

# DUMPSTER DYNAMICS

## Space Trash De-Orbiter System Drawing Packet

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EMA 569: Senior Design  
Engineering Mechanics and Astronautics  
University of Wisconsin-Madison  
May 22, 2025

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### *Authors*

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Martin Du Jardin  
Gavin Day  
Bryce Quinton

### *Supervisors*

Sonny Nimityongskul  
Travis Sheperd  
Scott Russell

# 1 Table of Contents

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Drawings included:

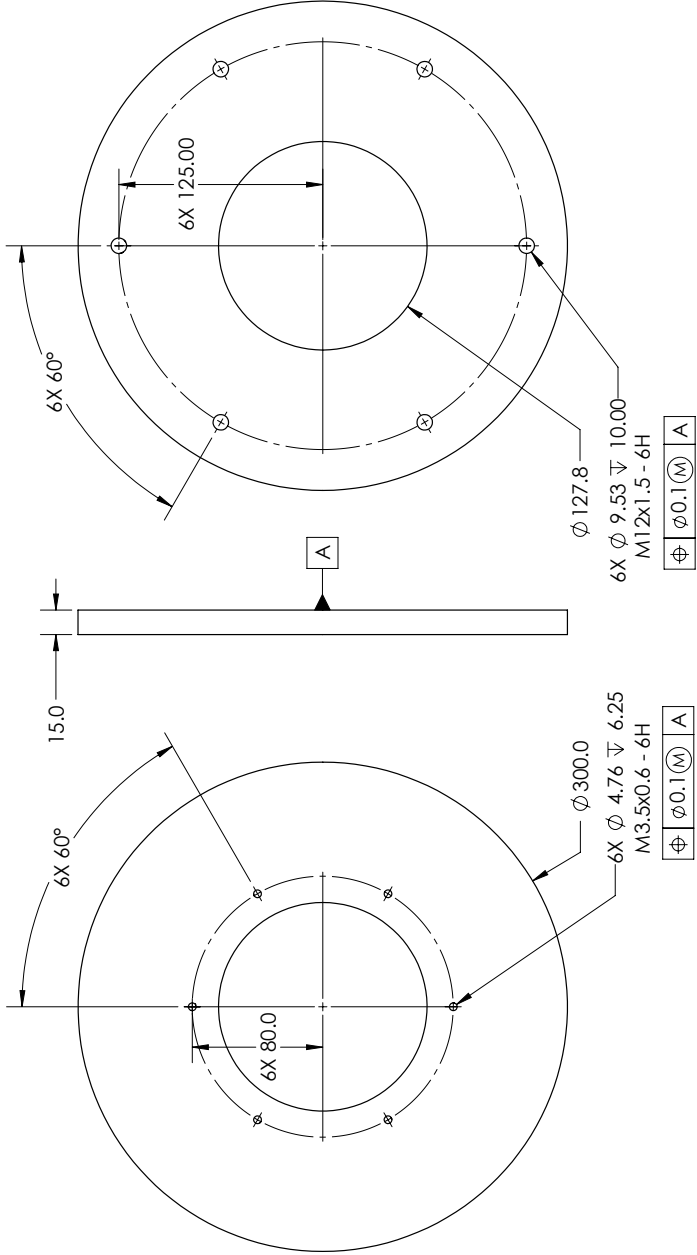
1. Thrust Plate
2. Rao Nozzle
3. Kick Stage Engine Mount Arm
4. Kick Stage Engine Mount Assembly
5. Kick Stage Assembly
6. Gripping Mechanism Jaw
7. Gearbox Output Housing
8. Gripping Mechanism Gearbox
9. Bottom Prism
10. Middle Prism
11. Top Prism
12. STD Structure Assembly
13. Injector-Manifold Assy
14. Injector Plate
15. Forward Manifold Plate
16. Final Assembly

6 5 4 3 2 1

USED ON	PART NUMBER	MATERIAL	SPECIFICATION	QTY.
569000, 569200	569202	ALUMINUM 2024	AMS 4037	1

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

- NOTES:
- BREAK ALL SHARP EDGES
  - HIDDEN LINES NOT SHOWN
  - PART TO BE FREE OF ANY DIRT AND DEBRIS
  - ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED



NAME	DATE	DUMPSTER DYNAMICS	
DRAWN	GMD	4/26/25	
CHECKED	DMR	4/29/25	
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN MILLIMETERS			
TOLERANCES:			
ANGULAR: MACH/BEND $\pm 1^\circ$			
HOLE NUMBER $\pm 1$			
ONE PLACE DECIMAL $\pm .2$			
THREE PLACE DECIMAL $\pm .01$			
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			
DO NOT SCALE DRAWING			
SIZE DWG. NO.		SCALE: 1:3	WEIGHT:
B		569202	
REV		1	
SHEET 1 OF 1			

6 5 4 3 2 1

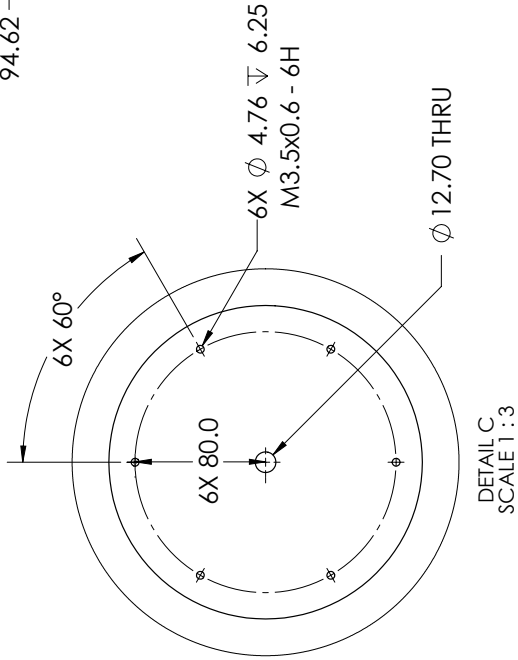
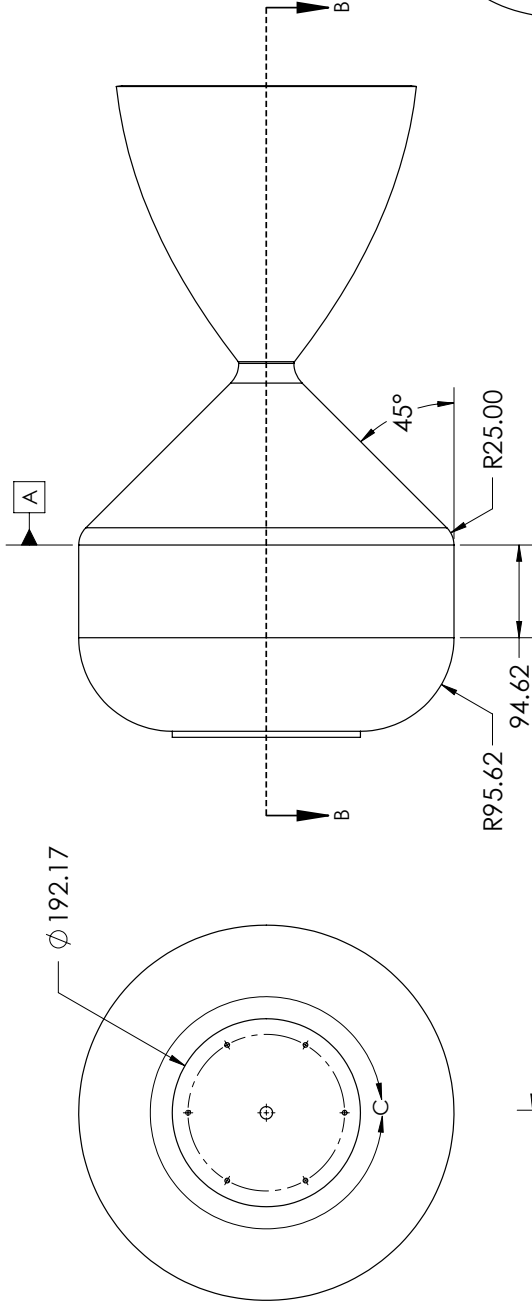
USED ON	PART NUMBER	MATERIAL	SPECIFICATION	QTY.
569000 569200	569201	HAYNES 25	AMS 5537	1

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

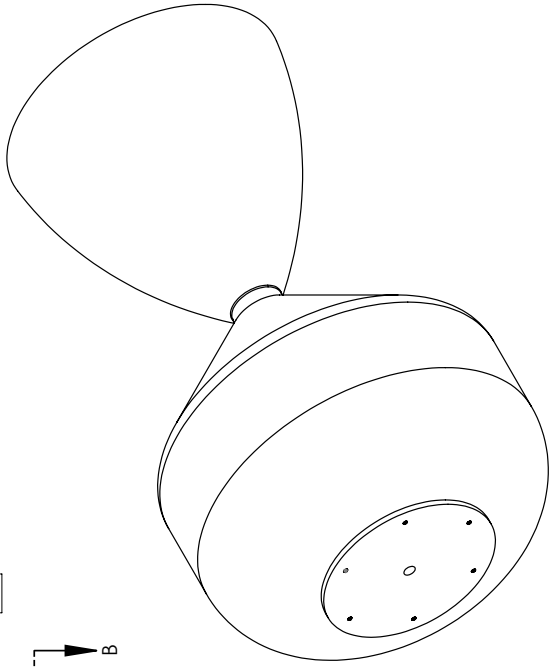
NOTES:

1. BREAK ALL SHARP EDGES
2. HIDDEN LINES NOT SHOWN
3. PART TO BE FREE OF ANY DIRT AND DEBRIS
4. ALL SURFACES  $\nabla$  0.8 UNLESS OTHERWISE NOTED
5. ALL INNER FILLETS EQUAL TO OUTER FILLETS

A DEFINED VIA TABLE 1 ALONG NOZZLE LENGTH



ISOMETRIC VIEW  
FOR REFERENCE ONLY



NAME	DATE	DUMPSTER DYNAMICS	
DRAWN	GMD	4/26/25	
CHECKED	DMR	4/29/25	
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN MILLIMETERS			
TOLERANCES:			
ANGULAR: MACH/BEND $\pm 1^\circ$			
HOLE NUMBER $\pm 1$			
ONE PLACE DECIMAL $\pm .2$			
THREE PLACE DECIMAL $\pm .01$			
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			
DO NOT SCALE DRAWING			

TITLE:

