

NOTES:
1. DIMS IN INCHES
2. QTY: 1

TITLE:
BALL MANIPULATOR TOTAL ASSEMBLY

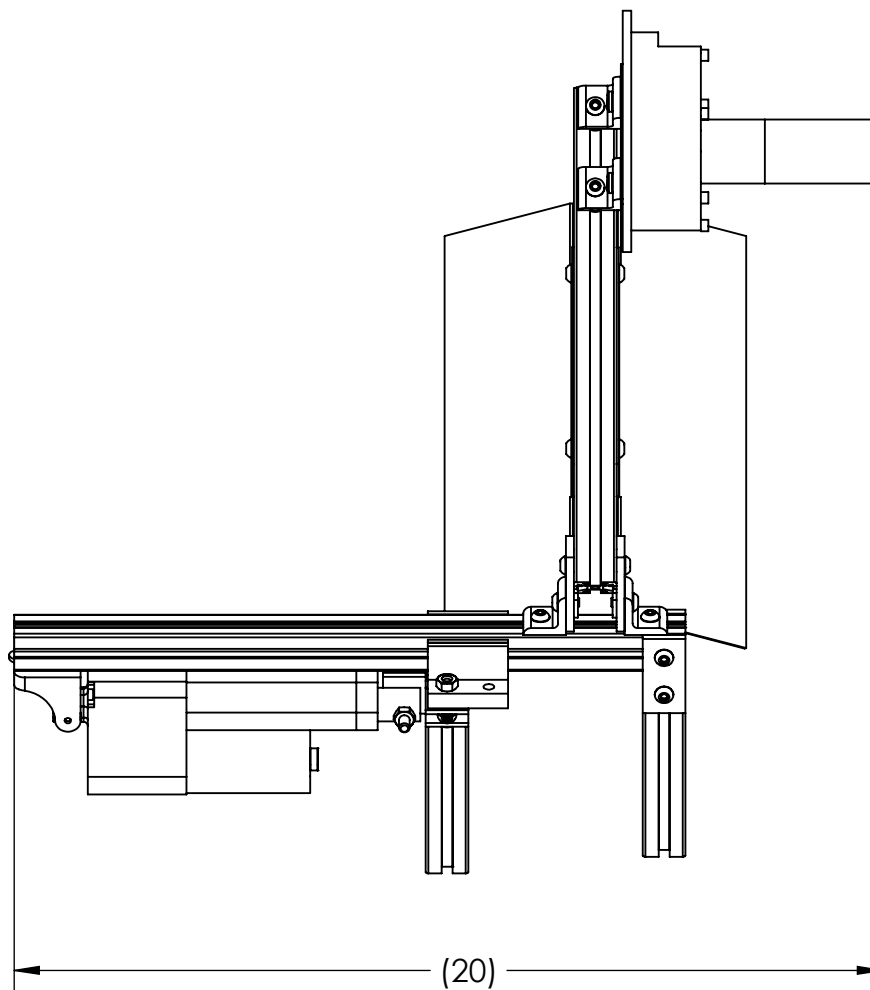
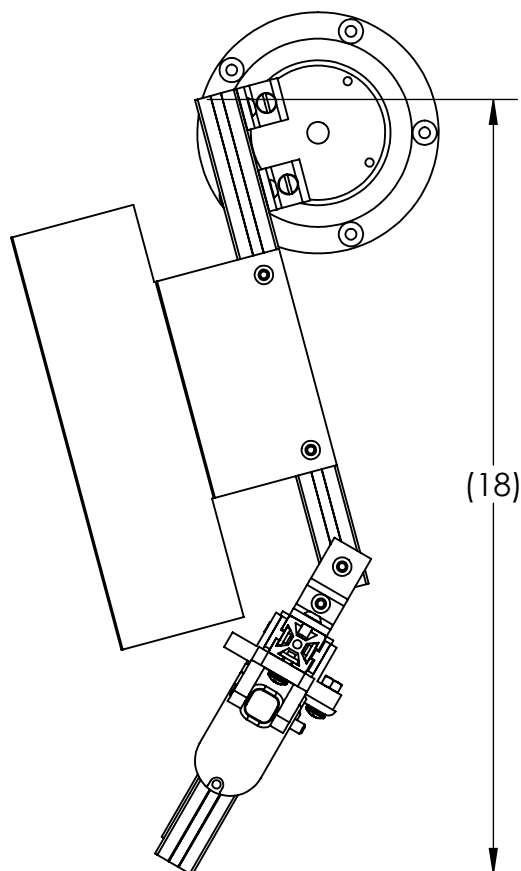
DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

SIZE	DWG. NO.	REV
A	EML2322L-A-009	A

SCALE: 1:2.5 SHEET 1 OF 18

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



- NOTES:
 1. DIMS IN INCHES
 2. QTY: 1

TITLE:
 BALL MANIPULATOR TOTAL ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

