

ITEM NO.	PART NUMBER	DESCRIPTION	Default/ QTY.	SHEET NO.
1	1-00	Case Sub Assembly	1	2
2	2-00	Powertrain Sub Assembly	1	11
3	3-00	Cylinder Sub Assembly	1	26
4	4-00	Valve Sub Assembly	1	49
5	5-00	Piston Sub Assembly	1	56
6	6-00	Stephenson Link Sub Assembly	1	60
7	7-00	Handle Sub Assembly	1	69

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION 

MATERIAL: Various metals

Marine Engine
Project

**UNIVERSITY OF IDAHO
ME DEPARTMENT**

DEFAULT TOLERANCES:

LINEAR:
X.±.25
X.X±.1
X.XX±.01
X.XXX±.002

ANGULAR:
X.± 2
X.X± 1
X.XX± 0.30'

DESCRIPTION: Exploded view of the Marine Motor

CHECKED BY: Andrew Engel

DATE: 5/2/2012

DRAWN BY: Chris Pratt

DATE: 5/3/2012

FILE NAME:

Stephenson Steam Engine.SLDASM

PART #: 0-00

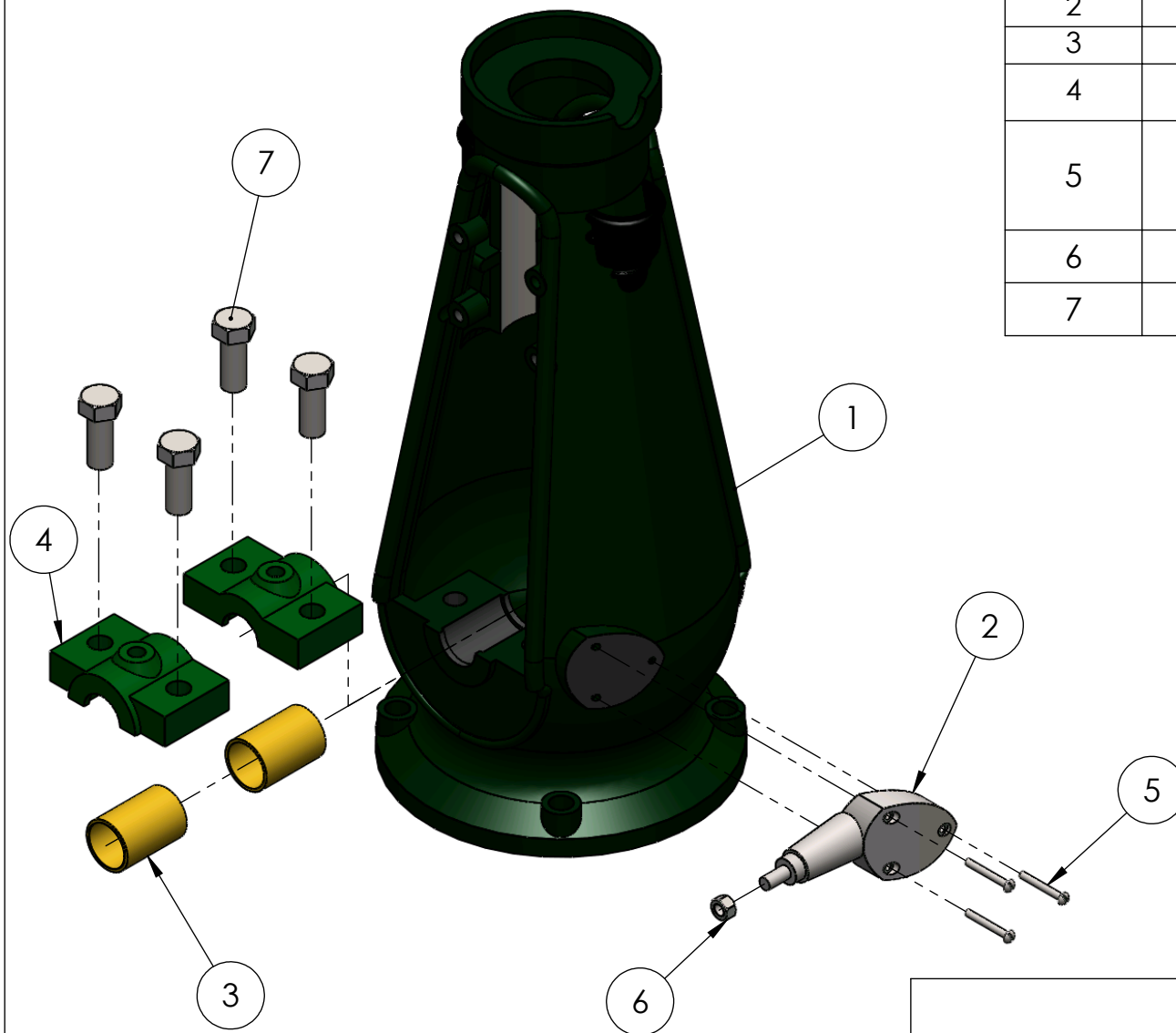
QTY: 1

SCALE: 1:9


SHEET: 1 OF 75

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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	1-01	Case	1	4
2	1-02	Handle Support	1	8
3	1-03	Bushing	2	9
4	1-04	Main Bearing Cap	2	10
5	1-05	1/4-28X1.5 Slotted Round Head Machine Screw	3	---
6	1-06	1/-20 Hex Nut	1	---
7	1-07	7/8-14X2.25 Hex Head Bolt	4	---




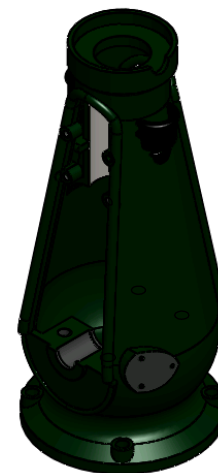
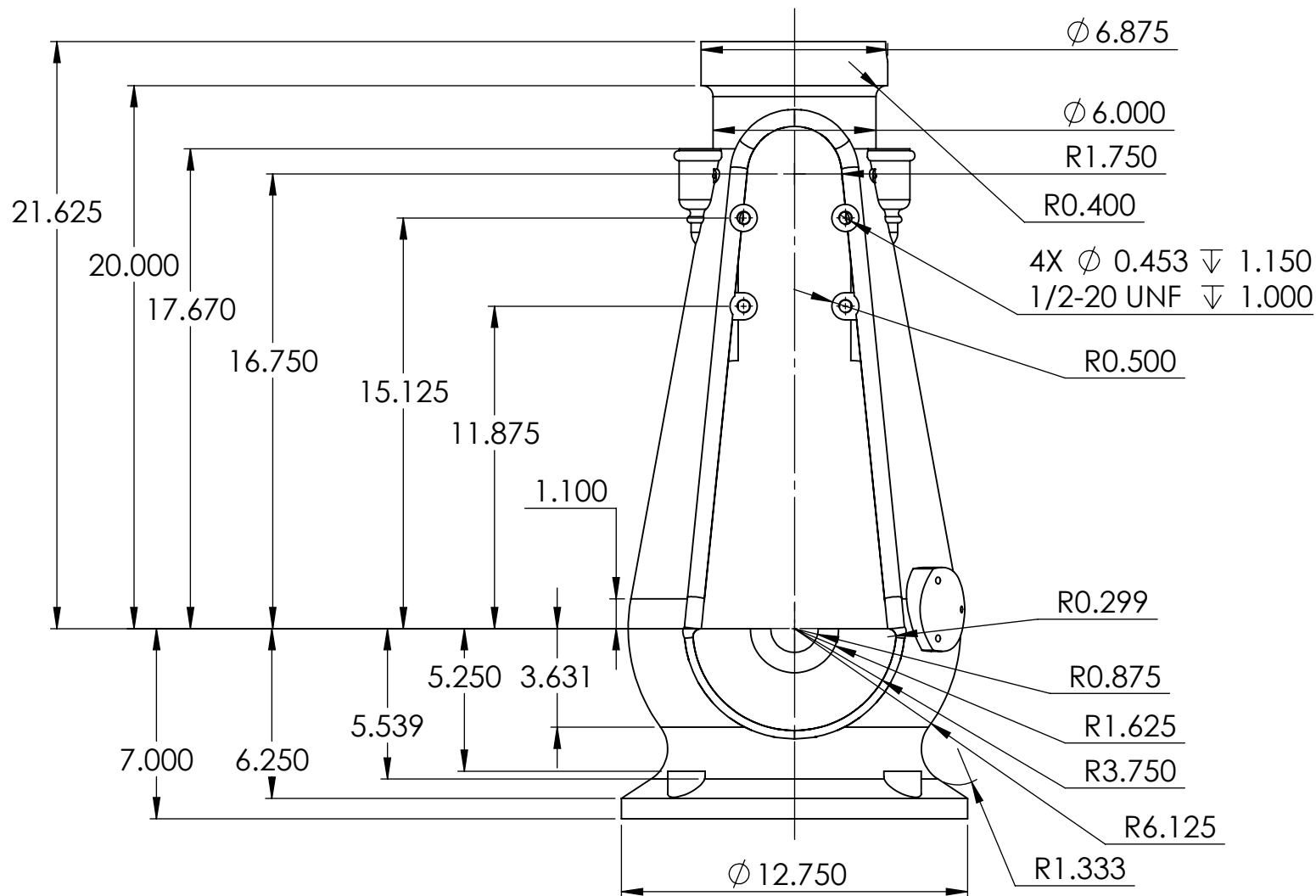
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			MATERIAL:				
DEFAULT TOLERANCES:		DESCRIPTION: Case Assembly				UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel		DATE: 5/2/2012			
		DRAWN BY: Jeremiah Schroeder		DATE: 4/26/2012			
		FILE NAME: Case Assembly.SLDASM		PART #: 1-00 QTY: 1			
						SCALE: 1:6 SHEET: 2 OF 75	



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		MATERIAL:			
DEFAULT TOLERANCES:		DESCRIPTION: Case Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/2/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/26/2012	PART #: 1-00	QTY: 1
FILE NAME: Case Assembly.SLDASM				SCALE: 1:4.5	SHEET: 3 OF 75



Front

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL: Gray Cast Iron

Marine Engine
Project

**UNIVERSITY OF IDAHO
ME DEPARTMENT**

DEFAULT TOLERANCES:

LINEAR:
X. $\pm .25$
X.X $\pm .1$
X.XX $\pm .01$
X.XXX $\pm .002$

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30

DESCRIPTION: Case

CHECKED BY: Andrew Engel DATE: 5/1/2012

DRAWN BY: Jeremiah Schroeder DATE: 5/3/2012

FILE NAME: case.SLDPR

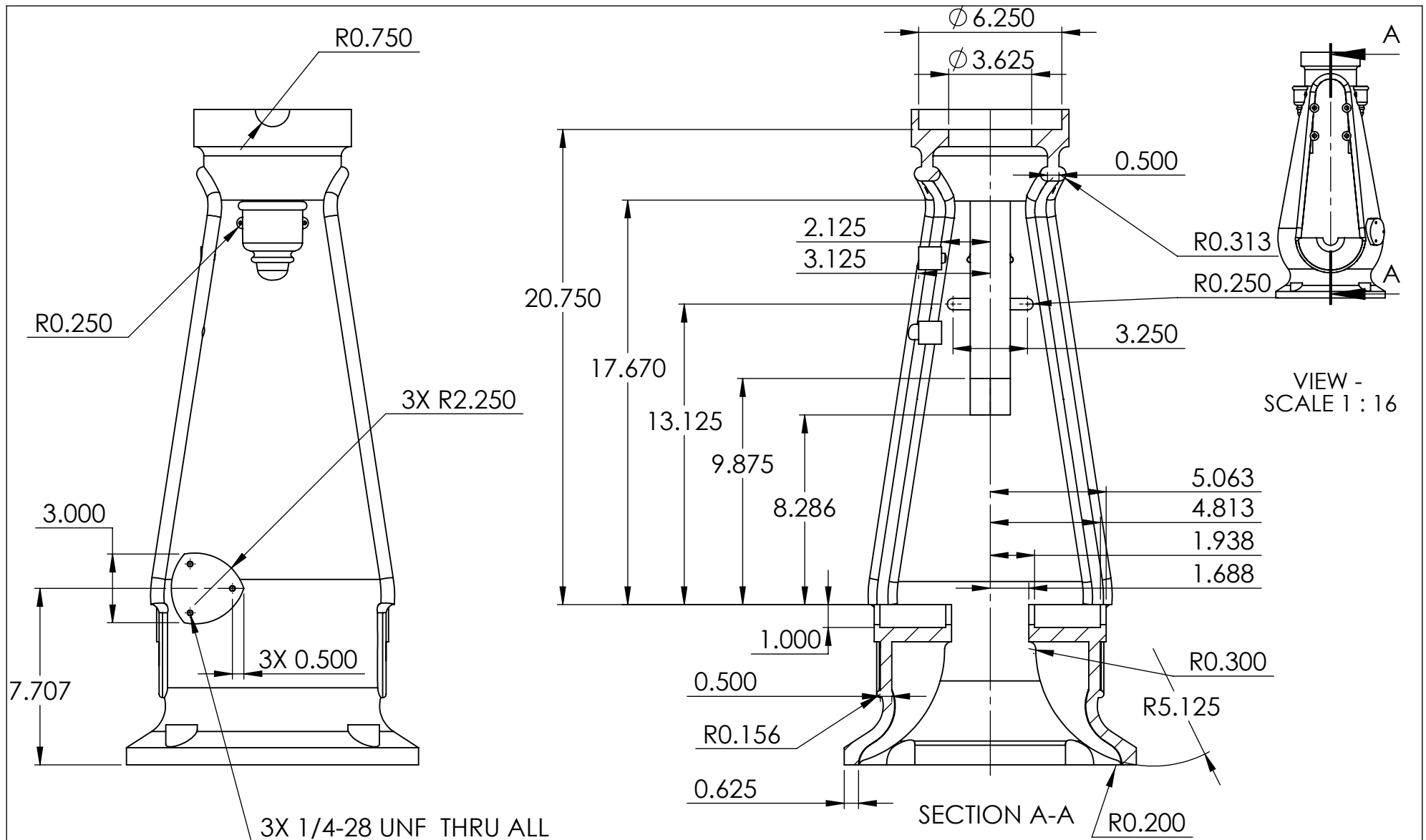
PART #: 1-01

QTY: 1

SCALE: 1:6


SHEET: 4 OF 75

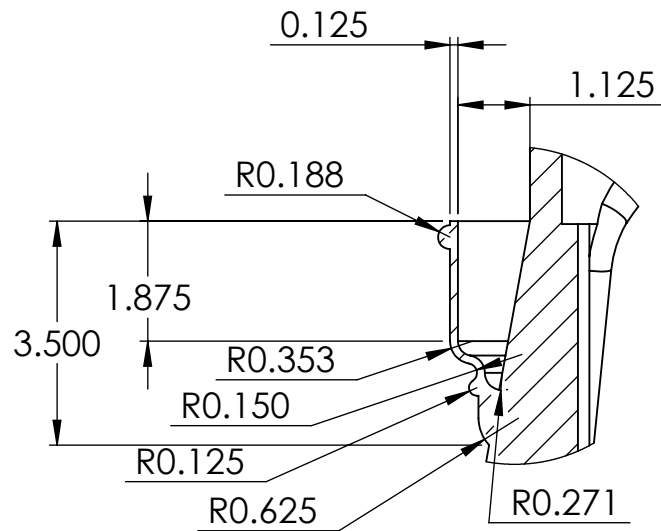
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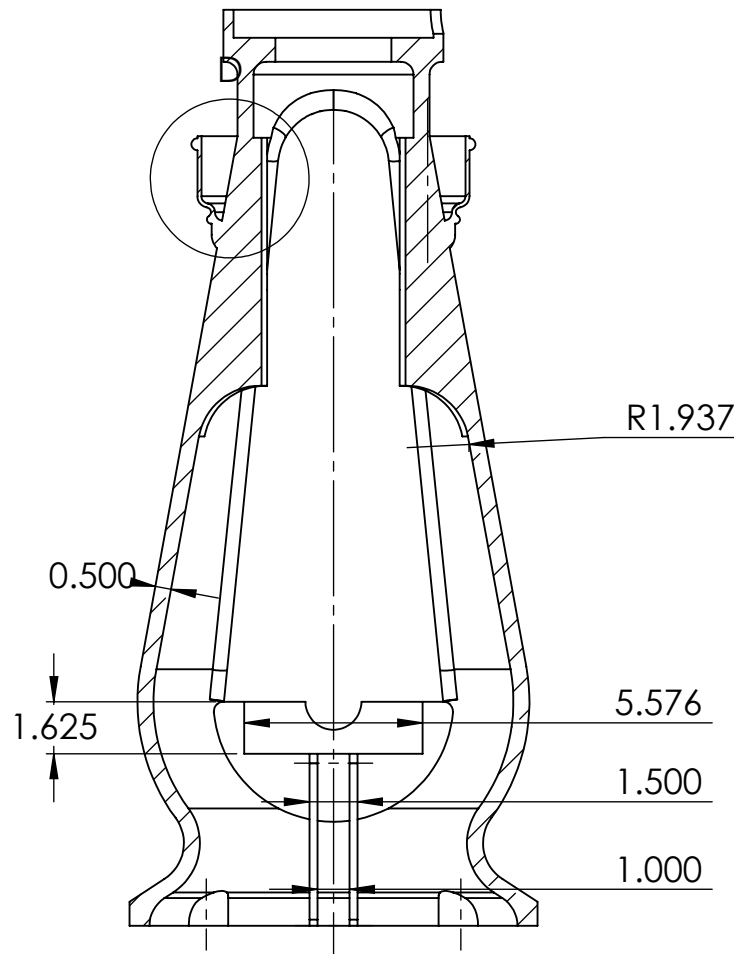
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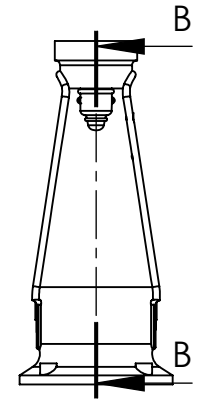
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		MATERIAL: Gray Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Case		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30° X.XXX±.002	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 5/3/2012	PART #: 1-01	QTY: 1
		FILE NAME: case.SLDPRT		SCALE: 1:6	SHEET: 5 OF 75



DETAIL D
SCALE 1 : 3




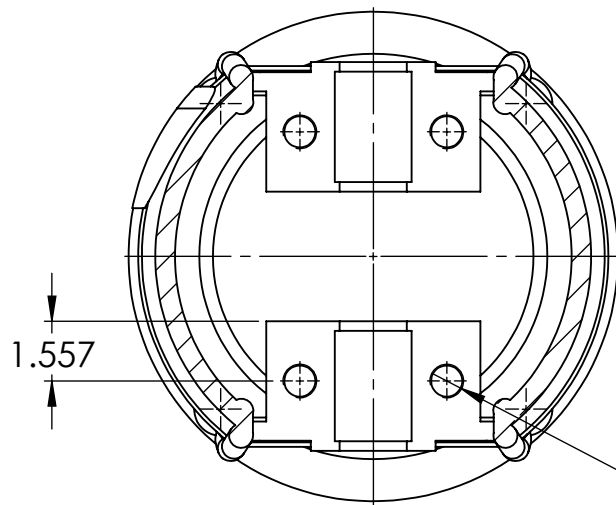
SECTION B-B



SCALE 1:16

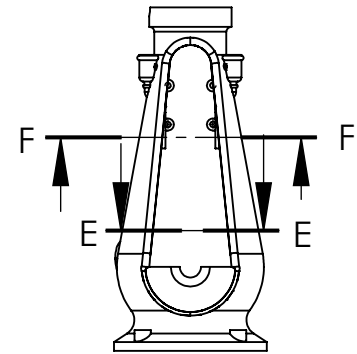
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		MATERIAL: Gray Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Case		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 5/3/2012	PART #: 1-01	QTY: 1
		FILE NAME: case.SLDPRT		SCALE: 1:6	SHEET: 6 OF 75

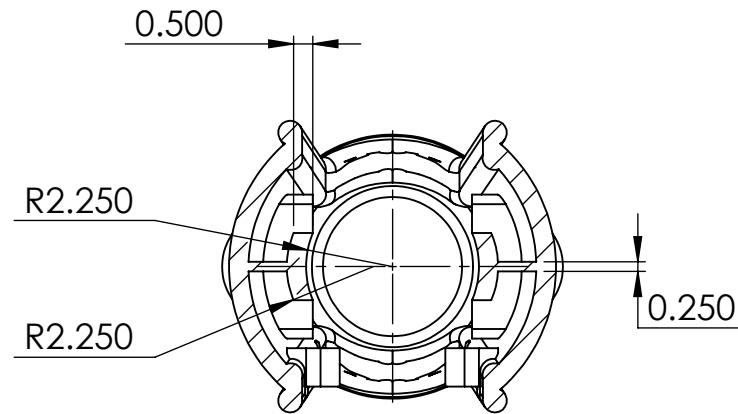
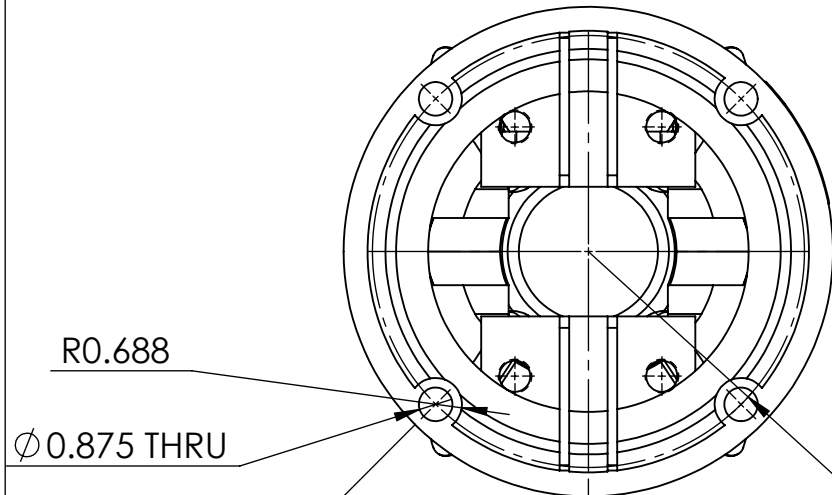


SECTION E-E
(Above shaft supports)

4X 7/8-14 UNF THRU ALL



SCALE 1:16



SECTION F-F
(Through crosshead brace)

R5.625

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Bottom

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL: Gray Cast Iron

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30°

DESCRIPTION: Case

CHECKED BY: Andrew Engel

DATE: 5/1/2012

DRAWN BY: Jeremiah Schroeder

DATE: 5/3/2012

FILE NAME: case.SLDPR

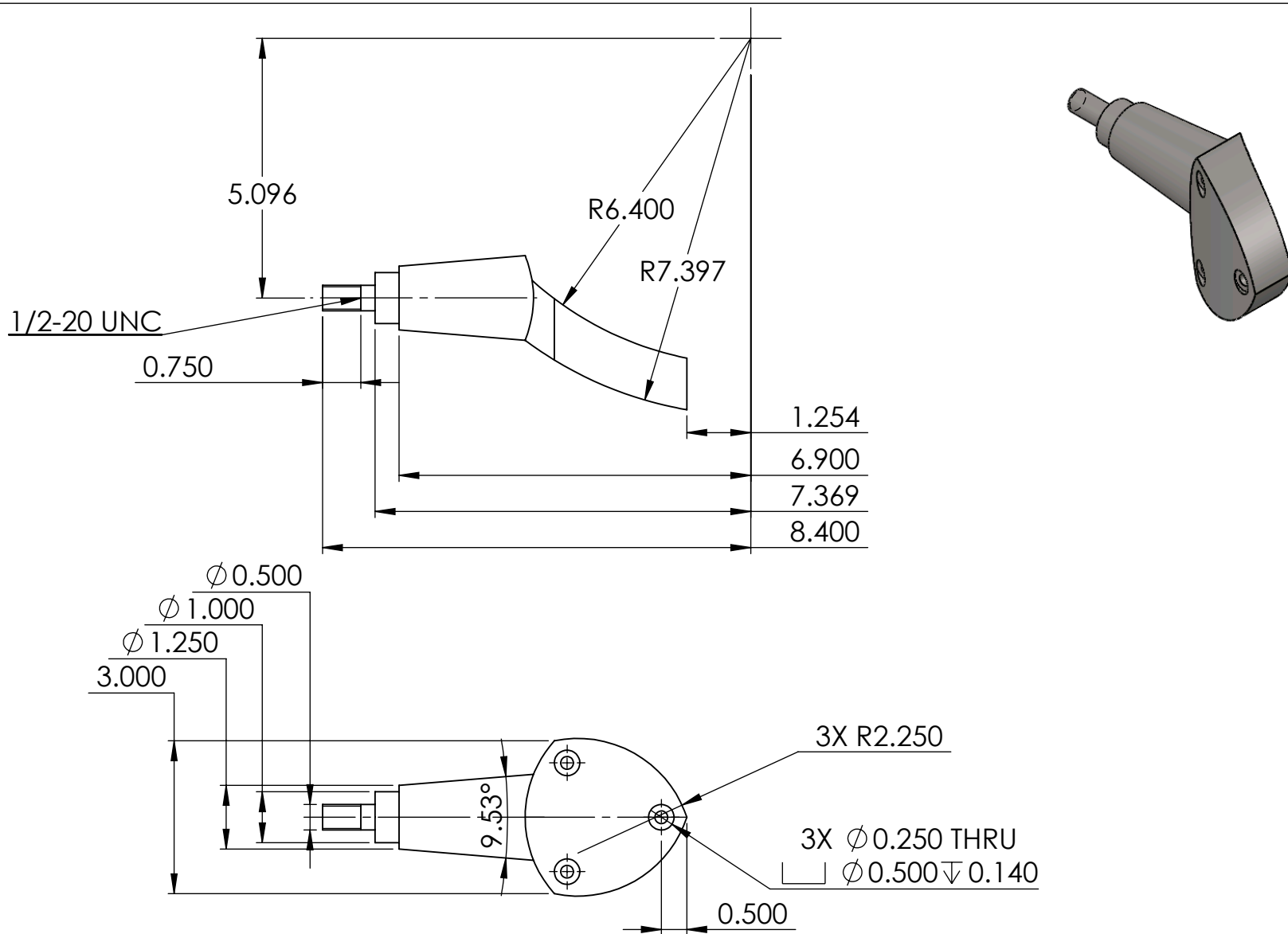
**UNIVERSITY OF IDAHO
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PART #: 1-01


QTY: 1

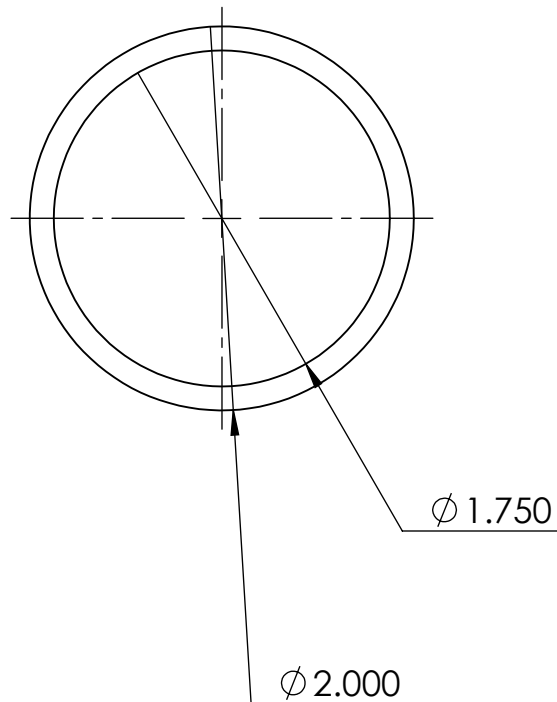
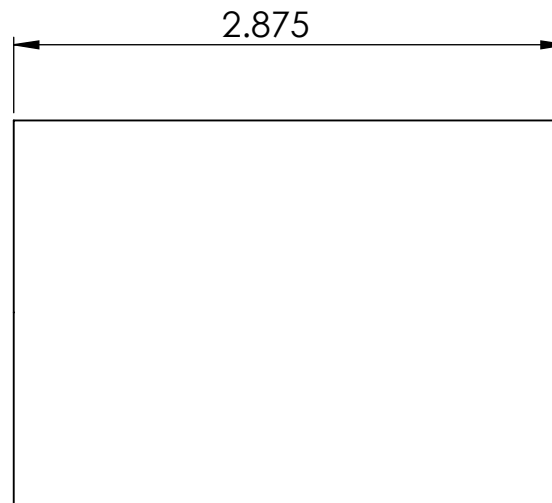
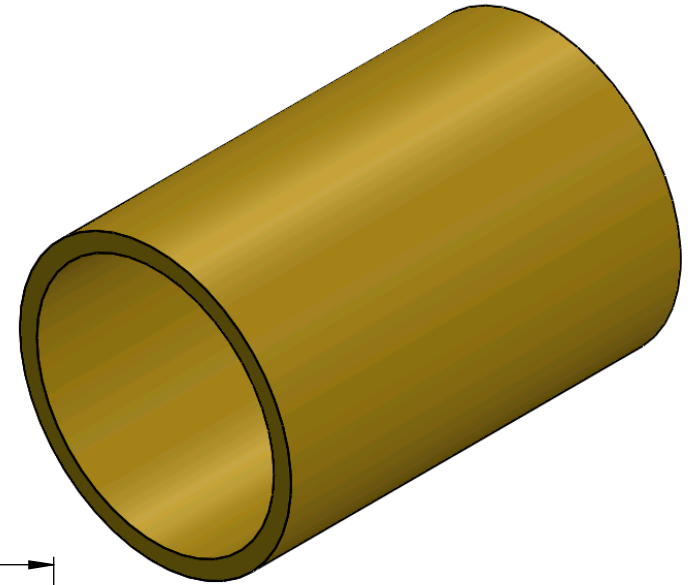
SCALE: 1:5

SHEET: 7 OF 75




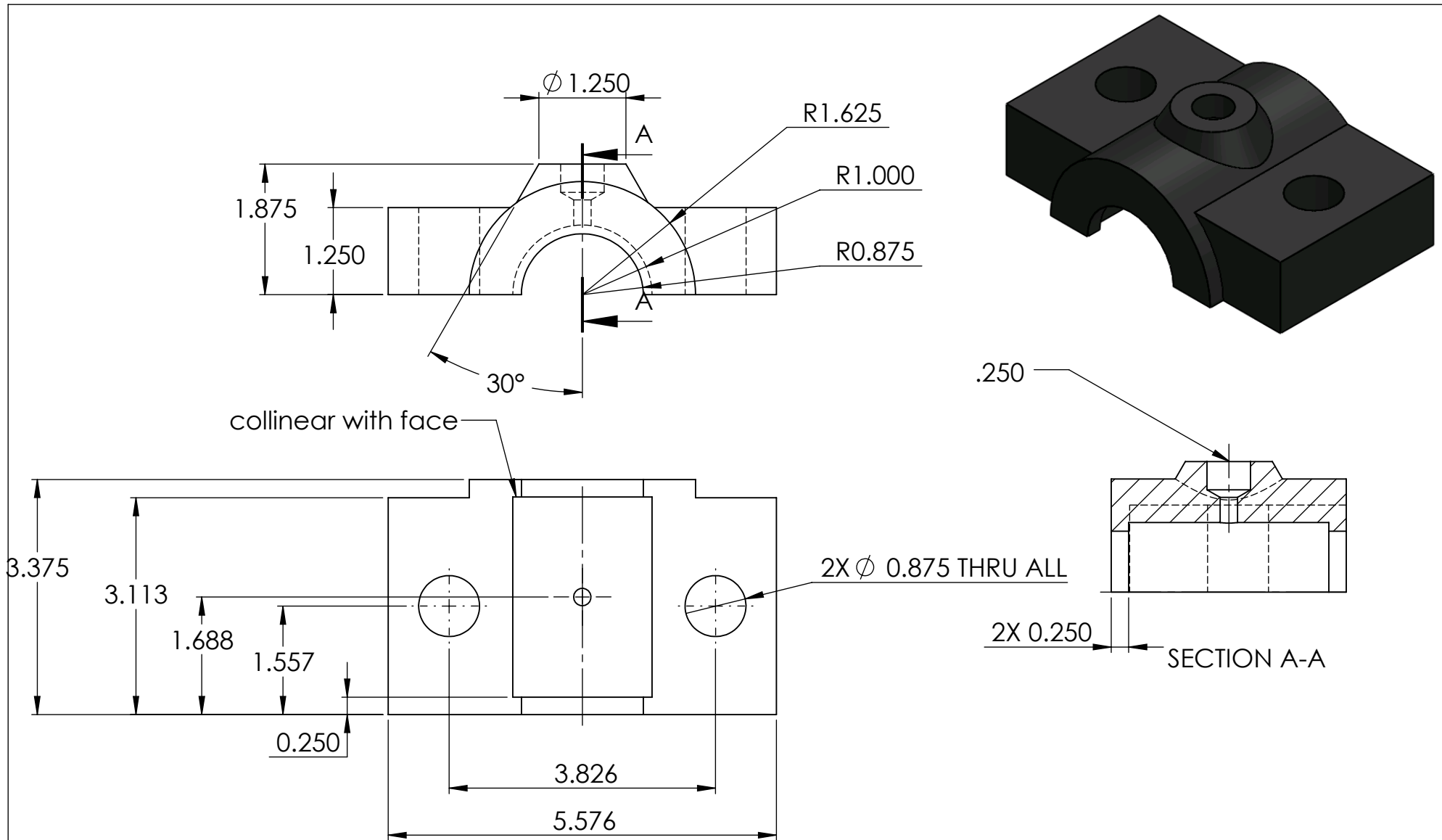
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Handle Support		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/26/2012	PART #: 1-02	QTY: 1
		FILE NAME: throttlesupport.SLDPRT		SCALE: 1:3	SHEET: 8 OF 75




