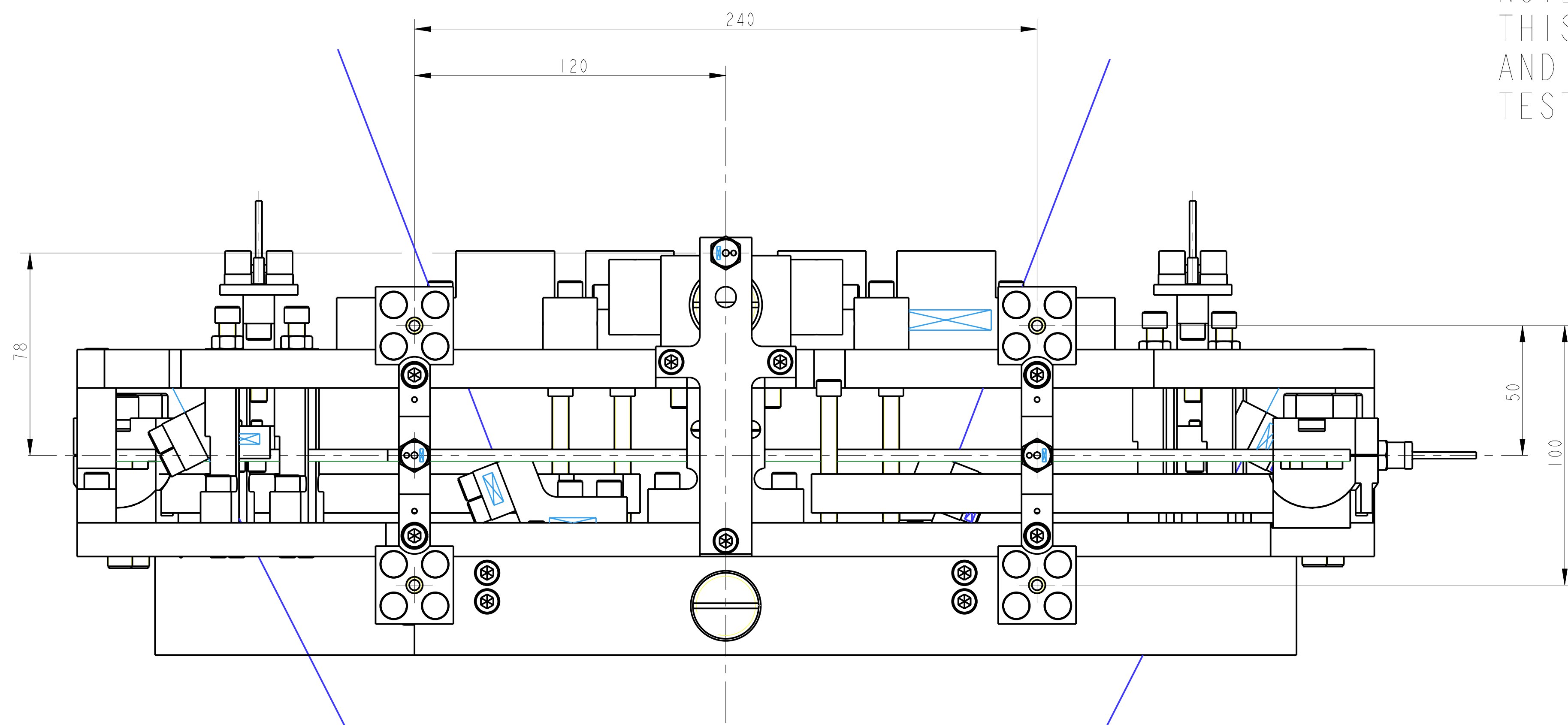