SIZE	DWG. NO.	REV
A	EML2322L-A-009	A

SCALE: 1:4.5	SHEET 2 OF 18
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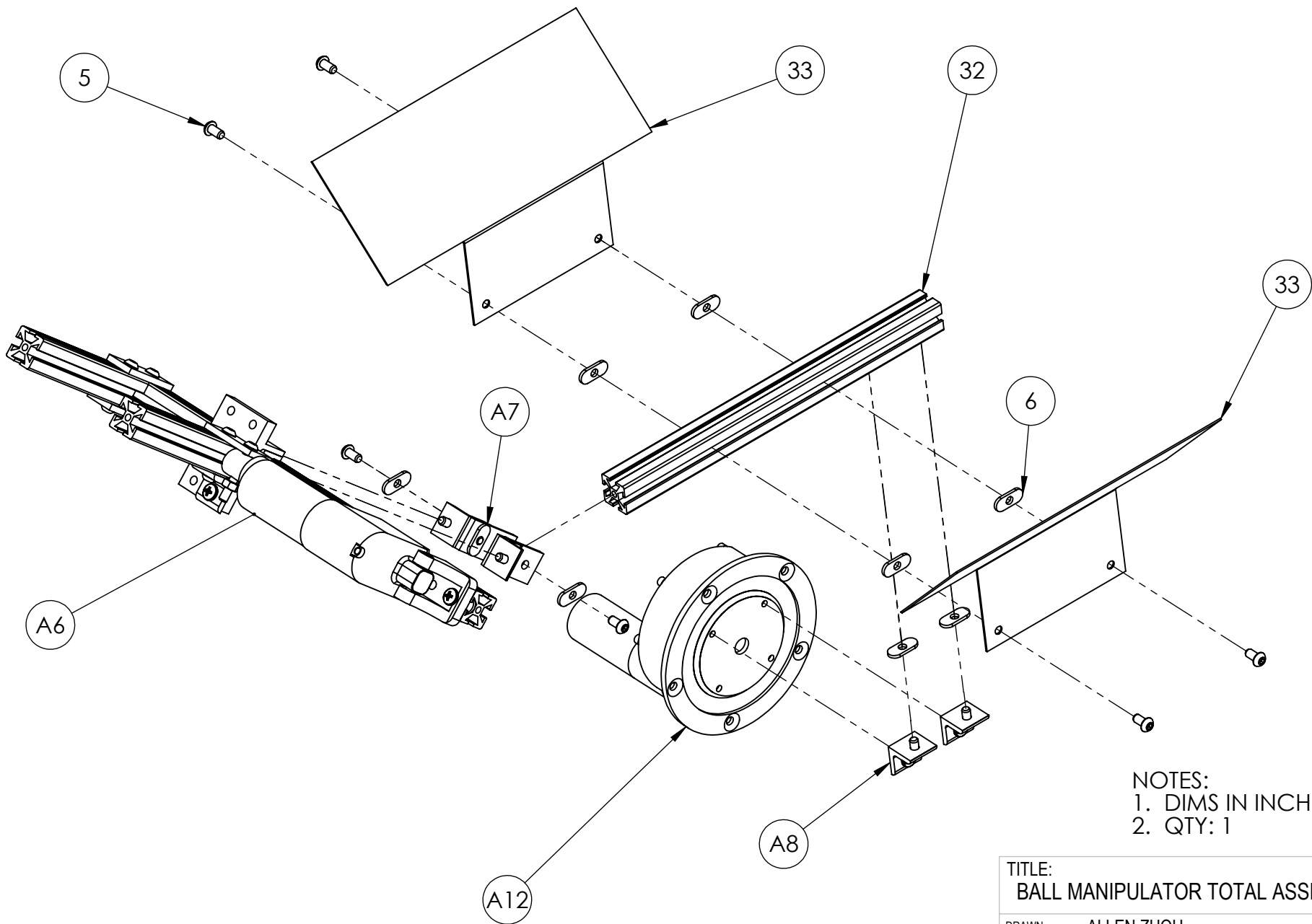
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

ITEM NO.	PART NUMBER	DESCRIPTION	STRETCH/Q TY.
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	6
6	EML2322L-0006	1/4-20 T-NUT	8
33	EML2322L-0033	BALL MANIPULATOR CHANNEL	2
32	EML2322L-0032	80/20 EXTRUSION - 12 in	1
A6	EML2322L-A-006	CLAW ASSEMBLY	1
A7	EML2322L-A-007	CLAW MOUNT ASSEMBLY	2
A8	EML2322L-A-008	GLOBE MOTOR BRACKET ASSEMBLY	2
A12	EML2322L-A-012	4.5 RPM GLOBE MOTOR ASSEMBLY	1
33	EML2322L-0033	BALL MANIPULATOR CHANNEL MOTOR SIDE	1

NOTES:
 1. DIMS IN INCHES
 2. QTY: 1

TITLE: BALL MANIPULATOR TOTAL ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-009		A
SCALE: 1:8		SHEET 3 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
1. DIMS IN INCHES
2. QTY: 1

TITLE:
BALL MANIPULATOR TOTAL ASSEMBLY

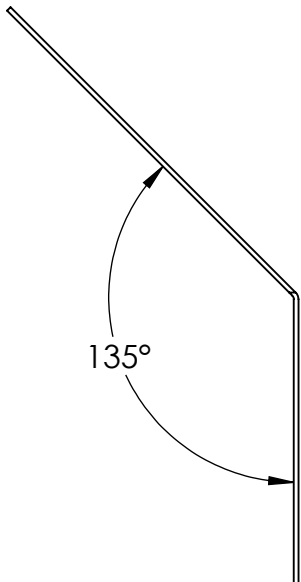
DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

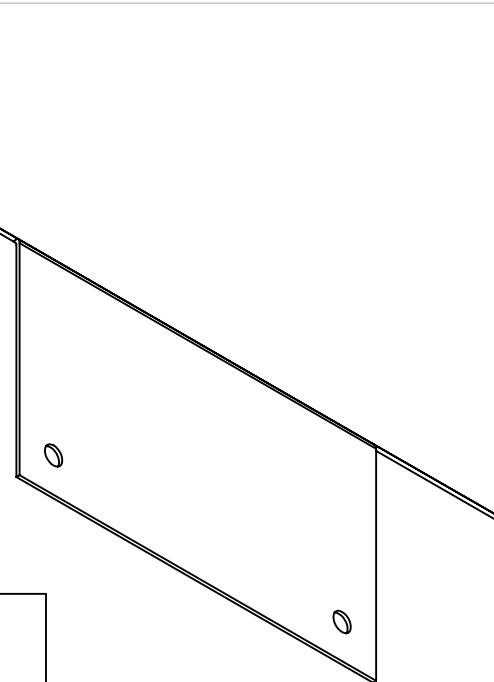
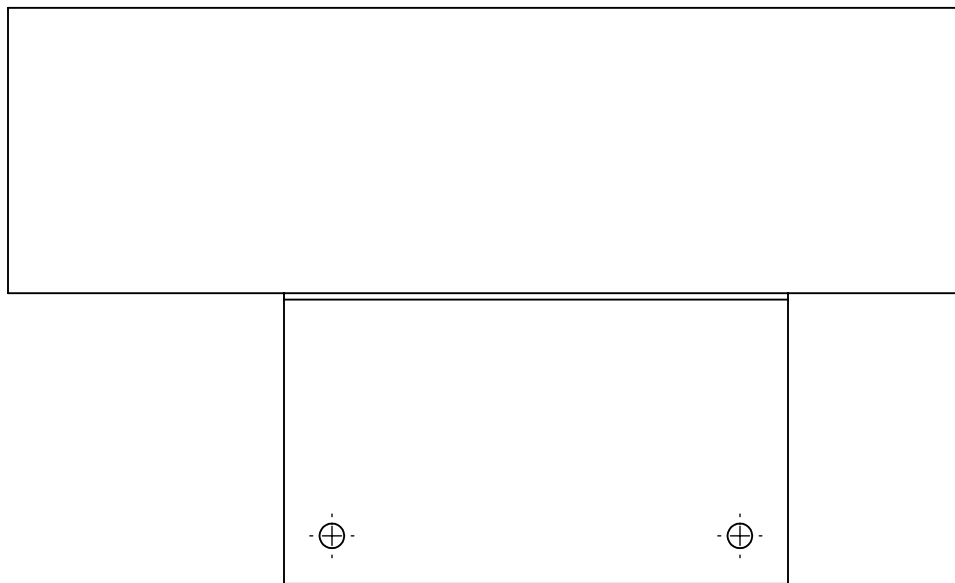
SIZE	DWG. NO.	REV
A	EML2322L-A-009	A

