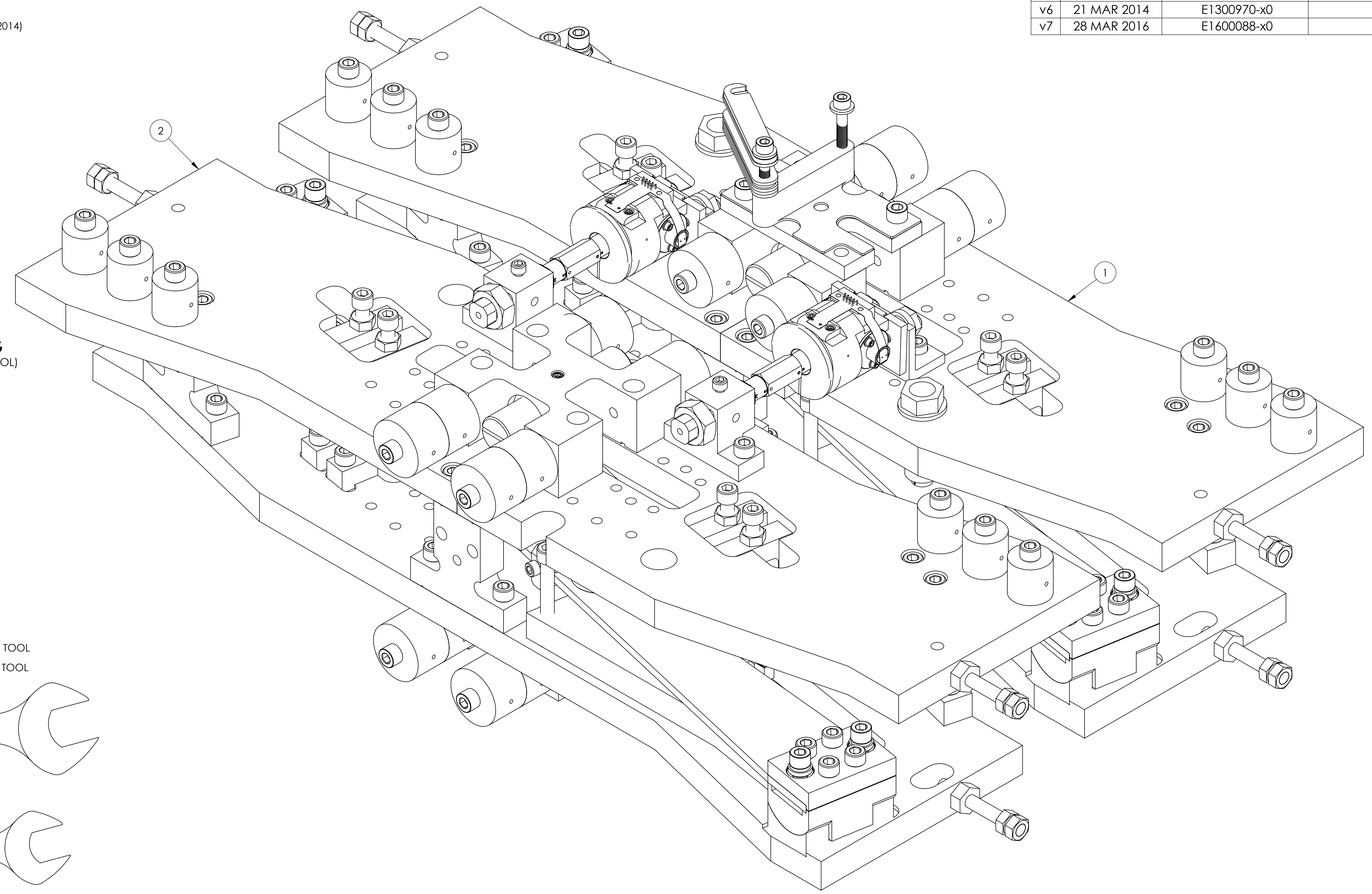


REV.	DATE	DCN #	DRAWING TREE #
v5	11 FEB 2014	-	-
v6	21 MAR 2014	E1300970-x0	-
v7	28 MAR 2016	E1600088-x0	-

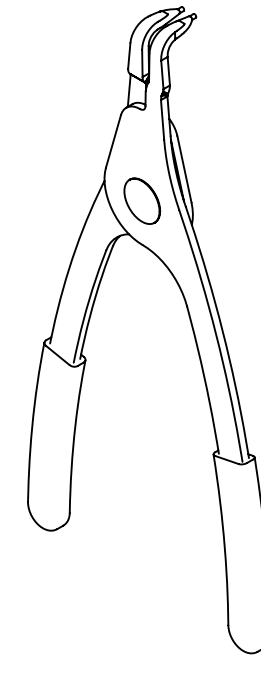
ASSEMBLY PROCESS

(DRAWING UPDATED TO CURRENT CAD FORMAT BY E.SANCHEZ 02/11/2014)

