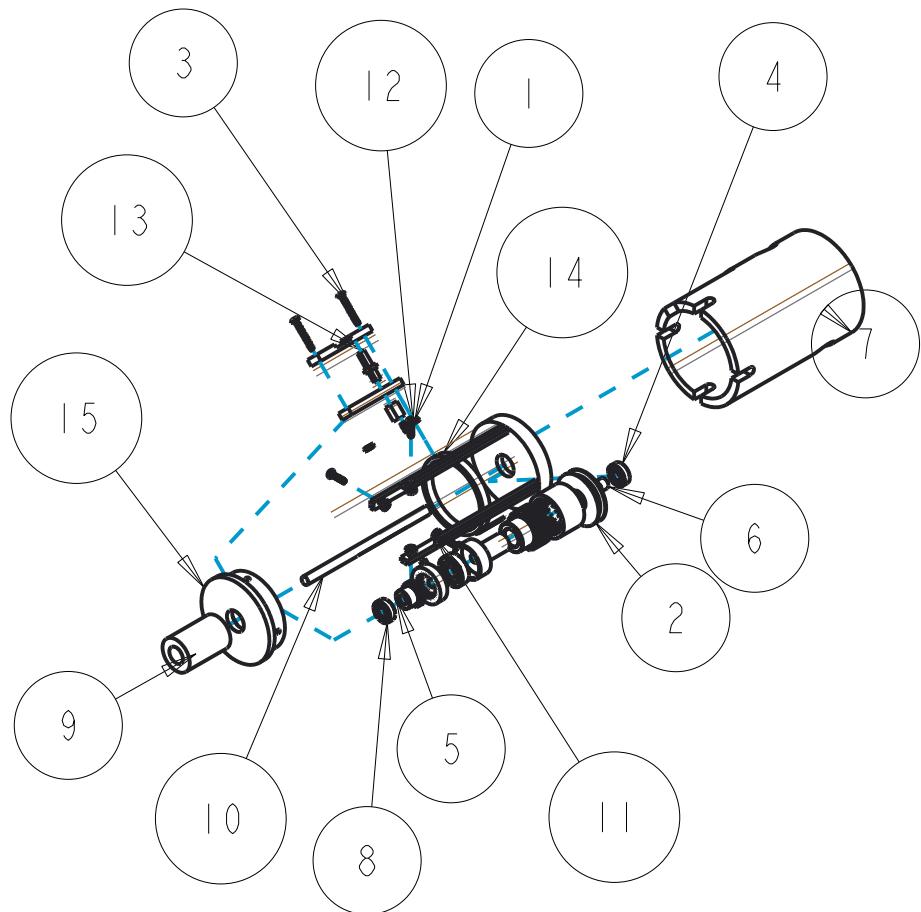


A



B

C

D

Index	Part Name	Quantity
1	I_2_IN SCREW	4
2	3_4_IN SCREW	2
3	3434T150_PULLEY_FOR_WIRE_ROPE	1
4	60355K701_BALL_BEARING	1
5	6325K950_MTL_GEAR--14--5_DEG_PR	1
6	6381K409_MULTIPURPOSE_SLEEVE_BR	1
7	CASING	1
8	FRAMEBALLBEARING	1
9	HAND_INTERFACE	1
10	KEYED_SHAFT	1
11	NUTFOR_3_4_IN SCREW	2
12	NUTFOR_1_2_IN SCREW	4
13	SLIDER	1
14	SUPPORT_FRAME	1
15	SUPPORT_FRAME_CAP	1

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 OTHERWISE SPECIFIED
 $.XX \pm 0.05$
 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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CHECKED BY <i>Logan Nofsinger</i>	DATE <i>12/6/2017</i>

FILE NAME **WRISTASSEMBLYFINAL**

MATERIAL

ME160

Vanderbilt University, Nashville, TN

TITLE
Wrist Assembly

SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

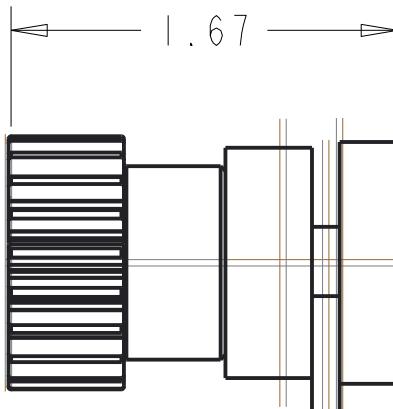
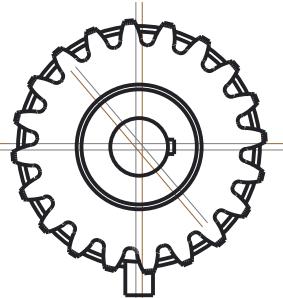
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A



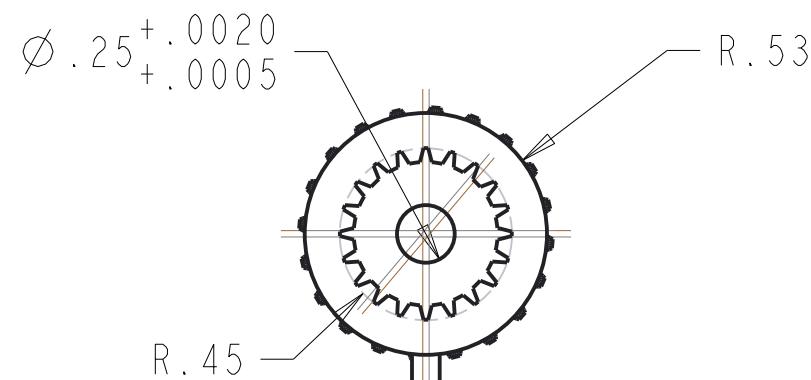
SCALE 1.200

B



SCALE 1.200

C



D

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 $.X \pm 0.1$
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CHECKED *Logan Nofsinger* DATE *12/6/2017*

FILE NAME *SLIDING_COLLAR*

MATERIAL

ME160

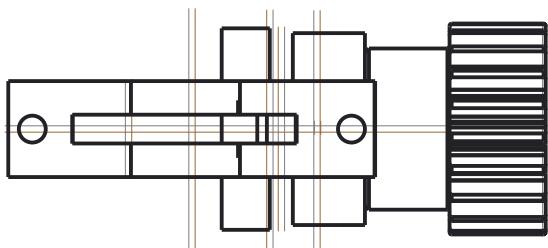
Vanderbilt University, Nashville, TN

TITLE
Sliding Collar

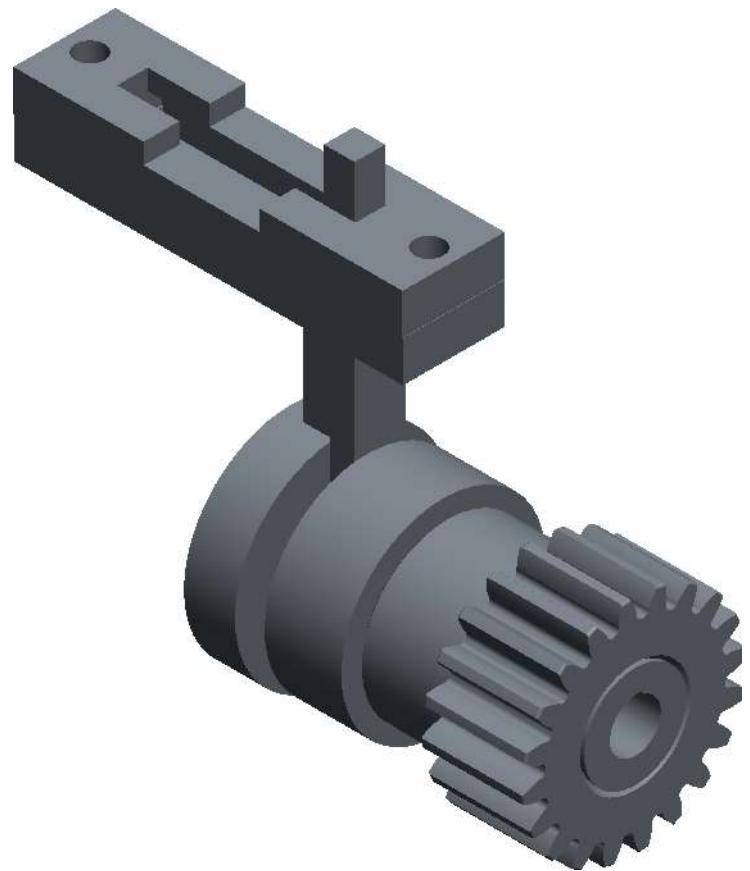
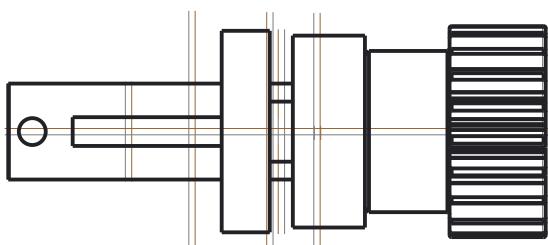
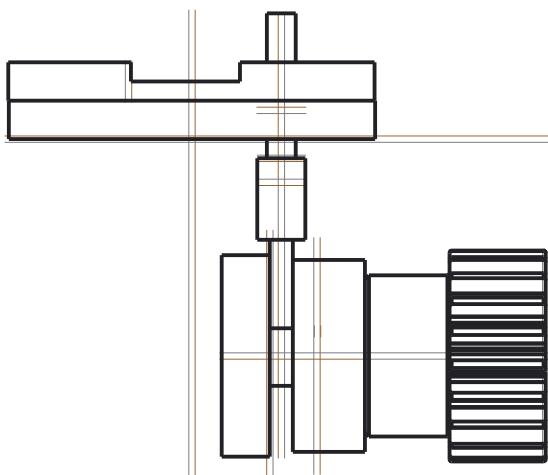
SIZE A **DWG. NO.** PR3_DRAWINGS **REV.** 1

