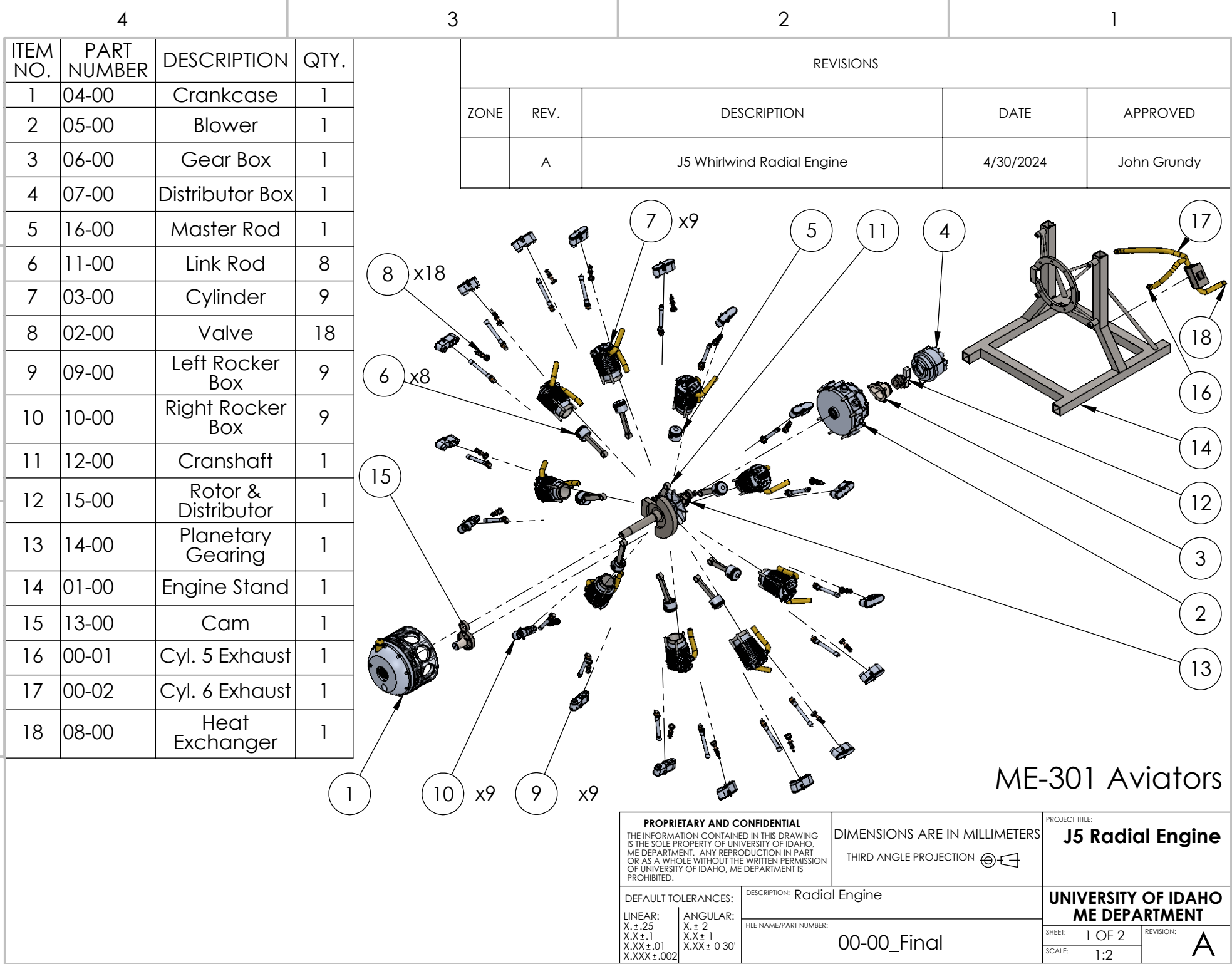




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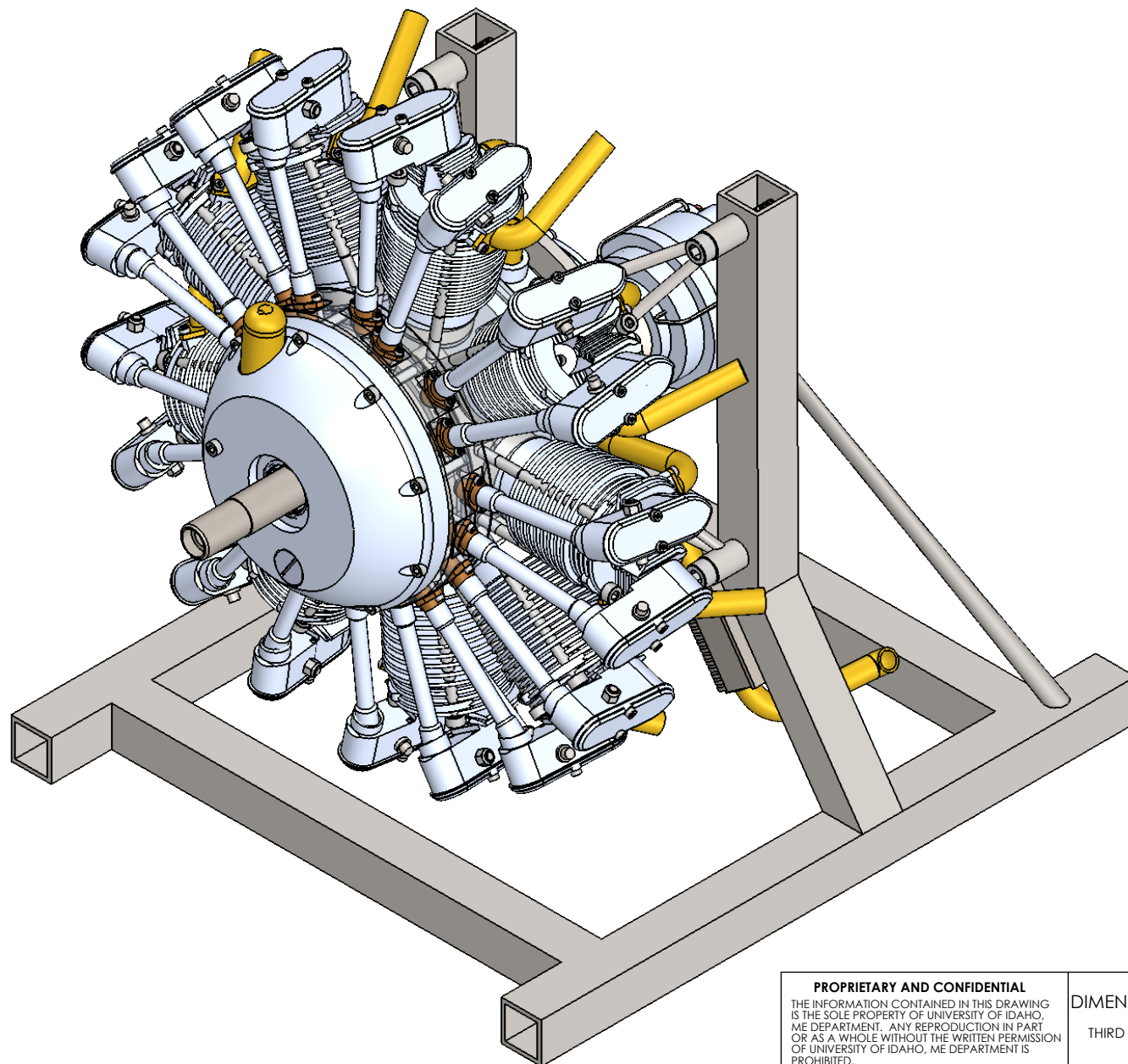
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DIMENSIONS ARE IN MILLIMETERS

THIRD ANGLE PROJECTION

PROJECT TITLE:

J5 Radial Engine

DEFAULT TOLERANCES:

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

ANGULAR:
X. $\pm$ 2
X.X $\pm$ 1
X.XX $\pm$ 0 30'

DESCRIPTION: Radial Engine

FILE NAME/PART NUMBER:

00-00_Final

**UNIVERSITY OF IDAHO
ME DEPARTMENT**

SHEET: 2 OF 2

SCALE: 1:2.25

REVISION:

A

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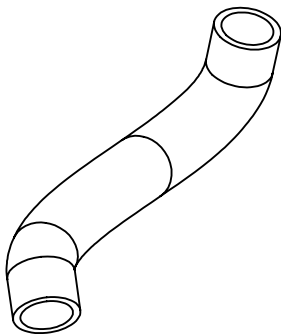
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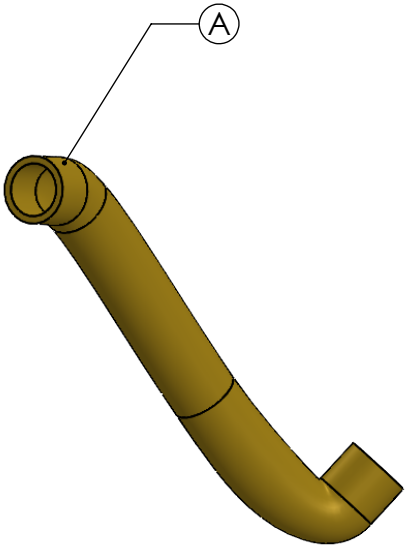
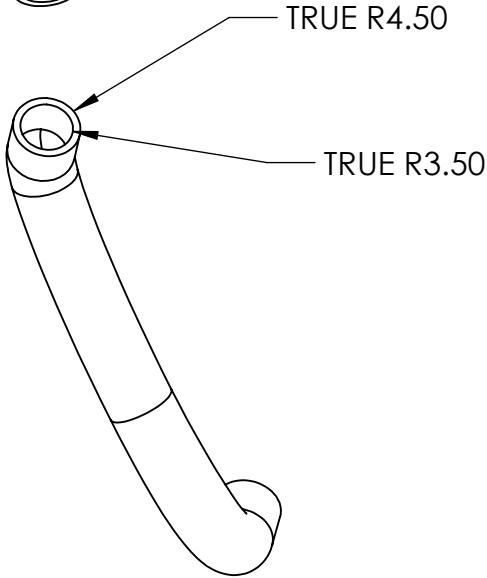
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ITEM NO	PART NUMBER	DESCRIPTION	MATERIAL	VENDOR	VENDOR NO	REV
1	00-01	Cyl. 5 Exhaust	Brass			A

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Cyl. 5 Exhaust	JG	EM	5/2/24



Custom Pipe
~ 70 mm length
Bend to fit

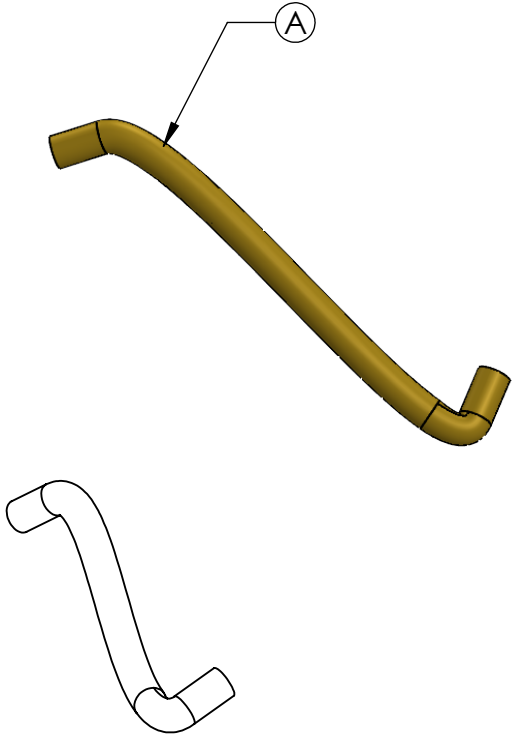
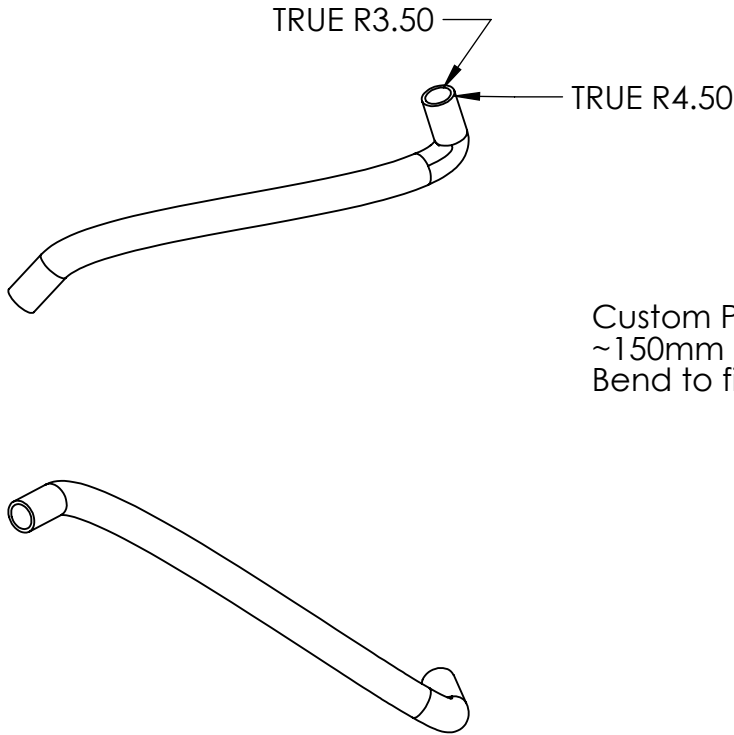


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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Cyl. 5 Exhaust		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		FILE NAME/PART NUMBER: 00-01_Final		SHEET: 1 OF 1 SCALE: 1:1	REVISION: A

ITEM NO	PART NUMBER	DESCRIPTION	MATERIAL	VENDOR	VENDORN0	REV
1	00-02_Cyl6	Cyl. 6 Exhaust	Brass			A

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Cyl. 6 Exhaust	JG	EM	05/02/24