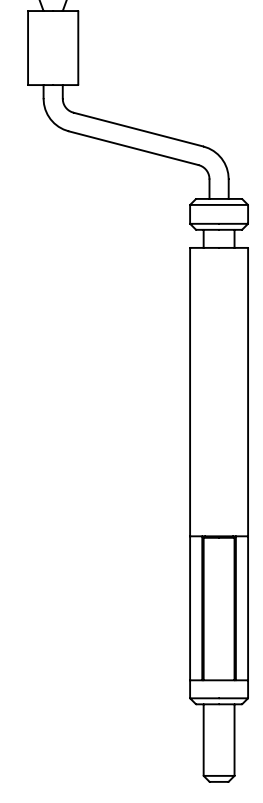


RECOMMENDED TOOLING

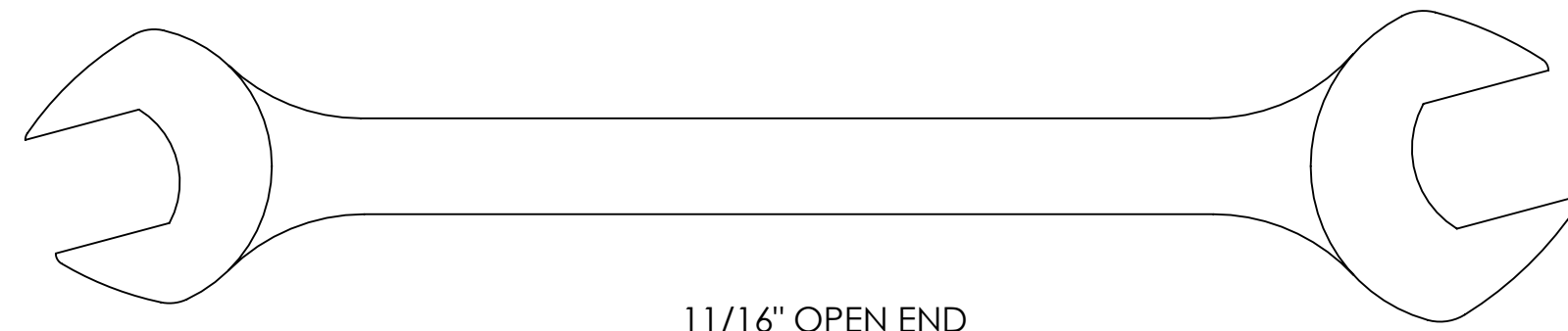
(IMAGE SHOWN MAY NOT REFLECT ACTUAL TOOL)



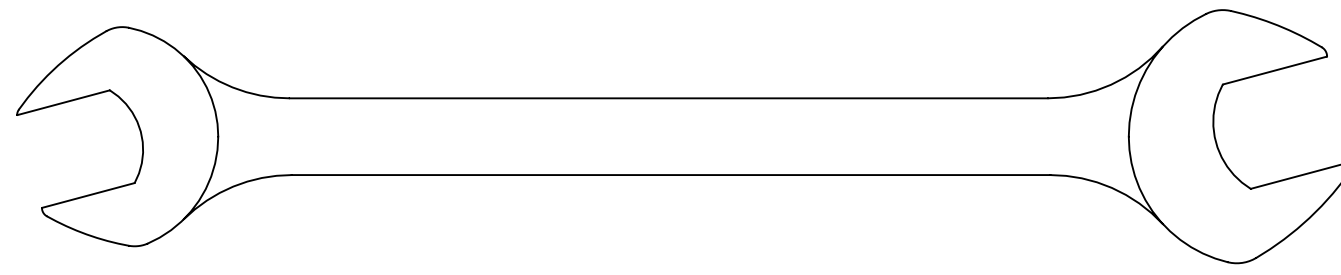
RETAINING RING PLIERS



1/4 HELICOIL INSERTION TOOL & #8 HELICOIL INSERTION TOOL



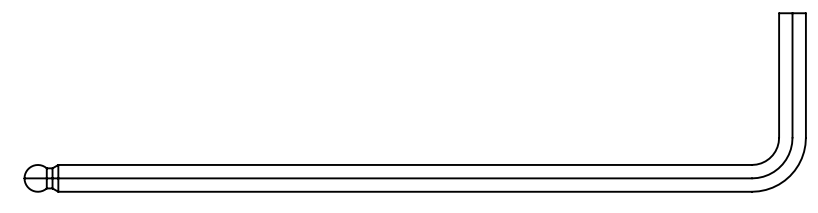
11/16" OPEN END WRENCH



1/2" OPEN END WRENCH



3/16" HEX L ALLEN WRENCH



9/64" HEX L ALLEN WRENCH



.050 HEX L ALLEN WRENCH

UI MAIN & REACTION CHAIN
(SHOWN AS ASSEMBLED ON QUAD LOWER STRUCTURE)

REFER TO LOWER LEVEL DRAWINGS FOR COMPLETE UI & REACTION CHAIN BOMS

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
2	D1101128	αLIGO, SUS, QUAD UI MASS, MAIN CHAIN	N/A	1
1	D1101129	αLIGO, SUS, QUAD UI MASS, REACTION CHAIN	N/A	1

PARTS LIST

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)	
DIMENSIONS ARE IN INCHES [MM]	
MATERIAL	N/A
FINISH	N/A μinch

