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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1

X.XX±.01 X.XXX±.002 DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

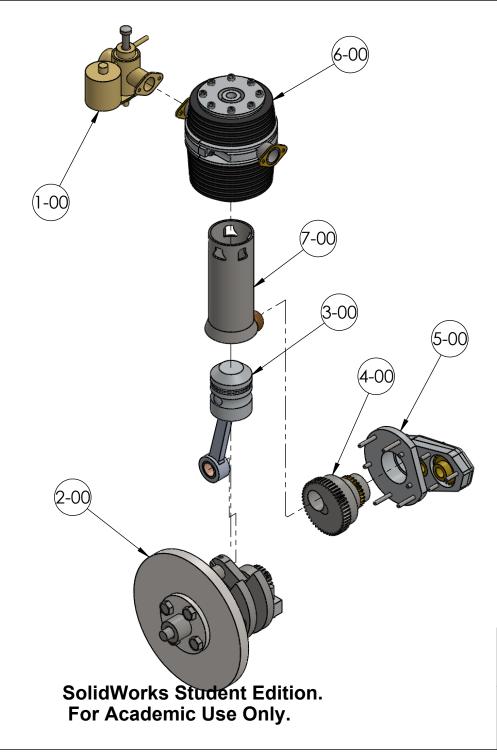
MATERIAL: Assorted

 DESCRIPTION:
 Final Assembly
 UNIVERSITY OF IDAHO ME DEPARTMENT

 CHECKED BY:
 DATE:
 ME DEPARTMENT

 DRAWN BY:
 Fantastic Four
 DATE: 12/9/2011
 PART #: 0-00
 GIY: 1

 FILE NAME:
 Motor.SLDPRT
 SCALE: 1:1
 SHEET: 1 OF 55



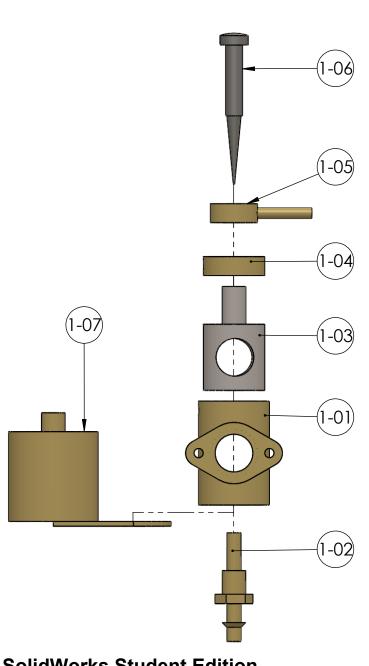
NOTE: Crank Case and Sump not shown for orientation clarity. These parts are shown in the renderings.

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

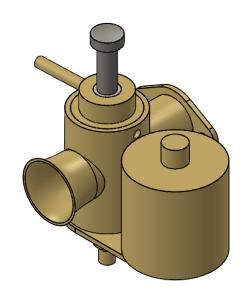
Part #	DESCRIPTION			QTY.	Sheet #	
1-00	Cark	ouretor A	ssembly		1	3
2-00	Crankshaf	t-Cranko	ase Assemb	oly	1	11
3-00	Piston	Connec Assemb	cting Rod oly		1	26
4-00	Gear Shaft Assembly			1	32	
5-00	Gear Box Assembly			1	36	
6-00	Cylinder Manifolds Assembly			/	1	43
7-00	Sleeve, Cam Assembly				1	51
IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF UNIVERSITY OF IDAHO. MF DEPARTMENT IS		TUIDD ANCIE DDO IECTION O —		Fantastic Four: The Barr & Stroud Engine		
DEFAULT TOLERANC	A.D.		UN		OF IDAHO	
X.±.25 X.X±.1 X.XX±.01 X.XX±.01 X.XX±.002 X.XX±.01	CHECKED BY: DAIE: DAIE: 12/9/2011		PART #:	0-00	QTY: 1	

LE NAME: Motor Exploded.SLDPRT

HEET: 2 OF 55







Part #	DESCRIPTION		QTY.	Sheet #
1-01	C	arburetor Body	1	4
1-02	F	ipe, Fuel Inlet	1	5
1-03	В	ARREL, 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
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THE SPANNING IS THE SOLE PROPERTY OF LINUXESSITY OF INJURESSITY OF I		DIMENSIONS ARE IN MILLIMETERS	Fantas	tic Four:

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Carburetor assembly complete.SLDPRT | SCALE: 1.5:1

DATE: 12/8/2011

MATERIAL: Assorted

DESCRIPTION: Carburetor Assembly

DRAWN BY: Alex Ackerman

The Barr & Stroud Engine

UNIVERSITY OF IDAHO

ME DEPARTMENT

HEET: 3 OF 55

PART #: 1-00

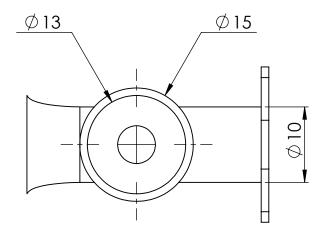
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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

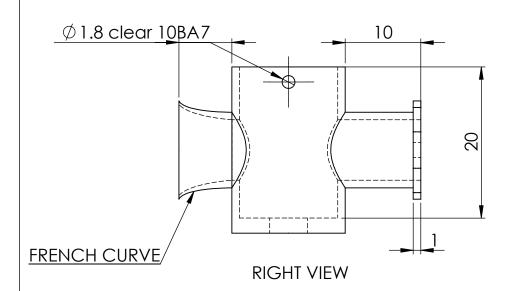
DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1

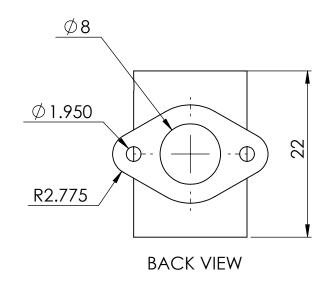
X.XX±.01 X.XXX ± .002



TOP VIEW

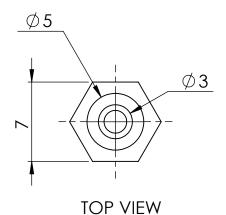


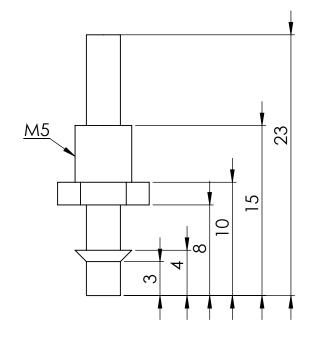
FRONT VIEW



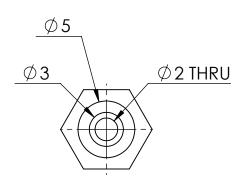
IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION	DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION O	The Barr & Strou
OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.	material: Brass	Engine
DEFAULT TOLERANCES: DESCRIPTION: Carbu	retor Body	HAILVEDSITY OF IDAIL

		110 (LEKO) E. D. G.G.		-	
DEFAULT TO	LERANCES:	DESCRIPTION: Carburetor Body		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR: X.±2	CHECKED BY:	DATE:		ARTMENT
X.X±.1 X.XX±.01	V V 1	DRAWN BY: Alex Ackerman	DATE: 12/8/2011	PART #: 1-01	QTY: 1
X.XXX + .002		CAPRUPETOR RODY	Brass 1/AA) SIDPPT	2.1	0.55 1 OF 55









BOTTOM VIEW

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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1

X.XX±.01

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION (6)

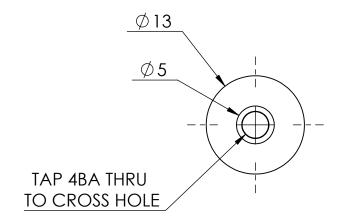
PIPE, Fuel inlet brass 1 (AA).SLDPRT

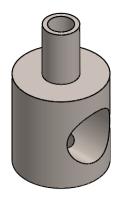
Fantastic Four: The Barr & Stroud Engine

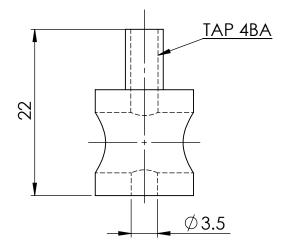
HEET: 5 OF 55

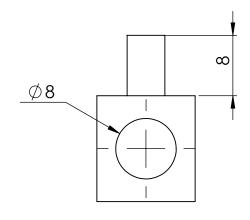
NATERIAL: Brass

DESCRIPTION: Pipe, Fuel Inlet **UNIVERSITY OF IDAHO** ME DEPARTMENT DRAWN BY: Alex Ackerman DATE: 12/8/2011 PART #: 1-02 SCALE: 3:1



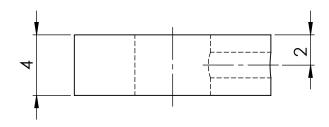


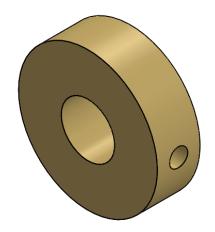


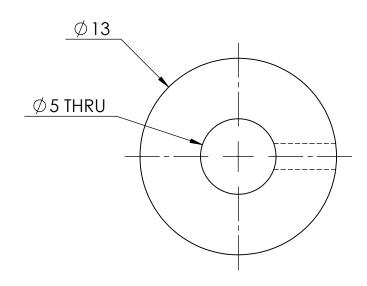


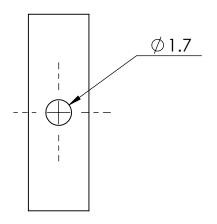
IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF UNIVERSITY OF IDAHO. ME DEPARTMENT IS		DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION (1) (1) MATERIAL: Plain Carbon Steel		The Barr & Stroud	
				Engine	
DEFAULT TO	LERANCES:	description: BARRE	L, Throttle	UNIVERSITY OF IDAHO	
LINEAR:	ANGULAR:	CHECKED BY:		DATE:	ME DEPARTMENT

PROHIBITED.		MATERIAL: PIGIN CORDON STEET		Lingino		1110
DEFAULT TO	LERANCES:	DESCRIPTION: BARREL, Throttle		UN	IVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR: X.±2	CHECKED BY:	DATE:		ME DEPA	
X.X ±.1	14 14	DRAWN BY: Alex Ackerman	date: 11/27/2011	PART #:	1-03	qty: 1
X.XXX ± .002		FILE NAME: BARREL, Throttle Mild S	Steel 1 (AA).SLDPRT	SCALE:	2:1	SHEET: 6 OF 55









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DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION .