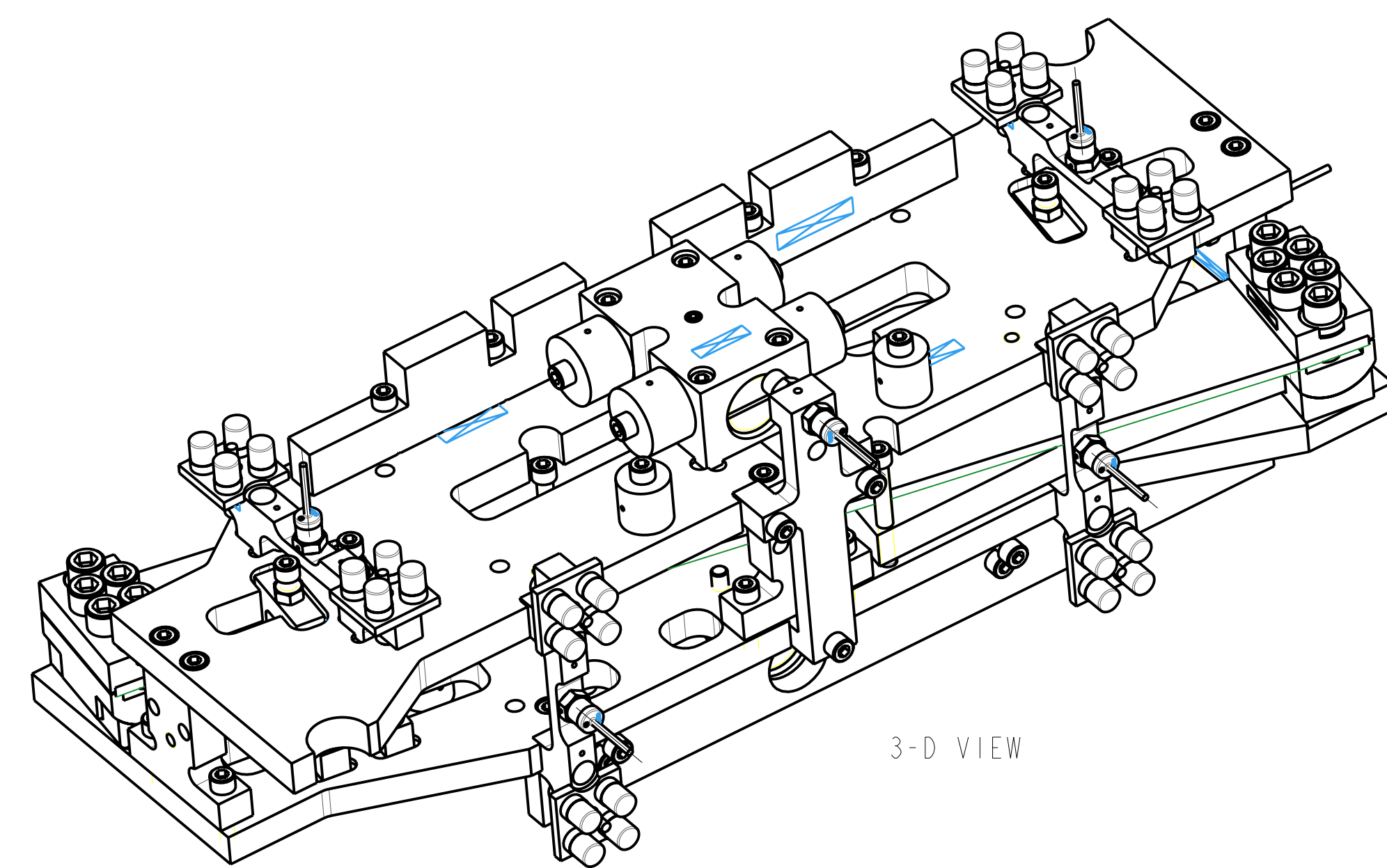
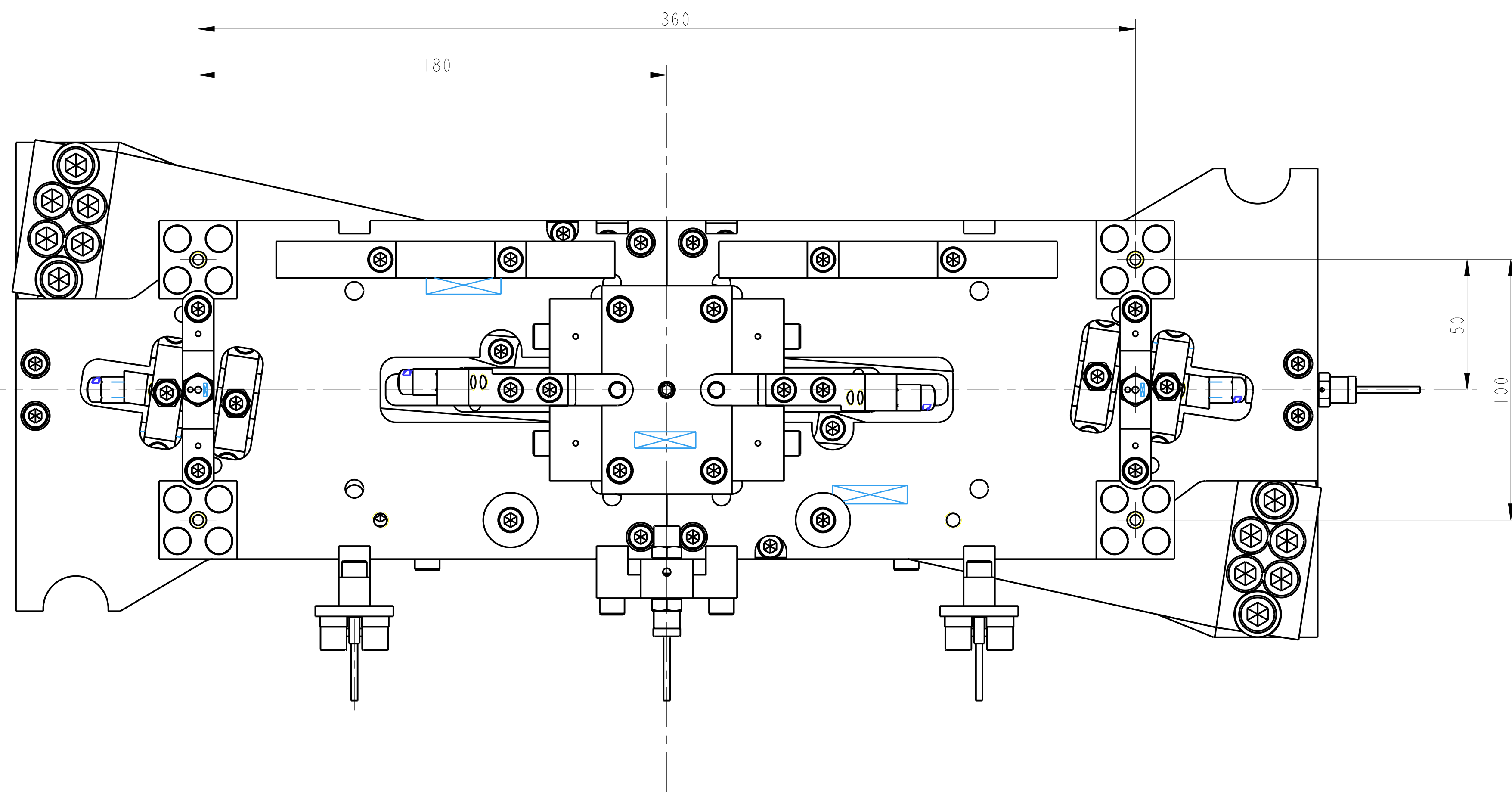