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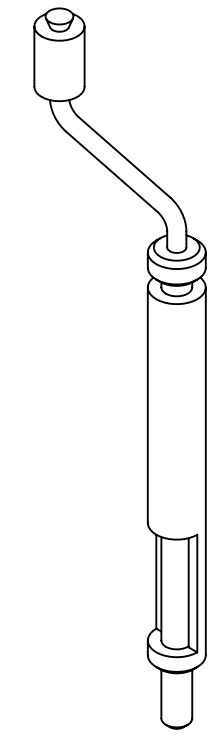
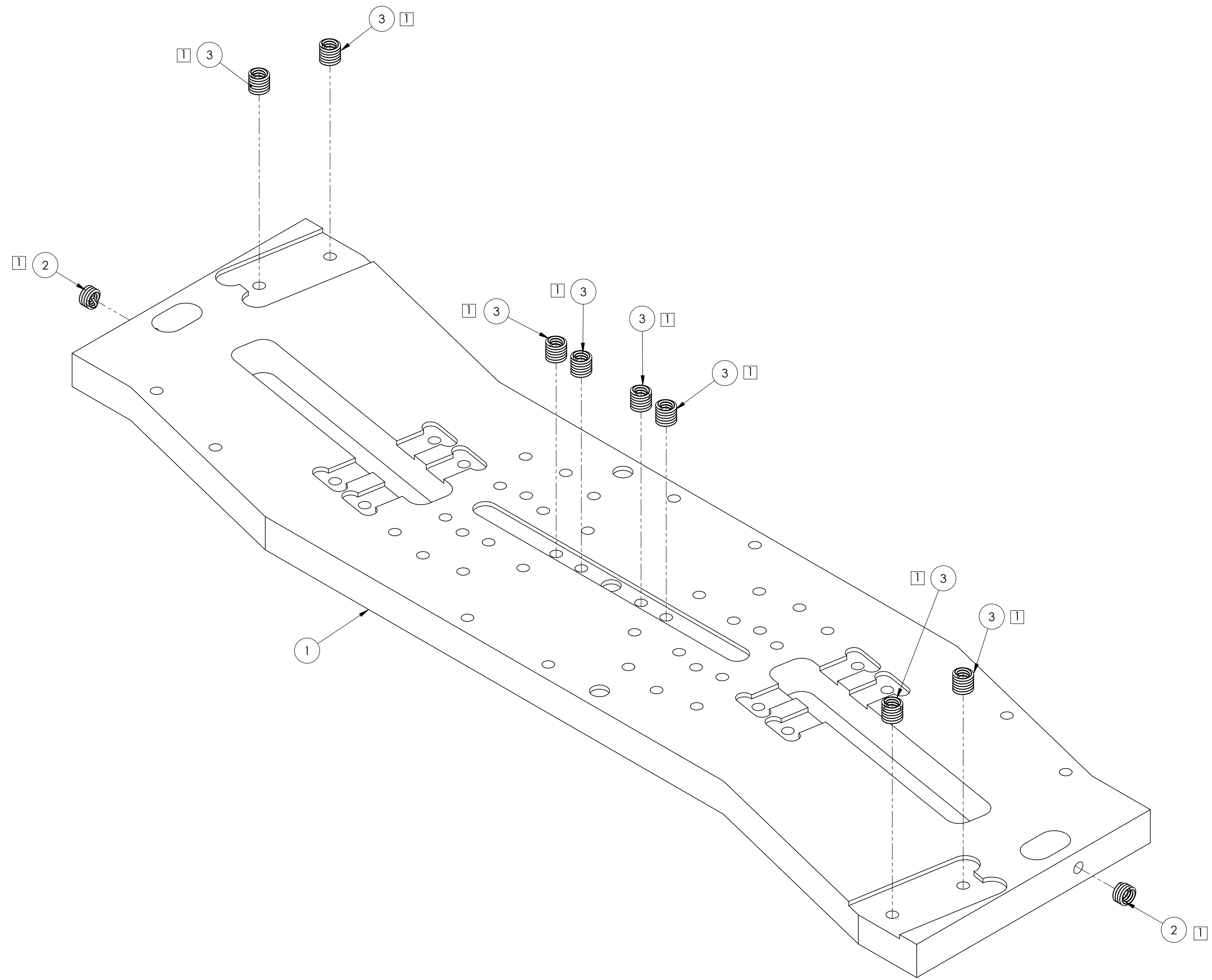
SYSTEM: SUB-SYSTEM: NEXT ASSY:

PART NAME: UI MASS MAIN AND REACTION ASSY, αLIGO SUS

DESIGNER	SIZE	DWG. NO.	REV.
DRAFTER	28 JUN 2007	D	D060375
CHECKER	SCALE: 1:2	PROJECTION:	SHEET 1 OF 23
APPROVAL	SEE DCC	SEE DCC	

D060375 αLIGO SUS, QUAD UI MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-051, DRAWING PDM REV. X-004