Fantastic Four: The Barr & Stroud Engine

DEFAULT TOLERANCES:

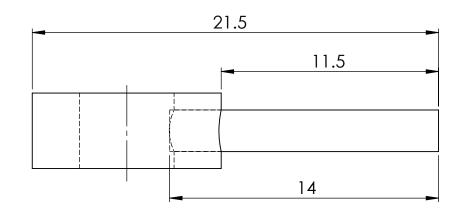
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30' LINEAR: X.±.25 X.X±.1 X.XX±.01

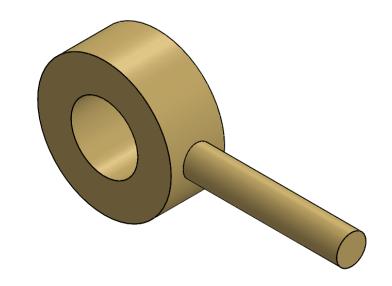
DESCRIPTION: Top Cover DRAWN BY: Alex Ackerman DATE: 12/8/2011

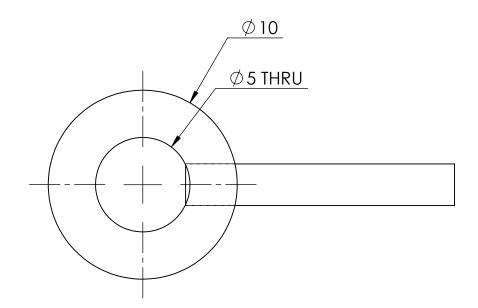
MATERIAL: Brass

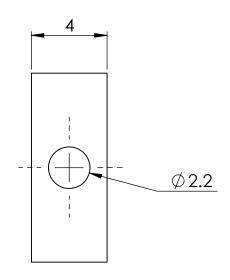
UNIVERSITY OF IDAHO ME DEPARTMENT

PART #: 1-04 COVER, Top Material brass 1 (AA).SLDPR Tscale: 4:1 HEET: 7 OF 55









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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1

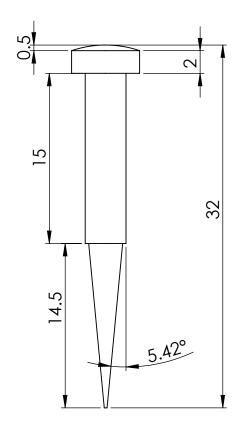
X.XX±.01

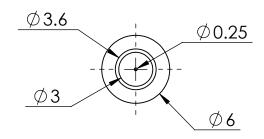
DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION (

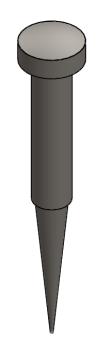
Fantastic Four: The Barr & Stroud Engine

MATERIAL: Brass

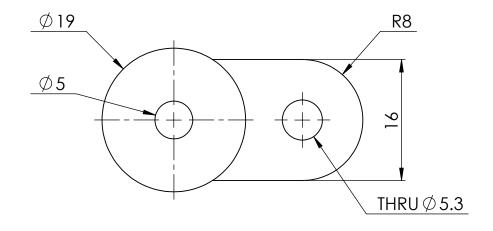
DESCRIPTION: Throttle Lever **UNIVERSITY OF IDAHO** ME DEPARTMENT DRAWN BY: Alex Ackerman DATE: 12/8/2011 PART #: 1-05 ILE NAME: LEVER, Throttle Material brass 1 (AA).SLDPSRILE: 5:1

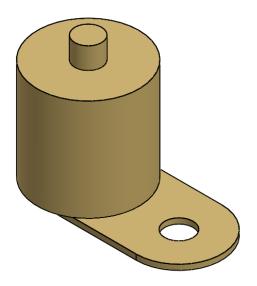


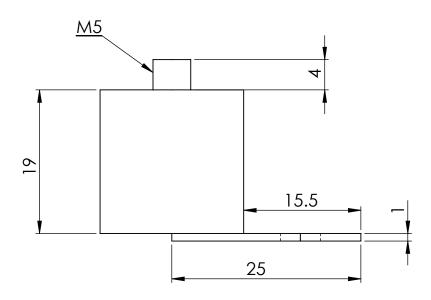




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PROHIBITED.			MATERIAL: Mild Steel		Linginic	
DEFAULT TO	DEFAULT TOLERANCES: DESCRIPTION: Needle		e Valve		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:		DATE:		ARTMENT
X.X ±.1		DRAWN BY: Alex A	ckerman	DATE: 12/8/2011	PART #: 1-06	QTY: 1
X.XXX+.002		NEEDI I	= V/ALVE midLst		3·1	oursz 9 ∩F 55

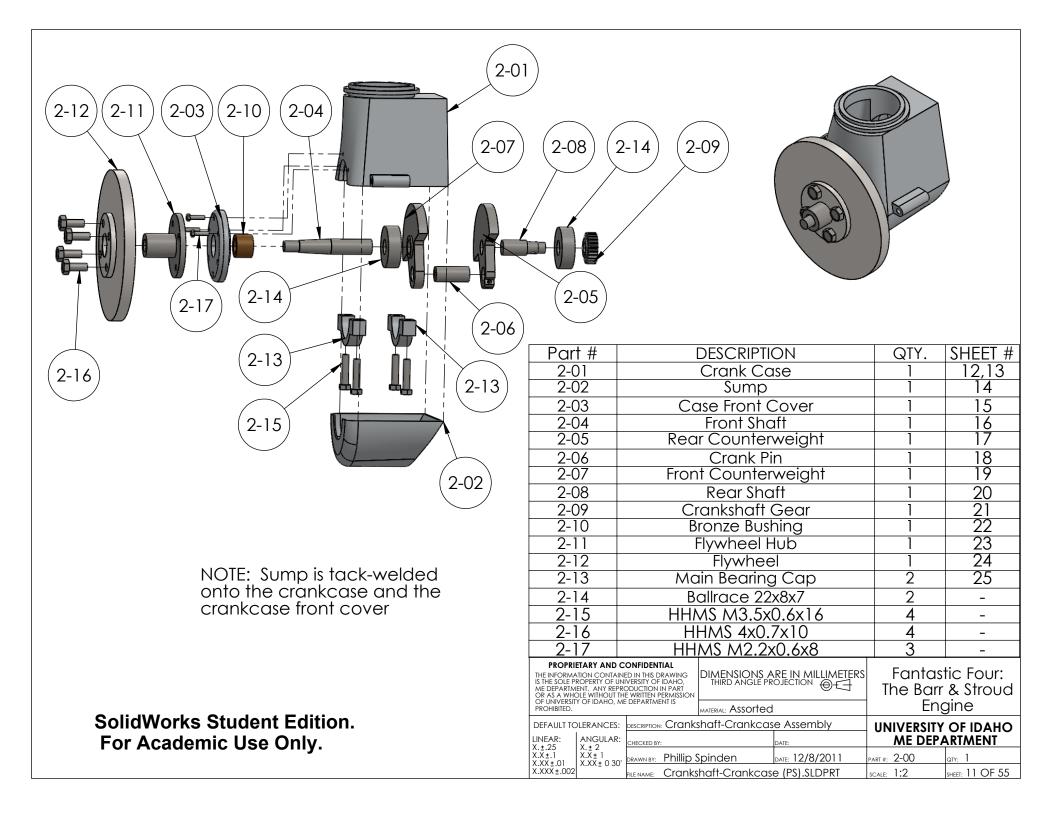


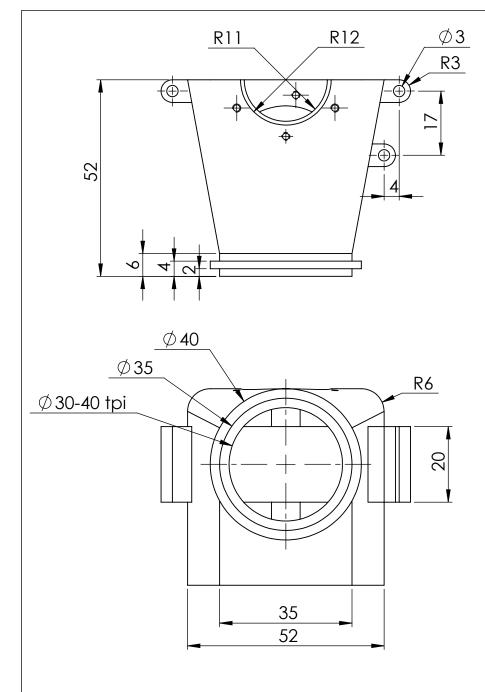


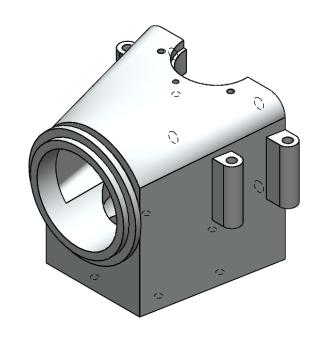


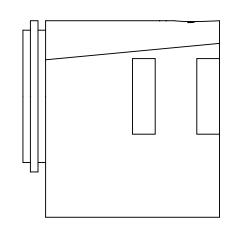
NOTE: The Float Chamber is a dummy and is optional

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PROHIBITED.		material: Brass		Eng	gine
DEFAULT TOLERANCES:	DESCRIPTION: Float Chamber			UNIVERSITY	OF IDAHO
LINEAR: ANGULAR: X.±.25	CHECKED BY:		DATE:	ME DEPA	
	DRAWN BY: Alex A	ckerman	DATE: 12/8/2011	PART #: 1-07	QTY: 1
V VVV . 000	FILE NAME: FLOAT	CHAMBER Bras	s 1(AA).SLDPRT	SCALE: 2:1	SHEET: 10 OF 55



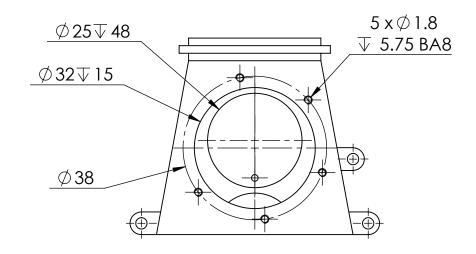


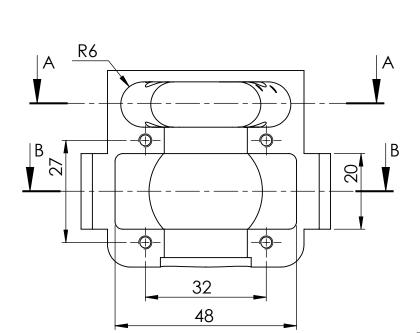




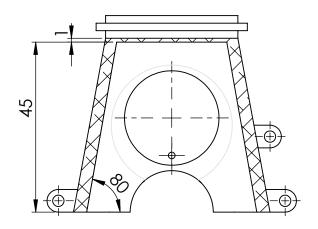
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION	DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION —	The Barr & Stroud
OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.	MATERIAL: 6061-T6 (SS)	Engine

DEFAULT TO	DLERANCES:	description: Crank	Case		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:		DATE:		ARTMENT
X.X±.1 X.XX±.01	X.± 2 X.X± 1 X.XX± 0 30'	drawn by: Brian Zo	aladonis	DATE: 12/4/2011	PART #: 2-01	QTY: 1
X.XXX±.002		FILE NAME: Crank (case (BZ).SLDPI	RT	SCALE: 1:1	SHEET: 12 OF 55

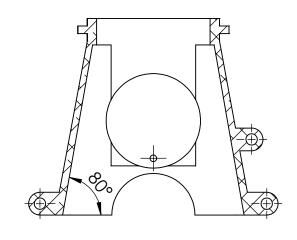








SECTION A-A

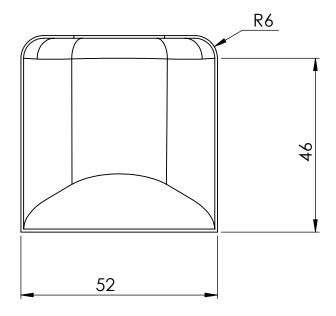


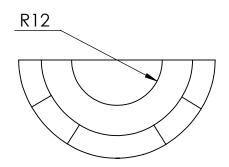
SECTION B-B

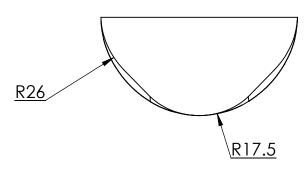
	THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION	DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION
l	OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.	MATERIAL: 6061-T6 (SS)