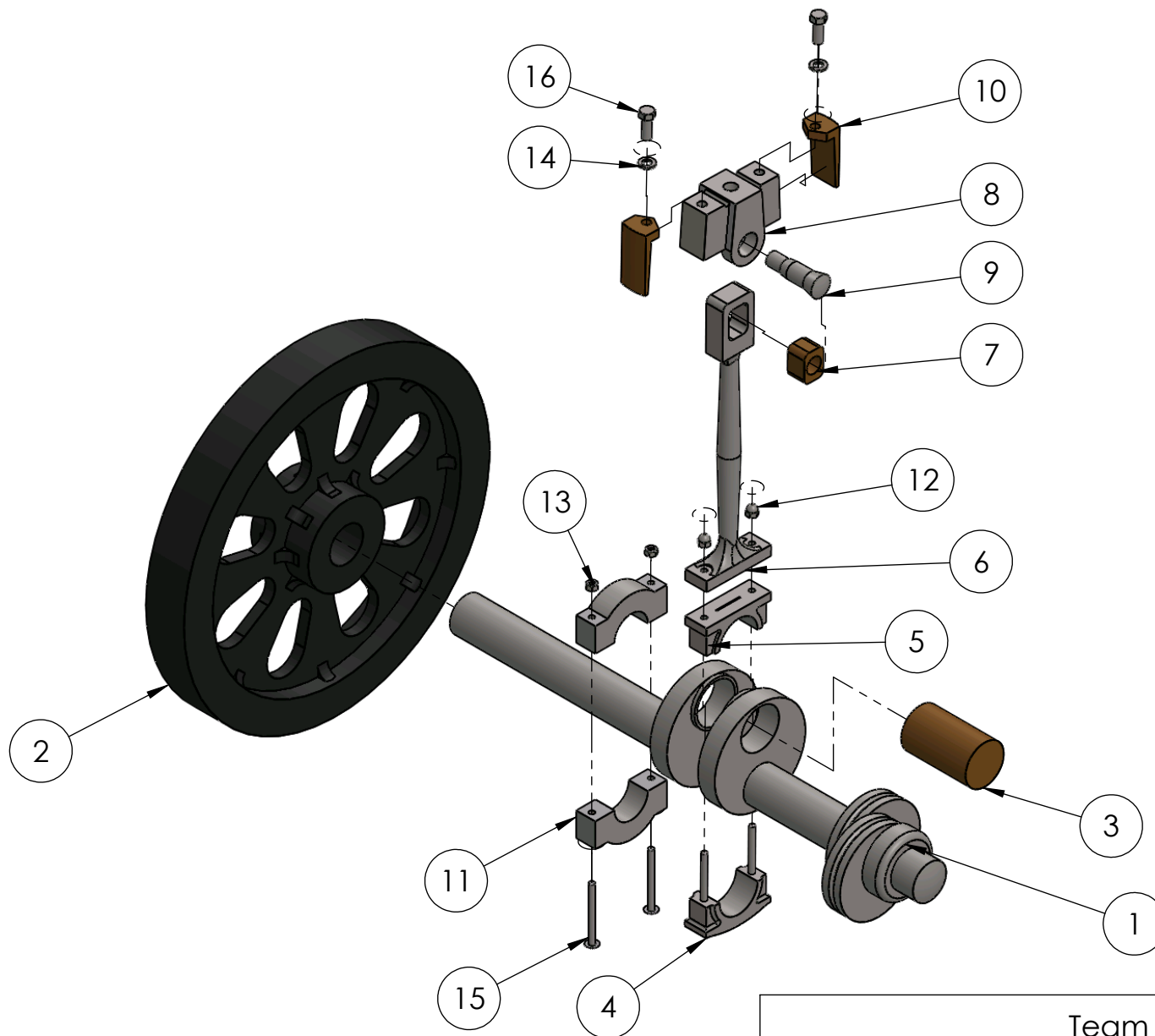
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		MATERIAL: Brass			
DEFAULT TOLERANCES:		DESCRIPTION: Bushing		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/25/2012	PART #: 1-03	QTY: 1
FILE NAME: bushing.SLDPRT		SCALE: 1:1		SHEET: 9 OF 75	



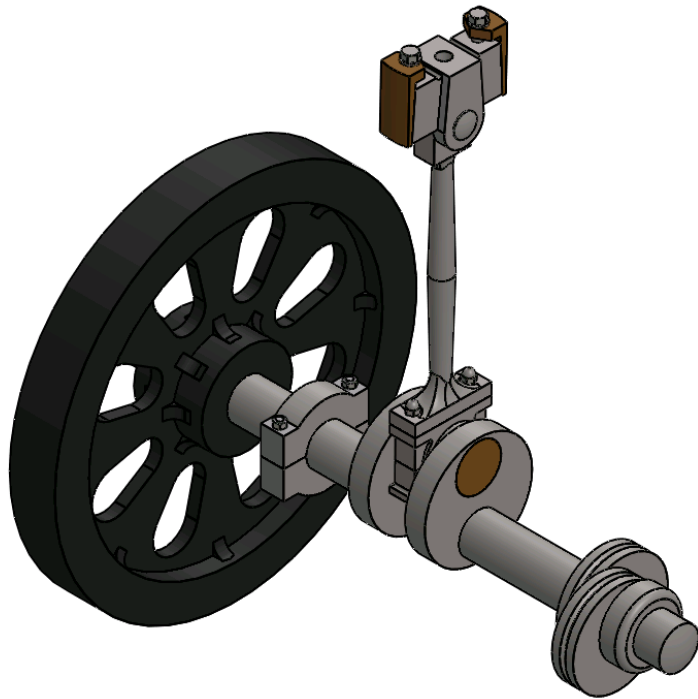
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		MATERIAL: Gray Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Main Bearing Cap		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schreoder	DATE: 4/25/2012	PART #: 1-04	QTY: 2
		FILE NAME: Mainbearinacaps.SLDPRT		SCALE: 1:2	SHEET: 10 OF 75



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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Powertrain Assembly, Vertical Steam Engine		UNIVERSITY OF IDAHO ME DEPARTMENT	
CHECKED BY: Jeremiah Schroeder		DATE: 4/27/2012		PART #: 2-00	
DRAWN BY: Andrew Engel		DATE: 5/1/2012		QTY: 1	
FILE NAME: Powertrain Assembly.SLDASM		SCALE: 1:6		SHEET: 11 OF 75	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	2-01	Crankshaft	1	13
2	2-02	Flywheel	1	15
3	2-03	Crank Pin	1	16
4	2-04	Connecting Rod End Cap	1	17
5	2-05	Connecting Rod Center Block	1	18
6	2-06	Connecting Rod	1	19
7	2-07	Connecting Rod Insert	1	20
8	2-08	Slipper	1	21
9	2-09	Connecting Rod Pin	1	23
10	2-10	Slipper Guides	2	24
11	2-11	Collar half	2	25
12	2-12	Acorn Nut 0.2500-28-N	2	---
13	2-13	Round Head BOLT 0.25-20x2.75x.75-N	2	---
14	2-14	Hex NUT 0.2500-20-D-N	2	---
15	2-15	Hex BOLT 0.375-24x1x1-N	2	---
16	2-16	Regular Lock Washer 0.375	2	---

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL:

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30'

DESCRIPTION: Powertrain Assembly, Vertical Steam Engine

CHECKED BY: Andrew Engel

DATE: 5/2/2012

DRAWN BY: Andrew Engel

DATE: 5/1/2012

FILE NAME: Powertrain Assembly.SLDASM

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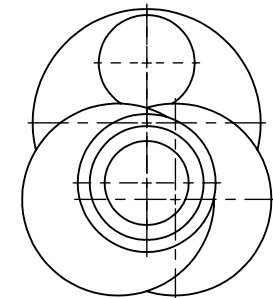
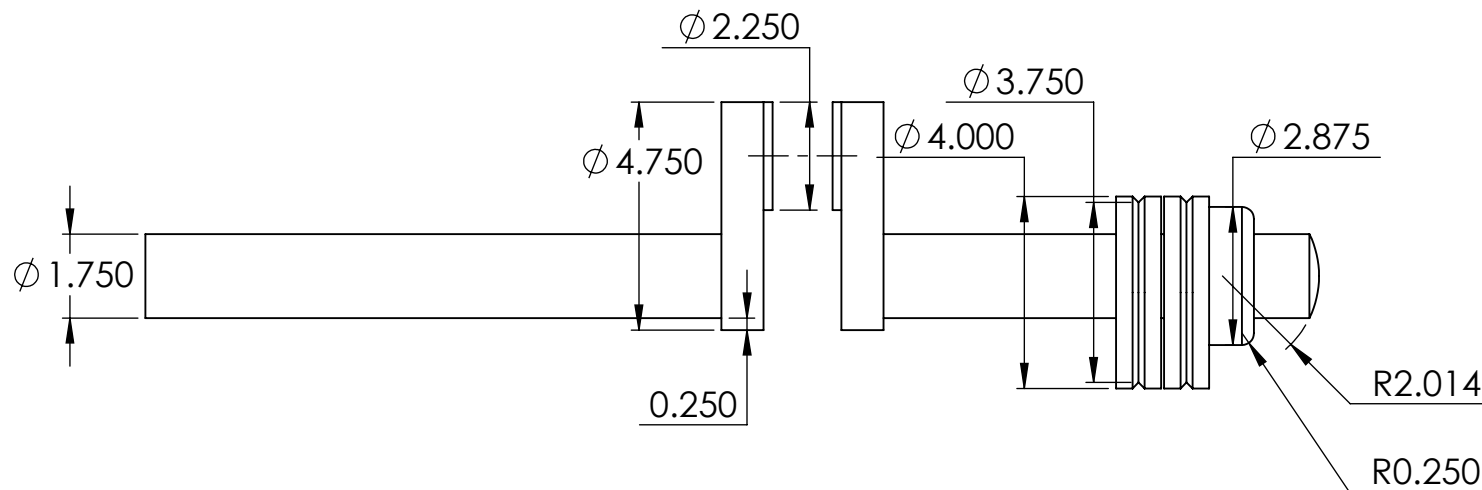
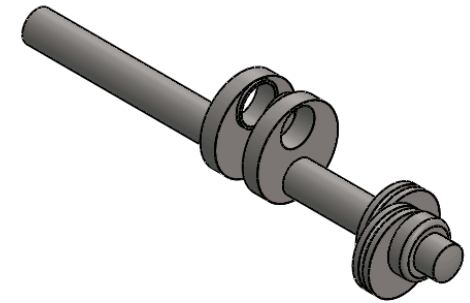
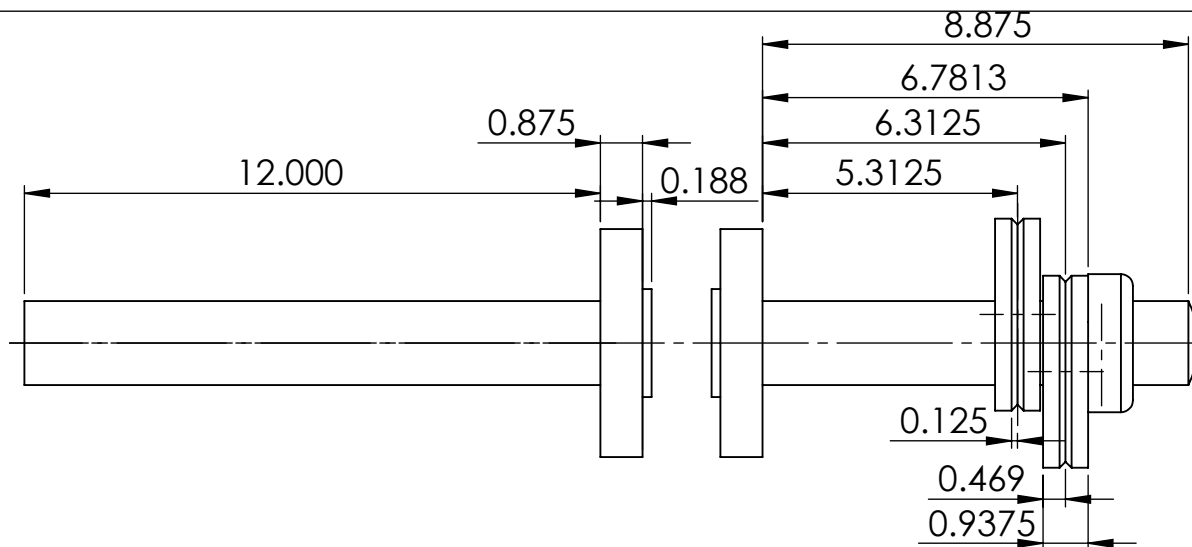
PART #: 2-00

QTY: 1

SCALE: 1:6

SHEET: 12 OF 75

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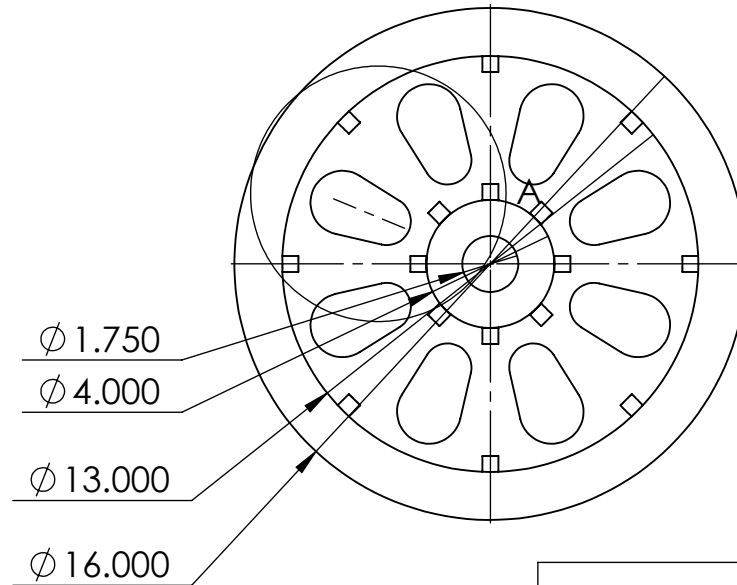
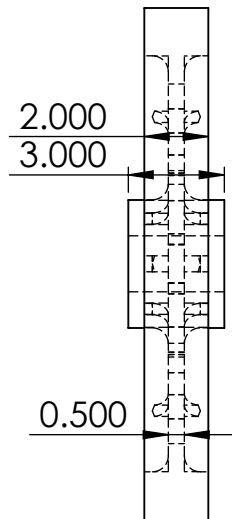
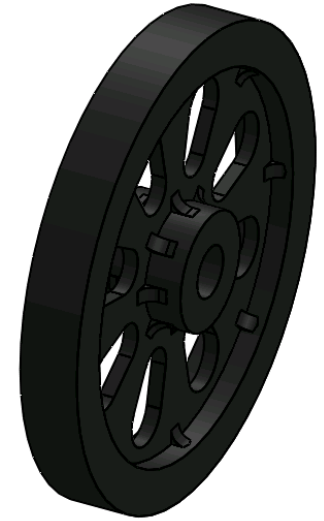
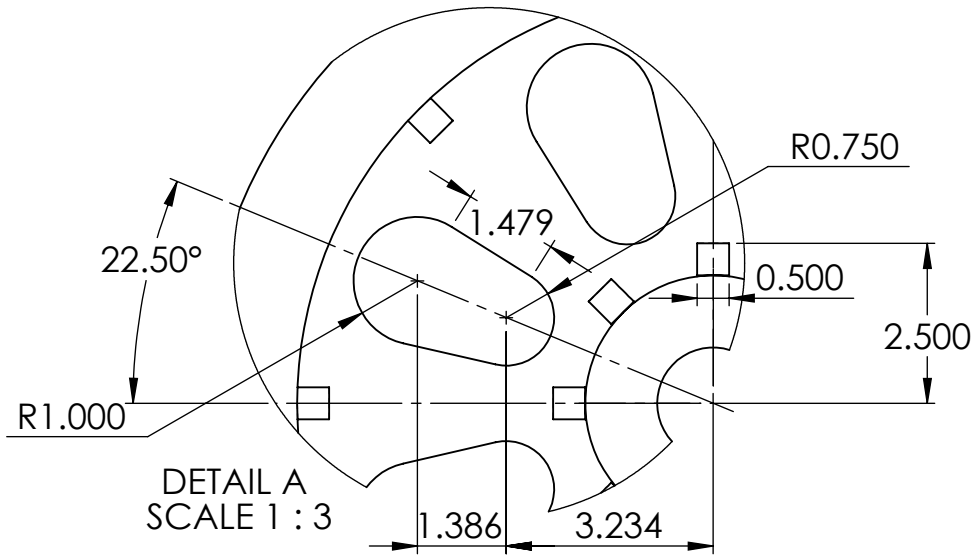


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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Crankshaft		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		CHECKED BY: Jeremiah Schroeder DATE: 4/27/2012			
ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		DRAWN BY: Andrew Engel DATE: 4/25/2012		PART #: 2-01 QTY: 1	
		FILE NAME: Crankshaft.SLDPRT		SCALE: 1:4 SHEET: 13 OF 75	

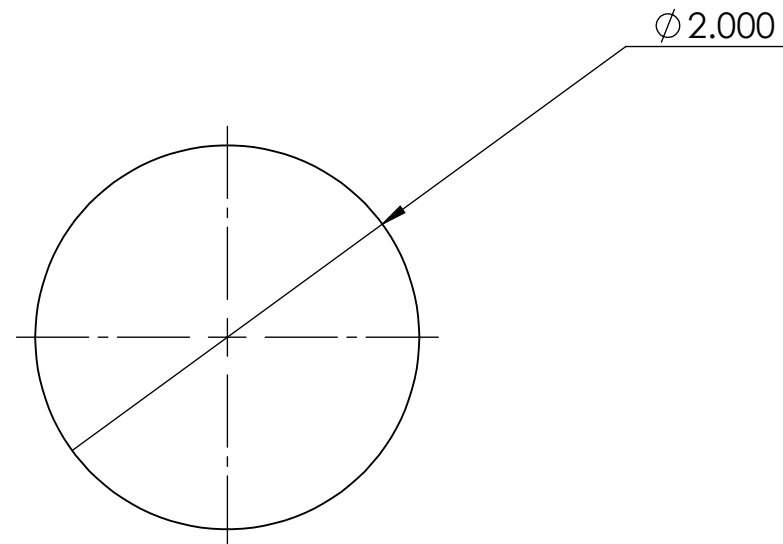
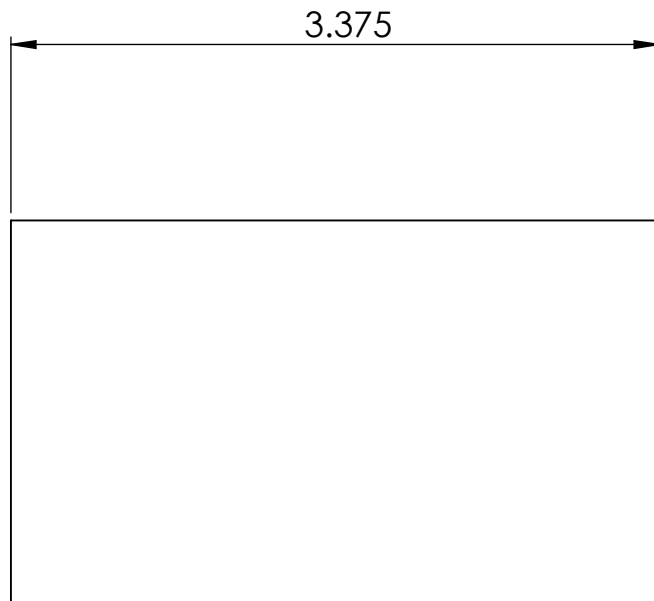
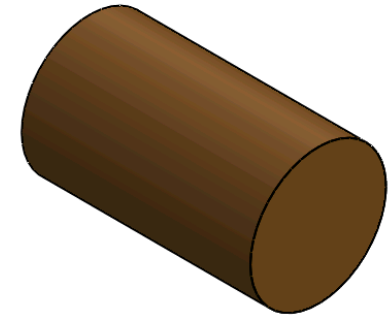


<h1 style="text-align: center;">Team Jabberwocky</h1>				
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		MATERIAL: Cast Alloy Steel		
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Crankshaft CHECKED BY: Jeremiah Schroeder DATE: 4/27/2012 DRAWN BY: Andrew Engel DATE: 4/25/2012		UNIVERSITY OF IDAHO ME DEPARTMENT
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30' FILE NAME: Crankshaft.SLDPRT		PART #: 2-01 QTY: 1 SCALE: 1:1 SHEET: 14 OF 75		




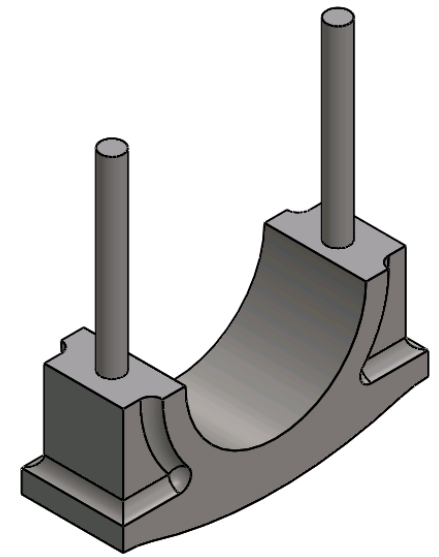
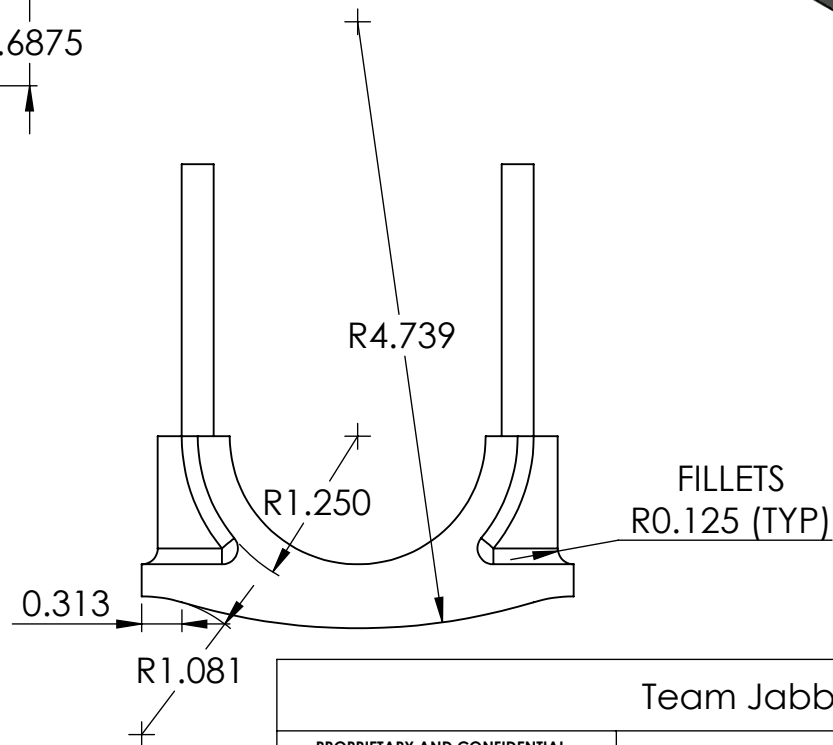
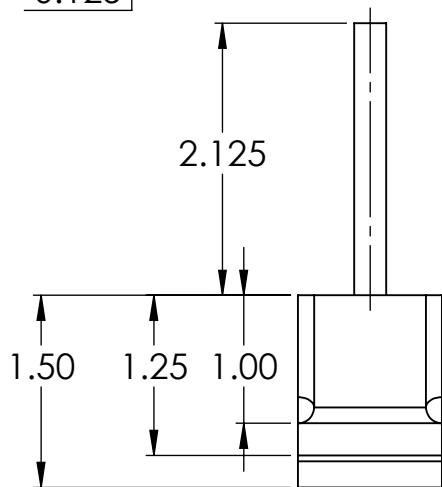
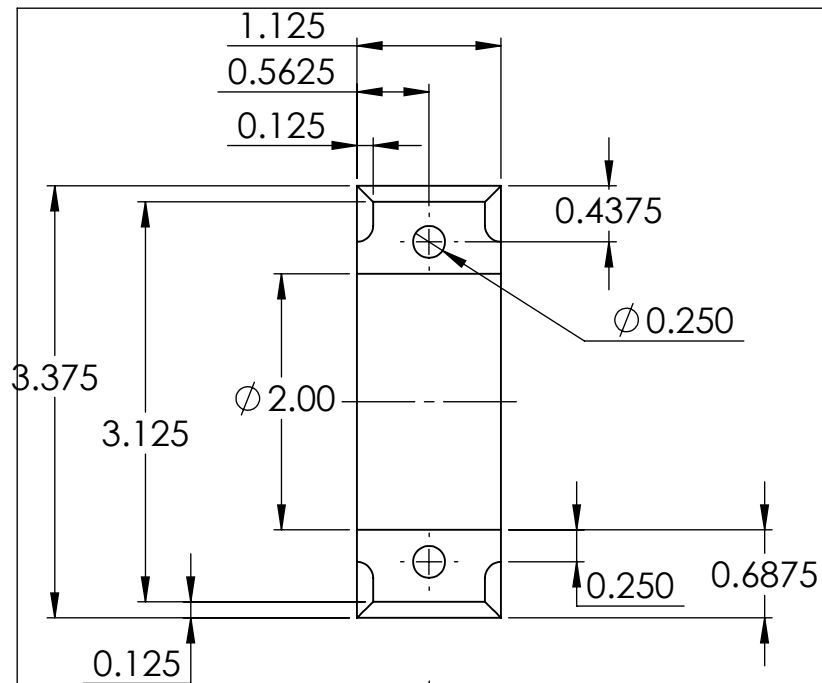
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		MATERIAL: Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Flywheel		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-02	QTY: 1
		FILE NAME: Flywheel.SLDPRT		SCALE: 1:6	SHEET: 15 OF 75



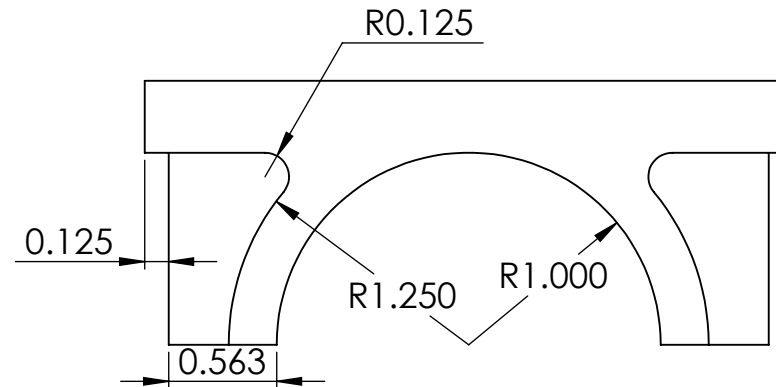
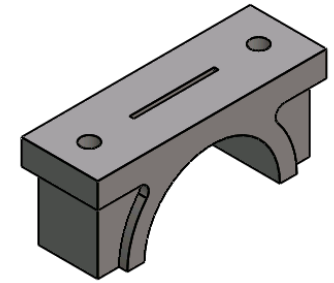
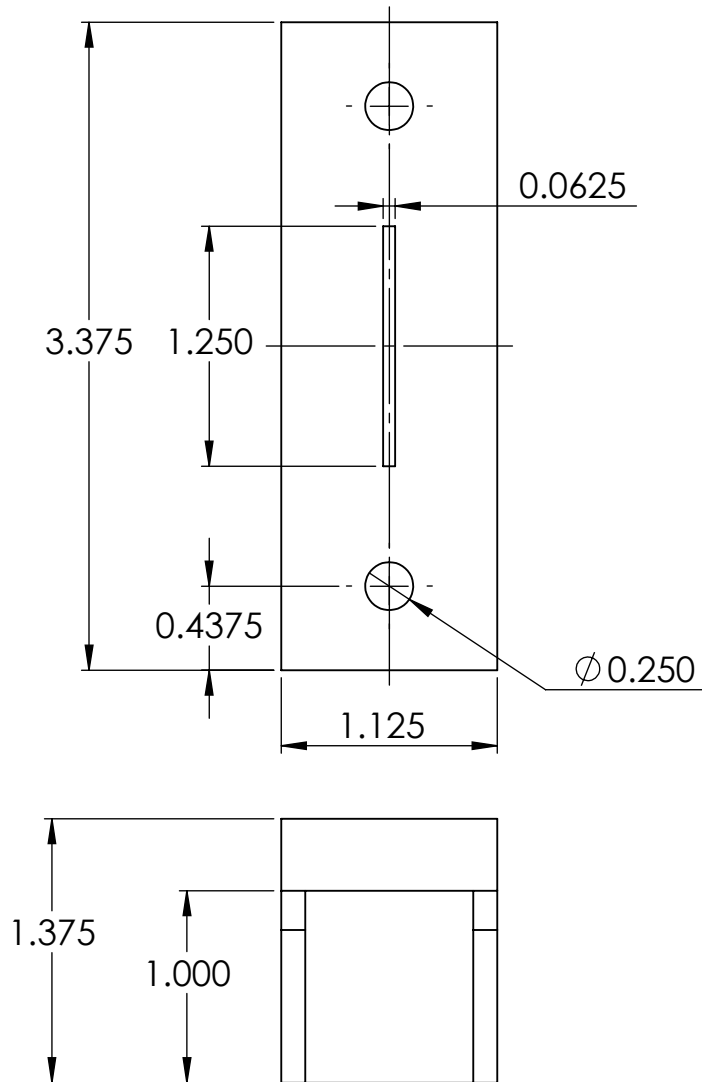
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				MATERIAL: Aluminum Bronze	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		DESCRIPTION: Connecting Rod Pin	
		CHECKED BY: Jeremiah Schroeder		DATE: 4/27/2012	
		DRAWN BY: Andrew Engel		DATE: 4/25/2012	
		FILE NAME: Crank Pin.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 2-03		QTY: 1	
		SCALE: 1:1		SHEET: 16 OF 75	




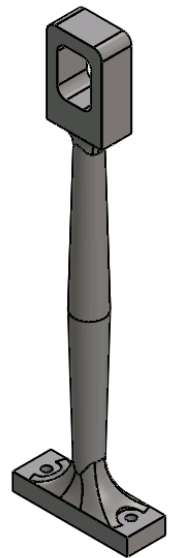
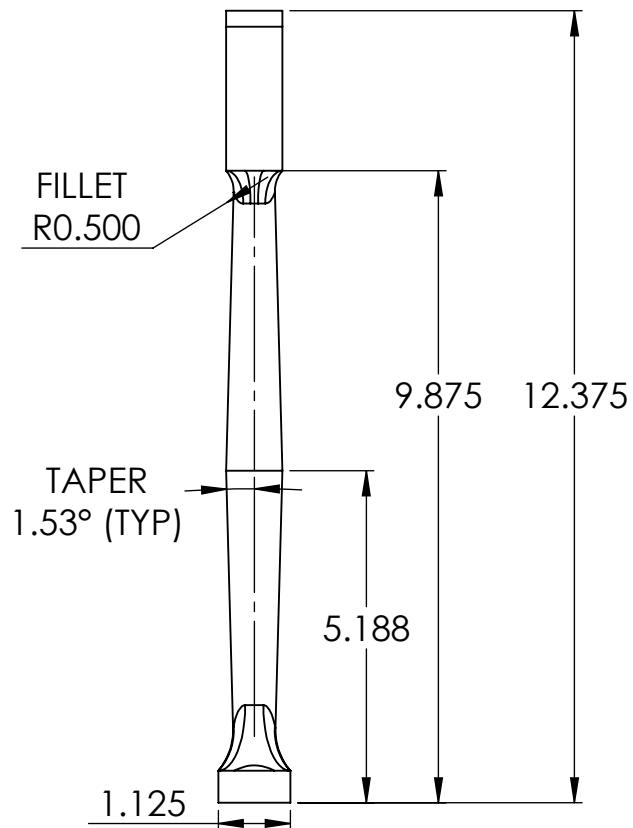
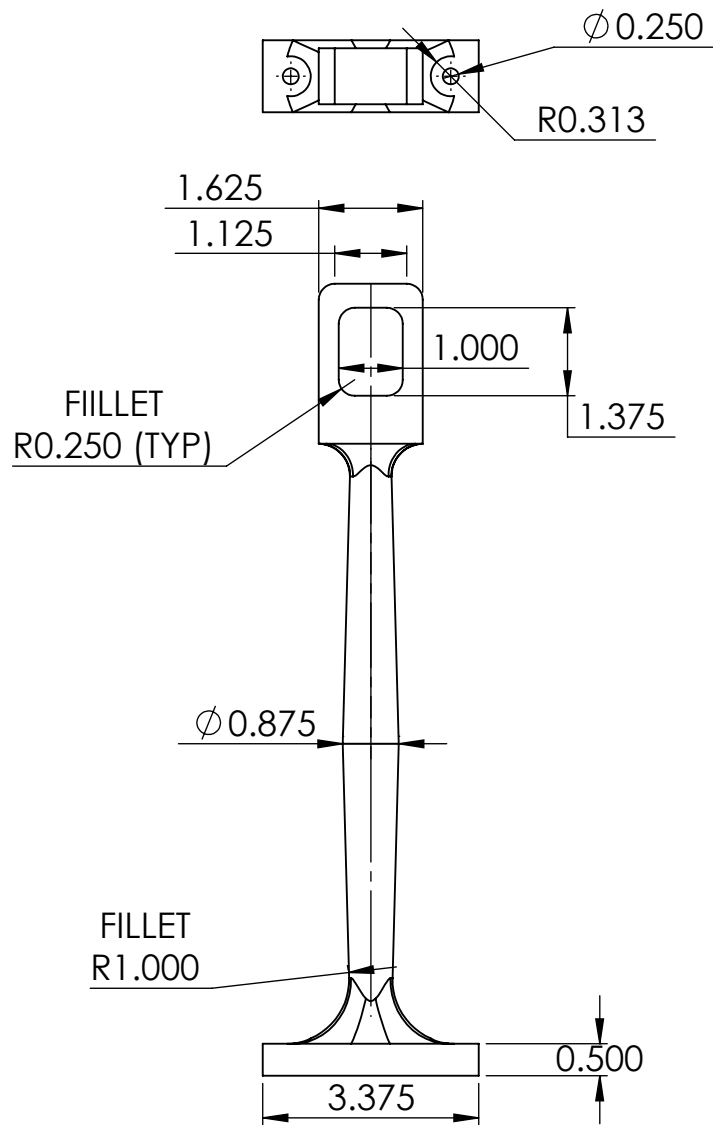
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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Connecting Rod Cap CHECKED BY: Jeremiah Schroeder DATE: 4/27/2012 DRAWN BY: Andrew Engel DATE: 4/25/2012 FILE NAME: Connecting Rod End Cap.SLDprt	MATERIAL: Cast Alloy Steel UNIVERSITY OF IDAHO ME DEPARTMENT PART #: 2-04 QTY: 1 SCALE: 1:1.5 SHEET: 17 OF 75