ASSY. STEP 1: ADD THREADED INSERTS TO BASE PLATE



USE 1/4 HELICOIL INSERTION TOOL

ISO VIEW, FRONT RIGHT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
3	1185-4EN375 EMHART OR EQ.	HELICOIL, 1/4-20 X .375 LG.	NITRONIC 60	8
2	1185-4EN250 EMHART OR EQ.	HELICOIL, 1/4-20 X .25 LG.	NITRONIC 60	2
1	D060376	aLIGO, SUS, Quad N-Ptype UI MASS, MASS BASE PLATE	6061-T6 Al	1

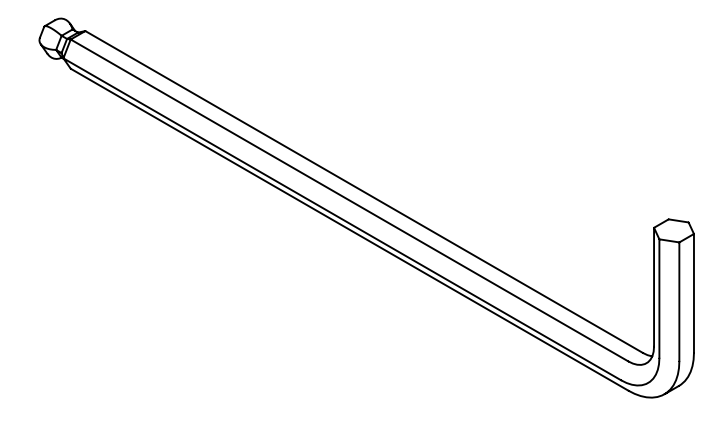
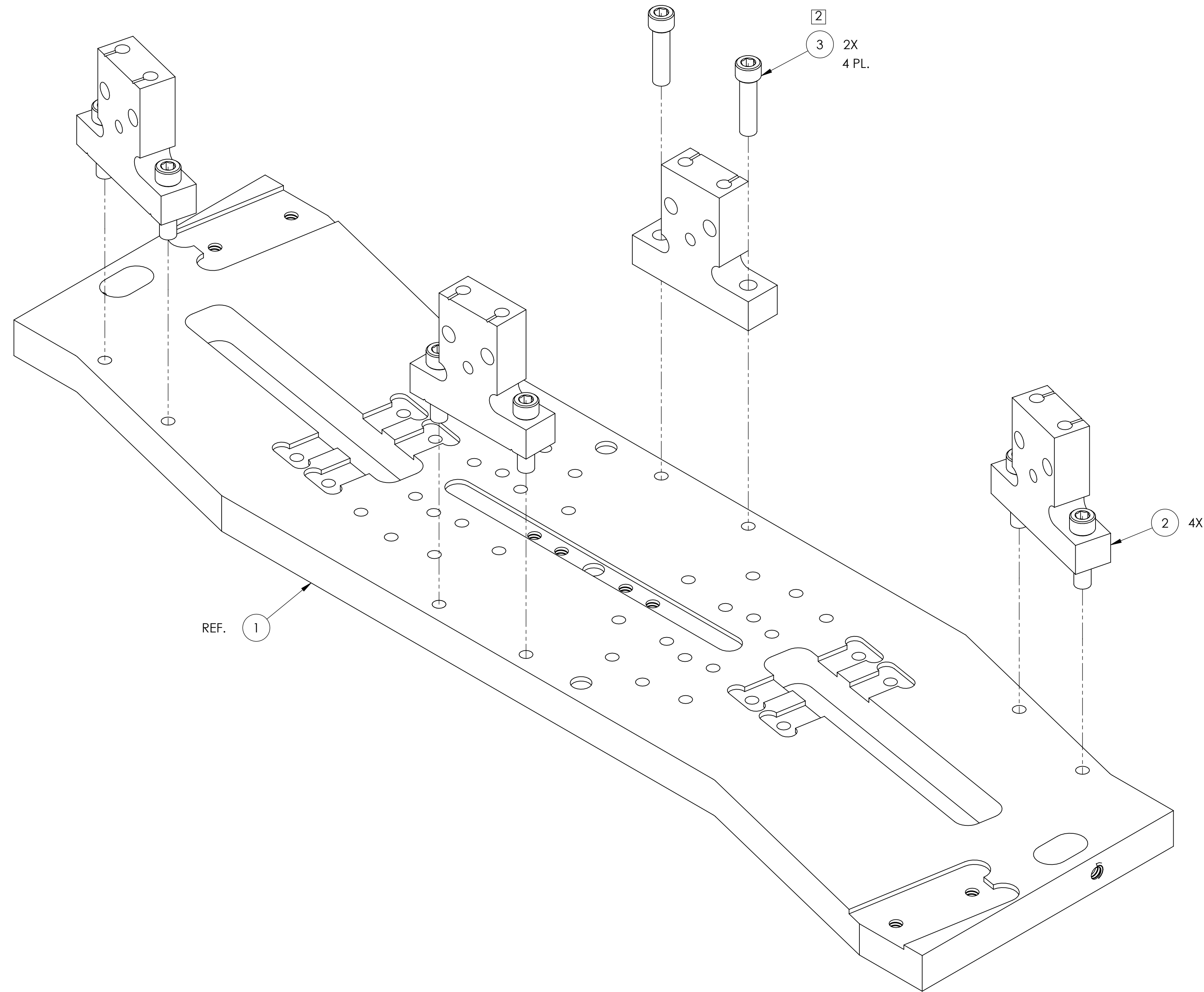
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SIZE DWG. NO. **D060375** REV. **v7**