Fantastic Four: The Barr & Stroud Engine

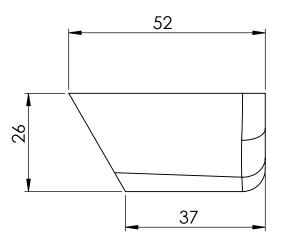
		TO THE COURT OF)		
DEFAULT TOLERANCES: DESCRIPTION: Crank Case			UNIVERSITY	OF IDAHO	
LINEAR:	ANGULAR:	CHECKED BY:	DATE:	ME DEPA	
X.±.25 X.X±.1 X.XX±.01	X.± 2 X.X± 1 X.XX± 0 30'	DRAWN BY: Brian Zaladonis	date: 12/4/2011	PART #: 2-01	qty: 1
X.XXX ±.002		FILE NAME: Crank case (BZ).SLDPF	RT	SCALE: 1:1	SHEET: 13 OF 55



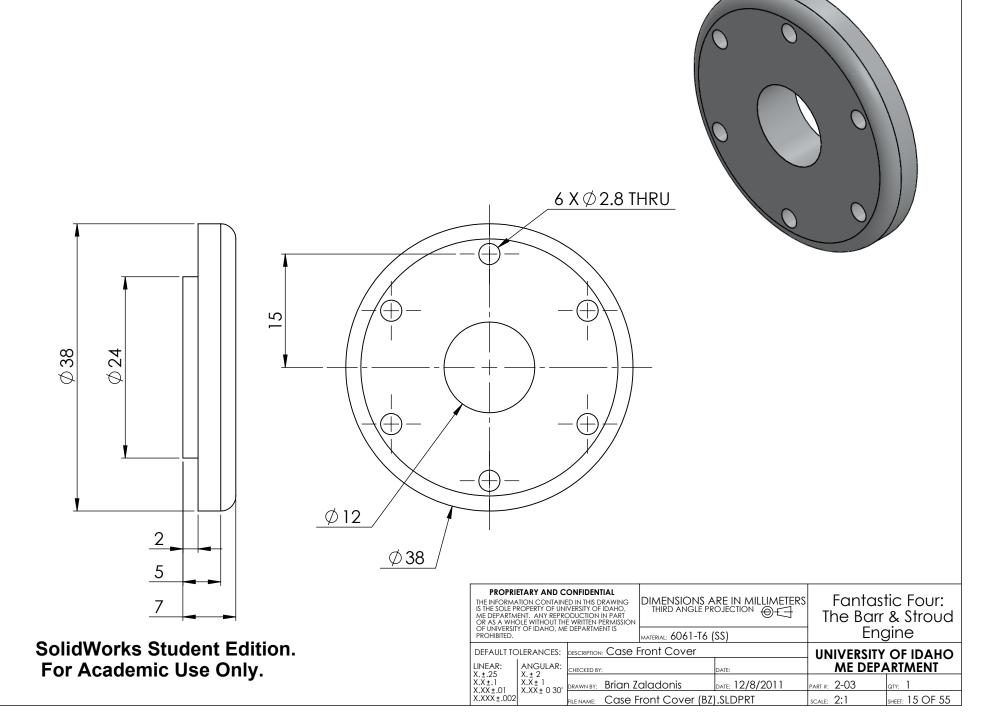


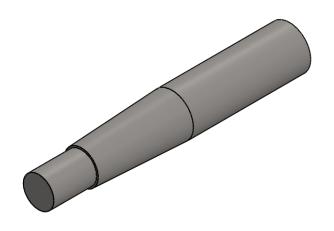


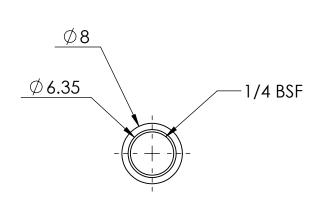
NOTE: Shell thickness is 0.7 mm Radius of sump body is 26mm

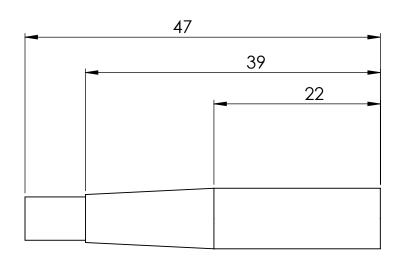


THE INFORMATI IS THE SOLE PRO ME DEPARTMENT OR AS A WHOLE	TION CONTAINE OPERTY OF UNI NT. ANY REPRO LE WITHOUT THE	IND CONFIDENTIAL INTAINED IN THIS DRAWING OF UNIVERSITY OF IDAHO, INTERPODUCTION IN PART OUT THE WRITTEN PERMISSION HO, ME DEPARTMENT IS MATERIAL: 6061-T6		<u> </u>	The Barr	tic Four: & Stroud
DEFAULT TOL	LERANCES:	DESCRIPTION: SUMP		UNIVERSITY	OF IDAHO	
	ANGULAR: X.±2	CHECKED BY:		DATE:		ARTMENT
X.X ± .1		DRAWN BY: Alex A	ckerman	DATE: 11/27/2011	PART #: 2-02	QTY: 1
X.XXX ±.002		FILE NAME: SUMP A	Aluminum shee	† 1(AA).SLDPRT	SCALE: 1:1	SHEET: 14 OF 55



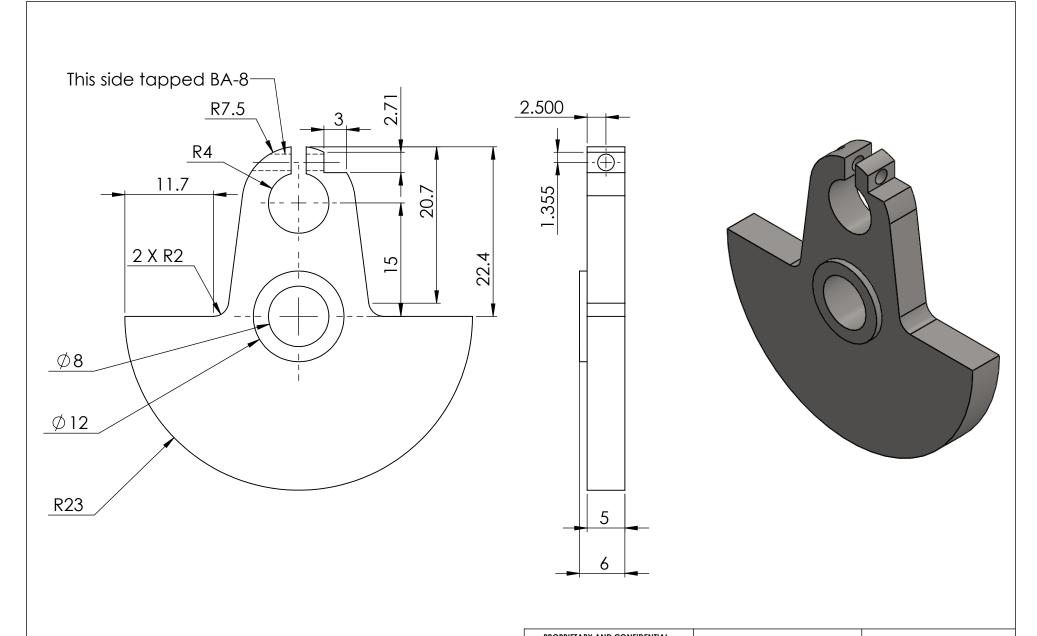




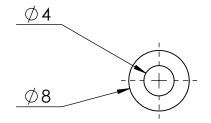


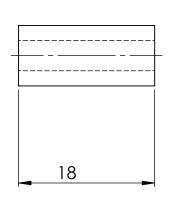
	PROPRIETARY AND C THE INFORMATION CONTAINE IS THE SOLE PROPERTY OF UNI ME DEPARTMENT. ANY REPRO OR AS A WHOLE WITHOUT THI OF UNIVERSITY OF IDAHO, ME PROHIBITED.	ED IN THIS DRAWING VERSITY OF IDAHO, DDUCTION IN PART E WRITTEN PERMISSION DEPARTMENT IS	DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION MATERIAL: Alloy Steel	Fantastic Four: The Barr & Stroud Engine
	DEFAULT TOLERANCES:	description: Front S	haft	UNIVERSITY OF IDAHO
- 1	1			01111 - 110111 01 1571110

DEFAULT TO	DLERANCES:	DESCRIPTION: Front Shaft		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:	DATE:	ME DEPA	
X.X±.1 X.XX±.01	1 1 1 1 1	DRAWN BY: Phillip Spinden	DATE: 12/8/2011	PART #: 2-04	QTY: 1
X.XXX ± .002		FILE NAME: Front Shaft (PS).SLDP	RT	SCALE: 2:1	SHEET: 16 OF 55



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DEFAULT TOLERANCES: DESCRIPTION: Rear Counterweigh		Counterweight		UN	IIVERSITY	OF IDAHO	
LINEAR: X.±.25	ANGULAR: X.± 2	CHECKED BY:		DATE:		ME DEPA	
X.X ± .1		drawn by: Phillip S	Spinden	DATE: 12/8/2011	PART #:	2-05	QTY: 1
X.XXX ±.002		FILE NAME: Rear C	ounterweight	(PS).SLDPRT	SCALE:	2:1	SHEET: 17 OF 55







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OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

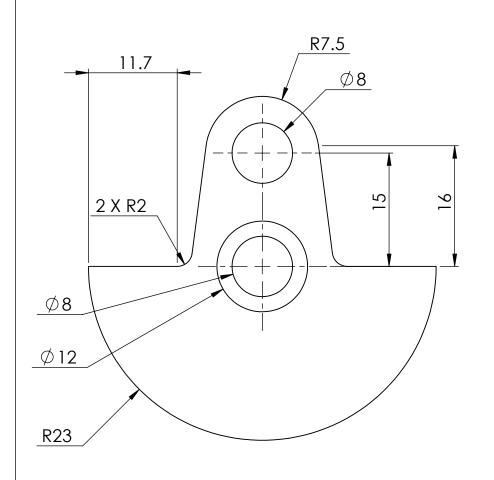
ME DEPARTMENT

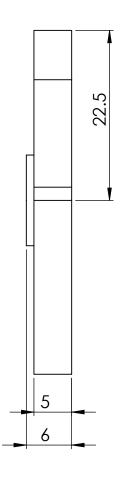
MATERIAL: Alloy Steel DEFAULT TOLERANCES:

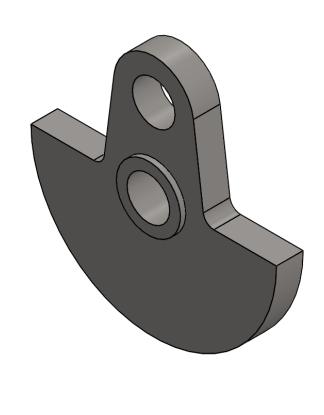
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002 X.XX± 1 X.XX± 0 30'

DESCRIPTION: Crank Pin **UNIVERSITY OF IDAHO**

DRAWN BY: Phillip Spinden DATE: 12/8/2011 PART #: 2-06 SCALE: 2:1 ILE NAME: Crank Pin (PS).SLDPRT SHEET: 18 OF 55







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DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

DEFAULT TOLERANCES: DESC

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

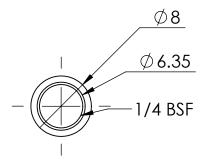
	5
JLAR:	CHECK
0 30'	DRAWI

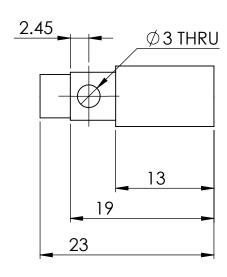
CRIPTION: Front Counterweight	_
CKED BY:	DATE:
wn BY: Phillip Spinden	DATE:

NATERIAL: Alloy Steel

UNIVERSITY OF IDAHO ME DEPARTMENT

PART #: 2-07 12/8/2011 SCALE: 2:1 FILE NAME: Front Counterweight (PS).SLDPRT SHEET: 19 OF 55

