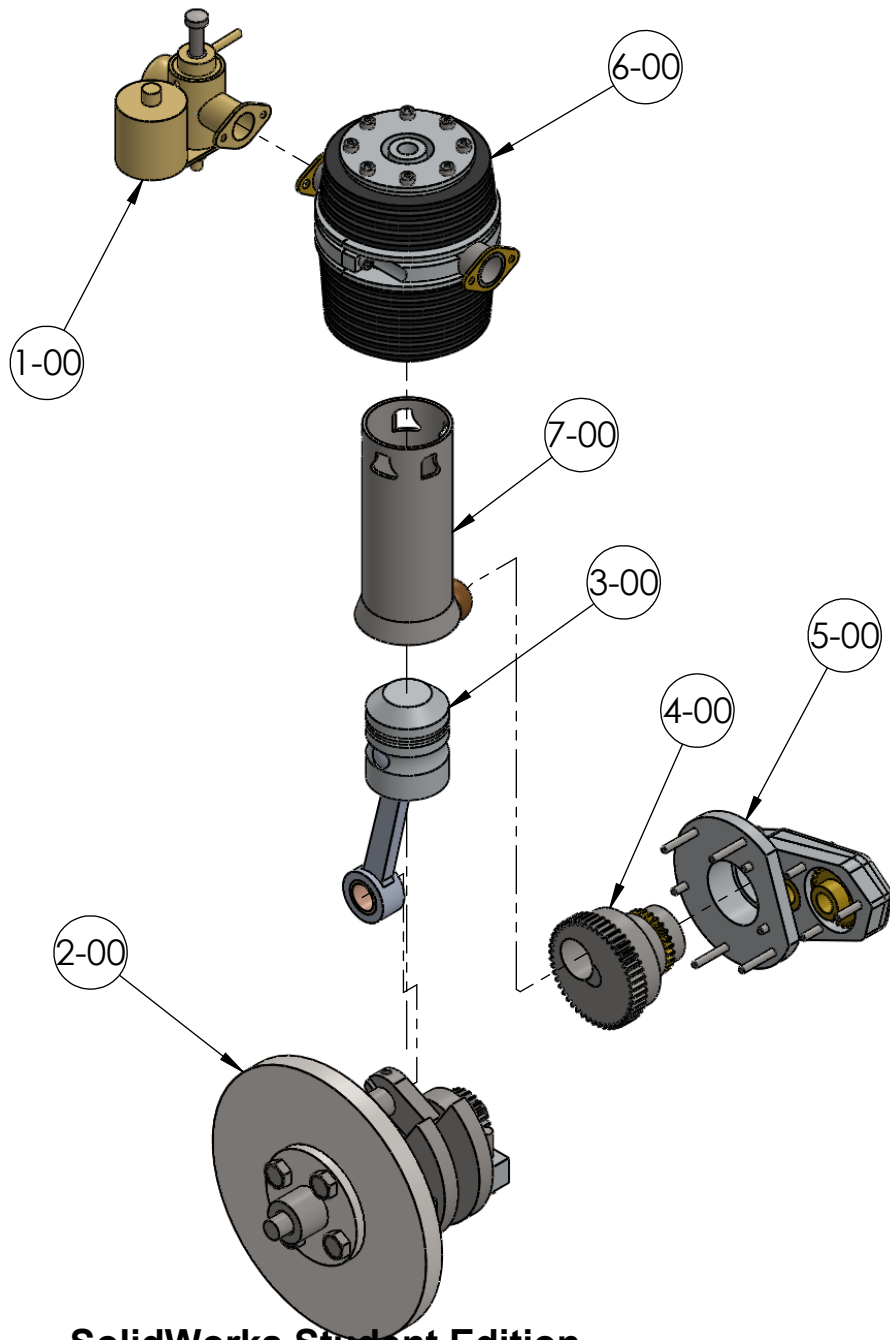


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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Final Assembly CHECKED BY: _____ DATE: _____ DRAWN BY: Fantastic Four DATE: 12/9/2011 FILE NAME: Motor.SLDPRT		MATERIAL: Assorted <b>UNIVERSITY OF IDAHO ME DEPARTMENT</b> PART #: 0-00 QTY: 1 SCALE: 1:1 SHEET: 1 OF 55	



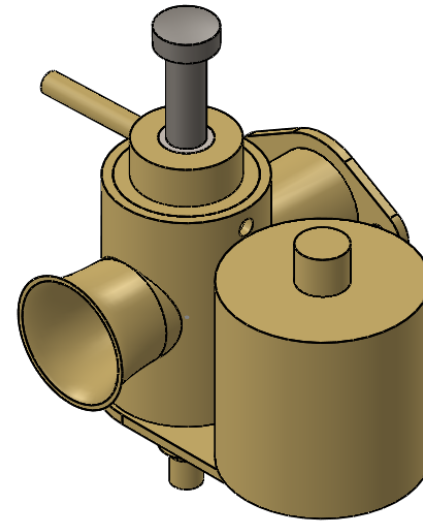
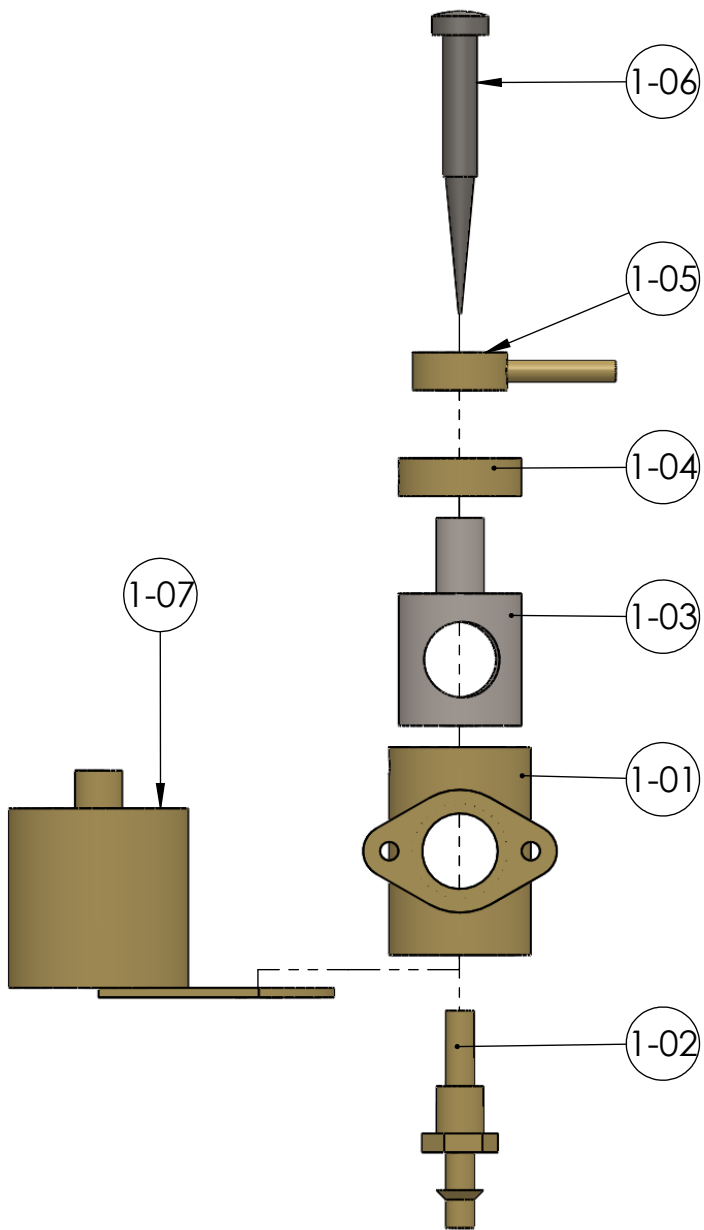
NOTE: Crank Case and Sump not shown for orientation clarity. These parts are shown in the renderings.

All purchased part are indicated by a (-)in the Sheet # column

Part #	DESCRIPTION	QTY.	Sheet #
1-00	Carburetor Assembly	1	3
2-00	Crankshaft-Crankcase Assembly	1	11
3-00	Piston Connecting Rod Assembly	1	26
4-00	Gear Shaft Assembly	1	32
5-00	Gear Box Assembly	1	36
6-00	Cylinder Manifolds Assembly	1	43
7-00	Sleeve, Cam Assembly	1	51

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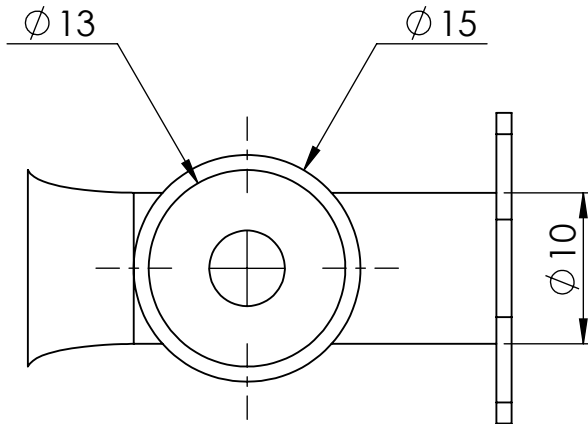
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DEFAULT TOLERANCES:		MATERIAL: Assorted			
LINER: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	DESCRIPTION: Final Assembly		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
		CHECKED BY:	DATE:		
		DRAWN BY: Fantastic Four		DATE: 12/9/2011	PART #: 0-00
		FILE NAME: Motor Exploded.SLDPRT		SCALE: 1:2	QTY: 1
					SHEET: 2 OF 55



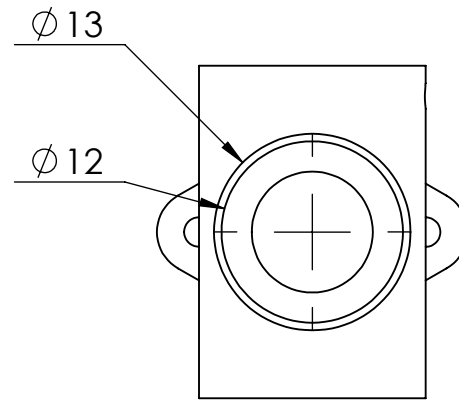
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Part #	DESCRIPTION	QTY.	Sheet #
1-01	Carburetor Body	1	4
1-02	Pipe, Fuel Inlet	1	5
1-03	BARREL, Throttle	1	6
1-04	Top Cover	1	7
1-05	Throttle Lever	1	8
1-06	Needle Valve	1	9
1-07	Float Chamber	1	10

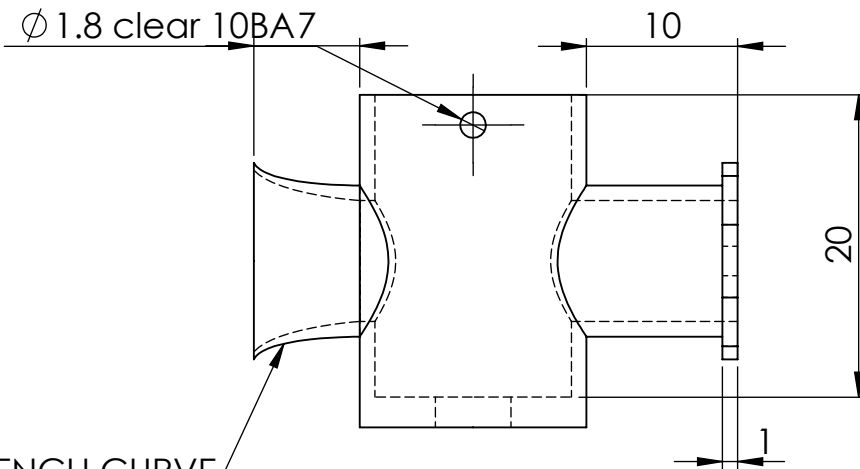
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		MATERIAL: Assorted			
ANGLAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		DESCRIPTION: Carburetor Assembly		PART #: 1-00	
		CHECKED BY:		DATE:	
		DRAWN BY: Alex Ackerman		DATE: 12/8/2011	
		FILE NAME: Carburetor assembly complete.SLDPRT		SCALE: 1.5:1	
				QTY: 1	
				SHEET: 3 OF 55	



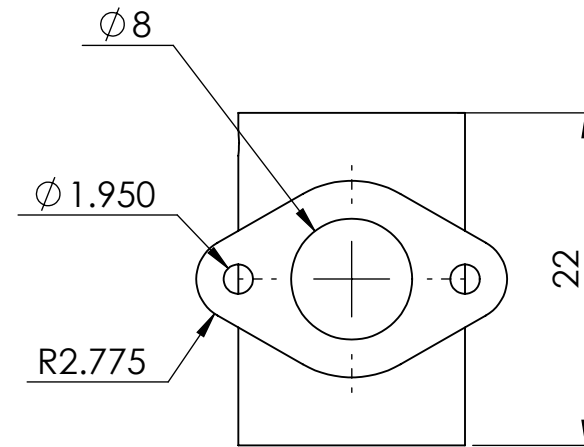
TOP VIEW



FRONT VIEW



RIGHT VIEW

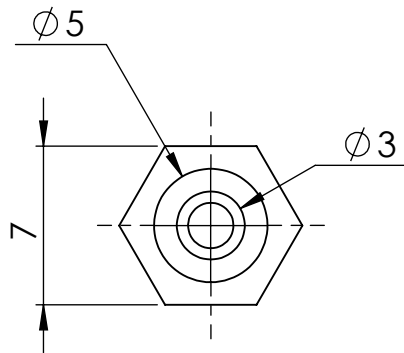


BACK VIEW

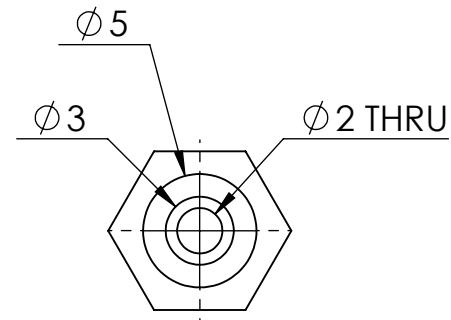
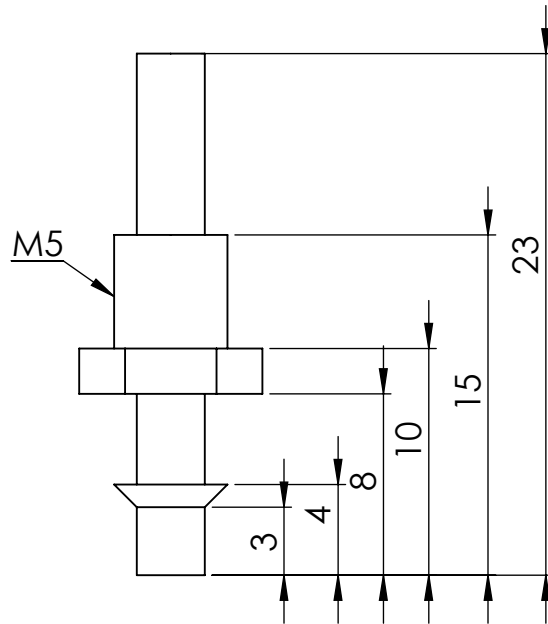
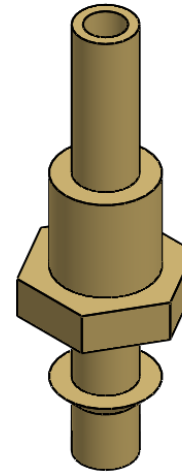
FRENCH CURVE

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DEFAULT TOLERANCES:		DESCRIPTION: Carburetor Body		MATERIAL: Brass	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Alex Ackerman	DATE: 12/8/2011	PART #: 1-01	QTY: 1
		FILE NAME: CARBURETOR BODY Brass 1(AA).SLDPRT	SCALE: 2:1	SHEET: 4 OF 55	



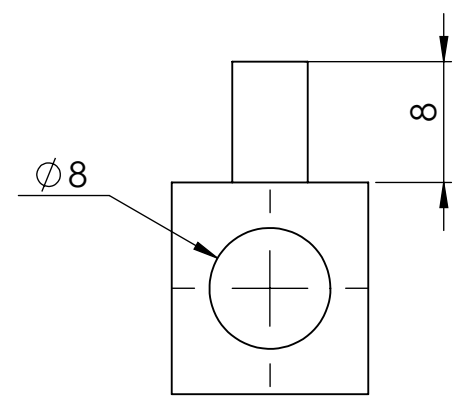
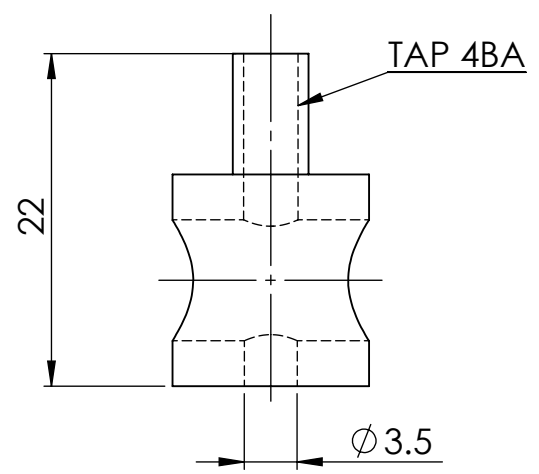
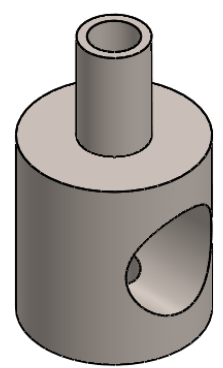
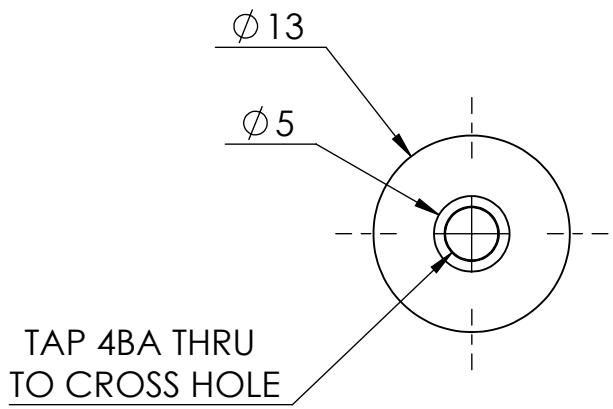
TOP VIEW



BOTTOM VIEW

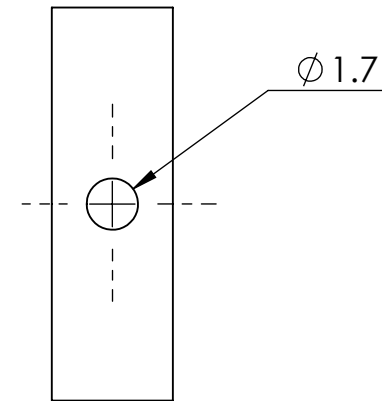
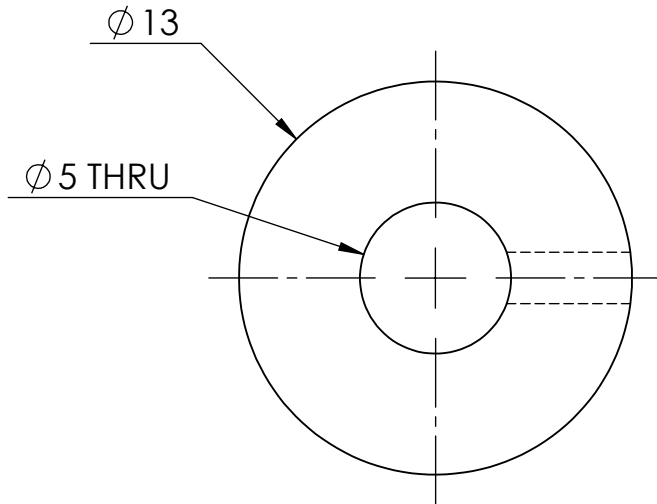
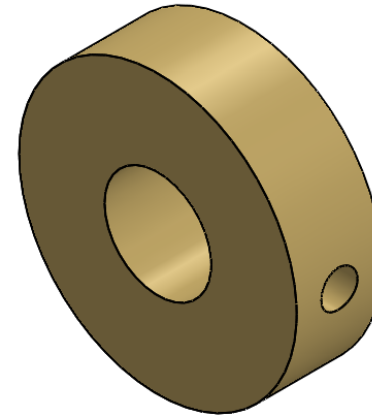
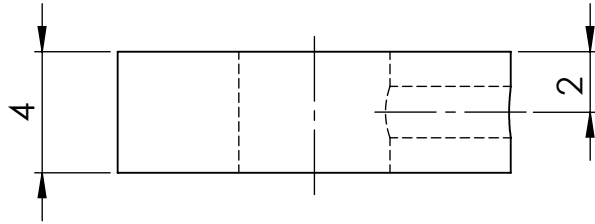
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Pipe, Fuel Inlet CHECKED BY: _____ DATE: _____ DRAWN BY: Alex Ackerman DATE: 12/8/2011 FILE NAME: PIPE, Fuel inlet brass 1 (AA).SLDPRT		MATERIAL: Brass <b>UNIVERSITY OF IDAHO          ME DEPARTMENT</b> PART #: 1-02 QTY: 1 SCALE: 3:1 SHEET: 5 OF 55	



