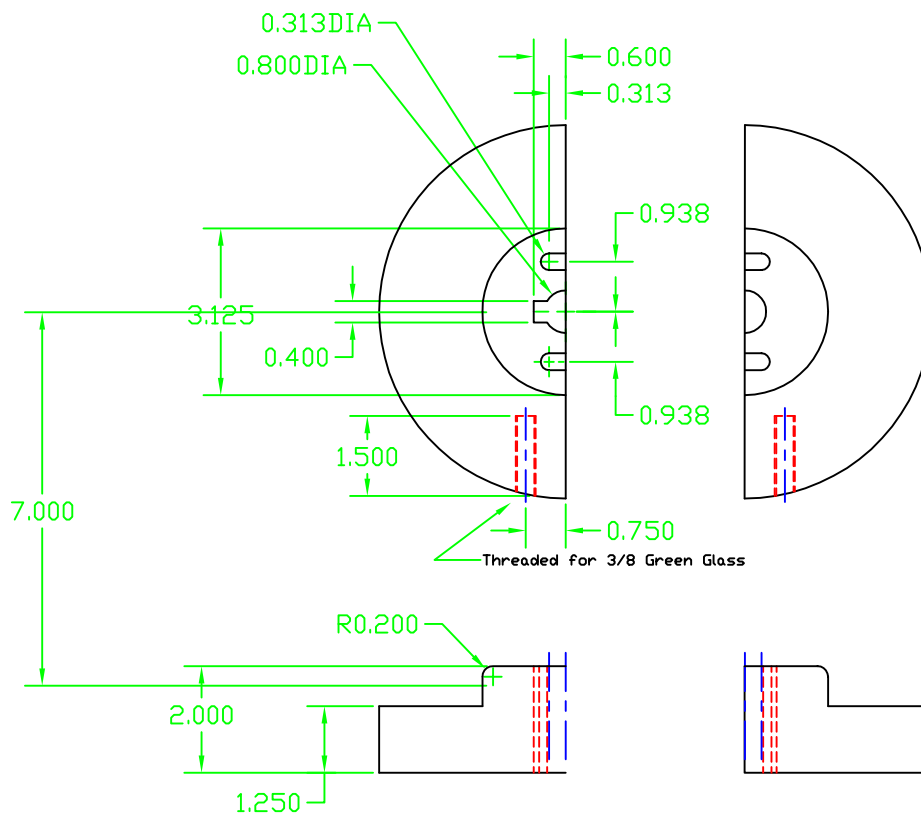
1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.

**TEST FIXTURE MANUAL**

TF Part #: 0069A
Issued: 10/26/11
Revision: Original
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: B3 (PYROTEK)
4. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.

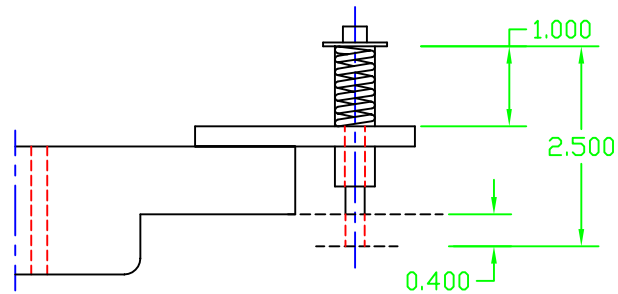
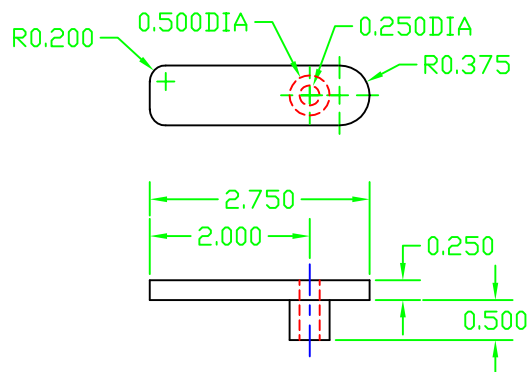


TEST FIXTURE MANUAL

TF Part #: 0070
 Issued: 10/26/11
 Revision: Original
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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. ALL DIMENSIONS ARE IN INCHES.
3. MATERIAL: B3 (PYRDEK)
4. TOLERANCE TO BE $-0.000/+0.005$, UNLESS OTHERWISE SPECIFIED.