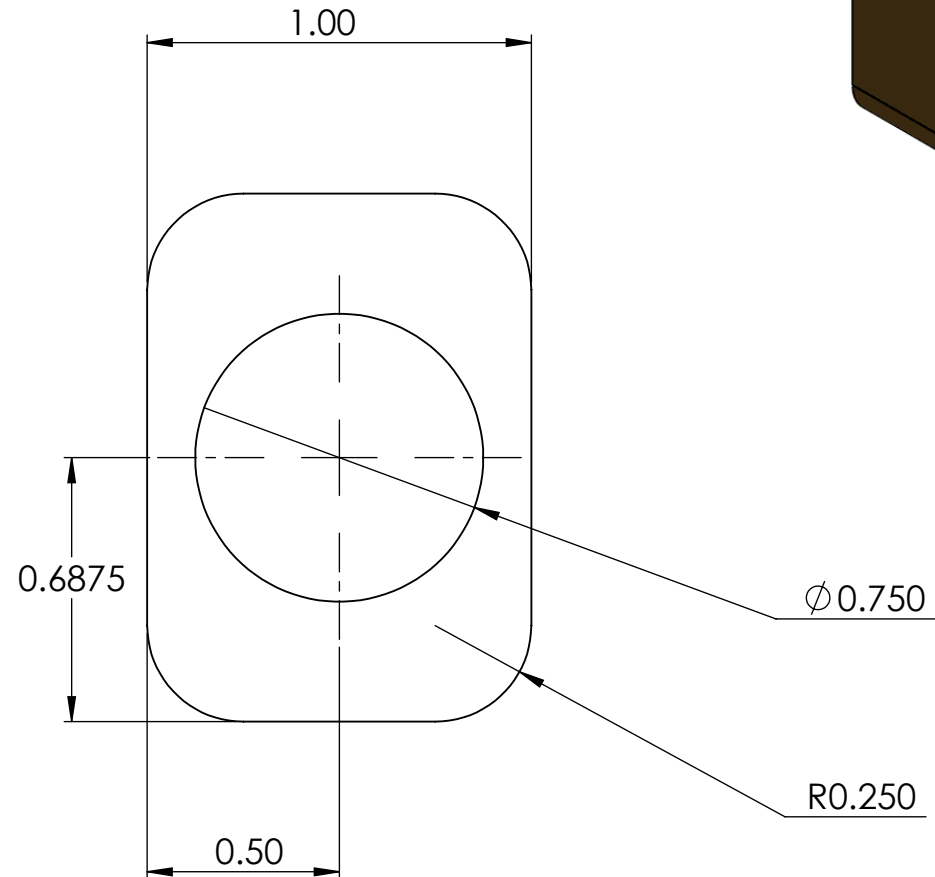
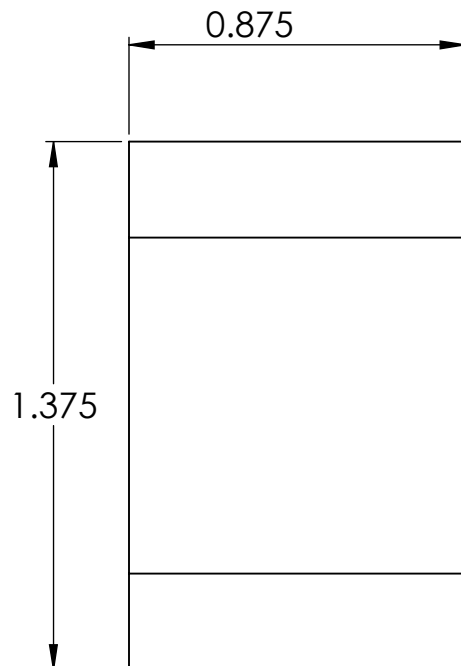
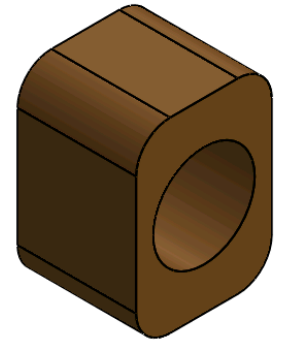
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Connecting Rod Center Block		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		CHECKED BY: Jeremiah Schroeder DATE: 4/27/2012			
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30° X.XXX ± .002		DRAWN BY: Andrew Engel DATE: 4/26/2012		PART #: 2-05	QTY: 1
		FILE NAME: Connecting Rod Center Block.SLDPR1		SCALE: 1:1	SHEET: 18 OF 75




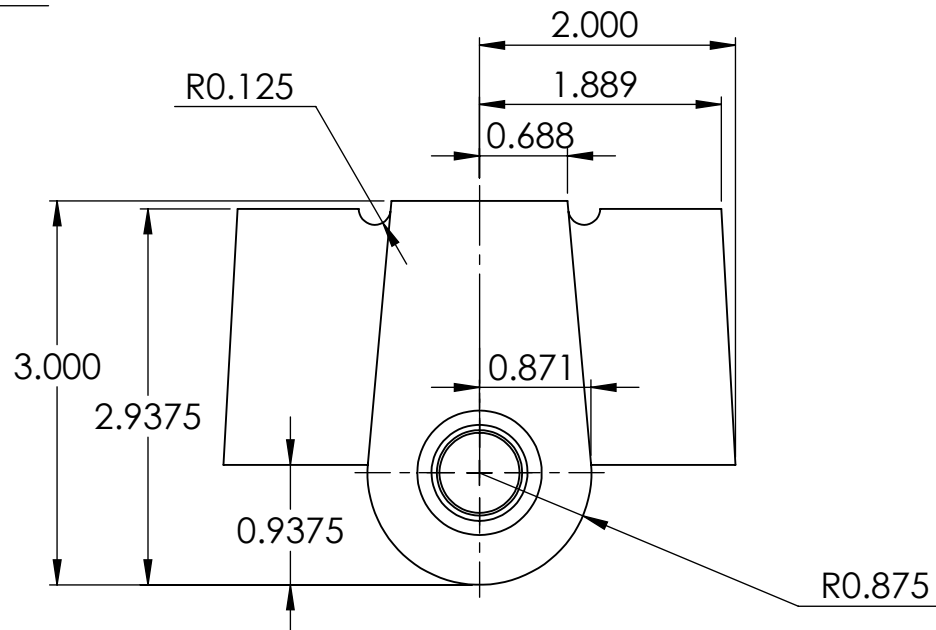
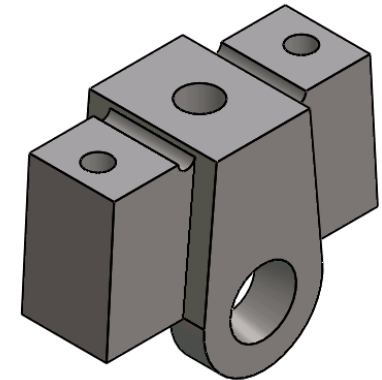
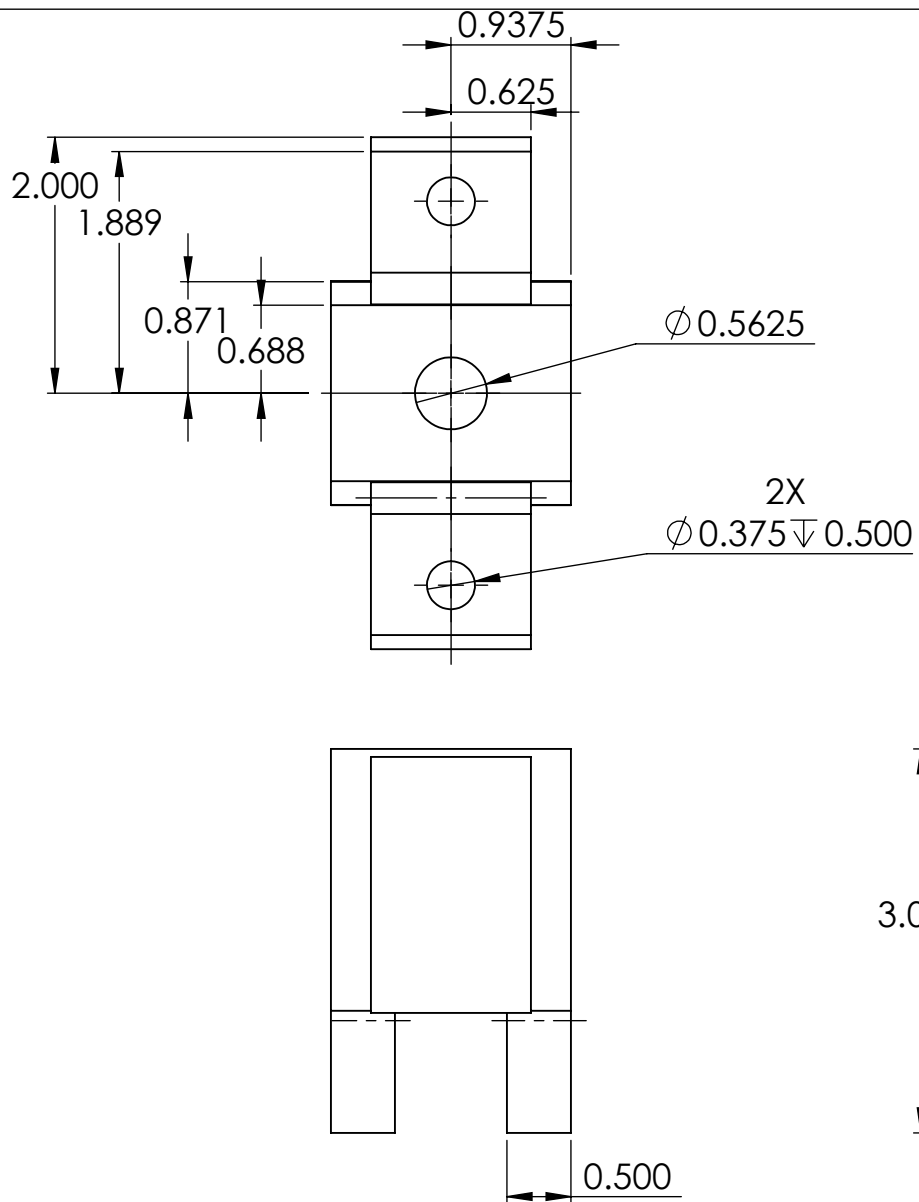
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Connecting Rod		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-06	QTY: 1
FILE NAME:		Connecting Rod.SLDPR1		SCALE: 1:3	SHEET: 19 OF 75




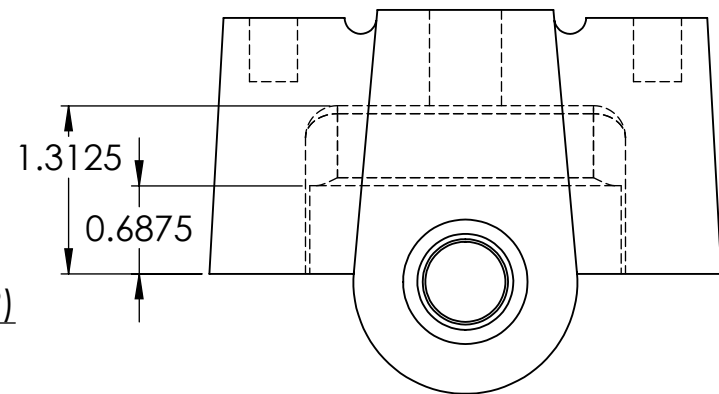
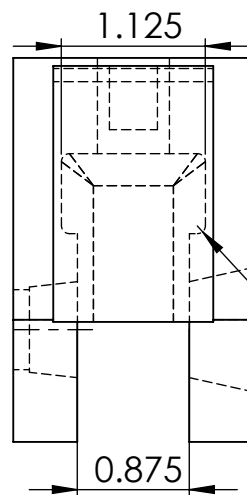
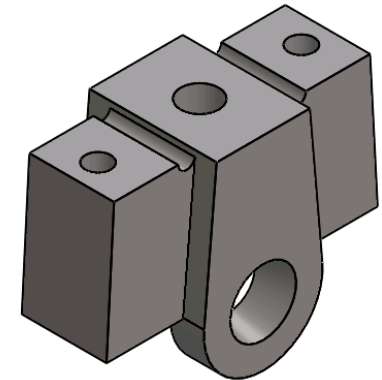
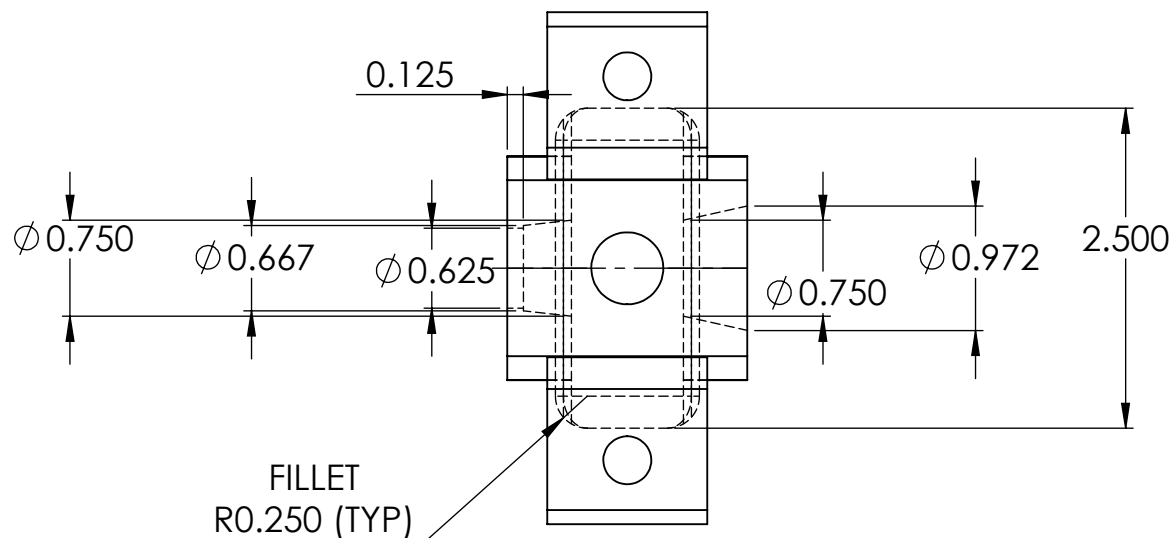
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		MATERIAL: Aluminum Bronze			
DEFAULT TOLERANCES:		DESCRIPTION: Connecting Rod Bearing Insert		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-07	QTY: 1
		FILE NAME: Connecting Rod Insert.SLDPRT		SCALE: 2:1	SHEET: 20 OF 75



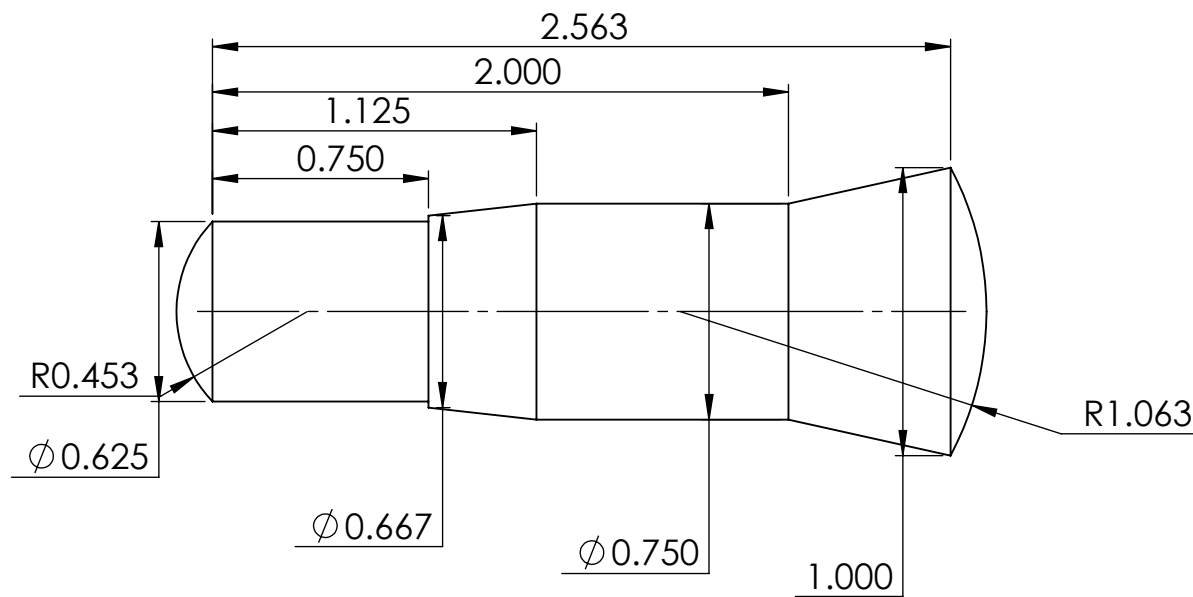
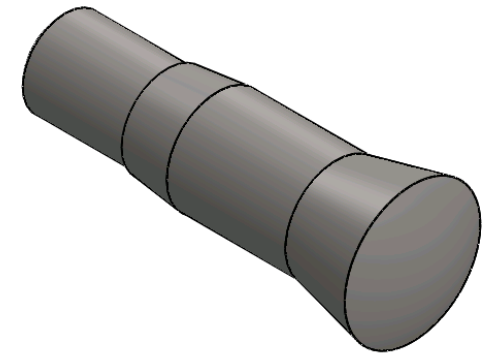
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Slipper Base		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-08	QTY: 1
		FILE NAME: Slipper.SLDPRT	SCALE: 1:1.5	SHEET: 21 OF 75	




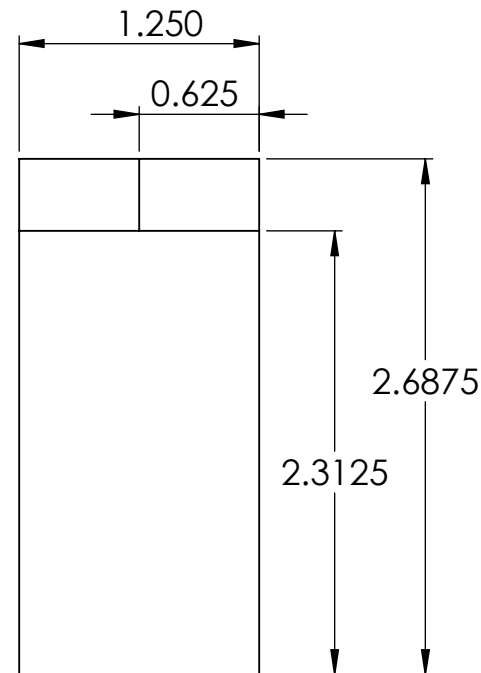
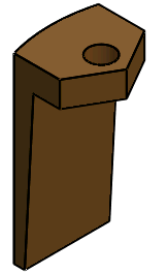
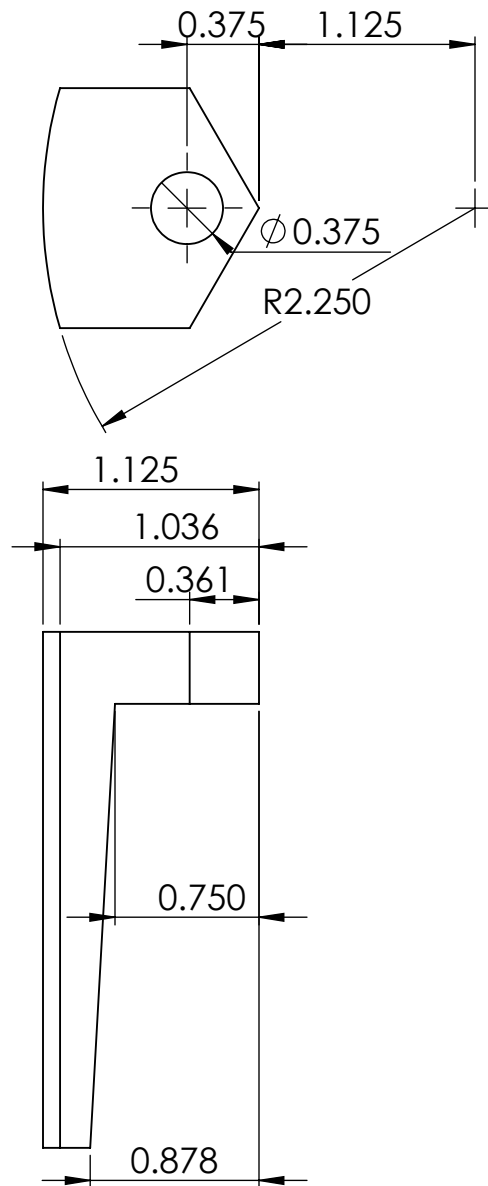
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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X. \pm .25 X.X \pm .1 X.XX \pm .01 X.XXX \pm .002		ANGULAR: X. \pm 2 X.X \pm 1 X.XX \pm 0.30'		DESCRIPTION: Slipper Base	
		CHECKED BY: Jeremiah Schroeder		DATE: 5/1/2012	
		DRAWN BY: Andrew Engel		DATE: 4/26/2012	
		FILE NAME: Slipper.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 2-08		QTY: 1	
		SCALE: 1:1.5		SHEET: 22 OF 75	




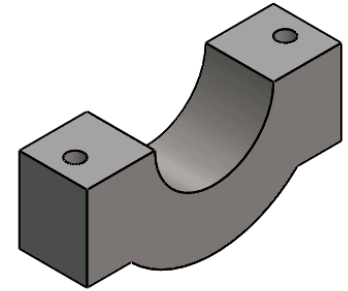
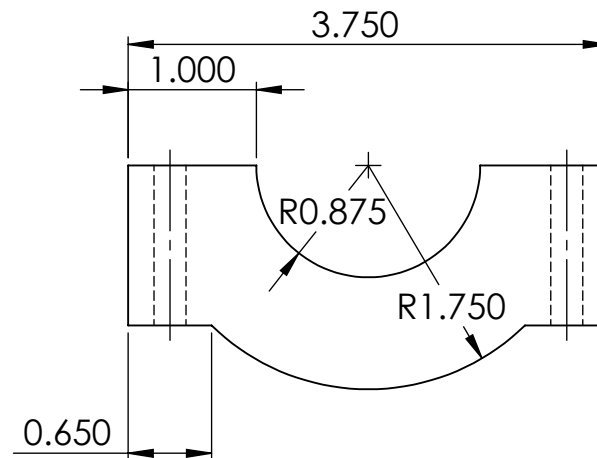
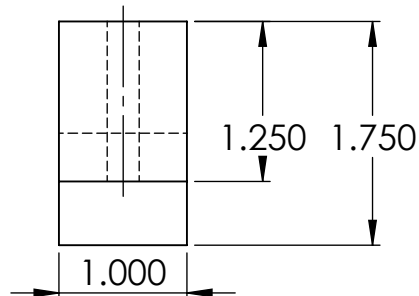
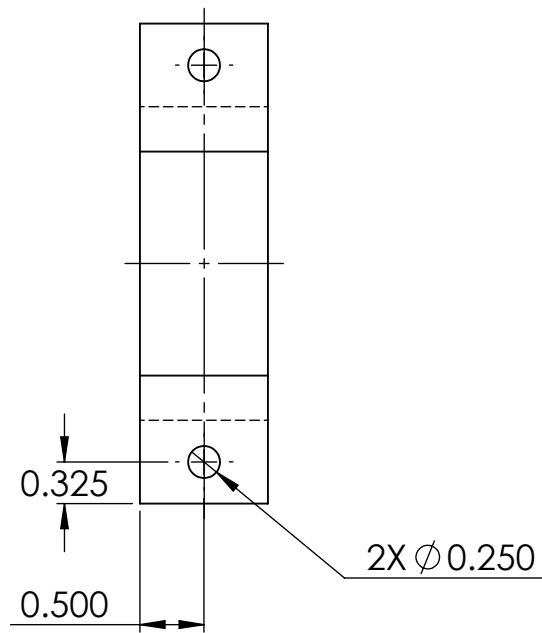
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Connecting Pin		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-09	QTY: 1
		FILE NAME: Connecting Rod Pin.SLDPRT		SCALE: 1.5:1	SHEET: 23 OF 75



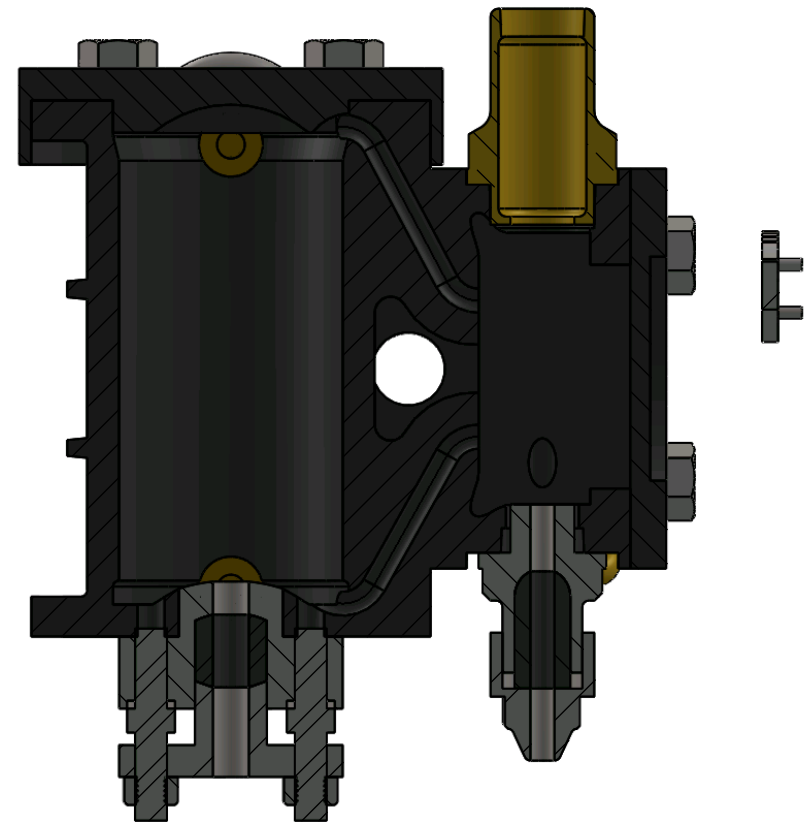
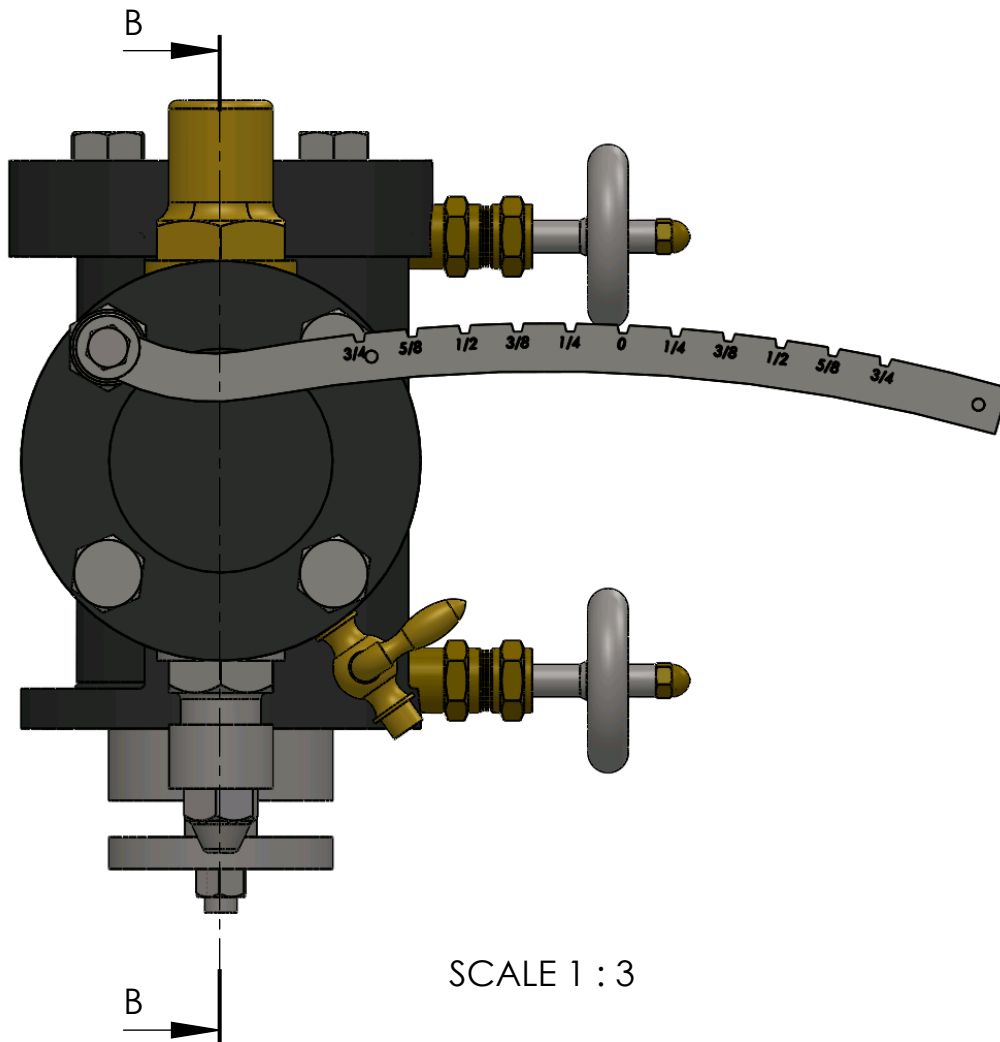
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		MATERIAL: Aluminum Bronze			
DEFAULT TOLERANCES:		DESCRIPTION: Slipper Guides		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/27/2012		
		DRAWN BY: Andrew Engel	DATE: 4/26/2012	PART #: 2-10	QTY: 2
		FILE NAME: Slipper Guides.SLDPR1	SCALE: 1:1	SHEET: 24 OF 75	



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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°		DESCRIPTION: Retaining Collar	
		CHECKED BY: Jeremiah Schroeder		DATE: 4/27/2012	
		DRAWN BY: Andrew Engel		DATE: 4/26/2012	
		FILE NAME: Collar half.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 2-11		QTY: 2	
		SCALE: 1:1.5		SHEET: 25 OF 75	



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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL:

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. \pm .25
X.X \pm .1
X.XX \pm .01
X.XXX \pm .002

ANGULAR:
X. \pm 2
X.X \pm 1
X.XX \pm 0.30'