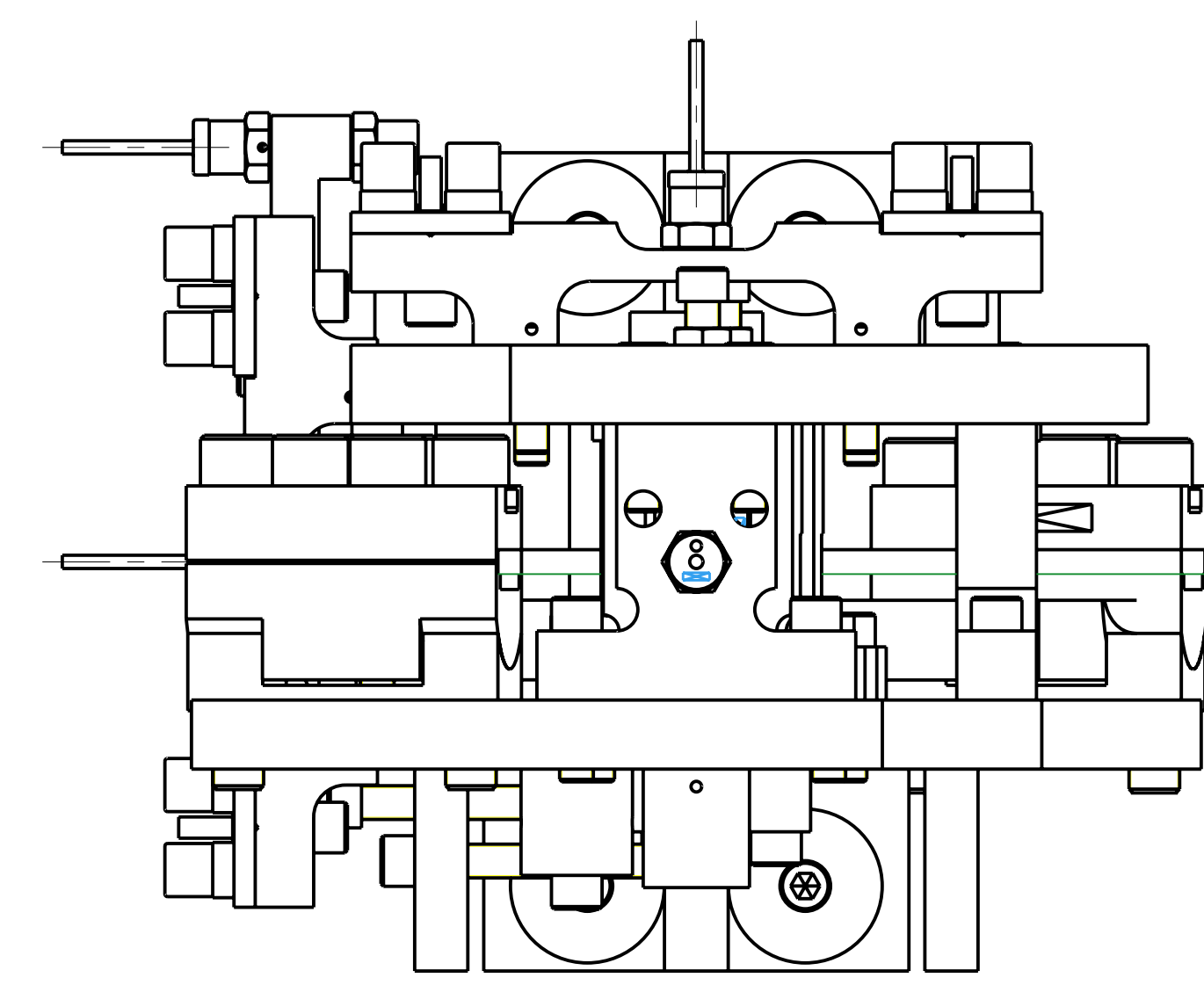