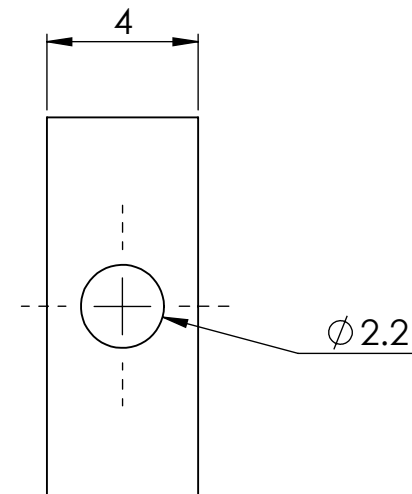
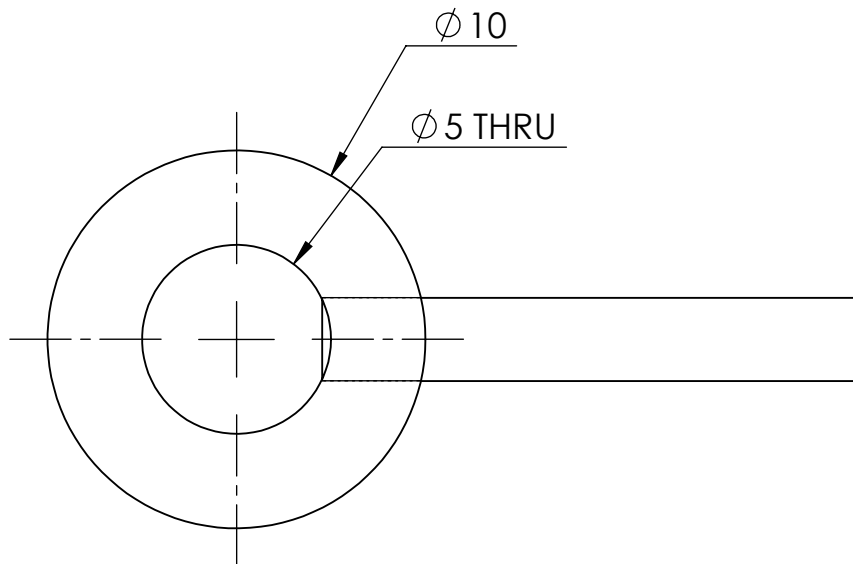
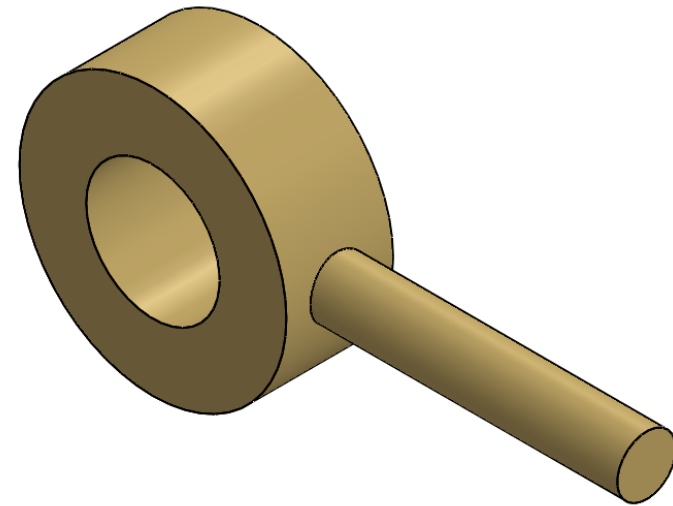
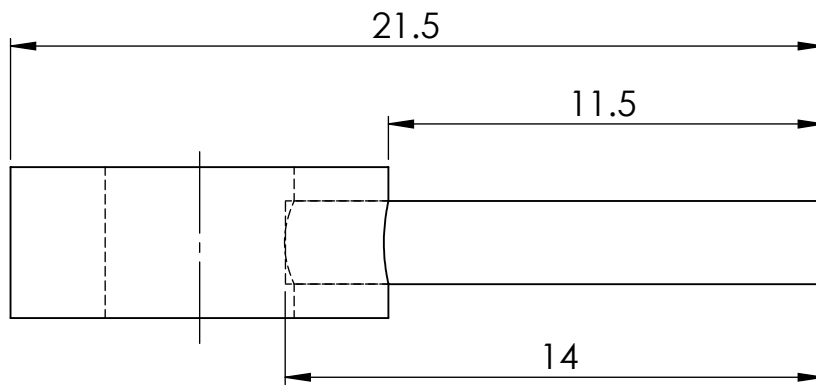
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		MATERIAL: Plain Carbon Steel		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
ANGLAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		DESCRIPTION: BARREL, Throttle		PART #: 1-03	
CHECKED BY:		DATE: 11/27/2011		QTY: 1	
DRAWN BY: Alex Ackerman		FILE NAME: BARREL, Throttle Mild Steel 1 (AA).SLDPRT		SCALE: 2:1	
				SHEET: 6 OF 55	



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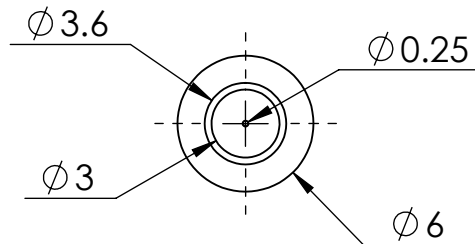
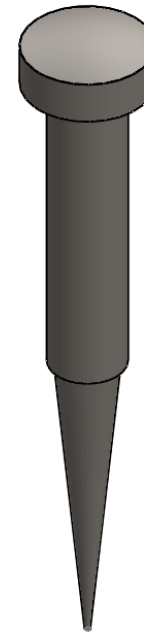
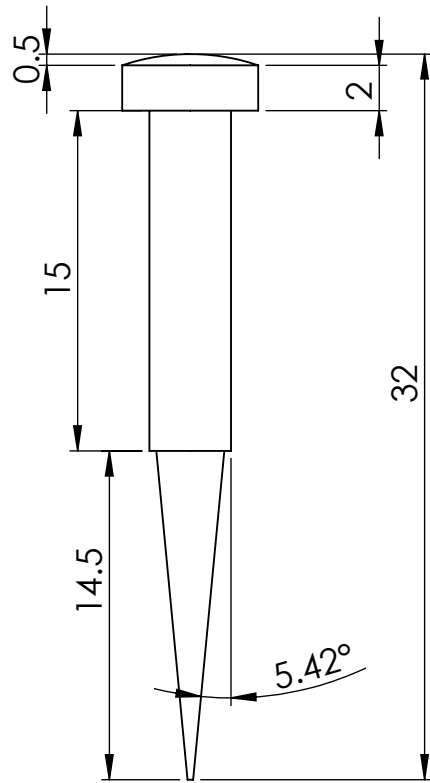
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MATERIAL: Brass		DESCRIPTION: Top Cover		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY: _____ DATE: _____ DRAWN BY: Alex Ackerman DATE: 12/8/2011 FILE NAME: COVER, Top Material brass 1(AA).SLDPRJ	
		PART #: 1-04		QTY: 1	
		SCALE: 4:1		SHEET: 7 OF 55	



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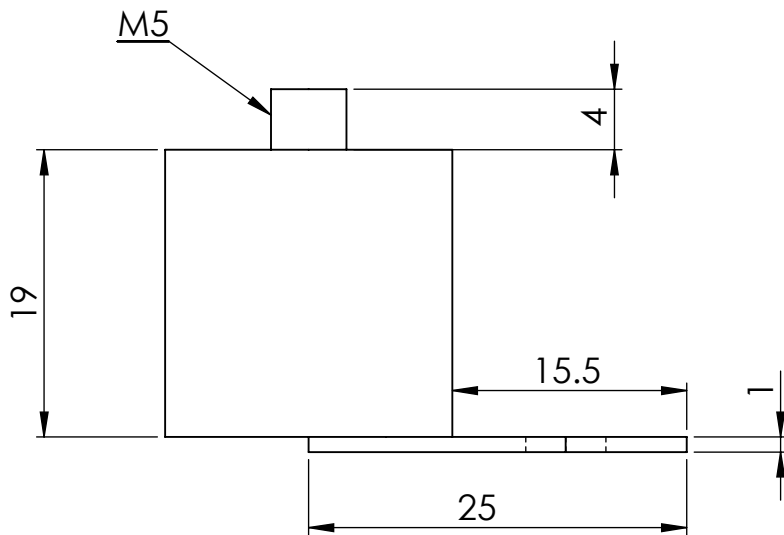
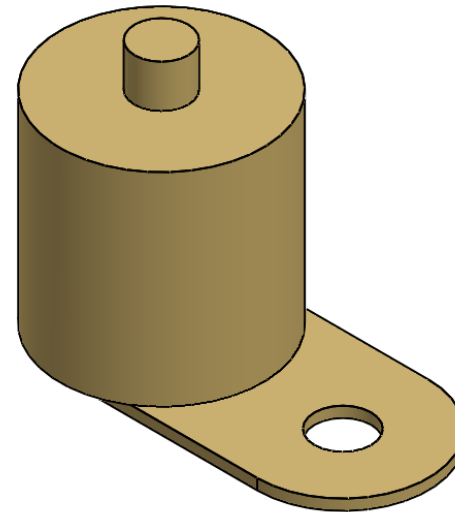
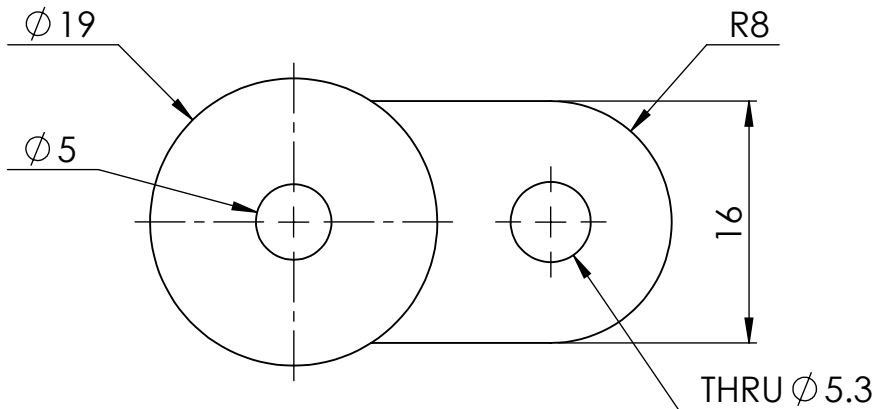
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DEFAULT TOLERANCES:		DESCRIPTION: Throttle Lever		MATERIAL: Brass	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Alex Ackerman	DATE: 12/8/2011	PART #: 1-05	QTY: 1
		FILE NAME: LEVER, Throttle Material brass 1 (AA).SLDPRTE	SCALE: 5:1	SHEET: 8 OF 55	





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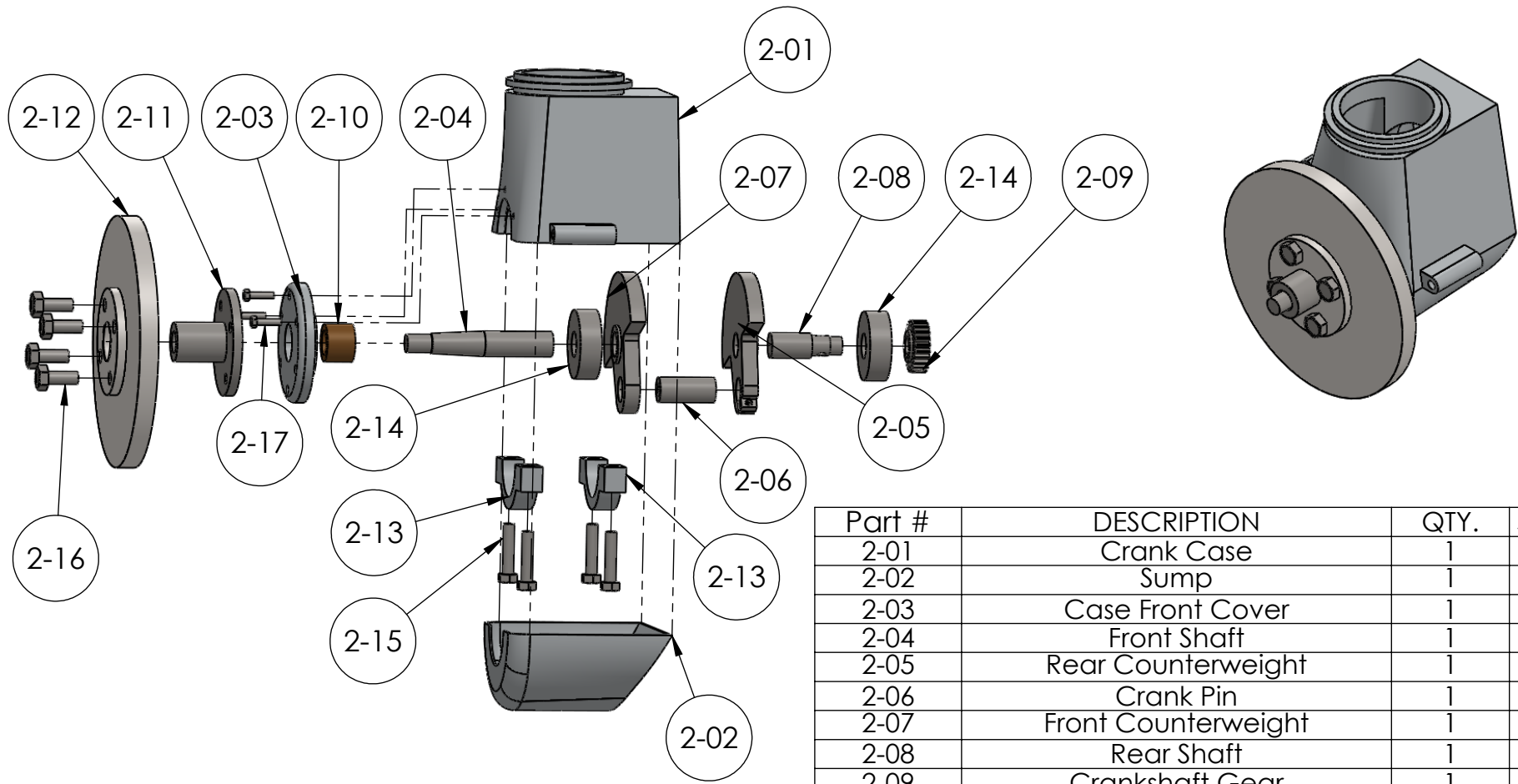
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DEFAULT TOLERANCES:		DESCRIPTION: Needle Valve		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	PART #:	QTY:
		DRAWN BY: Alex Ackerman	DATE: 12/8/2011	1-06	1
		FILE NAME: NEEDLE VALVE midl steel 1 (AA).SLDPRT	SCALE: 3:1	SHEET: 9 OF 55	



NOTE: The Float Chamber is a dummy and is optional

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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Float Chamber		MATERIAL: Brass	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		CHECKED BY:		DATE:	
		DRAWN BY: Alex Ackerman		DATE: 12/8/2011	
		FILE NAME: FLOAT CHAMBER Brass 1(AA).SLDPRT		PART #: 1-07 QTY: 1	
				SCALE: 2:1 SHEET: 10 OF 55	
				UNIVERSITY OF IDAHO ME DEPARTMENT	

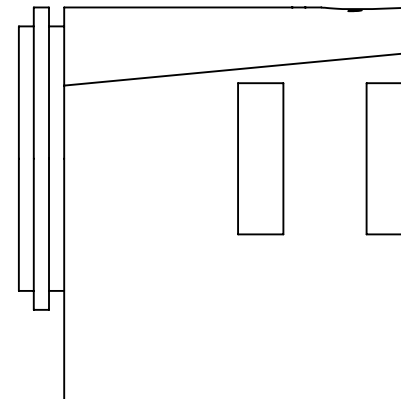
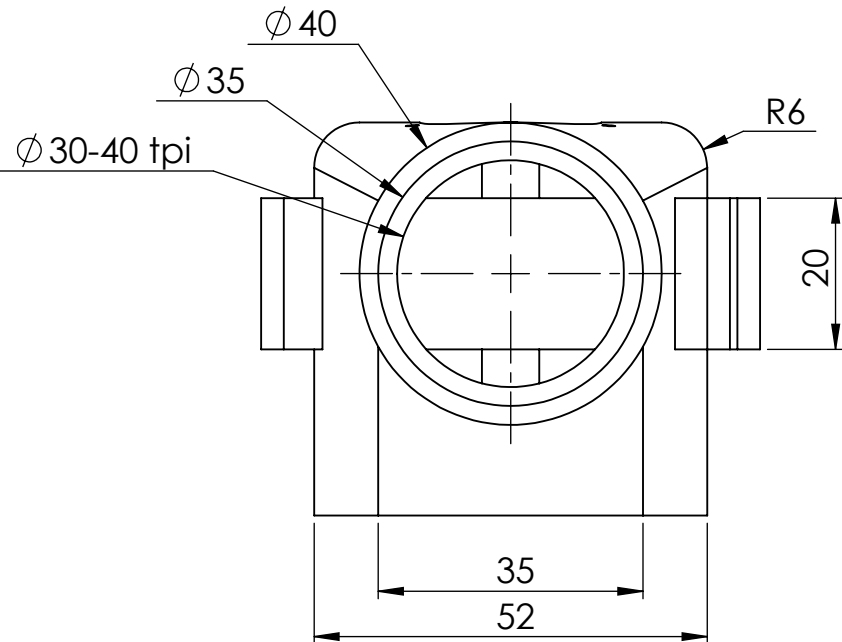
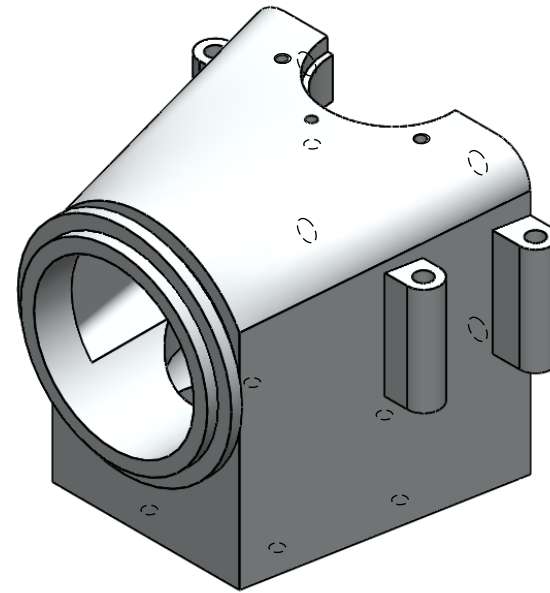
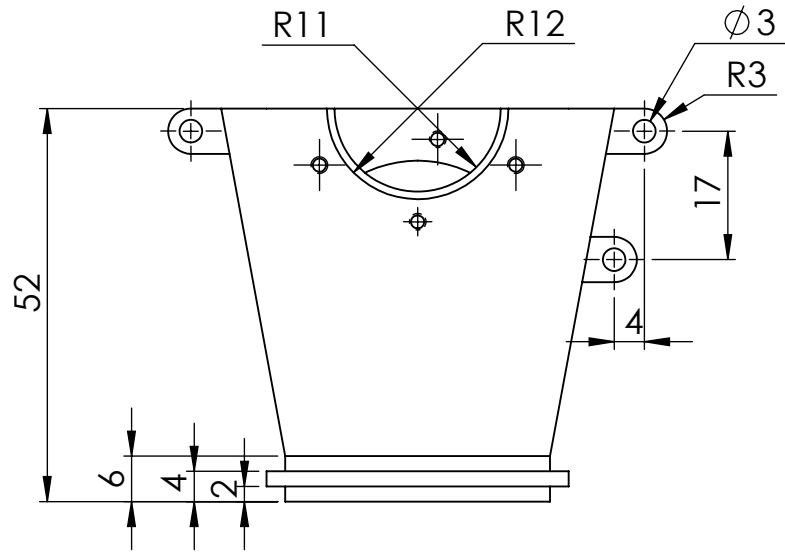


NOTE: Sump is tack-welded onto the crankcase and the crankcase front cover

Part #	DESCRIPTION	QTY.	SHEET #
2-01	Crank Case	1	12,13
2-02	Sump	1	14
2-03	Case Front Cover	1	15
2-04	Front Shaft	1	16
2-05	Rear Counterweight	1	17
2-06	Crank Pin	1	18
2-07	Front Counterweight	1	19
2-08	Rear Shaft	1	20
2-09	Crankshaft Gear	1	21
2-10	Bronze Bushing	1	22
2-11	Flywheel Hub	1	23
2-12	Flywheel	1	24
2-13	Main Bearing Cap	2	25
2-14	Ballrace 22x8x7	2	-
2-15	HHMS M3.5x0.6x16	4	-
2-16	HHMS 4x0.7x10	4	-
2-17	HHMS M2.2x0.6x8	3	-

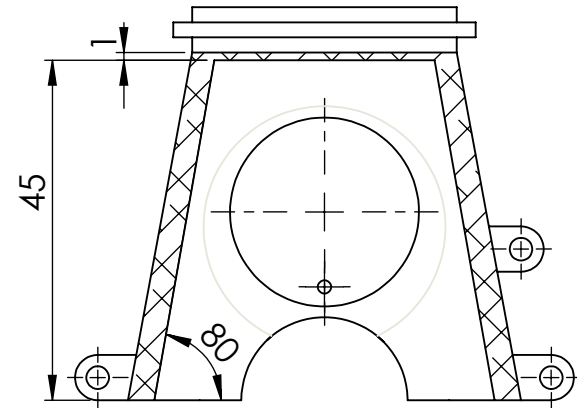
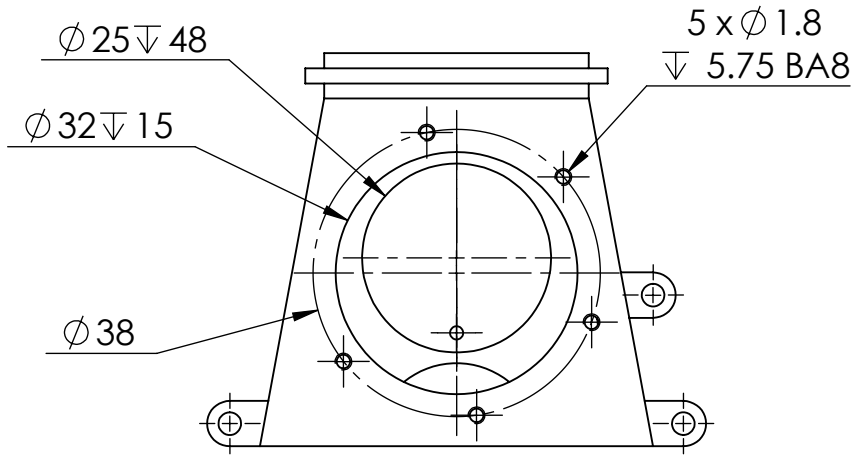
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MATERIAL: Assorted					
DESCRIPTION: Crankshaft-Crankcase Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT		PART #: 2-00	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		CHECKED BY: _____ DATE: _____ DRAWN BY: Phillip Spinden DATE: 12/8/2011		QTY: 1	
ANGULAR: X.±.2 X.X±.1 X.XX±.030'		FILE NAME: Crankshaft-Crankcase (PS).SLDPRT		SCALE: 1:2	
				SHEET: 11 OF 55	

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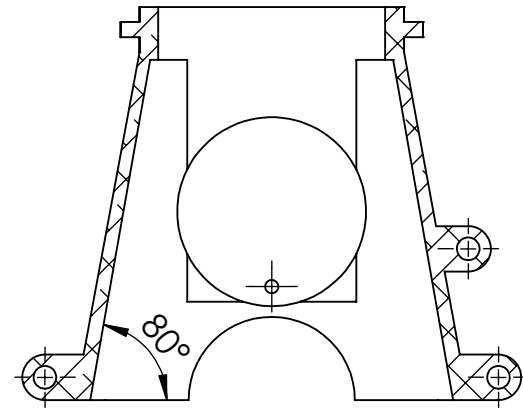
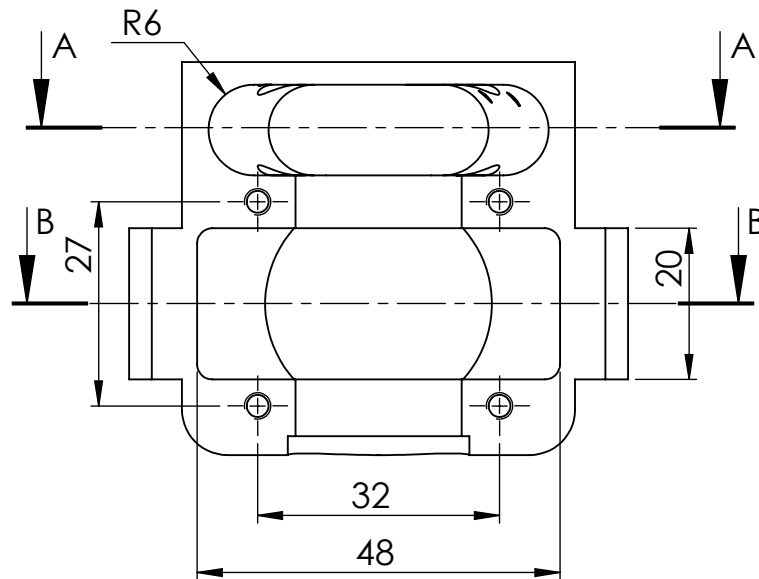