DESCRIPTION: Cylinder Assembly

CHECKED BY: Andrew Engel

DATE: 5/3/2012

DRAWN BY: Will Edwards

DATE: 5/3/2012

FILE NAME: Cylinder Assembly.SLDASM

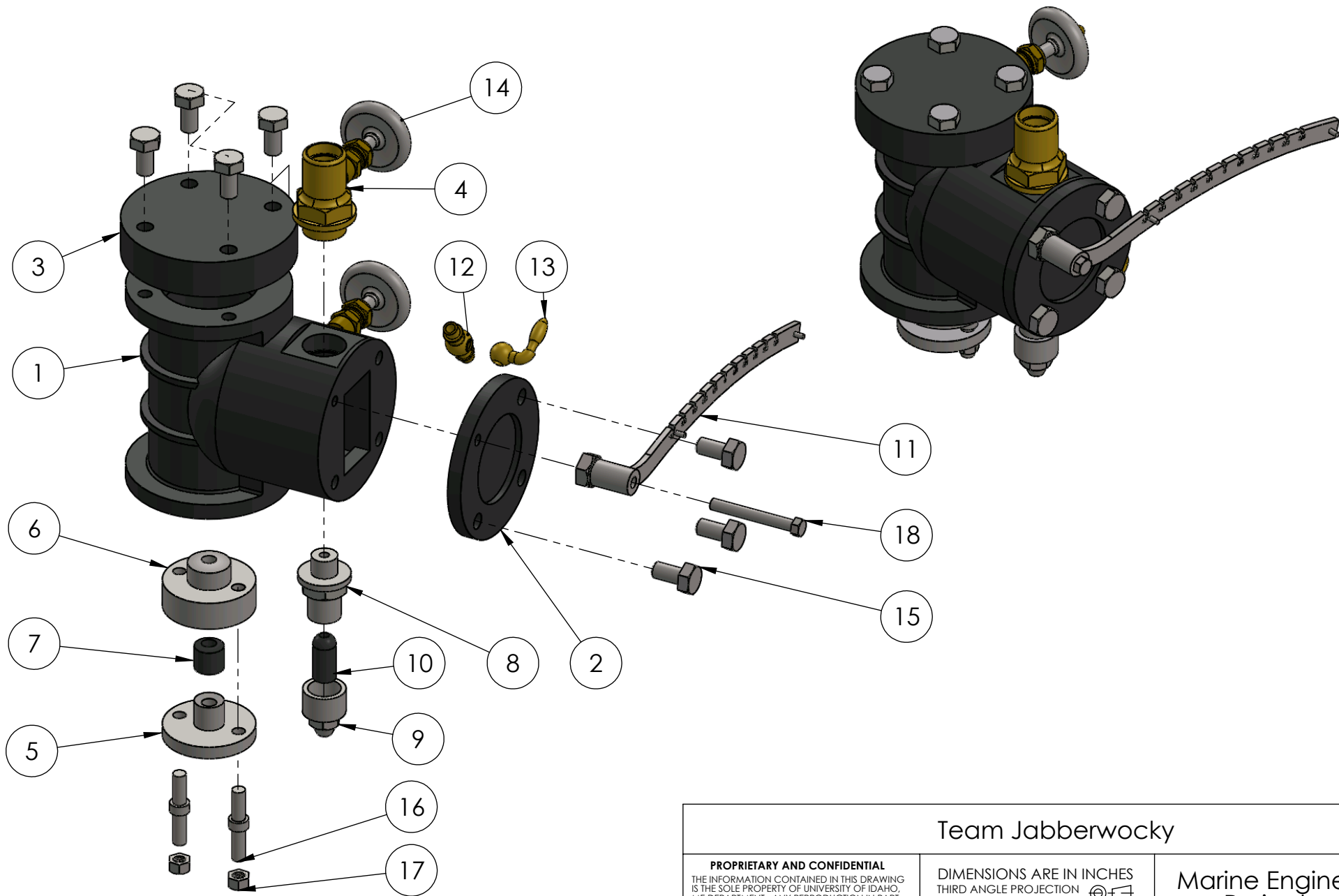
**UNIVERSITY OF IDAHO
ME DEPARTMENT**

PART #: 3-00


QTY: 1

SCALE: 1:5

SHEET: 26 OF 75




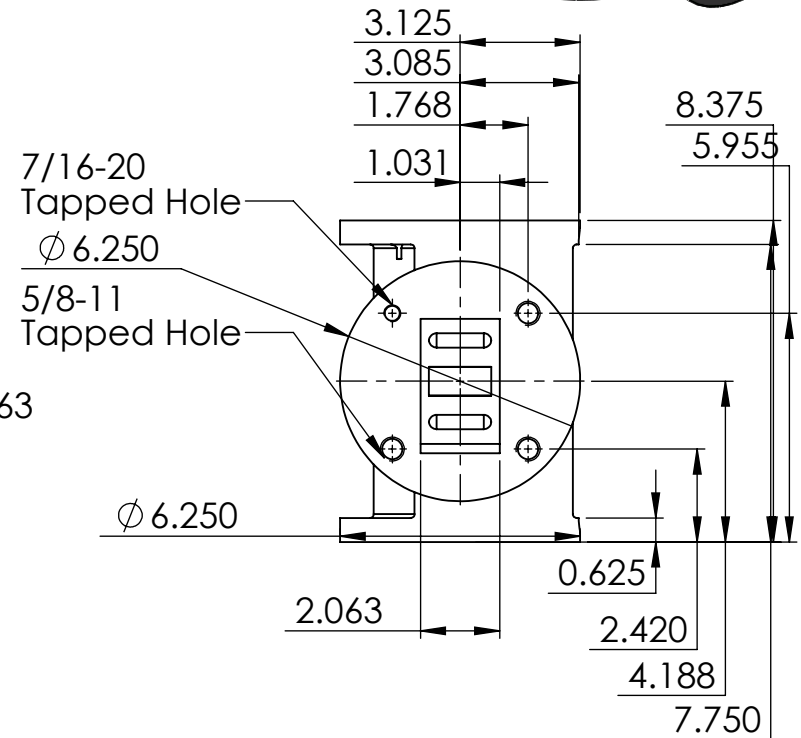
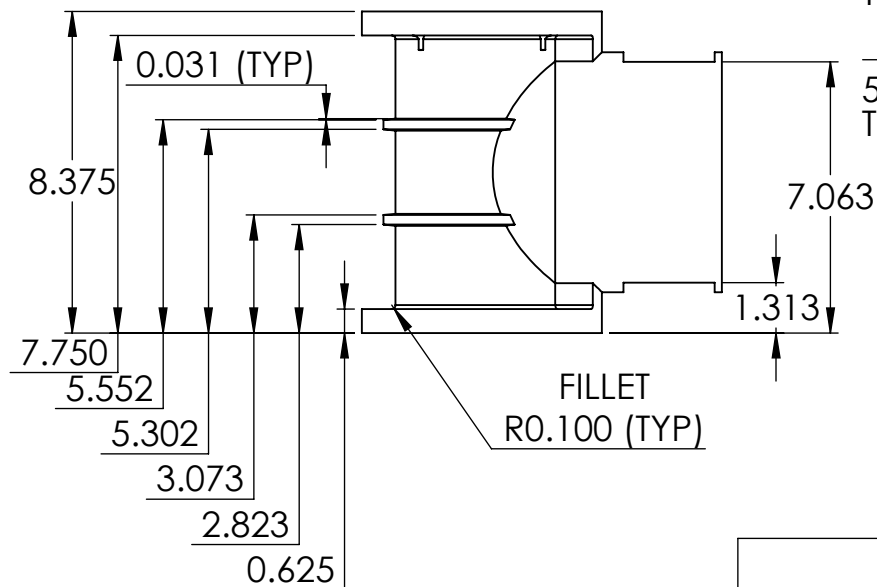
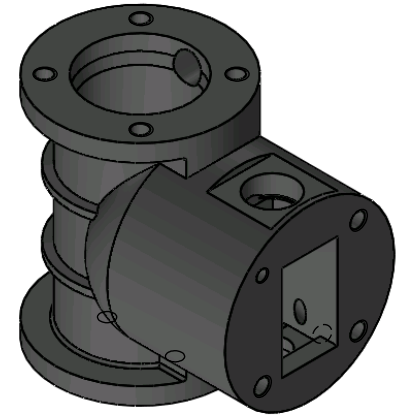
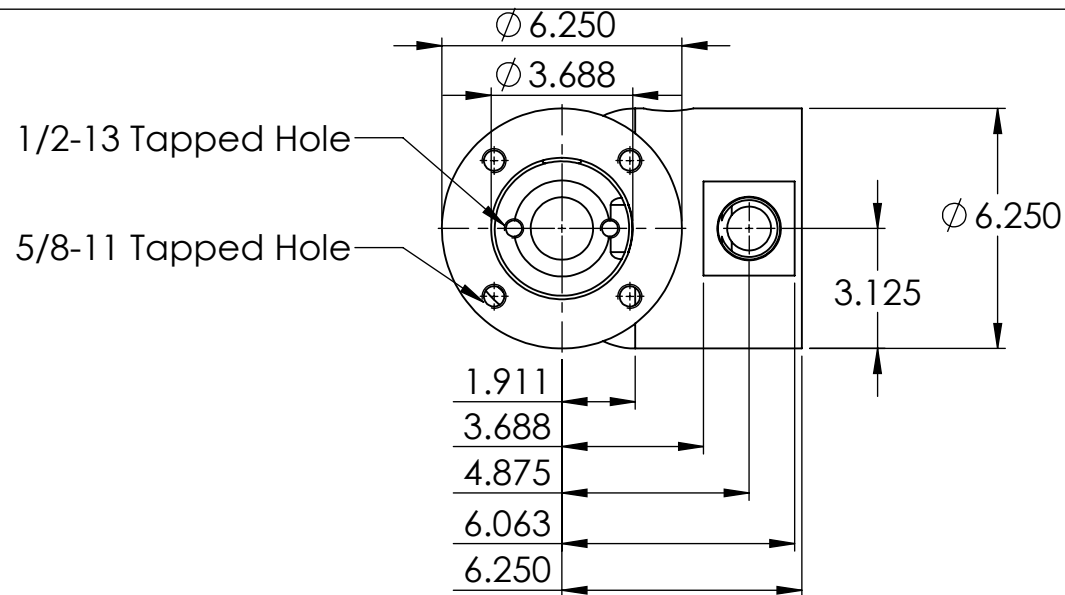
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		MATERIAL:			
DEFAULT TOLERANCES:		DESCRIPTION: Cylinder Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-00	QTY: 1
FILE NAME: Cylinder Assembly.SLDASM				SCALE: 1:5	SHEET: 27 OF 75


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	3-01		1	29
2	3-02	Valve Cover	1	32
3	3-03	Cylinder Cap	1	33
4	3-04	Cylinder Exhaust Valve	1	34
5	3-05	Bottom for Cylinder Packing Gland	1	35
6	3-06	Top for Cylinder Packing Gland	1	36
7	3-07	Packing for Cylinder	1	37
8	3-08	Valve Packing Gland Top	1	38
9	3-09	Valve Packing Gland Bottom	1	39
10	3-10	Valve Packing	1	40
11	3-11	Speed Indicator	1	41
12	3-12	Drain Cock	1	42
13	3-13	Drain Cock Handle	1	43
14	3-14	Pressure Valve Sub-Assembly	2	44
15	3-15	Hex Bolt 0.625-11x1.25x1.25	7	---
16	3-16	Cylinder Packing Studs	2	48
17	3-17	Hex Nut 0.4375-20x0.75	2	---
18	3-18	Hex Bolt 0.4375-20x3.5x1.125-N	1	---

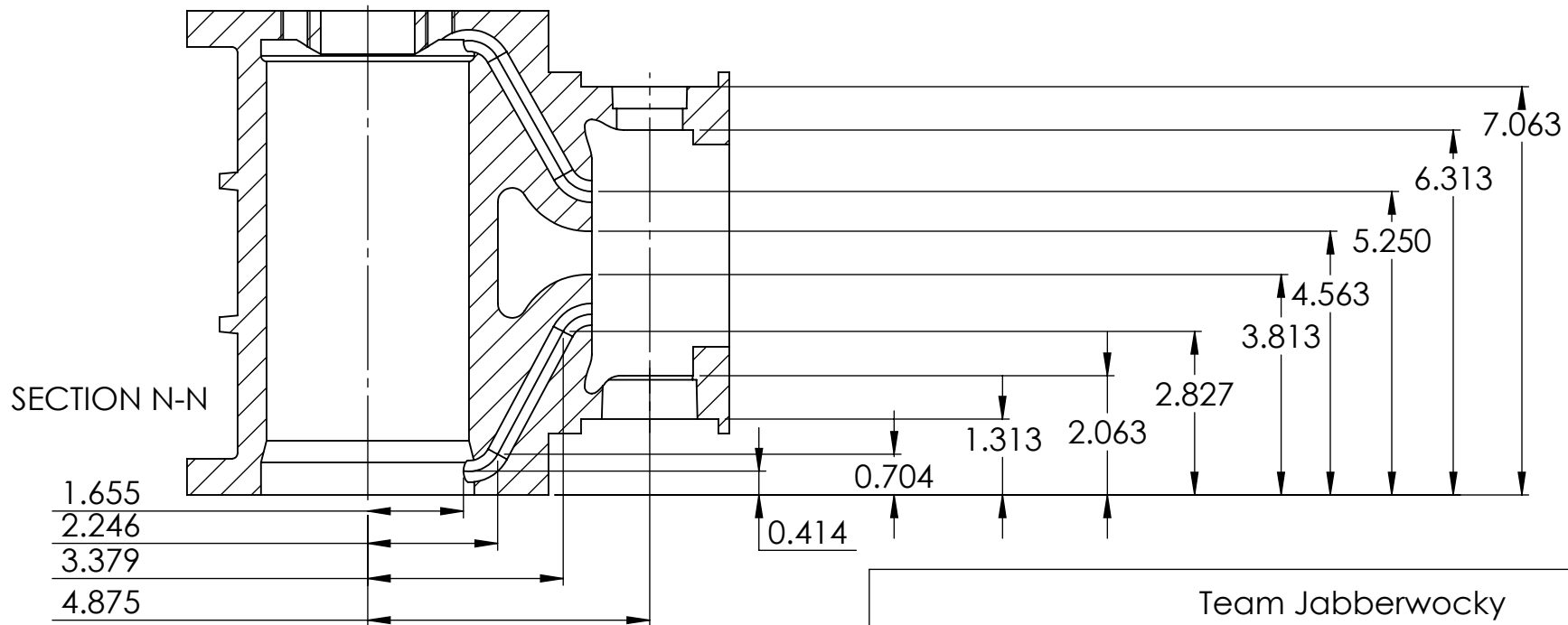
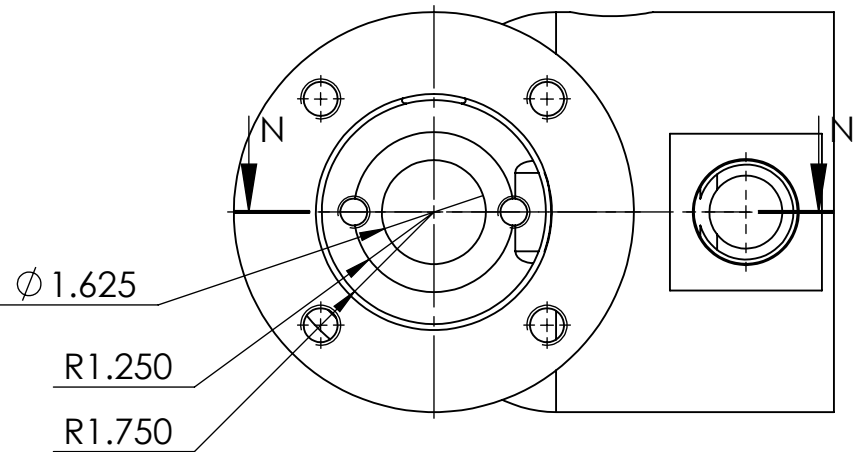
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		MATERIAL: _____	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Cylinder BOM CHECKED BY: Jeremiah Schroeder DATE: 5/2/2012 DRAWN BY: Andrew Engel DATE: 5/2/2012	
ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
FILE NAME: Cylinder Assembly.SLDASM		PART #: _____	QTY: _____
		SCALE: 1:4	SHEET: 28 OF 75




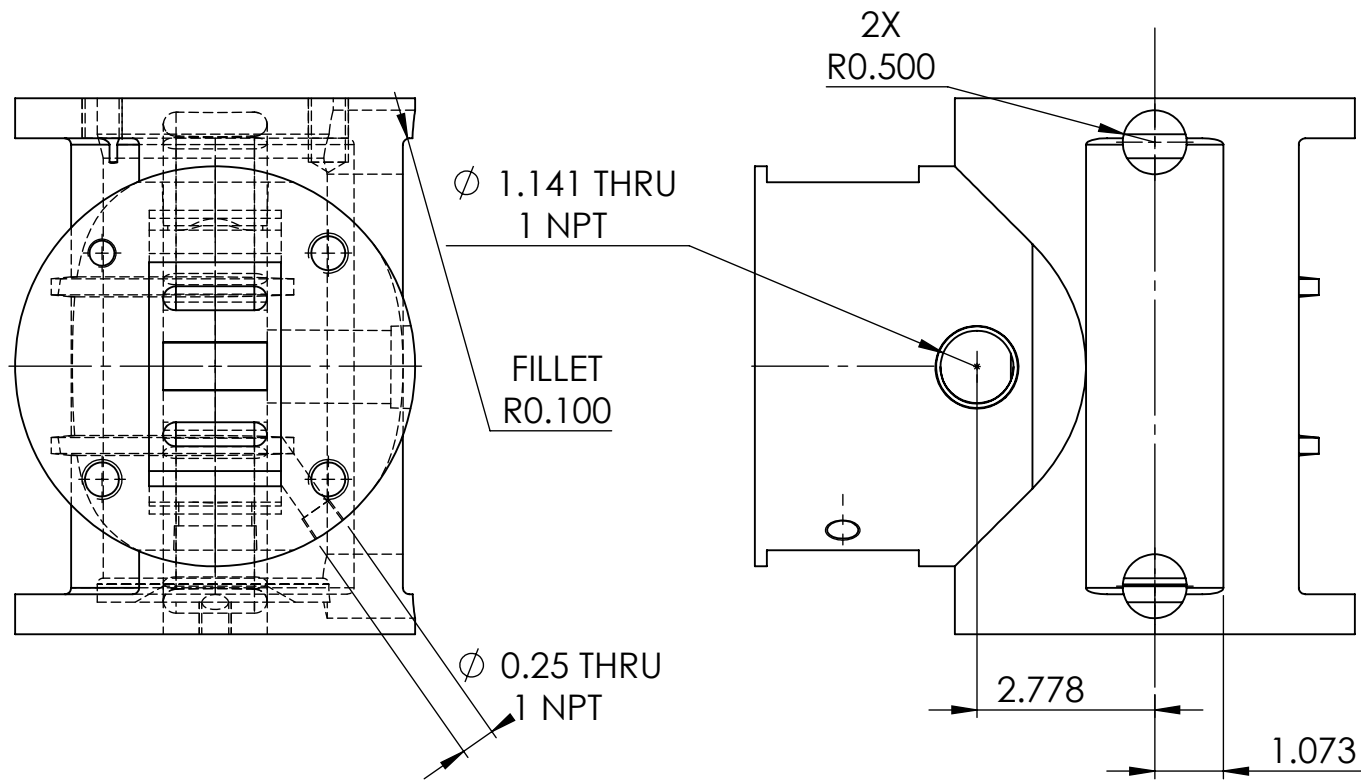
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		MATERIAL: Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION:		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012		
		FILE NAME: Cylinder.SLDPRT	SCALE: 1:5	PART #: 3-01	QTY: 1
				SHEET: 29 OF 75	




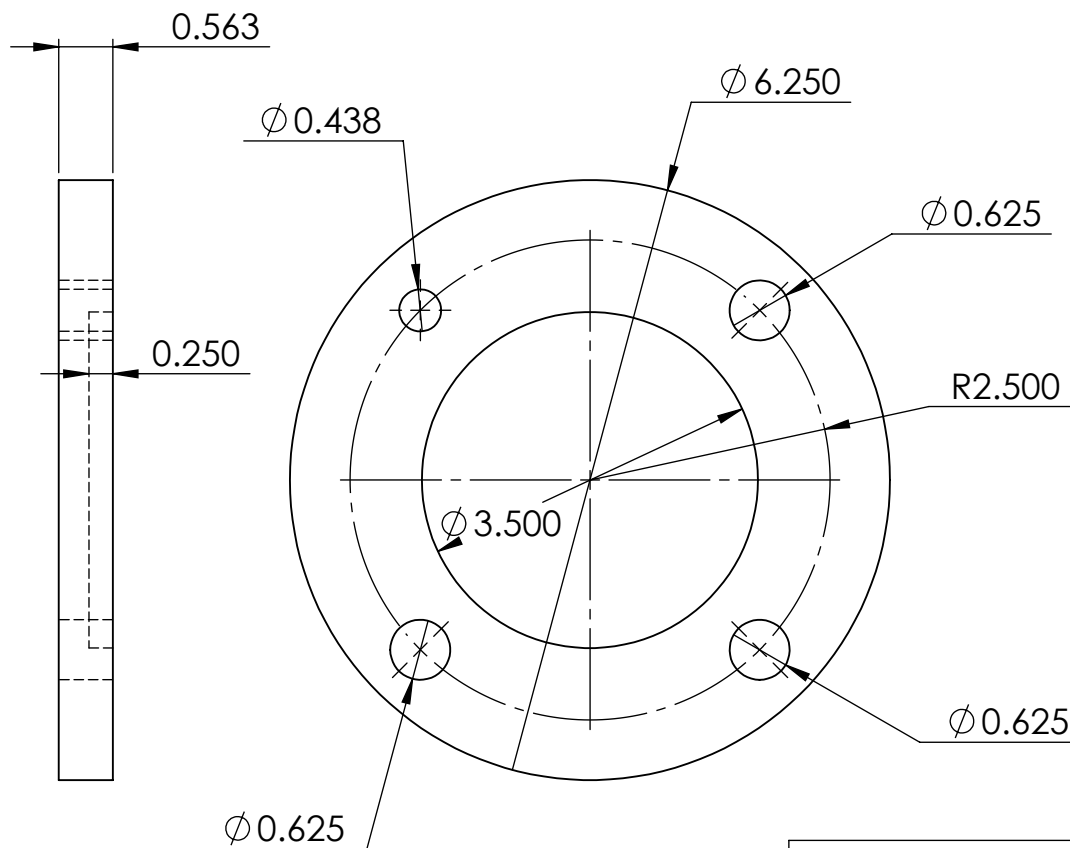
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		MATERIAL: Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION:		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ±.25 X.X ±.1 X.XX ±.01 X.XXX ±.002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-01	QTY: 1
		FILE NAME: Cylinder.SLDPRT		SCALE: 1:3	SHEET: 30 OF 75




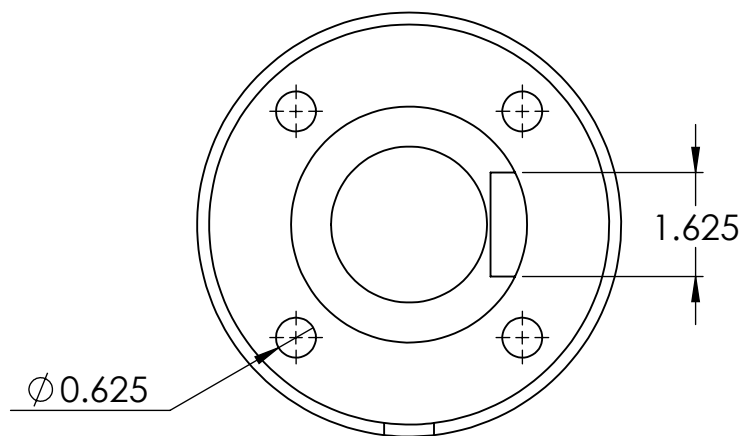
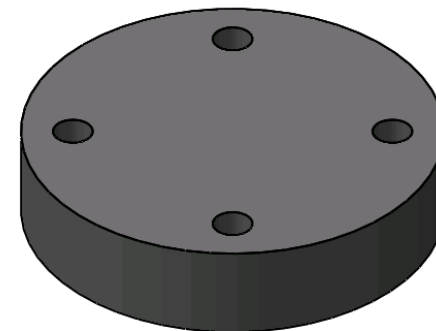
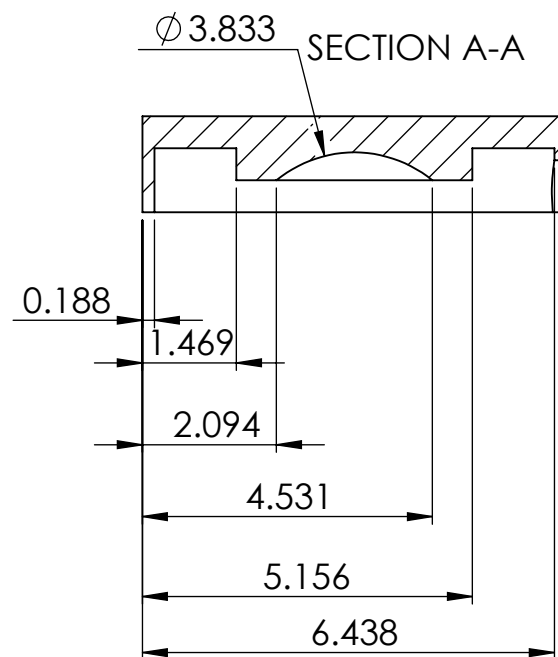
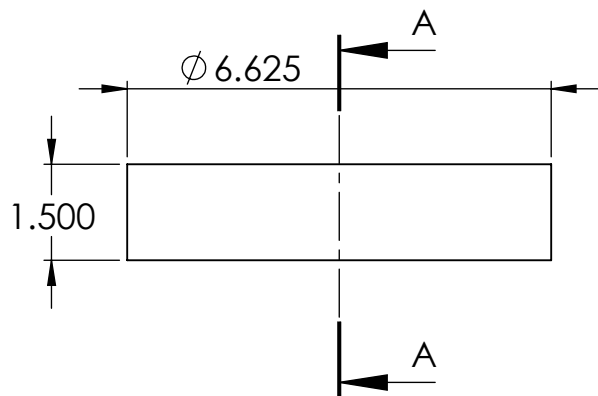
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		MATERIAL: Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION:		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-01	QTY: 1
		FILE NAME: Cylinder.SLDPRT		SCALE: 1:3	SHEET: 31 OF 75




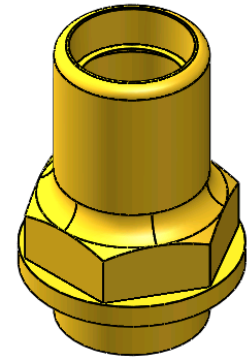
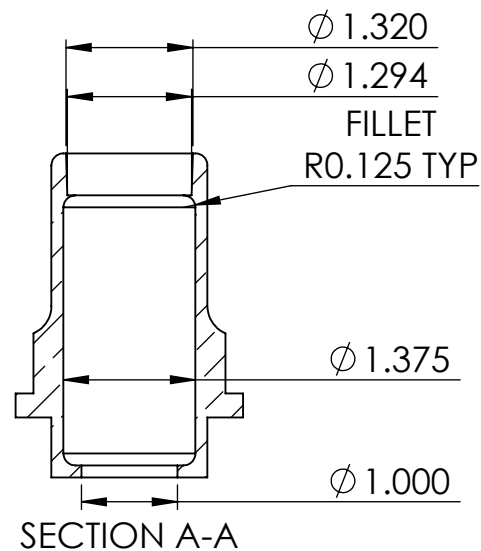
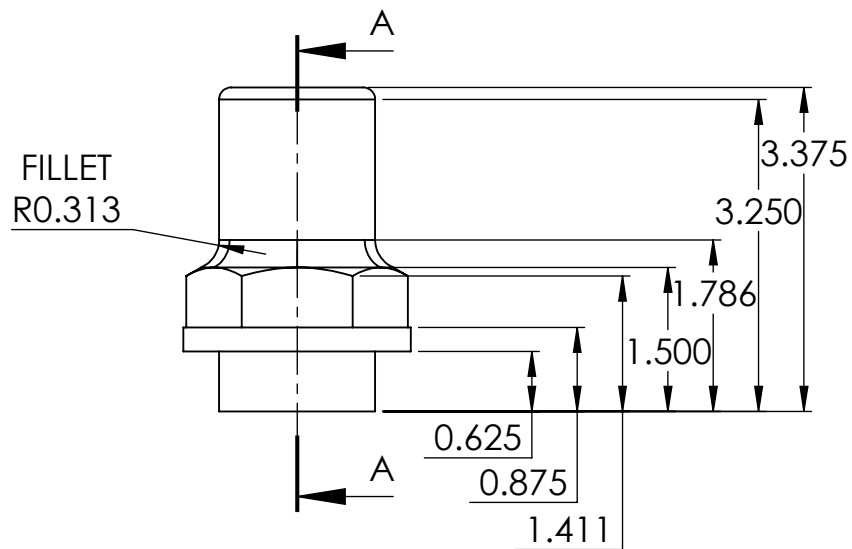
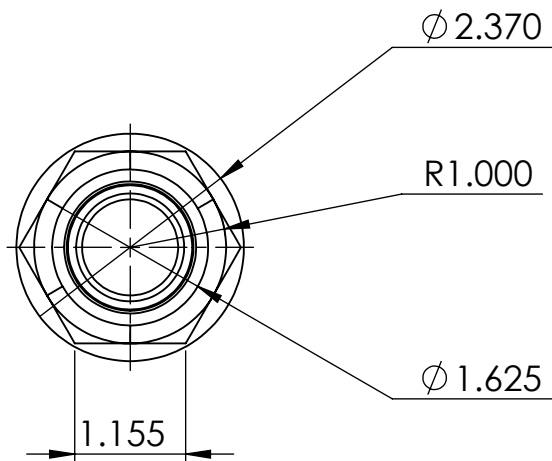
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		MATERIAL: Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Cover		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012		
FILE NAME: Valve Cover.SLDPRJT		PART #: 3-02	QTY: 1	SCALE: 1:2	
				SHEET: 32 OF 75	




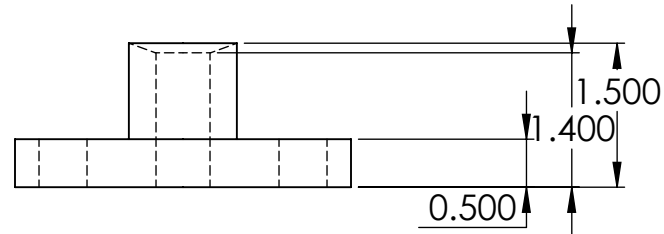
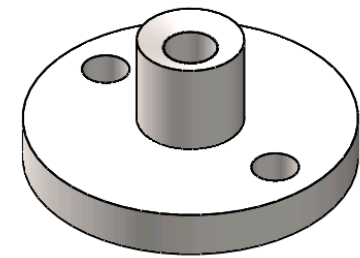
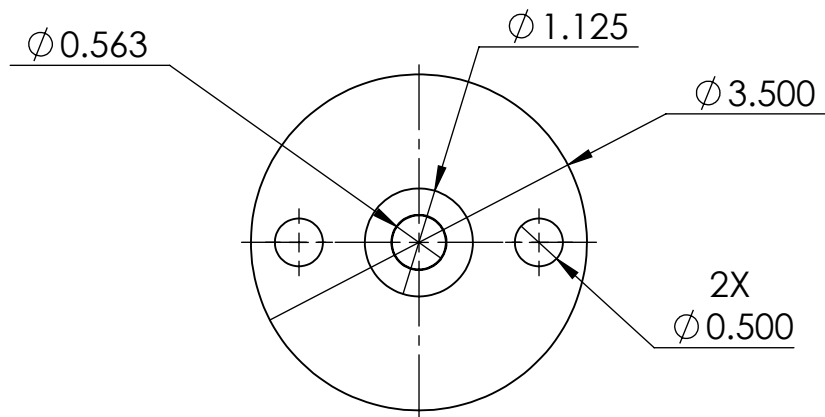
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		MATERIAL: Grey Cast Iron			
DEFAULT TOLERANCES:		DESCRIPTION: Cylinder Cap		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-03	QTY: 1
		FILE NAME: Cylinder Cap.SLDPR		SCALE: 1:3	SHEET: 33 OF 75




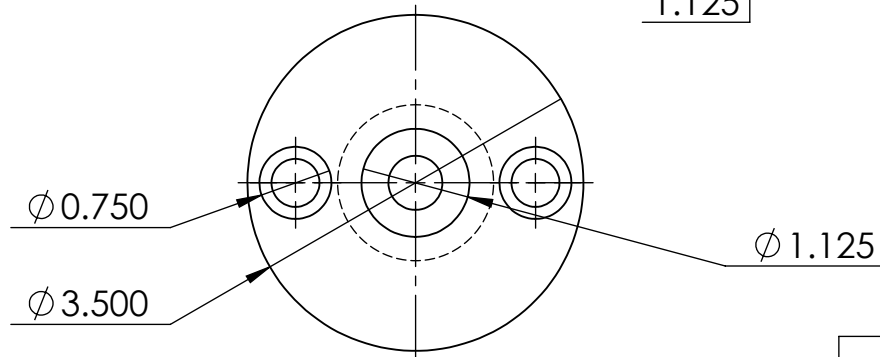
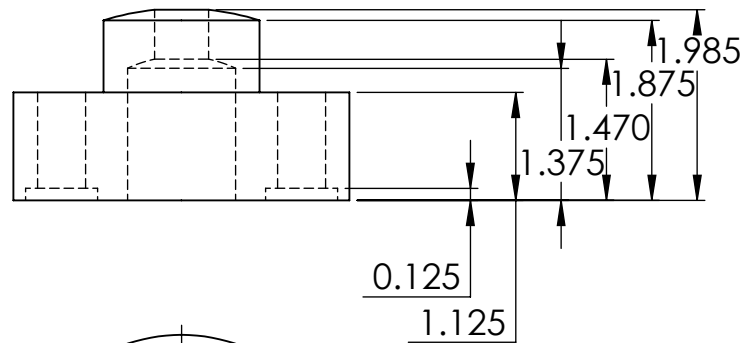
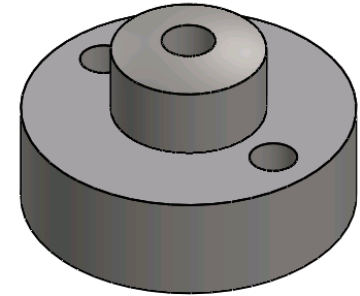
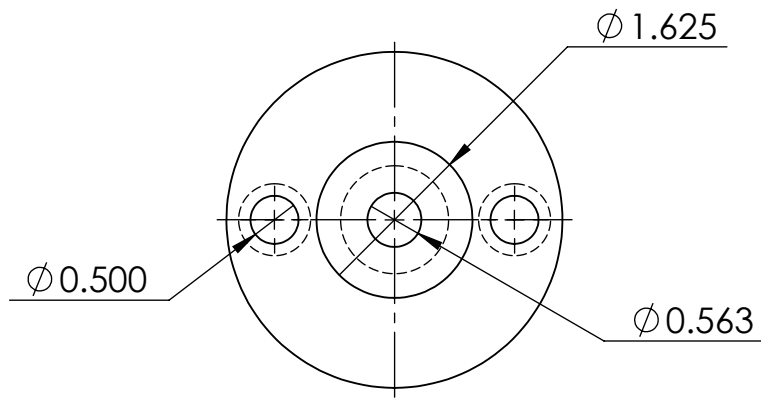
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		MATERIAL: Brass			
DEFAULT TOLERANCES:		DESCRIPTION: Cylinder Exhaust Valve		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-04	QTY: 1
		FILE NAME: Exhaust Valve.SLDPRT		SCALE: 1:2	SHEET: 34 OF 75