SCALE: 1:4 SHEET 4 OF 18

DIMENSION TYPE	TOLERANCE UNLESS NOTED		
	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

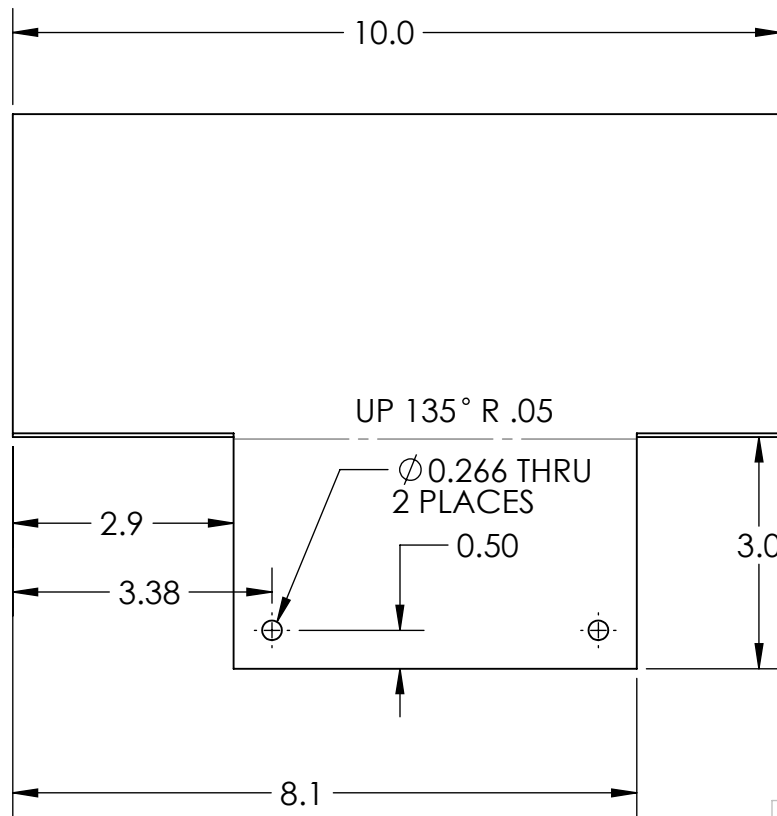


FOLDED VIEW

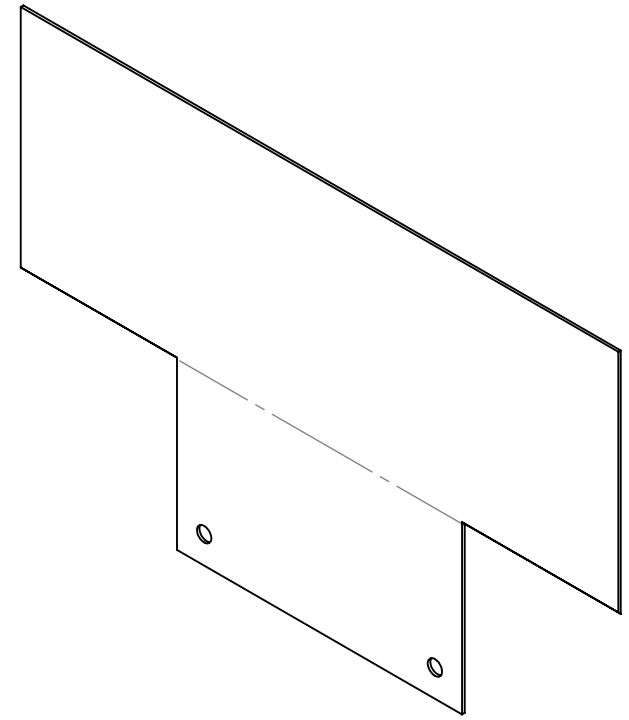


- NOTES:
1. QTY: 1
 2. MATL: 20GA STEEL
 3. DIMS IN INCHES
 4. BREAK ALL EDGES
 5. UNFINISHED SURFACES

TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-0034	E
ANGULAR DIMS	±5	±2		SCALE: 1:2		SHEET 5 OF 18

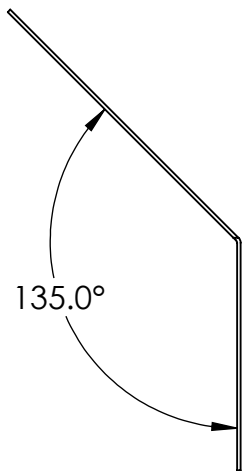


UNFOLDED VIEW

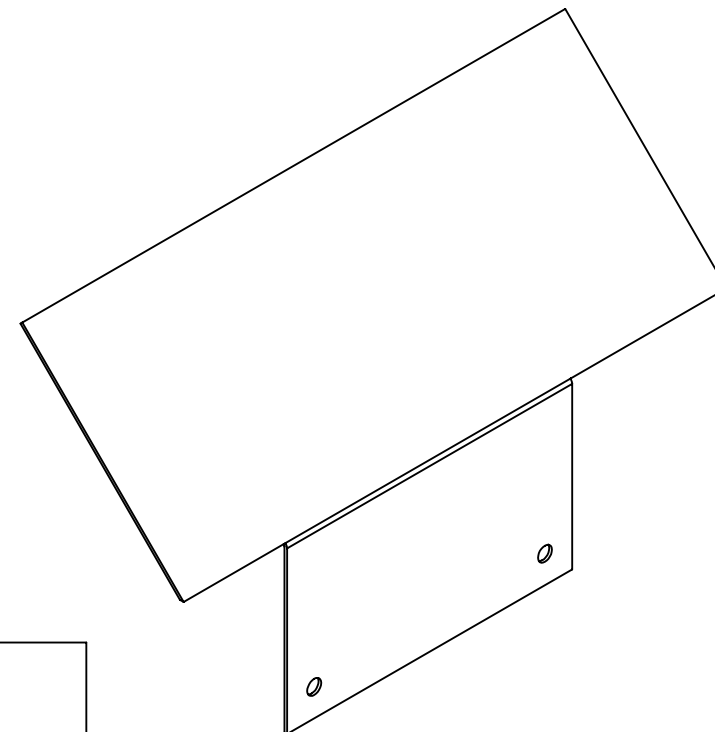
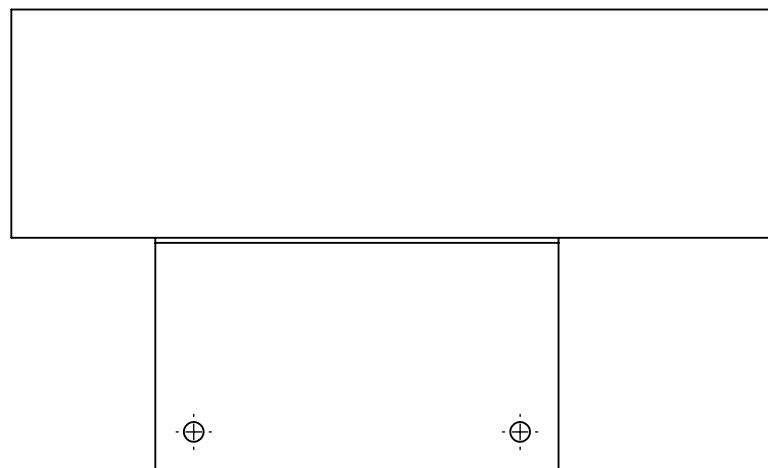