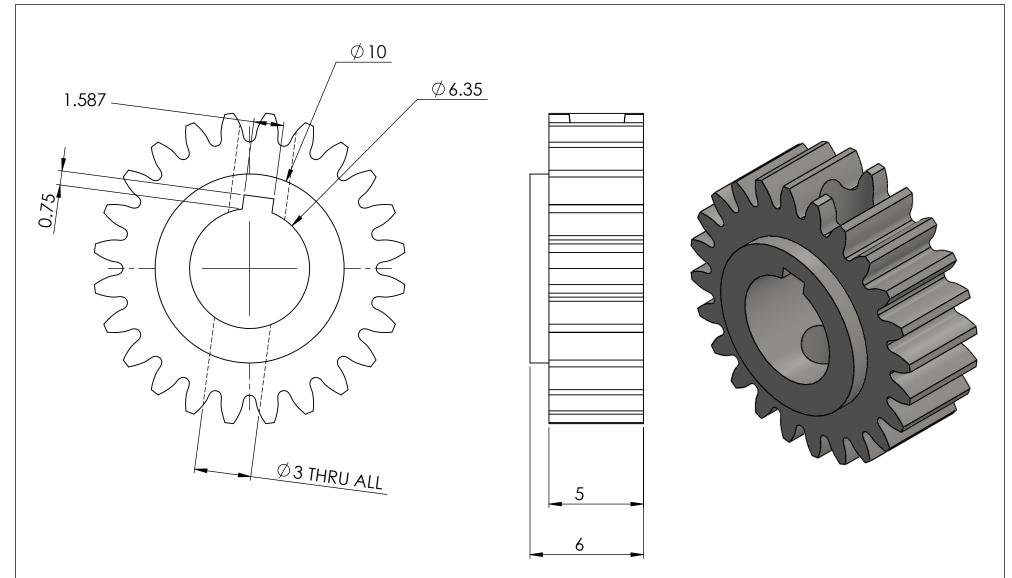






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PROHIBITED.		MATERIAL: Alloy Steel	Engine
DEFAULT TOLED AND FO	Door Cl	a off	

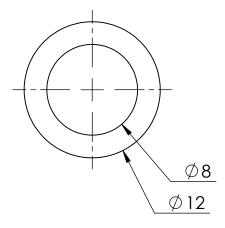
DEFAULT TO	DLERANCES:	DESCRIPTION: Rear Shaft		DESCRIPTION: Rear Shaft		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:	DATE:	ME DEPA			
X.X±.1 X.XX±.01	1 1 2 1	DRAWN BY: Phillip Spinden	DATE: 12/8/2011	PART #: 2-08	QTY: 1		
X.XXX ±.002		FILE NAME: Rear Shaft (PS).SLDPR	T	SCALE: 2:1	SHEET: 20 OF 55		

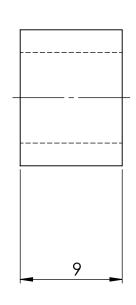


NOTE: DP=40 24-T PCD: 15.24mm OD: 16.51mm

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		MATERIAL: Alloy Steel	Engine	
DEFAULT TOLERANCES: DESCRIPTION: Crankshaft Gear		UNIVERSITY OF IDAHO		

DEFAULT TOLERANCES: D		DESCRIPTION: Crankshaft G	ear	UNIVERSIT	Y OF IDAHO
LINEAR: X.±.25	ANGULAR: X.± 2	CHECKED BY:	DATE:		ARTMENT
X.X+.1		DRAWN BY: Phillip Spinder	n DATE: 12/8/2011	PART #: 2-09	QTY: 1
X.XXX ±.002		FILE NAME: Crankshaft Ge	ear (PS).SLDPRT	SCALE: 5:1	SHEET: 21 OF 55







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DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.001 X.XXX±.002

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DEFAULT TO SE

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

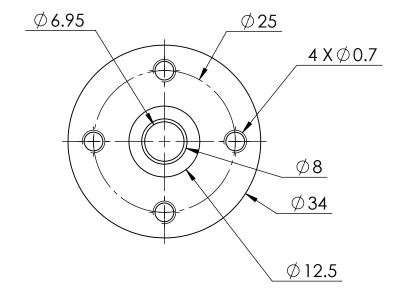
THIRD ANGLE PROJECTION

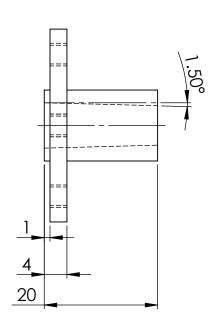
The Barr & Stroud Engine

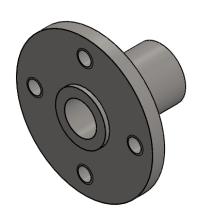
Fantastic Four:

MATERIAL: Aluminum Bronze

DESCRIPTION: Bronze Bushing **UNIVERSITY OF IDAHO** ME DEPARTMENT DRAWN BY: Brian Zaladonis DATE: 11/27/2011 PART #: 2-10 SCALE: 3:1 ILE NAME: Bronze bushing (BZ).SLDPRT SHEET: 22 OF 55







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OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS	-
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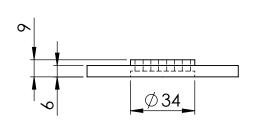
DEFAULT TOLERANCES:

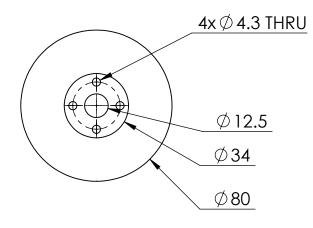
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002 X.XX± 1 X.XX± 0 30' DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

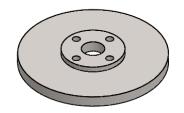
Fantastic Four: The Barr & Stroud Engine

MATERIAL: Alloy Steel

		_	,	
	DESCRIPTION: Flywheel Hub	UNIVERSITY	OF IDAHO	
CHECKED BY:		DATE:	ME DEPA	
	DRAWN BY: Richard Broaddus	DATE: 12/8/2011	PART #: 2-11	QTY: 1
	FILE NAME: HUB flywheel (RB).SLE	OPRT	scale: 1.5:1	SHEET: 23 OF 55







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

ANGULAR: X.± 2 X.X± 1 X.XX± 0 30' DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

PROHIBITED. | MATERIAL: Plain Carbon Steel

 DESCRIPTION: Flywheel
 UNIVERSITY OF IDAHO

 CHECKED BY:
 DATE:

 DRAWN BY:
 Alex Ackerman

 DATE:
 12/8/2011

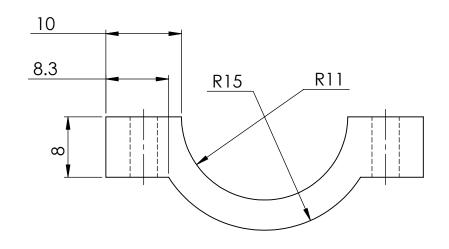
 PRATT #:
 2-12

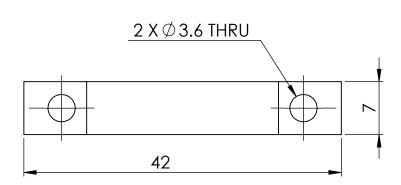
 GIT:
 1

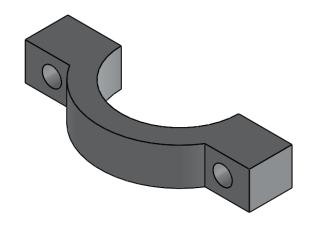
 FILE NAME:
 FLYWHEEL (AA).SLDPRT

 SCALE:
 1:2

 SHEET:
 24 OF 55

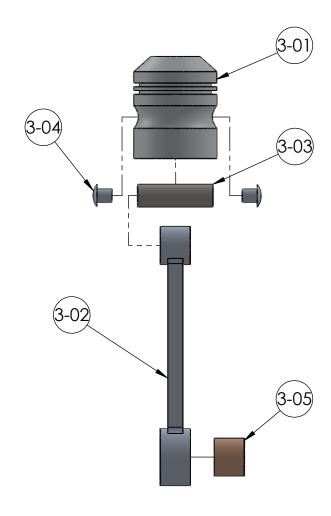


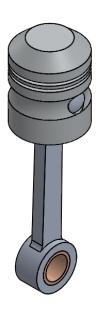




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OF UNIVERSITY OF IDAHO, I PROHIBITED.	ME DEPARIMENT IS	MATERIAL: 6061-T6 (SS)	Engine
DEFAULT TOLERANCES: DESCRIPTION: Main E		Bearing Cap	UNIVERSITY OF IDAHO
LINEAR: ANGULAR	CHECKED BY:	DATE-	ME DEPARTMENT

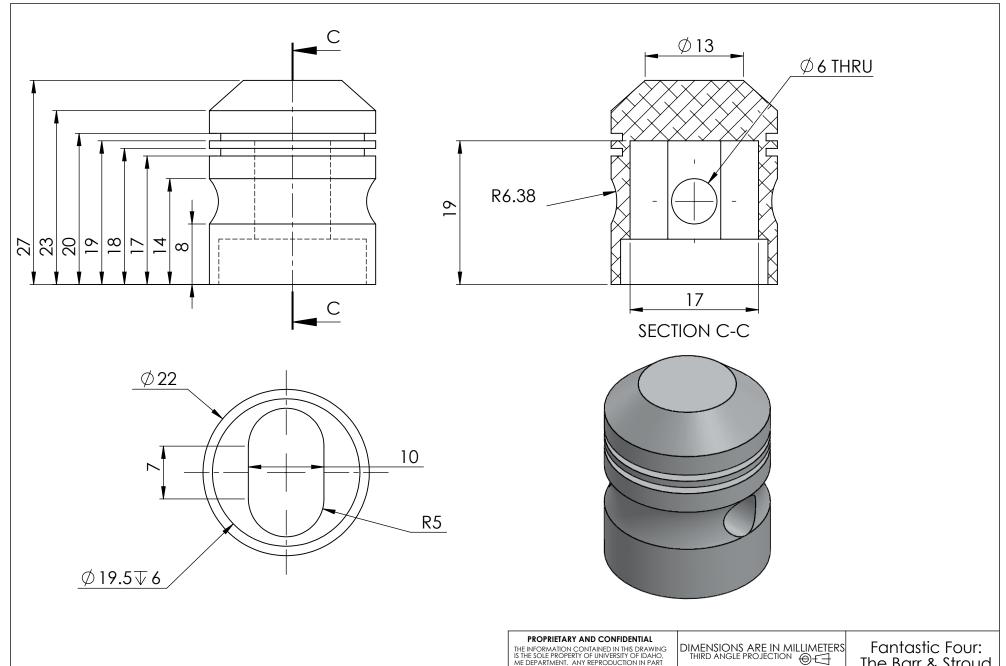
LINEAR: X.±.25	ANGULAR: X. ± 2	CHECKED BY	:	DATE:	ME DEPA	ARTMENT
X.X±.1 X.XX±.01	V V 1	DRAWN BY:	Brian Zaladonis	date: 11/27/2011	PART #: 2-13	QTY: 2
X.XXX±.002		FILE NAME:	Main Bearing Cap (BZ	().SLDPRT	SCALE: 1:2	SHEET: 25 OF 55





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

	3-03		1 1310111 111			ı	31
	THE INFORMATION CON IS THE SOLE PROPERTY C ME DEPARTMENT, ANY I OR AS A WHOLE WITHO	REPRODUCTION IN PART UT THE WRITTEN PERMISSION		ONS ARE IN MILLIMETERS SGLE PROJECTION The Barr & S		& Stroud	
	OF UNIVERSITY OF IDAHO PROHIBITED.	J, ME DEPARIMENT IS	MATERIAL: Assorted] Engine		ine
	DEFAULT TOLERANCES: DESCRIPTION: PISTON		Connecting R	od Assembly	UN	IVERSITY	OF IDAHO
				DATE:		ME DEPA	
			ckerman	DATE: 12/8/2011	PART #:	3-00	QTY: 1
	X.XXX ±.002		Connecting Ro	od.SLDPRT	SCALE:	1:1	SHEET: 26 OF 55