SCALE 1.00 : 1 **SHEET**

2 of 28



SCALE 1.000



SCALE 1.500

DO NOT SCALE DRAWING

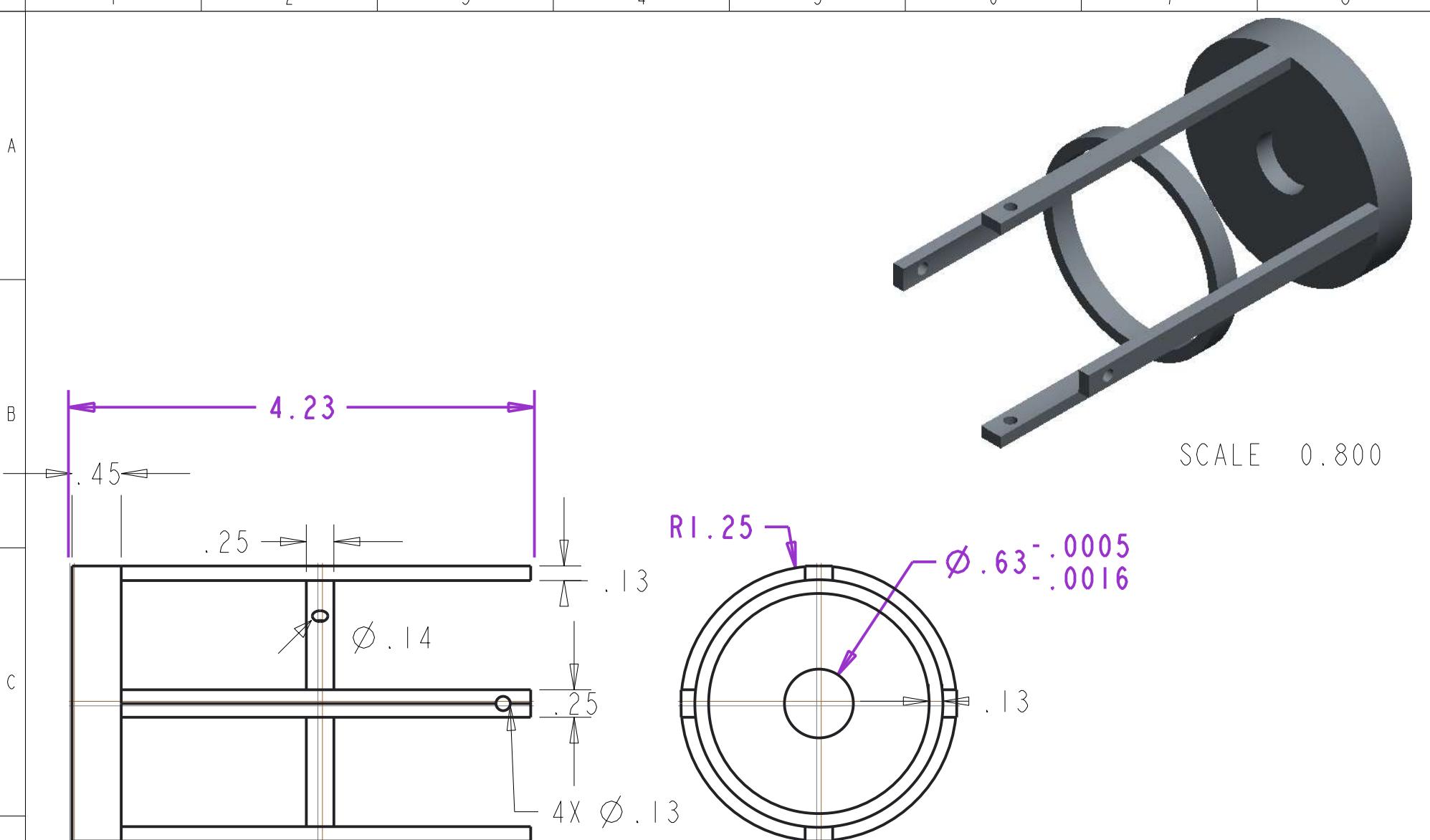
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ANG ± 0.5°

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CHECKED Logan Nofsinger		DATE 12/6/2017			
FILE NAME SLIDER	MATERIAL	SCALE 1.00 : 1	SHEET	3 of 28	



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 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

FILE NAME SUPPORT_FRAME

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DRAWN BY Swapnil Pande	DATE 12/6/2017
CHECKED BY Logan Nofsinger	DATE 12/6/2017
FILE NAME SUPPORT_FRAME	
MATERIAL Aluminum	SCALE 0.50 : 1
SHEET 1	REV. 1

ME160

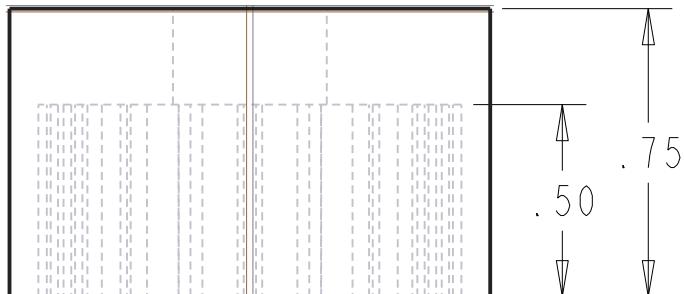
Vanderbilt University, Nashville, TN

TITLE
Support Frame

SIZE A **DWG. NO.** PR3_DRAWINGS **REV.** 1

4 of 28

A

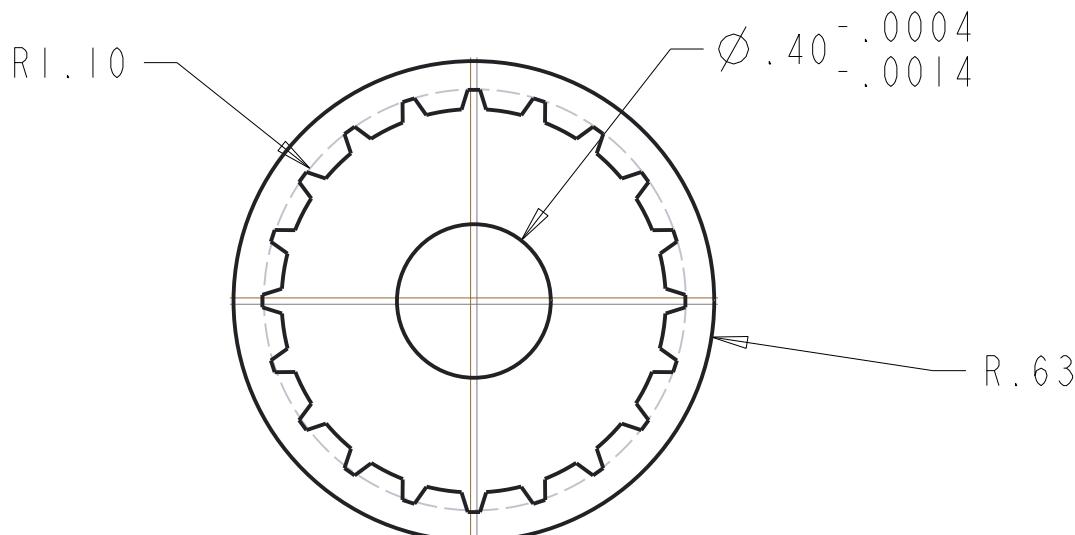


B



SCALE 2.000

C



D

SCALE 2.000

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CHECKED Logan Nofsinger DATE 12/6/2017

FILE NAME **PULLEYLOCKER**

MATERIAL **Aluminum**

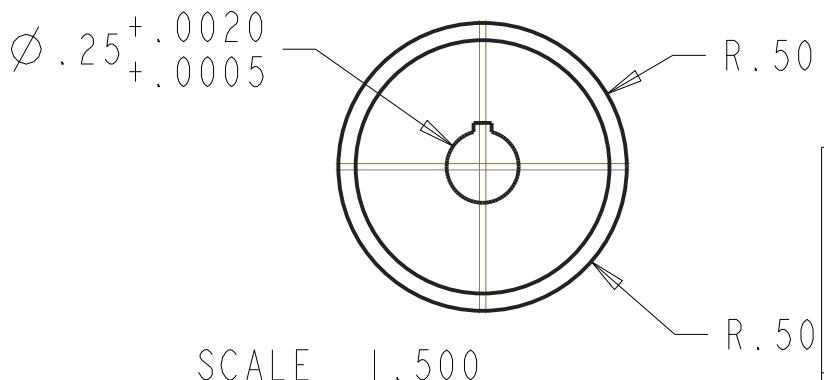
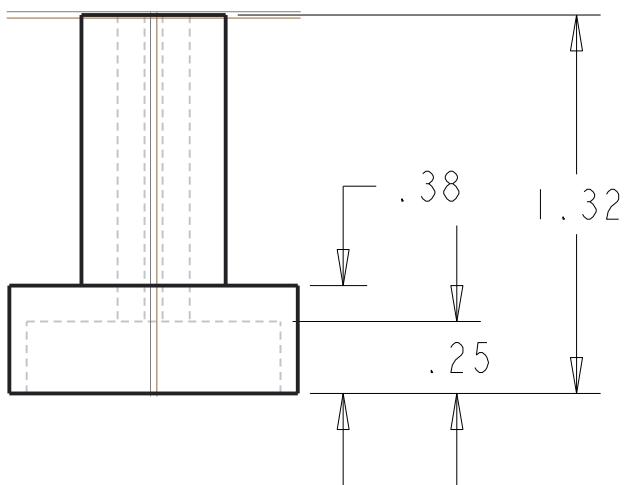
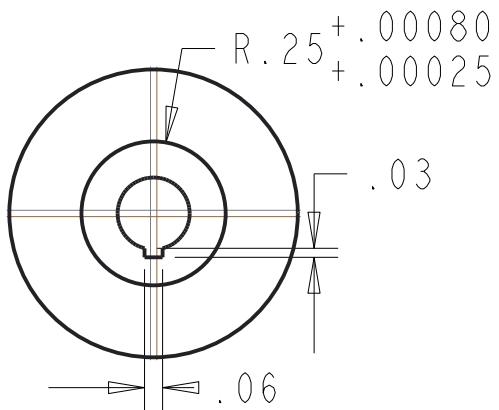
SCALE **1.00 : 1** SHEET **5 of 28**