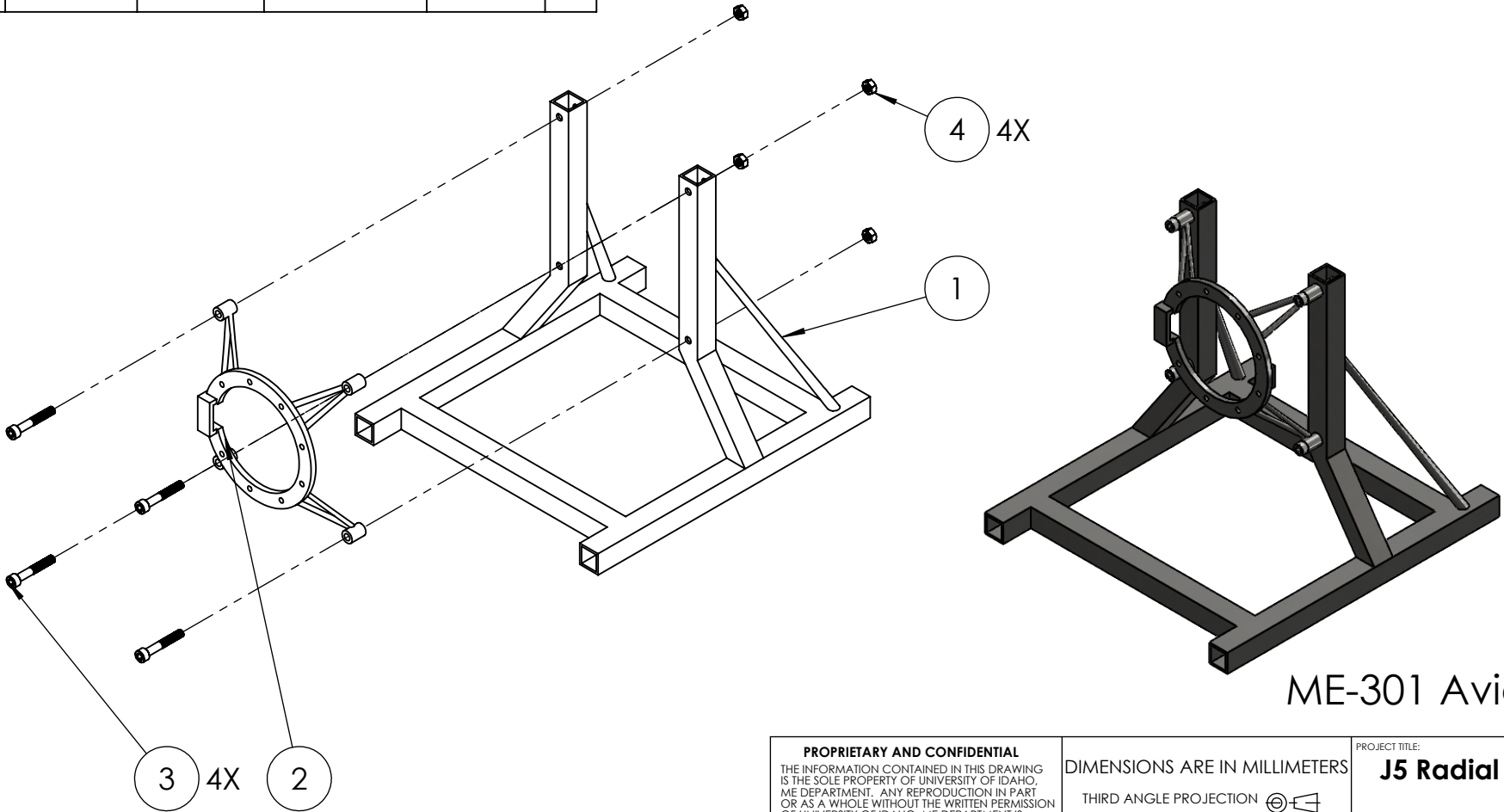


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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Cyl. 6 Exhaust		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'		FILE NAME/PART NUMBER: 00-02_Cyl6		SHEET: 1 OF 1 SCALE: 1:2	REVISION: A

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	01-02	Engine Running Stand			1
2	01-01	Engine Mount			1
3	SP-01	Fine-Thread Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	96144A140	4
4	SP-02	Steel Hex Nut	McMaster-Carr Supply Company	90592A016	4

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Initial	ACG	JR	2024 April 23



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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Engine Stand FILE NAME/PART NUMBER: 01-00_Engine_Stand		UNIVERSITY OF IDAHO ME DEPARTMENT	
				SHEET: 1 OF 1 SCALE: 1:5	REVISION: A

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ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN	QTY.
1	02-01	Valve placed on cylinder head			1
2	02-05	Retains valve spring			1
3	02-06	Lock Ring for Valve Retainer			1
4	02-07	Spring for Valve			1
5	02-08	Tappet Guide			1
6	02-10	Goes inside pushrod cover			1
7	02-02	Cover for Pushrod			1
8	02-04	Guide for Valve			1
9	02-03	Seat for the Valve			1
10	02-09	Tappet			1
11	SP-03	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A015	2

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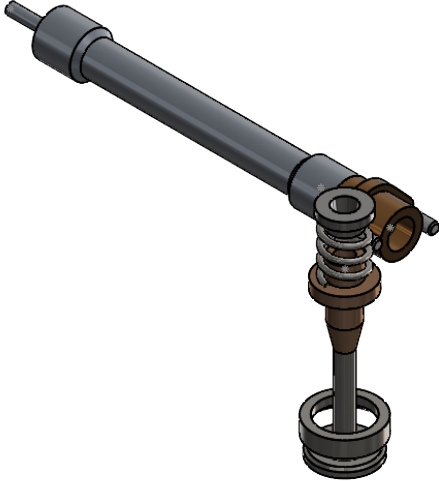
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REVISIONS

Rev	Description	DrawnBy	CheckedBy	Date
A	Valve	EM	JG	4/24/24



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DIMENSIONS ARE IN MILLIMETERS

THIRD ANGLE PROJECTION

DESCRIPTION: Valve Assembly

FILE NAME/PART NUMBER: 02-00_Valve

PROJECT TITLE: J5 Radial Engine

UNIVERSITY OF IDAHO
ME DEPARTMENT

SHEET: 1 OF 1

SCALE: 1:1

REVISION: AA

4

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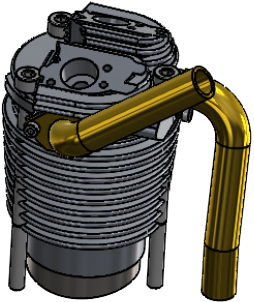
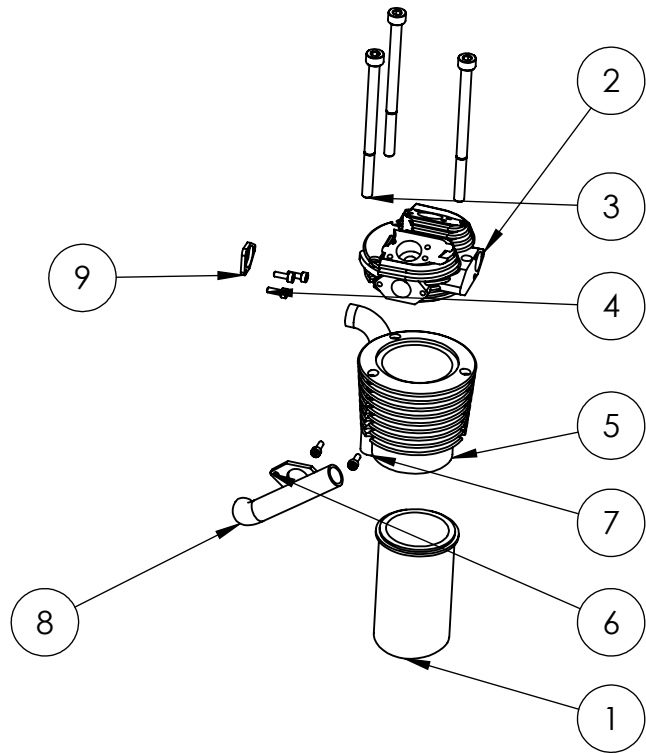
2

1

SOLIDWORKS Educational Product. For Instructional Use Only.

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	03-07	Liner for the fillet. Bottom arc lines up with piston			1
2	03-01	Cylinder Head			1
3	SP-04	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A187	3
4	SP-05	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A013	5
5	03-02	Cylinder			1
6	03-04	Flange, Exhaust Pipe			1
7	03-05	Intake Pipe Tubing			1
8	03-06	Exhaust Pipe			1
9	03-03	Flange, Intake Pipe			1

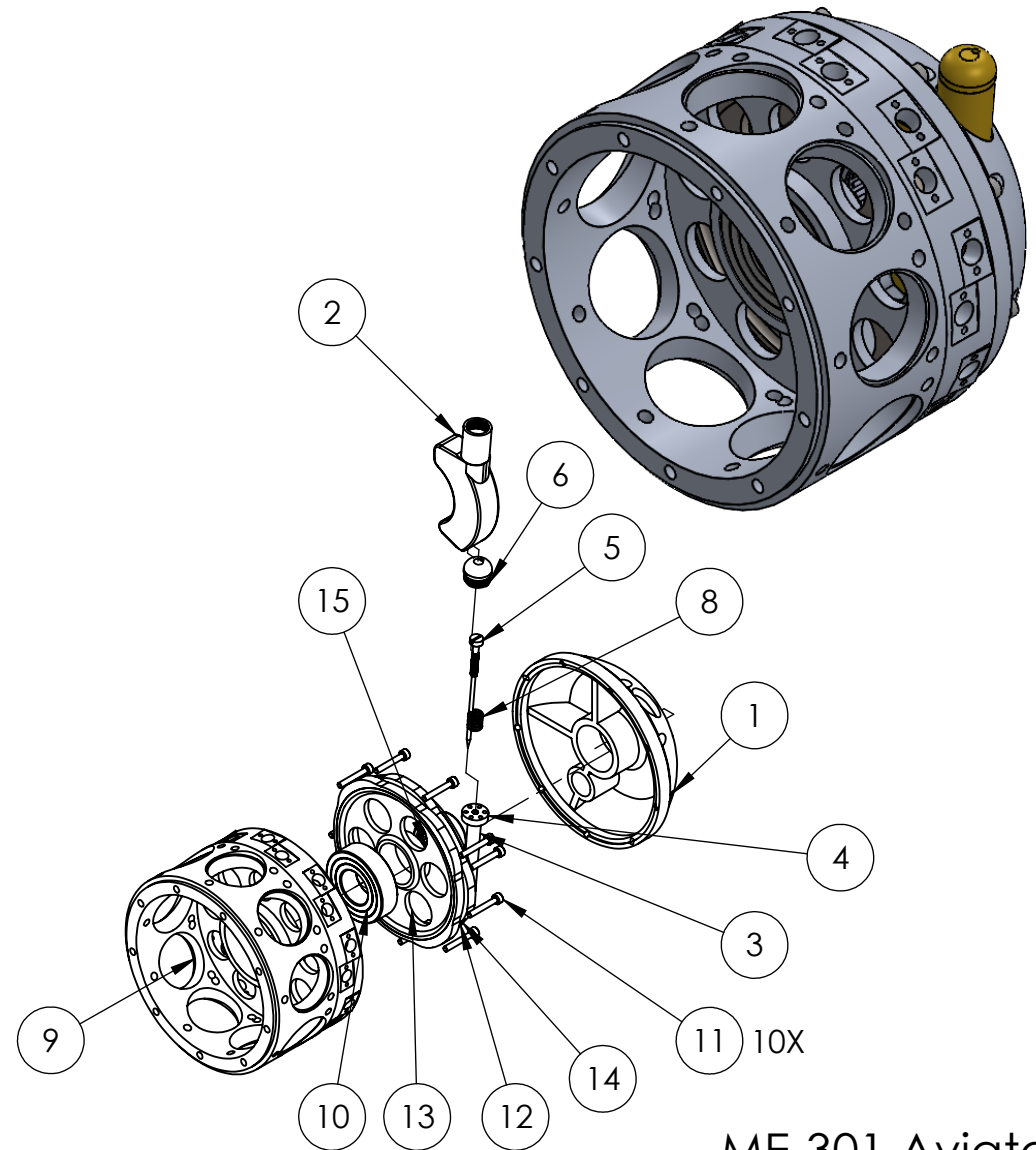
REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Cylinder Assembly	EM	JG	4/24/24