REV.	DATE	DCN #	DRAWING TREE #
A	19/OCT/06	E060248	
B	17/DEC/07	E060248-B	
J	15/JULY/08	E080368	



NOTE:
THIS SHEET IS FOR KEY DIMENSIONAL INFORMATION ONLY
AND THESE DIMENSIONS ARE CONSISTENT FOR BOTH
TEST AND REACTION CHAIN CONFIGURATIONS



NOTES: (UNLESS OTHERWISE SPECIFIED)

- REMOVE ALL SHARP EDGES. R: 0.25 MIN.
- DO NOT SCALE FROM DRAWING.
- ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE. SUCH AS CINCINNATI MILACRON'S CIMTECH 410 (STAINLESS STEEL).
- SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 07" HIGH CHARACTERS. EXAMPLE: D060403-001 - A VIBRATORY TOOL MAY BE USED.

DIMENSIONS ARE IN mm (INCHES)

FINISH: N/A

MATERIAL: AS BOM

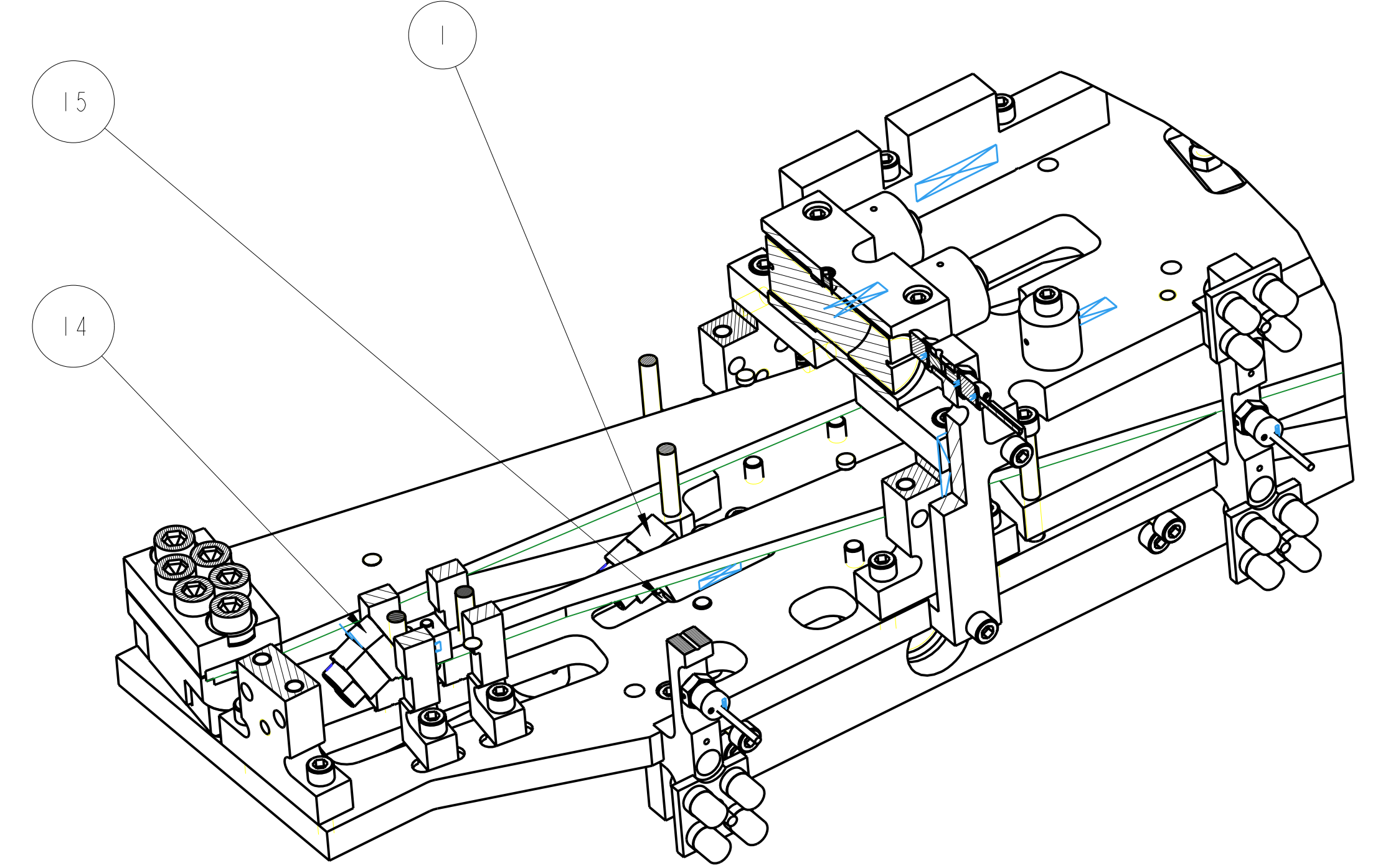
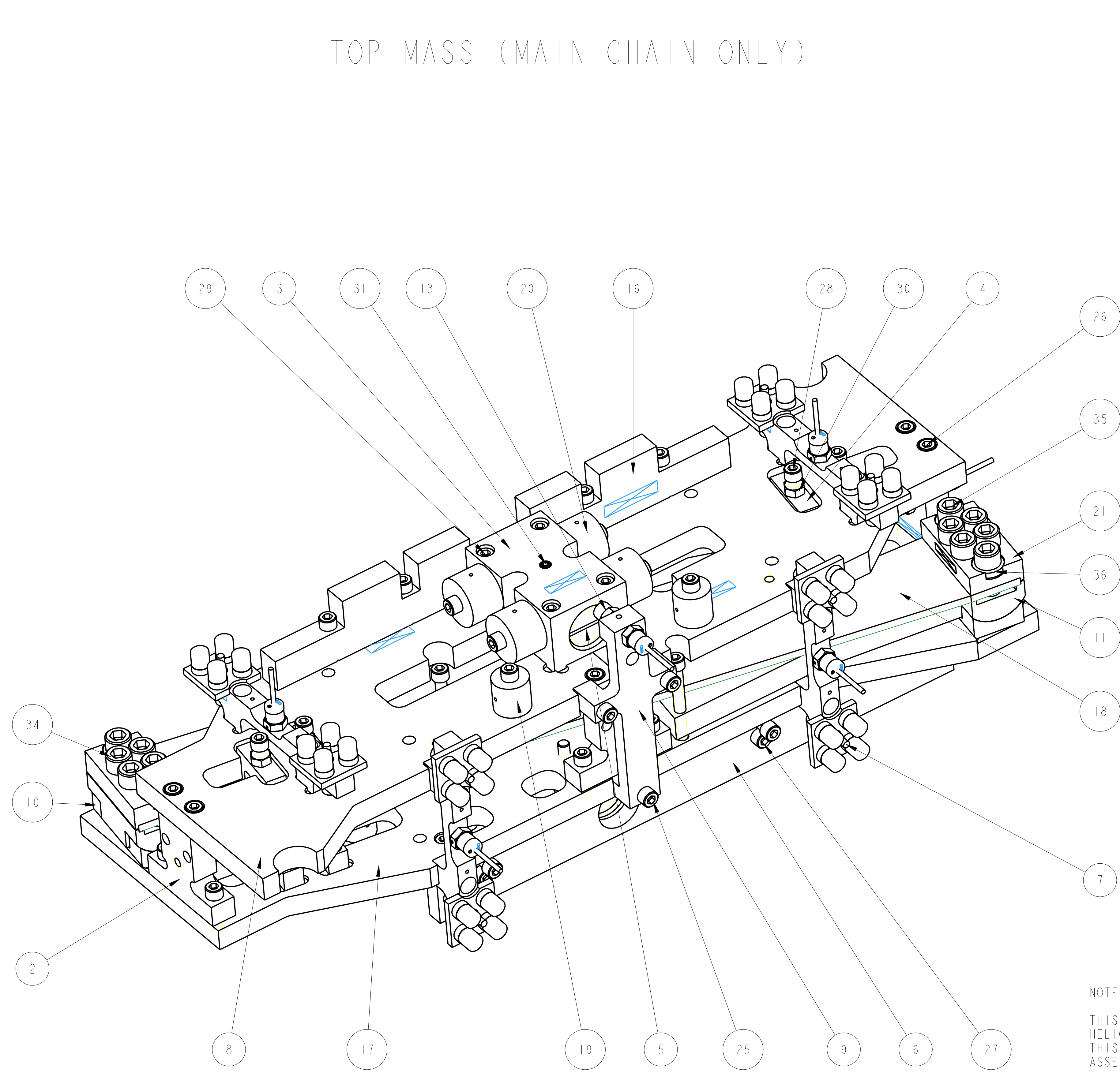
SCALE: 4:51 PROJECTION:

NAME	DATE	REV
J O'NEILL	14/SEP/09	1
MB	15/MAR/10	2
JOD	15/MAR/10	3

CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
GLASGOW UNIVERSITY GEC ROX GROUP
RUTHERFORD APPLION LABORATORIES

SYSTEM: aLIGO
SUB-SYSTEM: SUS - QUAD
NEXT ASSY: aLIGO QUAD
PART NAME: TOP MASS PRODUCTION GA
MAIN AND REACTION CHAINS
DRG. NO.: D060403
SHEET 1 OF 3

TOP MASS (MAIN CHAIN ONLY)



SECTION A-A
SCALE 3:5

NOTE:
THIS DRAWING DOES NOT CONTAIN THE EXACT INFORMATION REGARDING HELICOIL INSERT AND FASTENING SPECIFICATIONS AND POSITIONS. THIS INFORMATION CAN BE FOUND IN THE THE TOP MASS PICTURE-BOOK ASSEMBLY PROCEDURE "D060403_PROCEDURE"

ITEM	QTY	SPARE/TOTAL	PART NUMBER	DESCRIPTION	MATERIALS
1	2		D060391	TOP WIRE CLAMP; (TOP MASS)	SEE ITEMS LIST:
2	4		D060397	TOP MASS SPACER; .	ST. STEEL: 304
3	2		D060398	PITCH ADJUSTER & MASS; ADJUSTER TURRET	AL ALLOY: 5083
4	4		D060399	STOP BRIDGE; .	AL ALLOY: 5083
5	2		D060405	PITCH ADJUSTER; .	ST. STEEL: 304
6	2		D060406	BASE PLATE STIFFENER; .	AL ALLOY: 5083
7	4		D060409	OSEM ECD UNIT; .	AS DRW: AS DRAWN
8	2		D060411	TOP PLATE; .	ST. STEEL: 304
9	1		D060412	OSEM BRACKET (TOP OSEM); .	AL ALLOY: 5083
10	2		D060414	BLADE TIP Z POSITION ADJ.; (BTM HALF PART 2)	AL ALLOY: 5083
11	2		D060415	BLADE TIP Z POSITION ADJ.; (BTM HALF)	ST. STEEL: 304/316
12	2		D060416	OSEM MAGNET AND FLAG; .	AS DRAWING:
13	2		D060417	OSEM MAGNET AND FLAG CONCEPT; PART BUILT	AS BOM:
14	2		D060419	TOP MASS WIRE CLAMP; .	AS DRW: SEE DRAWINGS
15	2		D060420	WIRE CLAMP ADJUSTMENT BLOCK; .	AL ALLOY: 5083
16	2		D060421	MASS AND SUPPORT MEMBER; .	ST. STEEL: 304
17	1		D060430	BASE PLATE; .	ST. STEEL: 316
18	2		D060236_FLAT	MIDDLE BLADE SPRING; .	MARAGING STEEL 250:
19	4		D060359-050.0	ADDITIONAL MASS; .	ST. STEEL: 316
20	8		D060359-100.0	ADDITIONAL MASS; .	ST. STEEL: 316
21	2		D060404-000	BLADE CLAMP; (TOP HALF)	ST. STEEL: 304/316
22	1			1/4"-20 x 0.50 UNC THREAD INSERT; .	
23	12			1/4"-20 x 1.50 UNC THREAD INSERT; .	
24	13			1/4"-20 x 10 UNC THREAD INSERT; .	
25	15			1/4" 20 UNC X 1" CAP HEAD; .	
26	48			1/4" 20 UNC X 1" CAP HEAD SILVER PLATED; .	
27	2			1/4" 20 UNC X 2" CAP HEAD; .	
28	10			1/4" 20 UNC X 2" CAP HEAD, SPHERICAL TIP; .	
29	8			1/4" 20 UNC X 2" CAP HEAD SILVER PLATED; .	
30	4			1/4" 20 UNC NUT; .	
31	2			1/4" 20 UNC X 0.188" GRUBSCREW; .	
32	8			3/8-16 x 1.50 UNC THREAD INSERT; .	
33	4			3/8-16 x 10 UNC THREAD INSERT; .	
34	8			3/8" 16 UNC X 1.25" CAP HEAD; .	
35	4			3/8" 16 UNC X 2.25" CAP HEAD; .	
36	4			3/8 SPHERICAL WASHER; .	