- NOTES:
- 1.QTY: 1
 - 2.MATL: 20GA STEEL
 - 3.DIMS IN INCHES
 - 4.BREAK ALL EDGES
 - 5.FINISH NO SURFACE

TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-0034	E
ANGULAR DIMS	±5	±2		SCALE: 1:2.5		SHEET 6 OF 18

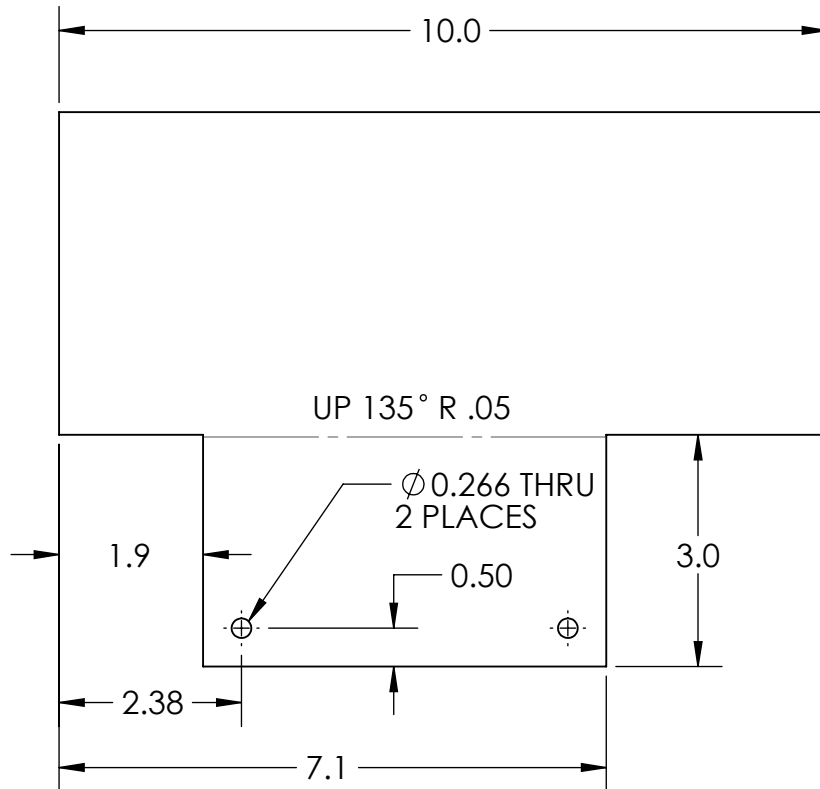


FOLDED VIEW

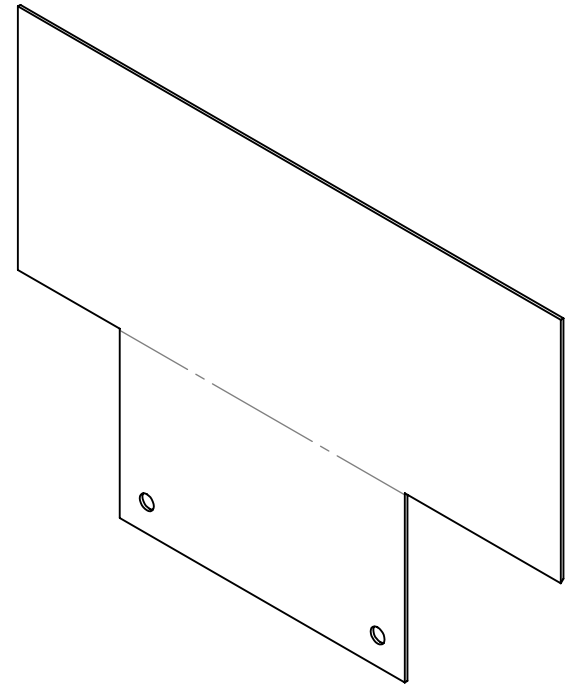
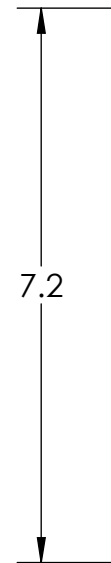


- NOTES:
1. QTY: 1
 2. MATL: 20GA STEEL
 3. DIMS IN INCHES
 4. BREAK ALL EDGES
 5. UNFINISHED SURFACES

TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-0034	E
ANGULAR DIMS	±5	±2		SCALE: 1:2.5		SHEET 7 OF 18