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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Cylinder Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		FILE NAME/PART NUMBER: 03-00_Cylinder		SHEET: 1 OF 1 SCALE: 1:2	REVISION: A B

D	4			3			
	ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORNO	REV	QTY.
	1	04-02	Crankcase Cover			A	1
	2	04-03	Oil_Tank			A	1
	3	04-04	Tube, Oil Feed			A	1
C	4	04-05	Stabilizer, Oil			A	1
	5	04-06	Needle			A	1
	6	04-07	Oil Tube Cap			A	1
	7	04-08	Oil Nozzle			A	1
	8	04-09	Pressure Spring			A	1
B	9	04-02	Crankcase			A	1
	10	SP-07	Permanently Lubricated Ball Bearing	McMaster-Carr Supply Company	2349K216		1
	11	SP-06	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A123		10
	12	04-10	CAM RING			A	2
	13	04-11	CAM WHEEL			A	1
	14	04-12	GEAR RIM			A	1
	15	SP-09	SKF Bearing	SKF Group	10-21092016-091377	A	1
REVISIONS							
Rev	Description			DrawnBy	CheckedBy	Date	
A	Crankcase Assembly			EM	JG	4/17/24	

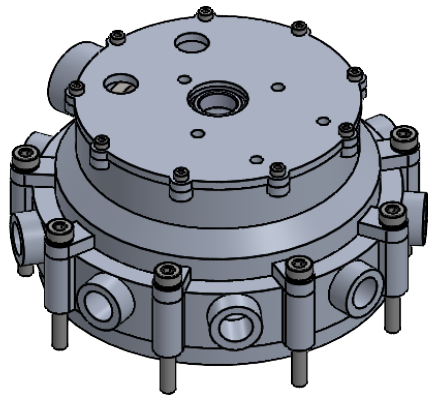
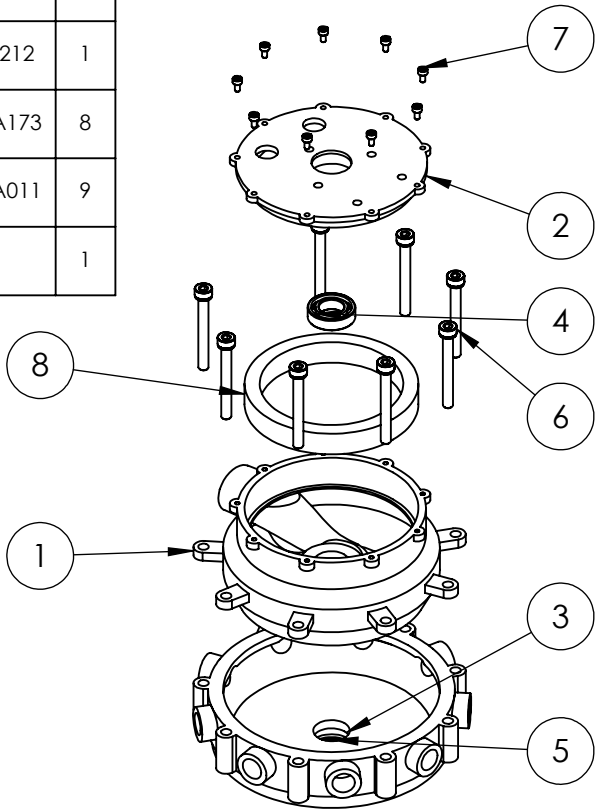


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		DESCRIPTION: Crankcase Assembly		UNIVERSITY OF IDAHO ME DEPARTMENT
DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30°		SHEET: 1 OF 1 SCALE: 1:2
FILE NAME/PART NUMBER: 04-00_Crankcase		REVISION: A		

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN	QTY.
1	05-01	HOUSING, Planetary Gear			1
2	05-02	Cover for Planetary Gear Housing			1
3	05-03	Assembly 5 Blower Housing			1
4	SP-09	Ball Bearing	SKF Group	10-21092016-091377	1
5	SP-10	Ball Bearing	McMaster-Carr Supply Company	5972K212	1
6	SP-11	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A173	8
7	SP-12	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A011	9
8	05-04	RingGearImpeller			1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Blower Assembly	EM	BL	4/24/24

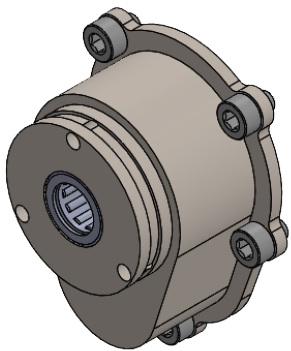
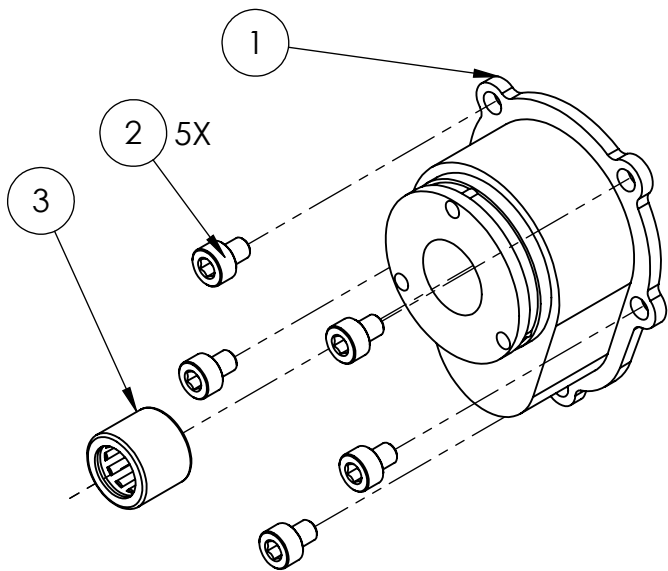


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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		ANGULAR: X.± 2 X.X± 1 X.XX± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Blower		Blower Assembly		SHEET: 1 OF 1	
FILE NAME/PART NUMBER:		05-00_Blower		REVISION: A	
				SCALE: 1:2	

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN	QTY.
1	06-01	GEAR BOX (with breaker point)			1
2	SP-13	Alloy Steel Socket Head Screw	91290A109		5
3	SP-20	Needle Bearing	SKF Group	10- 16022017-06 9000	1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Gearbox	JR	JG	4/26/24