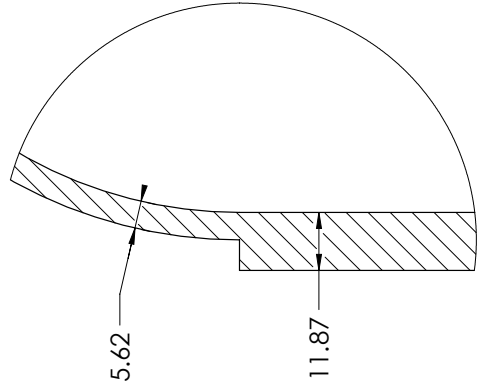
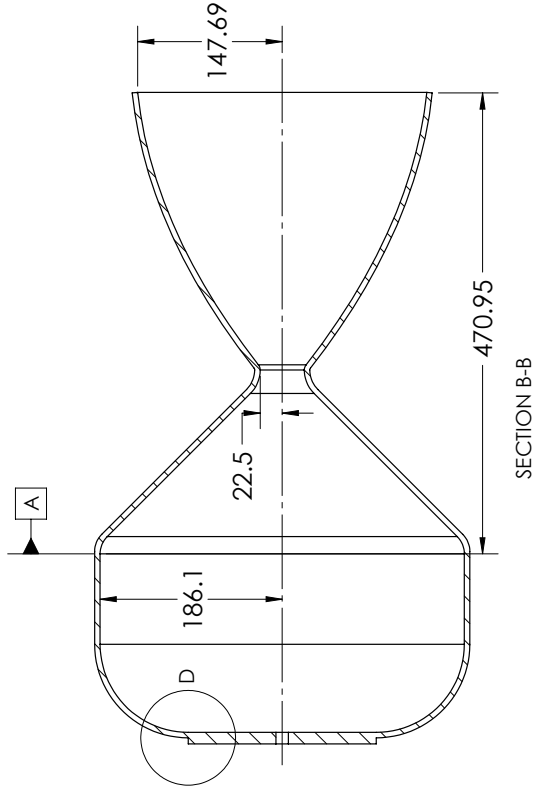
RAO NOZZLE

SIZE	DWG. NO.	REV	SHEET 1 OF 2
B	569201	3	

SCALE: 1:5 WEIGHT:

TABLE 1: SPLINE-DRIVEN CURVE

Axial Position from A (mm)	Radial Position (mm)	Axial Position from A (mm)	Radial Position (mm)
0.00	186.1	166.98	24.3
6.16	179.8	167.95	24.0
12.36	173.6	168.92	23.7
18.56	167.4	169.89	23.5
24.76	161.2	170.86	23.3
30.96	155.0	171.83	23.1
37.16	148.8	172.80	22.9
43.36	142.6	173.77	22.8
49.56	136.4	174.73	22.7
55.76	130.2	175.70	22.7
61.96	124.0	176.67	22.6
68.16	117.8	177.40	22.5
74.36	111.6	182.72	24.4
80.56	105.4	191.15	30.9
86.76	99.2	202.39	39.3
92.96	93.0	213.64	47.4
99.16	86.8	224.88	55.2
105.36	80.6	236.12	62.7
111.56	74.4	247.37	69.9
117.76	68.2	258.61	76.7
123.96	62.0	269.85	83.3
130.16	55.8	281.09	89.5
136.36	49.6	292.34	95.5
142.56	43.4	303.58	101.1
148.76	37.2	314.82	106.4
153.41	32.5	326.07	111.5
154.38	31.6	337.31	116.2
155.35	30.8	348.55	120.6
156.32	30.0	359.80	124.7
157.29	29.2	371.04	128.5
158.26	28.5	382.28	132.0
159.23	27.9	393.52	135.1
160.20	27.3	404.77	138.0
161.17	26.7	416.01	140.6
162.14	26.2	427.25	142.8
163.11	25.8	438.50	144.8
164.07	25.3	449.74	146.4
165.04	24.9	460.98	146.9
166.01	24.6	470.95	147.7



DETAIL D  
SCALE 1:1

DUMPSTER DYNAMICS

TITLE:

RAO NOZZLE

SIZE DWG. NO. REV  
B 569200 3

SCALE: 1:6 WEIGHT: SHEET 2 OF 2

6

5

4

3

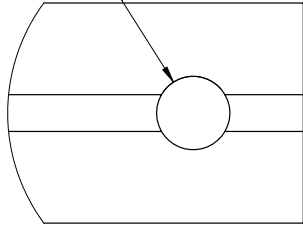
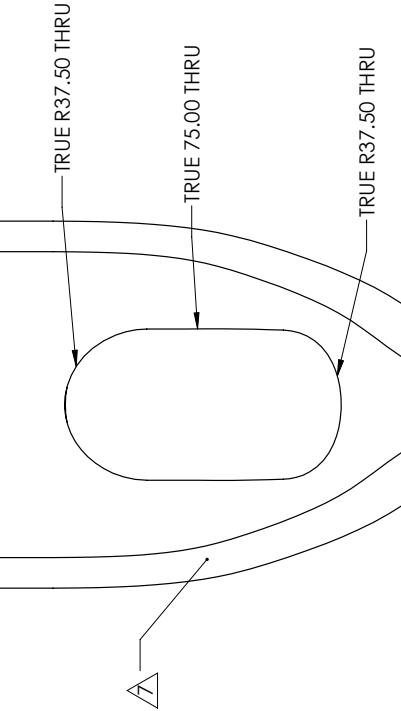
2

1

USED ON	PART NO.	DESCRIPTION
569100	569110	KICK STAGE ENGINE MOUNT ARM

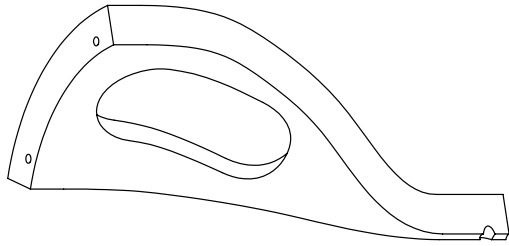
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

D



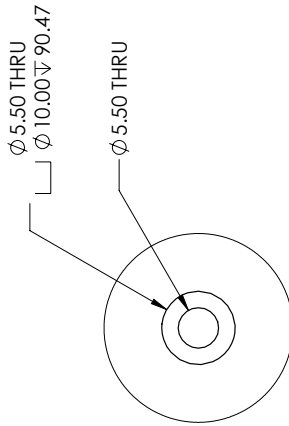
DETAIL G  
SCALE 3 : 2

C



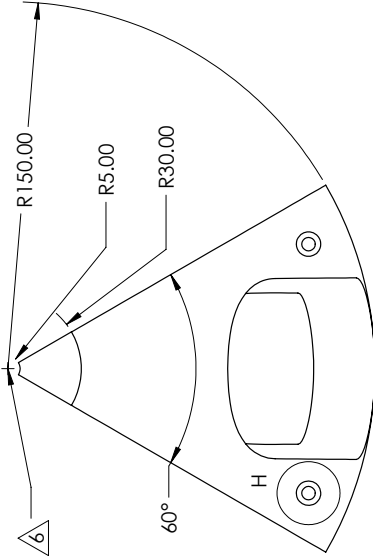
ISOMETRIC VIEW  
FOR REFERENCE ONLY  
SCALE 1:3

B



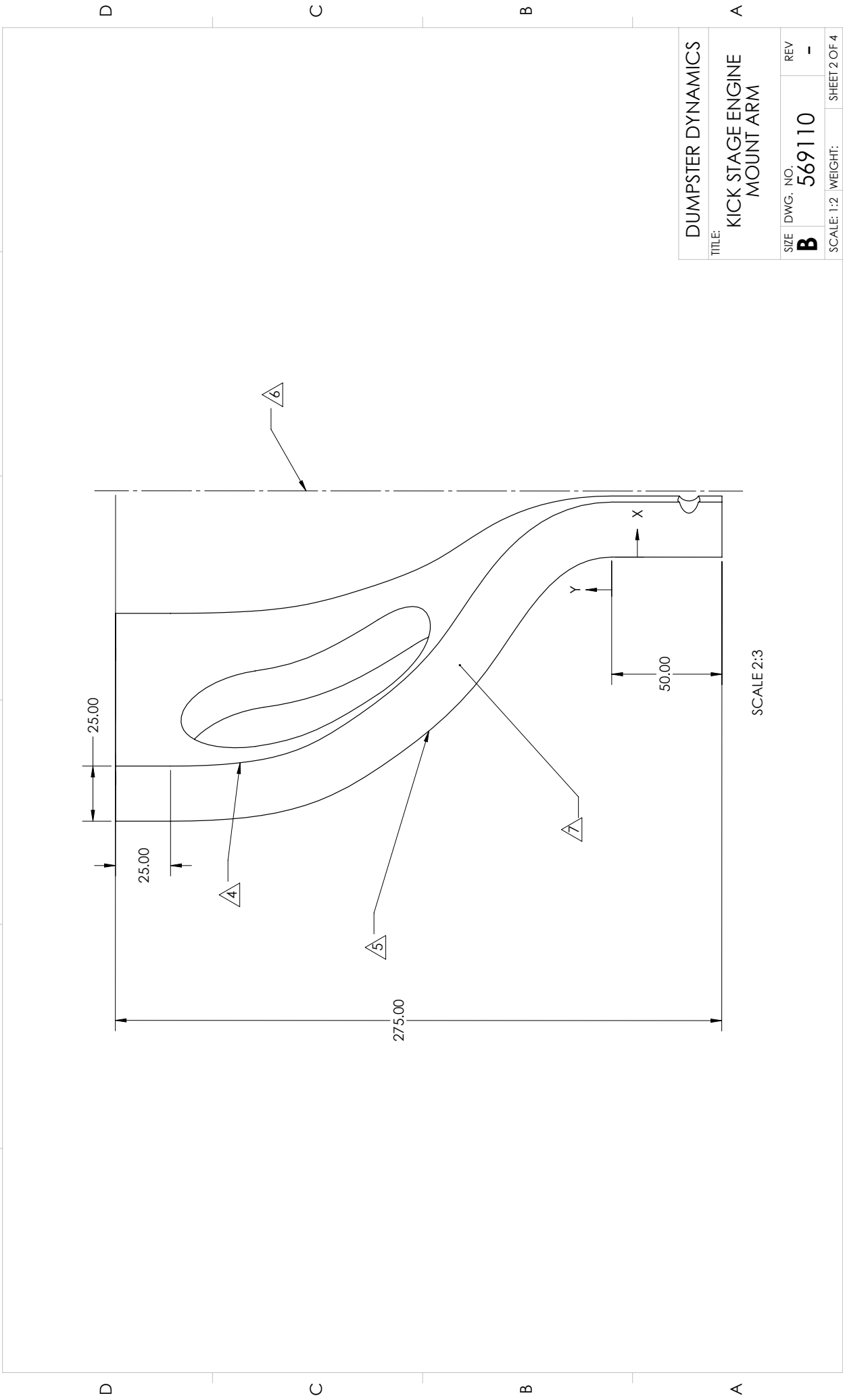
DETAIL H  
SCALE 3 : 2

A



NAME	DATE	DUMPSTER DYNAMICS	
DMR	4/29/25	TITLE:	
GMD	4/29/25	KICK STAGE ENGINE MOUNT ARM	
UNLESS OTHERWISE SPECIFIED:		SIZE	REV
DIMENSIONS ARE IN MILLIMETERS		DWG. NO.	569110
FRACTIONAL ± .01		SCALE	1:2
ANGULAR ± .01		WEIGHT	1 OF 4
HOLE POSITION ± .01			
THREE PLACE DECIMAL ± .005			
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			
DO NOT SCALE DRAWING			