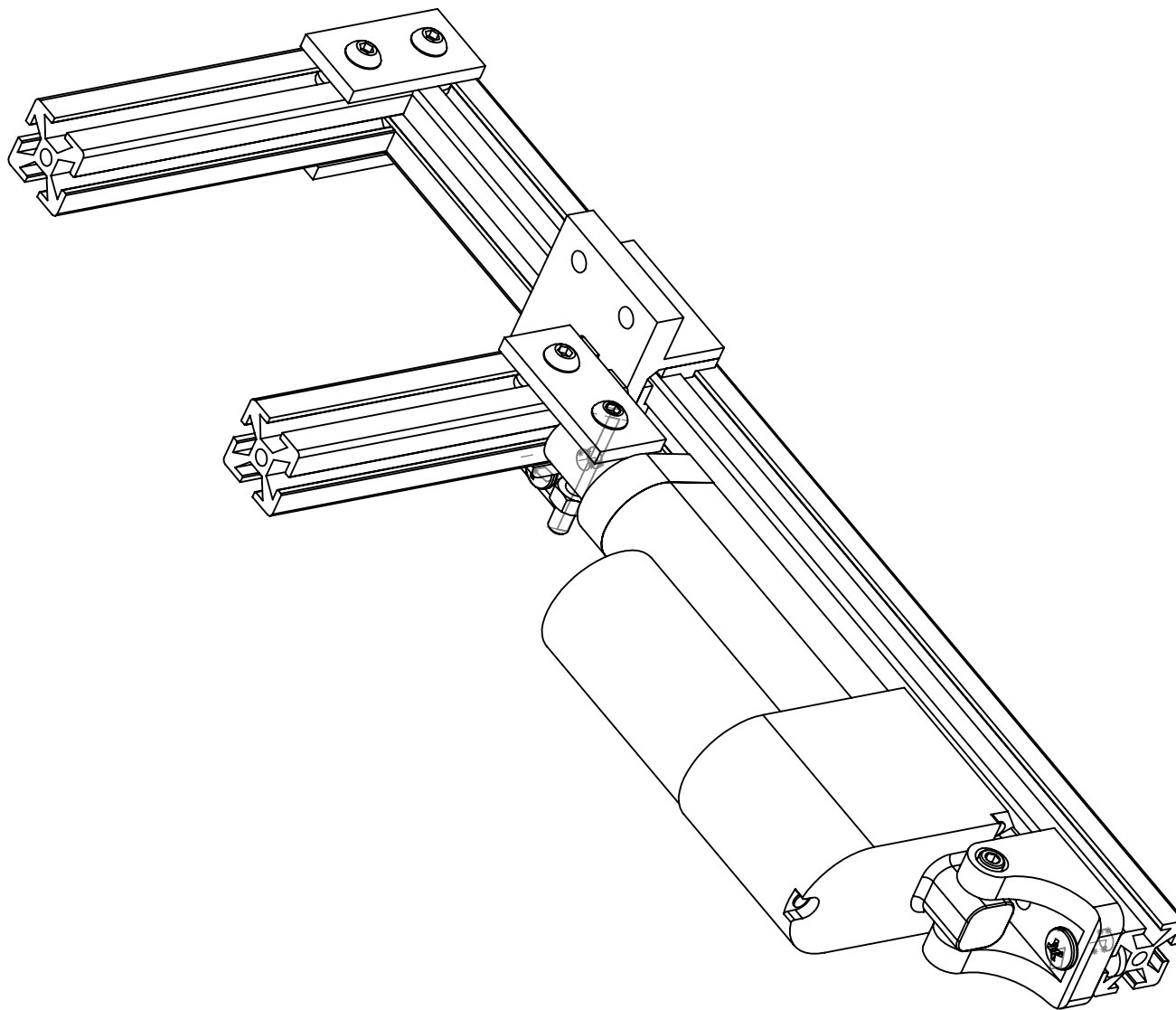


UNFOLDED VIEW



- NOTES:
 1. QTY: 1
 2. MATL: 20GA STEEL
 3. DIMS IN INCHES
 4. BREAK ALL EDGES
 5. FINISH NO SURFACE

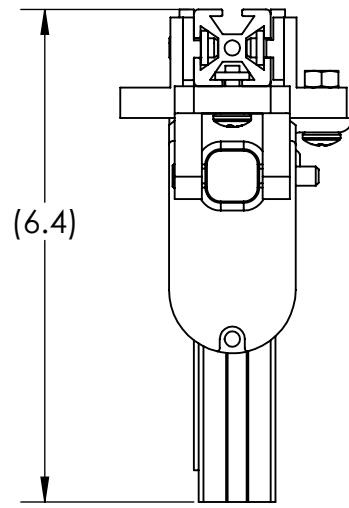
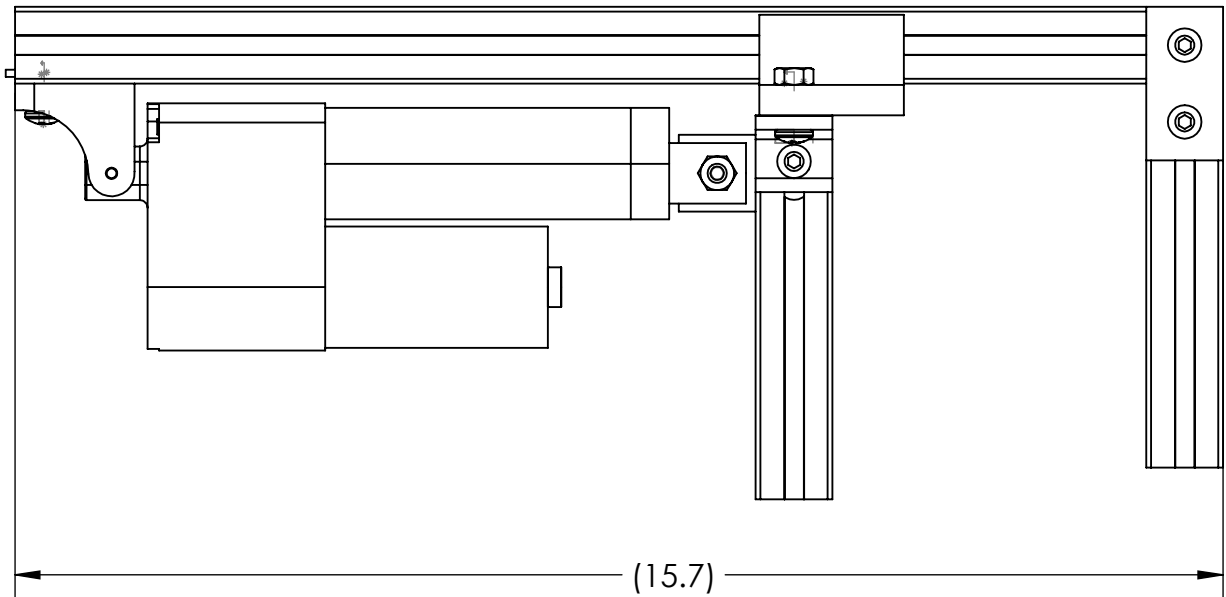
TOLERANCE UNLESS NOTED				TITLE:		
OPERATION	PLACES IN DIMENSION			BALL MANIPULATOR CHANNEL		
	0.0	0.00	0.000	DRAWN	ALLEN ZHOU	
MACHINING				DESIGNED	ALLEN ZHOU	
SHEETMETAL (SHEAR, BEND)	±0.1	±0.060	±0.030	SIZE	DWG. NO.	REV
WELDING	±0.1	±0.060		A	EML2322L-0034	E
ANGULAR DIMS	±5	±2		SCALE: 1:2.5		SHEET 8 OF 18



NOTES:
1. DIMS IN INCHES
2. QTY: 1

TITLE:			
CLAW ASSEMBLY			
DRAWN ALLEN ZHOU			
DESIGNED ALLEN ZHOU			
SIZE	DWG. NO.		REV
A	EML2322L-A-006		A
SCALE: 1:8		SHEET 9 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
 1. QTY: 1
 2. DIMS IN INCHES