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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Gear Box		FILE NAME/PART NUMBER: 06-00_Gearbox		SHEET: 1 OF 1 SCALE: 1:2	REVISION: A

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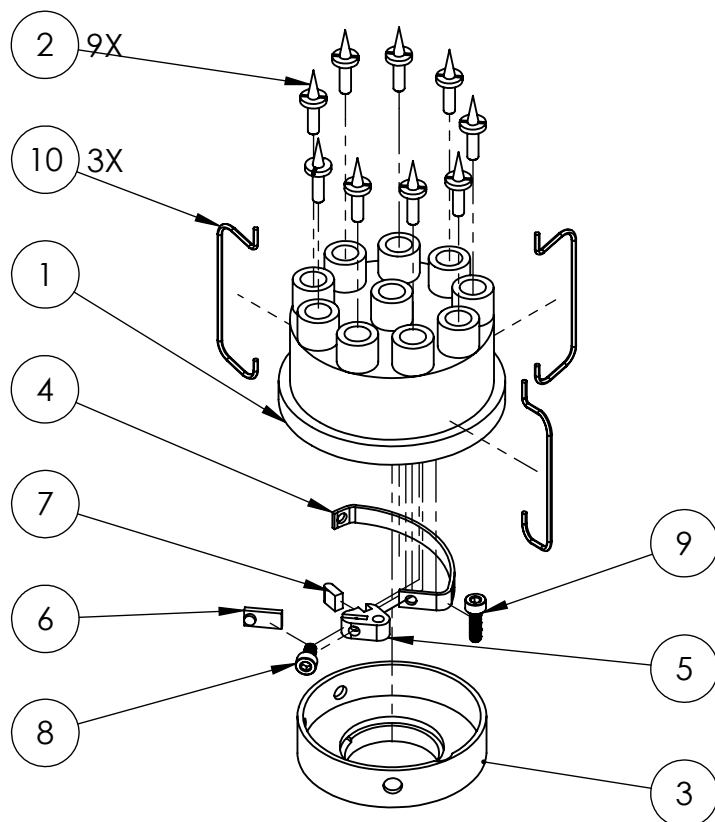
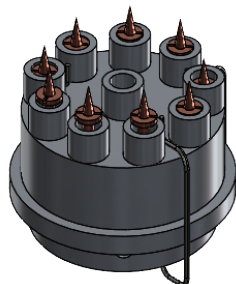
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ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	07-02	Cap Distributor			1
2	07-07	CAM, CONTACT POINTS			9
3	07-01	Base of the Distributer			1
4	07-03	Leaf Spring			1
5	07-04	Copper Head			1
6	07-05	Clamped Contact			1
7	07-06	Contact			1
8	SP-14	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A111	1
9	SP-15	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A115	1
10	07-08	Spring for Distributer			3

REVISIONS

Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Distributer Box	JR	JG	4/26/24

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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT
DESCRIPTION: Distributor Box		FILE NAME/PART NUMBER: 07-00_Distributor_Box		SHEET: 1 OF 1 SCALE: 1:4
				REVISION: A B

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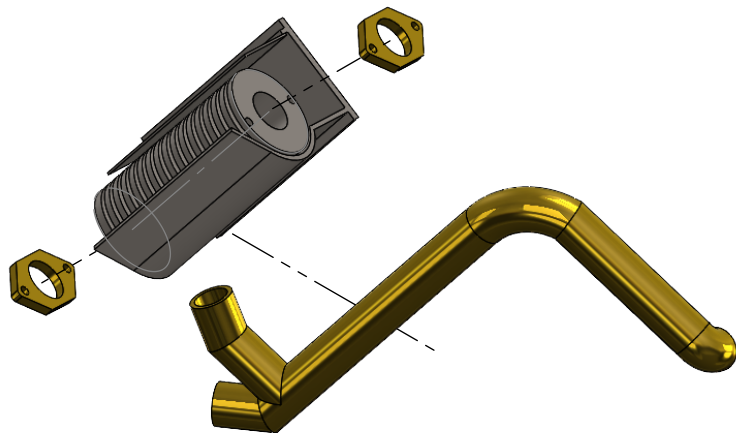
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ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	08-01	Heat Exchanger Casing			1
2	08-02	Pipe, Heat Exchanger			1
3	08-03	Flange, Exhaust Pipe			2

REVISIONS

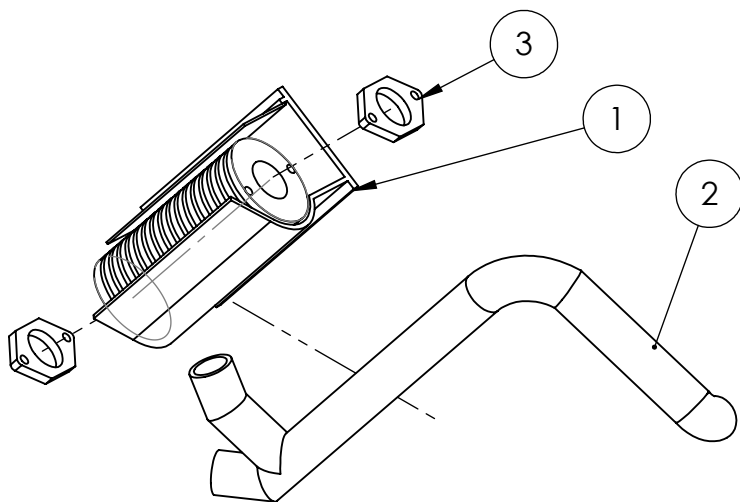
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Heat Exchanger	JR	JG	4/26/28

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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30'		UNIVERSITY OF IDAHO ME DEPARTMENT	
DESCRIPTION: Heat Exchanger		FILE NAME/PART NUMBER: 08-00_Heat_Exchange		SHEET: 1 OF 1 SCALE: 1:2	REVISION: A A

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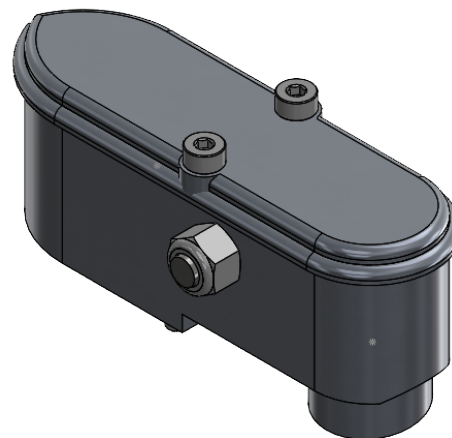
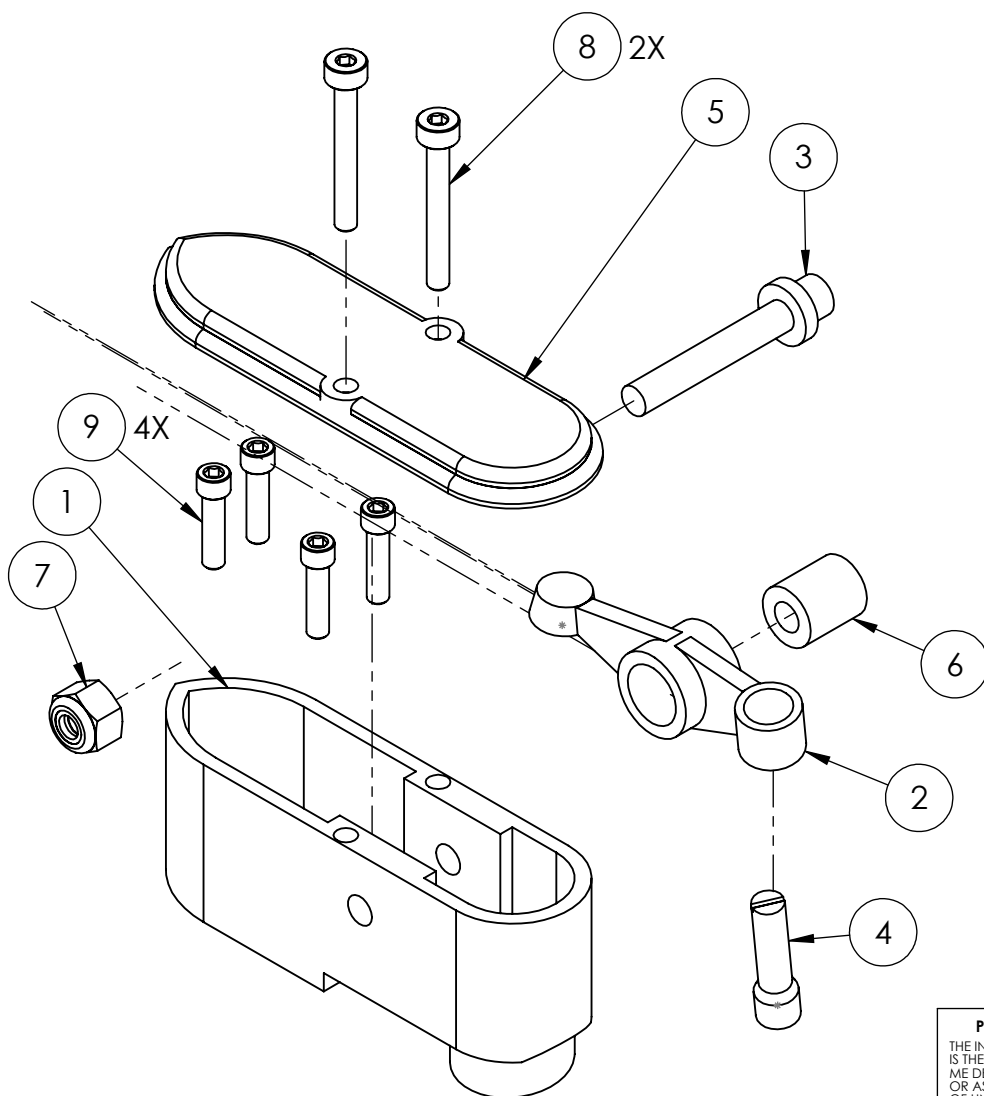
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REVISIONS

Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Rocker Box Left	JR	JG	4/25/24

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	09-01	Rocker Box for Left Rocker Box			1
2	09-02	Rocker Arm for Left Rocker Box			1
3	09-03	Rocker Arm Shaft for Left Rocker Box			1
4	09-04	Adjusting Screw for Left Rocker Box			1
5	09-05	Rocker Box Cover for Left Rocker Box			1
6	09-06	Rocker Arm Bushing for Left Rocker Box			1
7	SP-16	Medium-Strength Steel Nylon-Insert Locknut	McMaster-Carr Supply Company	90576A811	1
8	SP-17	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A047	2
9	SP-03	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A015	4



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DIMENSIONS ARE IN MILLIMETERS

THIRD ANGLE PROJECTION

PROJECT TITLE:

J5 Radial Engine

DEFAULT TOLERANCES:

LINEAR:	ANGULAR:
X. ± .25	X. ± 2
X.X ± .1	X.X ± 1
X.XX ± .01	X.XX ± 0.30
X.XXX ± .002	

DESCRIPTION: Left Rocker Box

FILE NAME/PART NUMBER:

09-00_Rocker_Box_Left

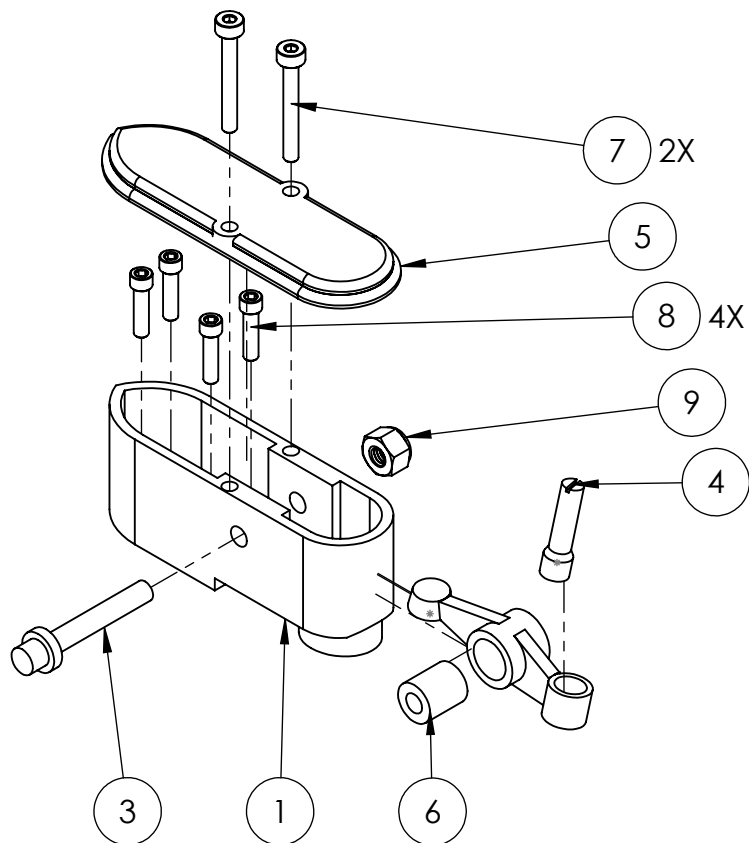
**UNIVERSITY OF IDAHO
ME DEPARTMENT**

SHEET: 1 OF 1

SCALE: 1:2

REVISION:

A A



ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY
1	10-01	Rocker Box for Right Rocker Box			1
2	10-02	Rocker Arm for Right Rocker Box			1
3	10-03	Rocker Arm Shaft for Right Rocker Box			1
4	10-04	Adjusting Screw for Right Rocker Box			1
5	10-05	Rocker Box Cover for Right Rocker Box			1
6	10-06	Rocker Arm Bushing for Right Rocker Box			1
7	SP-17	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A047	2
8	SP-03	Alloy Steel Socket Head Screw	McMaster-Carr Supply Company	91290A015	4
9	SP-16	Medium- Strength Steel Nylon- Insert Locknut	McMaster-Carr Supply Company	90576A811	1

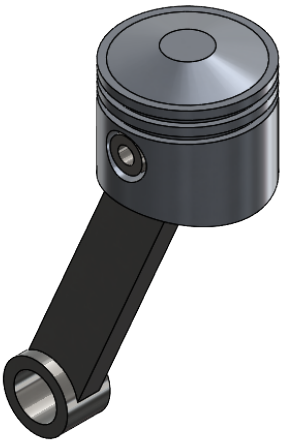
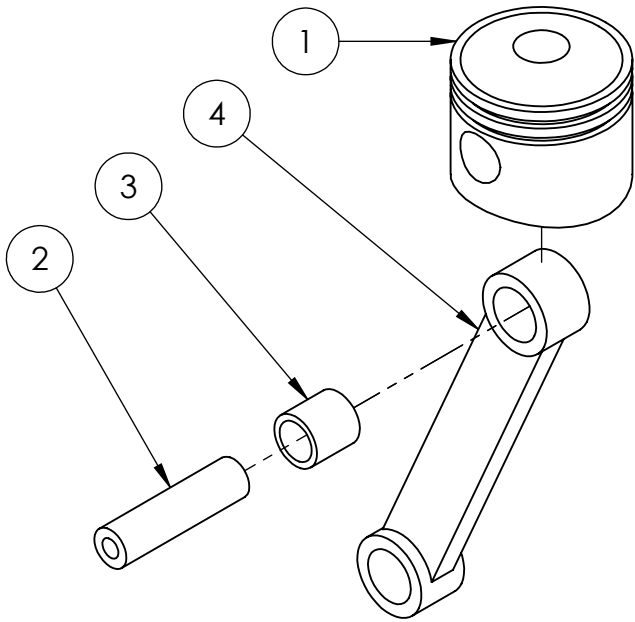
REVISIONS				
Rev	Description	CheckedBy	DrawnBy	Date
A	Assembly of Rocker Box Right	JG	JR	4/26/24

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DEFAULT TOLERANCES: <table><tr><td> LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002 </td><td> ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30° </td></tr></table>		LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°	DESCRIPTION: Right Rocker Box FILE NAME/PART NUMBER: 10-00_Rocker_Box_Right	UNIVERSITY OF IDAHO ME DEPARTMENT <table><tr><td> SHEET: 1 OF 1 </td><td> REVISION: A </td></tr><tr><td> SCALE: 1:2 </td><td></td></tr></table>		SHEET: 1 OF 1	REVISION: A	SCALE: 1:2	
LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002	ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°									
SHEET: 1 OF 1	REVISION: A									
SCALE: 1:2										