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DEFAULT TOLERANCES:		DESCRIPTION: Crank Case		MATERIAL: 6061-T6 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Brian Zaladonis	DATE: 12/4/2011	PART #: 2-01	QTY: 1
		FILE NAME: crank case (BZ).SLDPRT	SCALE: 1:1	SHEET: 12 OF 55	



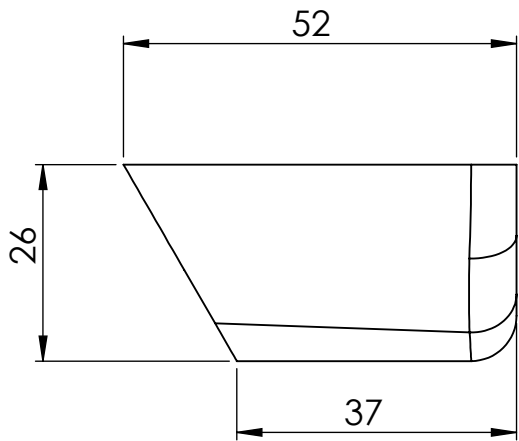
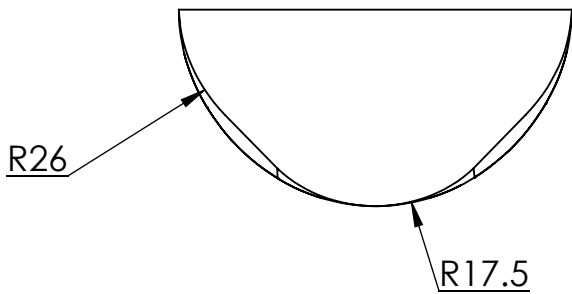
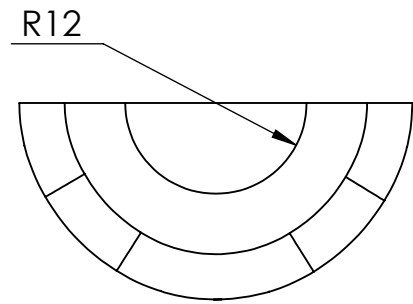
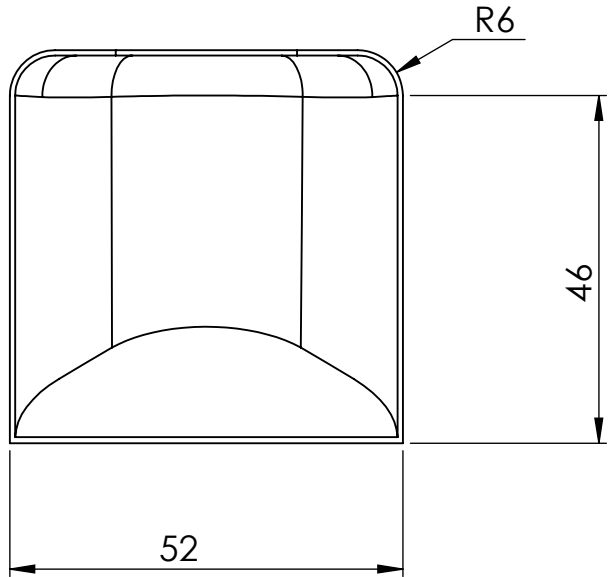
SECTION A-A



SECTION B-B

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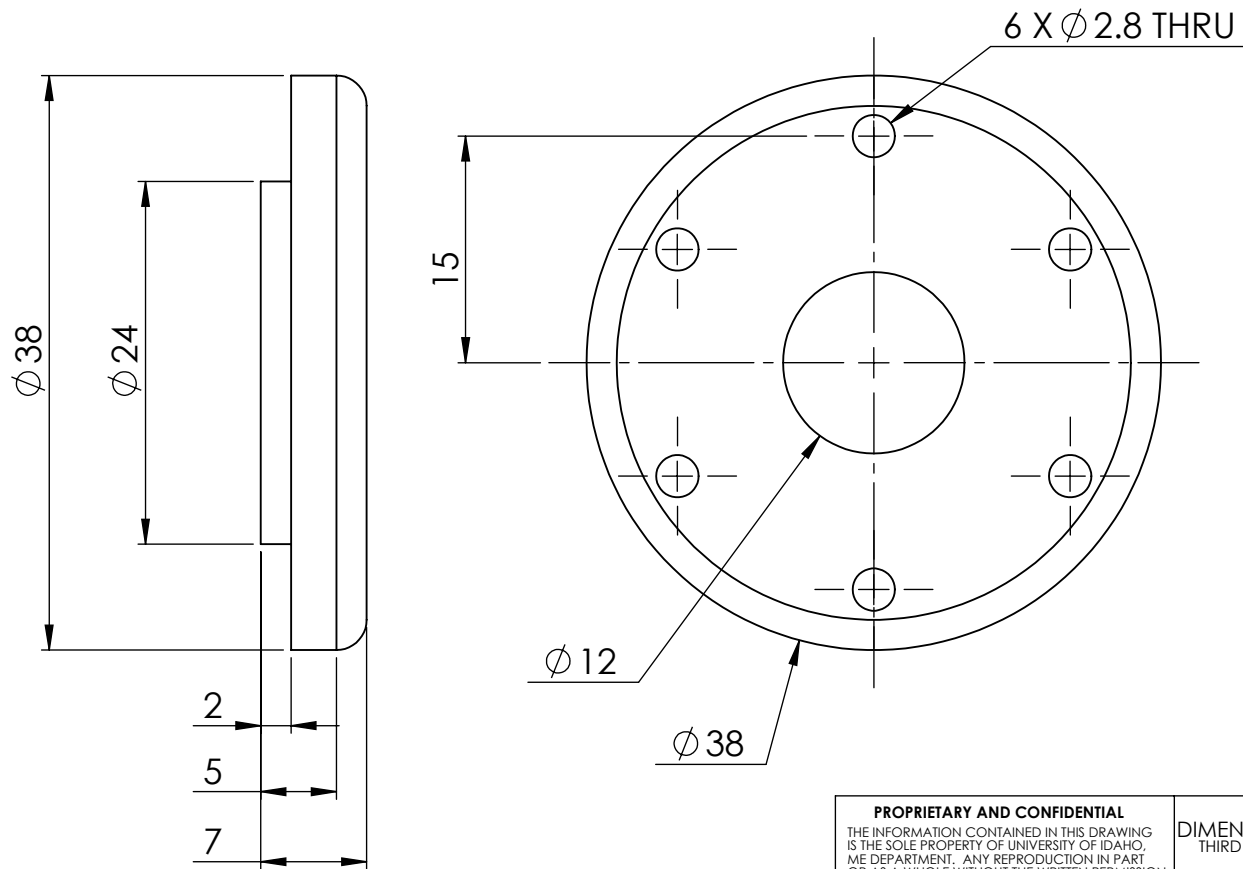
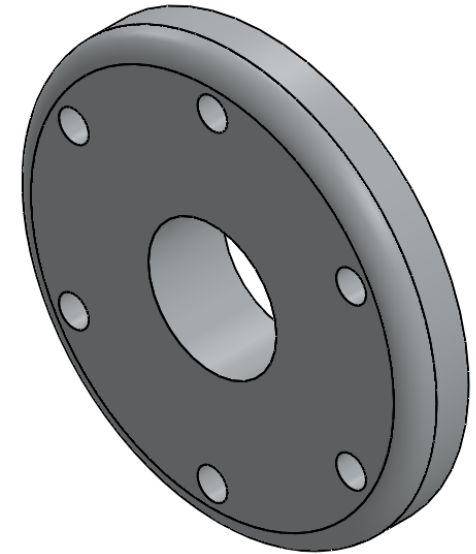
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Crank Case CHECKED BY: _____ DATE: _____ DRAWN BY: Brian Zaladonis DATE: 12/4/2011 FILE NAME: crank case (BZ).SLDPRT		MATERIAL: 6061-T6 (SS) <b>UNIVERSITY OF IDAHO ME DEPARTMENT</b> PART #: 2-01 QTY: 1 SCALE: 1:1 SHEET: 13 OF 55	



NOTE: Shell thickness is 0.7 mm  
Radius of sump body is 26mm

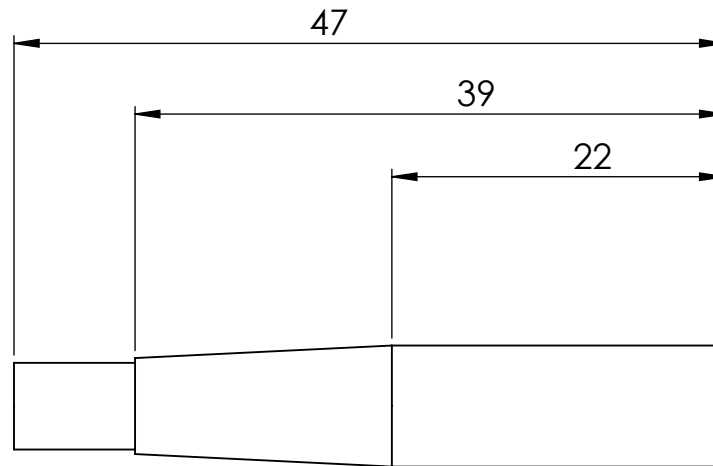
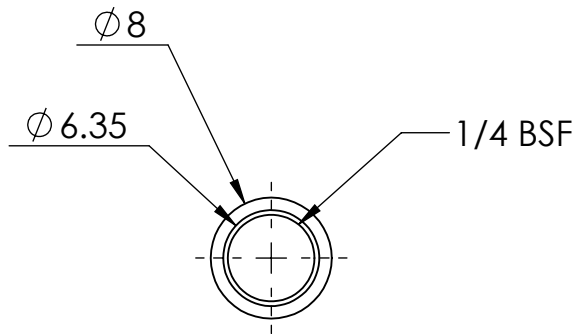
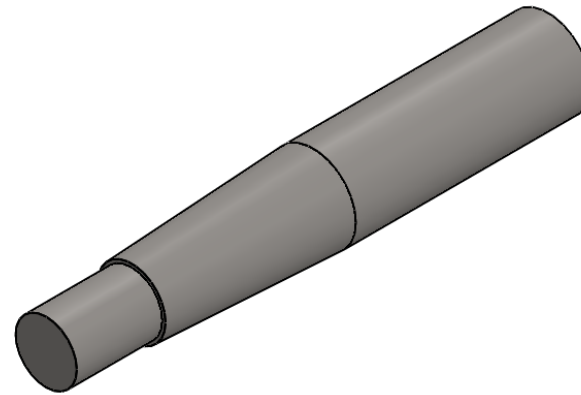
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DEFAULT TOLERANCES:		DESCRIPTION: Sump		MATERIAL: 6061-T6 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Alex Ackerman	DATE: 11/27/2011	PART #: 2-02	QTY: 1
		FILE NAME: SUMP Aluminum sheet 1(AA).SLDPRT	SCALE: 1:1	SHEET: 14 OF 55	



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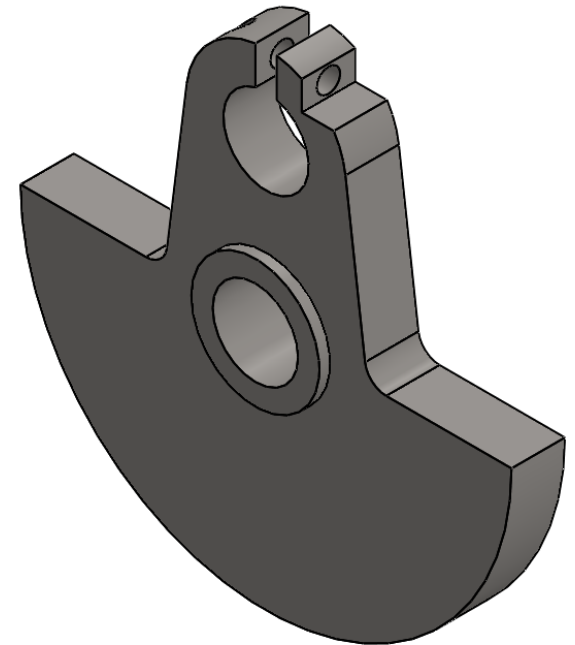
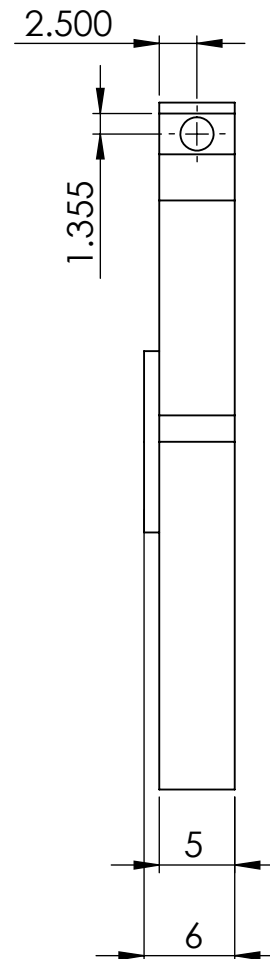
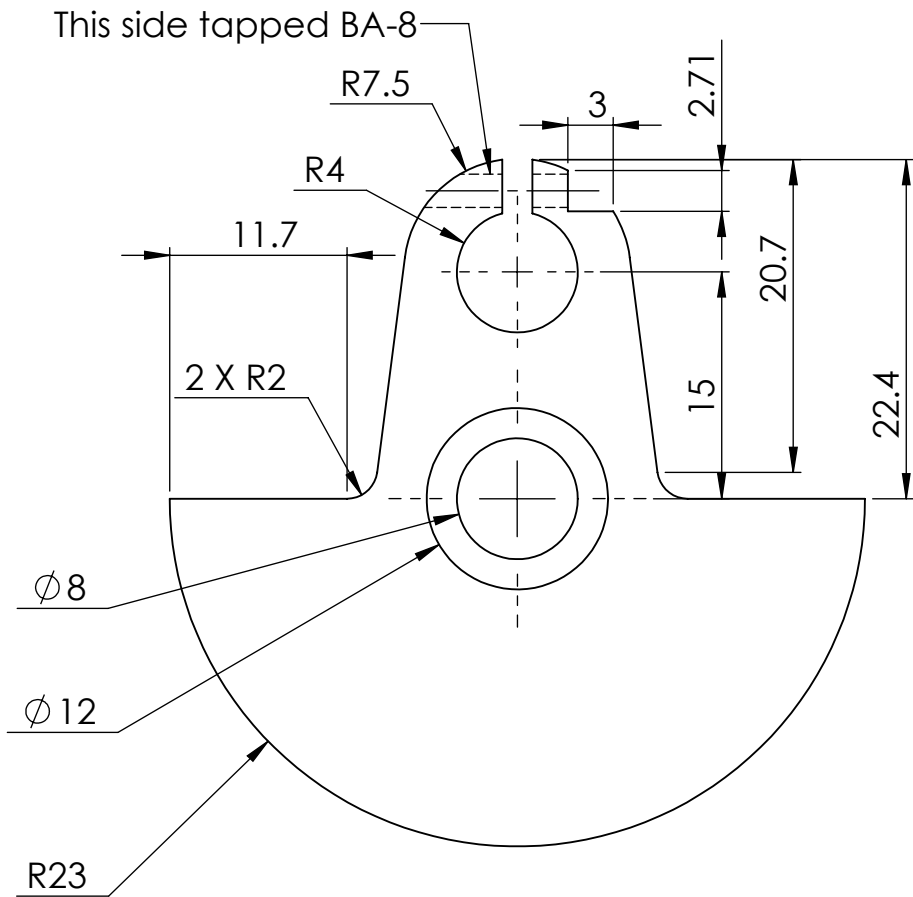
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DEFAULT TOLERANCES:		DESCRIPTION: Case Front Cover		MATERIAL: 6061-T6 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Brian Zaladonis	DATE: 12/8/2011	PART #: 2-03	QTY: 1
		FILE NAME: Case Front Cover (BZ).SLDPRT	SCALE: 2:1	SHEET: 15 OF 55	



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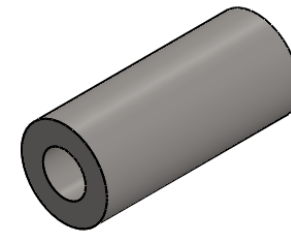
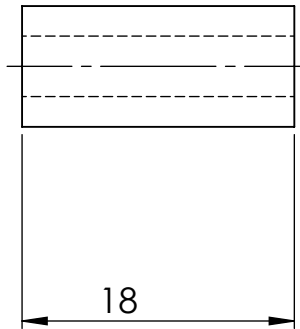
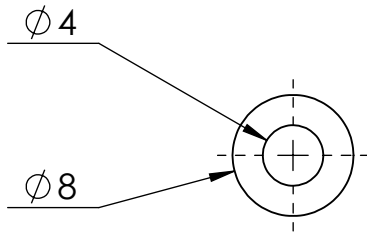
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DEFAULT TOLERANCES:		DESCRIPTION: Front Shaft		MATERIAL: Alloy Steel	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Phillip Spinden		DATE: 12/8/2011	PART #: 2-04
		FILE NAME: Front Shaft (PS).SLDPRT		SCALE: 2:1	QTY: 1 SHEET: 16 OF 55





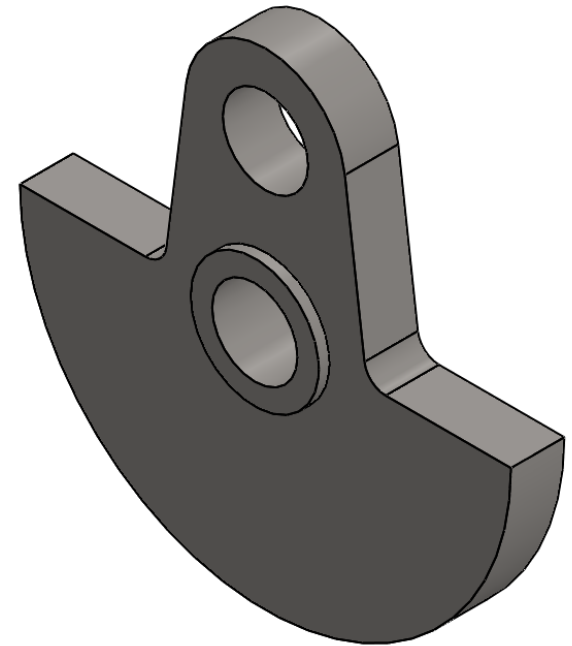
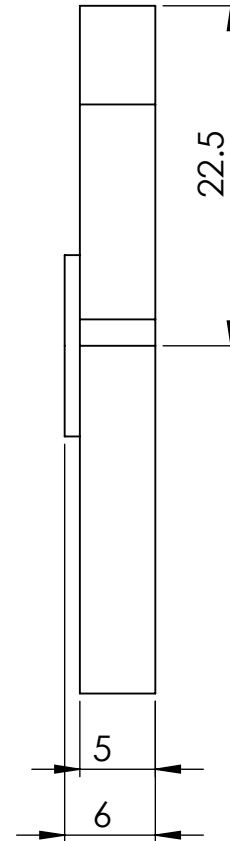
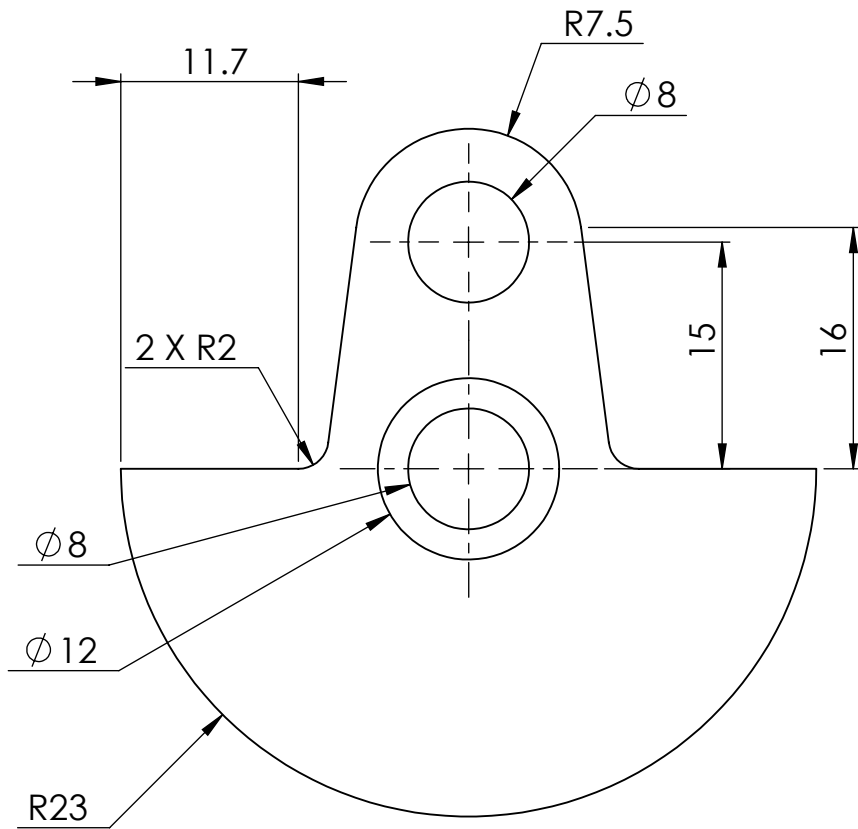
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		MATERIAL: Alloy Steel			
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Rear Counterweight		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY: _____ DATE: _____ DRAWN BY: Phillip Spinden DATE: 12/8/2011 FILE NAME: Rear Counterweight (PS).SLDPRT			
				SCALE: 2:1	SHEET: 17 OF 55



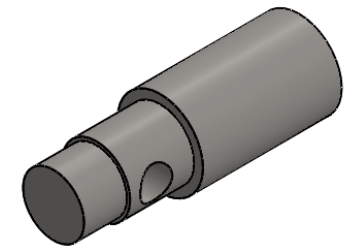
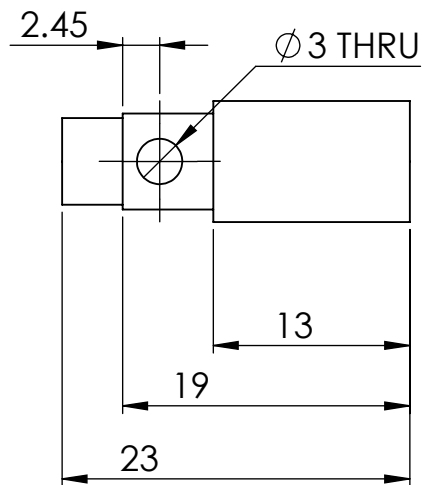
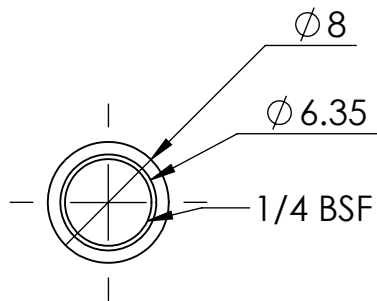
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		MATERIAL: Alloy Steel			
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002 ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		DESCRIPTION: Crank Pin		PART #: 2-06	
		CHECKED BY:	DATE:	DRAWN BY: Phillip Spinden	DATE: 12/8/2011
		FILE NAME: Crank Pin (PS).SLDPRT		SCALE: 2:1	QTY: 1 SHEET: 18 OF 55