TITLE:			
CLAW ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-006		A
SCALE: 1:2.5		SHEET 10 OF 18	

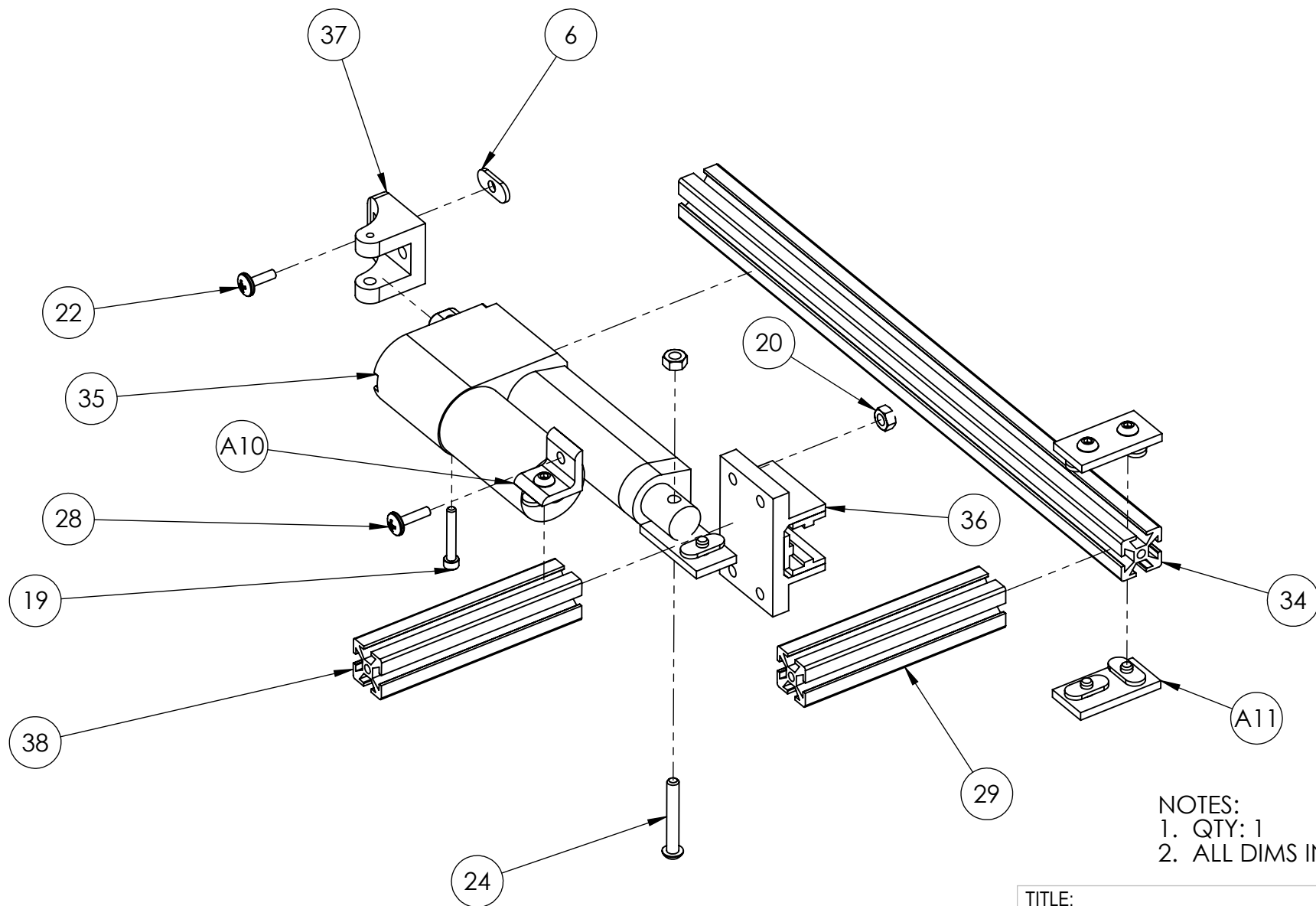
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
6	EML2322L-0006	1/4-20 T-NUT	1
34	EML2322L-0034	80/20 EXTRUSION - 15.7 in	1
36	EML2322L-0036	80/20 LINEAR SLIDE	1
37	EML2322L-0037	10-24 LINEAR ACTUATOR MOUNT	1
35	EML2322L-0035	30 IPM SPAL LINEAR ACTUATOR (2in)	1
28	EML2322L-0028	1/4-20 x 3/4 in PAN HEAD SCREW	1
24	EML2322L-0024	1/4-20 x 1.75 in BUTTON HEAD SCREW	1
22	EML2322L-0022	1/4-20 x 5/8 in PAN HEAD SCREW	1
20	EML2322L-0020	1/4-20 in HEX NUT	2
19	EML2322L-0019	10-24 x 1.25 in SOCKET HEAD SCREW	1
38	EML2322L-0038	80-20 EXTRUSION - 4.5 in	1
A10	EML2322L-A-010	90-DEGREE BRACKET ASSEMBLY	1
A11	EML2322L-A-011	STRAIGHT BRACKET ASSEMBLY	1
29	EML2322L-0029	80-20 EXTRUSION - 5.0 in	1
A11	EML2322L-A-011	STRAIGHT BRACKET ASSEMBLY	2

NOTES:
 1. QTY: 1
 2. ALL DIMS IN INCHES

TITLE:			
CLAW ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-006		A
SCALE: 1:8		SHEET 11 OF 18	

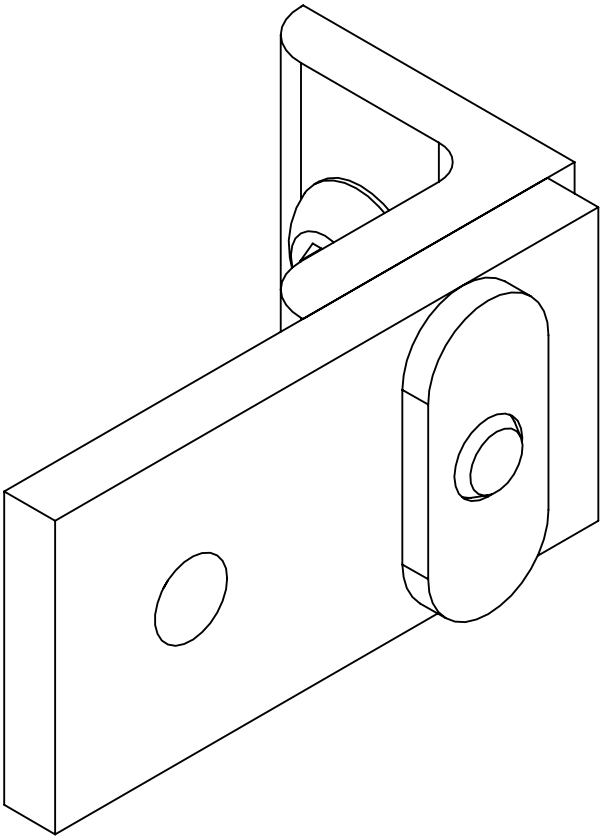
TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
 1. QTY: 1
 2. ALL DIMS IN INCHES