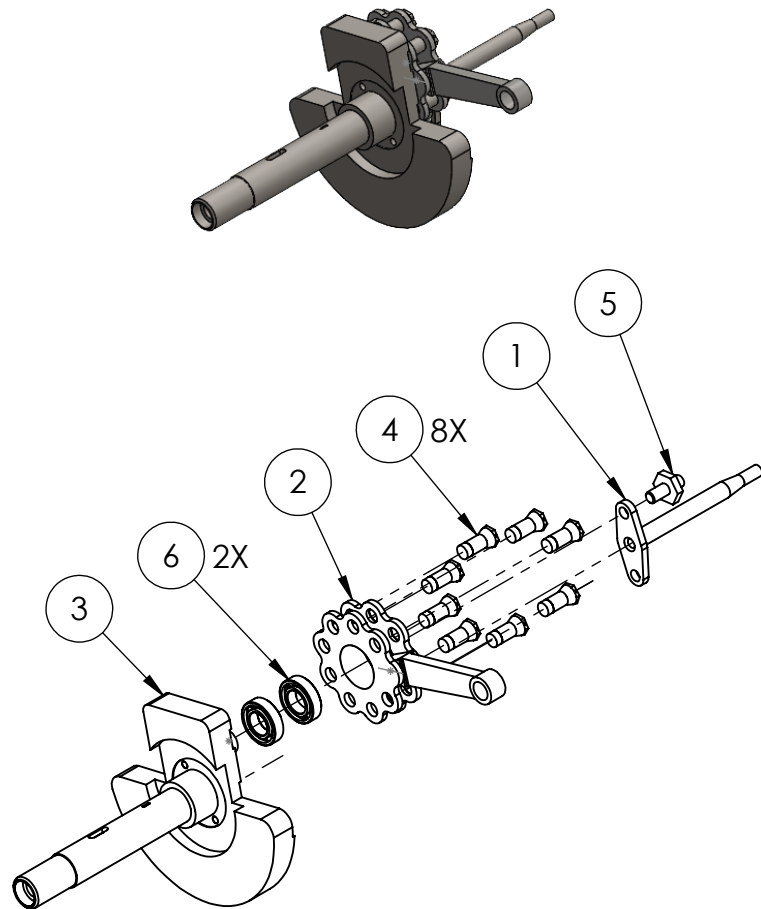
ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	11-01	Piston			1
2	11-02	Piston pin, without bumb			1
3	11-05	Bushing for rod/piston			1
4	11-03	Master Rod			1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Link Rod	JR	JG	4/25/24



ME-301 Aviators

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DEFAULT TOLERANCES: LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002		DESCRIPTION: Link Rod		UNIVERSITY OF IDAHO ME DEPARTMENT	
ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'		FILE NAME/PART NUMBER: 11-00_Link_Rod		SHEET: 1 OF 1 SCALE: 1:2	REVISION: A A



ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORNO	QTY.
1	12-02	Drive shaft, planetary gear			1
2	12-03	Rod Connector			1
3	12-01	Crankshaft			1
4	12-04	Pin, Link Rod			8
5	12-05	Drive Pin, Dist. shaft			1
6	SP-09	SKF Bearing	SKF Group	10- 21092016-09 1377	2

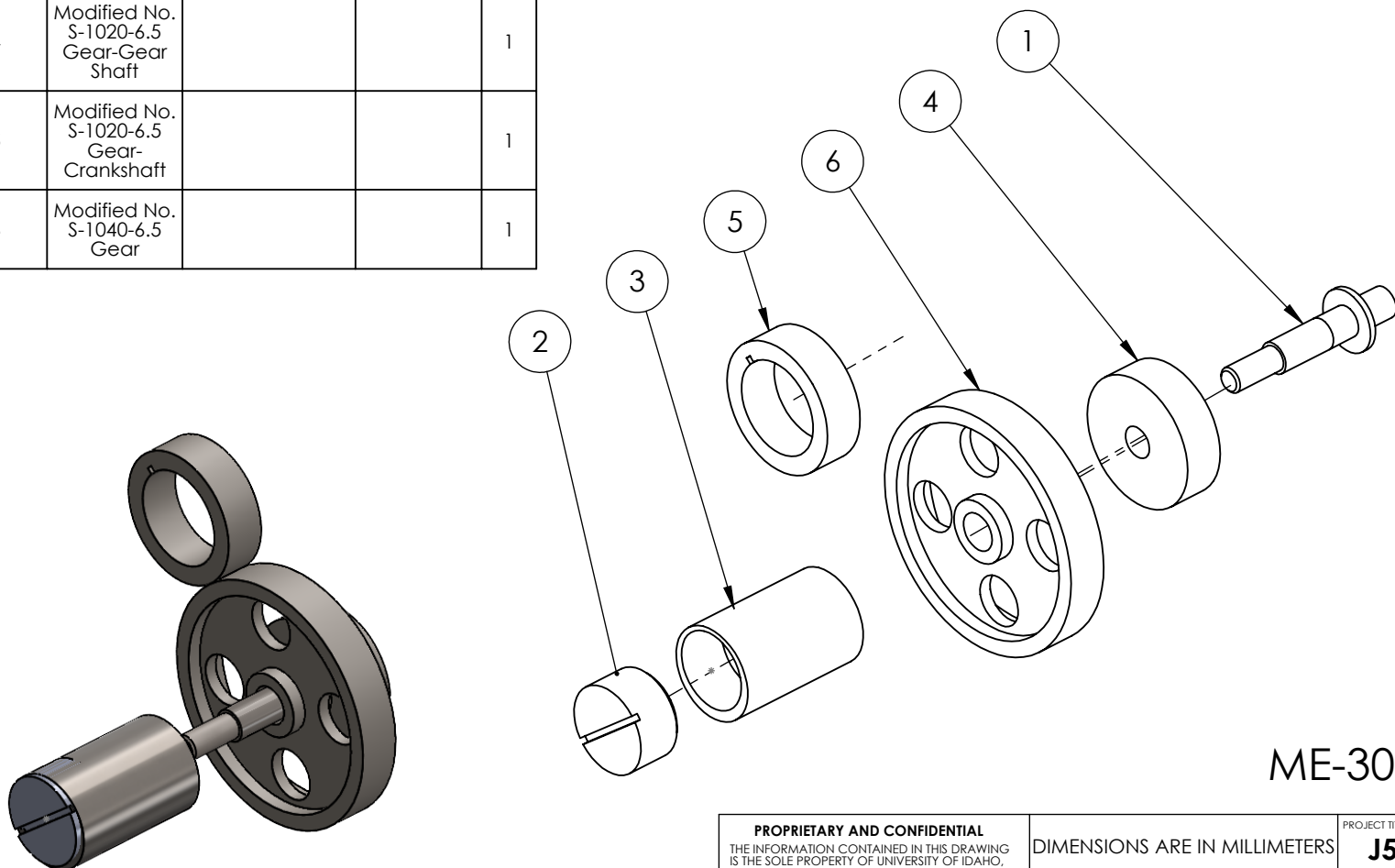
REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Crankshaft	JR	JG	4/26/24

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DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		DESCRIPTION: Cranshaft FILE NAME/PART NUMBER: 12-00_Crankshaft		UNIVERSITY OF IDAHO ME DEPARTMENT	
				SHEET: 1 OF 1 SCALE: 1:8	REVISION: A

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	13-01	Gear Shaft			1
2	13-02	Eccentric Bushing & Bearing Lock: Cap			1
3	13-03	Eccentric Bushing & Bearing Lock-Sheath			1
4	13-04	Modified No. S-1020-6.5 Gear-Gear Shaft			1
5	13-05	Modified No. S-1020-6.5 Gear-Crankshaft			1
6	13-06	Modified No. S-1040-6.5 Gear			1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Cam	JR	JG	4/25/24