6 5 4 3 2 1



DUMPSTER DYNAMICS			
TITLE: KICK STAGE ENGINE MOUNT ARM			
SIZE	DWG. NO.	REV	
B	569110	-	
SCALE: 1:2		WEIGHT:	SHEET 2 OF 4

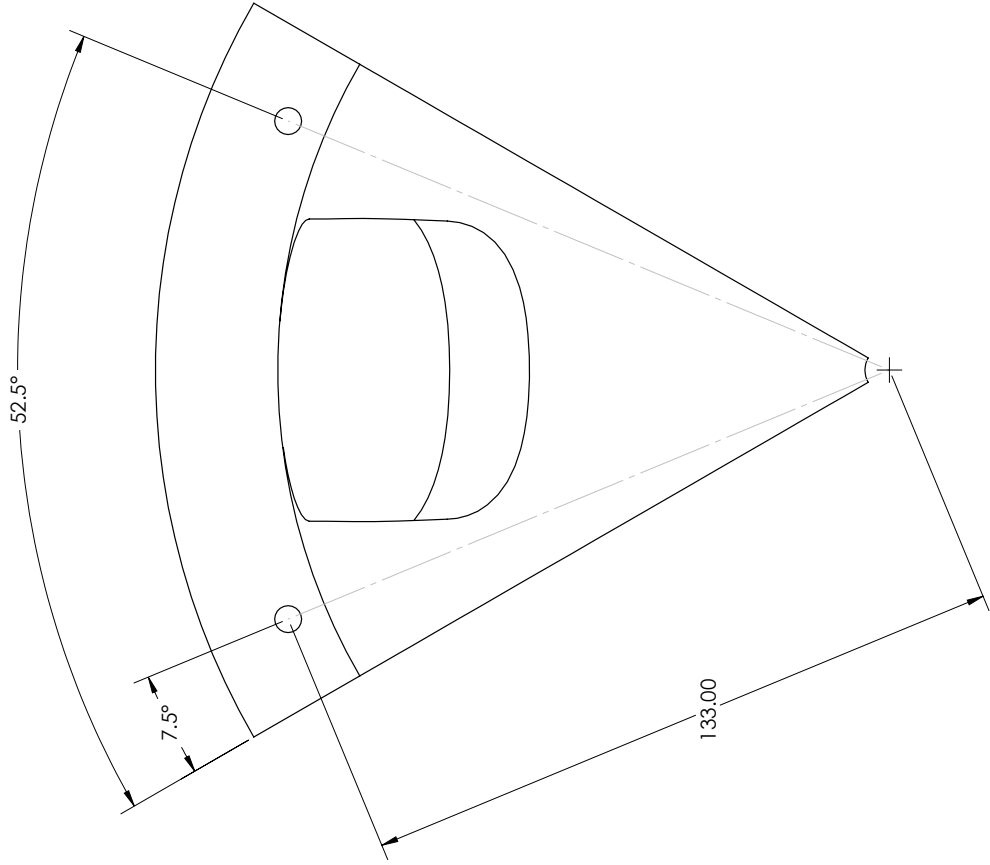
6 5 4 3 2 1

D

C

B

A



DUMPSTER DYNAMICS

TITLE:

KICK STAGE ENGINE  
MOUNT ARM

SIZE DWG. NO. REV  
**B** 569110 -

SCALE: 1:2 WEIGHT: SHEET 3 OF 4



6 5 4 3 2 1

TABLE 1		
X	Y	
31.02274676	50.17258383	
30.96144566	59.12228797	
30.47337278	66.71597633	
25.211174	82.44575937	
15.59310951	95.734714	
0.330696338	109.566075	
-17.13671641	123.1262327	
-31.9489109	136.1439842	
-38.65609725	144.0088757	
-48.93394649	158.6538462	
-55.29918103	169.5019724	
-59.80136781	177.6380671	
-63.18551153	186.0453649	
-65.96400394	194.995069	
-67.88815282	206.6568047	
-68.02643427	219.6745562	
-68.1186219	228.3530572	
-67.04560072	242.4556213	
-66.20626447	249.7781065	

TABLE 2		
X	Y	
5.634701141	51.52859961	
5.449253923	59.39349112	
2.43010891	68.61439842	
-4.571863477	78.64891519	
-16.37188063	89.49704142	
-26.6427622	97.09072978	
-42.81365235	110.1084813	
-55.72367293	123.1262327	
-66.33543435	137.2287968	
-74.41632364	149.704142	
-84.46852757	168.6883629	
-88.86941514	180.0788955	
-93.15989195	206.6568047	
-93.11165423	221.3017751	
-92.44972558	238.9299803	
-91.26843753	249.2357002	

D

C

B

A

D

C

B

A

DUMPSTER DYNAMICS

TITLE:

KICK STAGE ENGINE  
MOUNT ARM

SIZE DWG. NO. REV

B569110-

SCALE: 1:2 WEIGHT:

SHEET 4 OF 4



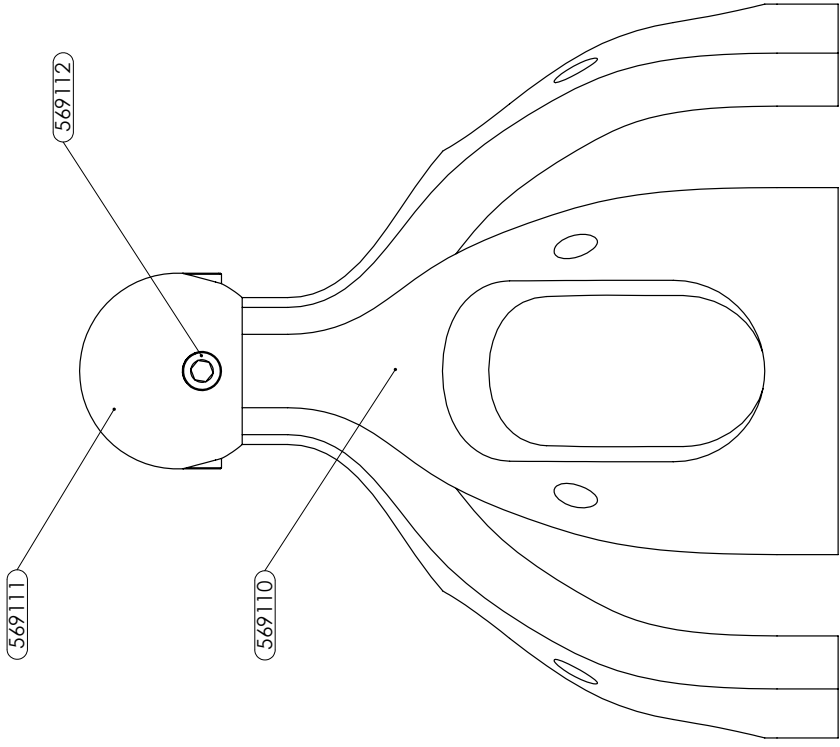
6 5 4 3 2 1

D

C

B

A



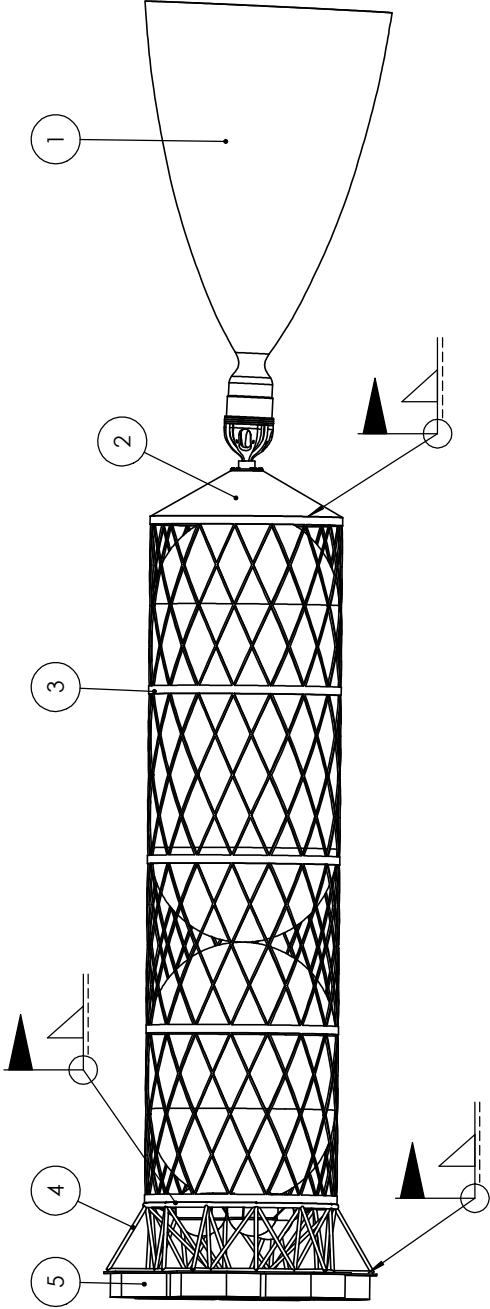
DUMPSTER DYNAMICS			
TITLE:			
KICK STAGE ENGINE MOUNT ASSEMBLY			
A			
SIZE	DWG. NO.	REV	
B	569100	-	
SCALE: 1:2 WEIGHT:			SHEET 2 OF 2
			1

6 5 4 3 2 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	569228	ASSEMBLY, MOUNTED PROPULSION	1
2	569229	PUCK, THRUST	1
3	569230	STRUCTURE, LATTICE	1
4	569231	FRAME	1
5	569232	PLATE, MOUNTING	1
6	569233	BOLT, HEX	6
7	569234	NUT, HEX	6
8	569235	TANK, NITROGEN	3
9	569236	MOUNT, NITROGEN	1
10	569237	SMALL TANK, PROPELLANT	1
11	569238	LARGE TANK, PROPELLANT	1
12	569239	RING MOUNT	3

NOTES:

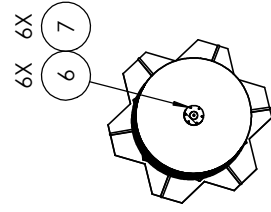
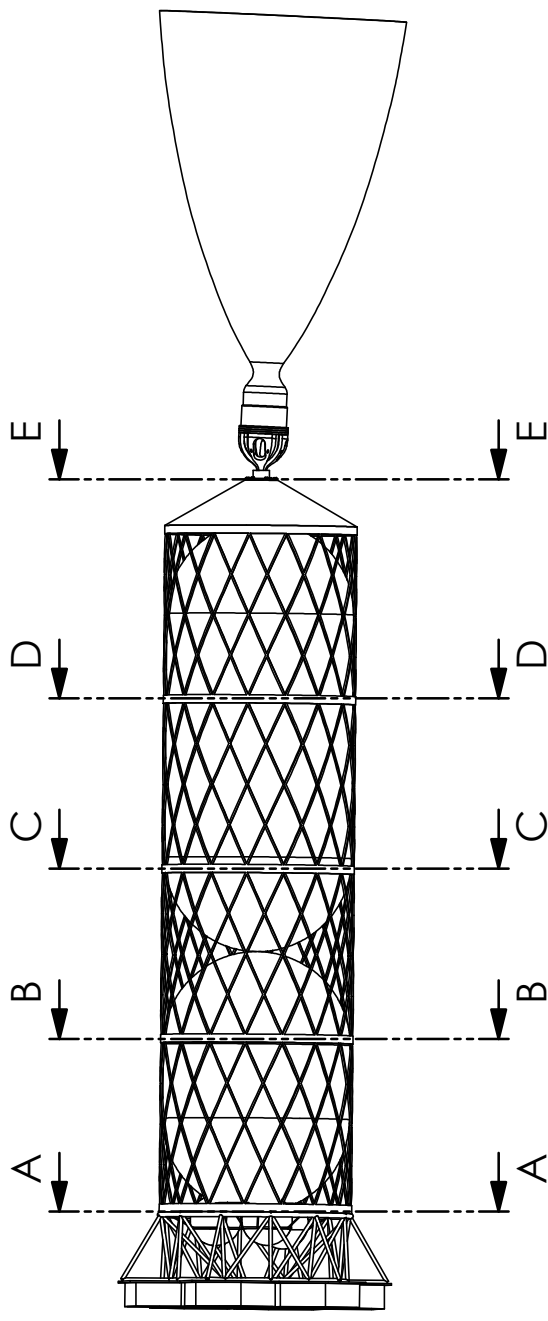
- ALL PARTS SHALL BE FREE OF DIRT AND DEBRIS
- LUBRICATE ITEM NO. 6 AND 7 PER ASTM A563 PRIOR TO INSTALLATION
- TORQUE ITEM NO. 6 AND 7 TO 50 LB FT
- PENETRANT INSPECTED ALL WELDS PER ASTM E1417



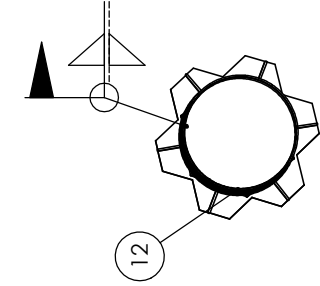
DRAWN	NAME	DATE	DUMPSTER DYNAMICS	
CHECKED	BYCE GUNION	4/29/2025	TITLE:	
UNLESS OTHERWISE SPECIFIED:			ASSEMBLY, KICK STAGE	
DIMENSIONS ARE IN mm			SIZE DWG. NO.	
TOLERANCES:			B 569227	
ANGULAR: MACH/BEND $\pm 1^\circ$			REV	
WHOLE NUMBER $\pm 1$			-	
ONE PLACE DECIMAL $\pm .2$			SCALE: 1:30   WEIGHT:	
TWO PLACE DECIMAL $\pm .01$			SHEET 1 OF 2	
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09				

6 5 4 3 2 1

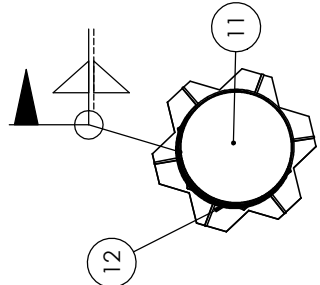
D C B A



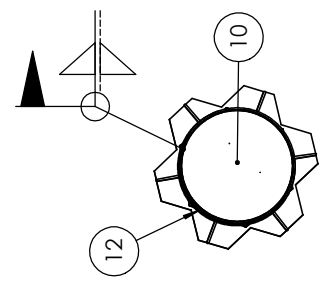
SECTION E-E  
SCALE 1 : 50



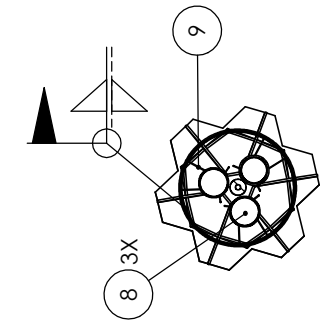
SECTION D-D  
SCALE 1 : 50



SECTION C-C  
SCALE 1 : 50



SECTION B-B  
SCALE 1 : 50



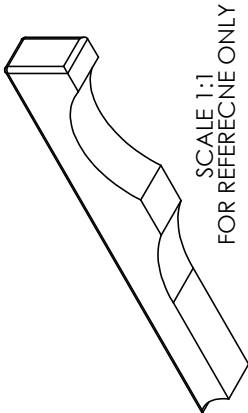
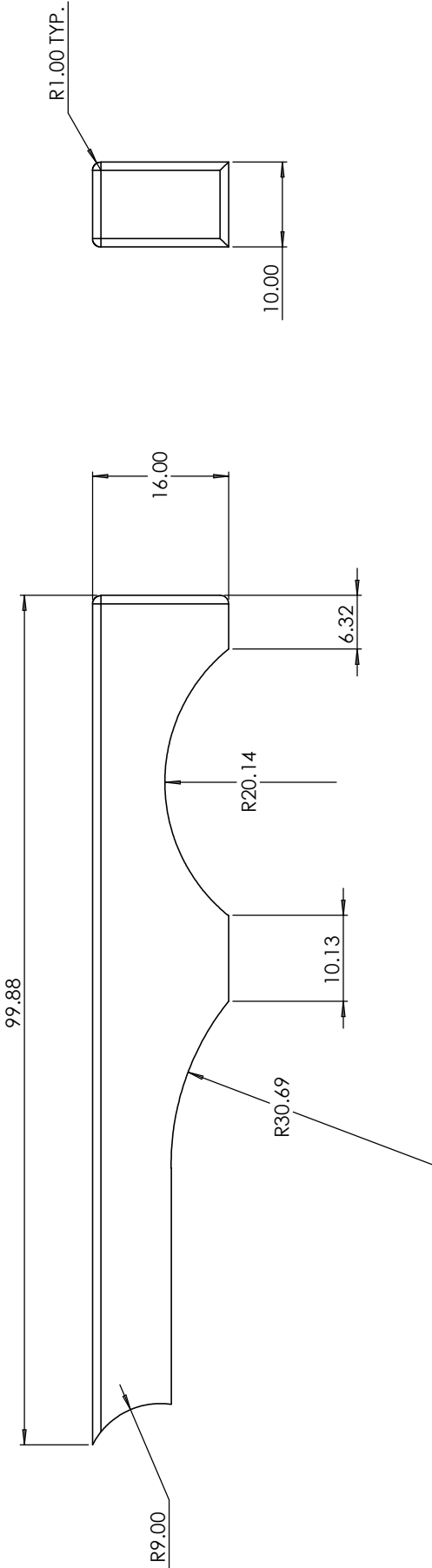
SECTION A-A  
SCALE 1 : 50

DUMPSTER DYNAMICS			
TITLE: ASSEMBLY, KICK STAGE			
SIZE	DWG. NO.	REV	SHEET 2 OF 2
B	569227	-	
SCALE: 1:30   WEIGHT:			

6 5 4 3 2 1

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

- NOTES:
1. BREAK ALL SHARP EDGES
  2. HIDDEN LINES NOT SHOWN
  3. PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  4. ALL SURFACES  $\nabla_{0.8}$  UNLESS OTHERWISE NOTED



DRAWN		NAME	DATE	DUMPSTER DYNAMICS	
BY/ENGINEER		4/29/2025			TITLE:  <

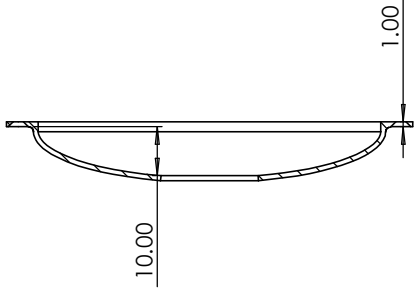
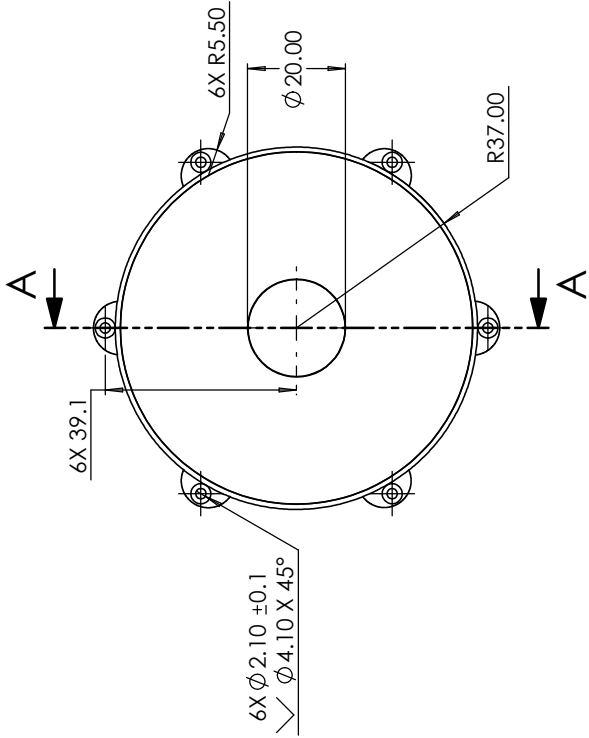
2 3 4 5 6

D C B A

6 5 4 3 2 1

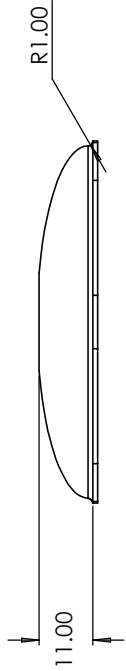
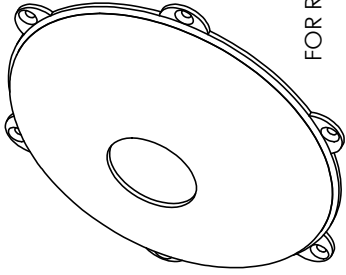
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