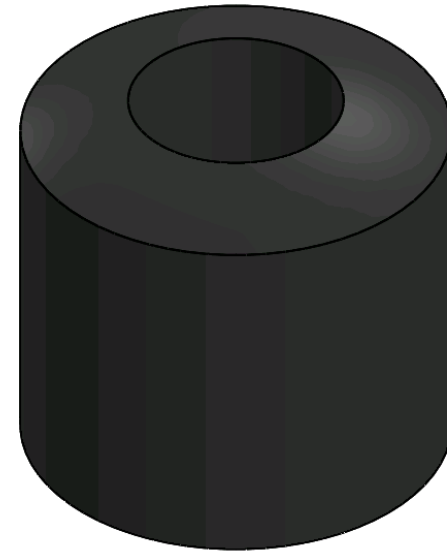
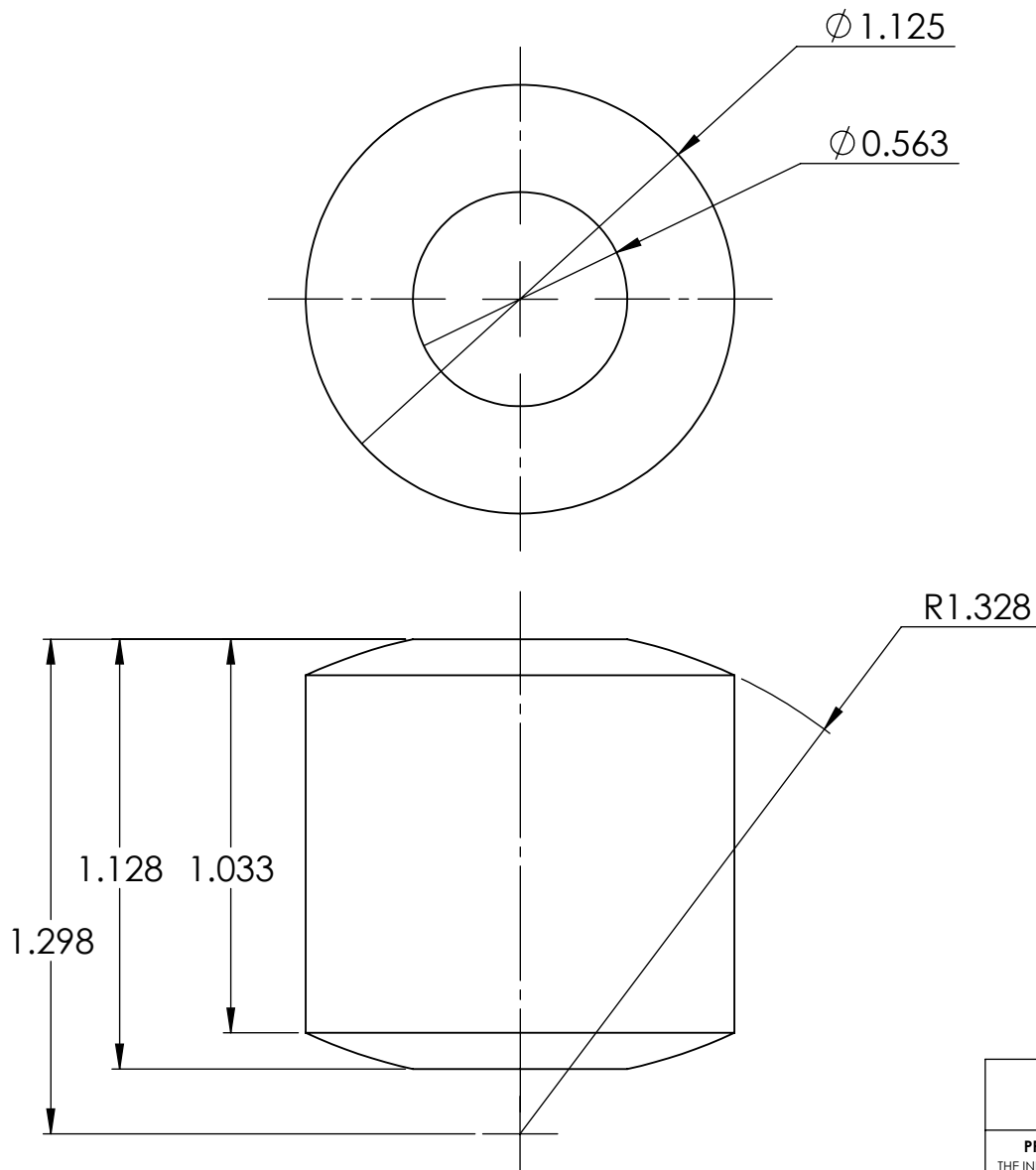
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Bottom for Cylinder Packing Gland		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-05	QTY: 1
FILE NAME: Packing Gland 1.SLDPRT				SCALE: 1:2	SHEET: 35 OF 75



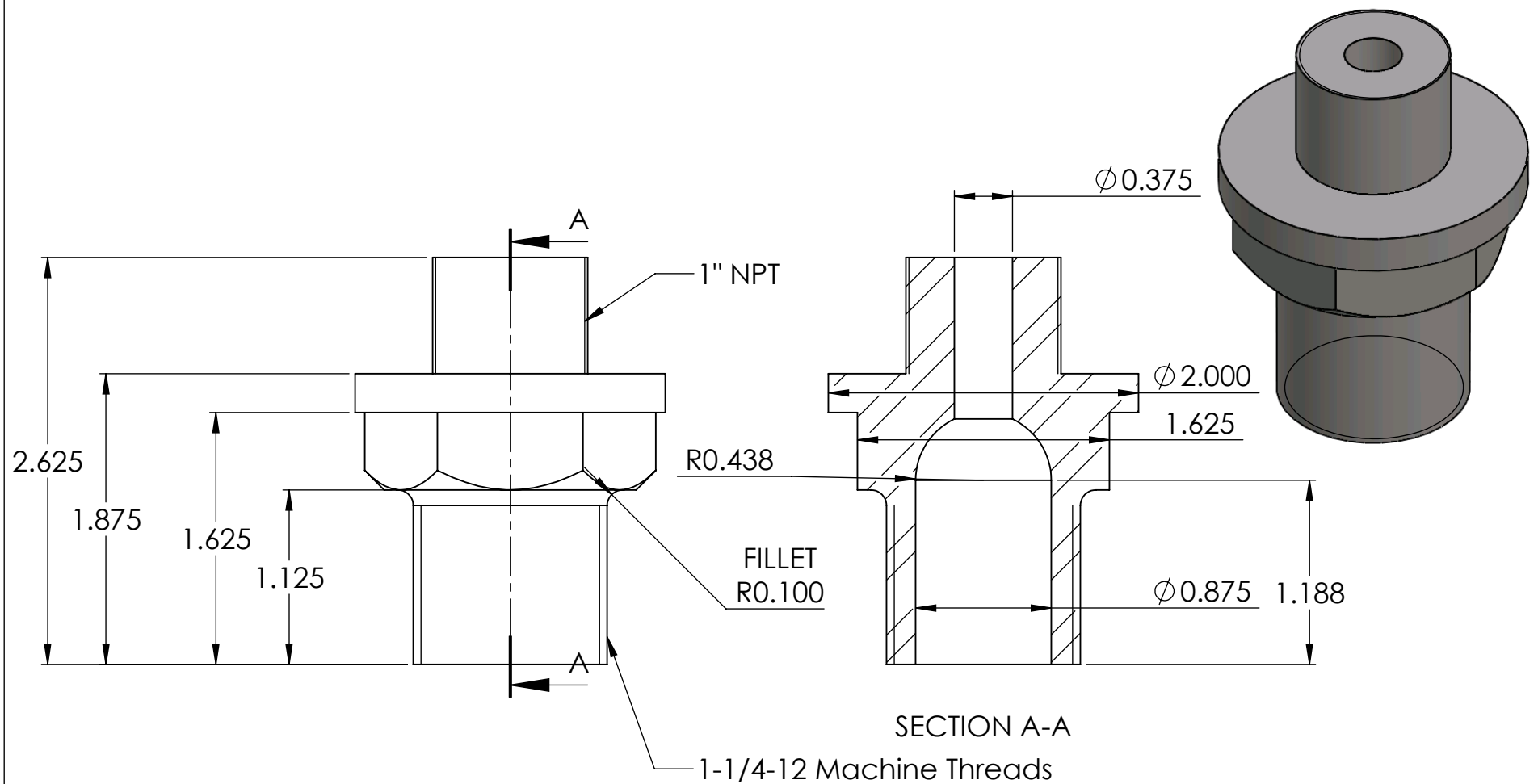
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Top for Cylinder Packing Gland		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 3-06	QTY: 1
FILE NAME: Packing Gland 2.SLDPR1		SCALE: 1:2		SHEET: 36 OF 75	




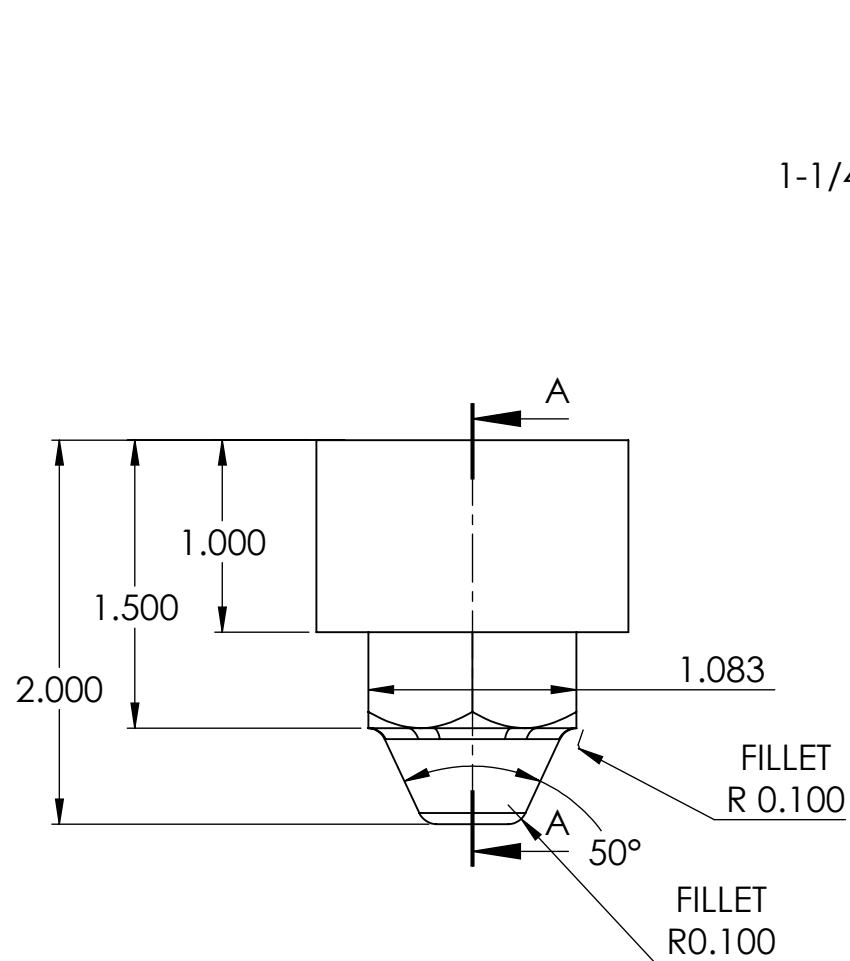
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Packing for Cylinder		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY: Andrew Engel	DATE: 5/3/2012		
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		FILE NAME: Packing.SLDPR	SCALE: 2:1	SHEET: 37 OF 75	

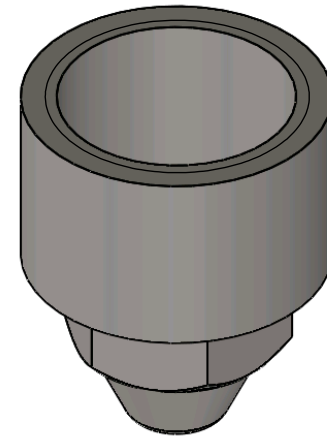
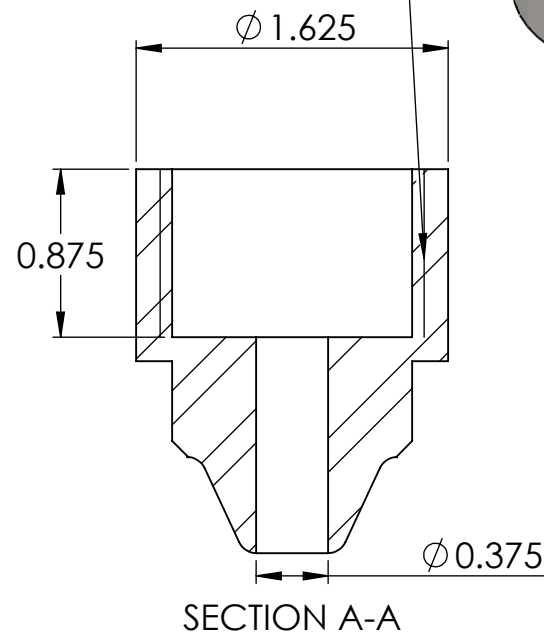


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
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Packing Gland Top		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'	CHECKED BY: Andrew Engel	DATE: 5/2/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/27/2012	PART #: 3-08	QTY: 1
		FILE NAME: packing gland top.SLDPRT		SCALE: 1:1	SHEET: 38 OF 75

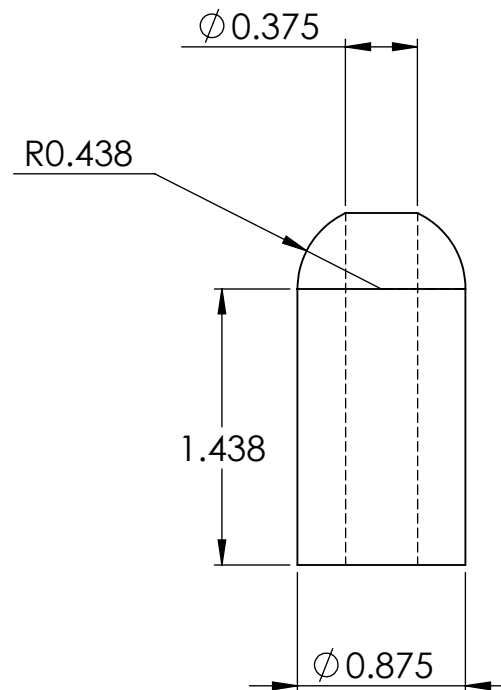
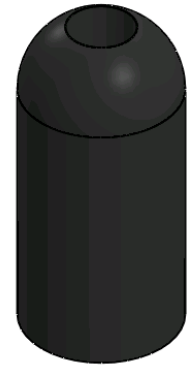


1-1/4-12 Machine Threads




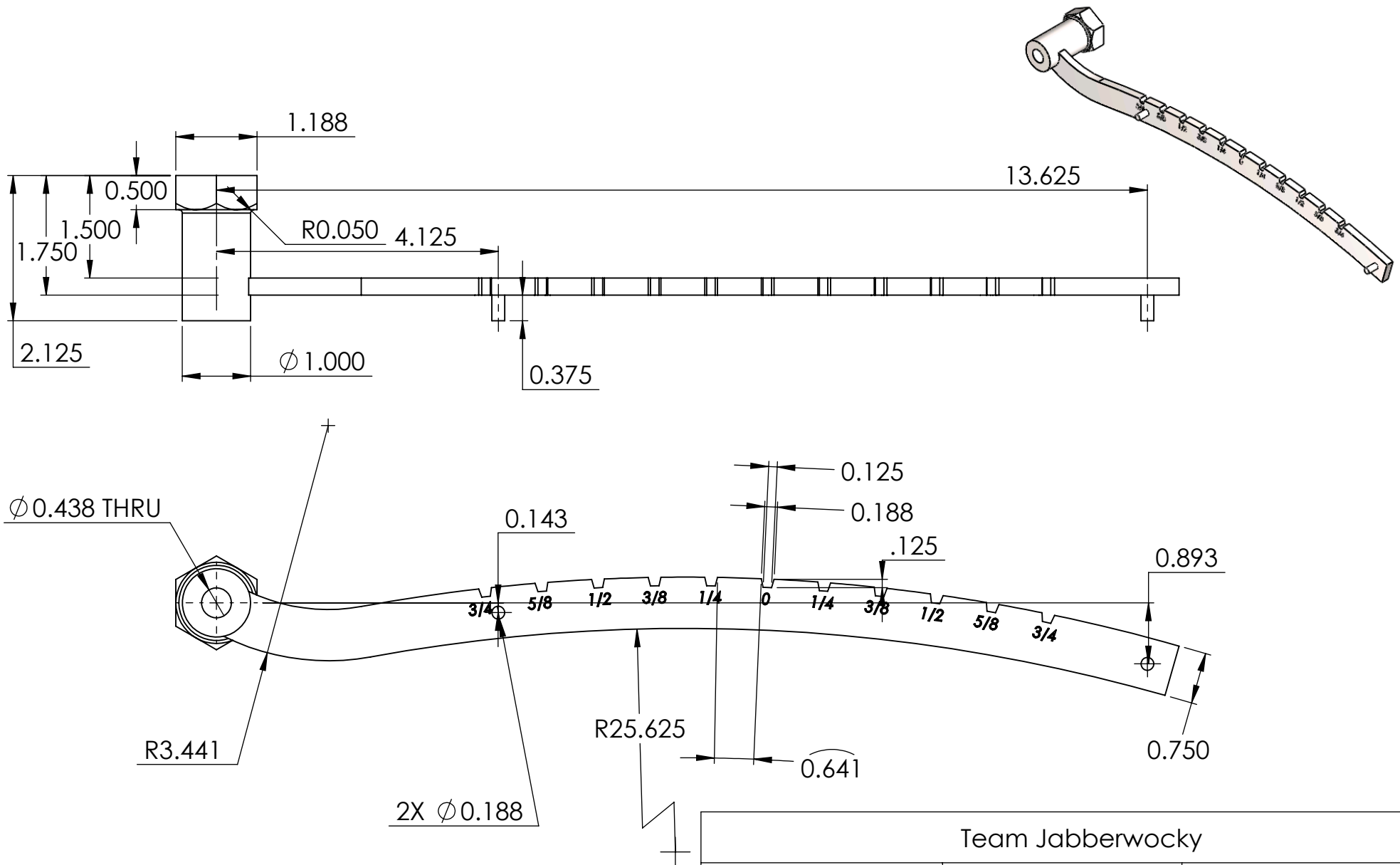
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Packing Gland Bottom		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/2/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/27/2012	PART #: 3-09	QTY: 1
		FILE NAME: Packing Gland bottom.SLDPRT	SCALE: 1:1	SHEET: 39 OF 75	



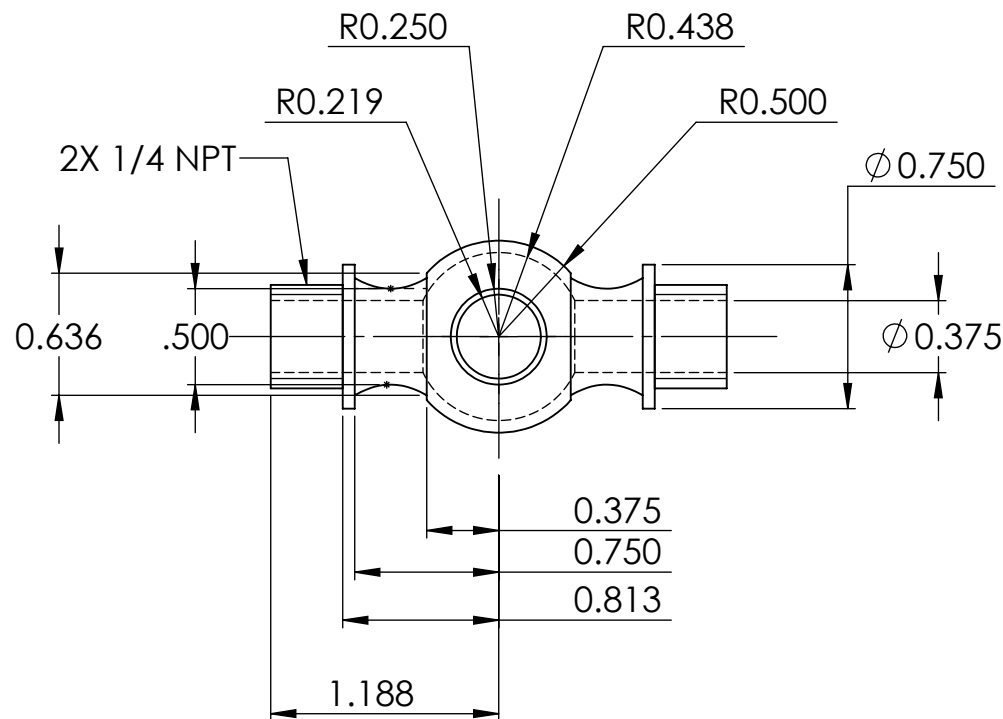
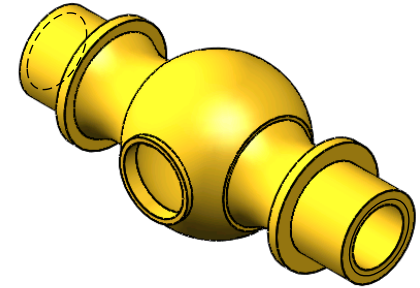
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		MATERIAL: BUTYL			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Packing		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/2/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/27/2012	PART #: 3-10	QTY: 1
		FILE NAME: stephenson packing.SLDPR		SCALE: 1:1	SHEET: 40 OF 75




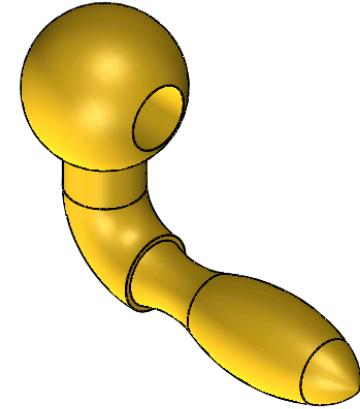
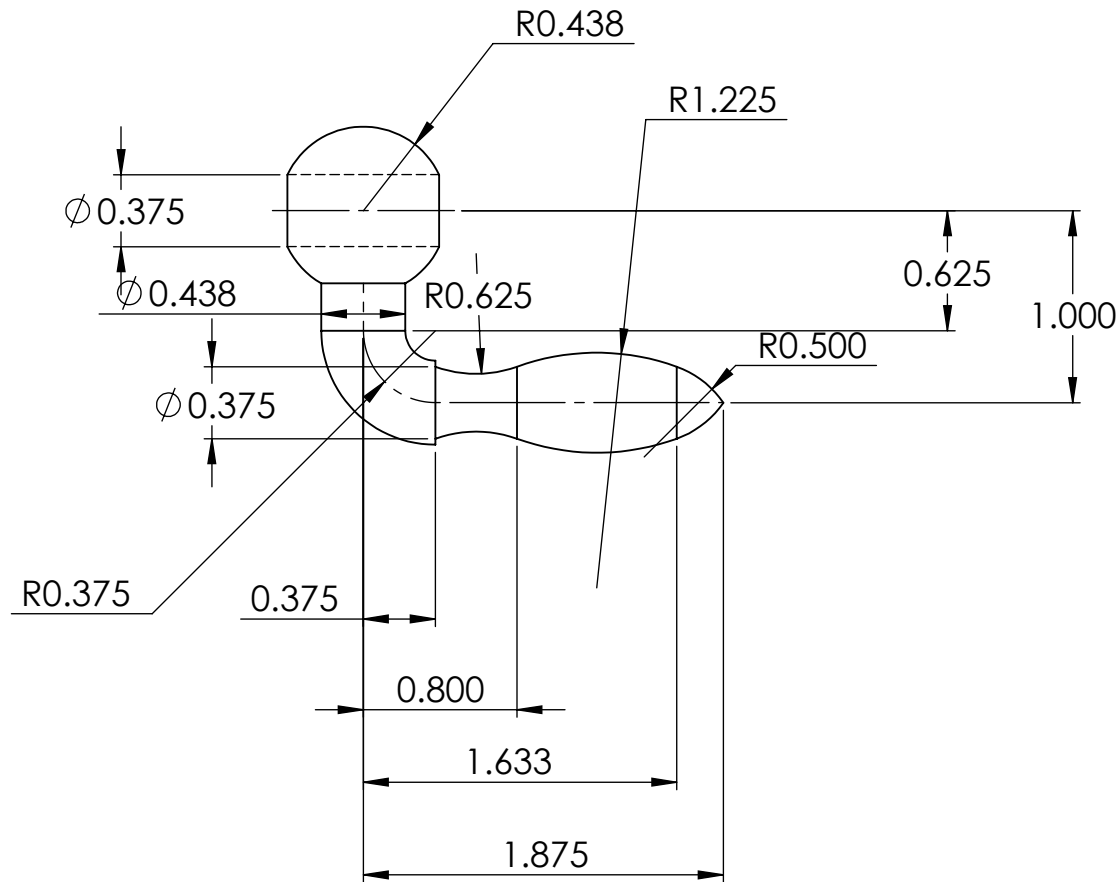
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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Speed Indicator CHECKED BY: Andrew Engel DATE: 5/2/2012 DRAWN BY: Jeremiah Schroeder DATE: 5/2/2012 FILE NAME: speed indicator.SLDPR		MATERIAL: Cast Alloy Steel UNIVERSITY OF IDAHO ME DEPARTMENT PART #: 3-11 QTY: 1 SCALE: 1:2 SHEET: 41 OF 75	



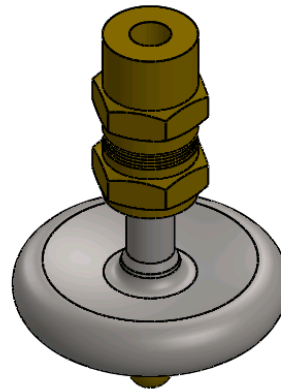
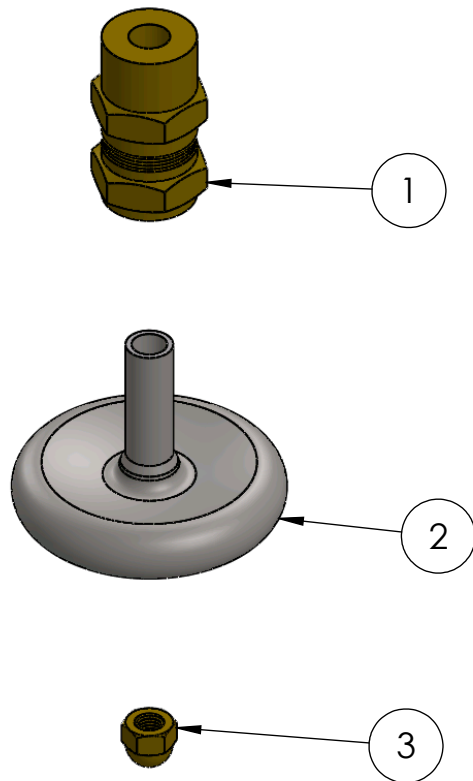
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		MATERIAL: Brass			
DEFAULT TOLERANCES:		DESCRIPTION: Drain Cock		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/2/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 5/3/2012	PART #: 3-12	QTY: 1
		FILE NAME: Draincock.SLDPRT	SCALE: 1:1	SHEET: 42 OF 75	



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				MATERIAL: Brass	
DEFAULT TOLERANCES: LINEAR: X. \pm .25 X.X \pm .1 X.XX \pm .01 X.XXX \pm .002		ANGULAR: X. \pm 2 X.X \pm 1 X.XX \pm 0 30'		DESCRIPTION: Drain Cock Handle	
		CHECKED BY: Andrew Engel		DATE: 5/2/2012	
		DRAWN BY: Jeremiah Schroeder		DATE: 5/3/2012	
		FILE NAME: Draincockhandle.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 3-13		QTY: 1	
		SCALE: 1:1		SHEET: 43 OF 75	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO
1	3-13-01	Pressure Valve Threaded Pipe	1	45
2	3-13-02	Pressure Valve	1	47
3	3-13-03	Acorn Nut 5/16"-24	1	---

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

Marine Engine
Project

MATERIAL:

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30°

DESCRIPTION: Pressure Valve SubAssembly

CHECKED BY: Andrew Engel

DATE: 5/3/2012

DRAWN BY: Will Edwards

DATE: 5/3/2012

FILE NAME: Pressure Valve Assembly.SLDASM

**UNIVERSITY OF IDAHO
ME DEPARTMENT**

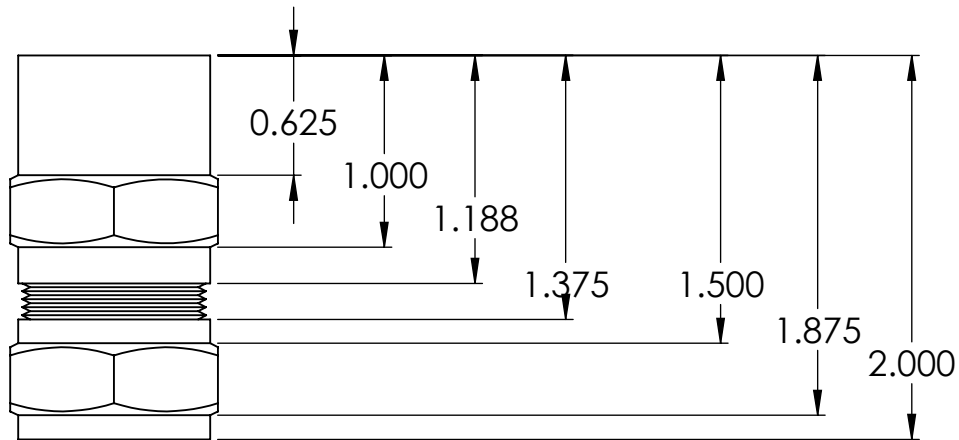
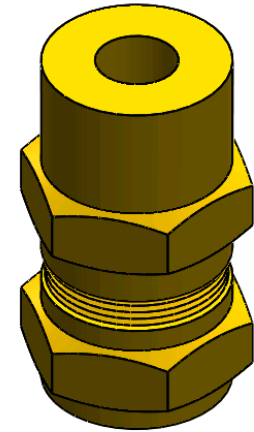
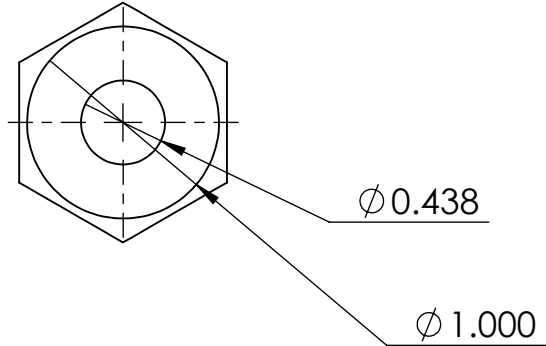
PART #: 3-13

QTY: 2


SCALE: 1:2

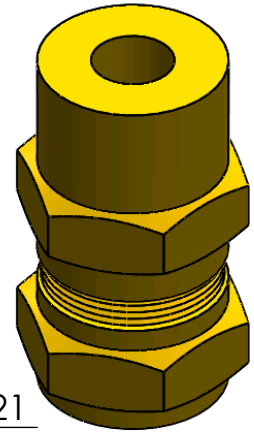
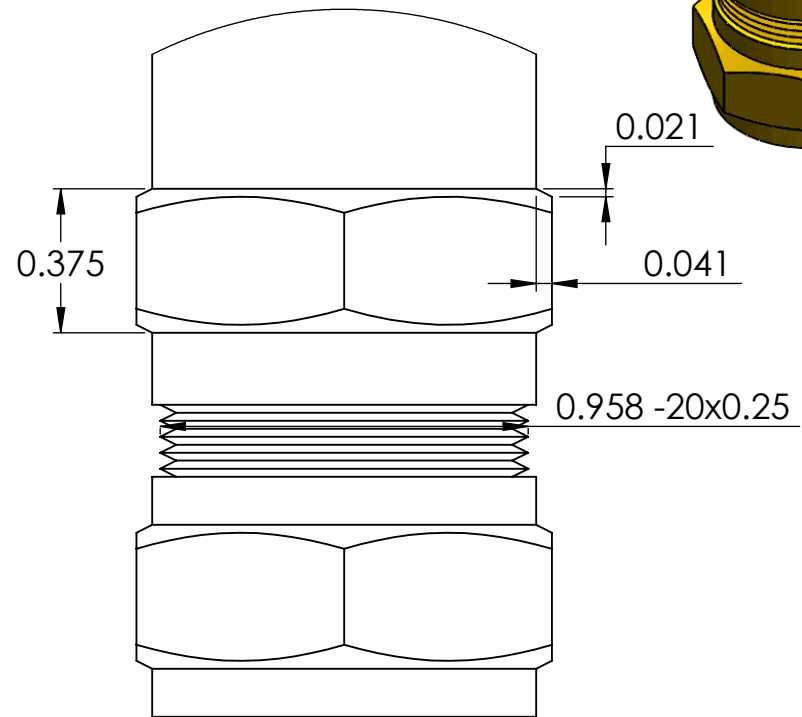
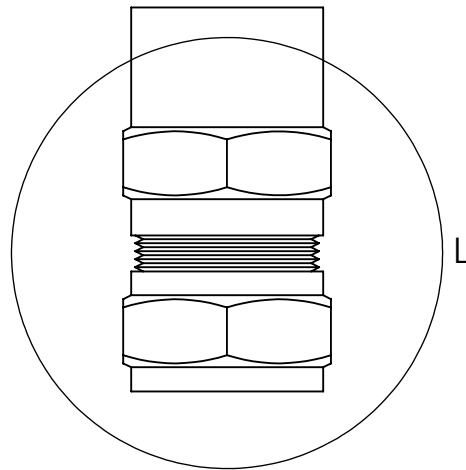
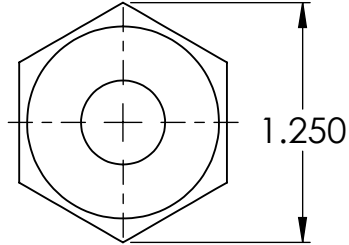
SHEET: 44 OF 75

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		MATERIAL: Brass			
DEFAULT TOLERANCES:		DESCRIPTION: Pressure Valve Pipe		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		CHECKED BY: Jeremiah Schroeder			
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'		DATE: 5/3/2012			
		DRAWN BY: Andrew Engel		PART #: 3-13-01	
		DATE: 5/3/2012		QTY: 2	
		FILE NAME: Pressure Valve Threaded Pipe.SLDPR		SCALE: 1:2	
				SHEET: 45 OF 75	