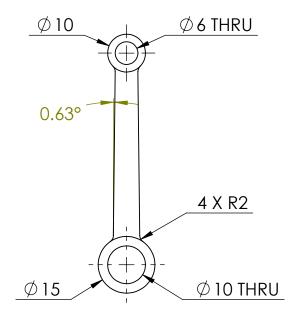


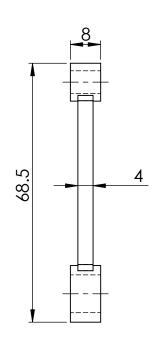
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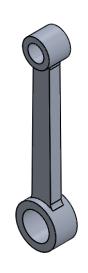
The Barr & Stroud Engine

MATERIAL: 2618-T61 (SS)

T KOTIBILES:		MAIERIAL: ZOTO TOT	(33)	1	J C
DEFAULT TOLERANCES:		DESCRIPTION: Piston Head		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:	DATE:	ME DEPA	
X.X±.1 X.XX±.01	1 : : :	DRAWN BY: Richard Broaddus	DATE: 12/8/2011	PART #: 3-01	qty: 1
X.XXX ±.002		FILE NAME: Piston Head (RB).SLDP	RT	SCALE: 2:1	SHEET: 27 OF 55







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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

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

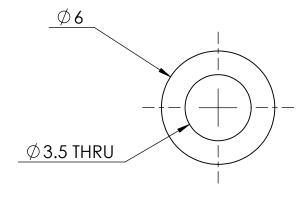
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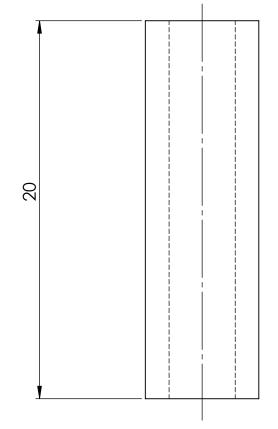
DIMENSIONS ARE IN MILLIMETER THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

MATERIAL: 2618-T61 (SS)

			,	
DESCRIPTION: Connecting Rod	UNIVERSITY OF IDAHO			
CHECKED BY:	DATE:			ARTMENT
RAWN BY: Richard Broaddus	date: 12/8/2011	PART #:	3-02	QTY: 1
Connecting Rod (PR)	SLUBBI		1.1	28 ∩E 55

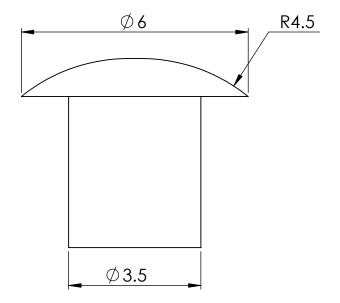


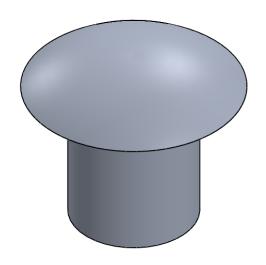




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	DEFAULT TOLERANCES: DESCRIPTION: Piston			Pin		UNIVERSITY	OF IDAHO
	LINEAR: X.±.25			DATE:	ME DEPA		
			ckerman	DATE: 12/8/2011	PART #: 3-03	qīy: 1	
	X.XX±.01 X.XX±030			Pin (RB).SLDPR	T	SCALE: 5:1	SHEET: 29 OF 55

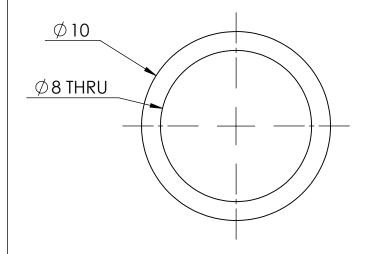
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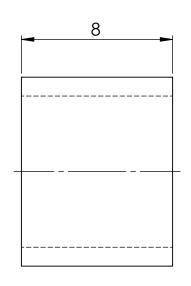


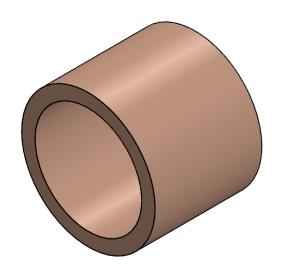


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			material: 1060 Alloy	Engine	
			aps	LINIVERSITY OF IDAHO	

			777 TELEVISE 1000 7 1110 7					
DEFAULT TOLERANCES:		DESCRIPTION: End Caps		UNIVERSITY OF IDAHO				
LINI X.±	EAR:	ANGULAR: X.± 2	CHECKED BY:		DATE:	ME DEPARTMENT		
X.X	±.1		DRAWN BY:	Richard Broaddus	DATE: 12/8/2011	PART #: 3-04	QTY: 2	
		FILE NAME: E	End Cap (RB).SLDPRT		scale: 10:1	SHEET: 30 OF 55		







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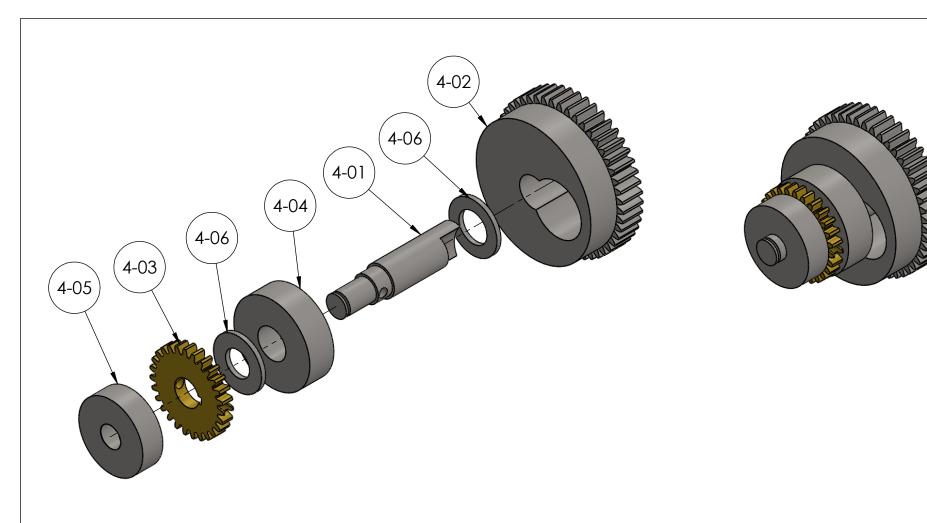
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DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

MATERIAL: Commercial Bronze, UNS C22000 (90-10 Bronze)

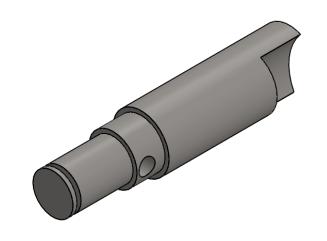
Fantastic Four: The Barr & Stroud Engine

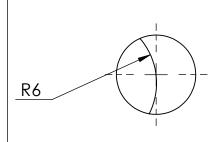
DEFAULT TOLERANCES:		DESCRIPTION: Connecting Rod Bushing		UNIVERSITY OF IDAHO		OF IDAHO	
LINEAR: X.±.25	ANGULAR:	CHECKED BY	<i>(</i> :	DATE:			ARTMENT
X.X±.1 X.XX±.01	1 1 1 1	DRAWN BY:	Richard Broaddus	date: 12/8/2011	PART #: 3	-05	QTY: 1
V VVV . 000		FILE NAME:	Connecting Rod Bush	nina (RB).SLDPRT	SCALE: 5	: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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OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.	material: Assorted	Eng	gine
DEFAULT TOLERANCES: DESCRIPTION: Gear	Shaft Assembly	UNIVERSITY	OF IDAHO
LINEAR: ANGULAR: CHECKED BY: X.±.25 X.± 2	DATE:	ME DEPA	ARTMENT
	Spinden DATE: 12/6/2011	PART #: 4-00	QTY: 1
	shaft (PS).SLDPRT	scale: 1.5:1	SHEET: 32 OF 55





29.5

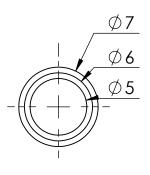
22

18.5

0.5

0.5

RIGHT SIDE VIEW



TOP VIEW

BOTTOM VIEW

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

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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR:

X.XX ±.01

X.±.25 X.X±.1 DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

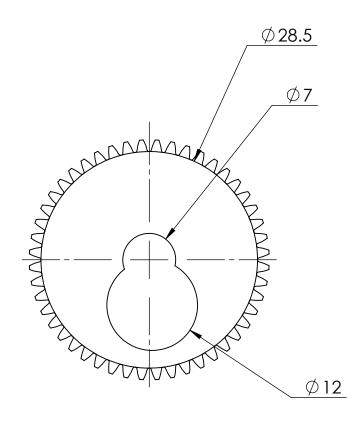
MATERIAL: Alloy Steel

 DESCRIPTION: Gear Shaft
 UNIVERSITY OF IDAHO

 CHECKED BY:
 DATE:
 ME DEPARTMENT

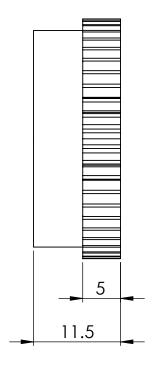
 DRAWN BY:
 Phillip Spinden
 DATE: 12/8/2011
 PART #: 4-01
 QTY: 1

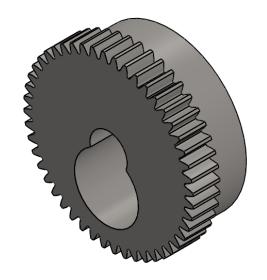
 FILE NAME:
 Gear shaft (PS).SLDPRT
 SCALE: 3:1
 SHEET: 33 OF 55



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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> ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1 DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

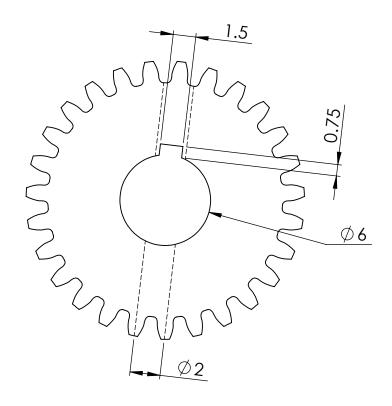
Fantastic Four: The Barr & Stroud Engine

MATERIAL: Alloy Steel

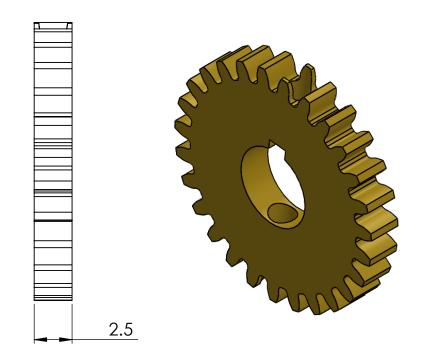
DESCRIPTION: Sleeve Drive Gear

CHECKED BY:

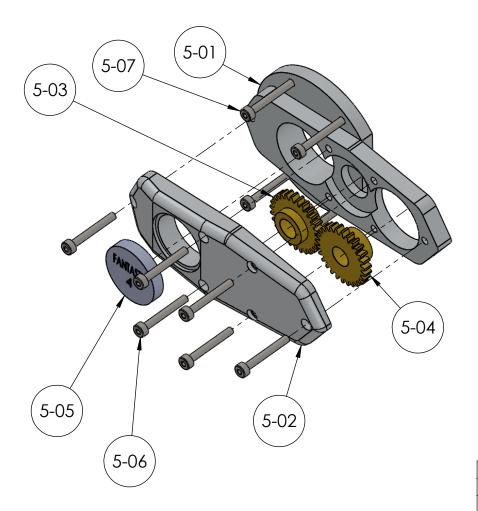
DATE:

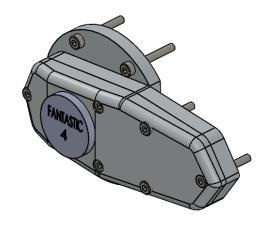


NOTE: PCD=17.145 OD=18.415 DP=40 27-T



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DEFAULT TOLERANCES: DESCRIPTION: Magne			eto Drive Gear		UNIVERSITY	OF IDAHO
LINEAR: ANGULAR: CHECKED BY:			DATE:		ARTMENT	
X.±.25 X.X±.1 X.XX±.01 X.XX±0 30'		Spinden	date: 12/8/2011	PART #: 4-03	QTY: 1	
X.XXX ±.002		FILE NAME: Driven	Gear (PS).SLDF	PRT	scale: 4:1	SHEET: 35 OF 55

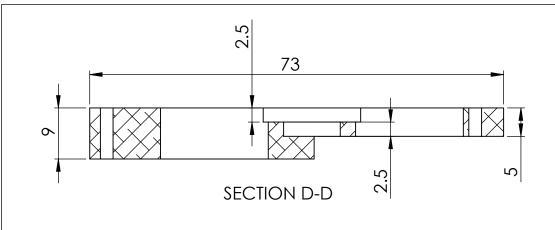


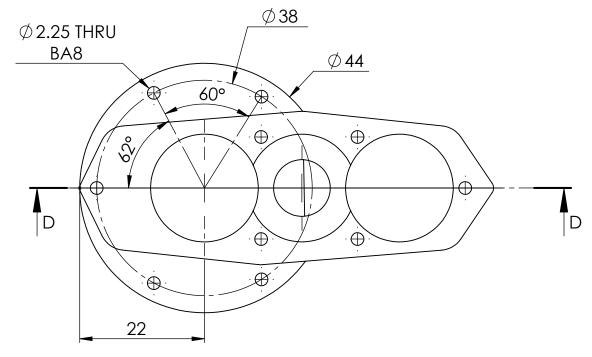


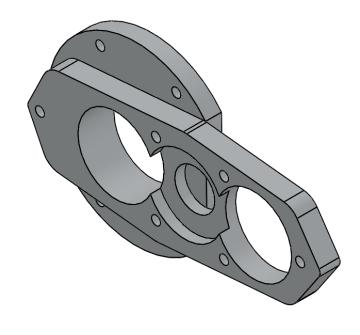
	Part #	DESCRIPTION	QTY.	Sheet #
l	5-01	Gear Box	1	37, 38
ĺ	5-03	Idler Gear	1	39
ĺ	5-04	Magneto Gear	1	40
l	5-02	Gear Box Cover	1	41
l	5-05	Name Plate	1	42
	5-07	SHCS M - 2 x 0.4 x 8	4	_
ĺ			10	

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	DEFAULT TOLERANCES: DESCRIPTION: Gear [Box Assembly		UNIVERSITY	OF IDAHO		
	LINEAR: X.±.25 X.X±.1 X.X±.0 30' X.XXX±.01 X.XX±.01 X.XX±.010 X.XXX±.002 FILE NAME: Gear by the control of the			DATE:		ARTMENT		
			DRAWN BY: Richard	d Broaddus	DATE: 12/9/2011	PART #: 5-00	QTY: 1	
			FILE NAME: Gear b	oox assembly e	exploded.SLDPRT	SCALE: 1:1	SHEET: 36 OF 55	

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THE INFORMATION	CONTA	INFD IN T	HIS DRAW

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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

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

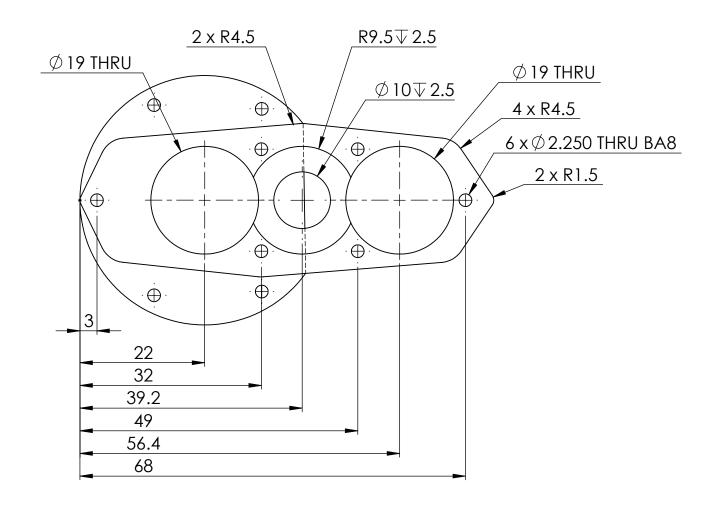
DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

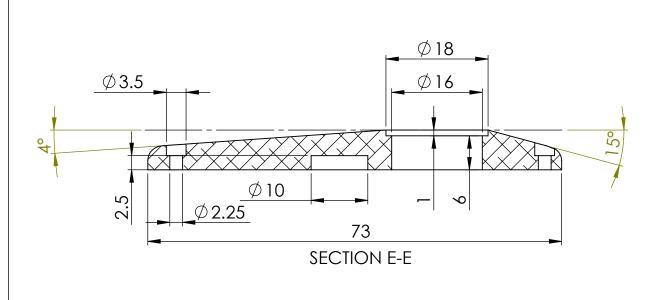
MATERIAL: 1060 Alloy

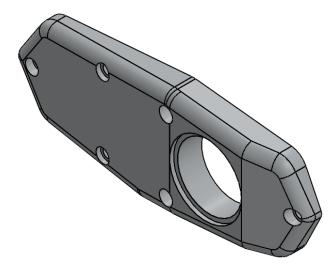
DESCRIPTION: Gear Box					UNIVERSITY OF IDAHO			
CHECKED BY:		DATE:	ME DEPAR					
	DRAWN BY: Richard	d Broaddus	DATE: 12/1/2011	PART #:	5-01	QTY: 1		
	FILE NAME: Gear B	ox (RB).SLDPR	Г	SCALE:	3:2	SHEET: 37 OF 55		

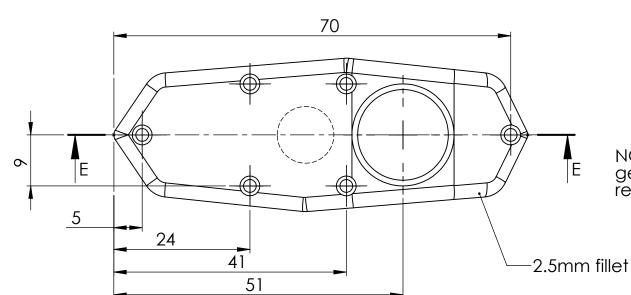


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DEFAULT T	DEFAULT TOLERANCES: DESCRIPTION: Gear I		Box		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR:	CHECKED BY:		DATE:	ME DEPA	
X.X±.1 X.XX±.01 X.XX±030' DRAWN BY: Richard		d Broaddus	DATE: 12/1/2011	PART #: 5-01	QTY: 1	
		FILE NAME: Gear B	1		SCALE: 3:2	SHEET: 38 OF 55

Fantastic Four







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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ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

DEFAULT TOLERANCES:

LINEAR: X.±.25 X.X±.1

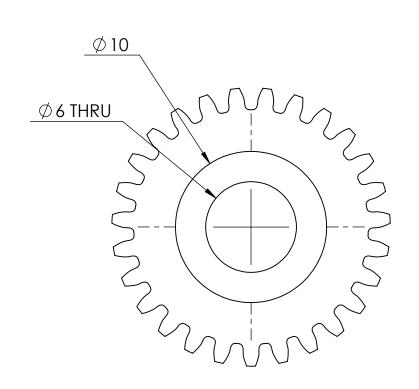
DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

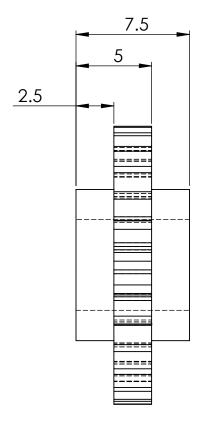
THIRD ANGLE PROJECTION

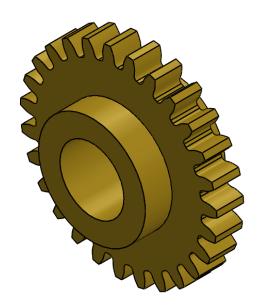
Fantastic Four: The Barr & Stroud Engine

ATERIAL: 1060 Alloy

UNIVERSITY OF IDAHO DESCRIPTION: Gear Box Cover **ME DEPARTMENT** DRAWN BY: Richard Broaddus DATE: 12/1/2011 PART #: 5-02 LE NAME: Gear Box Cover (RB).SLDPRT HEET: 39 OF 55







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

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DEFAULT TOLERANCES: DESCRIPTION: Idler (ear	DATE:	UNIVERSITY OF IDAHO ME DEPARTMENT	

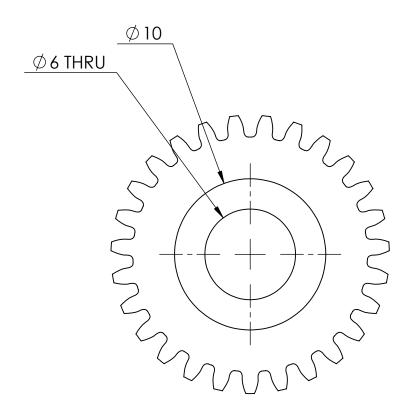
DRAWN BY: Phillip Spinden

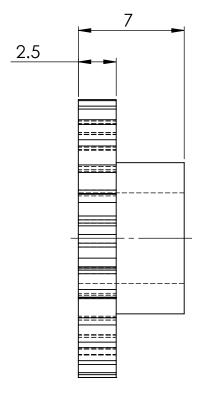
ILE NAME: Idler Gear (PS).SLDPRT

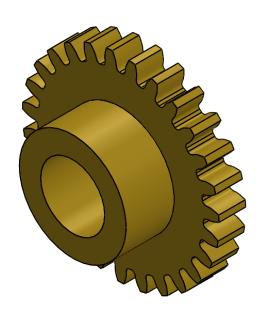
DATE: 12/6/2011

PART #: 5-03

SHEET: 40 OF 55







NOTE: DP=40 27-T

PCD: 17.145 mm OD: 18.415 mm

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DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

HEET: 41 OF 55

DEFAULT TOLERANCES:

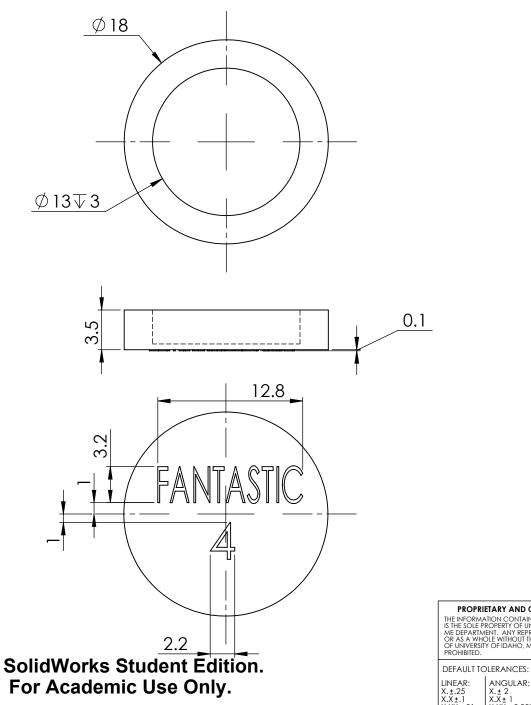
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002

ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

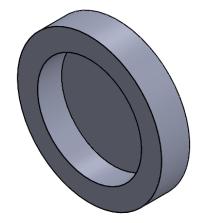
LE NAME: Magneto Gear (PS).SLDPRT

DESCRIPTION: Magneto Gear

UNIVERSITY OF IDAHO ME DEPARTMENT DRAWN BY: Phillip Spinden DATE: 12/1/2011 PART #: 5-04



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X.XX±.01

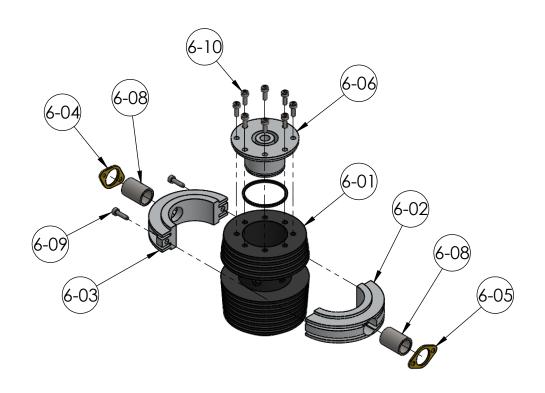
X.XXX ± .002

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

Fantastic Four: The Barr & Stroud Engine

MATERIAL: 2618-T61 (SS)

DESCRIPTION: Name Plate **UNIVERSITY OF IDAHO** ANGULAR: X.± 2 X.X± 1 X.XX± 0 30' ME DEPARTMENT DRAWN BY: Richard Broaddus DATE: 12/8/2011 PART #: 5-05 SCALE: 3:1 ILE NAME: Nameplate (RB).SLDPRT HEET: 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	-
	AND CONFIDENTIAL CONTAINED IN THIS DRAWING DIMENSIONS ARE IN MILLIMETE	RS Fantas	tic Four:

DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

LE NAME: (6) Cylinder_Manifolds_Assembly.SLDPRT | SCALE: 1:2

DATE: 12/8/2011

MATERIAL: Assorted

DESCRIPTION: Cylinder Manifolds Assembly

DRAWN BY: Aaron Kitchen

The Barr & Stroud Engine

UNIVERSITY OF IDAHO ME DEPARTMENT

HEET: 43 OF 55

PART #: 6-00

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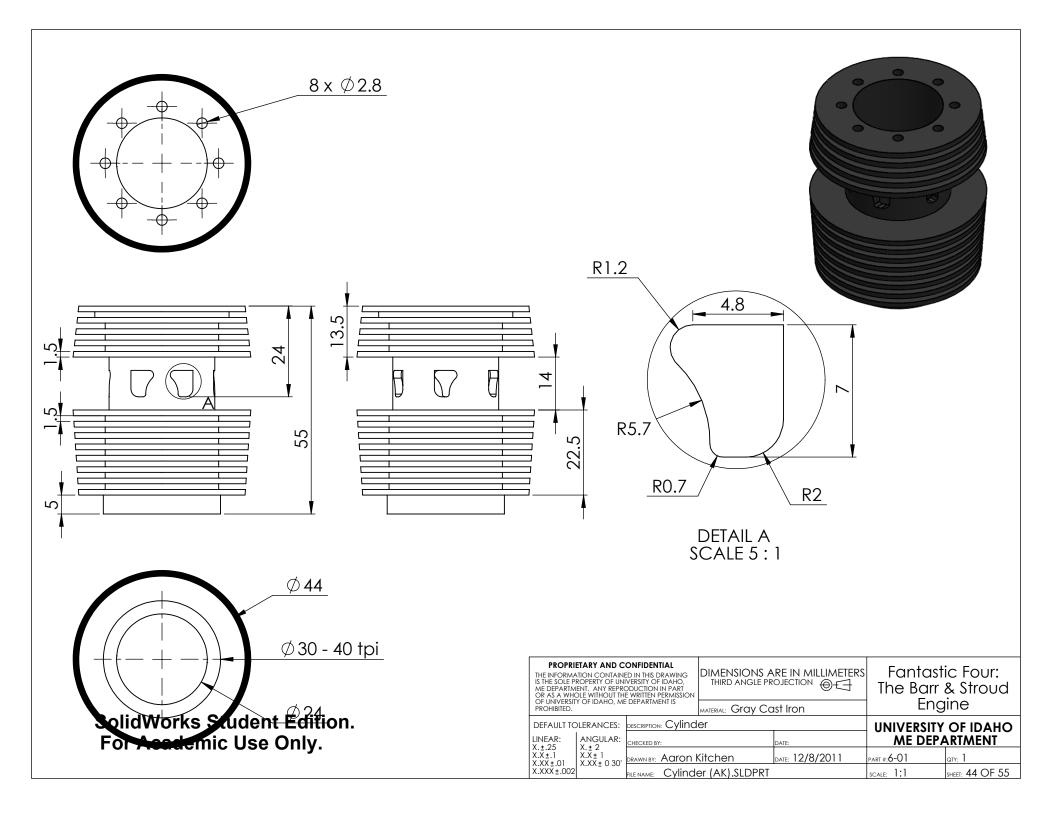
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'

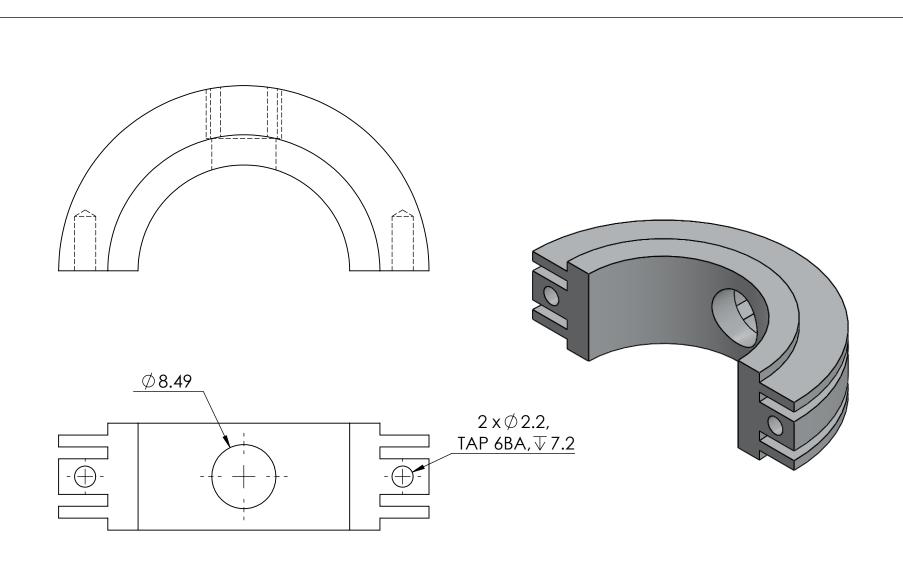
DEFAULT TOLERANCES:

LINEAR:

X.XX±.01

X.±.25 X.X±.1

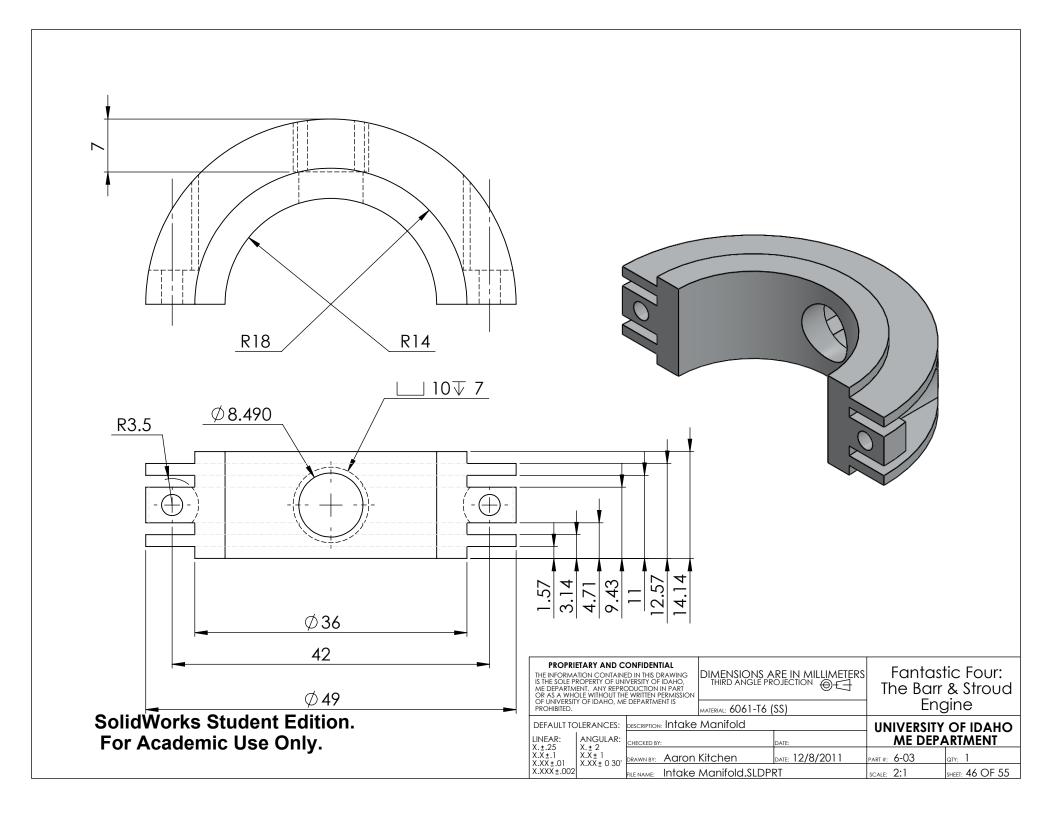


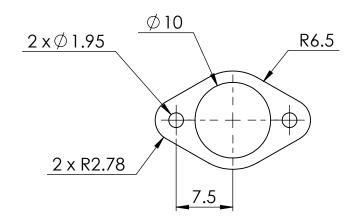


NOTE: All dimensions not noted are the same as the Intake Manifold.