ME160

Vanderbilt University, Nashville, TN

TITLE
Pulley Locker

SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1



SCALE 2.000

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.X ± 0.1
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DRAWN *Swapnil Pande* DATE *12/6/2017*

CHECKED *Logan Nofsinger* DATE *12/6/2017*

FILE NAME **SHAFT_ENGAGER**

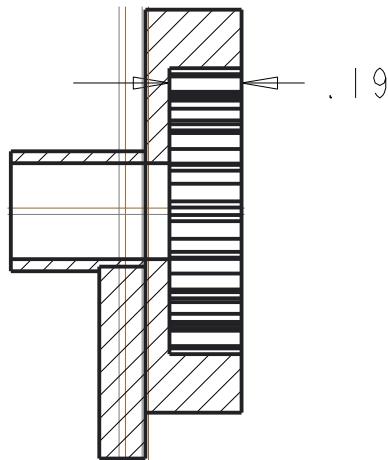
MATERIAL **Aluminum** SCALE **1.00 : 1** SHEET **6 of 28**

ME160

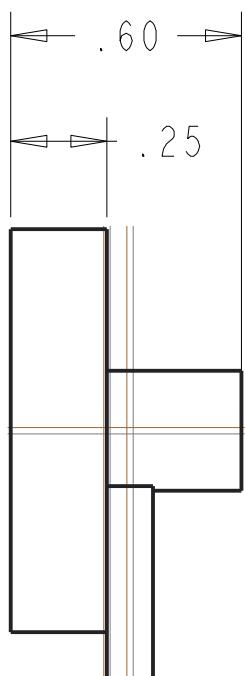
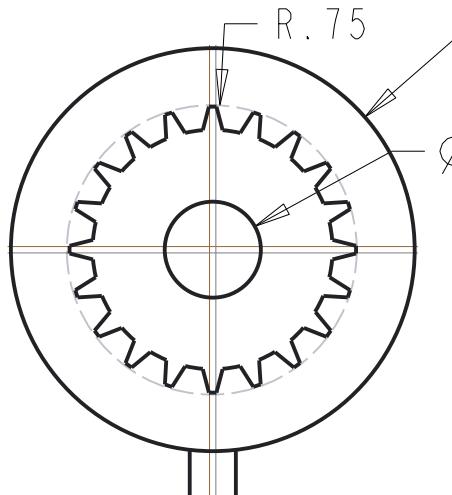
Vanderbilt University, Nashville, TN

Title
*Shaft Engager***Size** **A** **Dwg. No.** **PR3_DRAWINGS****Rev.** **1**

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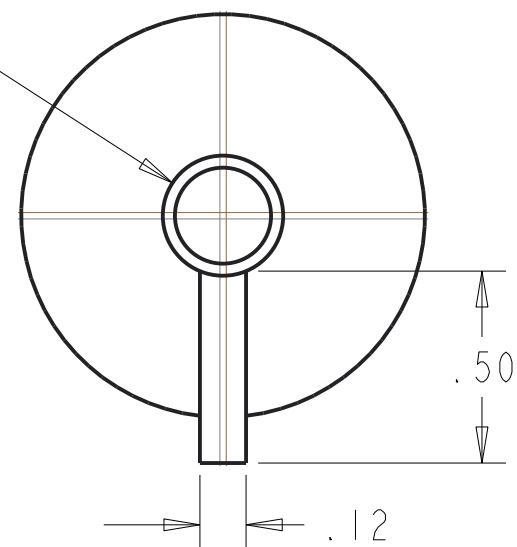


SECTION XSEC0001-XSEC0001
SCALE 2.000



SCALE 2.000

SCALE 2.500



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CHECKED *Logan Nofsinger* DATE *12/6/2017*

FILE NAME **LOCKINGSHAFT**

MATERIAL **Aluminum**

ME160

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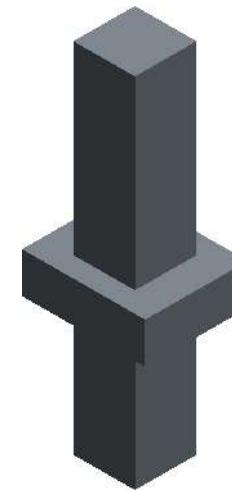
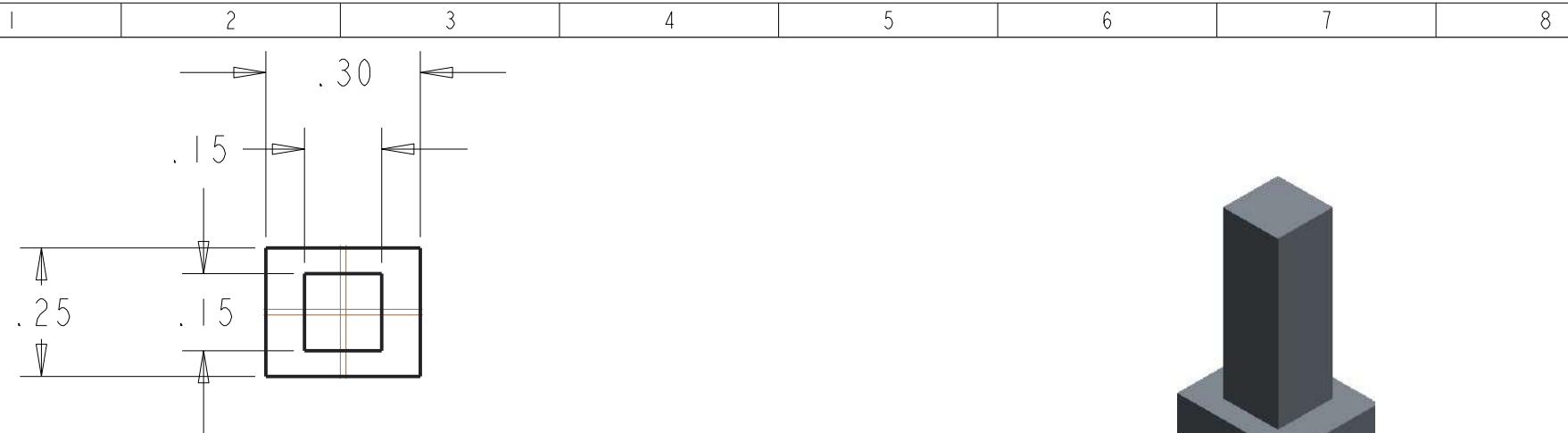
TITLE
Locking Shaft