DETAIL L
SCALE 2 : 1

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL: Brass

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30°

DESCRIPTION: Pressure Valve Pipe

CHECKED BY: Jeremiah Schroeder DATE: 5/3/2012

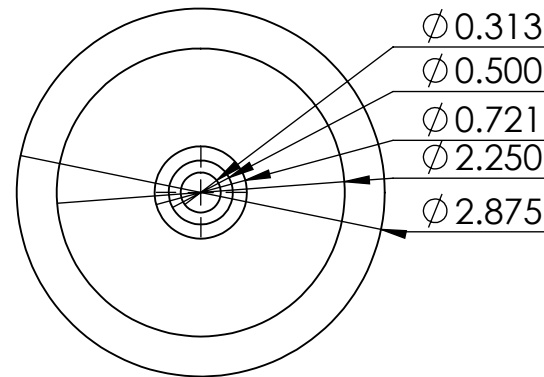
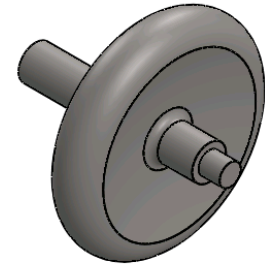
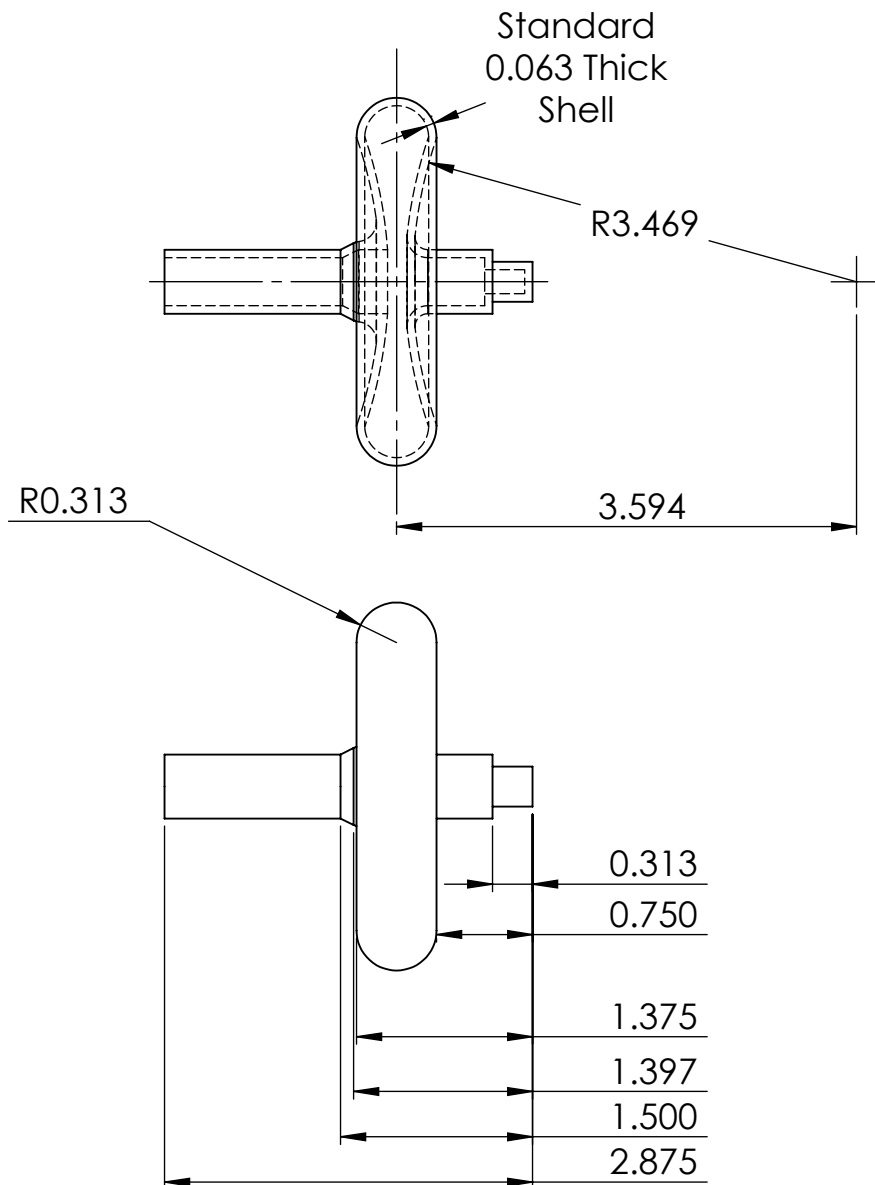
DRAWN BY: Andrew Engel DATE: 5/3/2012

FILE NAME: Pressure Valve Threaded Pipe.SLDPR


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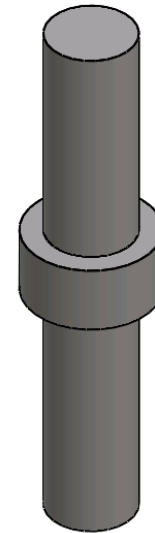
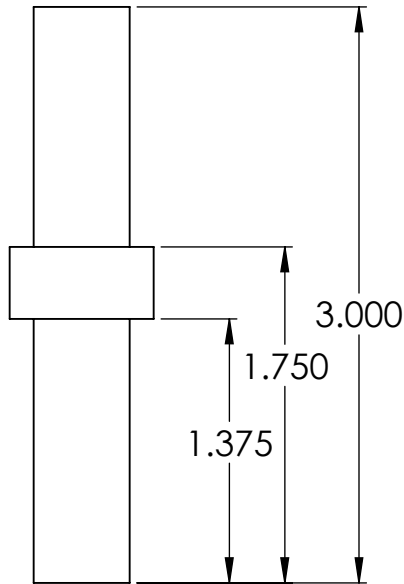
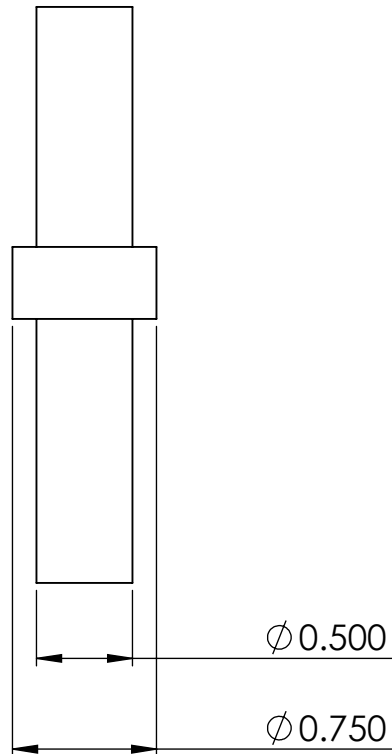
PART #: 3-13-01 QTY: 2

SCALE: 1:2 SHEET: 46 OF 75




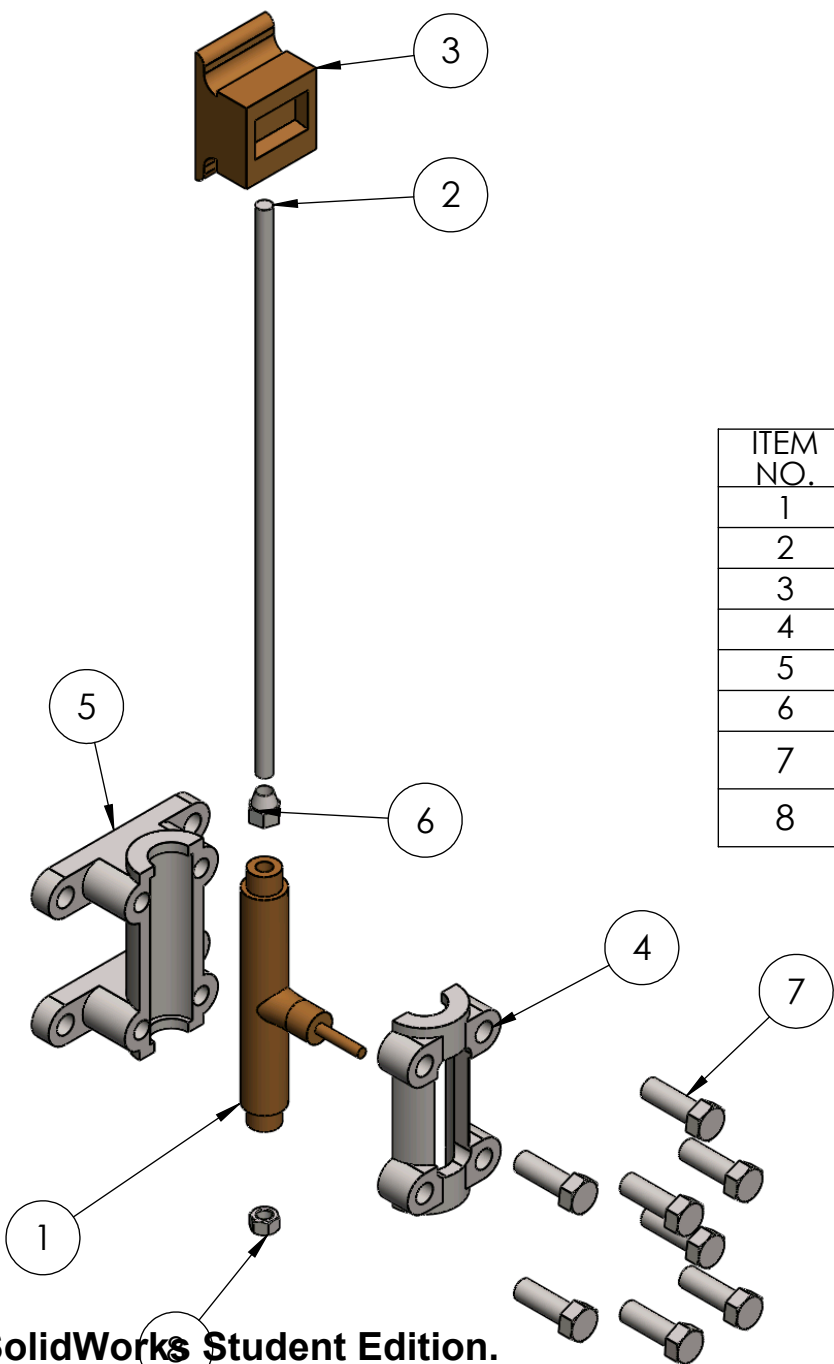
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Pressure Valve		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY: Jeremiah Schroeder	DATE: 5/3/2012		
		DRAWN BY: Andrew Engel	DATE: 5/3/2012	PART #: 3-13-02	QTY: 2
FILE NAME: Pressure Valve.SLDPRT		SCALE: 1:1.5		SHEET: 47 OF 75	




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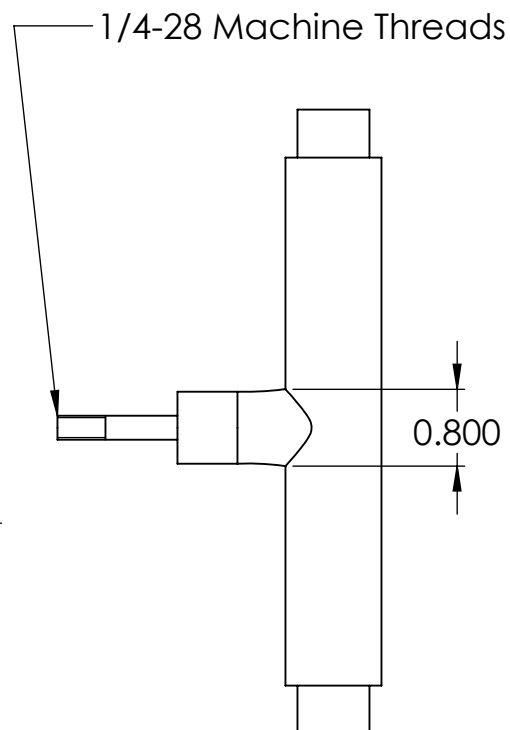
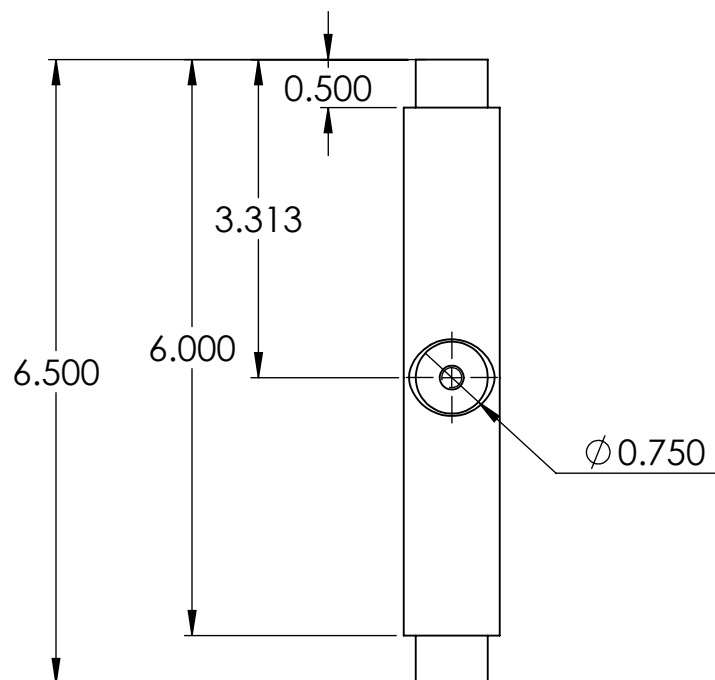
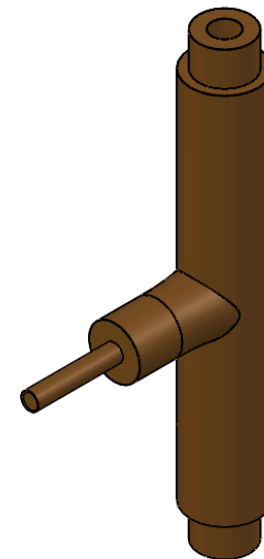
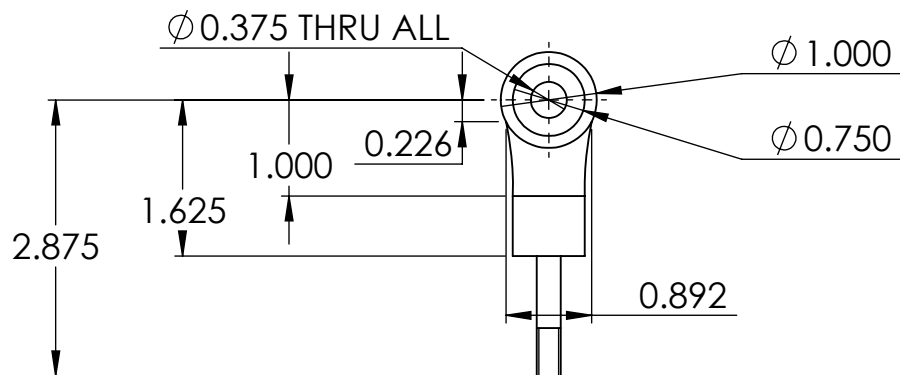
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Cylinder Packing Studs		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 5/2/2012		
		DRAWN BY: Andrew Engel	DATE: 5/3/2012	PART #: 3-15	QTY: 2
		FILE NAME: Packing Stud.SLDPRT		SCALE: 1:1	SHEET: 48 OF 75




ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO
1	4-01	Valve Rod Actuator	1	50
2	4-02	Valve Rod	1	51
3	4-03	Slide Valve	1	52
4	4-04	Sliding Block Front Piece	1	53
5	4-05	Sliding Block Rear Piece	1	54
6	4-06	Stephenson Valve Fastener	1	55
7	4-07	1/2-20-1.5 Hex Bolt	8	---
8	4-08	3/8-24 Hex Nut	1	---

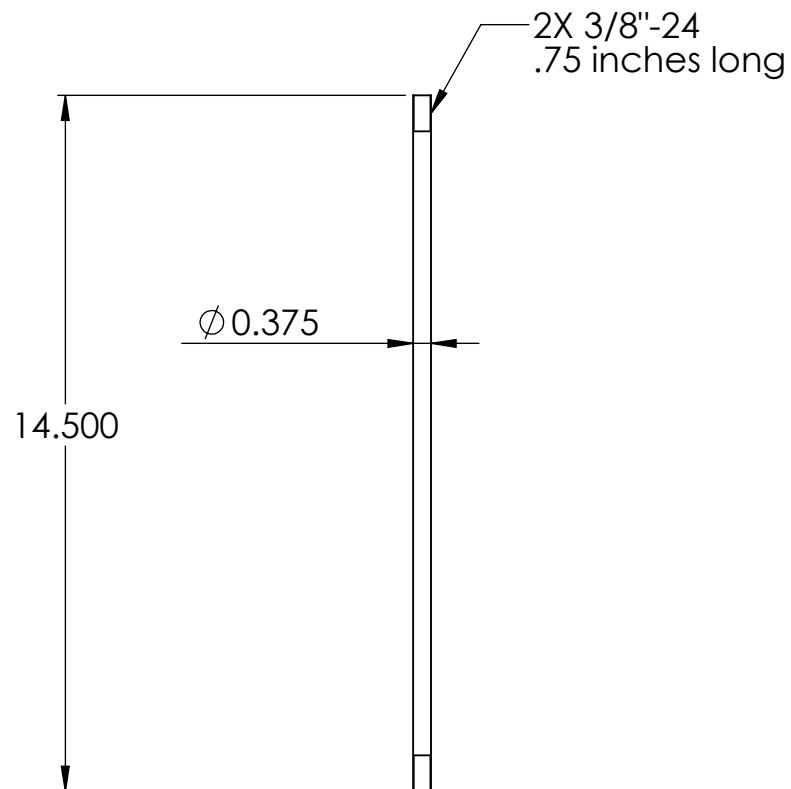
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DEFAULT TOLERANCES:		DESCRIPTION: Handle Sub Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012	PART #: 4-00	QTY: 1
		DRAWN BY: Jeremiah Schroeder	DATE: 5/3/2012	SCALE: 1:4	SHEET: 49 OF 75
		FILE NAME: Valve Assembly.SLDASM			



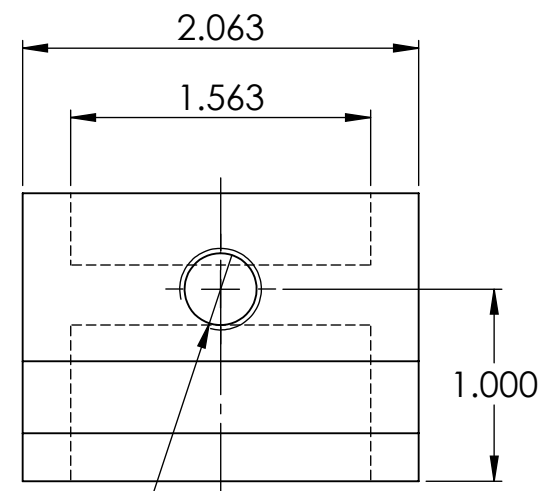
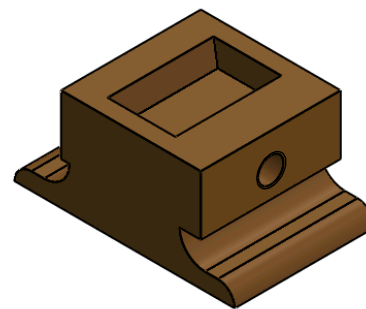
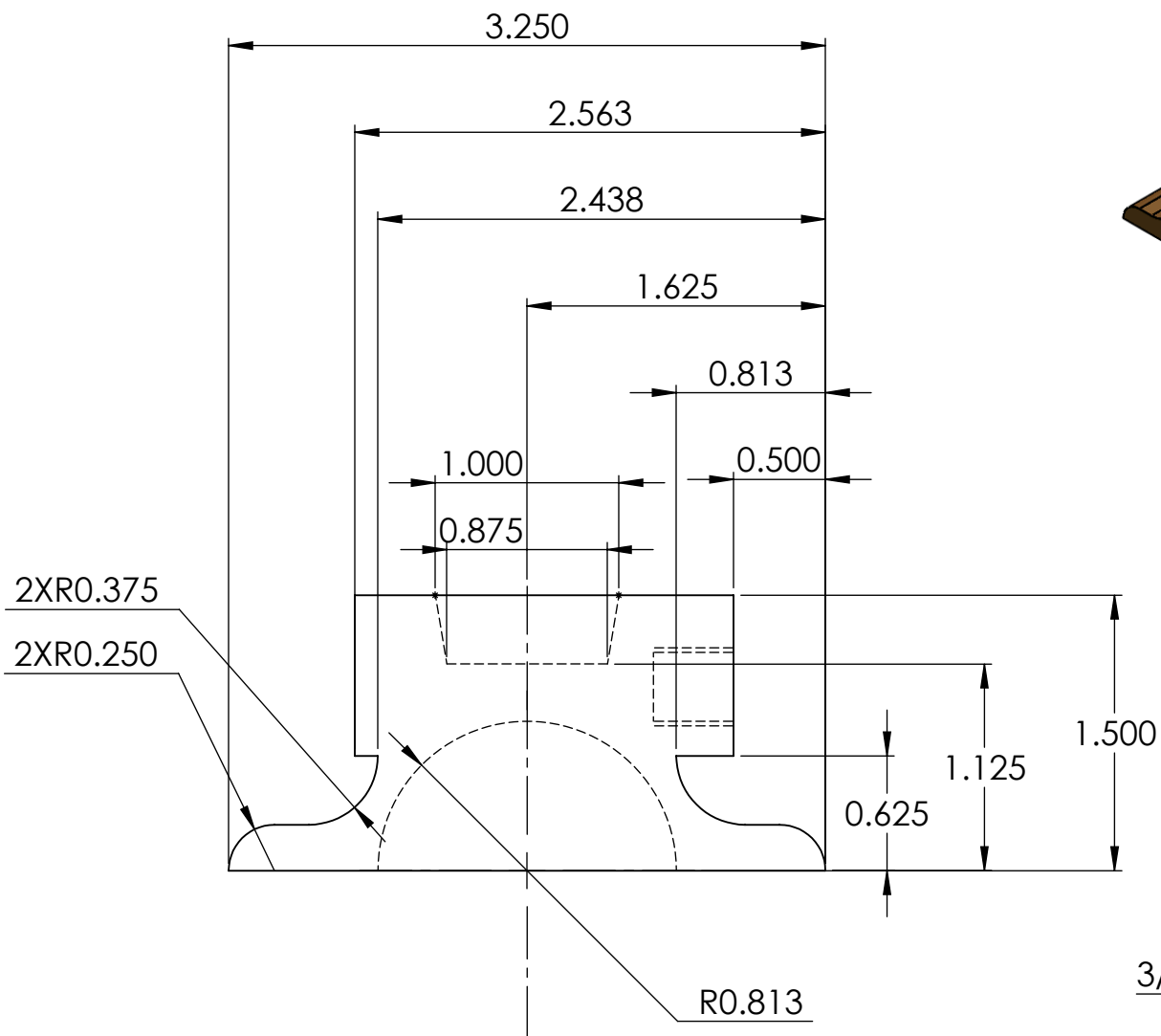
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		MATERIAL: Aluminum Bronze			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Rod Actuator		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 5/1/2012	PART #: 4-01	QTY: 1
		FILE NAME: Valve Rod Actuator.SLDPRT		SCALE: 1:2	SHEET: 50 OF 75



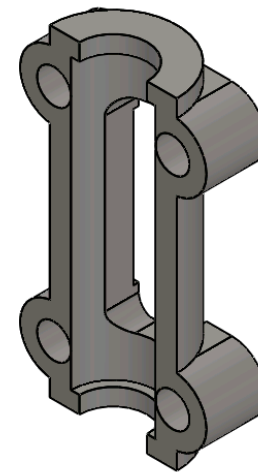
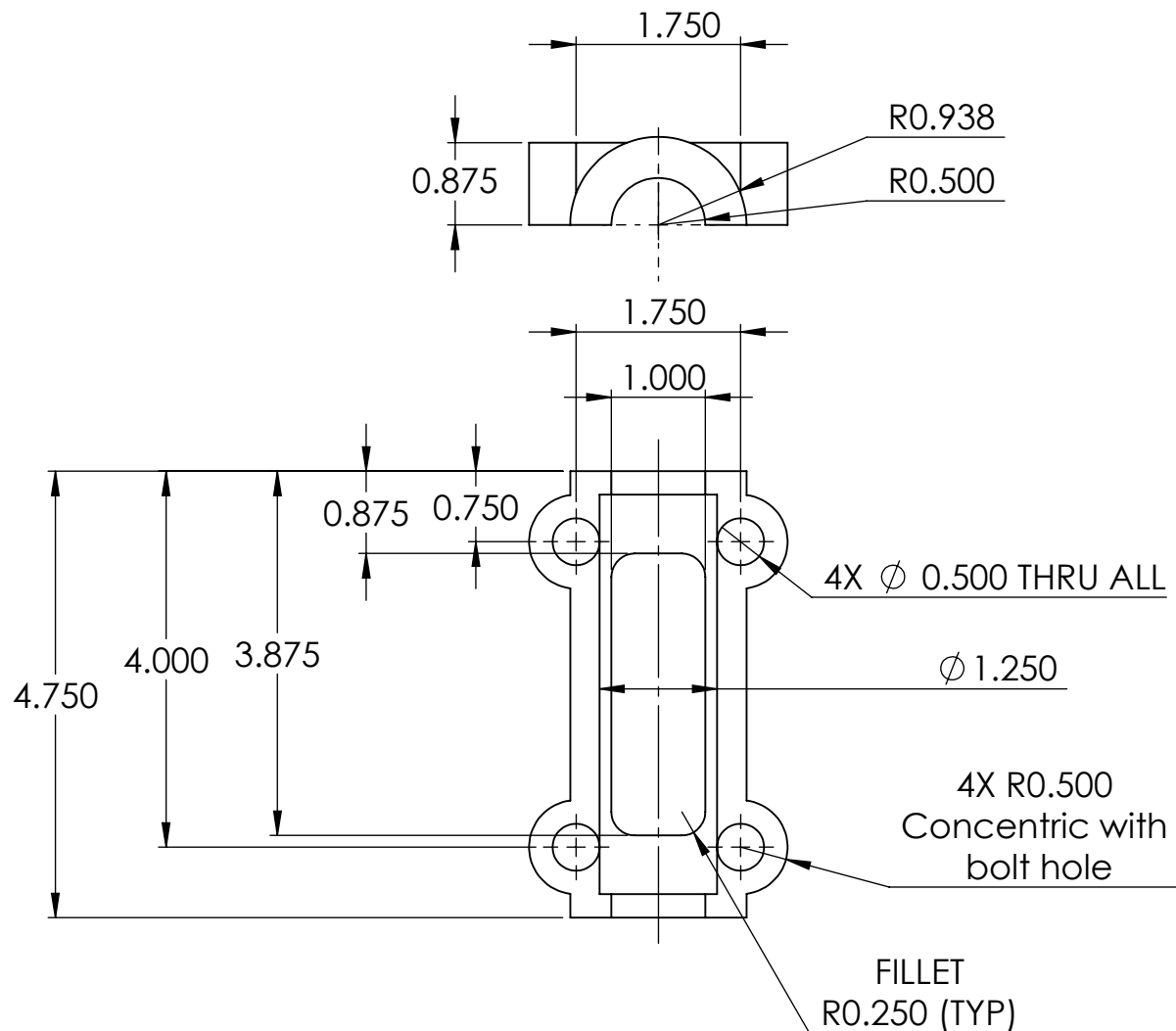
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		MATERIAL: Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Valve Rod		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/25/2012	PART #: 4-02	QTY: 1
		FILE NAME: valve rod.SLDPRT		SCALE: 1:4	SHEET: 51 OF 75




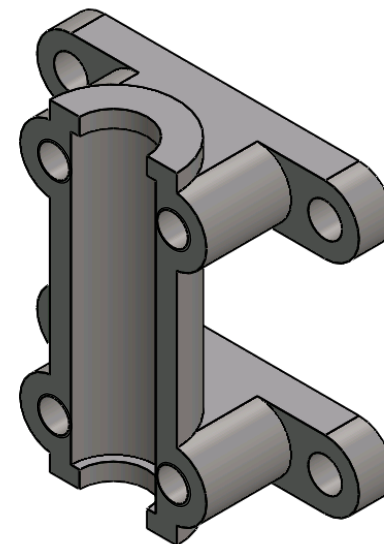
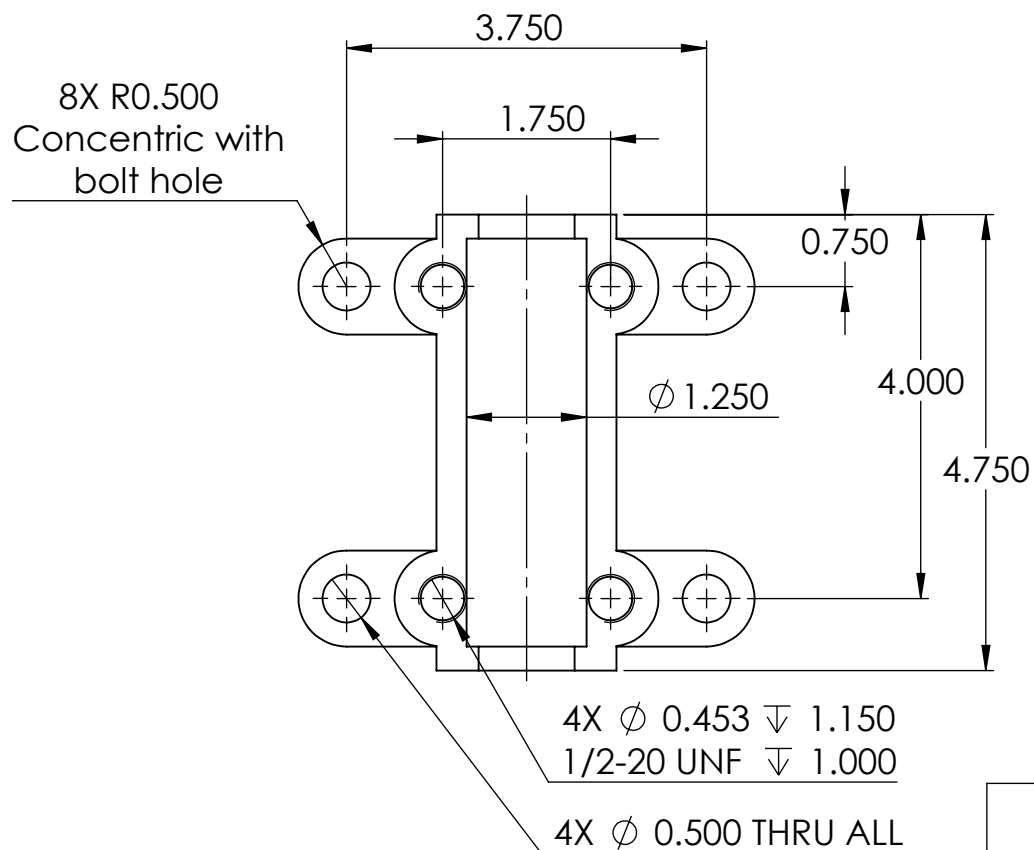
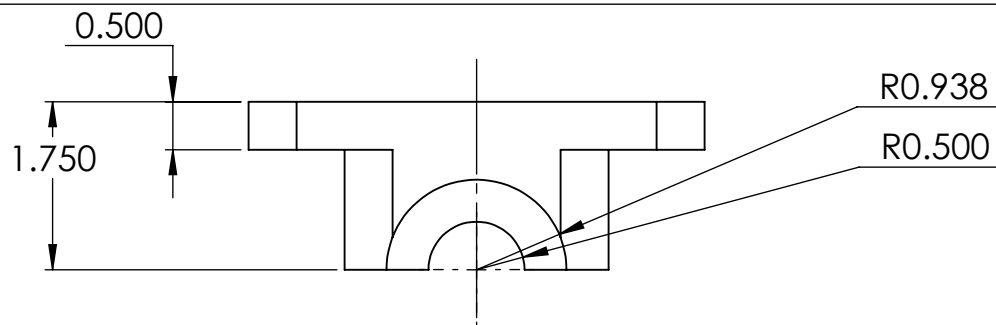
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		MATERIAL: Aluminum Bronze			
DEFAULT TOLERANCES:		DESCRIPTION: Slide Valve		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/25/2012	PART #: 4-03	QTY: 1
		FILE NAME: Slide Valve.SLDPRT		SCALE: 1:1	SHEET: 52 OF 75



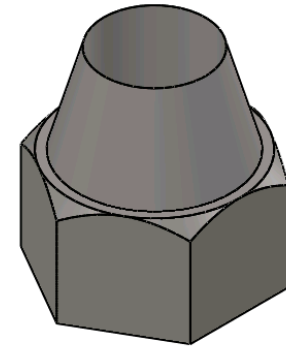
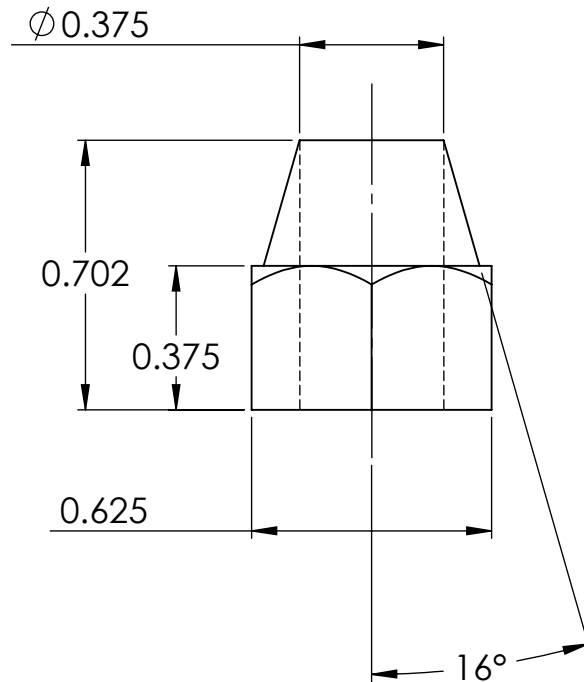
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Sliding Block Front Piece		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/26/2012	PART #: 4-04	QTY: 1
		FILE NAME: Sliding block front.SLDPRT		SCALE: 1:2	SHEET: 53 OF 75