NOTES: (UNLESS OTHERWISE SPECIFIED)

- REMOVE ALL SHARP EDGES.
- DO NOT SCALE FROM DRAWING.
- ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE, SUCH AS CINCINNATI MILACRON'S CIMTECH 410 (STAINLESS STEEL).
- SCRIBE, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 07" HIGH CHARACTERS. EXAMPLE: D060100-001 - A VIBRATOR TOOL MAY BE USED.

DIMENSIONS ARE IN mm (INCHES) TOLERANCES:
 X XX ± .13
 ANGULAR ±°

MATERIAL: AS BOM

FINISH: N/A
 √μm (1μin) Ra:

SCALE: 4:5

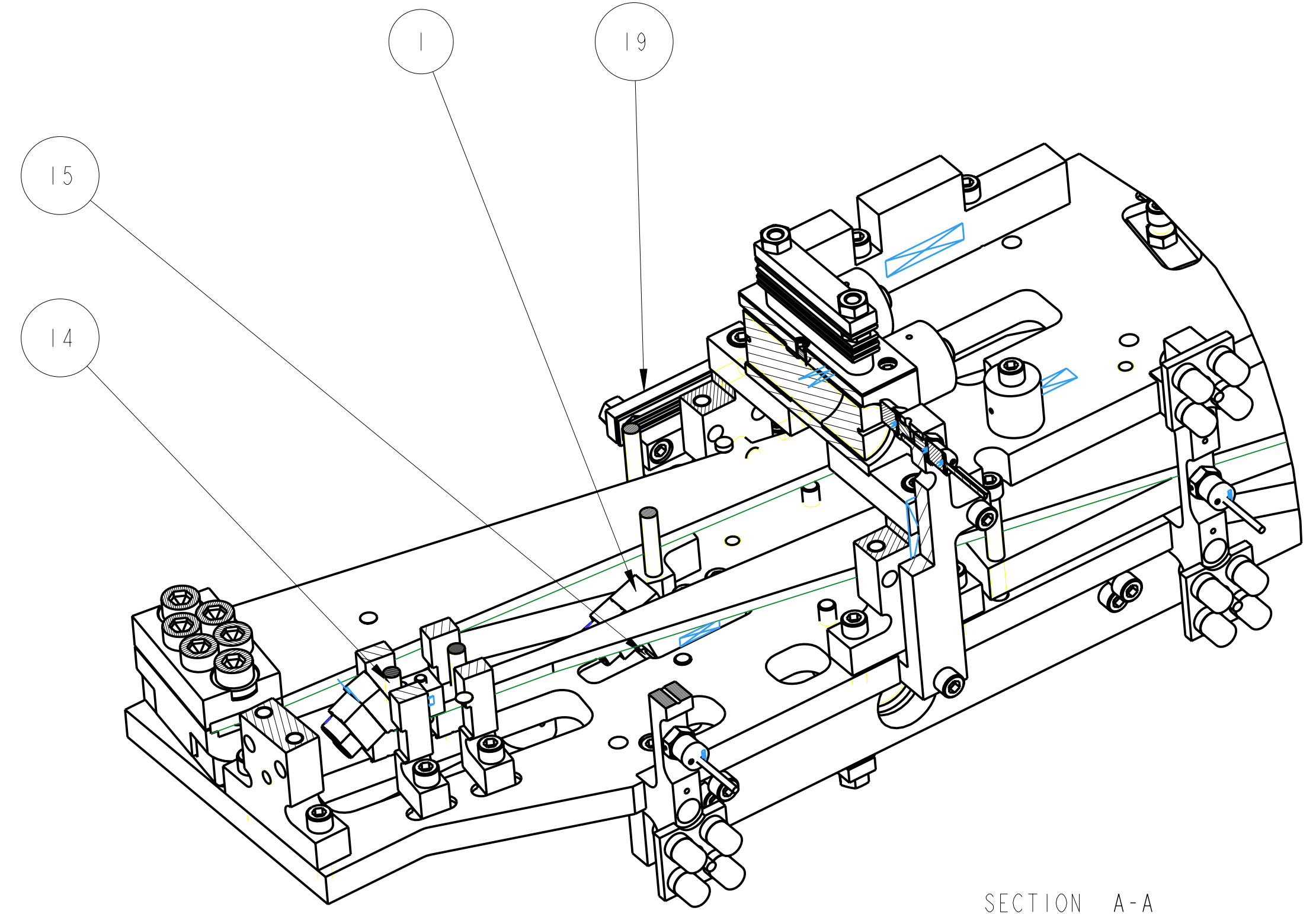
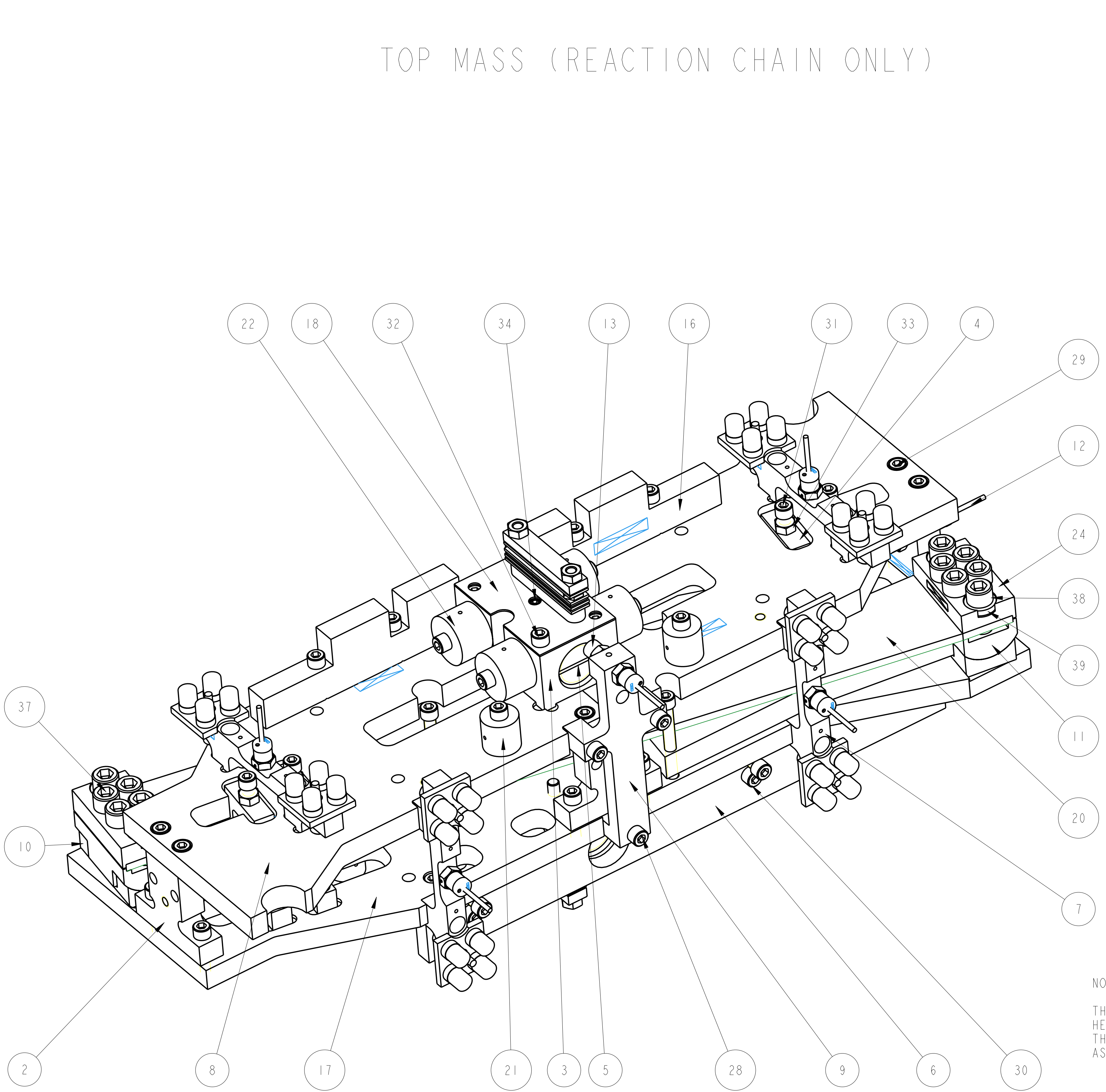
PRODUCTION: [Signature]

California Institute of Technology
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 DEPT. OF MECHANICAL ENGINEERING
 RUTHERFORD APPLETON LABORATORIES

SYSTEM: aLIGO
SUB-SYSTEM: SUS - QUAD
NEXT ASSY: aLIGO QUAD
PART NAME: TOP MASS PRODUCTION GA
MAIN AND REACTION CHAINS

DRG. NO.: D060403
DATE: 15/MAR/10
SCALE: 4:5
SHEET: 2 OF 3

TOP MASS (REACTION CHAIN ONLY)



SECTION A-A
SCALE 3:5

NOTE:

THIS DRAWING DOES NOT CONTAIN THE EXACT INFORMATION REGARDING HELICOIL INSERT AND FASTENING SPECIFICATIONS AND POSITIONS. THIS INFORMATION CAN BE FOUND IN THE TOP MASS PICTURE-BOOK ASSEMBLY PROCEDURE "D060403_PROCEDURE"