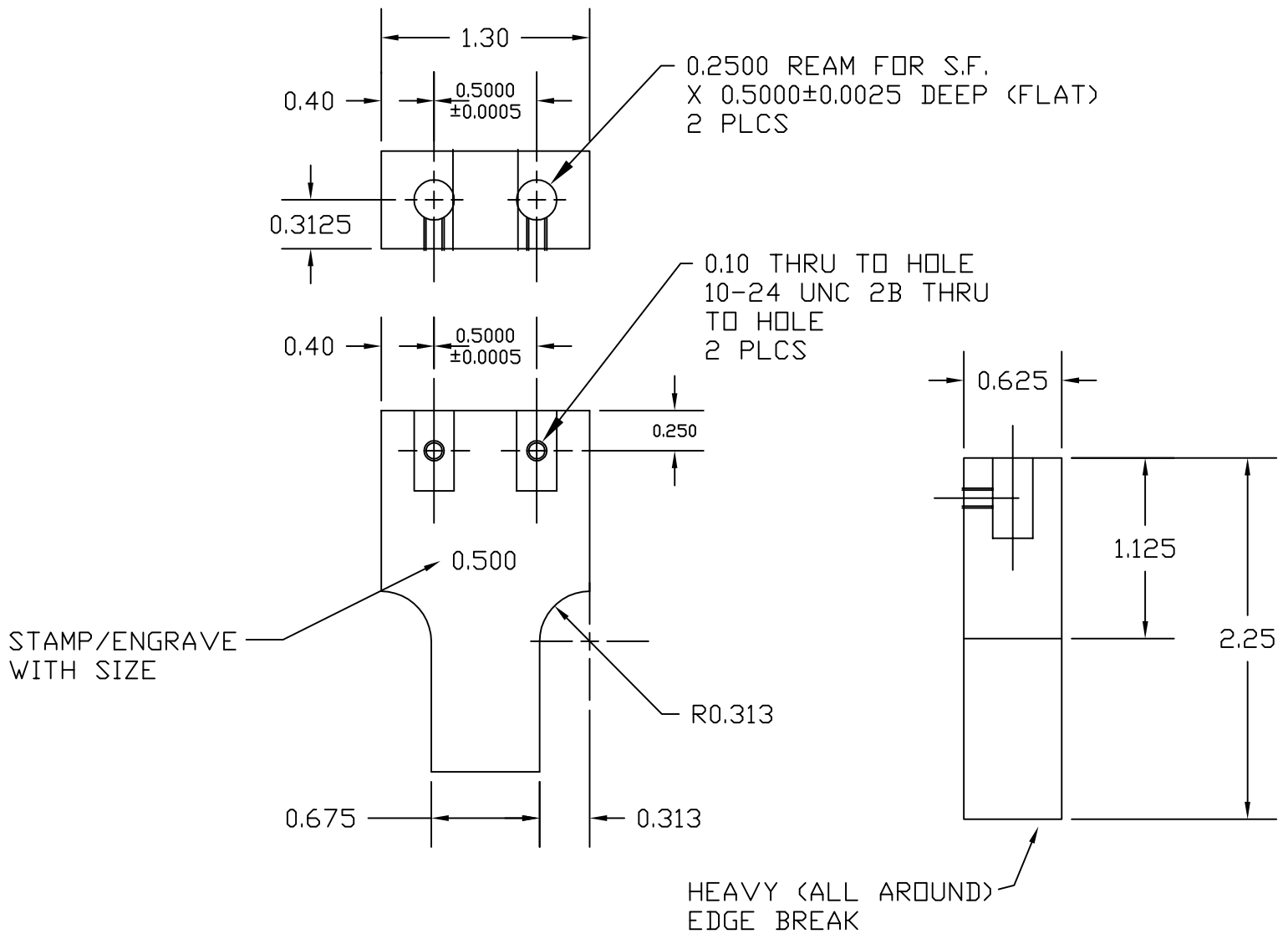


TEST FIXTURE MANUAL

TF Part #: 0070A
 Issued: 10/26/11
 Revision: Original
 Page: 1 of 1

NOTES:

1. ALL DIMENSIONS ARE IN INCHES
2. MATERIAL: S-7 TOOL STEEL



TEST FIXTURE MANUAL

TF Part #: 0071

Issued: 09/14/11

Revision: Original

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