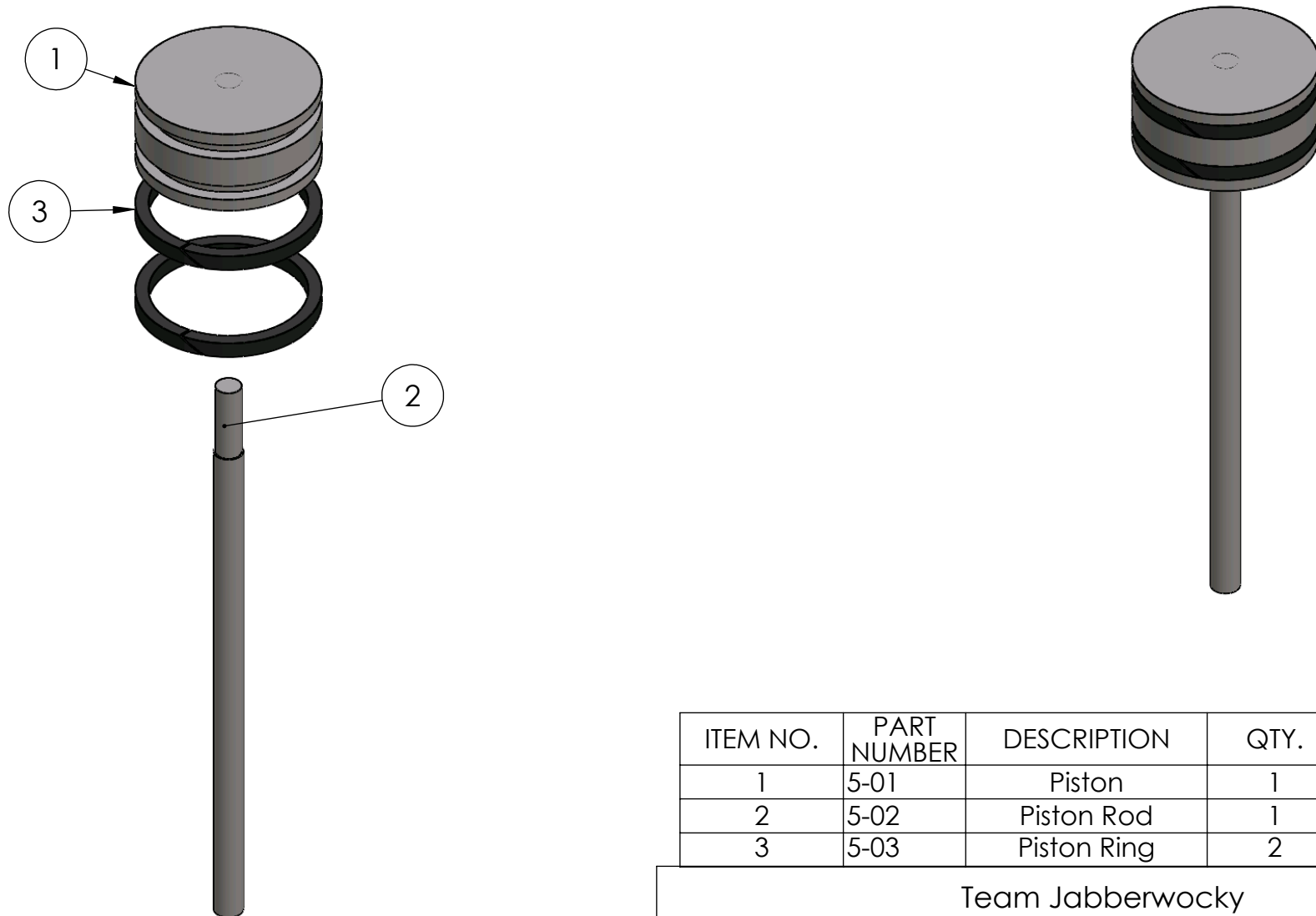
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Sliding Block Rear Piece		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/1/2012		
		DRAWN BY: Jeremiah Schroeder	DATE: 4/25/2012	PART #: 4-05	QTY: 1
FILE NAME: sliding block back.SLDPR		SCALE: 1:2		SHEET: 54 OF 75	



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				MATERIAL: Aluminum	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		DESCRIPTION: Stephenson Valve Fastener	
		CHECKED BY: Andrew Engel		DATE: 5/2/2012	
		DRAWN BY: Jeremiah Schroeder		DATE: 5/1/2012	
		FILE NAME: fastener.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 4-06		QTY: 1	
		SCALE: 2:1		SHEET: 55 OF 75	



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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	5-01	Piston	1	57
2	5-02	Piston Rod	1	58
3	5-03	Piston Ring	2	59

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION 

MATERIAL:

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30'

DESCRIPTION: Piston Assembly

CHECKED BY: Andrew Engel

DATE: 5/1/2012

DRAWN BY: Will Edwards

DATE: 5/3/2012

FILE NAME: Piston Assembly.SLDASM

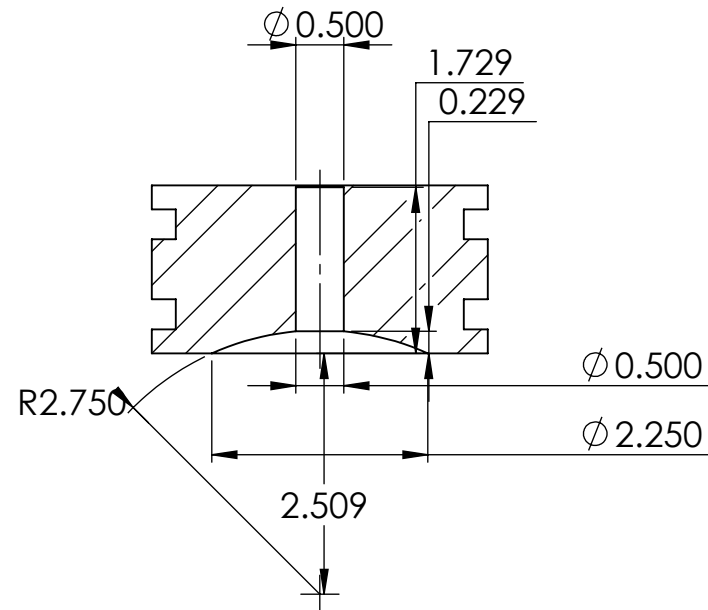
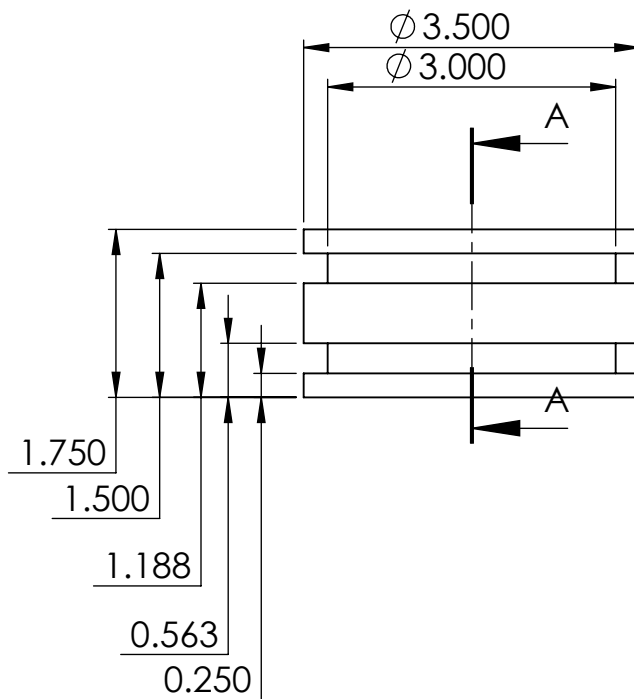
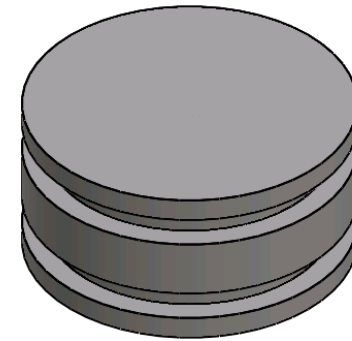
**UNIVERSITY OF IDAHO
ME DEPARTMENT**

PART #: 5-00

QTY: 1


SCALE: 1:3

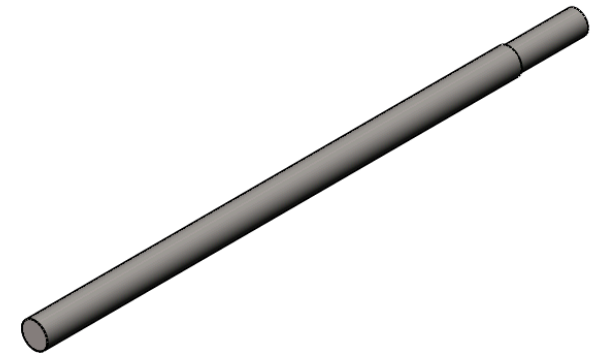
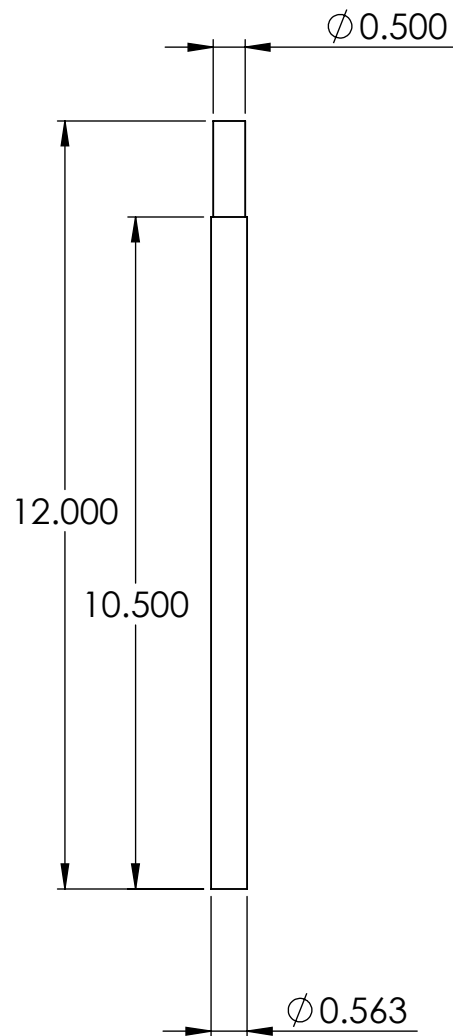
SHEET: 56 OF 75




SECTION A-A

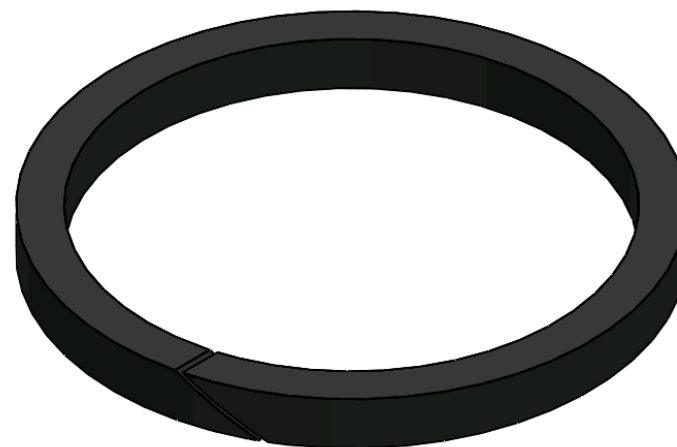
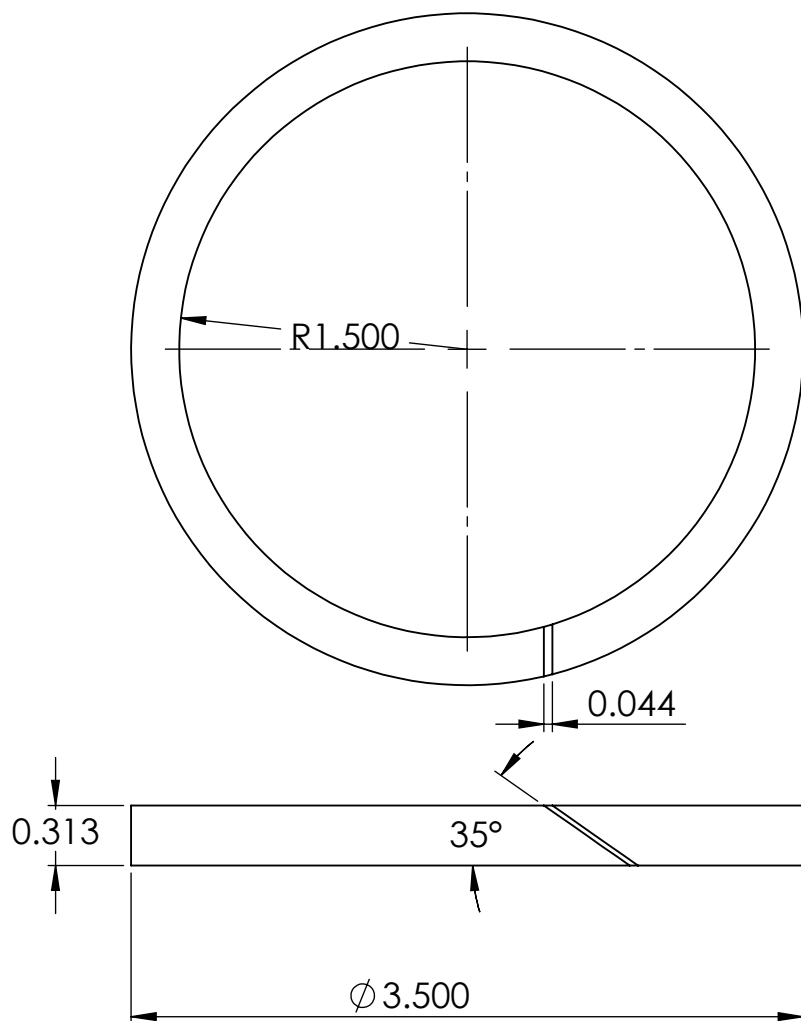
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Piston		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		CHECKED BY: XXXXXXXXXX DATE: 5/1/2012 DRAWN BY: Will Edwards DATE: 5/3/2012 FILE NAME: Piston.SLDPRT			
ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°				PART #: 5-01 QTY: 1 SCALE: 1:2 SHEET: 57 OF 75	




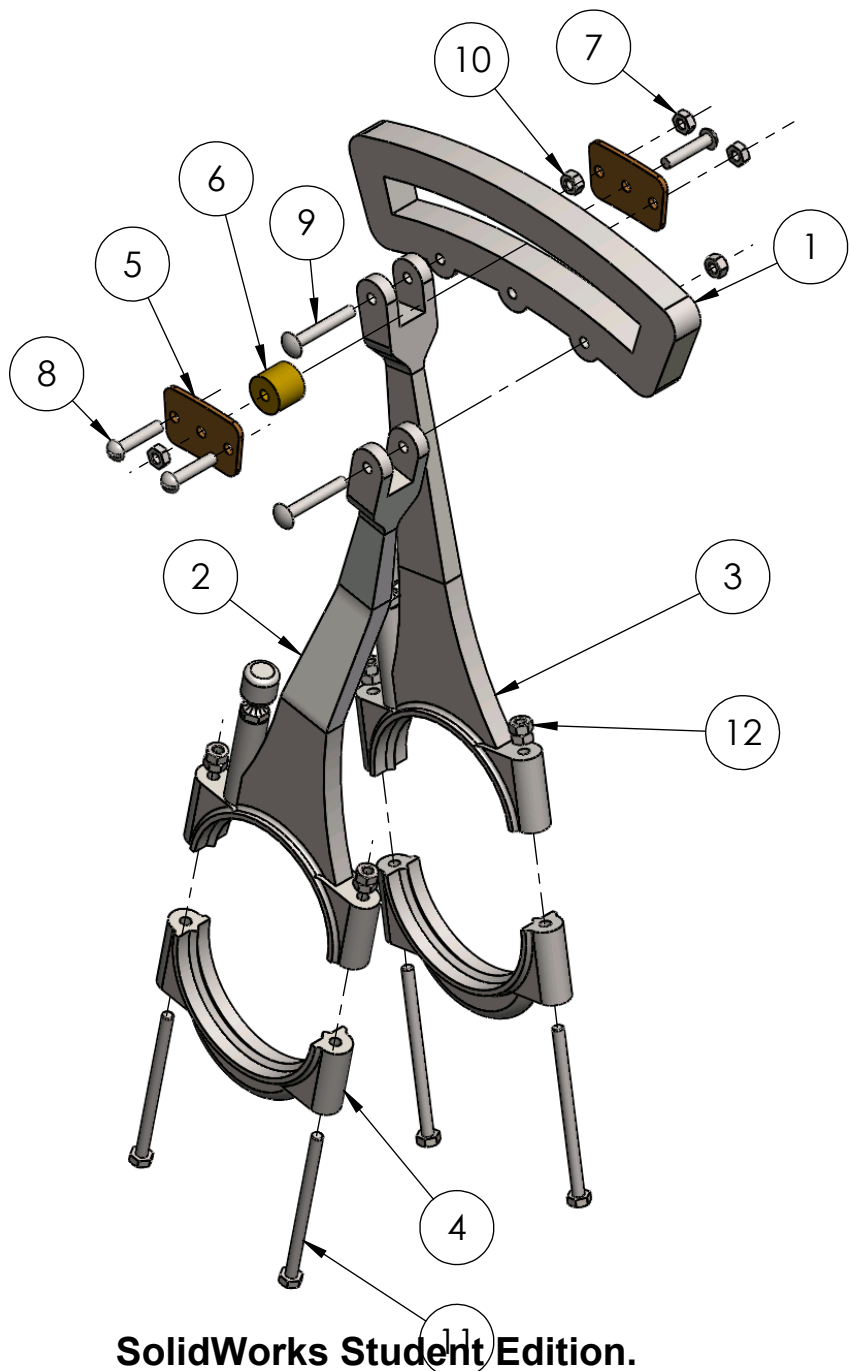
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Piston Rod		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Will Edwards	DATE: 5/3/2012	PART #: 5-02	QTY: 1
		FILE NAME: Piston Rod.SLDPRT		SCALE: 1:3	SHEET: 58 OF 75



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		MATERIAL: Cast Iron					
DEFAULT TOLERANCES:		DESCRIPTION: Piston Ring			UNIVERSITY OF IDAHO ME DEPARTMENT		
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY: Andrew Engel		DATE: 5/3/2012			
		DRAWN BY: Will Edwards		DATE: 5/3/2012			
		FILE NAME: Piston Ring.SLDPR		PART #: 5-03			
				QTY: 2			
				SCALE: 1:1		SHEET: 59 OF 75	



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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	6-01	Link	1	61
2	6-02	Outer eccentric rod	1	62
3	6-03	Inner eccentric rod	1	64
4	6-04	Eccentric rod cap	2	66
5	6-05	Link plate	2	67
6	6-06	Link screw bearing	1	68
7	6-07	1/4-28 Machine Threaded Nut	3	---
8	6-08	1/4-28X1.25 Slotted Head Machine Screw	3	---
9	6-09	1/4-20X1.75 Round Head Bolt	2	---
10	6-10	1/4-20 Hex Nut	2	---
11	6-11	1/4-28X4 Hex Bolt	4	---
12	6-12	1/4-28 Hex Nut	8	---

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL: Various Metals

Marine Engine
Project

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30'

DESCRIPTION: Exploded view of the Stephenson Link Assembly

CHECKED BY: Andrew Engel

DATE: 5/2/2012

DRAWN BY: Christopher Pratt

DATE: 5/3/2012

FILE NAME: Stephenson Link.SLDASM

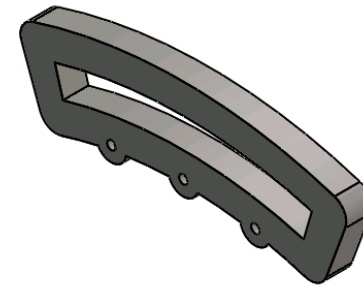
**UNIVERSITY OF IDAHO
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
PART #: 6-00

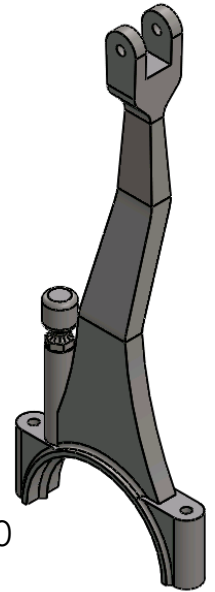
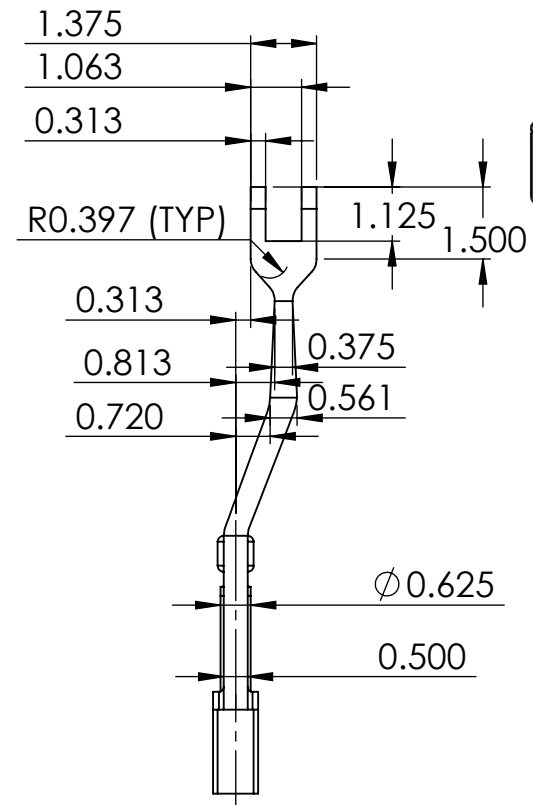
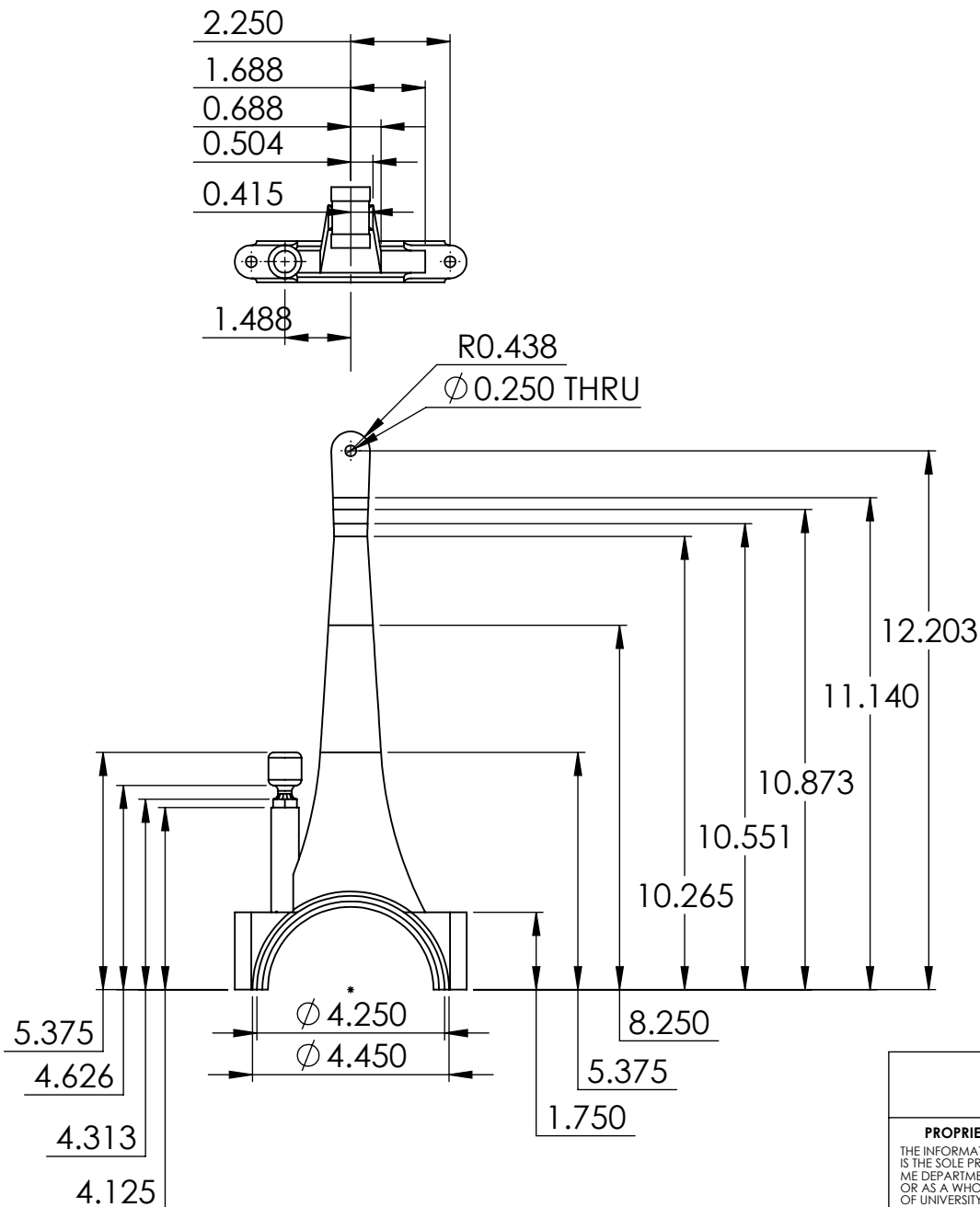
QTY: 1

SCALE: 1:4


SHEET: 60 OF 75

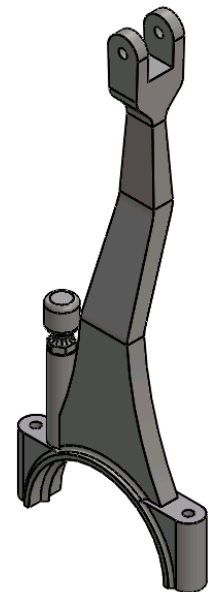
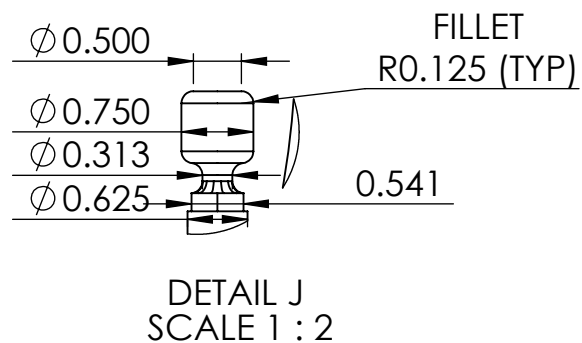
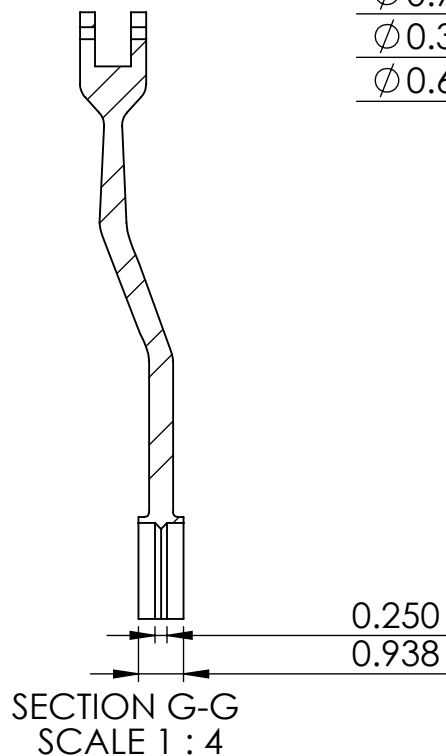
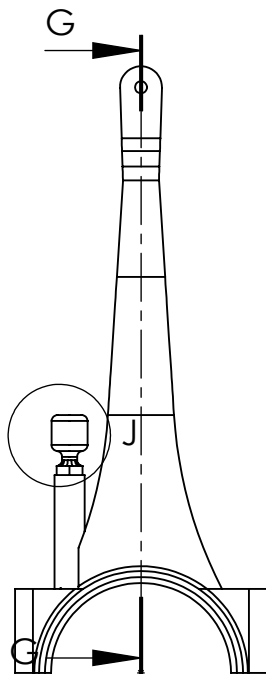
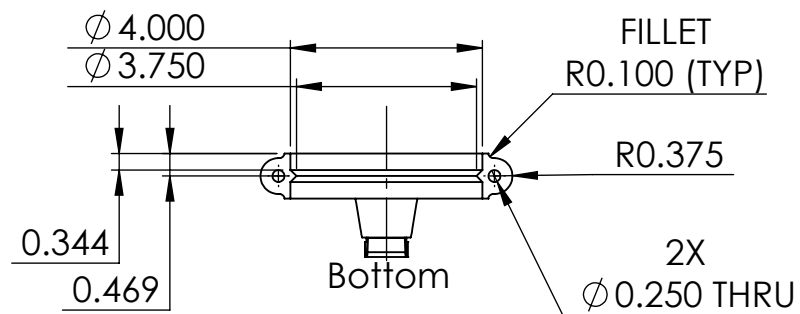


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		MATERIAL: Cast alloy steel	
Marine Engine Project			
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Links the control lever and powertrain	
ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°		CHECKED BY: Andrew Engel DATE: 5/2/2012	
DRAWN BY: Christopher Pratt		DATE: 4/25/2012	
FILE NAME: Link.SLDPRT		PART #: 6-01	
		QTY: 1	
		SCALE: 1:4	
		SHEET: 61 OF 75	
UNIVERSITY OF IDAHO ME DEPARTMENT			




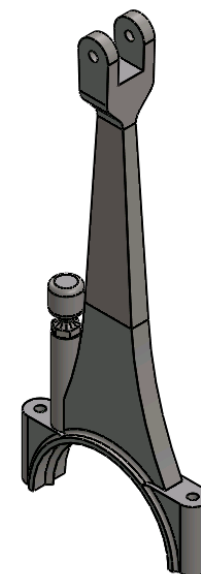
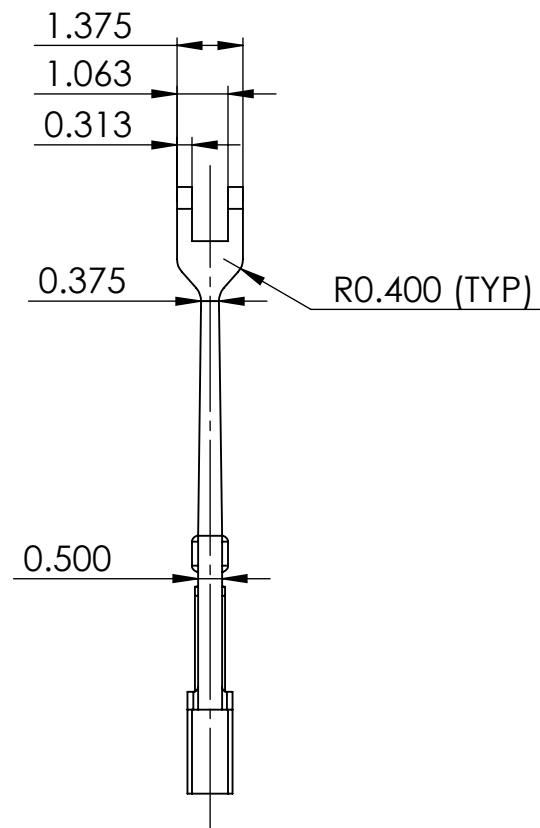
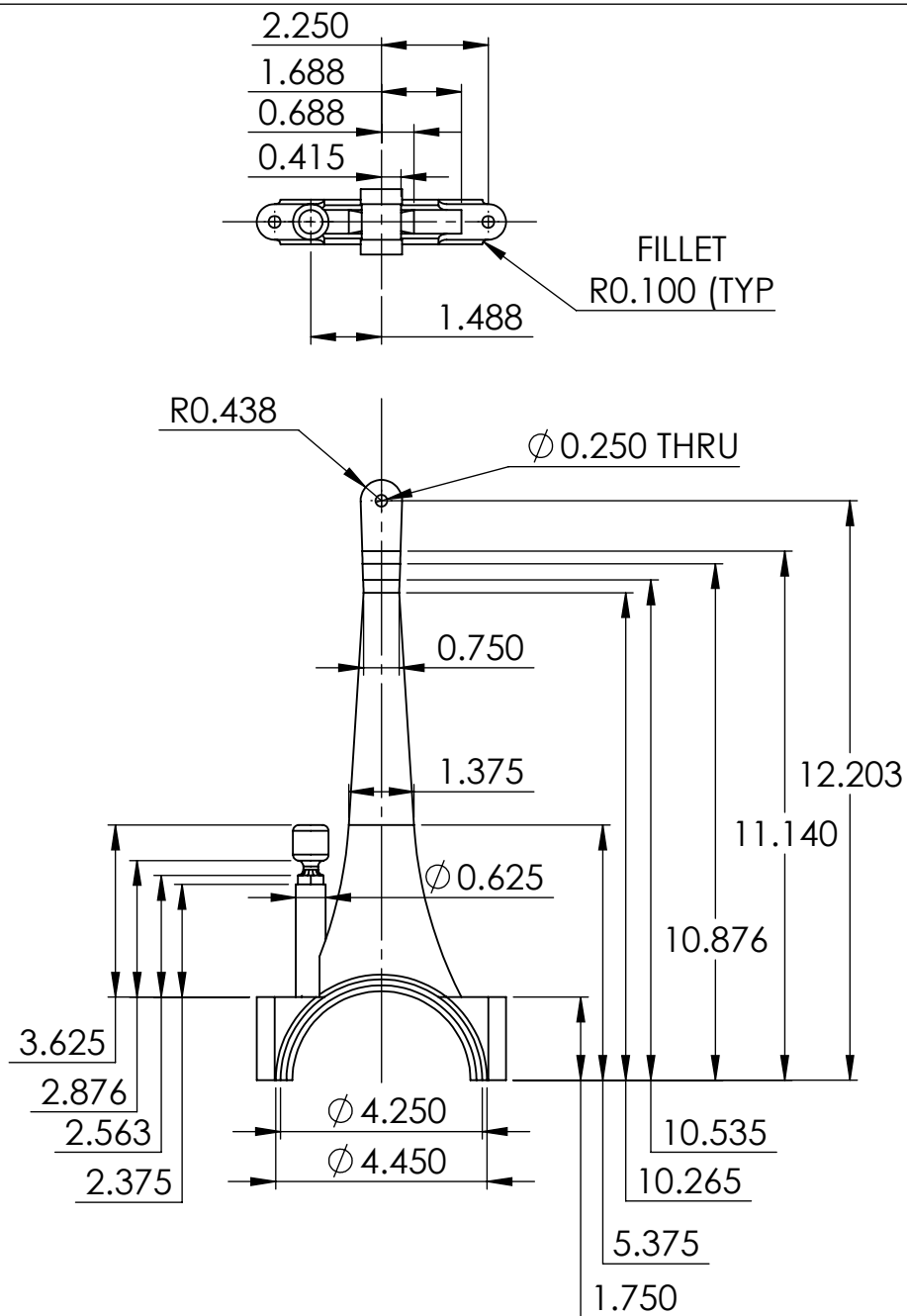
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Outer rod for powertrain and Link		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Christopher Pratt	DATE: 4/25/2012	PART #: 6-02	QTY: 1
FILE NAME: Outer eccentric rod top.SLDPR		SCALE: 1:4		SHEET: 62 OF 75	