SIZE **DWG. NO.**
A **PR3_DRAWINGS**

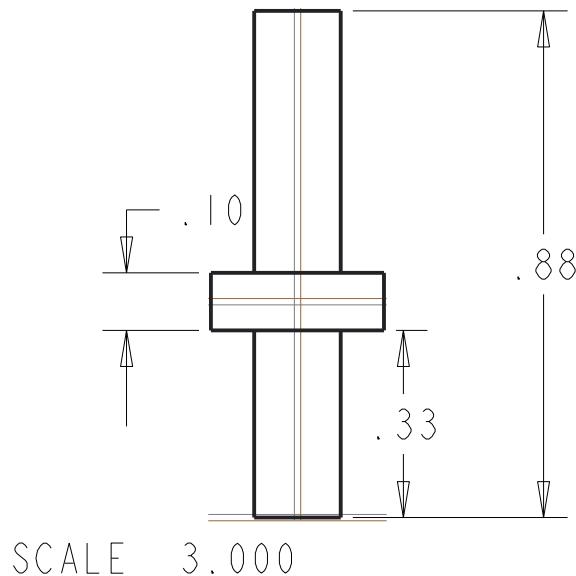
REV.
1

SCALE **1.00 : 1** **SHEET**

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SCALE 3.000



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FILE NAME **SLIDER**

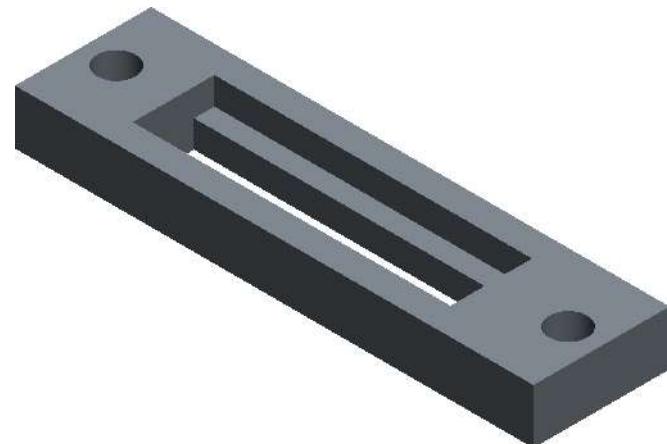
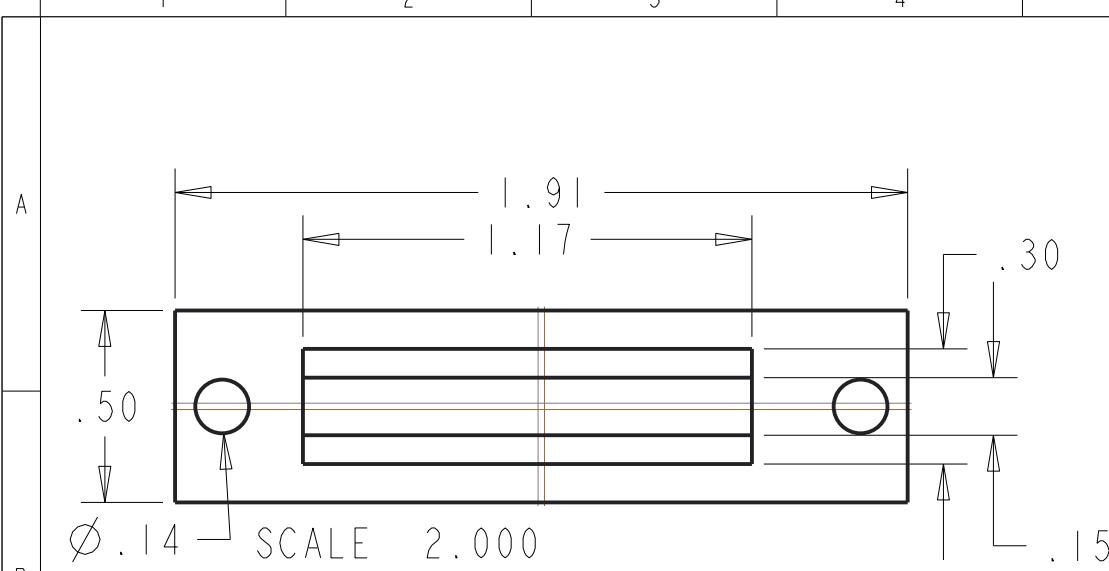
DRAWN BY **Swapnil Pande** DATE **12/6/2017**

CHECKED BY **Logan Nofsinger** DATE **12/6/2017**

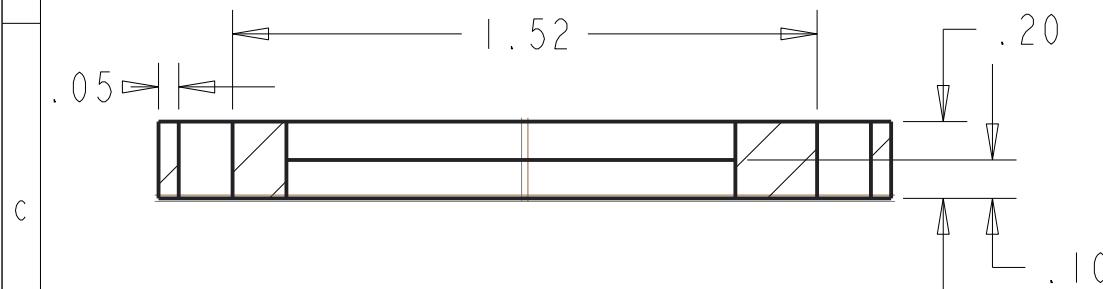
MATERIAL **Aluminum**

ME160		Vanderbilt University, Nashville, TN
TITLE Slider		
SIZE A	DWG. NO. PR3_DRAWINGS	REV. 1
SCALE 1.00 : 1	SHEET	8 of 28

1 2 3 4 5 6 7 8



SCALE 2.000



SECTION XSEC0001-XSEC0001
SCALE 2.000

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CHECKED Logan Nofsinger	DATE 12/6/2017

FILE NAME SLIDER_BASE_TOP

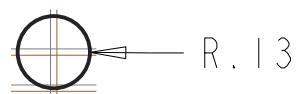
MATERIAL Aluminum	SCALE 1.00 : 1	SHEET 9 of 28
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ME160

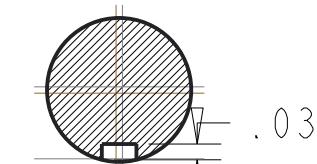
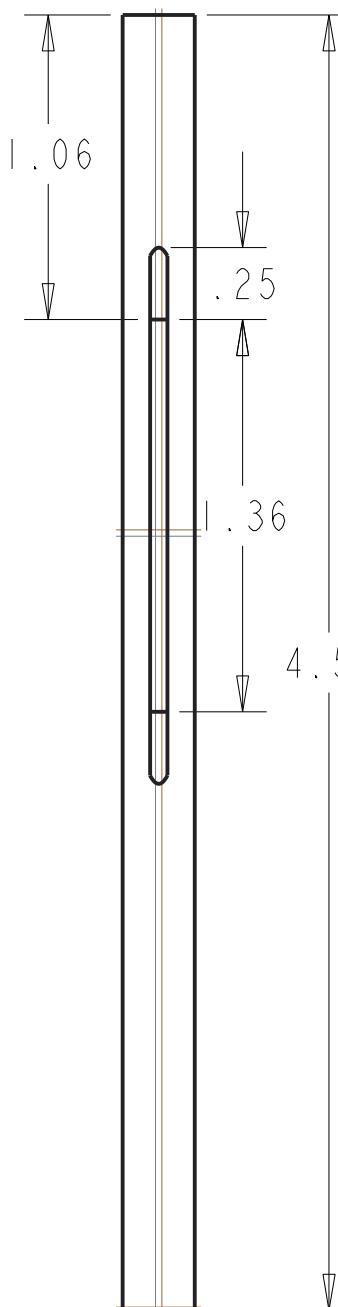
Vanderbilt University, Nashville, TN

TITLE
Slider Base Top

SIZE A **DWG. NO.** PR3_DRAWINGS **REV.** 1



R. 13



.03
.06
.06



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 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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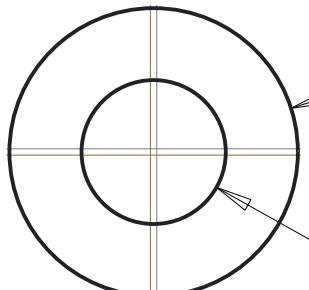
FILE NAME KEYED SHAFT

DRAWN *Swapnil Pande* DATE 12/6/2017
CHECKED *Logan Nofsinger* DATE 12/6/2017

MATERIAL Aluminum

ME160		Vanderbilt University, Nashville, TN
Title <i>Keyed Shaft</i>		
SIZE A	DWG. NO. PR3_DRAWINGS	REV. 1
SCALE 0.50 : 1	SHEET	10 of 28

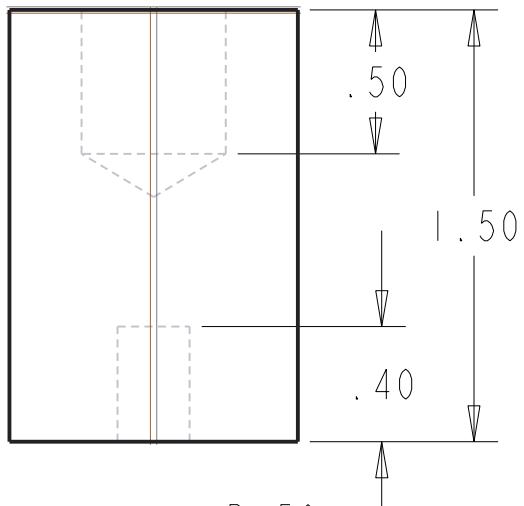
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R.50