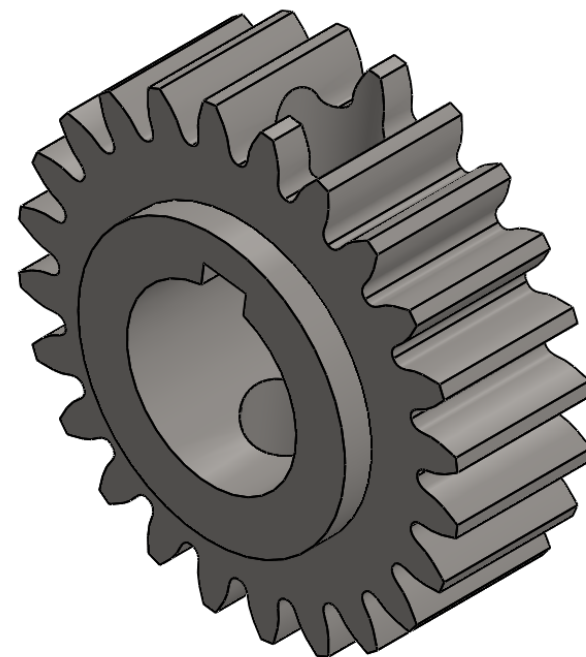
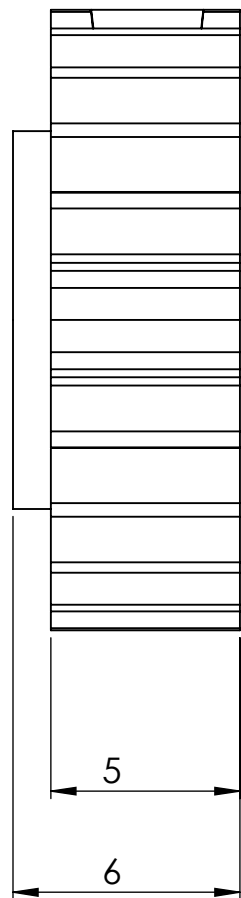
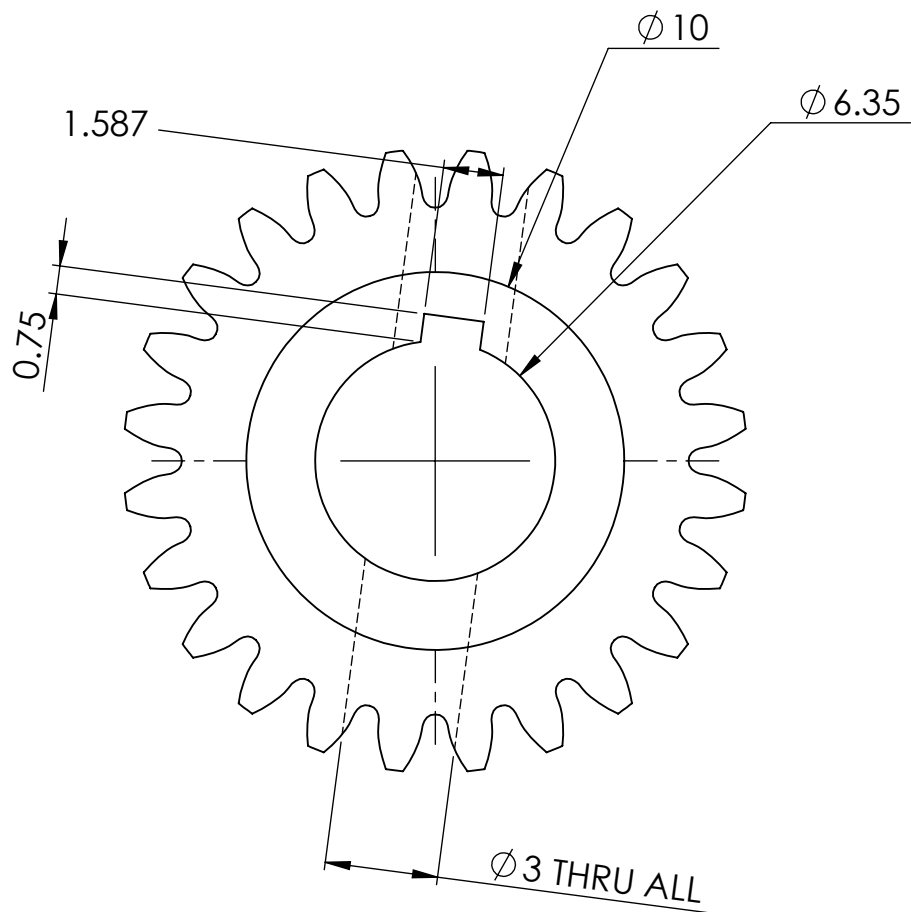
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MATERIAL: Alloy Steel		DESCRIPTION: Front Counterweight		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES:	CHECKED BY:	DATE:	DRAWN BY: Phillip Spinden		PART #: 2-07
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		DATE: 12/8/2011	QTY: 1	
FILE NAME: Front Counterweight (PS).SLDPRT			SCALE: 2:1	SHEET: 19 OF 55	



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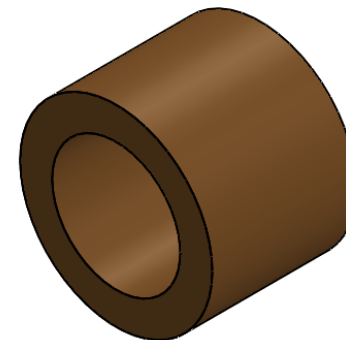
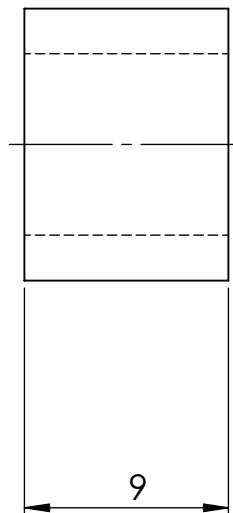
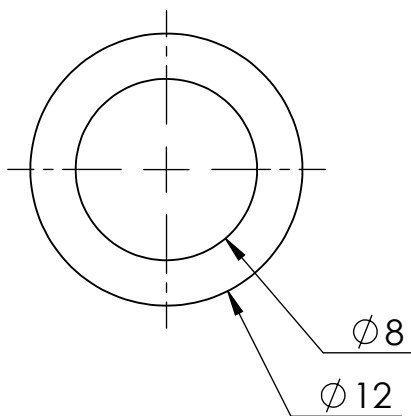
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DEFAULT TOLERANCES:		DESCRIPTION: Rear Shaft		MATERIAL: Alloy Steel	
LINEAR: X. $\pm$ .25 X.X $\pm$ .1 X.XX $\pm$ .01 X.XXX $\pm$ .002	ANGULAR: X. $\pm$ 2 X.X $\pm$ 1 X.XX $\pm$ 0 30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Phillip Spinden	DATE: 12/8/2011	PART #: 2-08	QTY: 1
		FILE NAME: Rear Shaft (PS).SLDPRT	SCALE: 2:1	SHEET: 20 OF 55	




NOTE: DP=40 24-T  
PCD: 15.24mm OD: 16.51mm

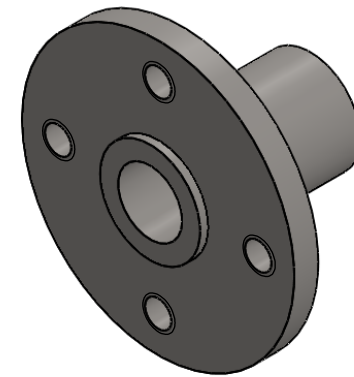
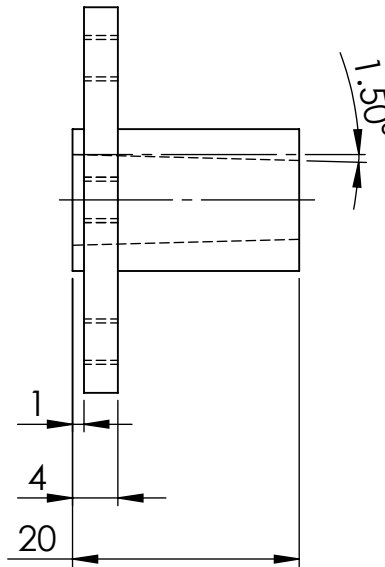
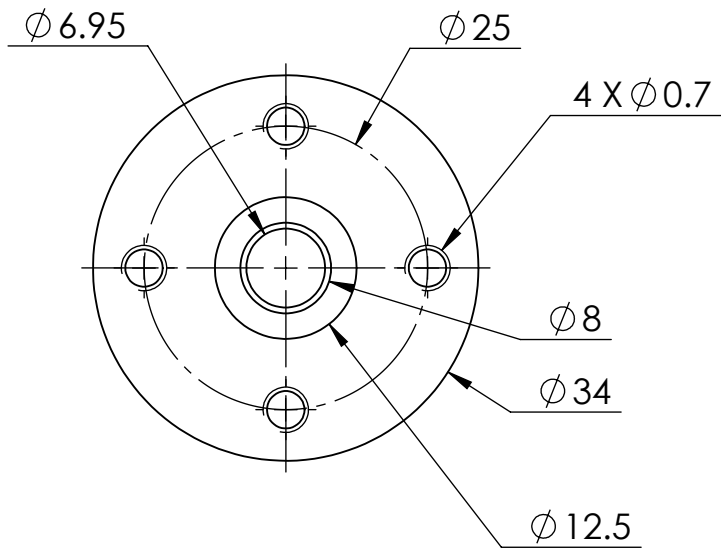
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DEFAULT TOLERANCES:		DESCRIPTION: Crankshaft Gear		MATERIAL: Alloy Steel	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Phillip Spinden	DATE: 12/8/2011	PART #: 2-09	QTY: 1
		FILE NAME: Crankshaft Gear (PS).SLDPRT	SCALE: 5:1	SHEET: 21 OF 55	



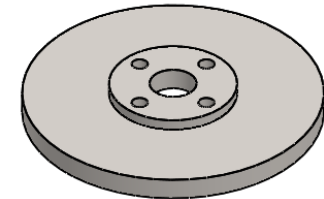
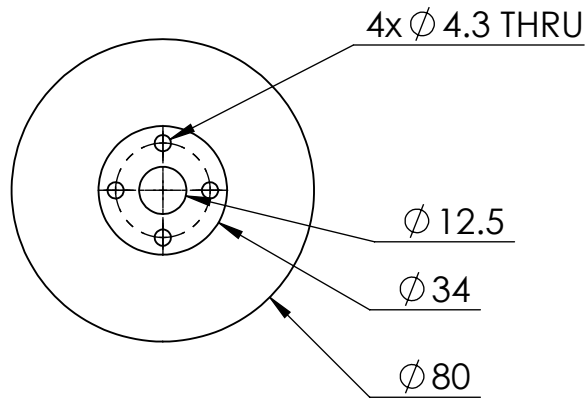
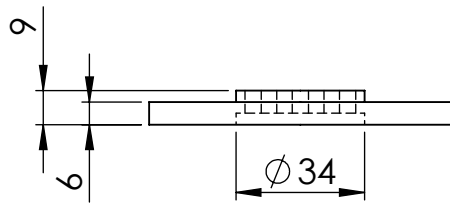
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		<p>MATERIAL: Aluminum Bronze</p>			
<p>DEFAULT TOLERANCES:</p>		<p>DESCRIPTION: Bronze Bushing</p>		<p><b>UNIVERSITY OF IDAHO ME DEPARTMENT</b></p>	
<p>LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002</p>	<p>ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'</p>	<p>CHECKED BY:</p>	<p>DATE:</p>		
		<p>DRAWN BY: Brian Zaladonis</p>	<p>DATE: 11/27/2011</p>	<p>SCALE: 3:1</p>	<p>SHEET: 22 OF 55</p>
		<p>FILE NAME: Bronze bushing (BZ).SLDPRT</p>			



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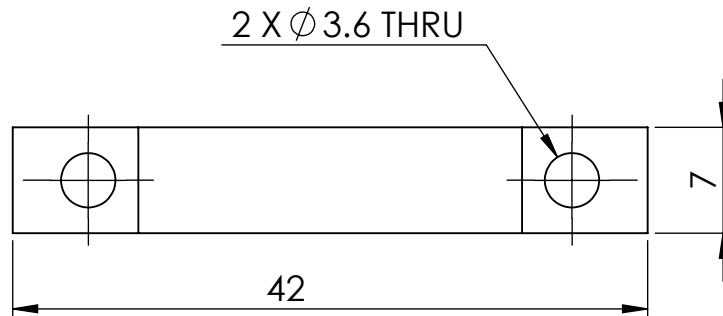
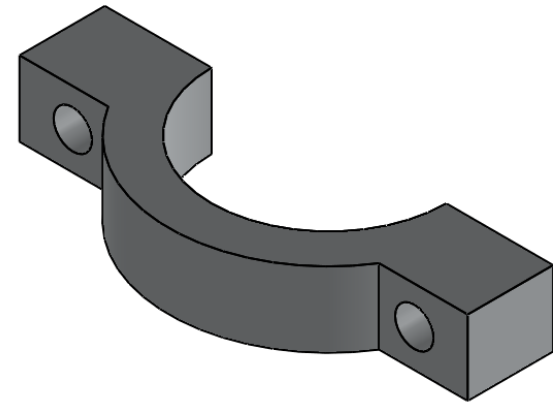
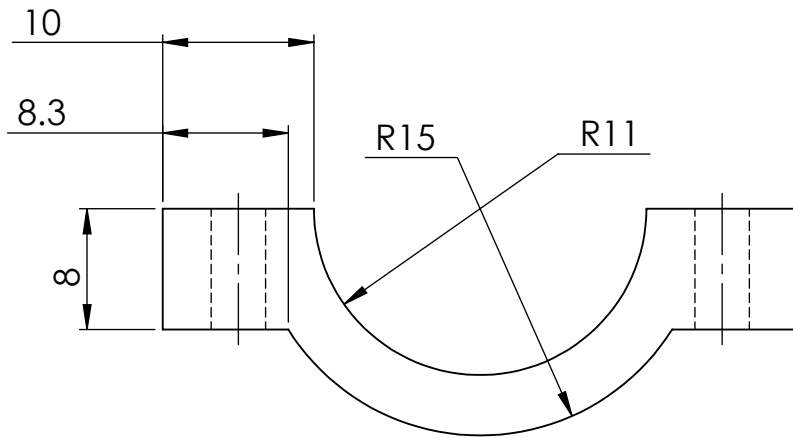
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		MATERIAL: Alloy Steel			
DEFAULT TOLERANCES: LINEAR: X. $\pm$ .25 X.X $\pm$ .1 X.XX $\pm$ .01 X.XXX $\pm$ .002		DESCRIPTION: Flywheel Hub			
ANGULAR: X. $\pm$ 2 X.X $\pm$ 1 X.XX $\pm$ 0 30'		CHECKED BY:	DATE:	PART #: 2-11	QTY: 1
		DRAWN BY: Richard Broaddus	DATE: 12/8/2011	SCALE: 1.5:1	SHEET: 23 OF 55
		FILE NAME: HUB flywheel (RB).SLDPRT			



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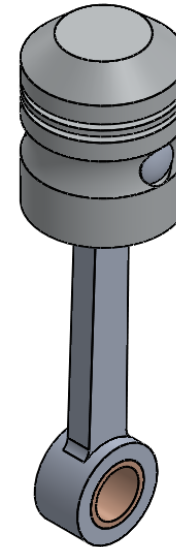
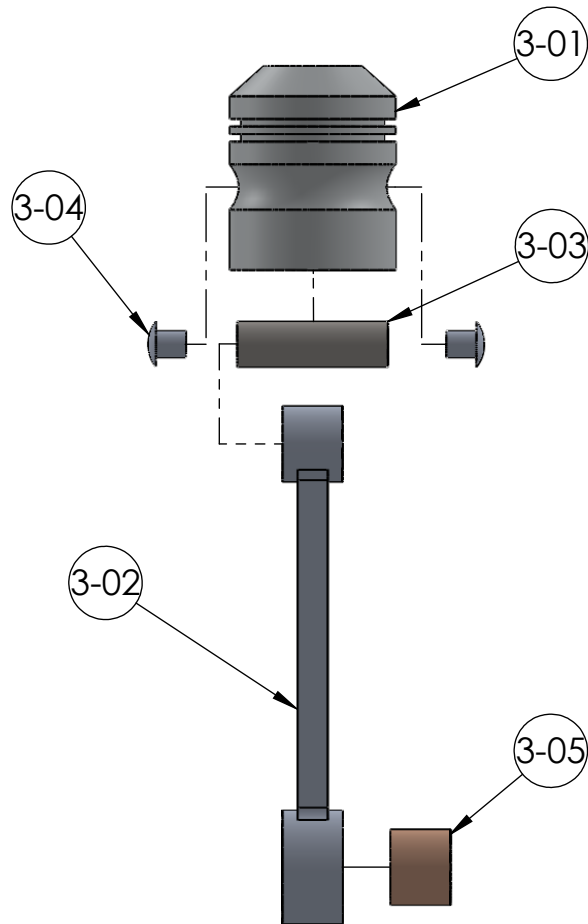
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		MATERIAL: Plain Carbon Steel			
DEFAULT TOLERANCES: LINEAR: X. $\pm$ .25 X.X $\pm$ .1 X.XX $\pm$ .01 X.XXX $\pm$ .002		DESCRIPTION: Flywheel		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
ANGULAR: X. $\pm$ 2 X.X $\pm$ 1 X.XX $\pm$ 0 30'		CHECKED BY:	DATE:		
		DRAWN BY: Alex Ackerman	DATE: 12/8/2011	SCALE: 1:2	SHEET: 24 OF 55
		FILE NAME: FLYWHEEL(AA).SLDPRT			





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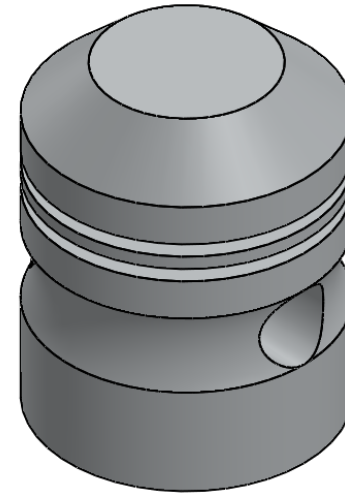
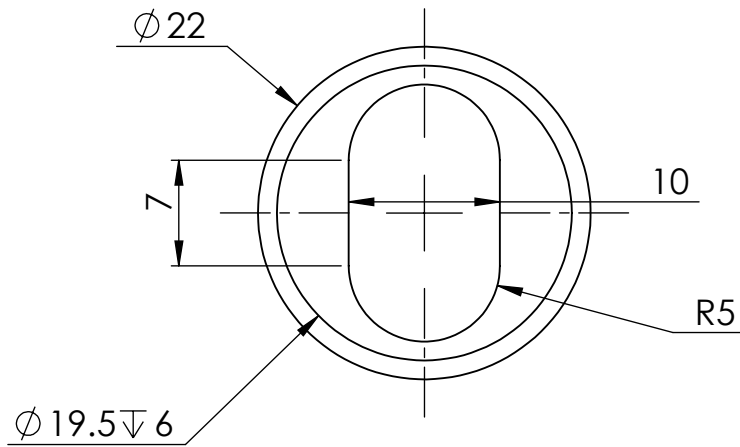
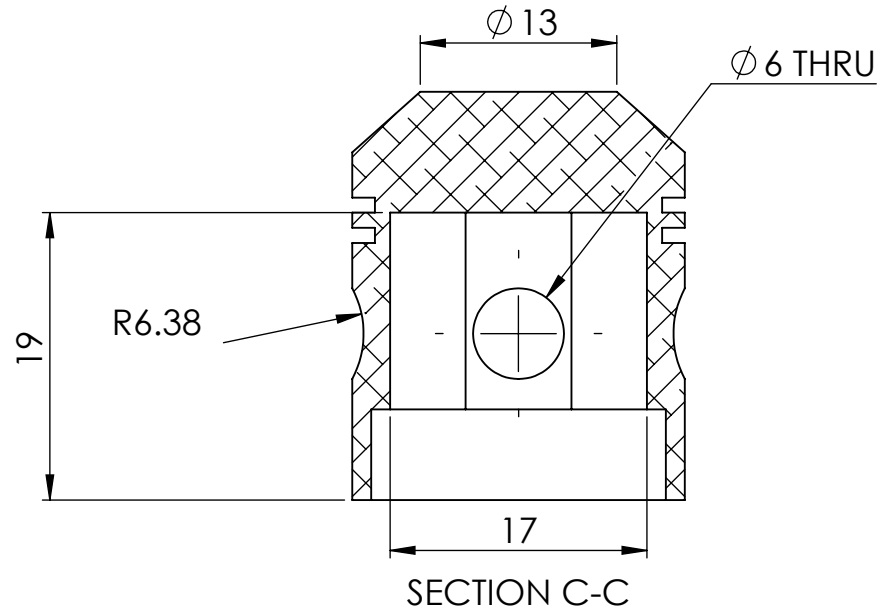
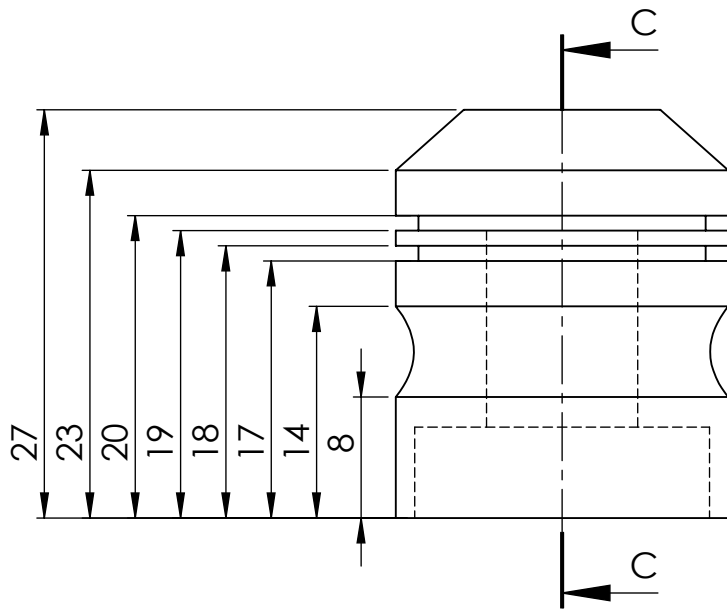
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DEFAULT TOLERANCES:		DESCRIPTION: Main Bearing Cap		MATERIAL: 6061-T6 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Brian Zaladonis	DATE: 11/27/2011	PART #: 2-13	QTY: 2
		FILE NAME: Main Bearing Cap (BZ).SLDPRT	SCALE: 1:2	SHEET: 25 OF 55	