- NOTES:
1. BREAK ALL SHARP EDGES
  2. HIDDEN LINES NOT SHOWN
  3. PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  4. ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED



SECTION A-A

FOR REFERENCE ONLY



DRAWN	CHECKED	NAME	DATE	DUMPSTER DYNAMICS	
BRUCE QUINN	GD	BRUCE QUINN	4/29/2025	TITLE:	
UNLESS OTHERWISE SPECIFIED:				TITLE:	
DIMENSIONS ARE IN MM				TITLE:	
TOLERANCES:				TITLE:	
ANGULAR: MACH/BEND $\pm 1^\circ$				TITLE:	
WHOLE NUMBER $\pm 1$				TITLE:	
ONE PLACE DECIMAL $\pm .2$				TITLE:	
TWO PLACE DECIMAL $\pm .01$				TITLE:	
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09				TITLE:	
DO NOT SCALE DRAWING				TITLE:	
SCALE: 1:1				TITLE:	
SHEET 1 OF 1				TITLE:	

HOUSING,  
OUTPUT

SIZE	DWG. NO.	REV
B	569208	-

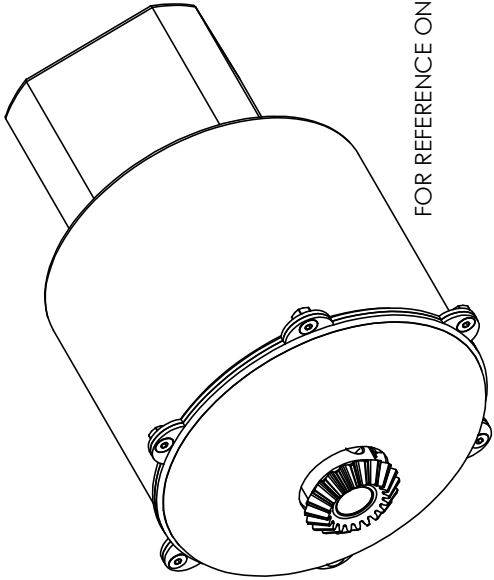
6 5 4 3 2 1

6 5 4 3 2 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	569202	NUT, HEX	10
2	569203	GEAR, PLANETARY	6
3	569204	GEAR, SUN	2
4	569205	GEAR, BEVEL	1
5	569217	SCREW, HEX FLAT HEAD	4
6	569206	SCREW, HEX BUTTON HEAD	4
7	569207	HOUSING, INPUT	1
8	569208	HOUSING, OUTPUT	1
9	569209	SCREW, HEX FLAT HEAD	6
10	569210	CARRIER, FIRST STAGE	1
11	569211	HOUSING, MOTOR	1
12	569212	GEAR, INTERNAL	2
13	569213	MOTOR, STEPPER	1
14	569214	CARRIER, SECOND STAGE	1
15	569218	SCREW, SET	6
16	569219	SCREW, SET	2

NOTES:

1. LUBRICATE ALL GEARS PER NASA-STD-6002B
2. ALL PARTS SHALL BE FREE OF DIRT AND DEBRIS
3. TORQUE ITEM NO. 5, 6, AND 9 TO 6 LB FT
4. TORQUE ITEM NO. 15 AND 16 TO 1 LB FT



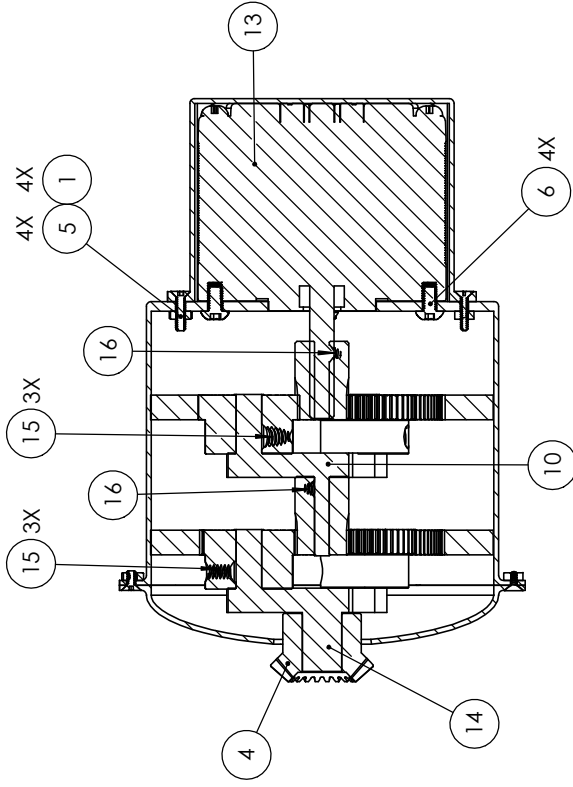
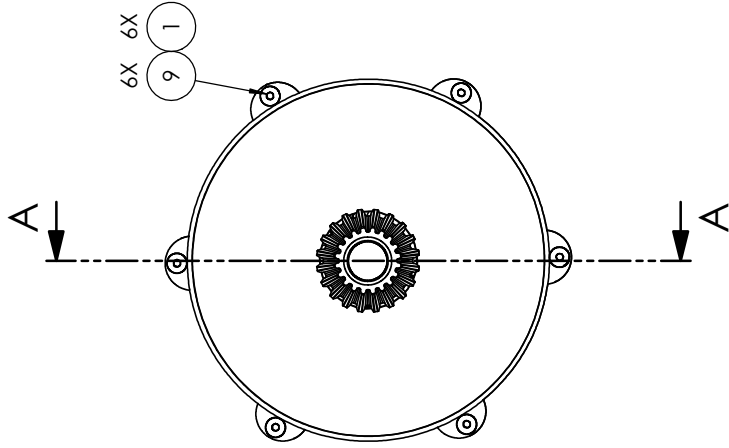
FOR REFERENCE ONLY

DRAWN	NAME	DATE	DUMPSTER DYNAMICS	
	BRYCE QUINN	4/28/2025		
CHECKED	GD	4/29/2025	TITLE:	
UNLESS OTHERWISE SPECIFIED:			GEARBOX, PLANETARY	
DIMENSIONS ARE IN INCHES				
TOLERANCES:				
FRACTIONAL $\pm .01$				
ANGULAR: MACH/BEND $\pm 3^\circ$				
TWO PLACE DECIMAL $\pm .01$				
THREE PLACE DECIMAL $\pm .005$				
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09				
DO NOT SCALE DRAWING			SIZE DWG. NO.	REV
			B	569301
			SCALE: 1:1	WEIGHT:
			SHEET 1 OF 3	



6 5 4 3 2 1

D C B A



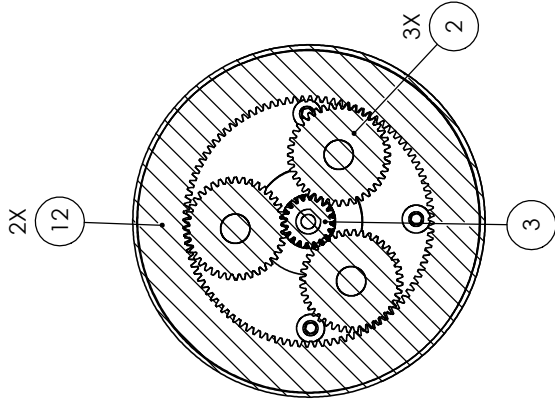
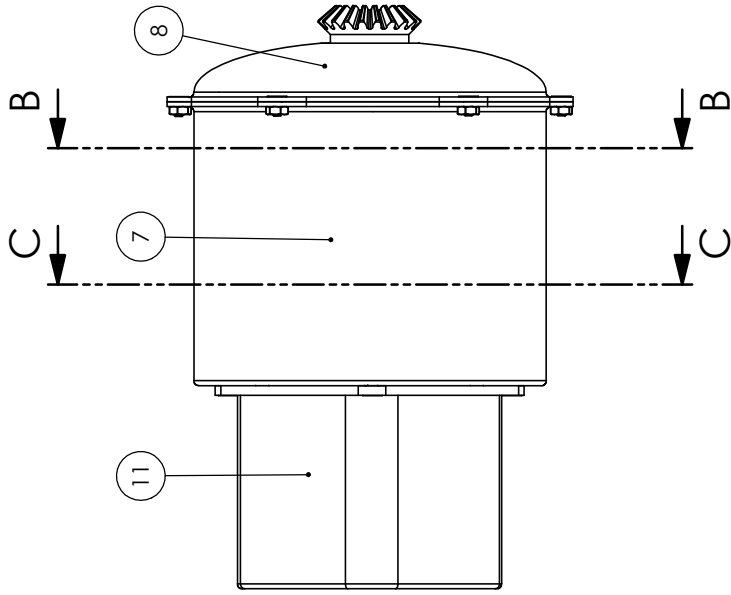
SECTION A-A  
SCALE 1 : 1