 $\phi .50^{+.0005}_{-.0016}$

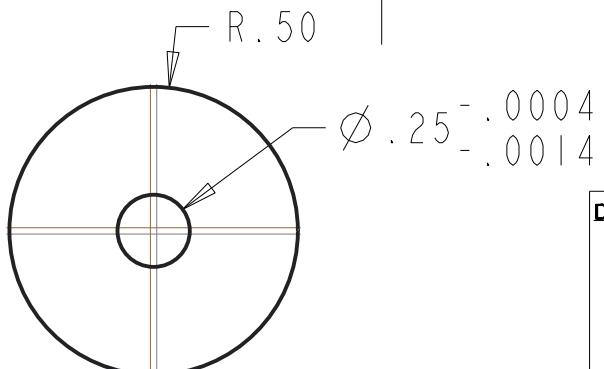
SCALE 1.500



.50

1.50

.40



R.50

 $\phi .25^{+.0004}_{-.0014}$ 

SCALE 2.000

DO NOT SCALE DRAWING

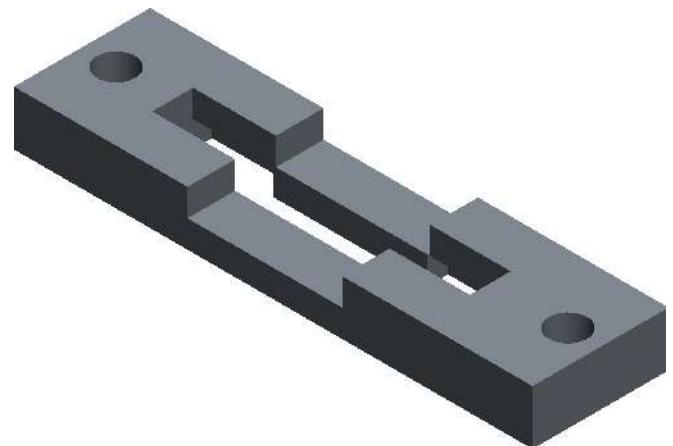
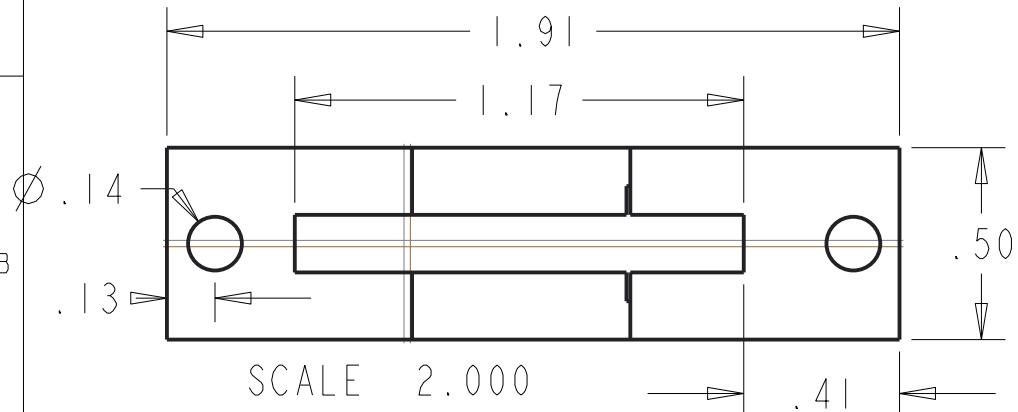
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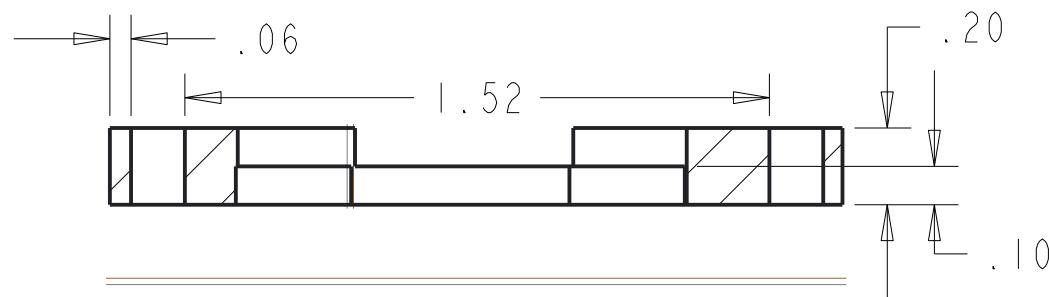
TITLE		ME160	
Vanderbilt University, Nashville, TN			
TITLE		Hand Interface	
SIZE	DWG. NO.		REV.
A	PR3_DRAWINGS		1
SCALE	1.00 : 1	SHEET	11 of 28
FILE NAME	HAND_INTERFACE	MATERIAL	Aluminum

A



SCALE 2.000

B



C

SECTION XSEC0001-XSEC0001
SCALE 2.000

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FILE NAME SLIDER_BASE

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DRAWN Logan Nofsinger DATE 12/6/2017

CHECKED Logan Nofsinger DATE 12/6/2017

MATERIAL Aluminum

ME160

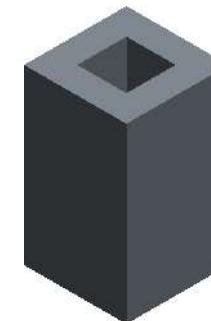
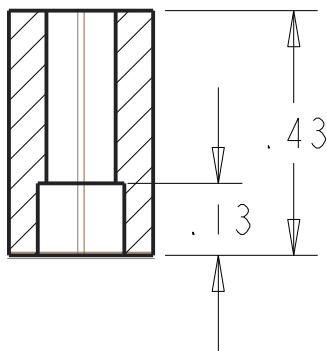
Vanderbilt University, Nashville, TN

TITLE
Slider Base

SIZE A DWG. NO. PR3_DRAWINGS REV. 1

SCALE 1.00 : 1 SHEET 12 of 28

A

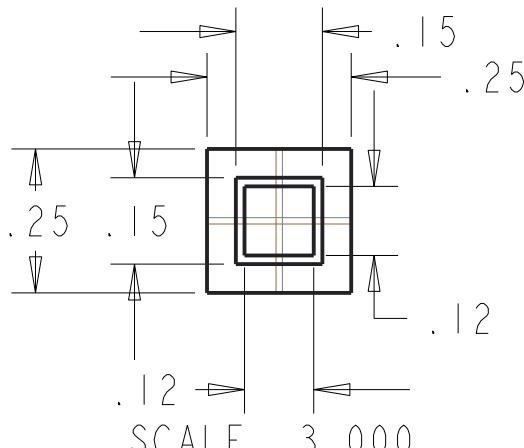


SCALE 3.000

B

SECTION XSEC0001-XSEC0001

C



SCALE 3.000

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FILE NAME SWITCH_CONNECTOR

DRAWN Logan Nofsinger DATE 12/6/2017

CHECKED Logan Nofsinger DATE 12/6/2017

ME160

Vanderbilt University, Nashville, TN

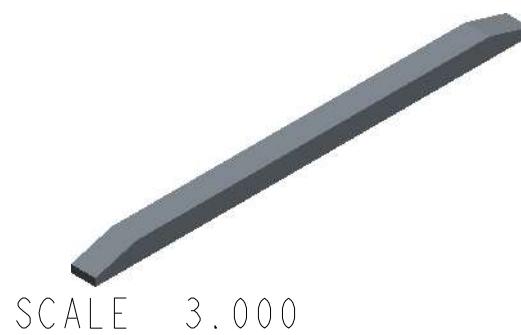
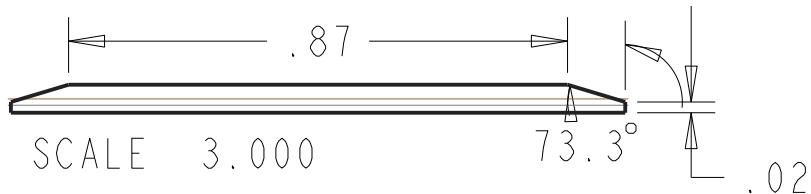
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Switch Connector

SIZE A **DWG. NO.** PR3_DRAWINGS **REV.** 1

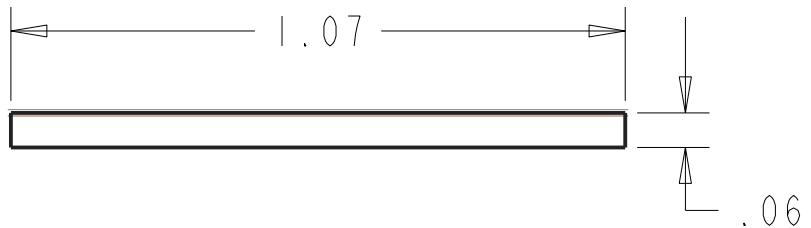
SCALE 3.00 : 1 **SHEET**

13 of 28

A



B



C

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FILE NAME

KEY

MATERIAL

Aluminum

DRAWN Logan Nofsinger DATE 12/6/2017

CHECKED Logan Nofsinger DATE 12/6/2017

ME160

Vanderbilt University, Nashville, TN

TITLE
Key

SIZE

DWG. NO.

A

PR3_DRAWINGS

REV.

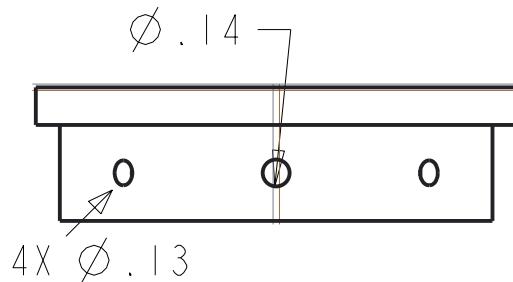
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SCALE 2.00 : 1

SHEET

14 of 28

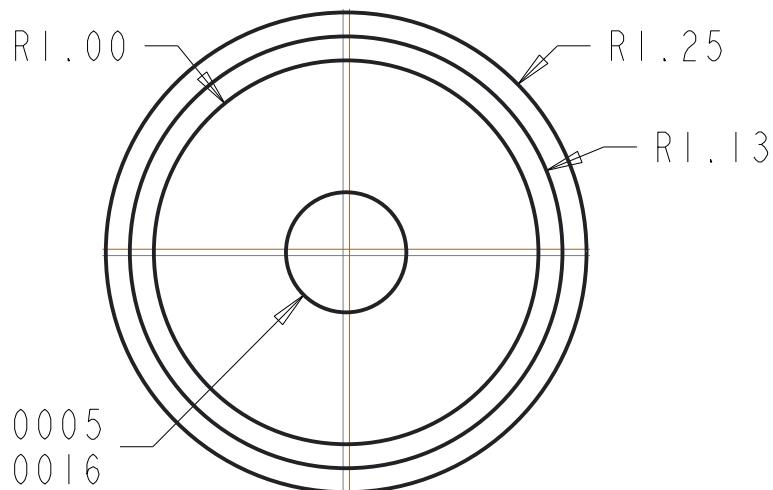
A



B



C



.63
.0005
.0016

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 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

FILE NAME: SUPPORT_FRAME_CAP

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DRAWN: Logan Nofsinger DATE: 12/6/2017

CHECKED: Logan Nofsinger DATE: 12/6/2017

MATERIAL: Aluminum

ME160

Vanderbilt University, Nashville, TN

TITLE:

Support Frame Cap

SIZE:

A

DWG. NO.:

PR3_DRAWINGS

REV.:

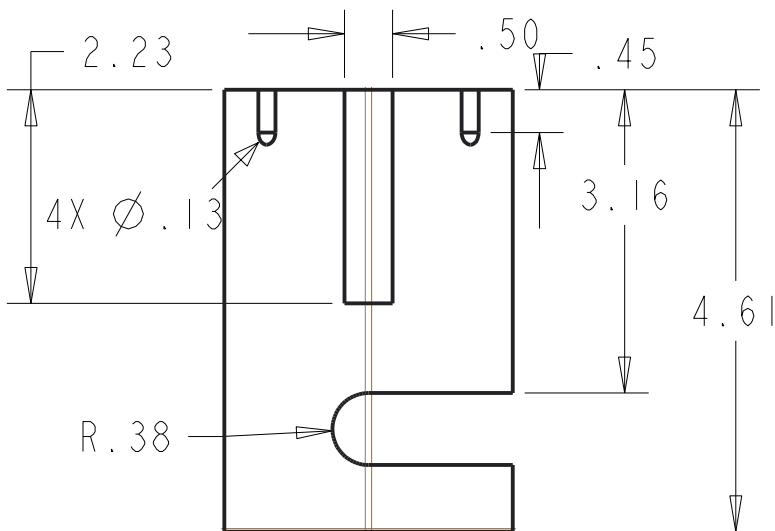
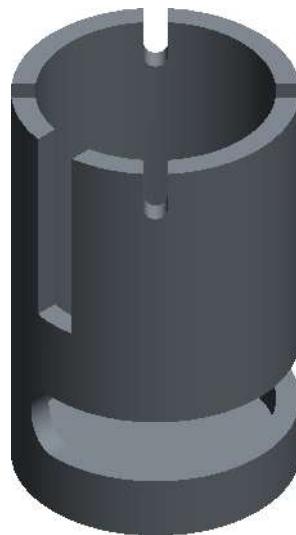
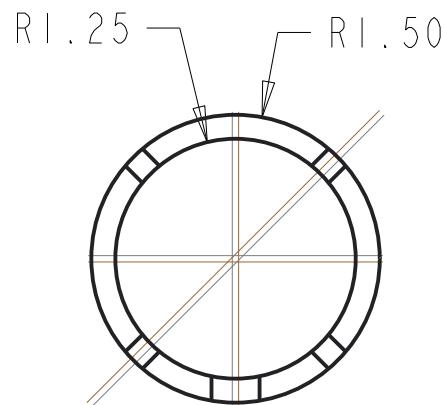
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SCALE:

1.00 : 1

SHEET:

15 of 28



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 TOLERANCES UNLESS
 OTHERWISE SPECIFIED
 $.XX \pm 0.05$
 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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DRAWN Logan Nofsinger DATE 12/6/2017

CHECKED Logan Nofsinger DATE 12/6/2017

FILE NAME	CASING	MATERIAL	ABS Plastic, 80% infill	SCALE	0.33 : 1	SHEET	16 of 28
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ME160

Vanderbilt University, Nashville, TN

TITLE
Casing

SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

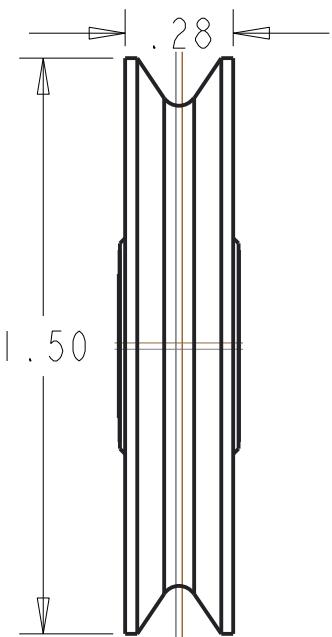
1 2 3 4 5 6 7 8

A

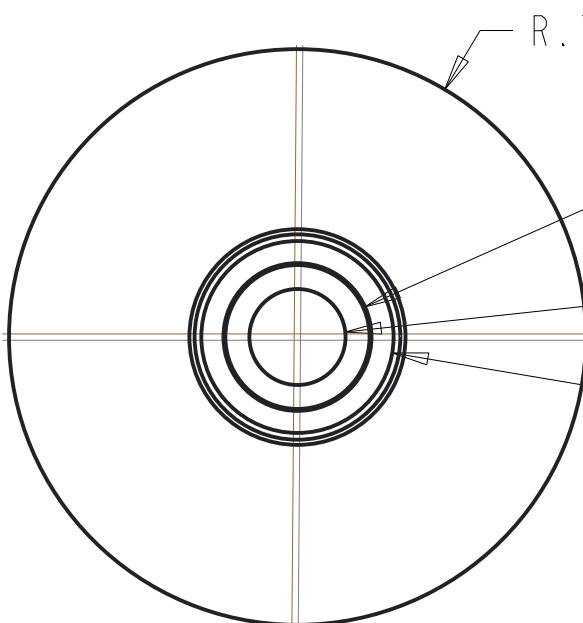
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SCALE 2.000



SCALE 2.000

R.19

Ø .25 .0004
.0014

R.25



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TOLERANCES UNLESS
OTHERWISE SPECIFIED

.XX ± 0.05

.X ± 0.1

ANG ± 0.5°

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CHECKED Logan Nofsinger DATE 12/6/2017

FILE NAME

3434T15

MATERIAL Steel and Nylon Plastic

ME160

Vanderbilt University, Nashville, TN

TITLE
Pulley for Wire

SIZE

DWG. NO.

A

PR3_DRAWINGS

REV.

1

SCALE

1.00 : 1

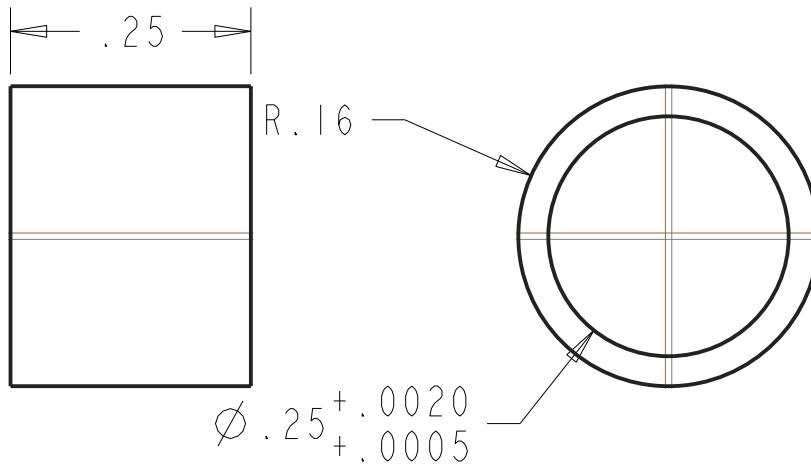
SHEET

17 of 28

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 OTHERWISE SPECIFIED
 $.XX \pm 0.05$
 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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FILE NAME: 6381K409 MULTIPURPOSE_SLEEVE_BR

DRAWN BY Logan Nofsinger DATE 12/7/2017

CHECKED BY Logan Nofsinger DATE 12/7/2017

ME160

Vanderbilt University, Nashville, TN

TITLE
Bushing

SIZE A

DWG. NO. PR3_DRAWINGS

REV. 1

SCALE

5.00 : 1

SHEET

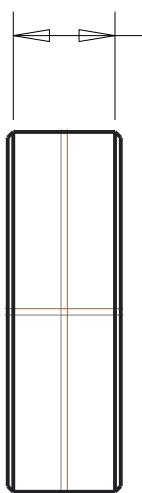
18 of 28

A

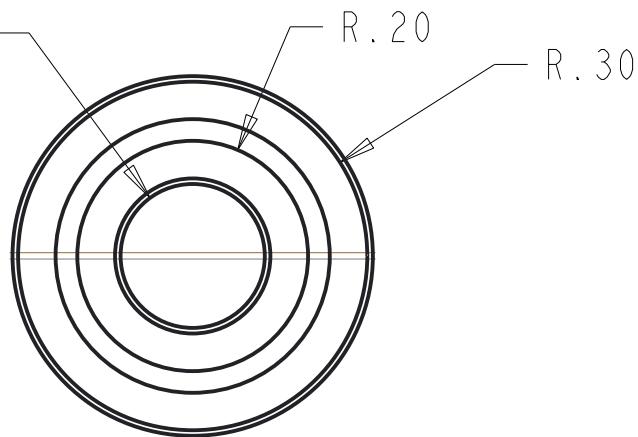
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.18
 $\phi .25$ $-.0004$
 $-.0014$



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 OTHERWISE SPECIFIED
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 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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DRAWN BY	Logan Nofsinger	DATE	12/7/2017
CHECKED BY	Logan Nofsinger	DATE	12/7/2017

FILENAME
 60355K701_BALL_BEARING

MATERIAL	Steel	SCALE	3.00 : 1	SHEET	19 of 28
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ME160

Vanderbilt University, Nashville, TN

TITLE
Support Bearing

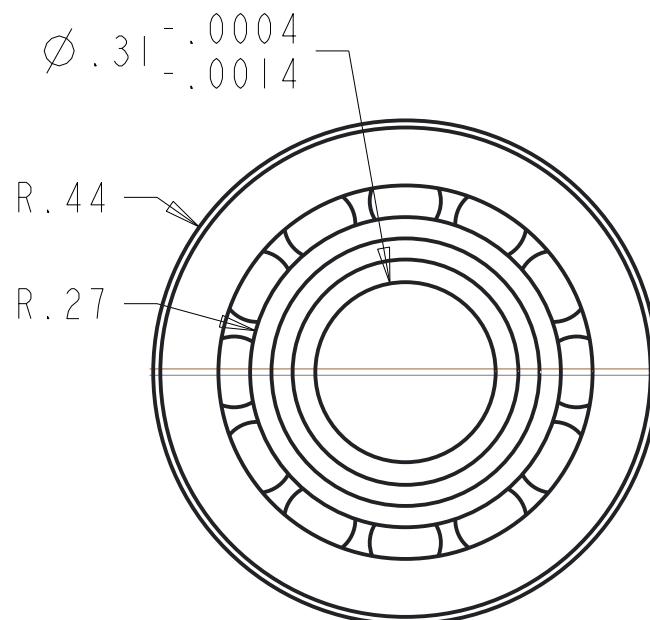
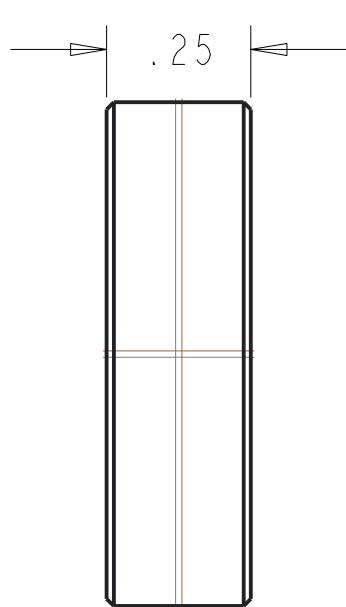
SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