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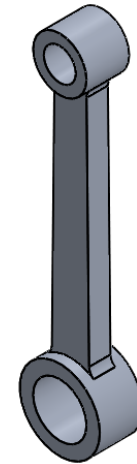
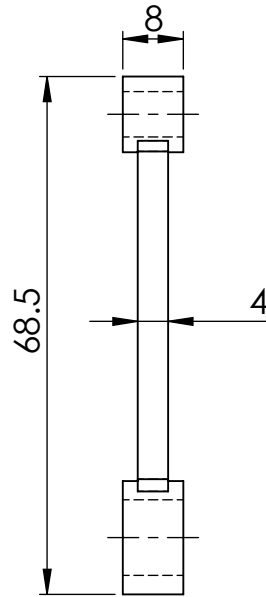
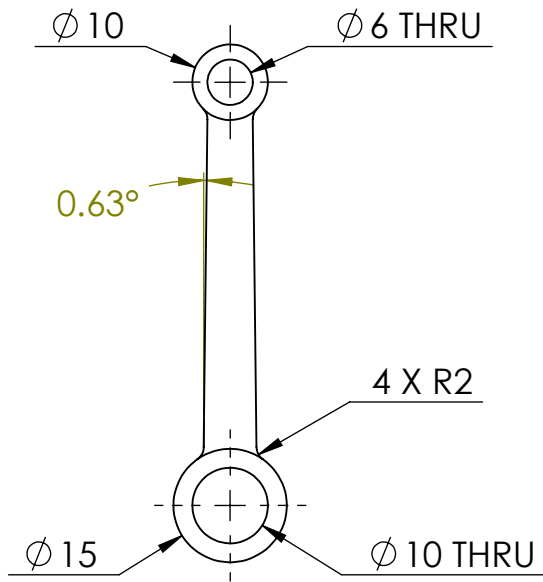
PART #	DESCRIPTION	QTY.	SHEET #
3-01	Piston Head	1	27
3-02	Connecting Rod	1	28
3-03	Connecting Rod Bushing	1	29
3-04	End Caps	2	30
3-05	Piston Pin	1	31

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DEFAULT TOLERANCES:		MATERIAL: Assorted			
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	DESCRIPTION: Piston Connecting Rod Assembly		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
		CHECKED BY:	DATE:		
		DRAWN BY: Alex Ackerman		DATE: 12/8/2011	SCALE: 1:1
		FILE NAME: Piston-Connecting Rod.SLDPRТ		SHEET: 26 OF 55	



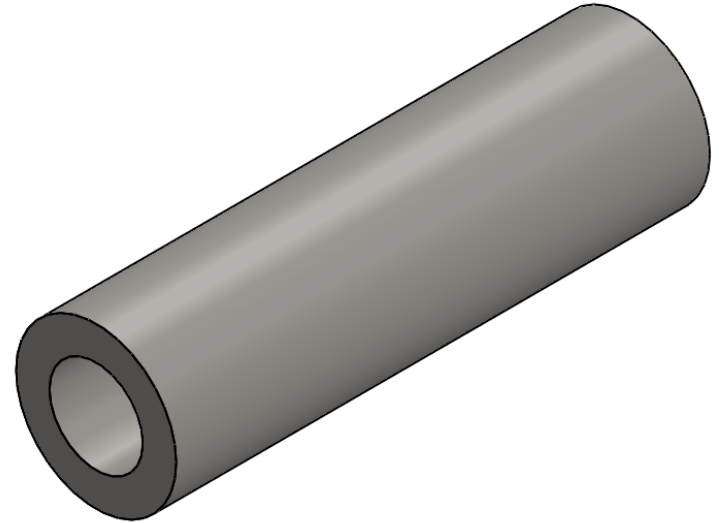
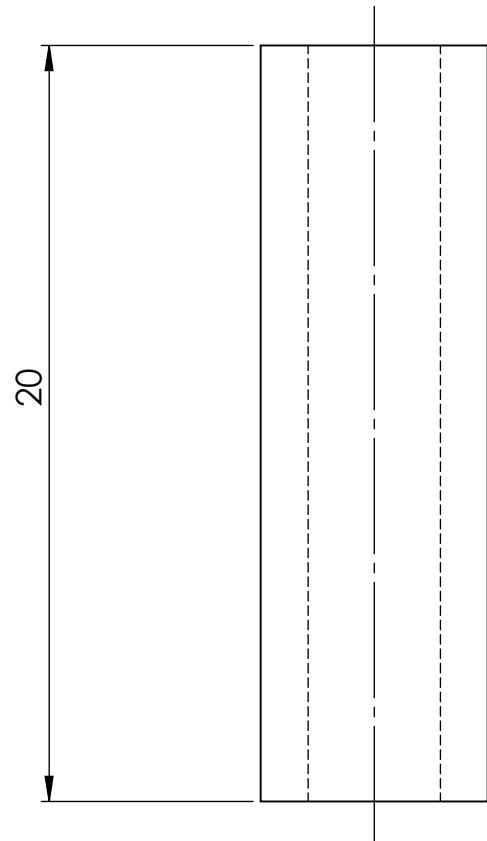
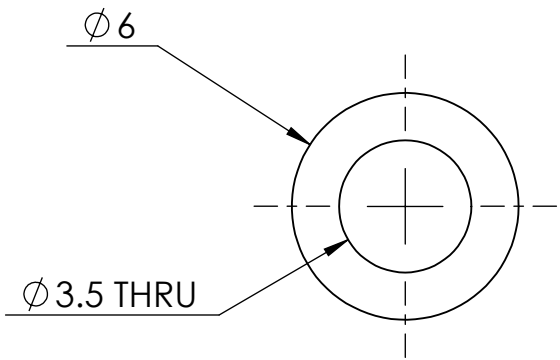
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DEFAULT TOLERANCES:		DESCRIPTION: Piston Head		MATERIAL: 2618-T61 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Richard Broaddus	DATE: 12/8/2011	PART #: 3-01	QTY: 1
		FILE NAME: Piston Head (RB).SLDPRT	SCALE: 2:1	SHEET: 27 OF 55	



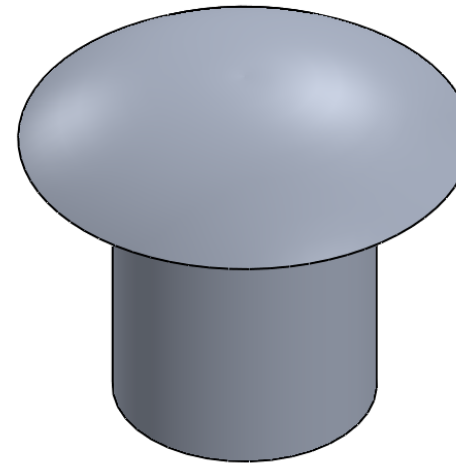
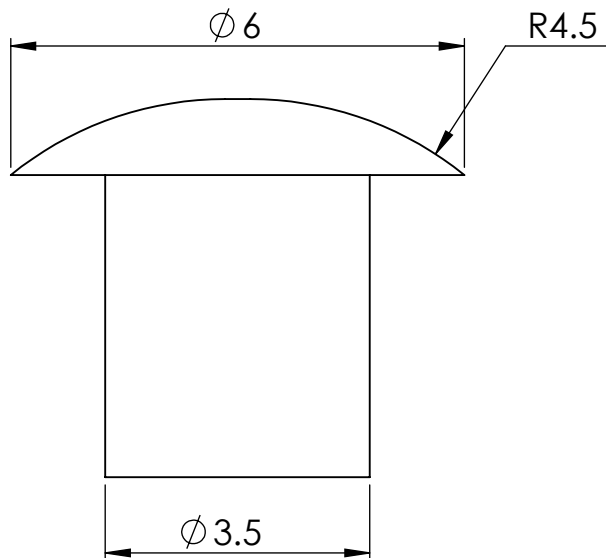
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		MATERIAL: 2618-T61 (SS)			
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002 ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		DESCRIPTION: Connecting Rod		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
		CHECKED BY:	DATE:		
		DRAWN BY: Richard Broaddus		DATE: 12/8/2011	SCALE: 1:1
		FILE NAME: Connecting Rod (RB).SLDPRT		SHEET: 28 OF 55	




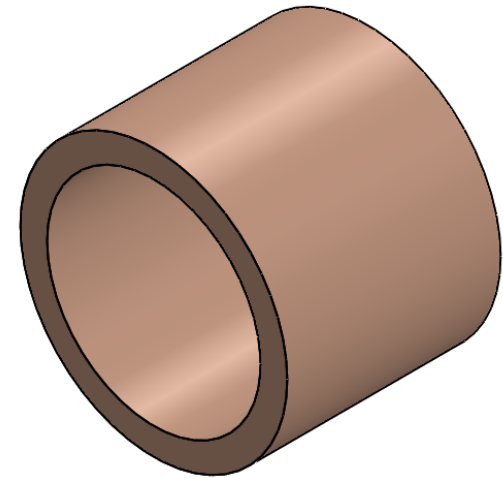
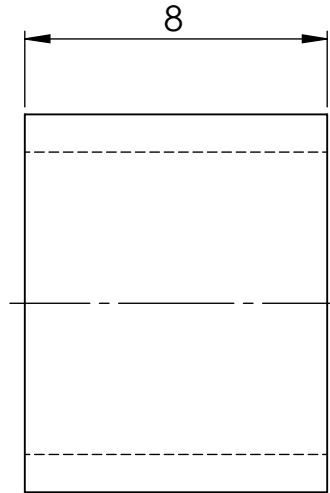
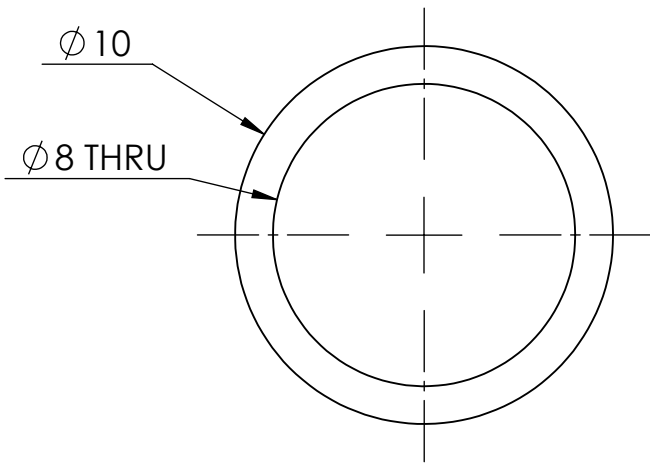
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Piston Pin		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY:	DATE:	PART #: 3-03	QTY: 1
DRAWN BY: Alex Ackerman		DATE: 12/8/2011		SCALE: 5:1	SHEET: 29 OF 55
FILE NAME: Piston Pin (RB).SLDPRT		MATERIAL: Silver Steel			




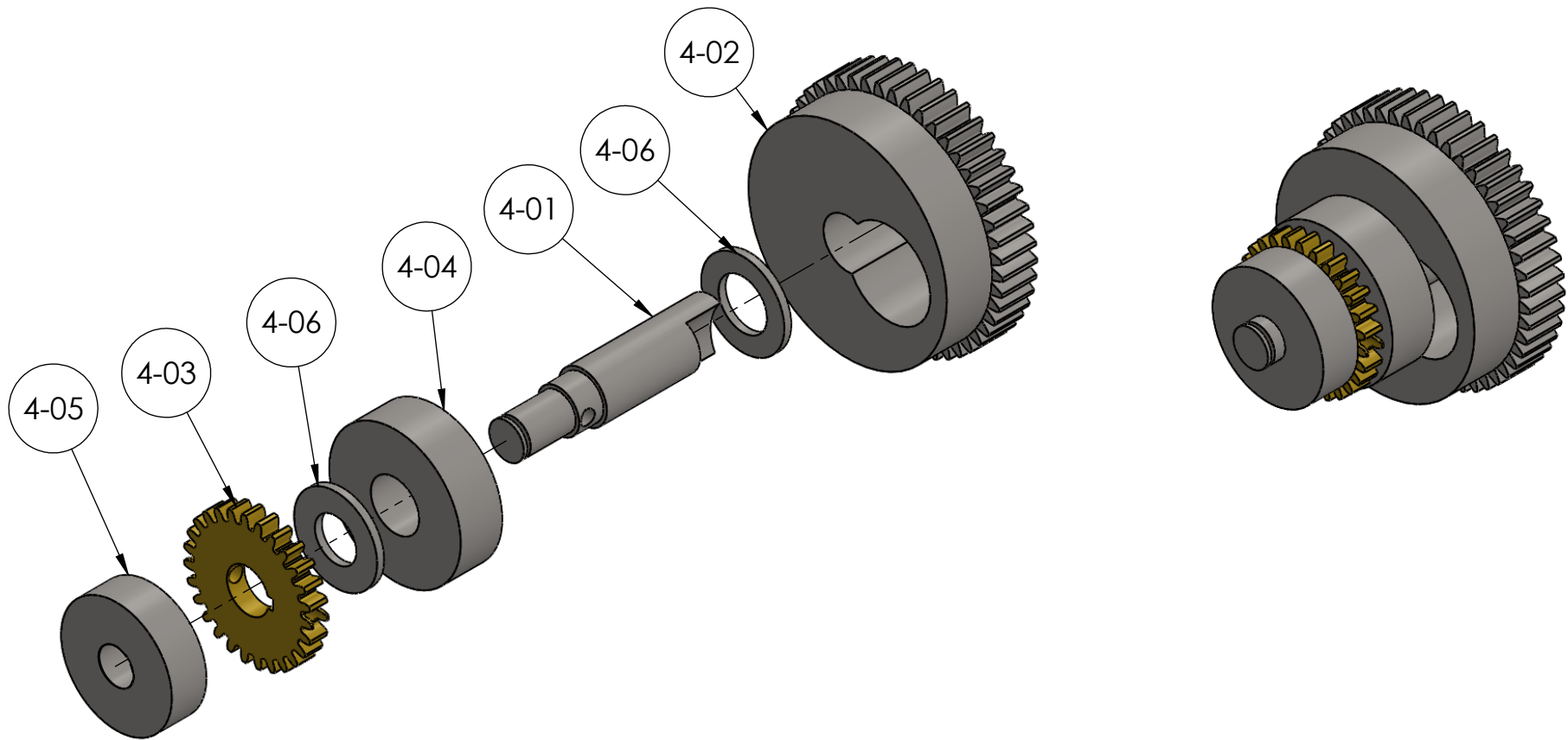
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DEFAULT TOLERANCES:		DESCRIPTION: End Caps		MATERIAL: 1060 Alloy	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Richard Broaddus	DATE: 12/8/2011	PART #: 3-04	QTY: 2
		FILE NAME: End Cap (RB).SLDPRT	SCALE: 10:1	SHEET: 30 OF 55	



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		MATERIAL: Commercial Bronze, UNS C22000 (90-10 Bronze)		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Connecting Rod Bushing		PART #: 3-05	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY:	DATE:	DRAWN BY: Richard Broaddus	DATE: 12/8/2011
		FILE NAME: Connecting Rod Bushing (RB).SLDPRT		SCALE: 5:1	QTY: 1 SHEET: 31 OF 55



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Part #	DESCRIPTION	QTY.	Sheet #
4-01	Gear Shaft	1	33
4-02	Sleeve Drive Gear	1	34
4-03	Magneto Drive Gear	1	35
4-05	Ballrace 16x5x5	1	-
4-04	Ballrace 19x7x6	1	-
4-06	1mm Spacer	2	-

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DIMENSIONS ARE IN MILLIMETERS  
 THIRD ANGLE PROJECTION

MATERIAL: Assorted

Fantastic Four:  
 The Barr & Stroud  
 Engine

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: Gear Shaft Assembly

CHECKED BY:

DATE:

DRAWN BY: Phillip Spinden

DATE: 12/6/2011

FILE NAME: Gear shaft (PS).SLDPRT

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 ME DEPARTMENT**

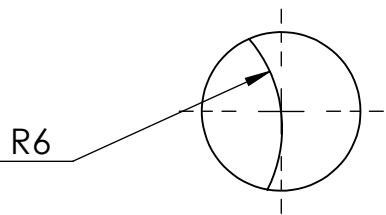
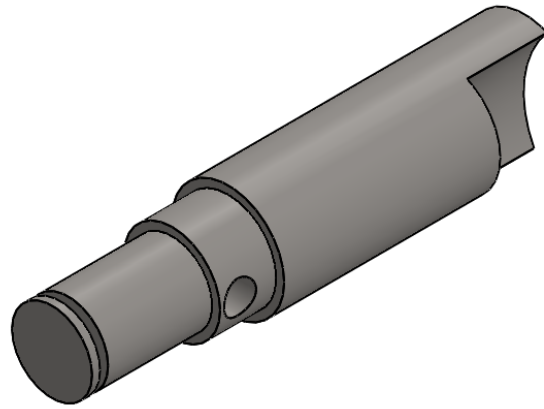
PART #: 4-00

QTY: 1

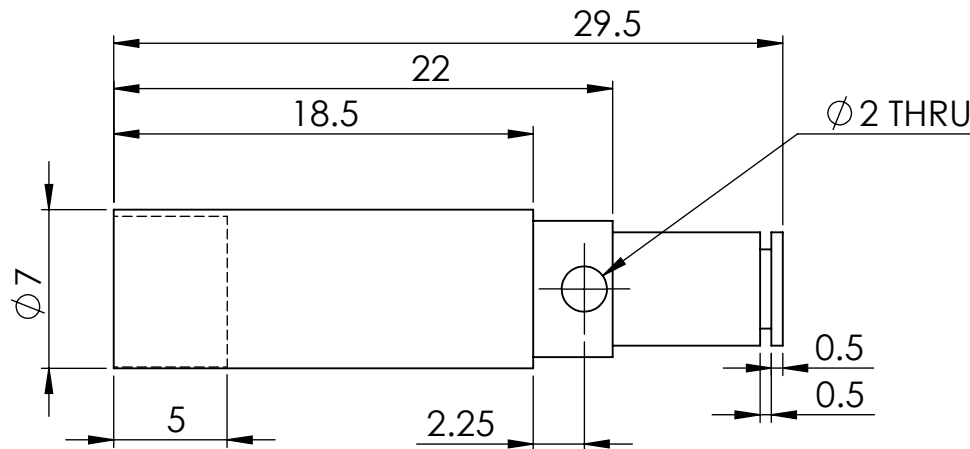
SCALE: 1.5:1

SHEET: 32 OF 55

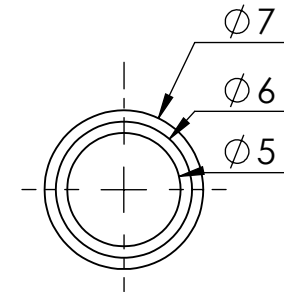




BOTTOM VIEW



RIGHT SIDE VIEW

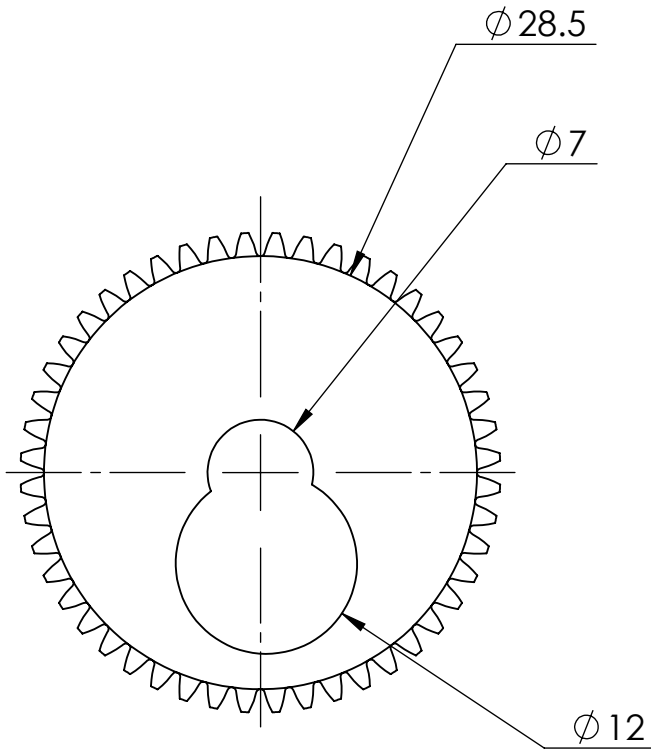


TOP VIEW

NOTE: The Cutout edge passes through the center of the shaft

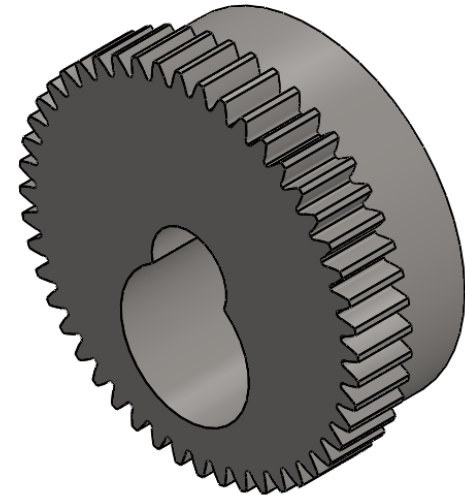
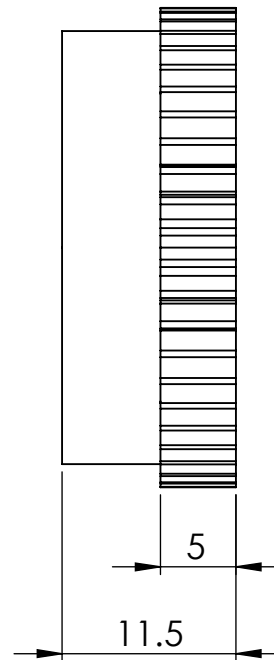
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DEFAULT TOLERANCES:		DESCRIPTION: Gear Shaft		MATERIAL: Alloy Steel	
LINEAR:	ANGULAR:	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
X. ± .25	X. ± 2	DRAWN BY: Phillip Spinden	DATE: 12/8/2011	PART #: 4-01	QTY: 1
X.X ± .1	X.X ± 1	FILE NAME: Gear shaft (PS).SLDPRT	SCALE: 3:1	SHEET: 33 OF 55	
X.XX ± .01	X.XX ± 0.30				
X.XXX ± .002					



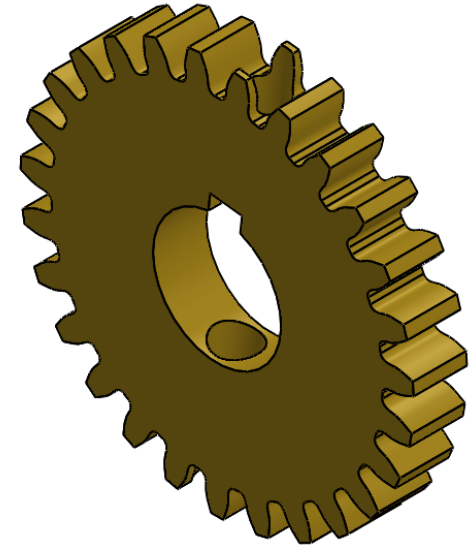
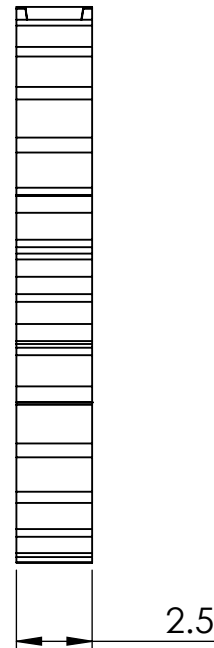
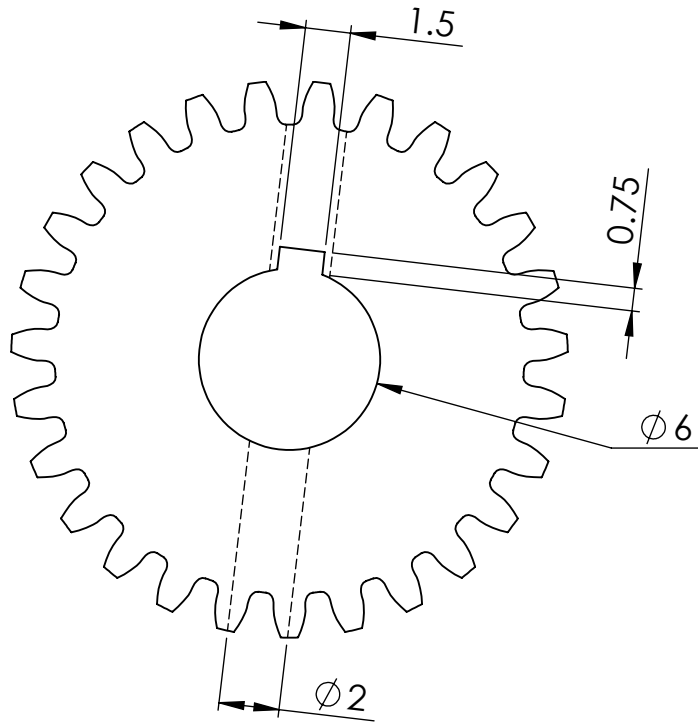
NOTE: PCD=30.48 OD= 31.75  
DP=40 48-T