TITLE:			
CLAW ASSEMBLY			
DRAWN		ALLEN ZHOU	
DESIGNED		ALLEN ZHOU	
SIZE	DWG. NO.		REV
A	EML2322L-A-006		A
SCALE:1:3		SHEET 12 OF 18	

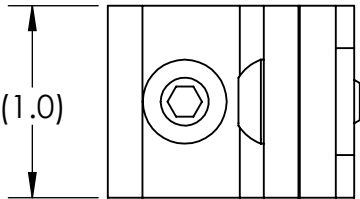
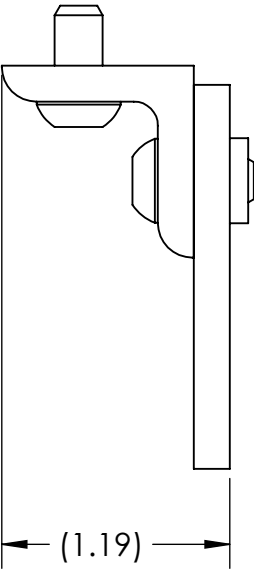
DIMENSION TYPE	TOLERANCE UNLESS NOTED		
	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
1. QTY: 2
2. DIMS IN INCHES

TITLE:			CLAW MOUNT		
DRAWN		ALLEN ZHOU			
DESIGNED		ALLEN ZHOU			
SIZE	DWG. NO.			REV	
A	EML2322L-A-007			A	
SCALE: 1:1				SHEET 13 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

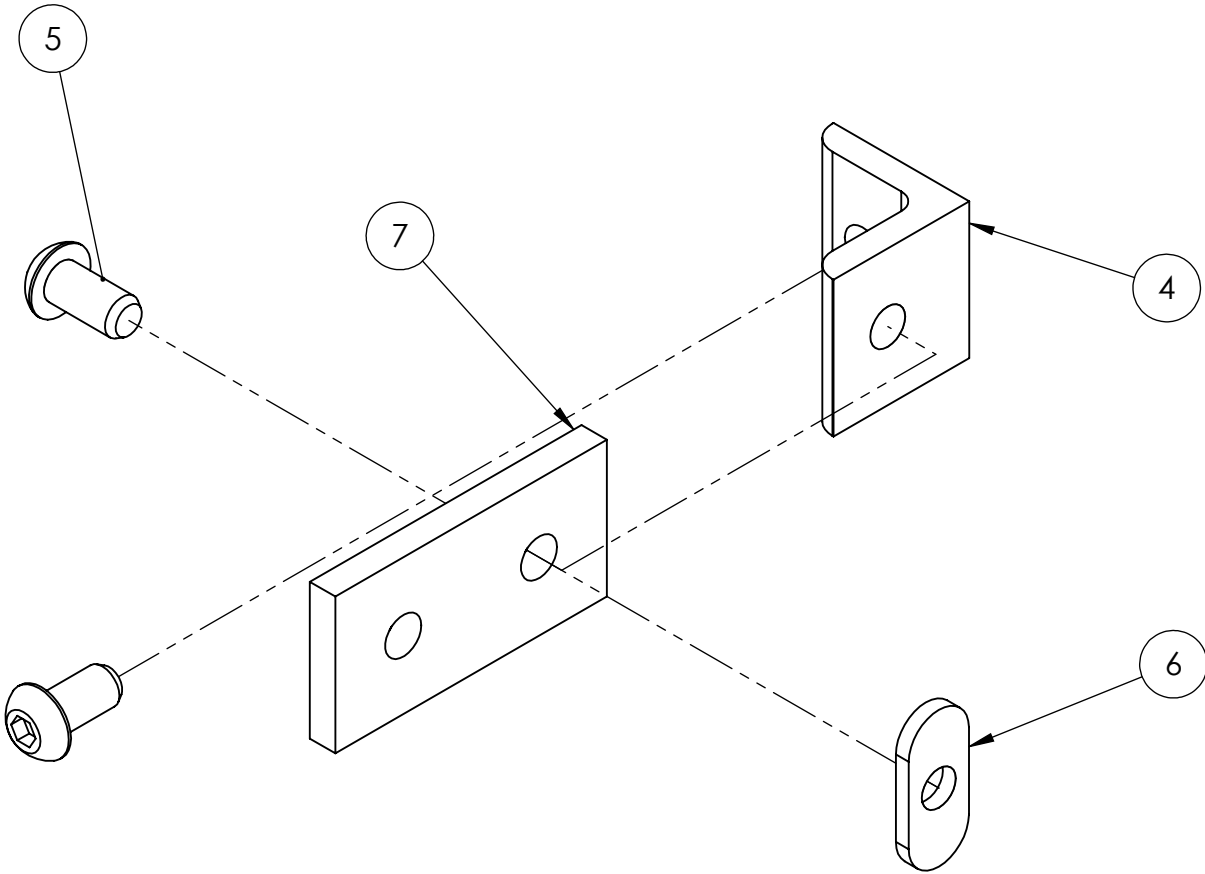


NOTES:
1. QTY: 2
2. DIMS IN INCHES

TITLE:			CLAW MOUNT		
DRAWN		ALLEN ZHOU			
DESIGNED		ALLEN ZHOU			
SIZE	DWG. NO.			REV	
A	EML2322L-A-007			A	
SCALE: 1:1				SHEET 14 OF 18	

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

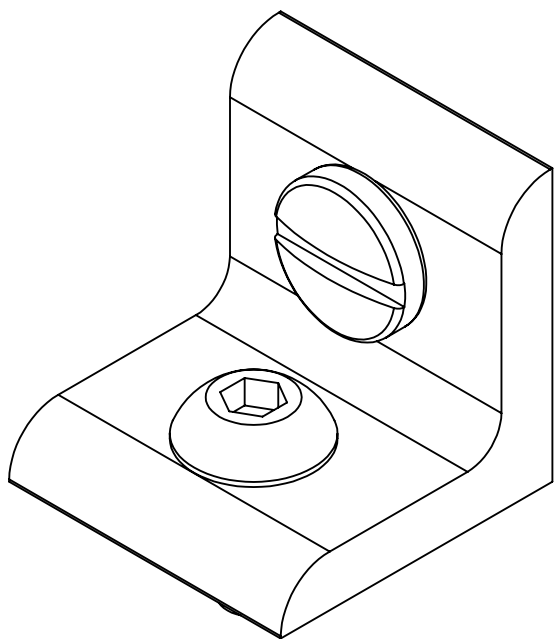
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	EML2322L-0004	80/20 90 DEG ANGLE BRACKET	1
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	2
6	EML2322L-0006	1/4-20 T-NUT	1
7	EML2322L-0007	80/20 STRAIGHT BRACKET	1