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DO NOT SCALE DRAWING

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TOLERANCES UNLESS
OTHERWISE SPECIFIED

.XX ± 0.05

.X ± 0.1

ANG ± 0.5°

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FILENAME
b383K150_BALL_BEARING

DRAWN
Logan Nofsinger

DATE
12/7/2017

CHECKED
Logan Nofsinger

DATE
12/7/2017

ME160

Vanderbilt University, Nashville, TN

TITLE
Sliding Collar Bearing

SIZE
A

DWG. NO.
PR3_DRAWINGS

REV.
1

SCALE
3.00 : 1

SHEET

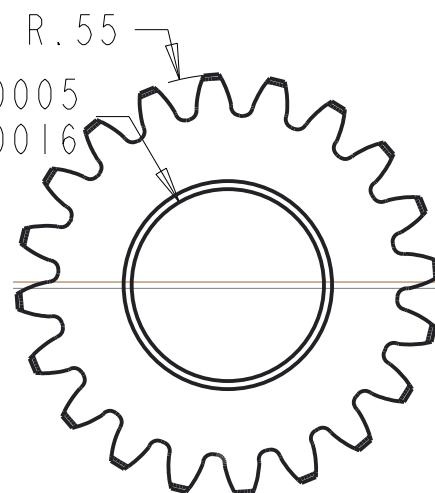
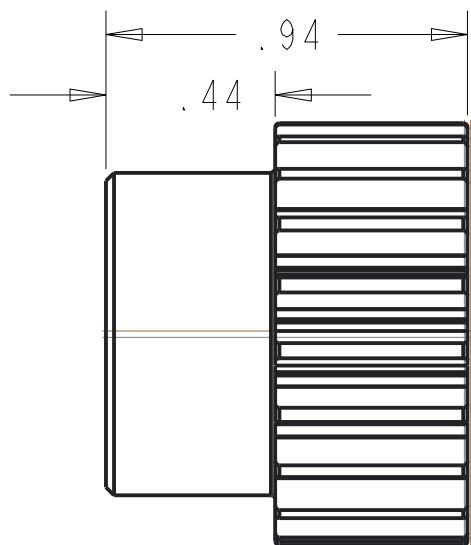
20 of 28

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 OTHERWISE SPECIFIED
 $.XX \pm 0.05$
 $.X \pm 0.1$
 $ANG \pm 0.5^\circ$

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FILE NAME: 5172T120_HY-LOAD_MTL_GEAR-20

DRAWN: Logan Nofsinger DATE: 12/7/2017

CHECKED: Logan Nofsinger DATE: 12/7/2017

MATERIAL:

Steel

SCALE: 2.00 : 1 SHEET: 21 of 28

ME160

Vanderbilt University, Nashville, TN

TITLE
Rotating Gear

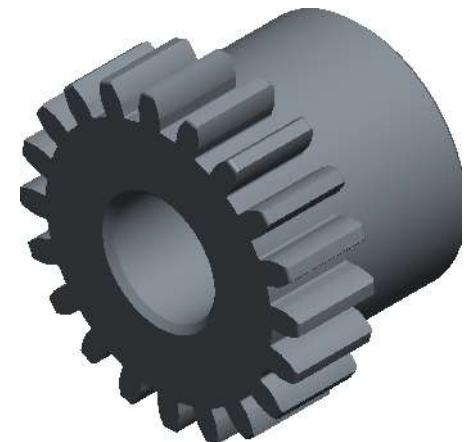
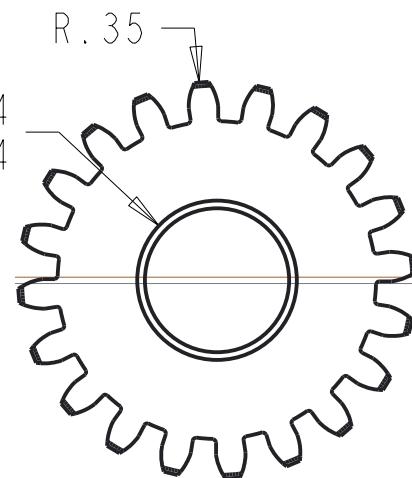
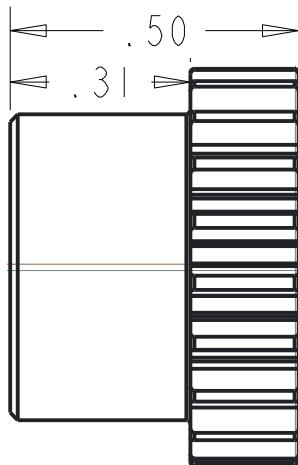
SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

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TOLERANCES UNLESS
OTHERWISE SPECIFIED
.XX ± 0.05
.X ± 0.1
ANG ± 0.5°

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DRAWN Logan Nofsinger DATE 12/7/2017

CHECKED Logan Nofsinger DATE 12/7/2017

FILENAME 6325K950_MTL_GEAR-14

MATERIAL Steel

SCALE 3.00 : 1 SHEET 22 of 28

ME160

Vanderbilt University, Nashville, TN

TITLE
Locking Gear

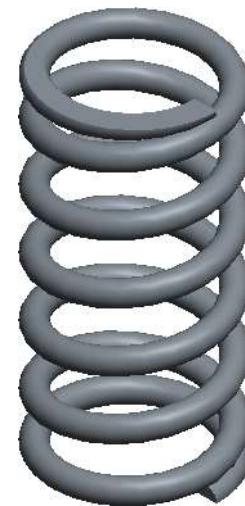
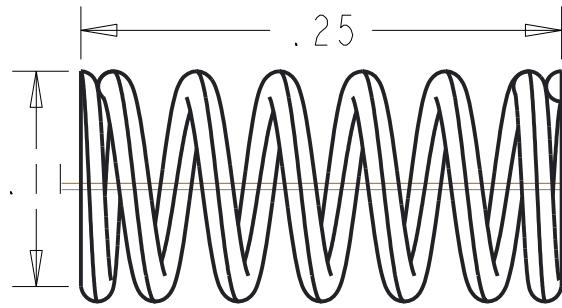
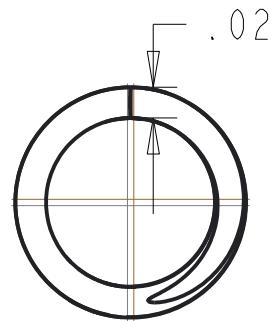
SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

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DRAWN Logan Nofsinger DATE 12/7/2017

CHECKED Logan Nofsinger DATE 12/7/2017

9001T110 FILE NAME MUSIC_WIRE_ULTRA-PREC1

MATERIAL

Steel

SCALE 10.00 : 1

SHEET 23 of 28

ME160

Vanderbilt University, Nashville, TN

TITLE
Slider Spring

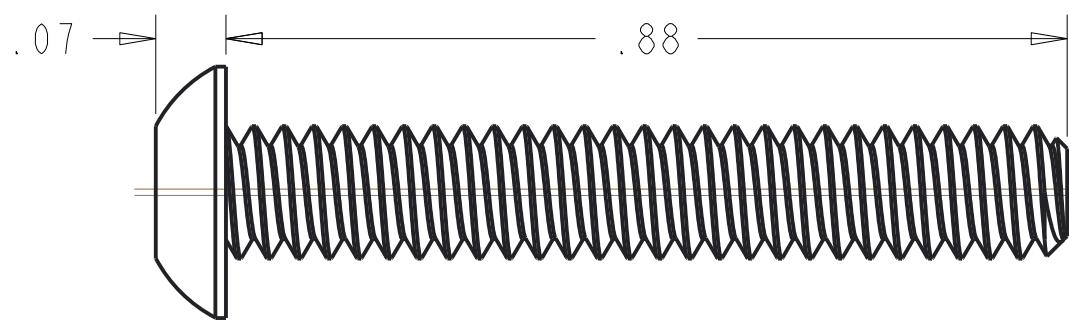
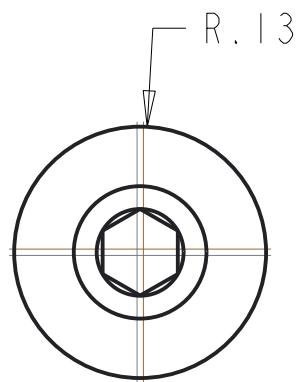
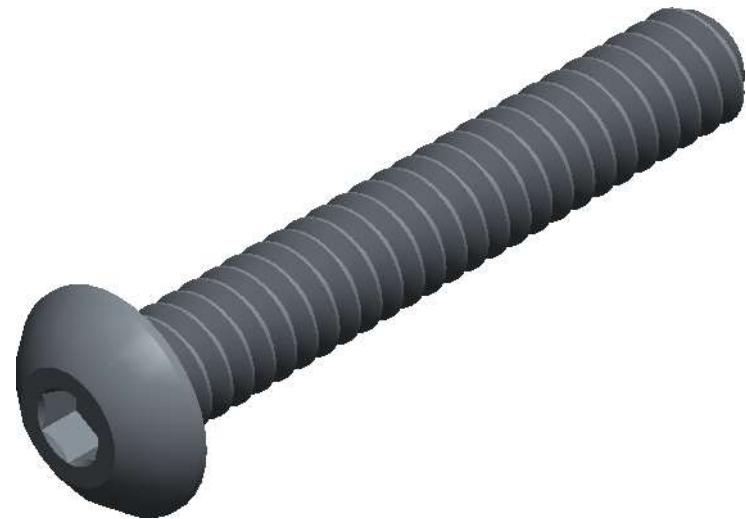
SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