Eccentric circle is 12mm diameter and intersects the center of the gear



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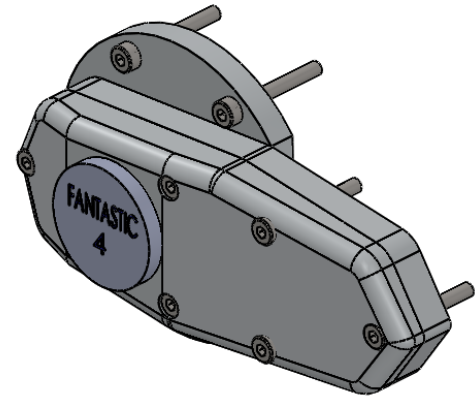
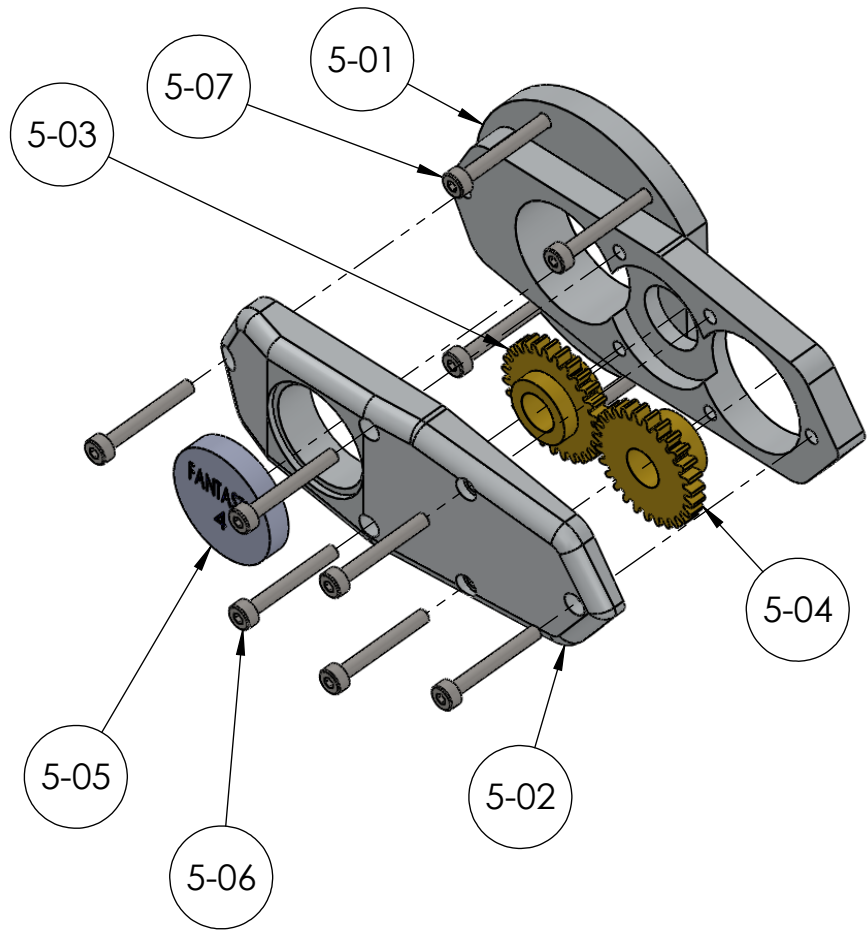
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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Sleeve Drive Gear		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		CHECKED BY:	DATE:	PART #:	QTY:
MATERIAL: Alloy Steel		DRAWN BY: Phillip Spinden		DATE: 12/8/2011	1
		FILE NAME: Sleeve Drive Gear (PS).SLDPRT		SCALE: 2:1	SHEET: 34 OF 55



NOTE: PCD=17.145 OD=18.415  
DP=40 27-T

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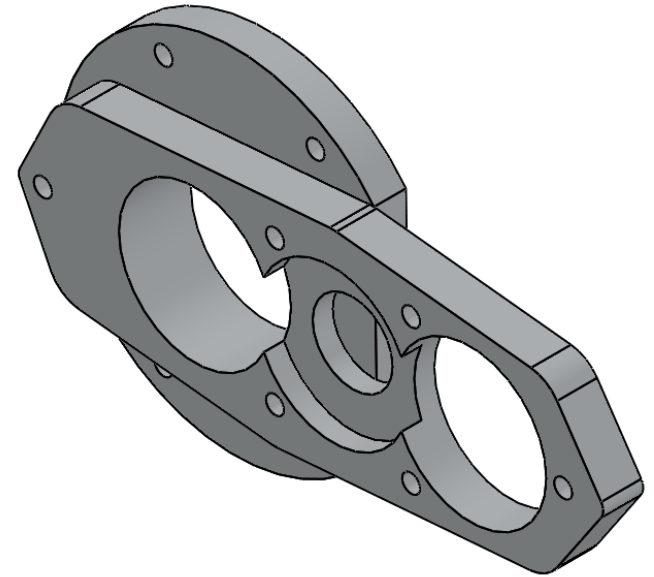
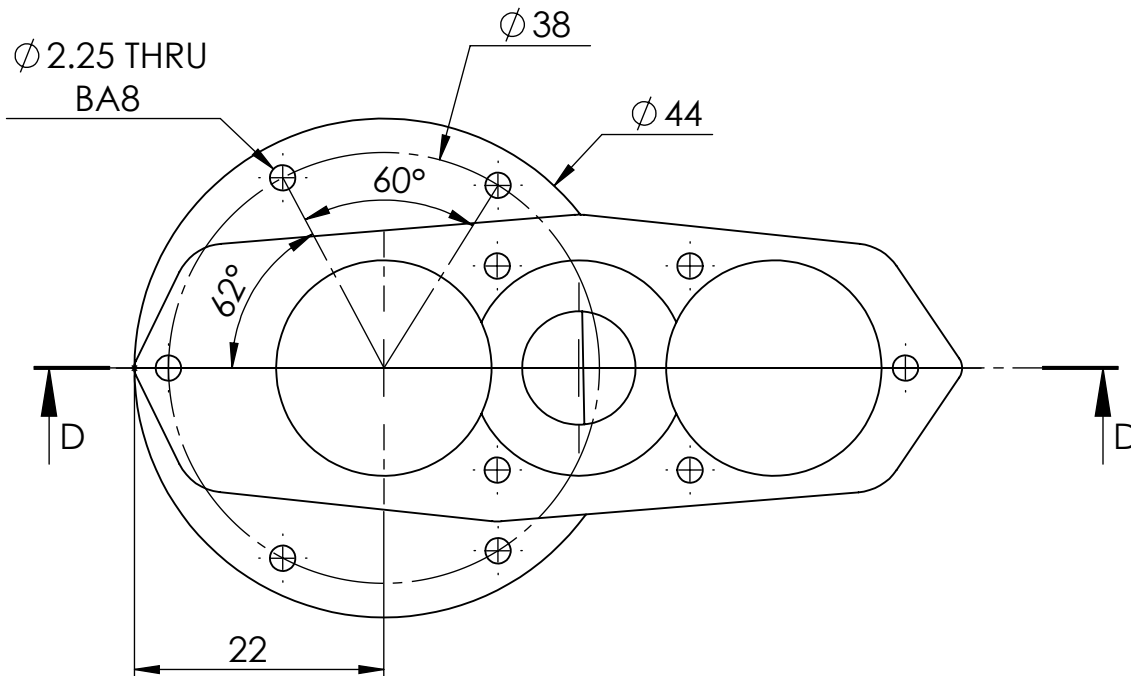
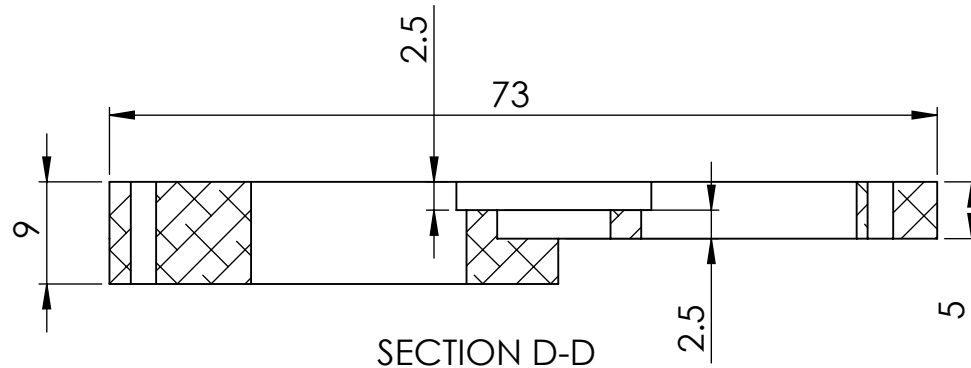
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DEFAULT TOLERANCES:		DESCRIPTION: Magneto Drive Gear		MATERIAL: Brass	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Phillip Spinden		DATE: 12/8/2011	PART #: 4-03
		FILE NAME: Driven Gear (PS).SLDPRT		SCALE: 4:1	QTY: 1 SHEET: 35 OF 55



Part #	DESCRIPTION	QTY.	Sheet #
5-01	Gear Box	1	37, 38
5-03	Idler Gear	1	39
5-04	Magneto Gear	1	40
5-02	Gear Box Cover	1	41
5-05	Name Plate	1	42
5-07	SHCS M - 2 x 0.4 x 8	4	-
		10	

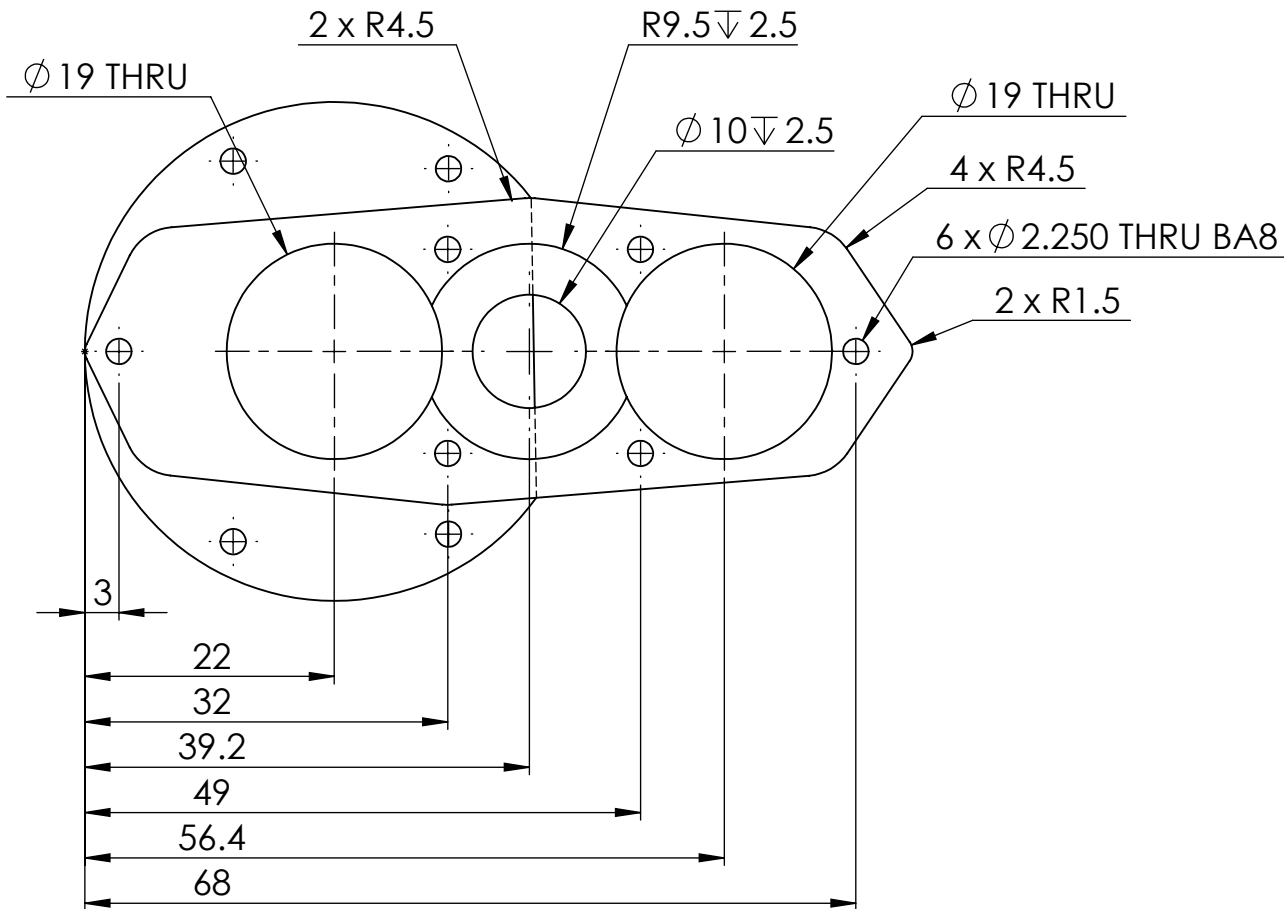
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DEFAULT TOLERANCES:		MATERIAL: Brass & 1060 Alloy			
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	DESCRIPTION: Gear Box Assembly		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
		CHECKED BY:	DATE:		
		DRAWN BY: Richard Broaddus	DATE: 12/9/2011	PART #: 5-00	QTY: 1
		FILE NAME: Gear box assembly exploded.SLDPRT	SCALE: 1:1	SHEET: 36 OF 55	

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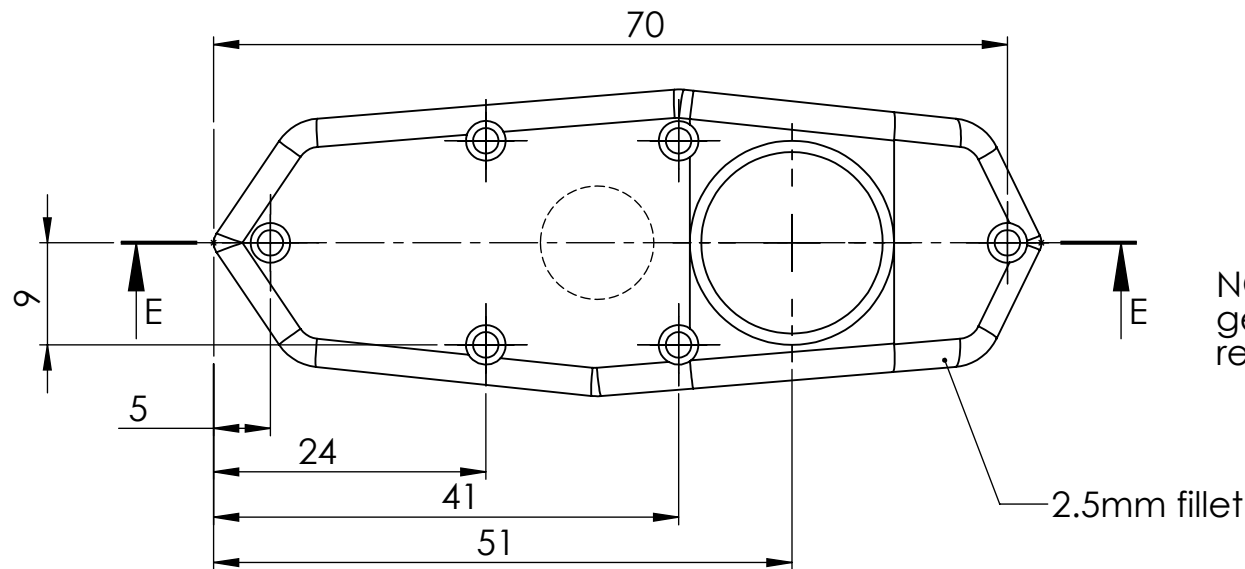
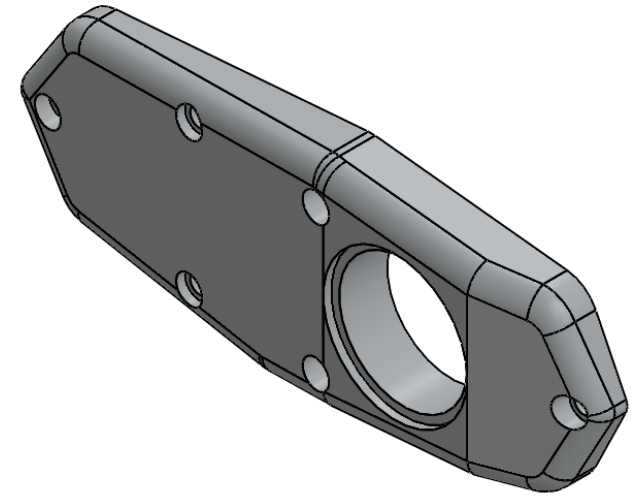
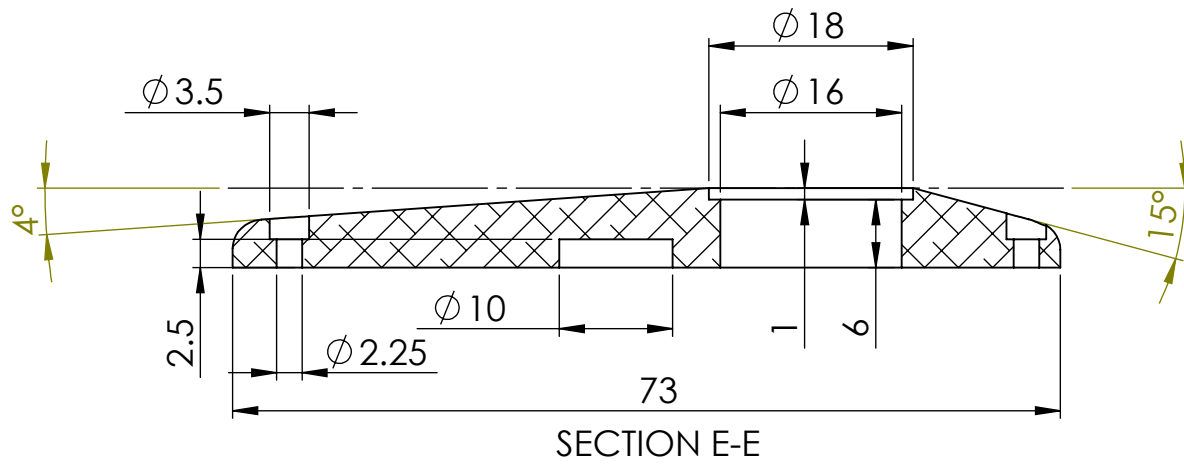
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MATERIAL: 1060 Alloy		DESCRIPTION: Gear Box		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		CHECKED BY:	DATE:
DRAWN BY: Richard Broaddus		DATE: 12/1/2011		PART #: 5-01	QTY: 1
FILE NAME: Gear Box (RB).SLDPRT		SCALE: 3:2		SHEET: 37 OF 55	



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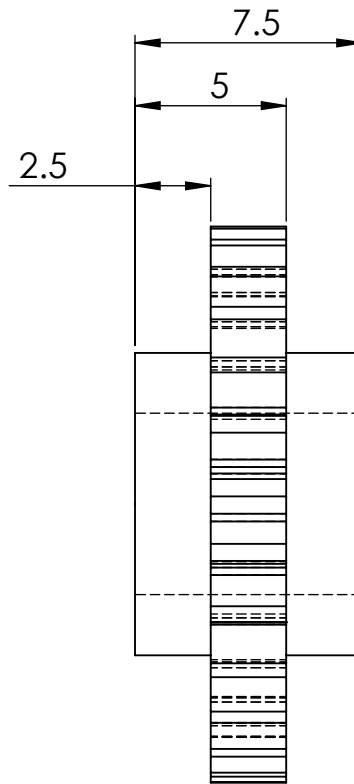
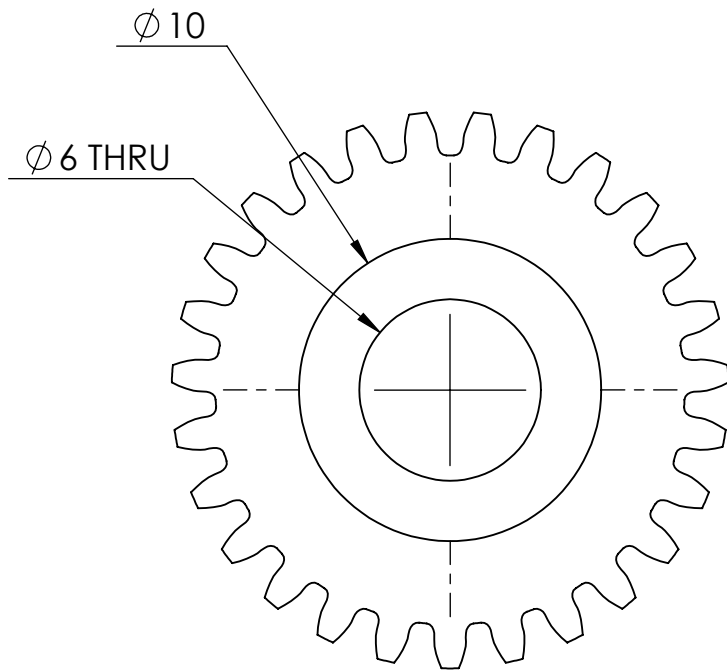
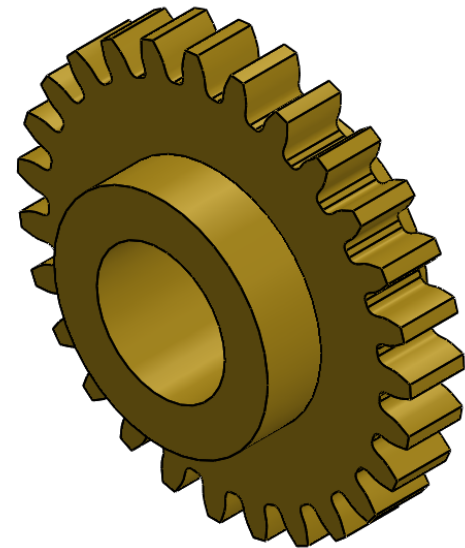
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		MATERIAL: 1060 Alloy		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGLAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		DESCRIPTION: Gear Box	
CHECKED BY:		DATE:		PART #: 5-01	
DRAWN BY: Richard Broaddus		DATE: 12/1/2011		QTY: 1	
FILE NAME: Gear Box (RB).SLDPRT		SCALE: 3:2		SHEET: 38 OF 55	



NOTE: The bolt pattern is the same as the gear box. Also the shape of the part is related to the gear box.