DUMPSTER DYNAMICS			
TITLE:			
GEARBOX, PLANETARY			
SIZE	DWG. NO.	REV	
B	569215	-	
SCALE: 1:1		WEIGHT:	SHEET 2 OF 3

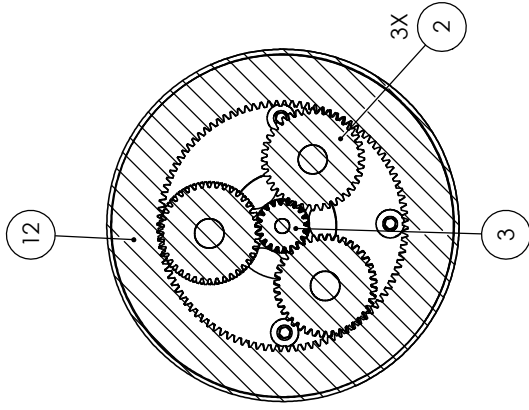
6 5 4 3 2 1

6 5 4 3 2 1

D C B A



SECTION C-C  
SCALE 1:1



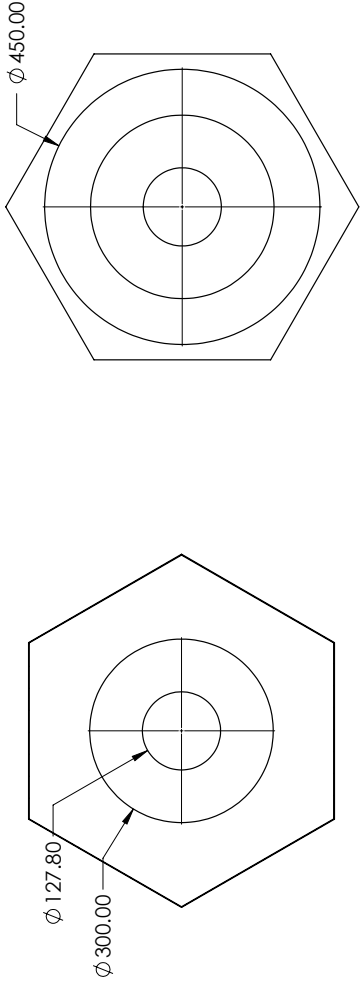
SECTION B-B  
SCALE 1:1

DUMPSTER DYNAMICS			
TITLE:			
GEARBOX, PLANETARY			
SIZE	DWG. NO.	REV	
B	569215	-	
SCALE: 1:1		WEIGHT:	SHEET 3 OF 3

6 5 4 3 2 1

USED ON	PART NUMBER	MATERIAL	SPECIFICATION	QTY.
569226	569221	TI-6AL-4V	AMS 4911	1

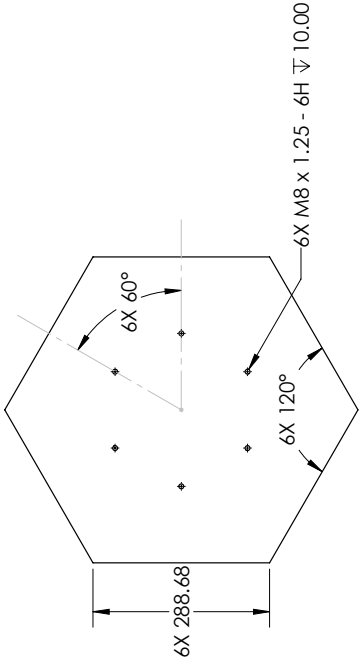
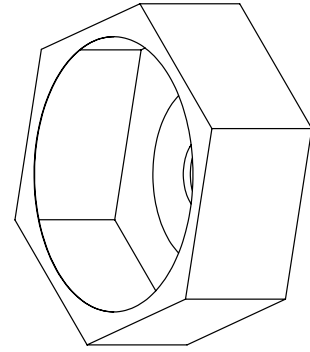
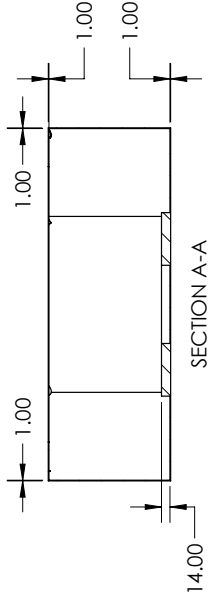
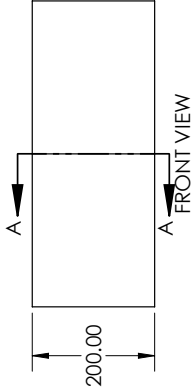
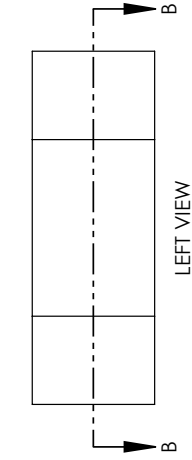
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED



- NOTES:
- HIDDEN LINES NOT SHOWN
  - BREAK ALL SHARP EDGES TO 0.01 UNLESS OTHERWISE NOTED
  - PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  - ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED

SECTION B-B

TOP VIEW



ISOMETRIC VIEW  
FOR REFERENCE ONLY

BOTTOM VIEW

DUMPSTER DYNAMICS

TITLE:

BOTTOM PRISM

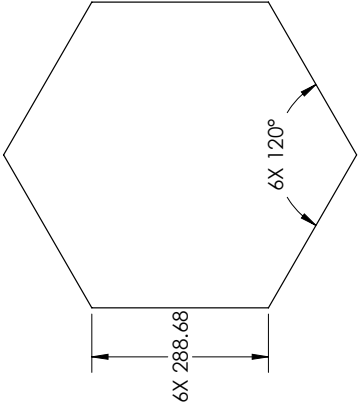
SIZE DWG. NO. REV  
B 569221 -

SCALE: 1:8 WEIGHT: SHEET 1 OF 1

6 5 4 3 2 1

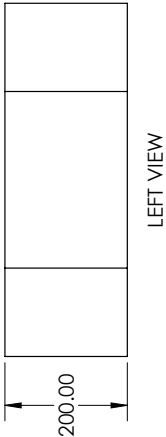
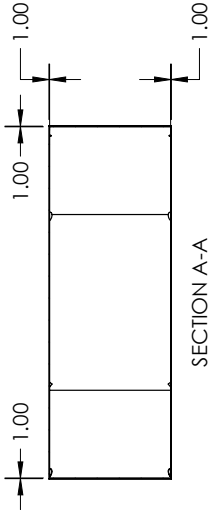
USED ON	PART NUMBER	MATERIAL	SPECIFICATION	QTY.
569226	569222	TI-6AL-4V	AMS 4911	1

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED

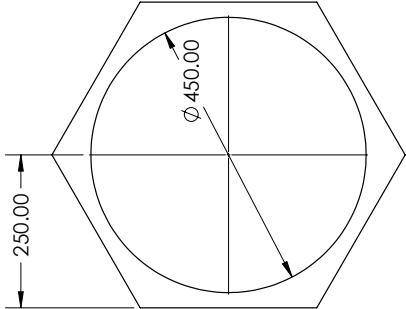


- NOTES:
- HIDDEN LINES NOT SHOWN
  - BREAK ALL SHARP EDGES TO 0.01 UNLESS OTHERWISE NOTED
  - PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  - ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED

TOP VIEW



FRONT VIEW



DRAWN	CHECKED	NAME	DATE
		MDJ	4/29/25
UNLESS OTHERWISE SPECIFIED:			
DIMENSIONS ARE IN MILLIMETERS			
TOLERANCES:			
ANGULAR: MACH/BEND $\pm 1^\circ$			
WHOLE NUMBER $\pm 1$			
ONE PLACE DECIMAL $\pm .2$			
TWO PLACE DECIMAL $\pm .01$			
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			
DO NOT SCALE DRAWING			

SIZE	DWG. NO.	REV
B	569222	-

SCALE: 1:8	WEIGHT:	SHEET 1 OF 1
------------	---------	--------------

DUMPSTER DYNAMICS

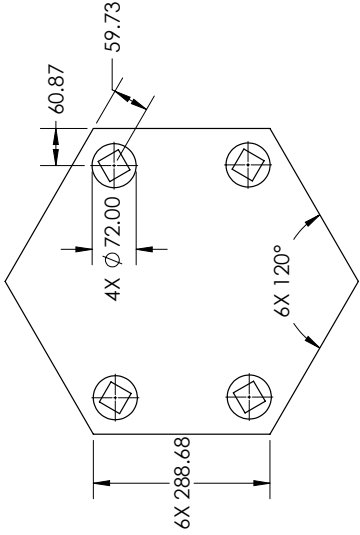
MIDDLE PRISM

6 5 4 3 2 1

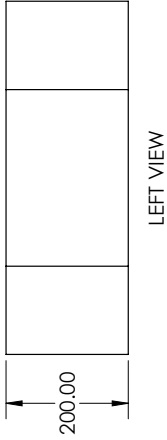
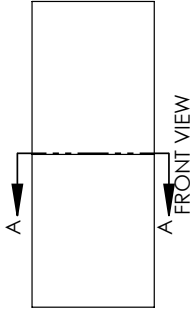
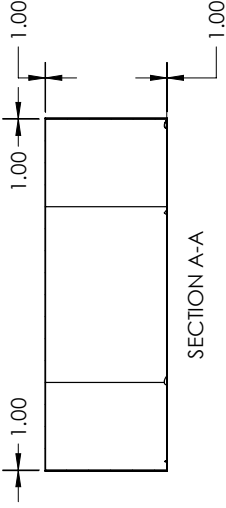
6 5 4 3 2 1

USED ON	PART NUMBER	MATERIAL	SPECIFICATION	QTY.
569226	569223	TI-6AL-4V	AMS 4911	1

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

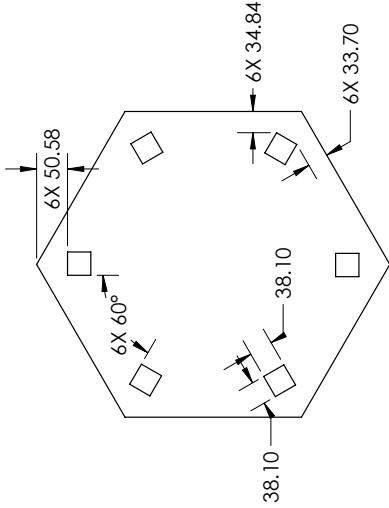


TOP VIEW



LEFT VIEW

SECTION A-A



BOTTOM VIEW

- NOTES:
- HIDDEN LINES NOT SHOWN
  - BREAK ALL SHARP EDGES TO 0.01 UNLESS OTHERWISE NOTED
  - PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  - ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED

NAME		DATE	DUMPSTER DYNAMICS	
DRAWN	MDJ	4/29/25		
CHECKED			TITLE:	
UNLESS OTHERWISE SPECIFIED:			TOP PRISM	
DIMENSIONS ARE IN MILLIMETERS				
TOLERANCES:				
ANGULAR: MACH/BEND $\pm 1^\circ$				
WHOLE NUMBER $\pm 1$				
ONE PLACE DECIMAL $\pm .2$				
TWO PLACE DECIMAL $\pm .01$				
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			SIZE	REV
			B	569223 -
DO NOT SCALE DRAWING		SCALE: 1:8	WEIGHT:	SHEET 1 OF 1

TITLE:		SIZE	DWG. NO.	REV
TOP PRISM		B	569223	-
SCALE: 1:8		WEIGHT:		SHEET 1 OF 1

6 5 4 3 2 1

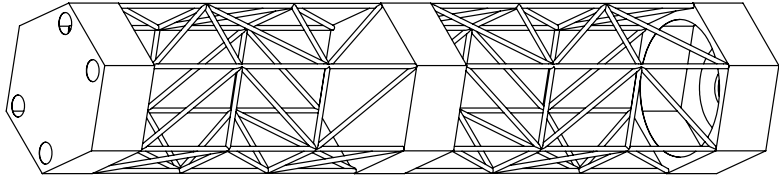
6 5 4 3 2 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	569220	CHS 16 x 1 BEAM	96
2	569221	BOTTOM PRISM	1
3	569222	MIDDLE PRISM	1
4	569223	TOP PRISM	1

REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

D

D



ISOMETRIC VIEW  
FOR REFERENCE ONLY

- NOTES:
- HIDDEN LINES NOT SHOWN
  - BREAK ALL SHARP EDGES TO 0.01 UNLESS OTHERWISE NOTED
  - PART TO BE FREE OF DIRT, OIL, AND DEBRIS
  - ALL CHS 16X1 BEAMS TO BE GTAW (TIG) WELDED, AUTOGENOUS WHERE POSSIBLE, TO AWS D17.1 CLASS C.