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TOLERANCES UNLESS
OTHERWISE SPECIFIED

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 $.X \pm 0.1$
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DRAWN Logan Nofsinger DATE 12/7/2017

CHECKED Logan Nofsinger DATE 12/7/2017

ME160

Vanderbilt University, Nashville, TN

TITLE
3/4" Screw
SIZE
DWG. NO.
REV.
A PR3_DRAWINGS
1

92949A152_188_SS_BUTTON-HEAD

MATERIAL

Steel

SCALE

5.00 : 1

SHEET

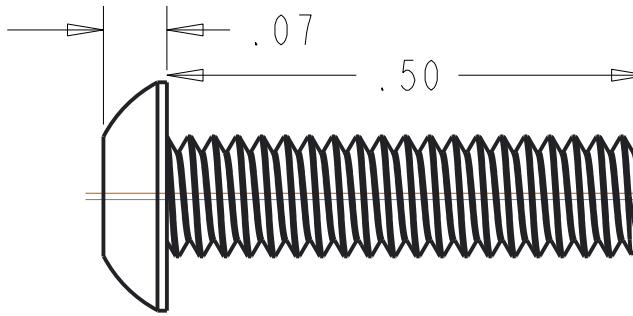
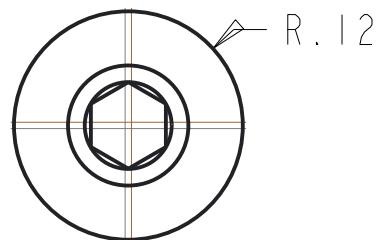
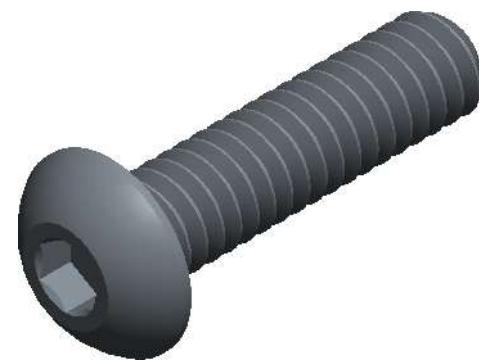
24 of 28

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OTHERWISE SPECIFIED

 $.XX \pm 0.05$
 $.X \pm 0.1$
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ME160
Vanderbilt University, Nashville, TN

TITLE
1/2" Screw

SIZE DWG. NO. REV.

A *PR3_DRAWINGS* **1**

FILE NAME: *98164A438_TYPE_316_SS_BUTTON-HEAD*

MATERIAL

Steel

SCALE

5.00 : 1

SHEET

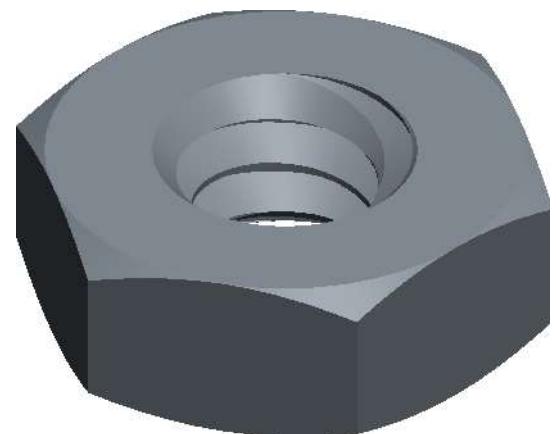
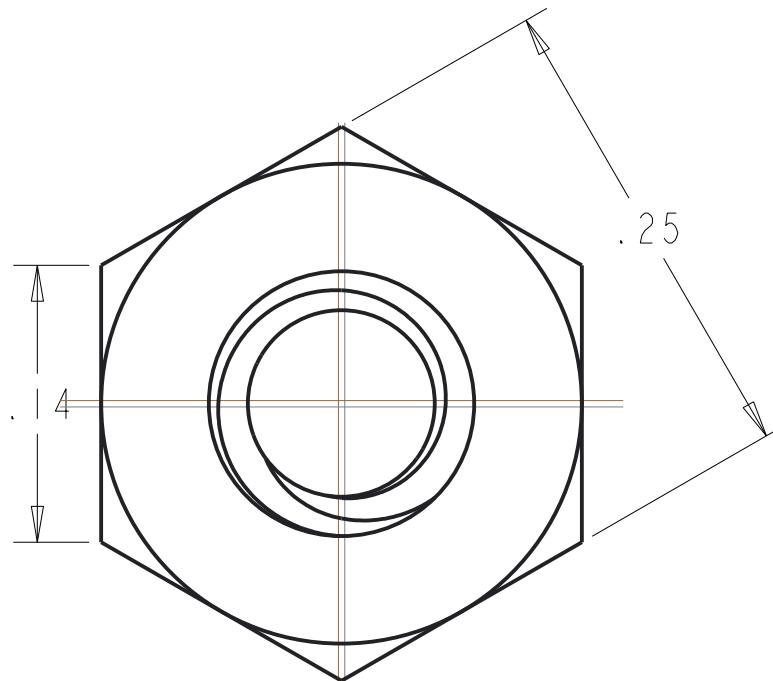
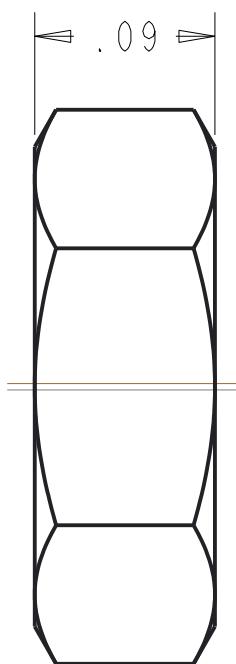
25 of 28

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 $.X \pm 0.1$
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DRAWN Logan Nofsinger DATE 12/7/2017

CHECKED Logan Nofsinger DATE 12/7/2017

FILE NAME 90760A007_ZINC_PLATED_STEEL_NARROW_NUT

MATERIAL

Steel

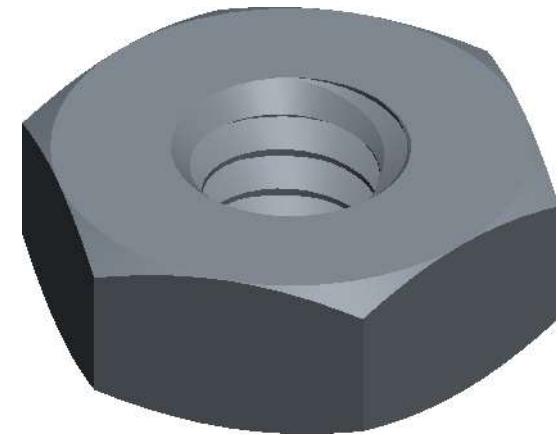
ME160
 Vanderbilt University, Nashville, TN

TITLE
Nut for 3/4" Screw

SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

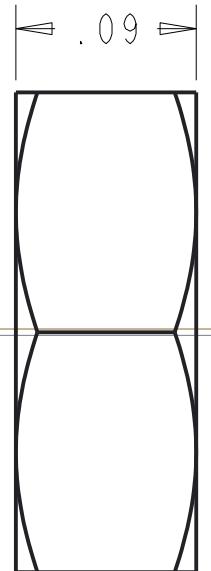
SCALE 10.00 : 1 **SHEET** 26 of 28

A

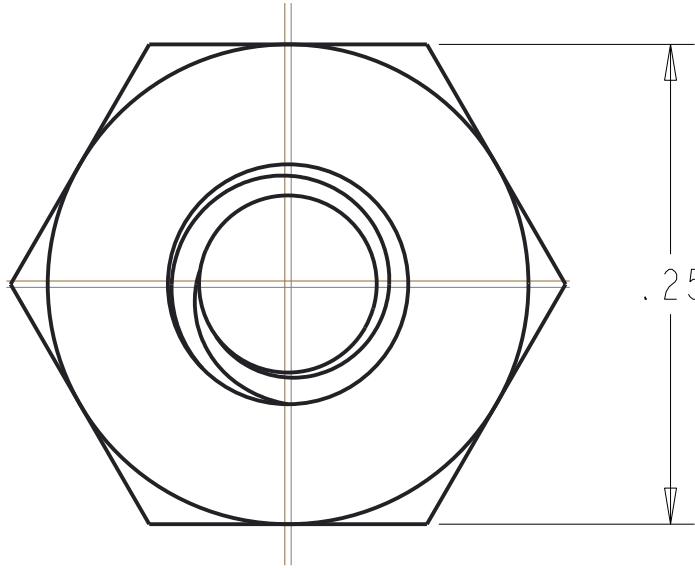


SCALE 10.000

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 $.XX \pm 0.05$
 $.X \pm 0.1$
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90730A006_TYPE FILE NAME 18-8 STAINLESS STEEL NUT

DRAWN Logan Nofsinger DATE 12/7/2017

CHECKED Logan Nofsinger DATE 12/7/2017

MATERIAL Steel

SCALE 10.00 : 1

ME160

Vanderbilt University, Nashville, TN

TITLE
Nut for 1/2" Screw

SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

SHEET 27 of 28

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.XX ± 0.05
.X ± 0.1
ANG ± 0.5°

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DRAWN *Swapnil Pande* DATE *12/7/2017*

CHECKED *Swapnil Pande* DATE *12/7/2017*

FILE NAME **WRISTASSEMBLYPR3**

MATERIAL

ME160		Vanderbilt University, Nashville, TN
TITLE <i>Wrist Assembly Isometric</i>		
SIZE	DWG. NO.	REV.
A	PR3_DRAWINGS	1

SCALE **0.20 : 1**

SHEET **28 of 28**