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DEFAULT TOLERANCES:		DESCRIPTION: Gear Box Cover		MATERIAL: 1060 Alloy	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Richard Broaddus	DATE: 12/1/2011	PART #: 5-02	QTY: 1
		FILE NAME: Gear Box Cover (RB).SLDPRT	SCALE: 3:2	SHEET: 39 OF 55	

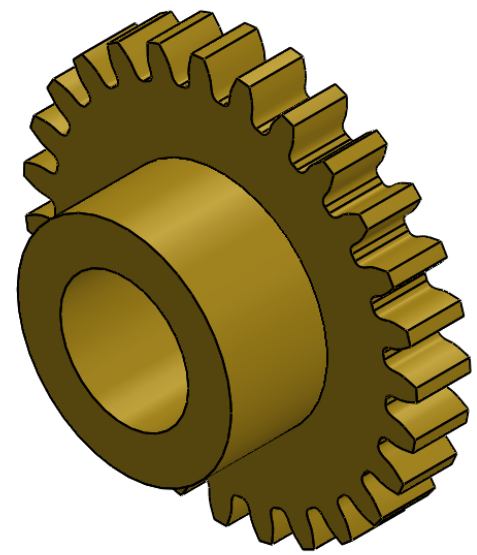
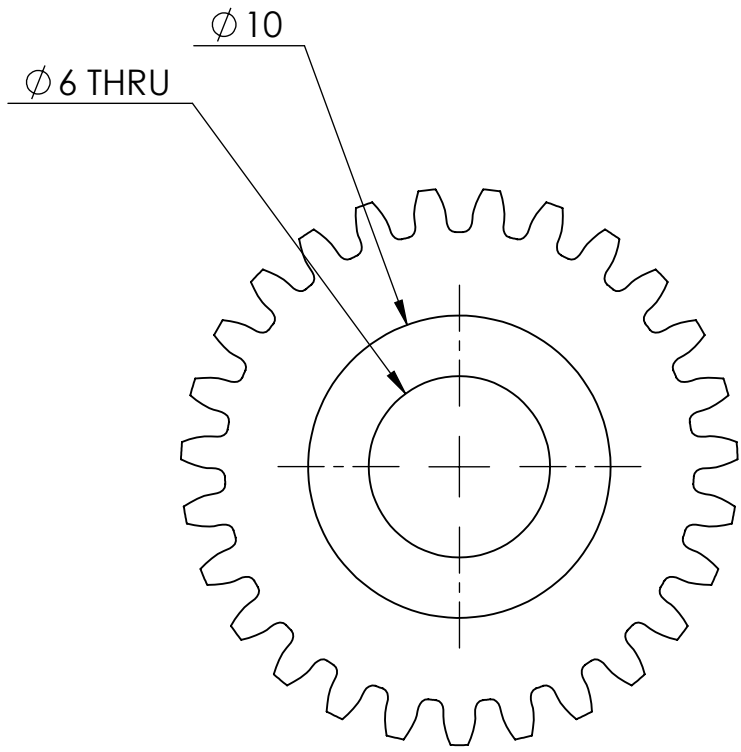


NOTE: DP=40 27-T  
PCD: 17.145 mm OD: 18.415 mm

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		MATERIAL: Brass			
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Idler Gear		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		CHECKED BY:	DATE:		
		DRAWN BY: Phillip Spinden	DATE: 12/6/2011	SCALE: 4:1	SHEET: 40 OF 55
		FILE NAME: Idler Gear (PS).SLDPRT			

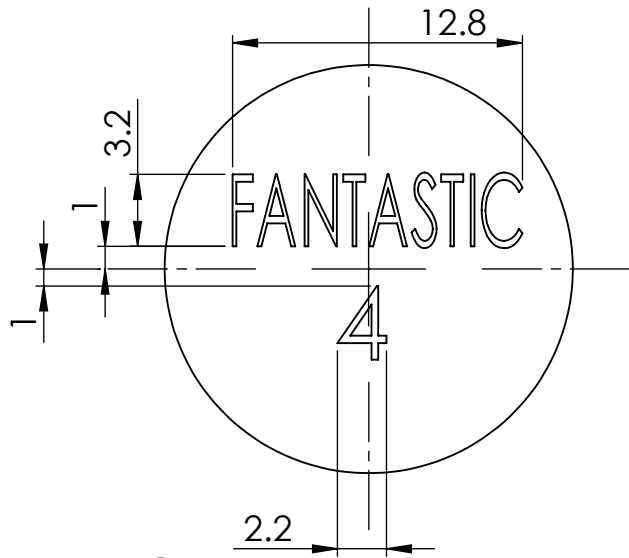
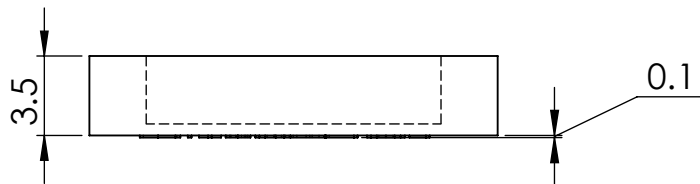
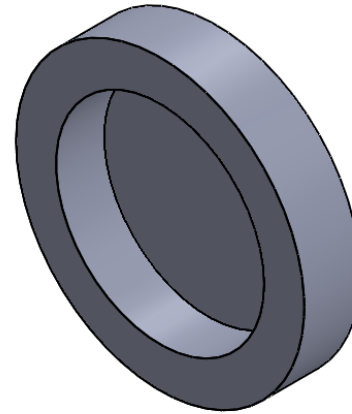
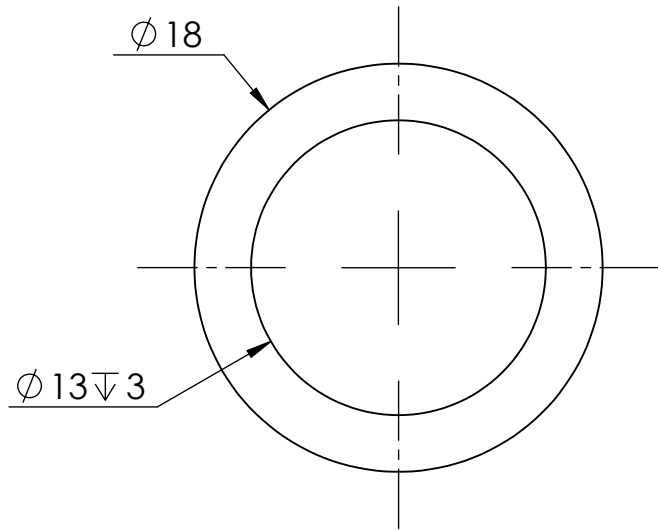




NOTE: DP=40 27-T  
PCD: 17.145 mm OD: 18.415 mm

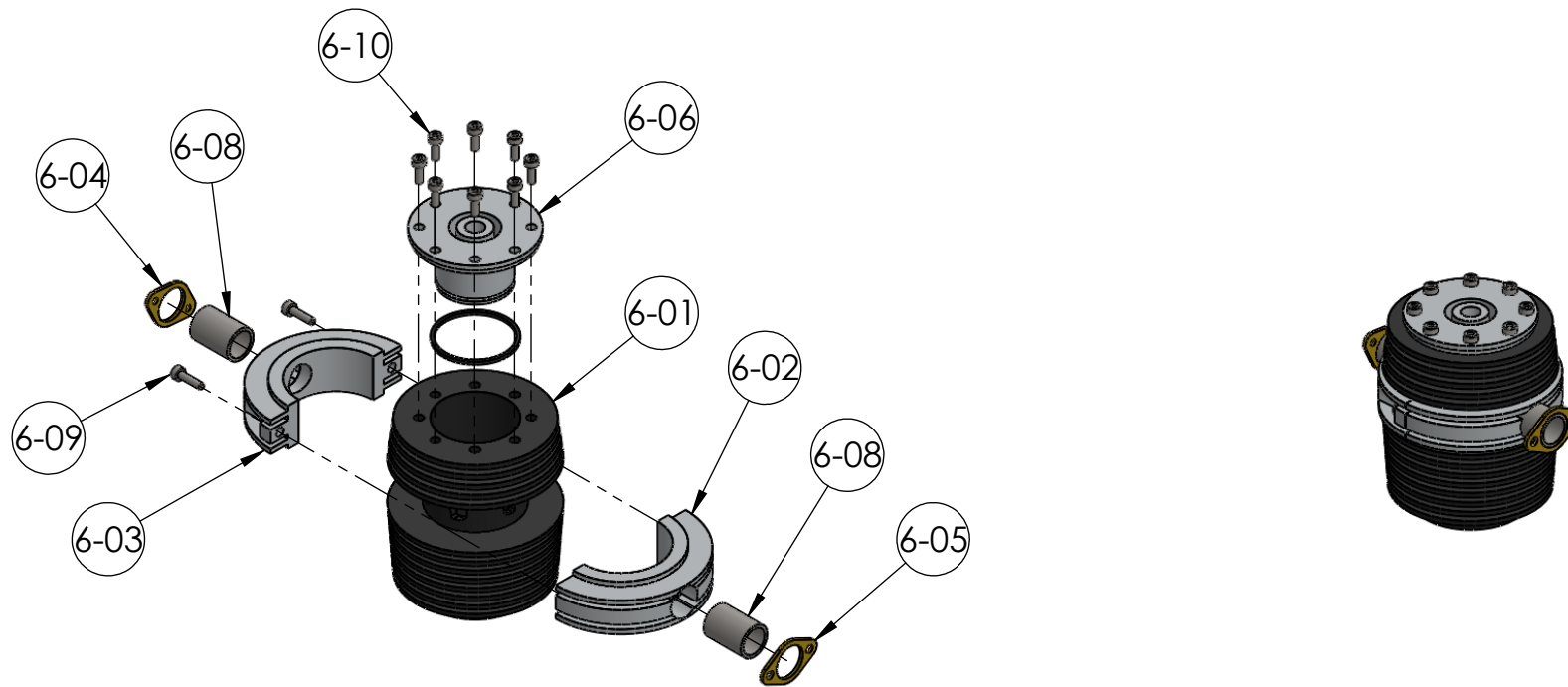
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DEFAULT TOLERANCES:		DESCRIPTION: Magneto Gear		MATERIAL: Brass	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Phillip Spinden		DATE: 12/1/2011	PART #: 5-04
		FILE NAME: Magneto Gear (PS).SLDPRT		SCALE: 4:1	QTY: 1 SHEET: 41 OF 55



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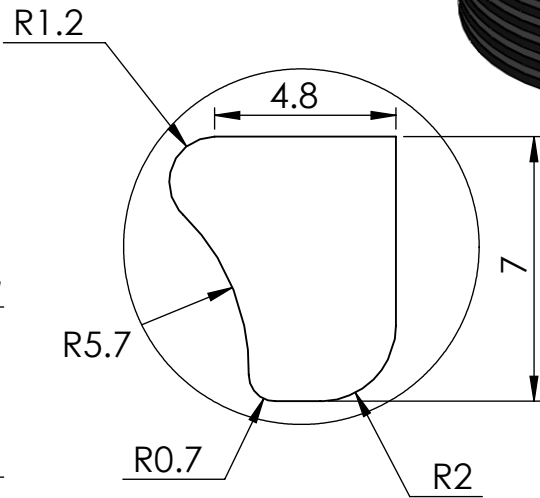
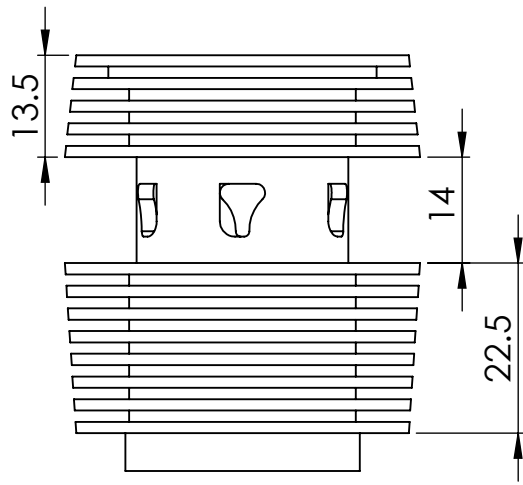
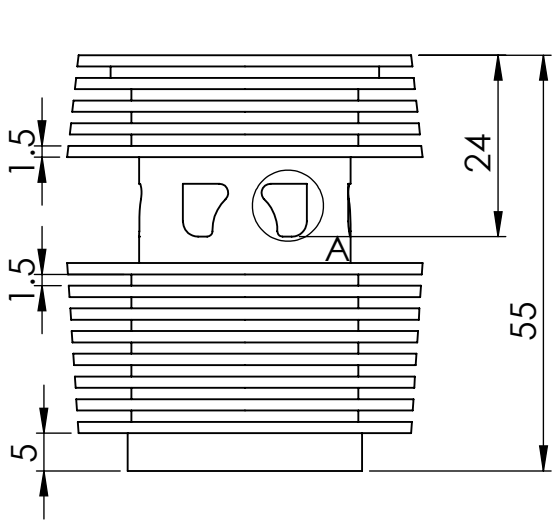
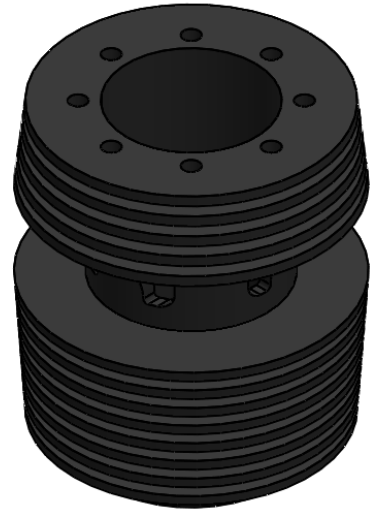
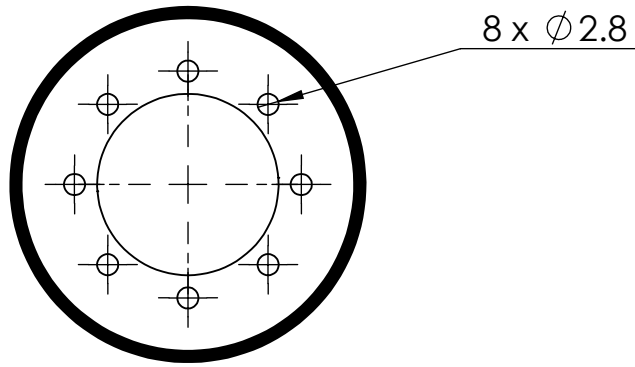
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DEFAULT TOLERANCES:		DESCRIPTION: Name Plate		MATERIAL: 2618-T61 (SS)	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Richard Broaddus	DATE: 12/8/2011	PART #: 5-05	QTY: 1
		FILE NAME: Nameplate (RB).SLDPRT	SCALE: 3:1	SHEET: 42 OF 55	



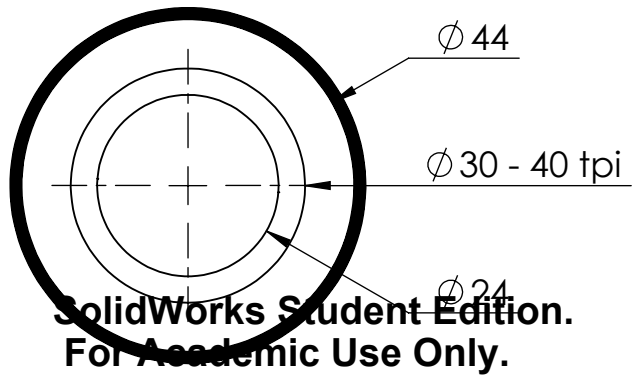
Part #	DESCRIPTION	QTY.	Sheet #
6-01	Cylinder	1	44
6-02	Exhaust Manifold	1	45
6-03	Intake Manifold	1	46
6-04	Intake Flange	1	47
6-05	Exhaust Flange	1	48
6-06	Junk Head	1	49
6-07	Piston Ring	1	50
6-08	Studs Intake & Exhaust	2	51
6-09	2 x 0.4 x 8 Hex	2	-
6-10	2 x 0.4 x 6 Hex	8	-

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DEFAULT TOLERANCES:		MATERIAL: Assorted			
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	DESCRIPTION: Cylinder Manifolds Assembly		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
		CHECKED BY:	DATE:		
		DRAWN BY: Aaron Kitchen		DATE: 12/8/2011	SCALE: 1:2
		FILE NAME: (6) Cylinder_Manifolds_Assembly.SLDPRT		SHEET: 43 OF 55	

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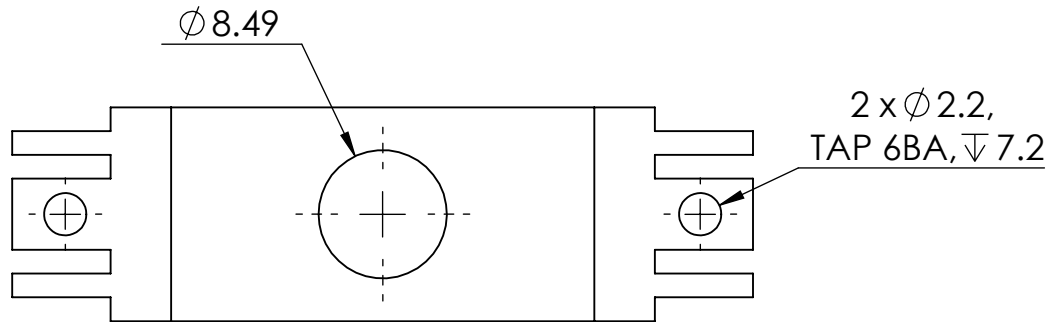
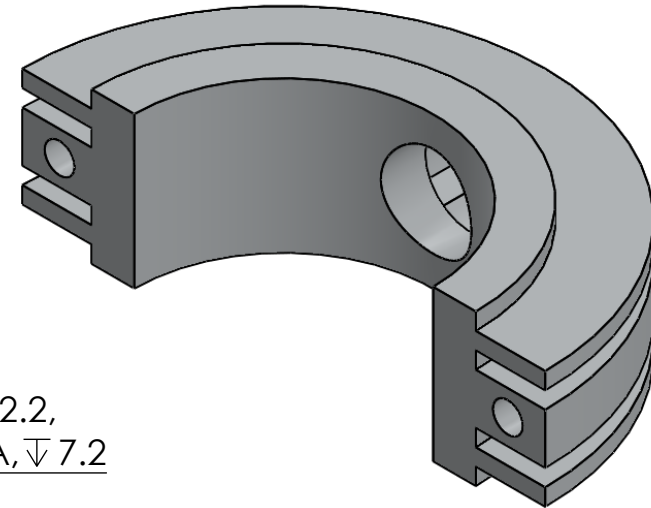
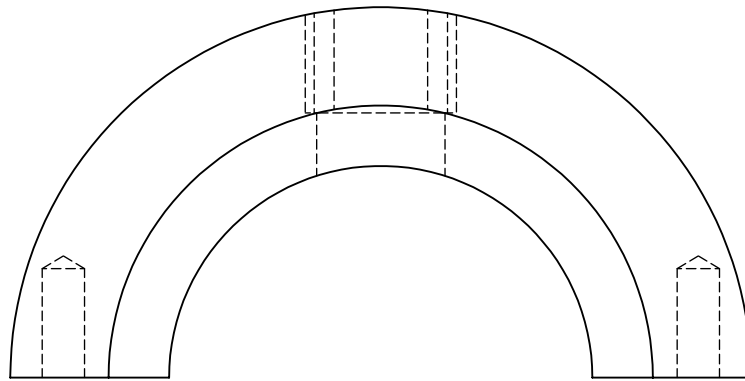


DETAIL A  
SCALE 5 : 1



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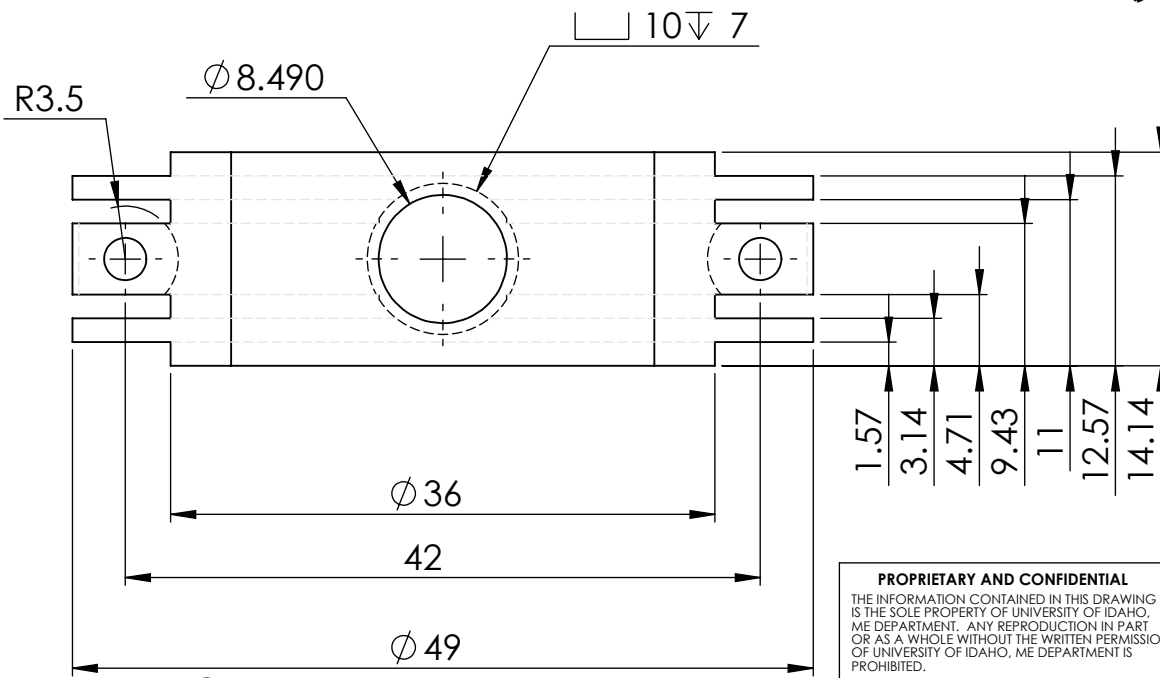
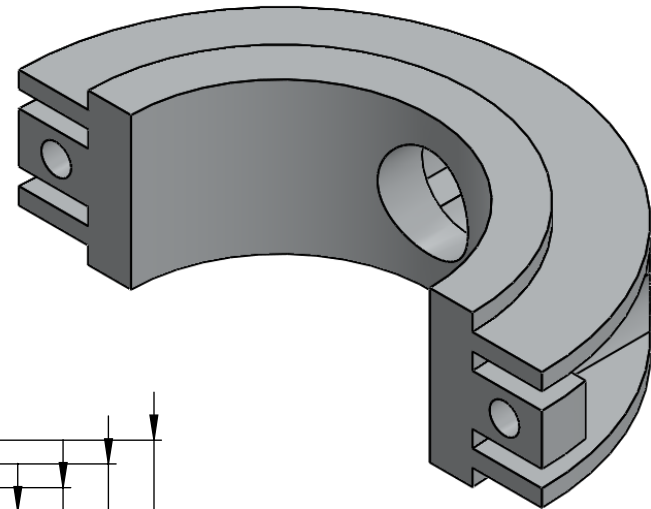
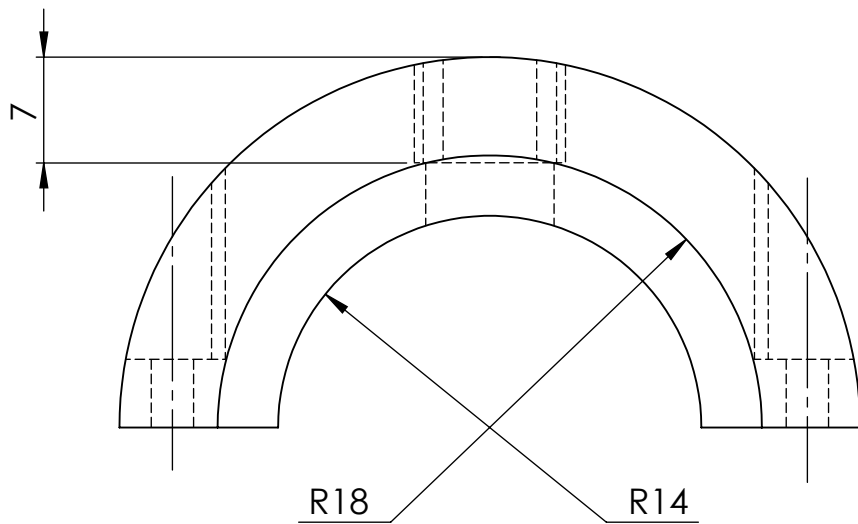
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MATERIAL: Gray Cast Iron		DESCRIPTION: Cylinder		<b>UNIVERSITY OF IDAHO          ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		PART #: 6-01 QTY: 1	
CHECKED BY:		DATE:		SCALE: 1:1	
DRAWN BY: Aaron Kitchen		DATE: 12/8/2011		SHEET: 44 OF 55	
FILE NAME: Cylinder (AK).SLDPRT					



NOTE: All dimensions not noted are the same as the Intake Manifold.