C

C

B

B

A

A

DRAWN	NAME	DATE	DUMPSTER DYNAMICS	
CHECKED	MDJ	4/29/25	TITLE:	
UNLESS OTHERWISE SPECIFIED:			STD STRUCTURE ASSEMBLY	
DIMENSIONS ARE IN MILLIMETERS			TOLERANCES:	
ANGULAR: MACH/BEND $\pm$ 1°			SIZE DWG. NO.	
WHOLE NUMBER $\pm$ 1			B 569226	
ONE PLACE DECIMAL $\pm$ .2			REV	
TWO PLACE DECIMAL $\pm$ .01			-	
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09			SCALE: 1:16 WEIGHT:	
DO NOT SCALE DRAWING			SHEET 1 OF 2	

6 5 4 3 2 1

1

2

3

4

5

6

D

C

B

A

DUMPSTER DYNAMICS

TITLE:

STD STRUCTURE  
ASSEMBLY

SIZE DWG. NO. REV

B

569226

-

SCALE: 1:16 WEIGHT: SHEET 2 OF 2

1

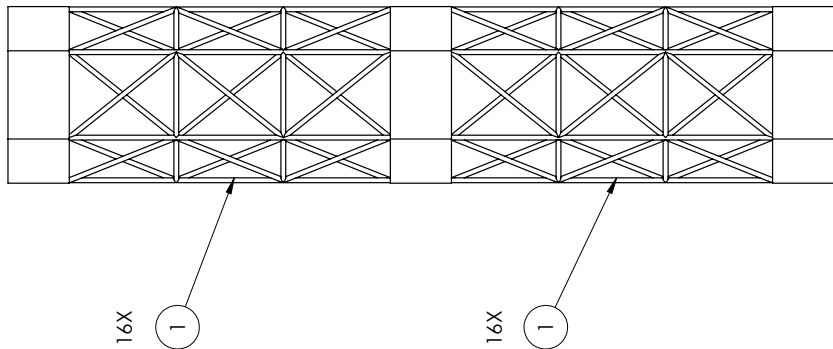
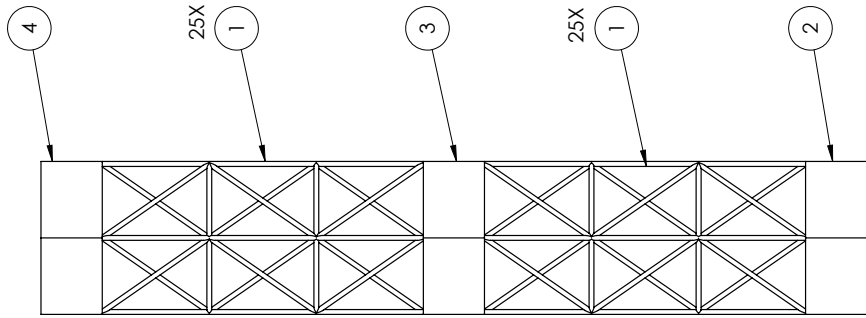
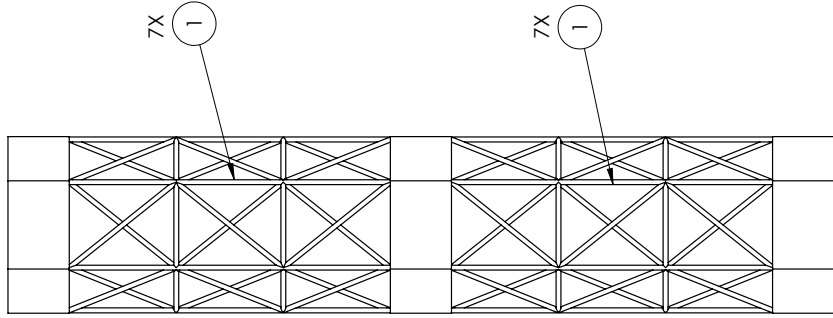
2

3

4

5

6



D

C

B

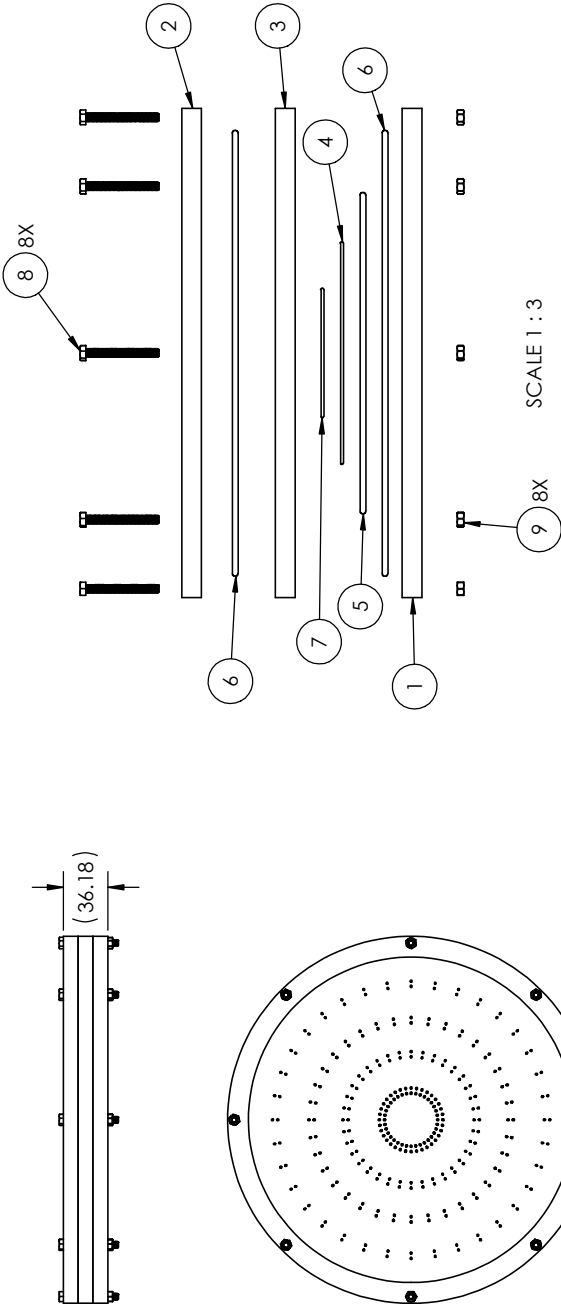
A

6 5 4 3 2 1

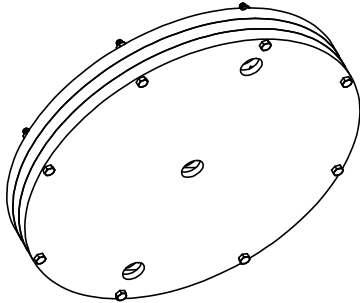
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	569113	INJECTOR PLATE	1
2	569115	FORWARD MANIFOLD PLATE	1
3	569114	AFT MANIFOLD PLATE	1
4	9559K147	ULTRA-CHEMICAL-RESISTANT RIGID PTFE O-RING -050	1
5	9559K251	ULTRA-CHEMICAL-RESISTANT RIGID PTFE O-RING -264	1
6	9559K263	ULTRA-CHEMICAL-RESISTANT RIGID PTFE O-RING -275	2
7	9559K337	ULTRA-CHEMICAL-RESISTANT RIGID PTFE O-RING -041	1
8	91287A331	18-8 STAINLESS STEEL HEX HEAD SCREW	8
9	91828A241	18-8 STAINLESS STEEL HEX NUT	8

NOTES:  
1. TORQUE FASTENERS TO VALUES INDICATED IN TORQUE TABLE

SEE NOTE 1



FOR REFERENCE ONLY



SCALE 1 : 3

DUMPSTER DYNAMICS		
DRAWN	NAME	DATE
CHECKED	KDA	4/26/25
UNLESS OTHERWISE SPECIFIED:	BQ	4/26/25
DIMENSIONS ARE IN INCHES		
TOLERANCES:		
ANGULAR: MACH/BEND $\pm 1^\circ$		
HOLE NUMBER $\pm .1$		
ONE PLACE DECIMAL $\pm .2$		
TWO PLACE DECIMAL $\pm .01$		
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09		
DO NOT SCALE DRAWING		
TITLE: INJECTOR-MANIFOLD ASSY		
SIZE DWG. NO. REV		
B 569112 -		
SCALE: 1:4 WEIGHT: SHEET 1 OF 1		

TORQUE TABLE	
PART NUMBER	TORQUE (N-M)
91287A331	1.4

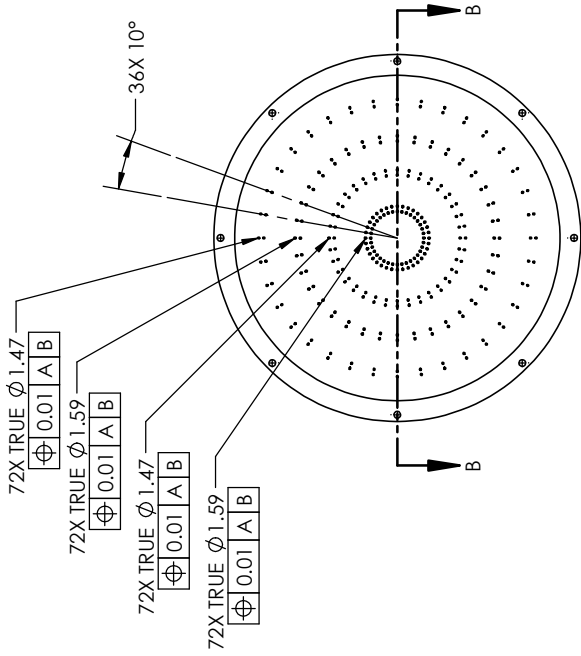


6 5 4 3 2 1

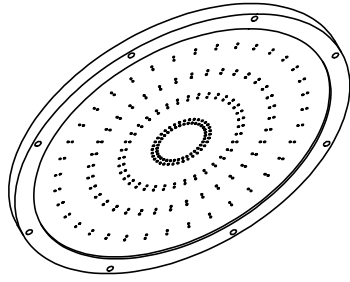
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

NOTES:

1. BREAK ALL SHARP EDGES
2. HIDDEN LINES NOT SHOWN
3. PART TO BE FREE OF ANY DIRT AND DEBRIS
4. ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED

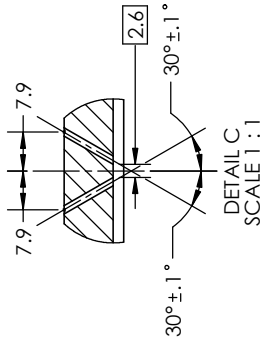
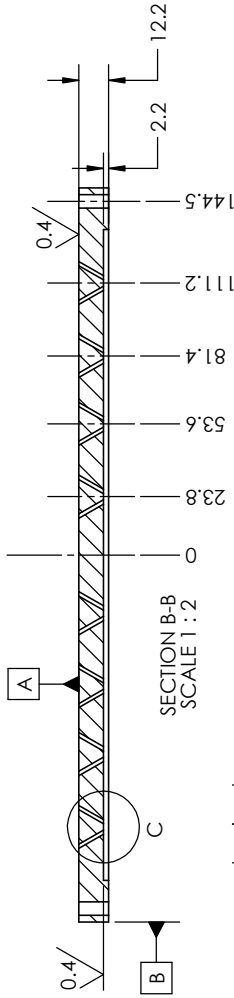


FORWARD VIEW



FOR REFERENCE ONLY

AFT VIEW



DRAWN	NAME	DATE	DUMPSTER DYNAMICS	
	KDA	4/21/25		
CHECKED	BQ	4/26/25	TITLE:	
UNLESS OTHERWISE SPECIFIED:			INJECTOR PLATE	
DIMENSIONS ARE IN MILLIMETERS				
TOLERANCES:				
ANGULAR: MACH/BEND $\pm 1^\circ$				
HOLE NUMBER $\pm 1$				
ONE PLACE DECIMAL $\pm .2$				
TWO PLACE DECIMAL $\pm .01$				
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09				
DO NOT SCALE DRAWING				
			SCALE: 1:4	WEIGHT:
			SHEET 1 OF 1	

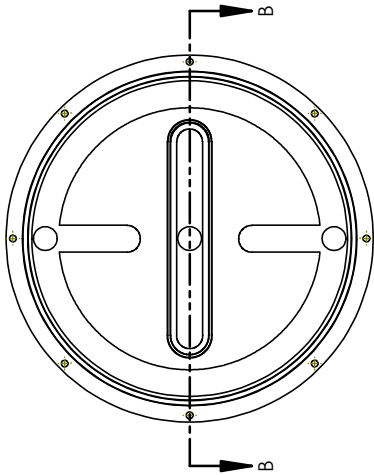
2 3 4 5 6

6 5 4 3 2 1

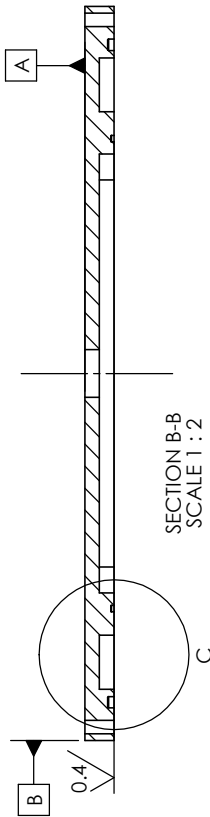
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

NOTES:

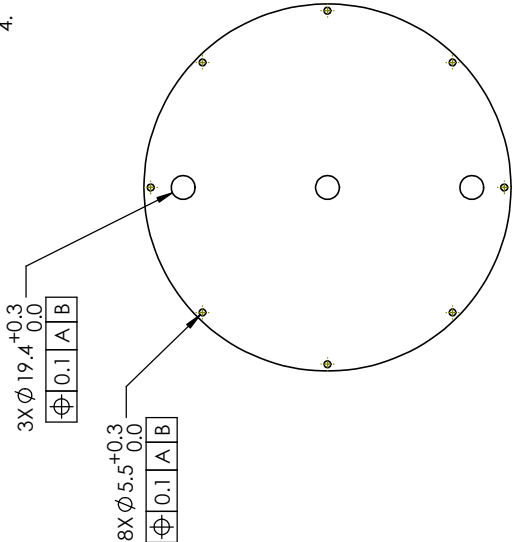
1. BREAK ALL SHARP EDGES
2. HIDDEN LINES NOT SHOWN
3. PART TO BE FREE OF ANY DIRT AND DEBRIS
4. ALL SURFACES  $\sqrt{0.8}$  UNLESS OTHERWISE NOTED



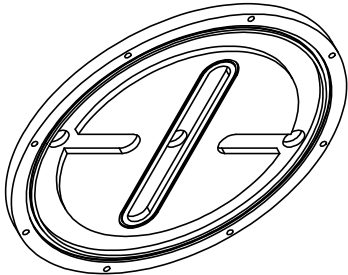
AFT VIEW



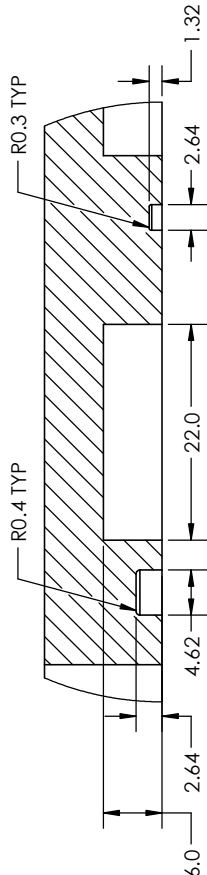
SECTION B-B  
SCALE 1:2



FORWARD VIEW



FOR REFERENCE ONLY



DETAIL C  
SCALE 2:1

DRAWN	CHECKED	NAME	DATE	DUMPSTER DYNAMICS	
		KDA	4/21/25		
		BQ	4/26/25		
UNLESS OTHERWISE SPECIFIED:				TITLE:	
DIMENSIONS ARE IN MILLIMETERS					
TOLERANCES:					
ANGULAR: MACH/BEND $\pm 1^\circ$					
HOLE NUMBER $\pm 1$					
ONE PLACE DECIMAL $\pm .2$					
TWO PLACE DECIMAL $\pm .01$					
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09					
DO NOT SCALE DRAWING					
				SCALE: 1:4 WEIGHT:	
				SHEET 1 OF 1	

FORWARD  
MANIFOLD PLATE

SIZE	DWG. NO.	REV
B	569115	-

6 5 4 3 2 1

6 5 4 3 2 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	569227	KICK STAGE ASSEMBLY	1
2	569226	STD ASSEMBLY	8

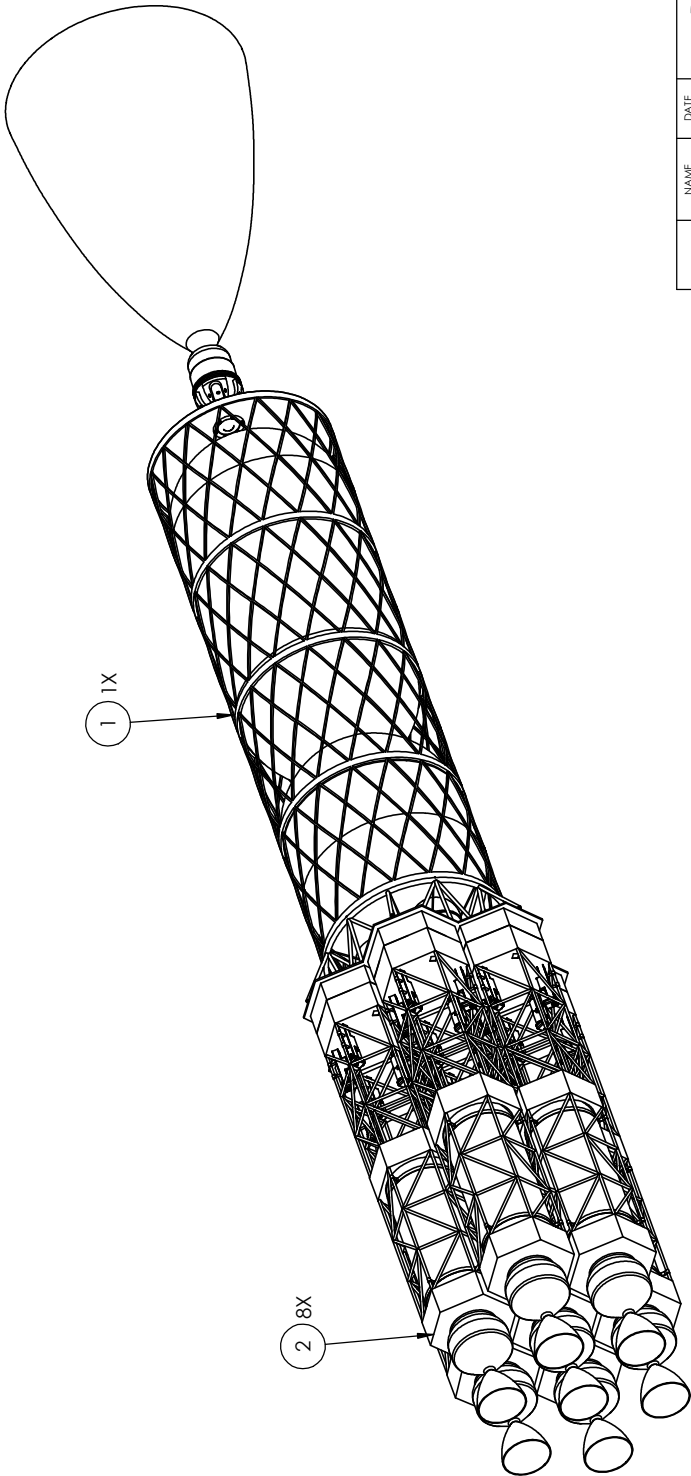
REVISIONS			
ZONE	REV.	DESCRIPTION	DATE
			APPROVED

D D

C C

B B

A A



DRAWN		NAME	DATE	DUMPSTER DYNAMICS	
CHECKED		KDA	4/26/25	TITLE:  <b>MASTER ASSEMBLY</b>	
UNLESS OTHERWISE SPECIFIED:		BQ	4/26/25		
DIMENSIONS ARE IN INCHES					
TOLERANCES:					
ANGULAR: MACH/BEND $\pm 1^\circ$					
WHOLE NUMBER $\pm 1$					
ONE PLACE DECIMAL $\pm .2$					
TWO PLACE DECIMAL $\pm .01$					
INTERPRET GEOMETRIC TOLERANCING PER ASME Y14.5-09					
DO NOT SCALE DRAWING				SCALE: 1:30	WEIGHT: SHEET 1 OF 1

6 5 4 3 2 1