ITEM	QTY	SPARE	TOTAL	PART NUMBER	DESCRIPTION	MATERIALS
1	2			D060391	TOP WIRE CLAMP; (TOP MASS)	SEE ITEMS LIST:
2	4			D060397	TOP MASS SPACER; ..	ST. STEEL: 304
3	2			D060398	PITCH ADJUSTER & MASS; ADJUSTER TURRET	AL ALLOY: 5083
4	4			D060399	STOP BRIDGE; ..	AL ALLOY: 5083
5	2			D060405	PITCH ADJUSTER; ..	ST. STEEL: 304
6	2			D060406	BASE PLATE STIFFENER; ..	AL ALLOY: 5083
7	4			D060409	OSEM ECD UNIT; ..	AS DRW: AS DRAWN
8	2			D060411	TOP PLATE; ..	ST. STEEL: 304
9	1			D060412	OSEM BRACKET (TOP OSEM); ..	AL ALLOY: 5083
10	2			D060414	BLADE TIP Z POSITION ADJ; (BTM HALF PART 2)	AL ALLOY: 5083
11	2			D060415	BLADE TIP Z POSITION ADJ; (BTM HALF)	ST. STEEL: 304/316
12	2			D060416	OSEM MAGNET AND FLAG; ..	AS DRAWING:
13	2			D060417	OSEM MAGNET AND FLAG CONCEPT; PART BUILT	AS BOM:
14	2			D060419	TOP MASS WIRE CLAMP; ..	AS DRW: SEE DRAWINGS
15	2			D060420	WIRE CLAMP ADJUSTMENT BLOCK; ..	AL ALLOY: 5083
16	2			D060421	MASS AND SUPPORT MEMBER; ..	ST. STEEL: 304
17	1			D060430	BASE PLATE; ..	ST. STEEL: 316
18	2			D070218	MASS WIRE CLAMP #1; ..	AS DRW:
19	1			D070225	MASS WIRE CLAMP; ..	AS DRW:
20	2			D060236_FLAT	MIDDLE BLADE SPRING; ..	MARAGING STEEL 250;
21	4			D060359-050.0	ADDITIONAL MASS; ..	ST. STEEL: 316
22	8			D060359-100.0	ADDITIONAL MASS; ..	ST. STEEL: 316
23	1			D060403_SKEEL
24	2			D060404-000	BLADE CLAMP; (TOP HALF)	ST. STEEL: 304/316
25	1				1/4"-20 x 0.50 UNC THREAD INSERT; ..	
26	12				1/4"-20 x 1.50 UNC THREAD INSERT; ..	
27	13				1/4"-20 x 10 UNC THREAD INSERT; ..	
28	15				1/4" 20 UNC X 1" CAP HEAD; ..	
29	48				1/4" 20 UNC X 1" CAP HEAD SILVER PLATED; ..	
30	2				1/4" 20 UNC X 2" CAP HEAD; ..	
31	10				1/4" 20 UNC X 2" CAP HEAD, SPHERICAL TIP; ..	
32	8				1/4" 20 UNC X 2" CAP HEAD SILVER PLATED; ..	
33	4				1/4 20 UNC NUT; ..	
34	2				1/4" 20 UNC X 0.188" GRUBSCREW; ..	
35	8				3/8-16 x 1.50 UNC THREAD INSERT; ..	
36	4				3/8-16 x 10 UNC THREAD INSERT; ..	
37	8				3/8 16 UNC X 1.25" CAP HEAD; ..	
38	4				3/8" 16 UNC X 2.25" CAP HEAD; ..	
39	4				3/8 SPHERICAL WASHER; ..	

NOTES: (UNLESS OTHERWISE SPECIFIED)

- REMOVE ALL SHARP EDGES. R.02 MIN.
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- ALL MACHINING FLUIDS SHALL BE WATER SOLUBLE AND FREE OF SULFUR, CHLORINE AND SILICONE. SUCH AS CINCINNATI MILACRON'S CMTTECH 410 (STAINLESS STEEL).
- SCORE, ENGRAVE OR STAMP DRAWING PART NUMBER ON NOTED SURFACE OF PART AND A THREE DIGIT SERIAL NUMBER. SERIAL NUMBERS START AT 001 FOR THE FIRST PART AND PROCEED CONSECUTIVELY. USE 07" HIGH CHARACTERS. EXAMPLE: D060100-001 - A VIBRATOR TOOL MAY BE USED.

DIMENSIONS ARE IN mm (INCHES) TOLERANCES:
 X XX ± .13
 ANGULAR ±

MATERIAL: AS BOM

FINISH: N/A
 √(um (10in) Rq:

NAME: J O'BELL
 DATE: 23/09/09
 DRAWN: J O'BELL
 CHECKED: MB
 APPROVED: JOD

SCALE 4:5

CALIFORNIA INSTITUTE OF TECHNOLOGY
 MASSACHUSETTS INSTITUTE OF TECHNOLOGY
 GLASGOW UNIVERSITY GEC ROX GROUP
 RUTHERFORD APPLETON LABORATORIES

SYSTEM: aLIGO
 SUB-SYSTEM: SUS - QUAD
 NEXT ASSY: aLIGO QUAD
 PART NAME: TOP MASS PRODUCTION GA
 MAIN AND REACTION CHAINS
 DRG. NO.: D060403
 SHEET 3 OF 3