NOTES:
1. DIMS IN INCHES
2. QTY: 2

TITLE:			CLAW MOUNT		
DRAWN		ALLEN ZHOU			
DESIGNED		ALLEN ZHOU			
SIZE	DWG. NO.			REV	
A	EML2322L-A-007			A	
SCALE: 1:4				SHEET 15 OF 18	

DIMENSION TYPE	TOLERANCE UNLESS NOTED		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



NOTES:
1. DIMS IN INCHES
2. QTY: 2

TITLE:
GLOBE MOTOR BRACKET ASSEMBLY

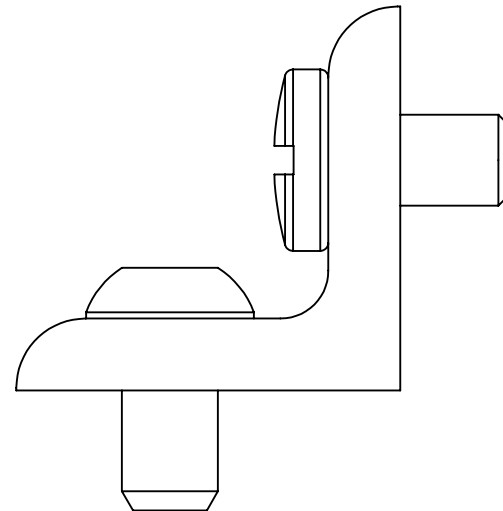
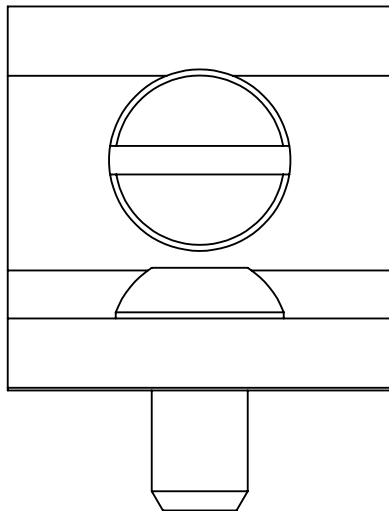
DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

SIZE	DWG. NO.	REV
A	EML2322L-A-008	A

SCALE: 1:2	SHEET 16 OF 18
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DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5



- NOTES:
 1. QTY: 2
 2. DIMS IN INCHES

TITLE:
 GLOBE MOTOR BRACKET ASSEMBLY

DRAWN ALLEN ZHOU

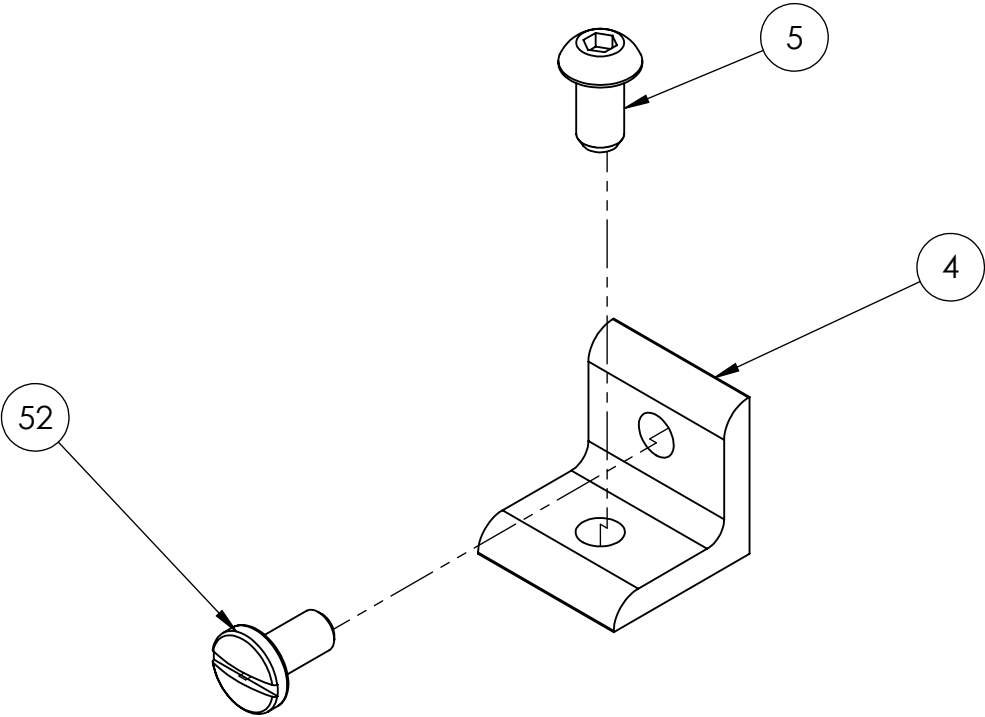
DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED				SIZE	DWG. NO.	REV
DIMENSION TYPE	PLACES IN DIMENSION			A	EML2322L-A-008	A
	0.0	0.00	0.000			
LOCATIONAL	±0.050	±0.020	±0.005			
ANGULAR	±5	±2	±0.5			

SCALE: 2:1

SHEET 17 OF 18

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
4	EML2322L-0004	80/20 90 DEG ANGLE BRACKET	1
5	EML2322L-0005	1/4-20 x 1/2 in BUTTON HEAD CAP SCREW	1
26	EML2322L-0026	M6 x 1 - 12 mm PAN HEAD SCREW FOR GM	1



NOTES:
 1. DIMS IN INCHES
 2. QTY: 2

TITLE:
 GLOBE MOTOR BRACKET ASSEMBLY

DRAWN ALLEN ZHOU

DESIGNED ALLEN ZHOU

TOLERANCE UNLESS NOTED			
DIMENSION TYPE	PLACES IN DIMENSION		
	0.0	0.00	0.000
LOCATIONAL	±0.050	±0.020	±0.005
ANGULAR	±5	±2	±0.5

SIZE	DWG. NO.	REV
A	EML2322L-A-008	A

SCALE: 1:2 SHEET 18 OF 18