SCALE: 1:1 PROJECTION: SHEET 2 OF 23

D060375 aLIGO SUS, QUAD N-Ptype UI MASS, MASS BASE PLATE, PART PDM REV. X-360, DRAWING PDM REV. X-004

ASSY. STEP 2: ATTACH ALL 4 STANDOFFS TO BASE PLATE



2 USE STANDARD 3/16" HEX L ALLEN WRENCH. TORQUE TO 10 FT / LB.

ISO VIEW, FRONT RIGHT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
3	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	8
2	D060397	αLIGO, SUS, TOP MASS QUAD N-PTYPE, TOP MASS SPACER	304 SSSL	4
1	D060376	αLIGO, SUS, Quad N-Ptype UI MASS, MASS BASE PLATE	6061-T6 Al	1

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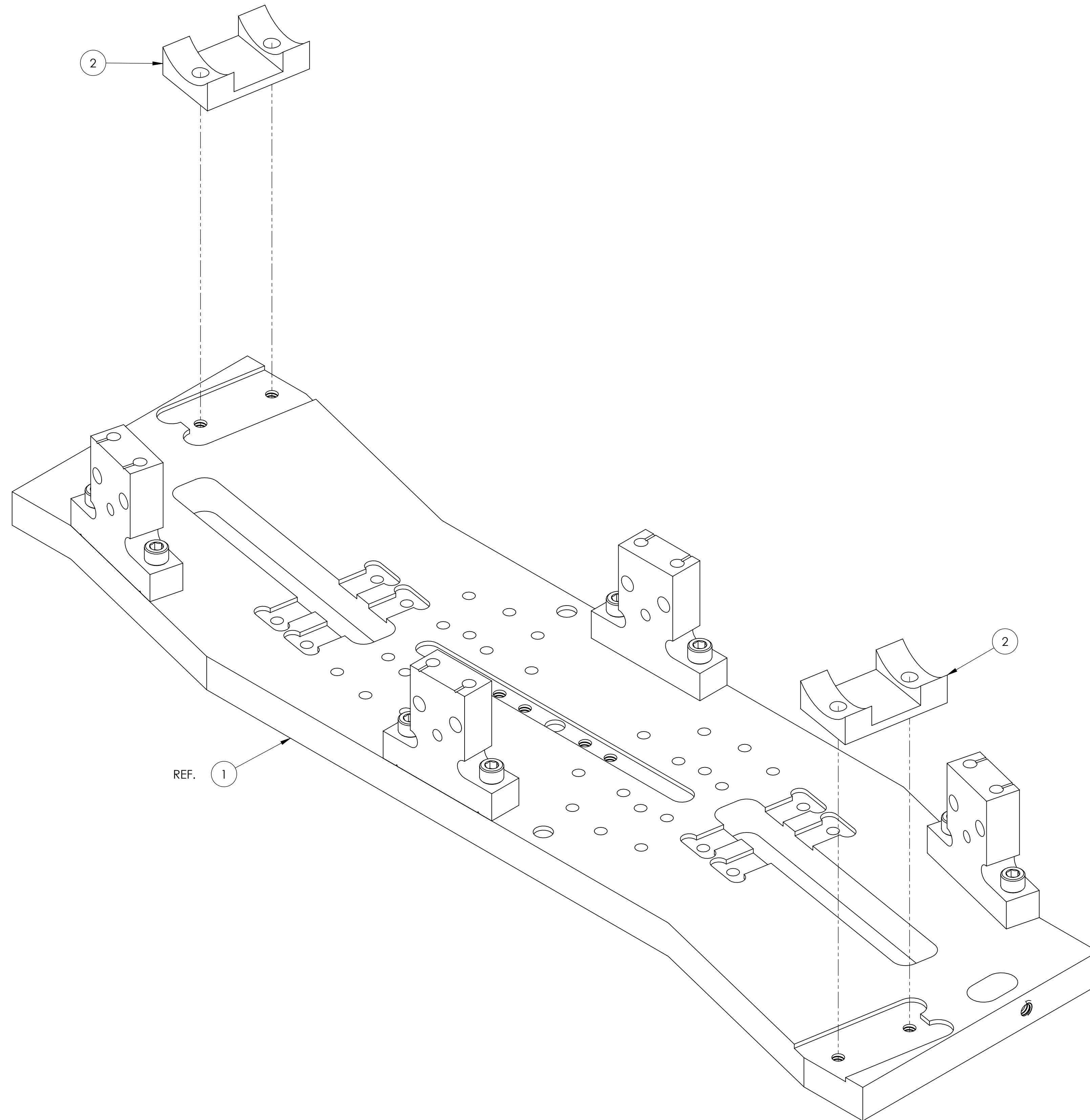
SIZE DWG. NO. **D060375** REV. **v7**