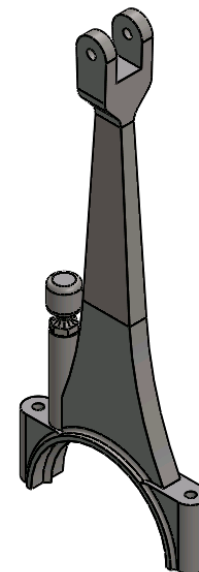
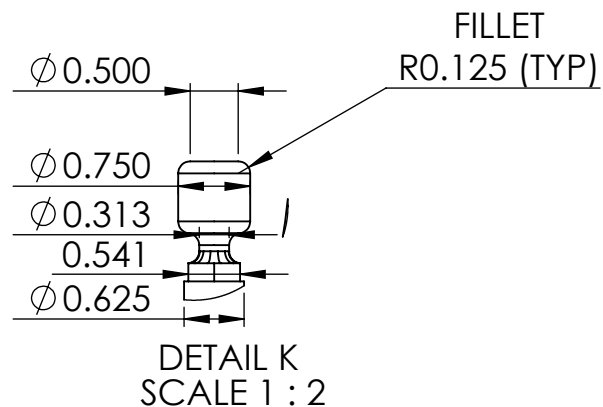
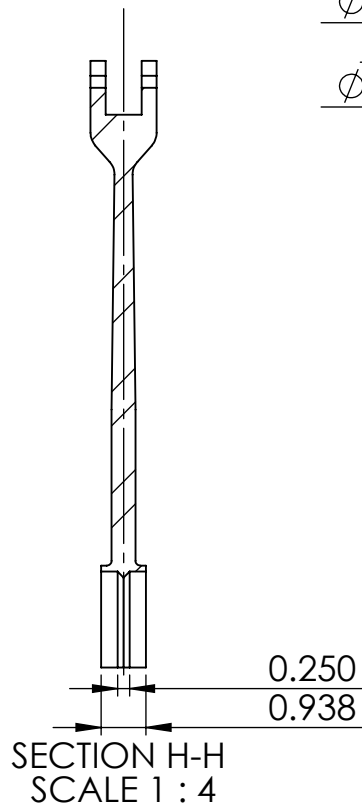
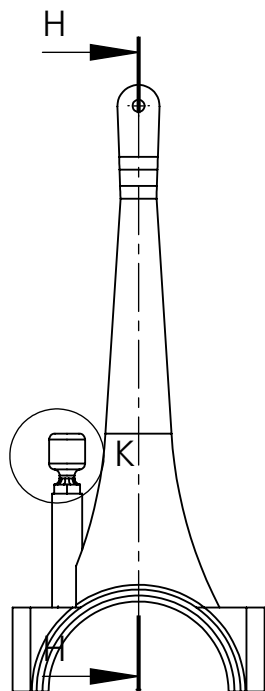
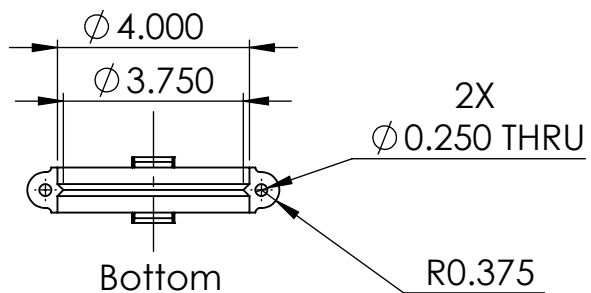
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Outer rod for powertrain and Link		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/3/2012		
		DRAWN BY: Christopher Pratt	DATE: 4/25/2012	PART #: 6-02	QTY: 1
		FILE NAME: Outer eccentric rod top.SLDPR	SCALE: 1:4	SHEET: 63 OF 75	



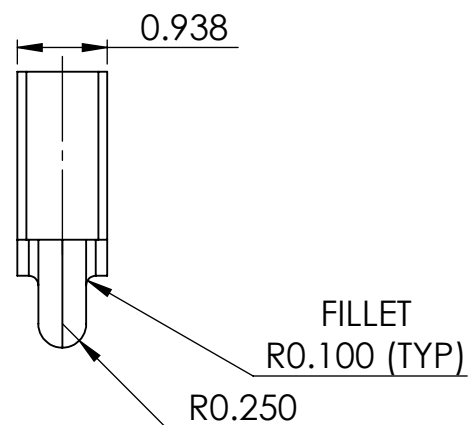
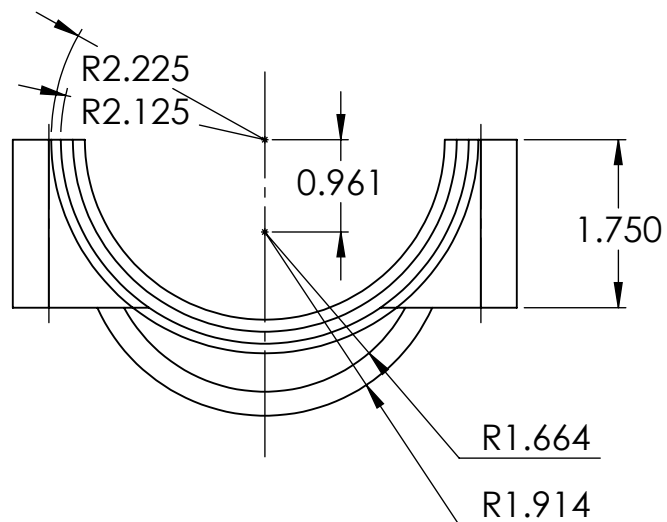
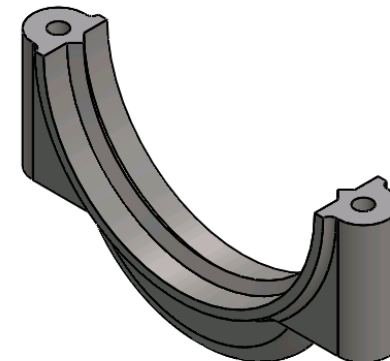
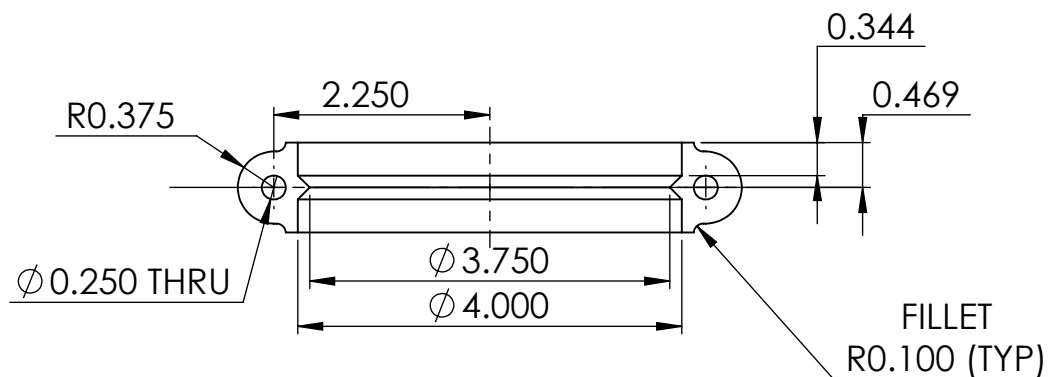
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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°		DESCRIPTION: Inner rod for power train and Link	
		CHECKED BY: Andrew Engel		DATE: 5/3/2012	
		DRAWN BY: Christopher Pratt		DATE: 4/24/2012	
		FILE NAME: Inner eccentric rod top.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
				PART #: 6-03	QTY: 1
				SCALE: 1:4	SHEET: 64 OF 75



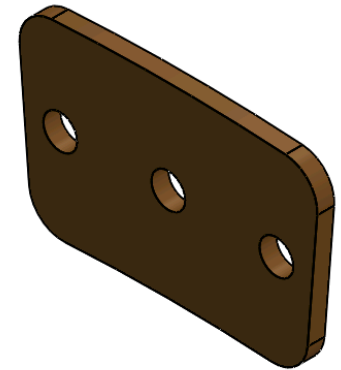
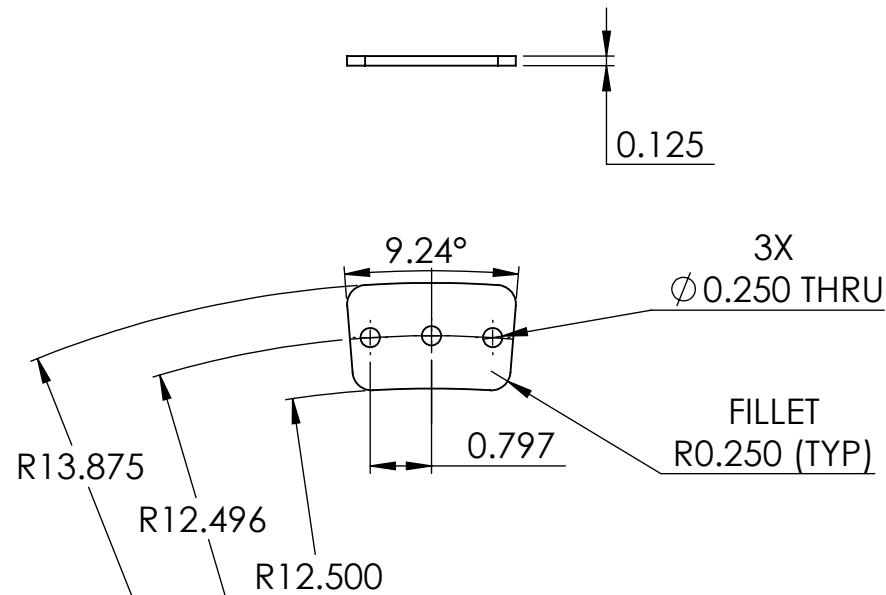
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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		DESCRIPTION: Inner rod for power train and Link	
		CHECKED BY: Andrew Engel		DATE: 5/3/2012	
		DRAWN BY: Christopher Pratt		DATE: 4/24/2012	
		FILE NAME: Inner eccentric rod top.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 6-03		QTY: 1	
		SCALE: 1:4		SHEET: 65 OF 75	



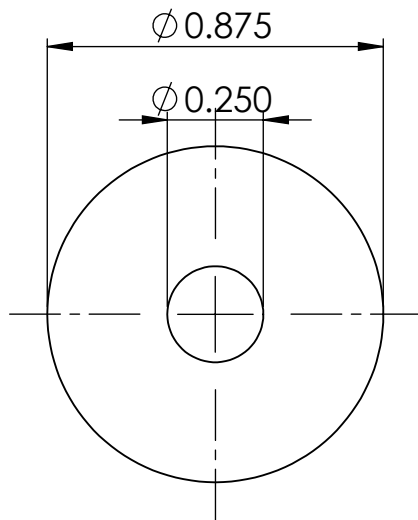
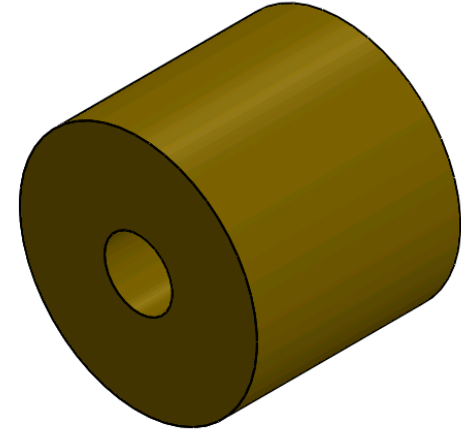
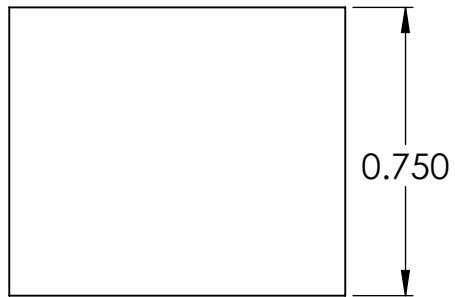
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Bottom part of the eccentric rods		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Andrew Engel	DATE: 5/4/2012		
		DRAWN BY: Christopher Pratt	DATE: 4/19/2012	PART #: 6-04	QTY: 2
		FILE NAME: Eccentric rod cap.SLDPRT	SCALE: 1:2	SHEET: 66 OF 75	




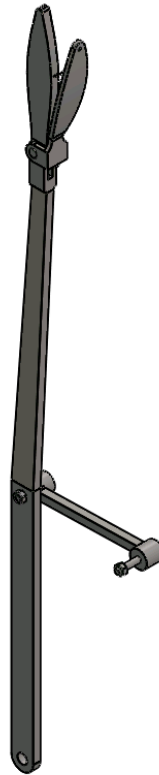
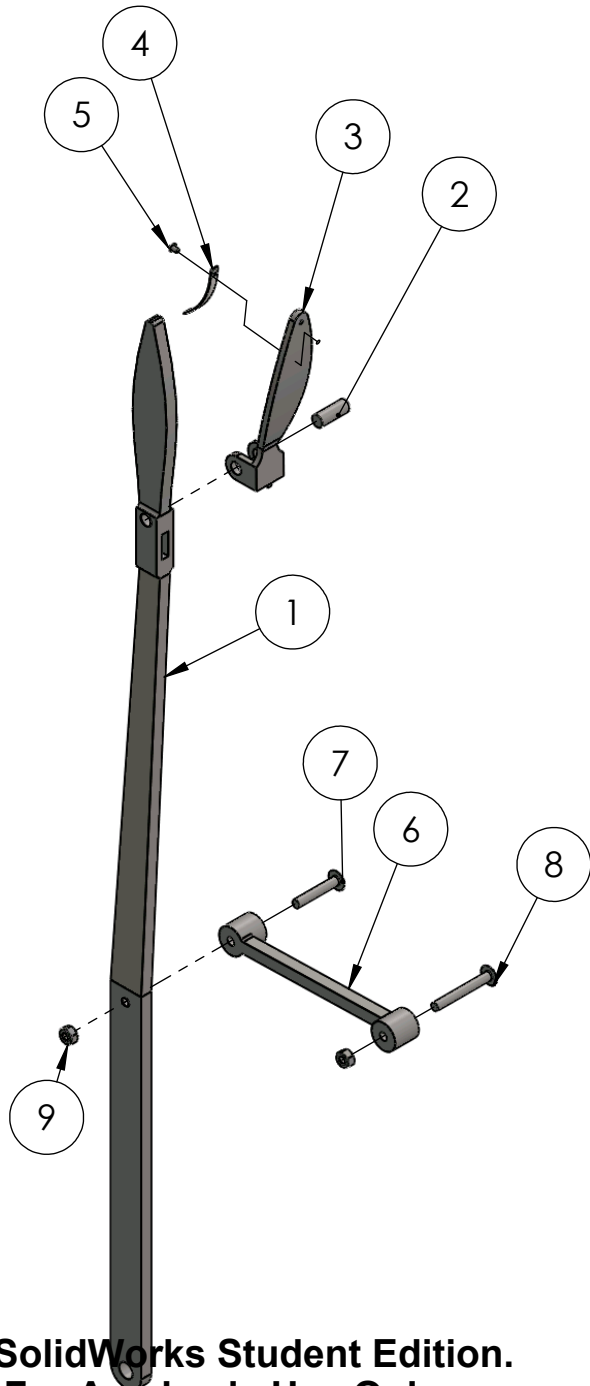
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				MATERIAL: Cast brass	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		DESCRIPTION: Plate that sandwiches the link	
		CHECKED BY: Andrew Engel		DATE: 5/2/2012	
		DRAWN BY: Christopher Pratt		DATE: 5/1/2012	
		FILE NAME: Link plate.SLDPR		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 6-05		QTY: 2	
		SCALE: 1:2.5		SHEET: 67 OF 75	



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				MATERIAL: Cast brass	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Bearing for the screw in the link		CHECKED BY: Andrew Engel		DATE: 5/2/2012	
DRAWN BY: Christopher Pratt		DATE: 4/17/2012		PART #: 6-06	QTY: 1
FILE NAME: Link screw bearing.SLDPRT		SCALE: 2:1		SHEET: 68 OF 75	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	SHEET NO.
1	7-01	Control Lever	1	70
2	7-02	Control Lever Pin	1	71
3	7-03	Grip	1	72
4	7-04	Handle Spring	1	73
5	7-05	Handle Spring Pin	1	74
6	7-06	Suspension link	1	75
7	7-07	1/4-20-1.5 Round Head Bolt	1	---
8	7-08	1/4-20-2 Round Head Bolt	1	---
9	7-09	HNU 0.2500 20 D N	2	---

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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

MATERIAL: Cast Alloy & Spring Steel

Marine Engine
Project

**UNIVERSITY OF IDAHO
ME DEPARTMENT**

DEFAULT TOLERANCES:

LINEAR:
X. ± .25
X.X ± .1
X.XX ± .01
X.XXX ± .002

ANGULAR:
X. ± 2
X.X ± 1
X.XX ± 0.30'

DESCRIPTION: Handle Sub-Assembly

CHECKED BY: Jeremiah Schroeder

DATE: 4/24/2012

DRAWN BY: Brandon Cisco

DATE: 5/2/2012

FILE NAME: Handle Assembly.SLDASM

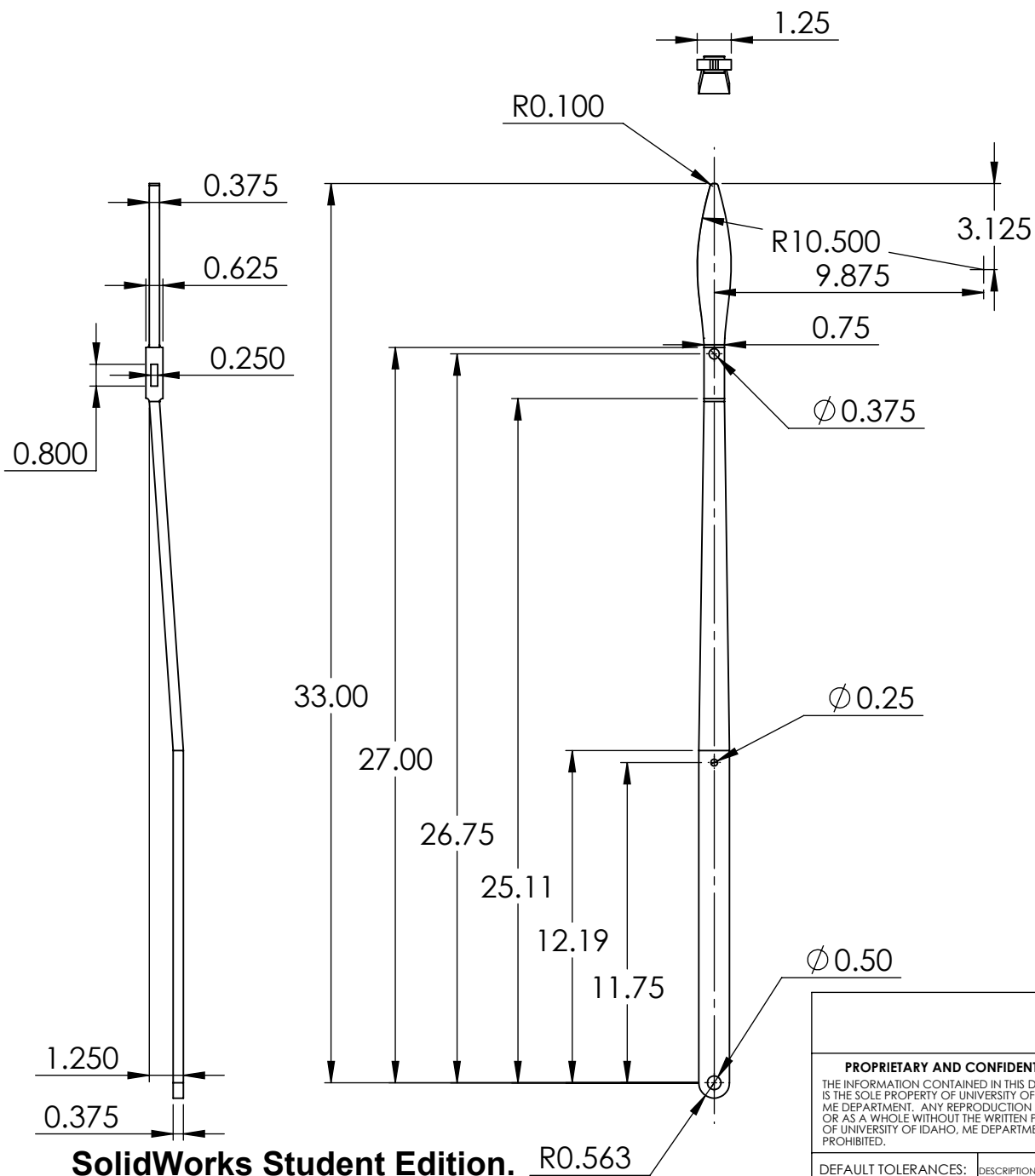
PART #: 7-00

QTY: 1

SCALE: 1:5

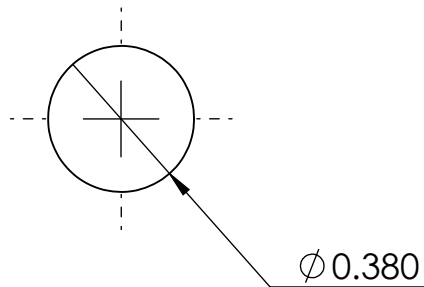
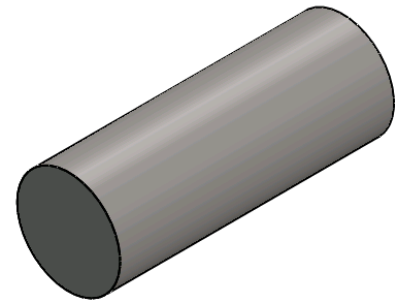
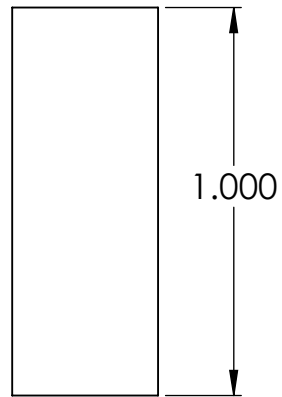
SHEET: 69 OF 75

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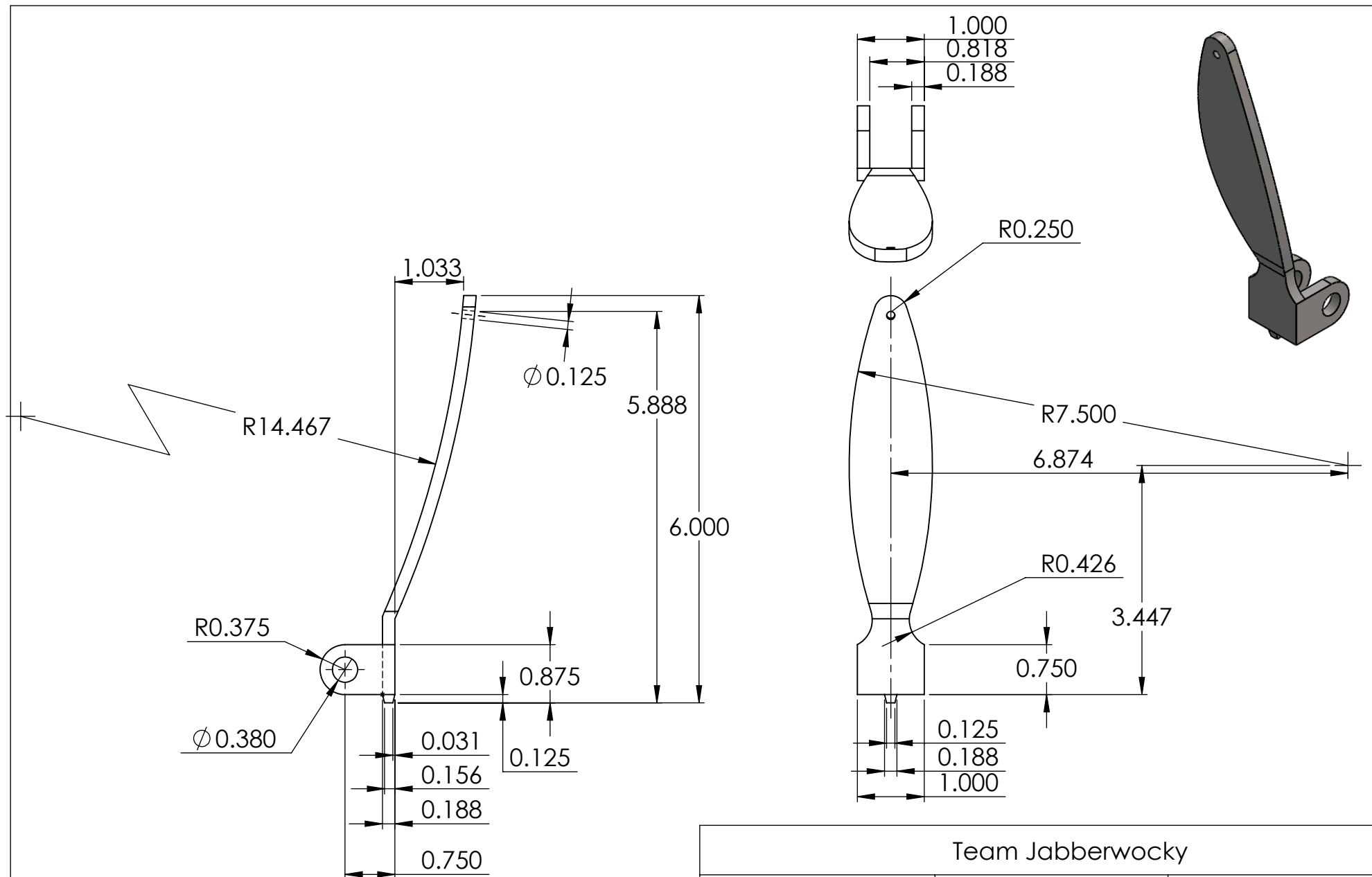
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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Control Lever		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°	CHECKED BY: Jeremiah Schroeder	DATE: 4/25/2012		
		DRAWN BY: Brandon Cisco	DATE: 4/26/2012	PART #: 7-01	QTY: 1
		FILE NAME: Control Lever.SLDPRT	SCALE: 1:6	SHEET: 70 OF 75	



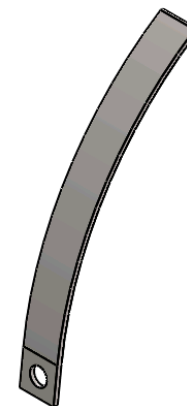
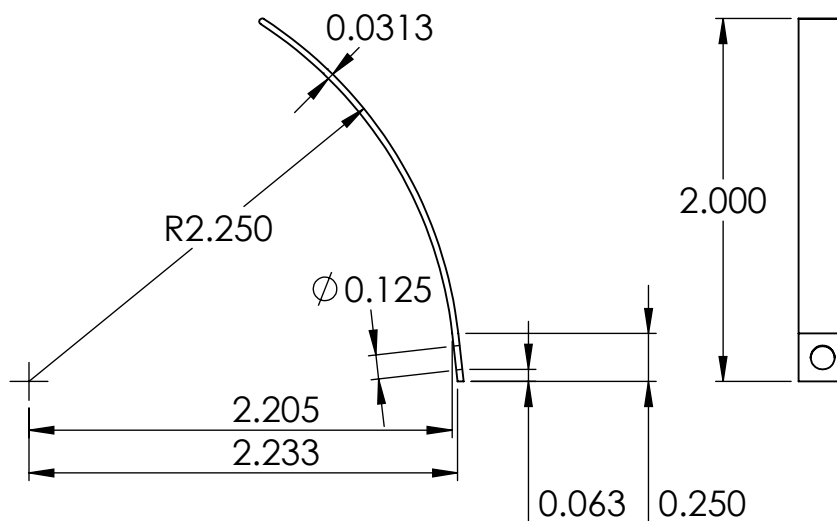
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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		DESCRIPTION: Control Lever Pin	
		CHECKED BY: Jeremiah Schroeder		DATE: 4/25/2012	
		DRAWN BY: Brandon Cisco		DATE: 4/24/2012	
		FILE NAME: Control lever Hand Grip pin.SLDPRT		UNIVERSITY OF IDAHO ME DEPARTMENT	
		PART #: 7-02		QTY: 1	
		SCALE: 2:1		SHEET: 71 OF 75	



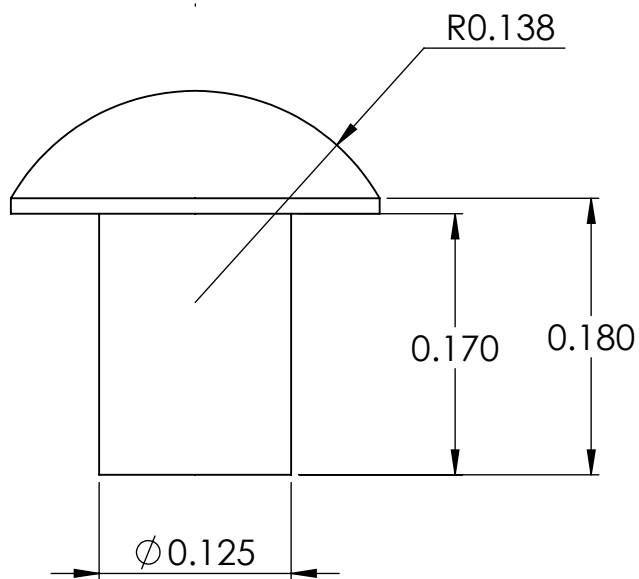
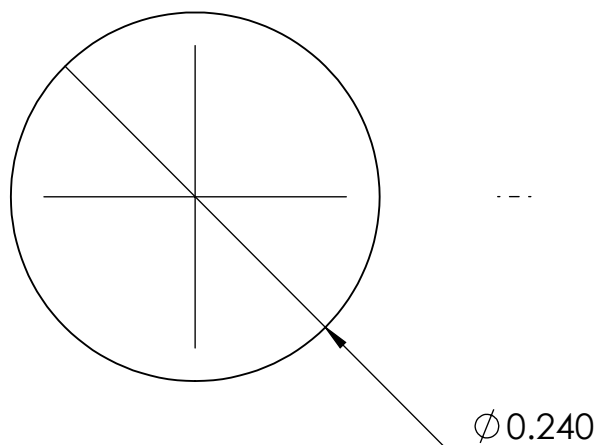
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				MATERIAL: Cast Alloy Steel	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Grip		CHECKED BY: Jeremiah Schroeder		DATE: 4/26/2012	
DRAWN BY: Andrew Engel		DATE: 5/2/2012		PART #: 7-03	
FILE NAME: Grip.SLDPR		SCALE: 1:2		QTY: 1	
				SHEET: 72 OF 75	



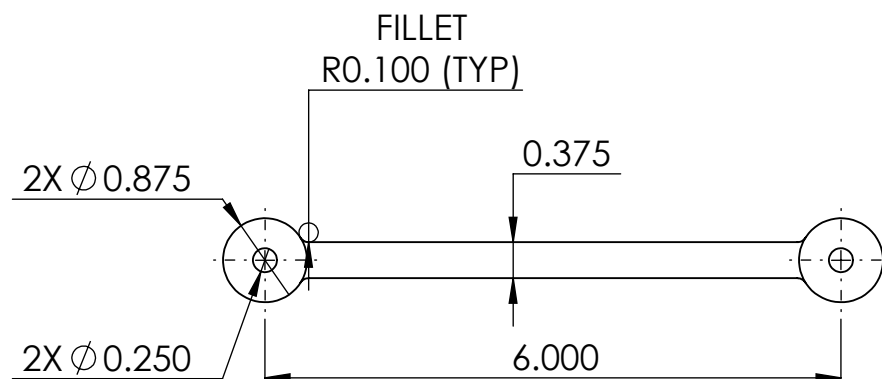
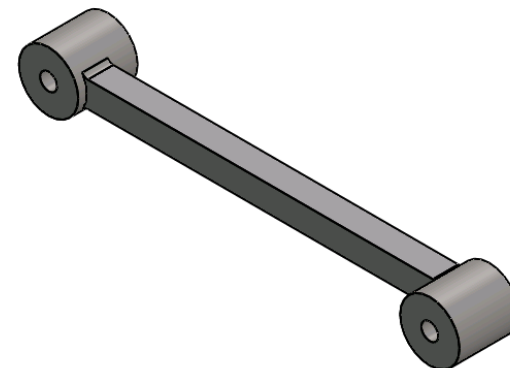
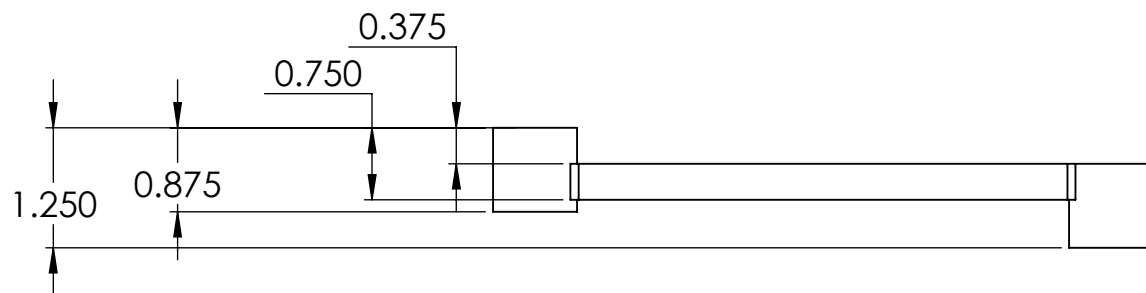
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				MATERIAL: Spring Steel	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Handle leaf spring		CHECKED BY: Jeremiah Schroeder		DATE: 4/26/2012	
DRAWN BY: Andrew Engel		DATE: 5/2/2012		PART #: 7-04	
FILE NAME: Handle Spring.SLDPRT		SCALE: 1:1		QTY: 1	
				SHEET: 73 OF 75	




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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Handle Spring Pin		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.±2 X.X±1 X.XX±0.30'	CHECKED BY: Jeremiah Schroeder	DATE: 4/26/2012		
		DRAWN BY: Brandon Cisco	DATE: 4/24/2012	PART #: 7-05	QTY: 1
		FILE NAME: handle spring arip pin.SLDPRT		SCALE: 8:1	SHEET: 74 OF 75



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		MATERIAL: Cast Alloy Steel			
DEFAULT TOLERANCES:		DESCRIPTION: Suspension Link		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	CHECKED BY: Jeremiah Schroeder	DATE: 4/25/2012		
		DRAWN BY: Christoper Pratt	DATE: 5/3/2012	PART #: 7-06	QTY: 1
		FILE NAME: Suspension link.SLDPR	SCALE: 1:2	SHEET: 75 OF 75	