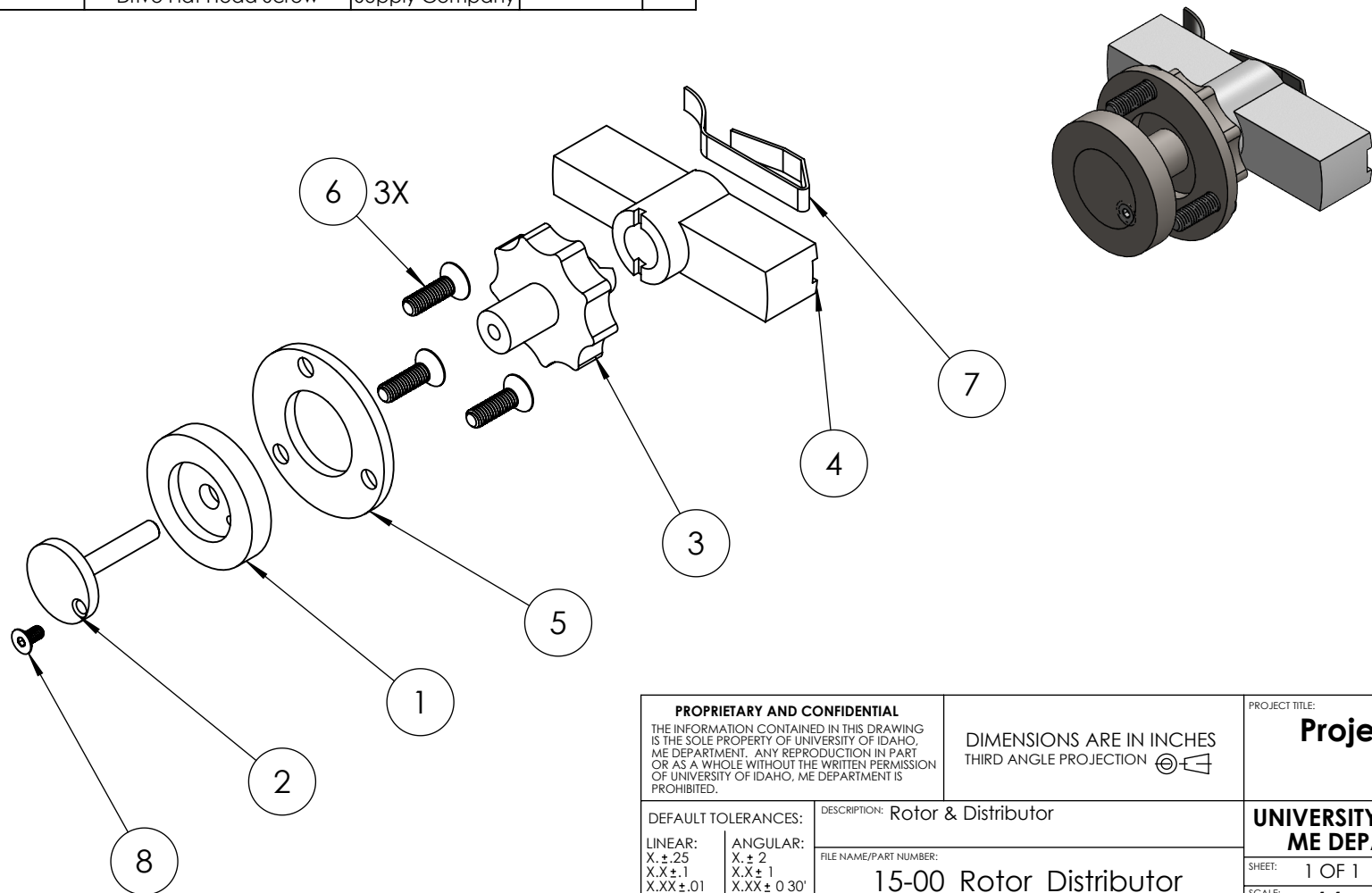


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DEFAULT TOLERANCES:		DESCRIPTION: Cam FILE NAME/PART NUMBER: 13-00_Cam		UNIVERSITY OF IDAHO ME DEPARTMENT	
LINEAR: X.±.25 X.X±.1 X.XX±.01 X.XXX±.002	ANGULAR: X.± 2 X.X± 1 X.XX± 0 30'				
				SHEET: 1 OF 1 SCALE: 1:2	REVISION: A

ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY
1	15-01	No. S-0540-04 GEAR modify per drawing			1
2	15-02	SHAFT, Cam			1
3	15-03	CAM, Breaker point			1
4	15-05	Rotor			1
5	15-04	PLATE, Clamping			1
6	SP-21	Black-Oxide Alloy Steel Hex Drive Flat Head Screw	McMaster-Carr Supply Company	91294A130	3
7	15-06	Spring for rotor electrode			1
8	SP-22	Black-Oxide Alloy Steel Hex Drive Flat Head Screw	McMaster-Carr Supply Company	91294A002	1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Initial Assembly	ACG	EM	2024 April 23



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DIMENSIONS ARE IN INCHES
THIRD ANGLE PROJECTION

PROJECT TITLE:

Project Title

DEFAULT TOLERANCES:

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

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

DESCRIPTION:	Rotor & Distributor
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FILE NAME/PART NUMBER:

15-00_Rotor_Distributor

UNIVERSITY OF IDAHO
ME DEPARTMENT

SHEET: 1 OF 1

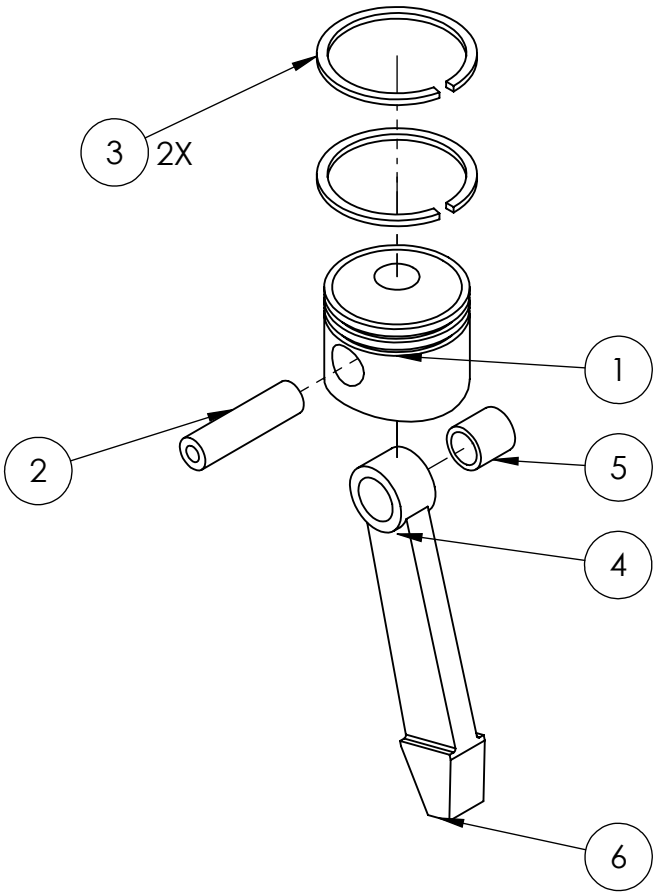
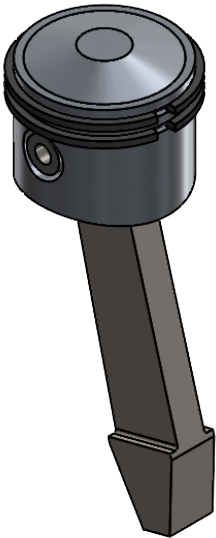
SCALE: 1:1

REVISION:

A

4		3			
ITEM NO	PartNo	DESCRIPTION	VENDOR	VENDORN0	QTY.
1	16-01	Piston			1
2	16-02	Piston pin, without bumb			1
3	16-04	A piston ring			2
4	16-00				1
5	16-05	Bushing for rod/piston			1
6	16-03	Final Attachment Rod			1

REVISIONS				
Rev	Description	DrawnBy	CheckedBy	Date
A	Assembly of Master Rod	JR	STM	04/25/24



ME-301 Aviators

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				UNIVERSITY OF IDAHO ME DEPARTMENT	
DEFAULT TOLERANCES: LINEAR: X. ± .25 X.X ± .1 X.XX ± .01 X.XXX ± .002		ANGULAR: X. ± 2 X.X ± 1 X.XX ± 0.30°		DESCRIPTION: FILE NAME/PART NUMBER: 16-00_Master_Rod	
				SHEET: 1 OF 1 SCALE: 1:1	REVISION: A