SCALE: 1:1 PROJECTION: SHEET 3 OF 23

D060375 αLIGO SUS QUAD N-PTYPE REACTION CHAIN ASSY PART PDM REV. X-060 DRAWING PDM REV. X-004

ASSY. STEP 3: INSTALL UIM BLADE ADJUSTER BASES (D060377)

(MAY REQUIRE TAPPING IN WITH SOFT HEAD HAMMER)



ISO VIEW, FRONT RIGHT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
2	D060377	ALIGO, SUS, QUAD N-P-TYPE UI MASS, BLADE TIP Z POSITION ADJ (BTM HALF PART 2)	6061-T6 Al	2
1	D060376	ALIGO, SUS, Quad N-P-type UI MASS, MASS BASE PLATE	6061-T6 Al	1

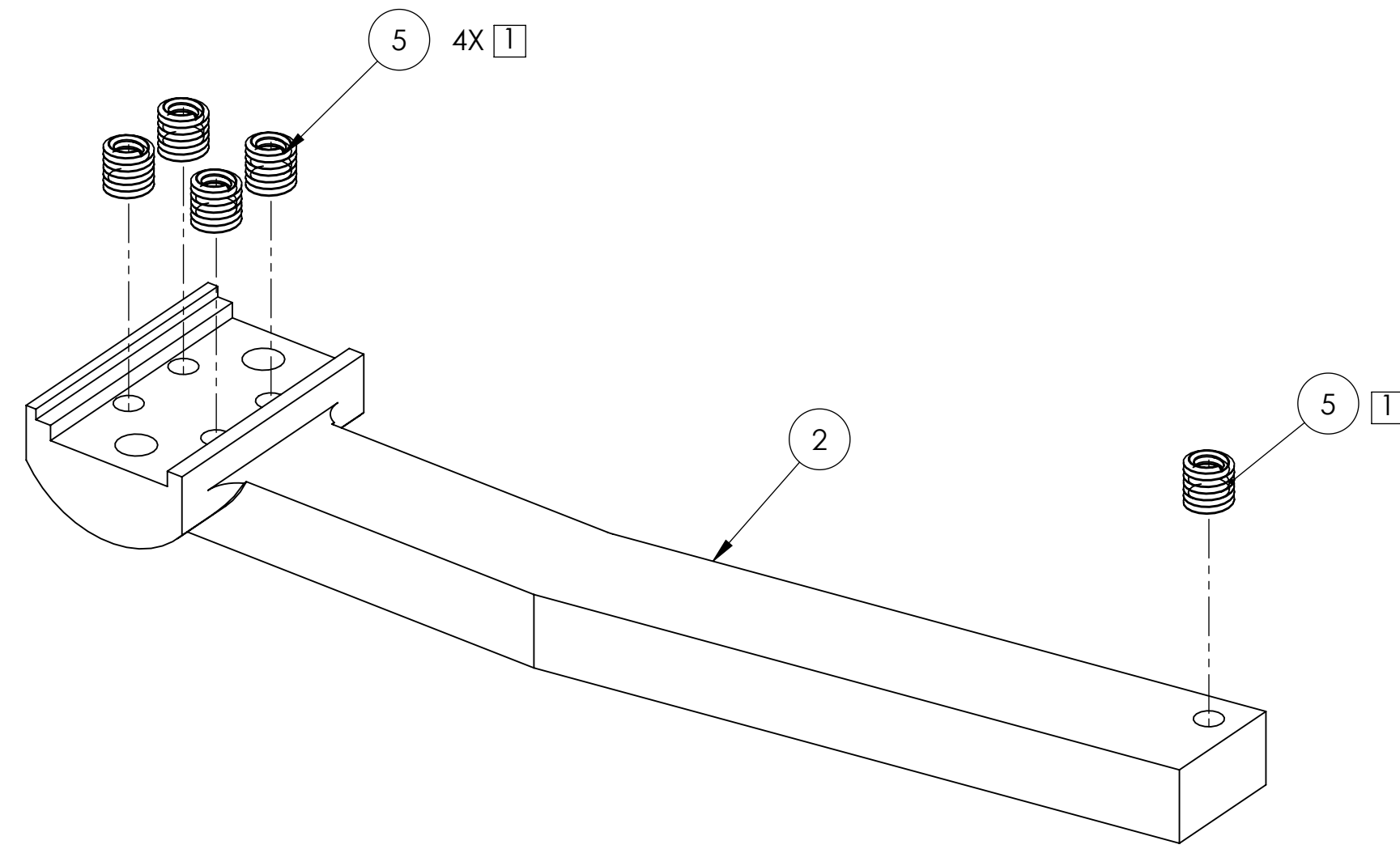
PARTS LIST

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
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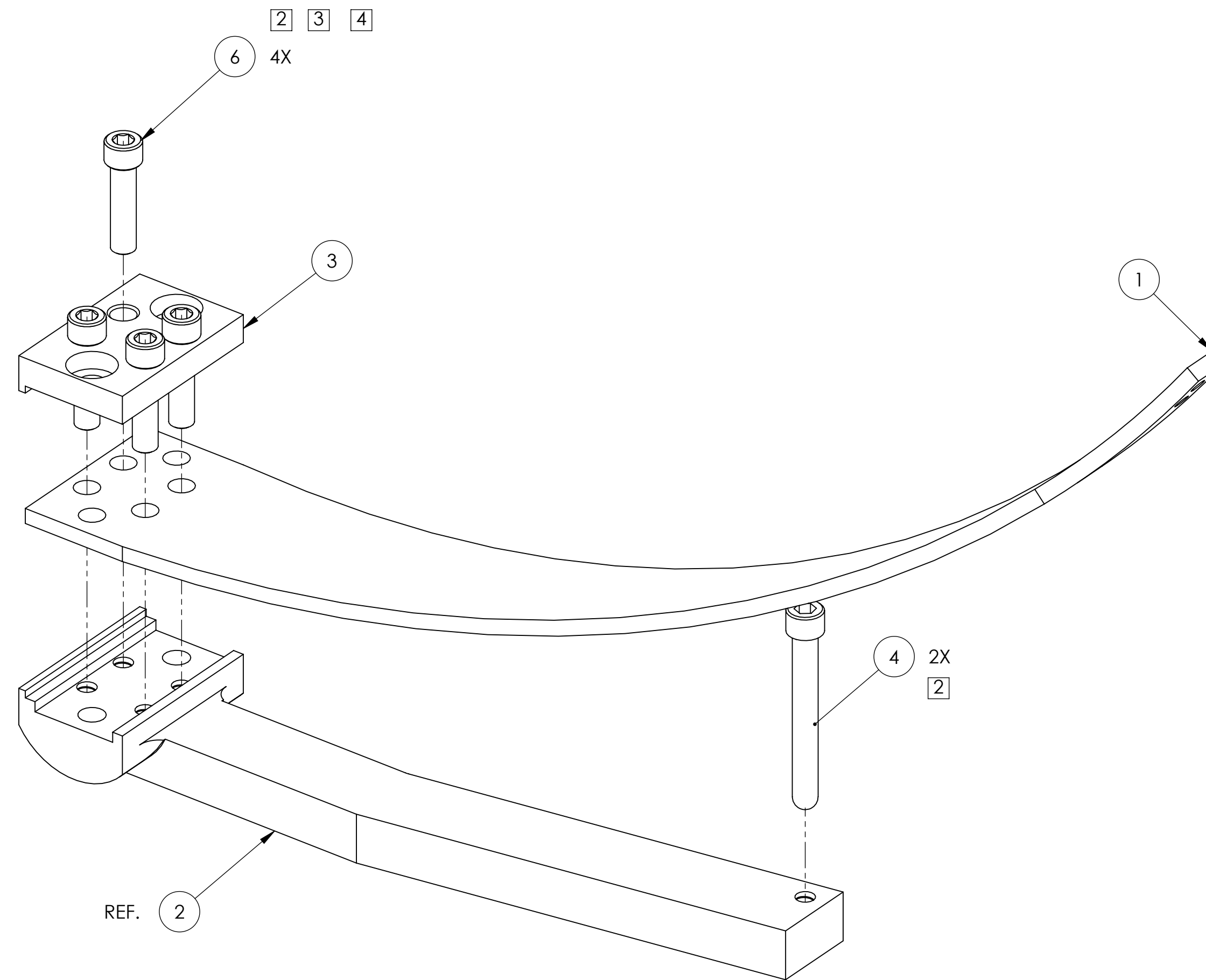
SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 4 OF 23

D060375 ALIGO SUS QUAD N-P-TYPE UI MASS MAIN AND REACTION CHAIN ASSY PART PDM REV X-360 DRAWING PDM REV X-004

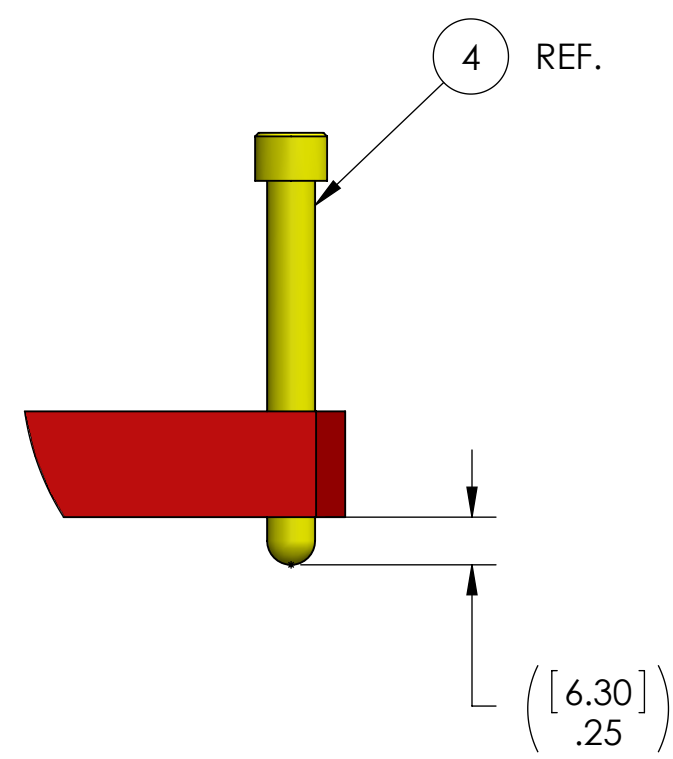
ASSY. STEP 4: ASSEMBLE BLADE INTO BLADE CLAMP (2 OFF)