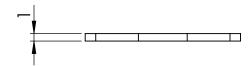
DEFAULT TOLERANCES: DESCRIPTION: Exhaust Manifold UNIVERSITY OF IDAHO	PROPRIETARY AND C THE INFORMATION CONTAINS IS THE SOLE PROPERTY OF UNI ME DEPARTMENT. ANY REPRO OR AS A WHOLE WITHOUT TH OF UNIVERSITY OF IDAHO, ME PROHIBITED.	ED IN THIS DRAWING VERSITY OF IDAHO, DDUCTION IN PART E WRITTEN PERMISSION E DEPARTMENT IS	DIMENSIONS A THIRD ANGLE PRI MATERIAL: 6061-T6 (RE IN MILLIMETERS OJECTION SS)	Fantastic Four: The Barr & Stroud Engine
	DEFAULT TOLERANCES:	DESCRIPTION: Exhaus	st Manifold		UNIVERSITY OF IDAHO

PROHIBITED.			MATERIAL: 6061-T6 (SS)		Engine	
DEFAULT TOLERANCES:		DESCRIPTION: Exhaust Manifold		UNIVERSITY	OF IDAHO	
LINEAR: X.±.25				DATE:		ARTMENT
X.X±.1 X.XX±.01	1:75	drawn by: Aaron	Kitchen	DATE: 12/8/2011	PART #: 6-02	QTY: 1
			st Manifold.SLDPRT		SCALE: 1:2	SHEET: 45 OF 55



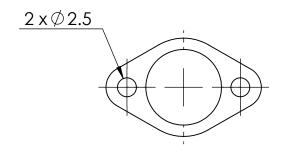






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OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.	material: Brass	Engine
DEFAULT TOLERANCES: DESCRIPTION: Intak	e Flange	LINIVERSITY OF IDAHO

ı			MATERIAL. D	1 0 3 3	5		
DEFAULT TOLERANCES:		LERANCES:	DESCRIPTION: Intake Flange		UNIVERSITY	OF IDAHO	
	LINEAR: X.±.25	ANGULAR:	CHECKED BY:	DATE:		ARTMENT	
	X.X ± .1	::: : = .	DRAWN BY: Aaron Kitcher	DATE: 12/8/2011	PART #: 6-04	qīy: 1	
	X.XXX ± .002		FILE NAME: Flanges_Intake	e&Exhaust_1.95 (AK).SLDP	REALE: 2:1	SHEET: 47 OF 55	





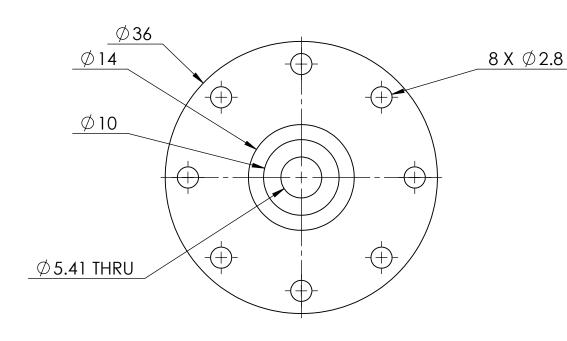
NOTE: All dimensions not noted are the same as the Intake Flange.

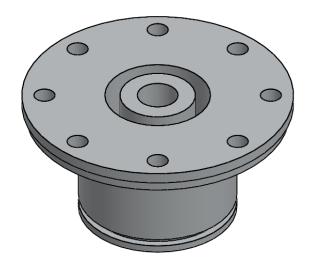
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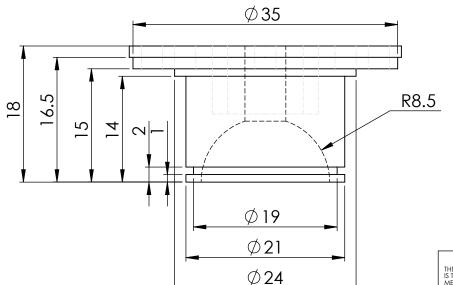
IS THE SOLE PROPERTY OF UNIVERSITY OF IDAHO, ME DEPARTMENT. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS		DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION		Fantastic Four: The Barr & Stroud Engine		
PROHIBITED.			material: Brass		Engine	
DEFAULT TOLERANCES: DESCRIPTION: Exhau		st Flange		UNIVERSITY	OF IDAHO	
LINEAR: ANGULAR: CHECKED BY:			DATE:		ARTMENT	
X.±.25 X.X±.1 XX±.1 XX±.1 XX±.1 XX±.1 XX±.1 XX±.1 XX±.1		Kitchen	DATE: 12/8/2011	PART #: 6-05	oty: 1	

FILE NAME: Flanges_Intake&Exhaust_2.55 (AK).SLDPREALE: 2:1

SHEET: 48 OF 55







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DIMENSIONS ARE IN MILLIMETERS THIRD ANGLE PROJECTION

THIRD ANGLE PROJECTION

MATERIAL: 6061-T6 (SS)

Fantastic Four: The Barr & Stroud Engine

DEFAULT TOLERANCES: DESCRIPTION: Junk Head

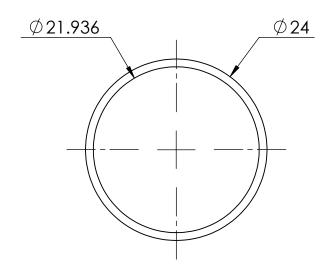
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002 ANGU X.± 2 X.X± 1 X.XX±

JLAR:	CHECK
0 30'	DRAWI

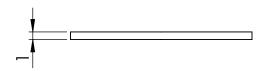
NBY: Aaron Kitchen

UNIVERSITY OF IDAHO ME DEPARTMENT

DATE: 12/1/2011 PART #: 6-06 SCALE: 2:1 FILE NAME: Junk Head (AK).SLDPRT HEET: 49 OF 55

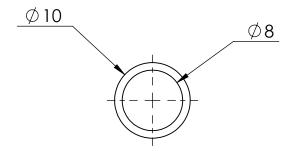


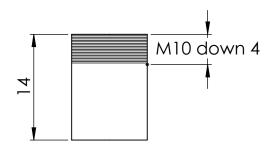


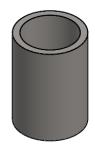


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DEFAULT TOLERANCES: DESCRIPTION: Piston	Ring	UNIVERSITY OF IDAHO

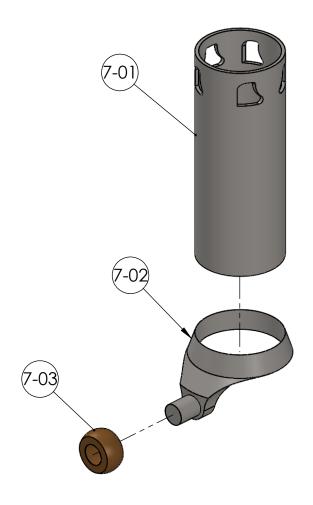
	PROHIBITED.		MATERIAL: BUTYL			IIIE
	DEFAULT TO	LERANCES:	DESCRIPTION: Piston Ring		UNIVERSITY OF IDAHO	
		ANGULAR:	CHECKED BY:	DATE:	ME DEPA	
1	X.X ±.1	::: 	DRAWN BY: Aaron Kitchen	DATE: 12/1/2011	PART #: 6-07	QTY: 1
	X.XXX±.002		FILE NAME: Ring_Piston&JunkHead	d (AK).SLDPRT	SCALE: 2:1	SHEET: 50 OF 55

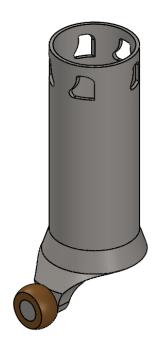






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PROHIBITED.	OF UNIVERSITY OF IDAHO, ME DEPARTMENT IS PROHIBITED.		MATERIAL: Alloy Steel		Engine	
DEFAULT TO	LERANCES:	DESCRIPTION: Studs Intake & Exhaust		UNIVERSITY	OF IDAHO	
LINEAR: X.±.25	ANGULAR: X.± 2	CHECKED BY:		DATE:		ARTMENT
X.X±.1 X.XX±.01	.X±.1 X.X±1 DRAWNERY AGRON		Kitchen	DATE: 12/1/2011	PART #: 6-08	QTY: 1
X.XXX±.002 X.XX±030 FILE NAME: Studs II		ntake&Exhaus	t (AK).SLDPRT	scale: 2:1	SHEET: 51 OF 55	





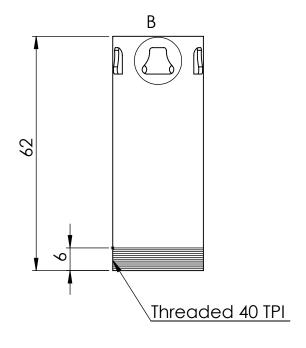
Part #	DE	SCRIPTION	QTY.	SHEET #
7-02	Sleeve Crank Pin Collar		1	53
7-01	Sleeve		1	54
7-03	Universal Ball		1	55
PROPRIETARY AND		DIMENSIONS ARE IN MILLIME	reps Fanta	astic Four

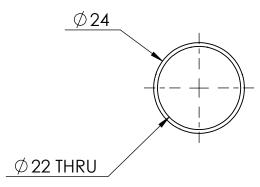
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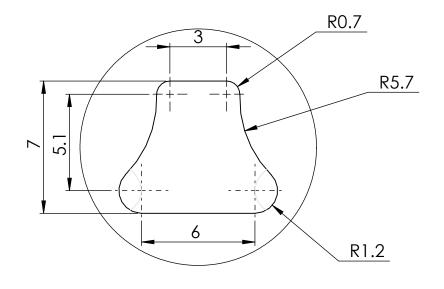
DEFAULT TOLERANCES: DESCRIPTION: Sleeve, Cam Peices Assembly

LINEAR: ANGULAR: CHECKED BY: DATE: CHECKED BY:

LINEAR: X.±.25
X.X±.1
X.XX±.0
X.XX±.01
X.XXX±.02
X.X±.0
X.XX±.02
X.X±.0
X.XX±.01
X.XXX±.002
X.XX±.020
X.X±.020
X.X



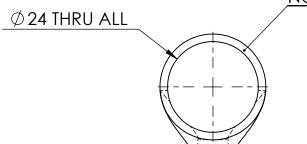




DETAIL B SCALE 5 : 1

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PROPRIETARY AND CONFIDENTIA THE INFORMATION CONTAINED IN THIS DRA	O DIMENSIONS ARE IN MILLIMETERS	1 01111 01011 0 1 0 011

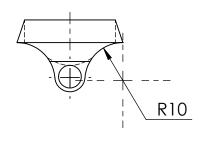
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XX±.03 X.XX±.01 X.XXX±.02 X.X±.01 X.XX±.01 X.XXX±.02 X.X±.01 X.XXX±.02 X.X±.01 X.XXX±.002 X.X±.01 X.XX±.002 X.X±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.02 X.X±.01 X.XX±.02 X.X±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.01 X.XX±.02 X.X±.01 X.XX±.01 X.XX±.02 X.X±.01 X.X±.01

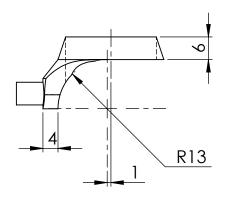


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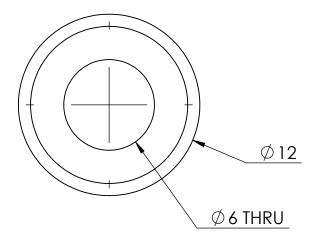


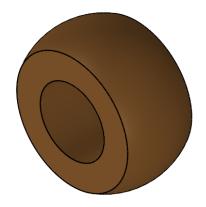


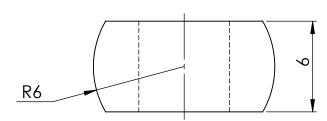




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		el		االو		
DEFAULT TO	LERANCES:	description: Sleeve	CRIPTION: Sleeve Crank Pin Collar		UNIVERSITY	OF IDAHO
LINEAR: X.±.25	ANGULAR: X.± 2	CHECKED BY:		DATE:		ARTMENT
X.X±.1 X.XX±.01	V V . 1	drawn by: Brian Z	aladonis	date: 11/26/2011	PART #: 7-02	qīy: 1
		FILE NAME: Sleeve	Crank Pin Colle	ar(BZ).SLDPRT	scale: 1:1	SHEET: 54 OF 55







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PROHIBITED.	material: Aluminum Bronze	21191110

DEFAULT TOLERANCES:

LINEAR:

X. ± 25

X.X ± .1

X.XX ± .01

X.XXX ± .01

X.XXX ± .01

X.XXX ± .02

DEFAULT TOLERANCES:

DESCRIPTION: Universal Ball

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ME DEPARTMENT

DATE:

DATE: 11/26/2011

PART #: 7-03

QTY: 1

SCALE: 4:1

SHEET: 55 OF 55