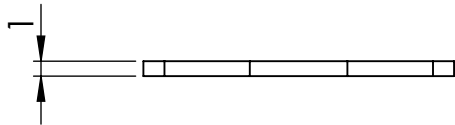
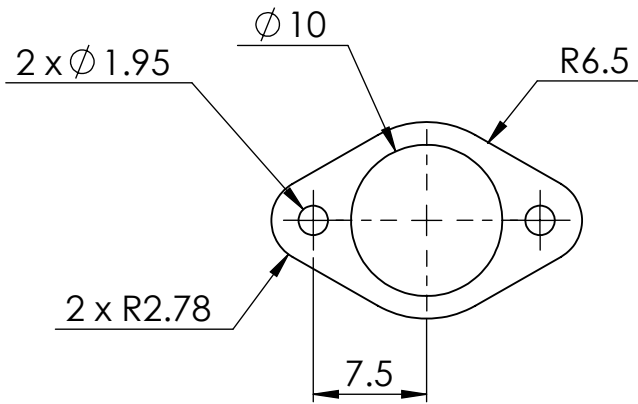
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DEFAULT TOLERANCES:		DESCRIPTION: Exhaust Manifold		MATERIAL: 6061-T6 (SS)	
LINER: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	DRAWN BY: Aaron Kitchen	DATE: 12/8/2011
		FILE NAME: Exhaust Manifold.SLDPRТ	SCALE: 1:2	PART #: 6-02	QTY: 1
				<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
				SHEET: 45 OF 55	



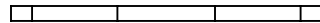
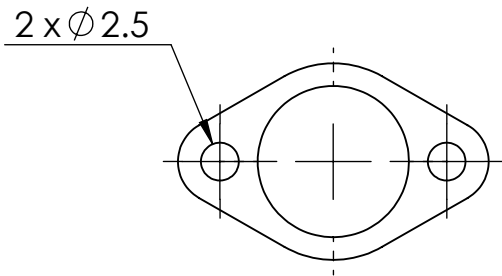
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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		MATERIAL: 6061-T6 (SS)		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DESCRIPTION: Intake Manifold		CHECKED BY:		DATE:	
DRAWN BY: Aaron Kitchen		DATE: 12/8/2011		PART #: 6-03	
FILE NAME: Intake Manifold.SLDPRT		SCALE: 2:1		QTY: 1 SHEET: 46 OF 55	



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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Intake Flange		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		CHECKED BY:	DATE:	PART #: 6-04	QTY: 1
		DRAWN BY: Aaron Kitchen	DATE: 12/8/2011	SCALE: 2:1	SHEET: 47 OF 55
		FILE NAME: Flanges_Intake&Exhaust_1.95 (AK).SLDPRT			

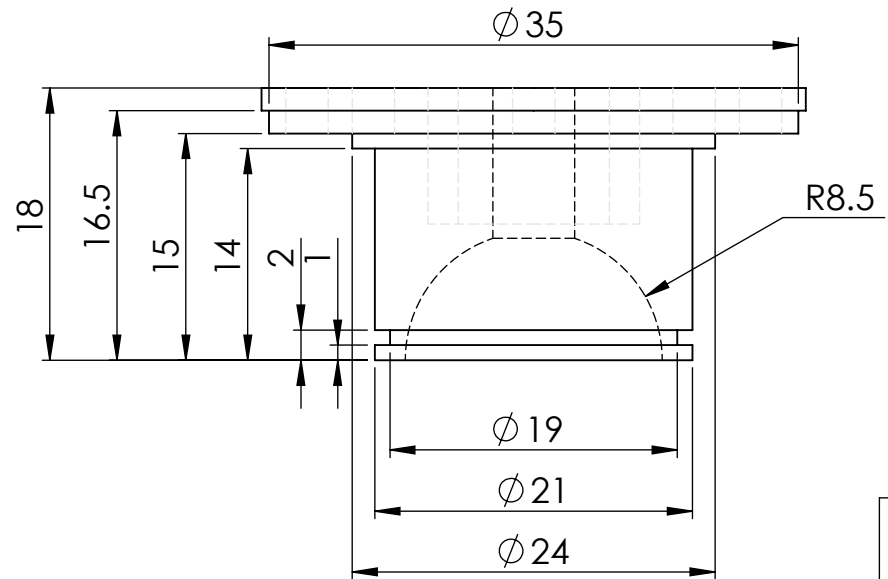
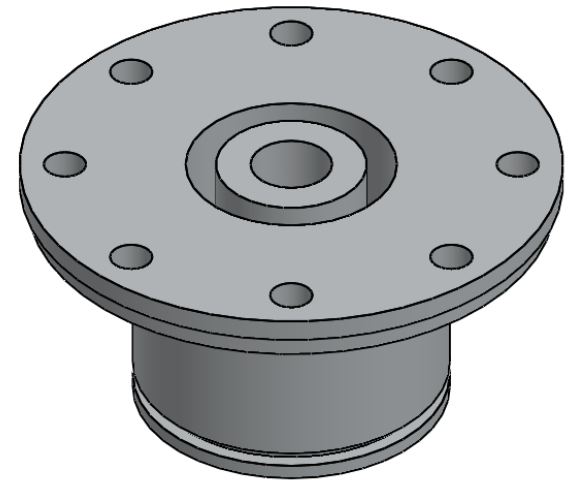
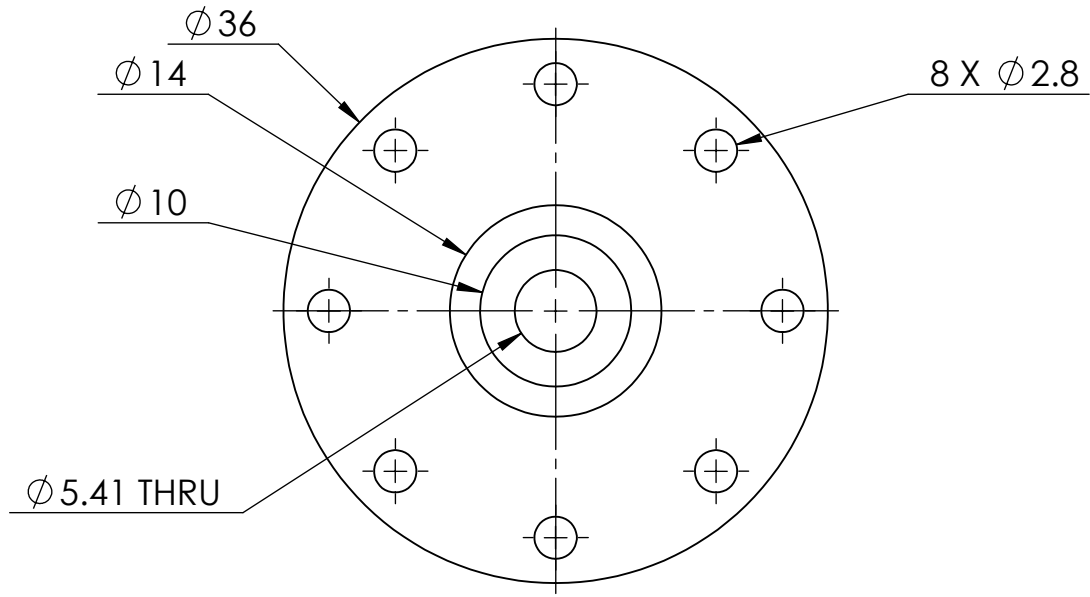


NOTE: All dimensions not noted are the same as the Intake Flange.

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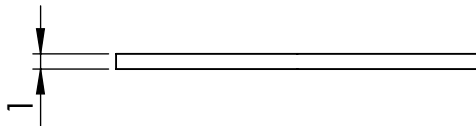
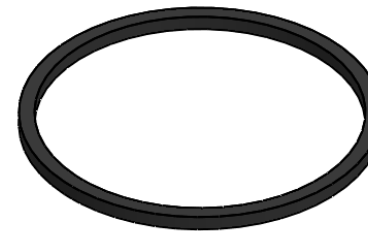
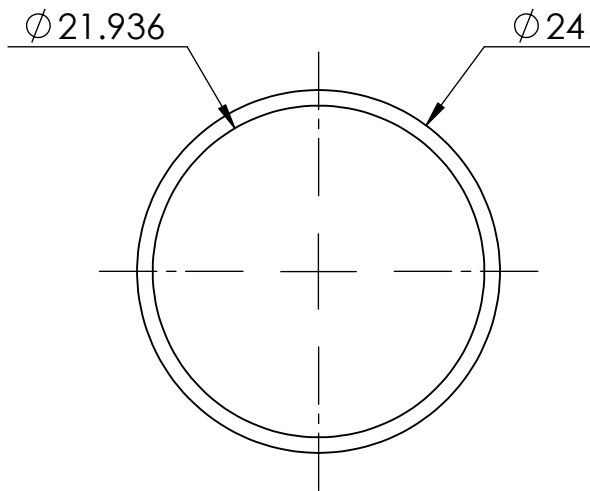
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		MATERIAL: Brass		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002 ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		DESCRIPTION: Exhaust Flange		PART #: 6-05	
		CHECKED BY:	DATE:	DRAWN BY: Aaron Kitchen	DATE: 12/8/2011
		FILE NAME: Flanges_Intake&Exhaust_2.55 (AK).SLDPRT		SCALE: 2:1	QTY: 1 SHEET: 48 OF 55






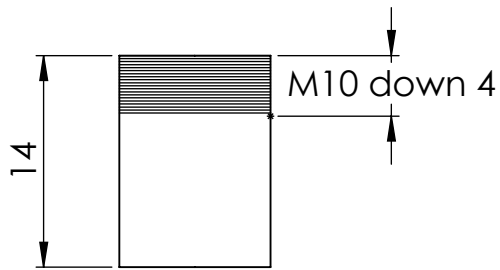
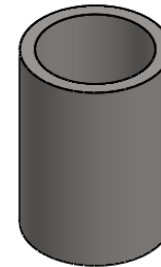
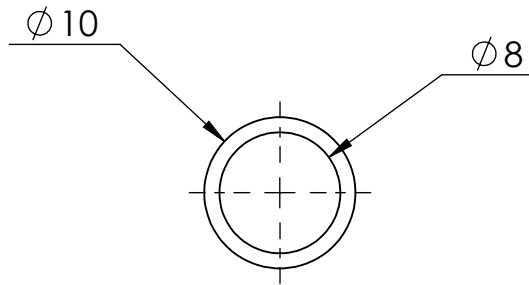
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MATERIAL: 6061-T6 (SS)		DESCRIPTION: Junk Head		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'		CHECKED BY: _____ DATE: _____ DRAWN BY: Aaron Kitchen DATE: 12/1/2011 FILE NAME: Junk Head (AK).SLDPRT	
		SCALE: 2:1		PART #: 6-06 QTY: 1 SHEET: 49 OF 55	




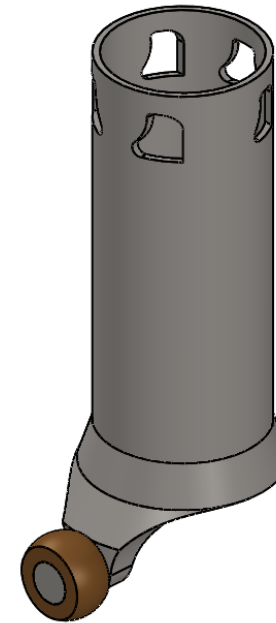
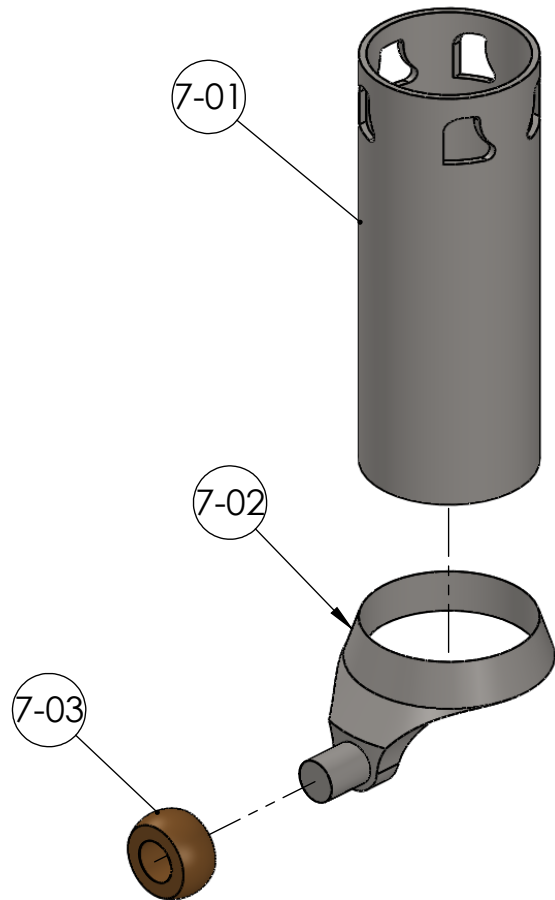
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		MATERIAL: BUTYL		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGLAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		DESCRIPTION: Piston Ring	
		CHECKED BY:		DATE:	
		DRAWN BY: Aaron Kitchen		DATE: 12/1/2011	
		FILE NAME: Ring_Piston&JunkHead (AK).SLDPRT		PART #: 6-07	
				QTY: 1	
				SCALE: 2:1	
				SHEET: 50 OF 55	



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DEFAULT TOLERANCES:		DESCRIPTION: Studs Intake & Exhaust		MATERIAL: Alloy Steel	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Aaron Kitchen	DATE: 12/1/2011	PART #: 6-08	QTY: 1
		FILE NAME: Studs_Intake&Exhaust (AK).SLDPRT	SCALE: 2:1	SHEET: 51 OF 55	

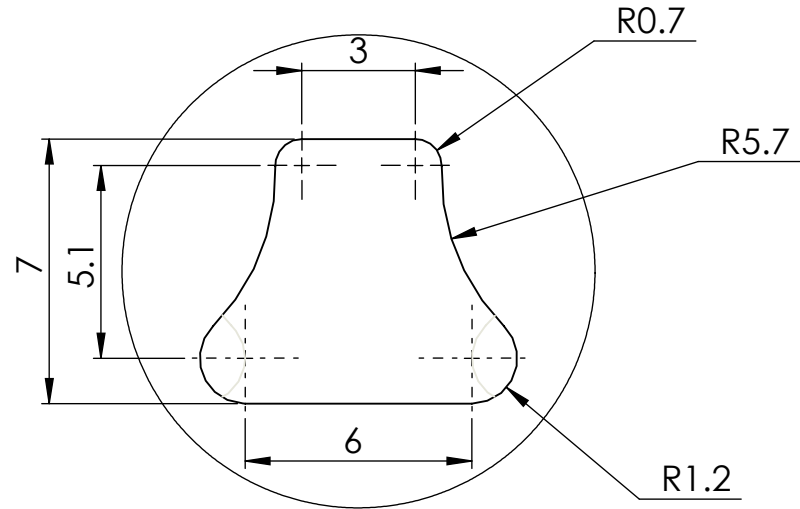
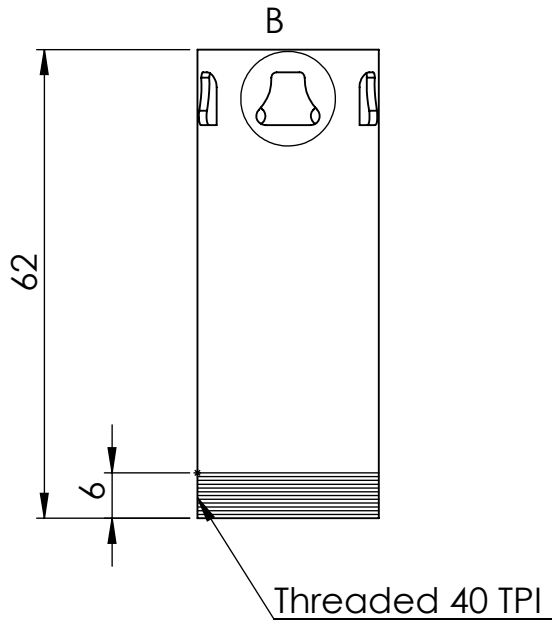


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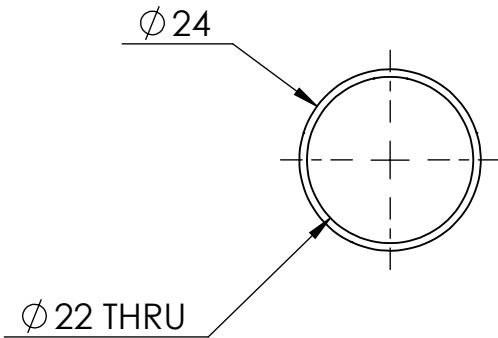
Part #	DESCRIPTION	QTY.	SHEET #
7-02	Sleeve Crank Pin Collar	1	53
7-01	Sleeve	1	54
7-03	Universal Ball	1	55

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DEFAULT TOLERANCES:		MATERIAL: Assorted		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'	DESCRIPTION: Sleeve, Cam Peices Assembly		PART #: 7-00	
		CHECKED BY:	DATE:	QTY: 1	
		DRAWN BY: Brian Zaladonis		DATE: 11/26/2011	SHEET: 52 OF 55
		FILE NAME: Sleeve, Cam Peices Assembly exploded		SCALE: 1:1	



DETAIL B  
SCALE 5 : 1

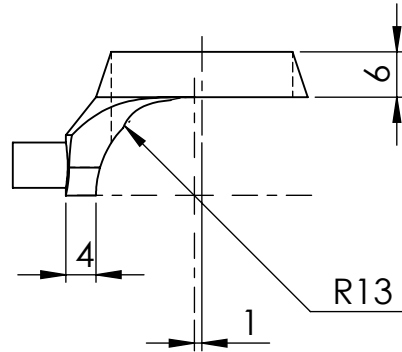
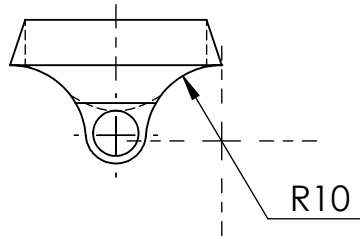
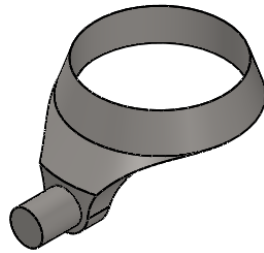
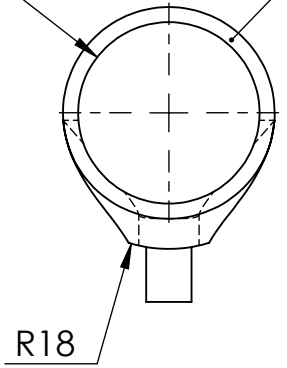


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DEFAULT TOLERANCES:		DESCRIPTION: Sleeve		MATERIAL: Cast Carbon Steel	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
		DRAWN BY: Aaron Kitchen	DATE: 11/22/2011	PART #: 7-01	QTY: 1
		FILE NAME: Sleeve (AK).SLDPRT	SCALE: 1:1	SHEET: 53 OF 55	

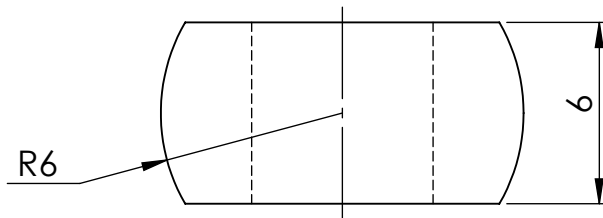
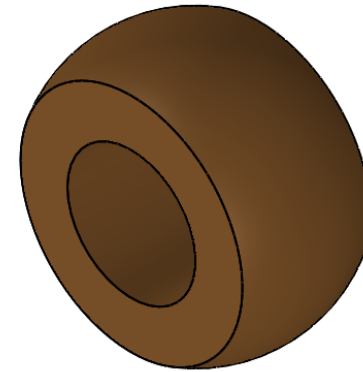
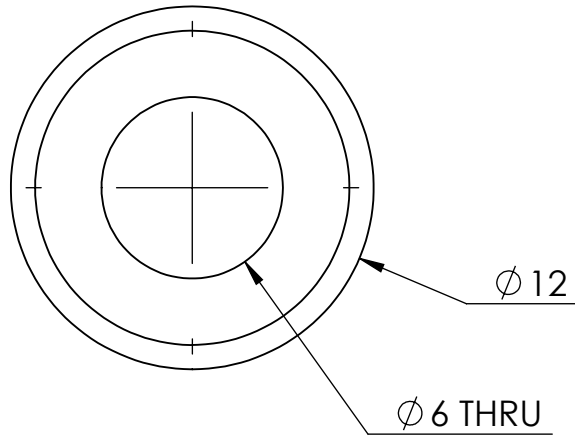
Ø 24 THRU ALL

NOTE: Threaded 40 TPI



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DEFAULT TOLERANCES:		DESCRIPTION: Sleeve Crank Pin Collar		MATERIAL: Alloy Steel	
LINEAR:	ANGULAR:	CHECKED BY:	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	
X. ± .25	X. ± 2	DRAWN BY: Brian Zaladonis	DATE: 11/26/2011	PART #: 7-02	QTY: 1
X.X ± .1	X.X ± 1	FILE NAME: Sleeve Crank Pin Collar(BZ).SLDPRT	SCALE: 1:1	SHEET: 54 OF 55	
X.XX ± .01	X.XX ± 0.30				
X.XXX ± .002					



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		MATERIAL: Aluminum Bronze			
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Universal Ball		<b>UNIVERSITY OF IDAHO ME DEPARTMENT</b>	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0 30'		CHECKED BY:	DATE:		
		DRAWN BY: Brian Zaladonis		DATE: 11/26/2011	SCALE: 4:1
		FILE NAME: Universal Ball (BZ).SLDPRT		SHEET: 55 OF 55	