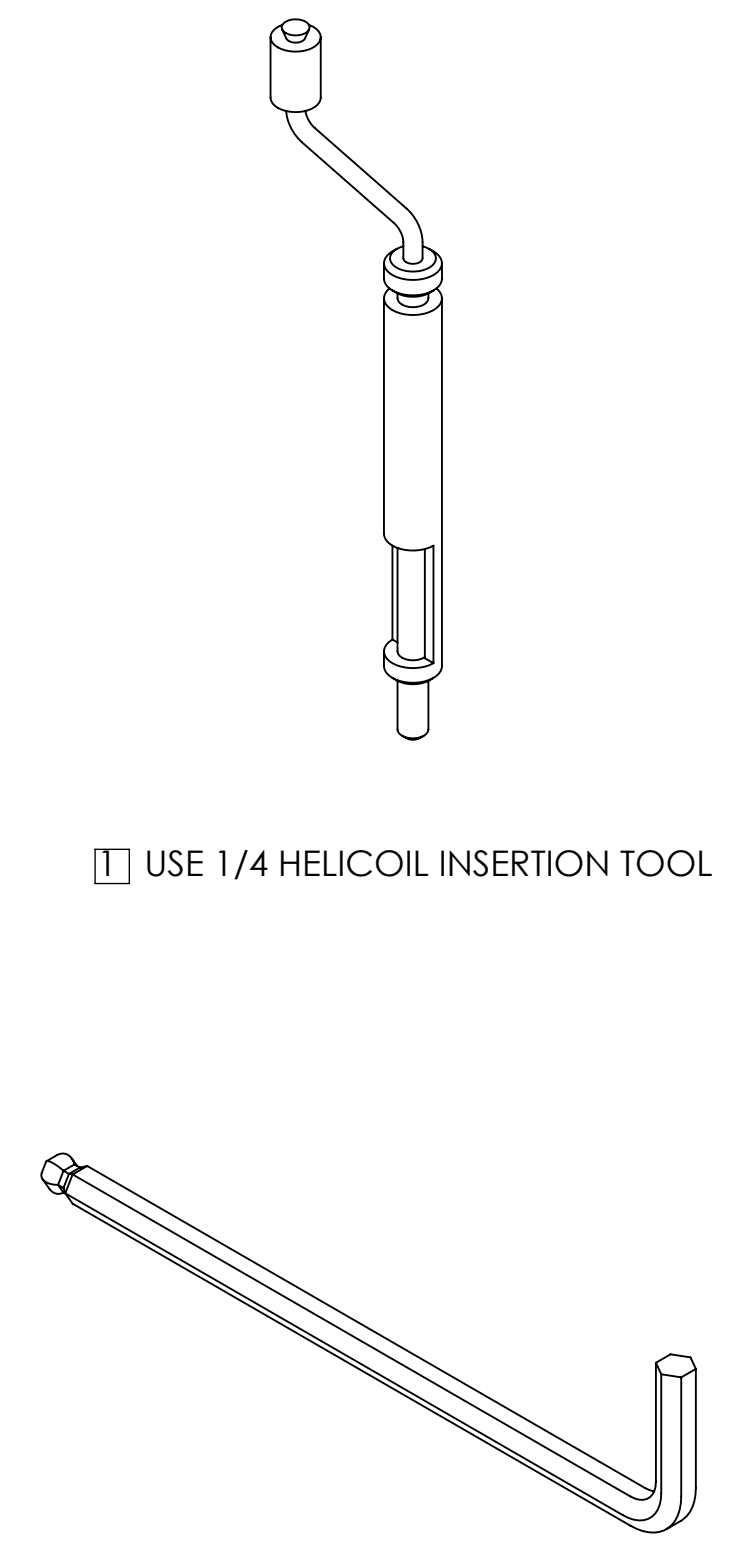
**ISO VIEW, FRONT RIGHT
(PARTIAL)**



**ISO VIEW, FRONT RIGHT
(PARTIAL)**



**ITEM NO. 4 DEPTH
(PARTIAL VIEW)**



☐ USE 1/4 HELICOIL INSERTION TOOL

☐ USE STANDARD 3/16" HEX L ALLEN WRENCH.

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
6	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	8
5	1185-4EN375 EMHART OR EQ.	HELICOIL, 1/4-20 X .375 LG.	NITRONIC 60	10
4		SCREW, SHC, 1/4-20 X 2.00 , ROUNDED END	300 SSSL	2
3	D060380	αLIGO, SUS, QUAD N-PTYPE UI MASS, BLADE CLAMP (TOP HALF)	304 SSSL	2
2	D060378	αLIGO, SUS, QUAD N-PTYPE UI MASS, BLADE TIP Z POSITION ADJ (BTM HALF)	304, 316 OR 302 SSSL	2
1	D060237	QUAD UI MASS, BOTTOM BLADE SPRING, αLIGO SUS	-	2

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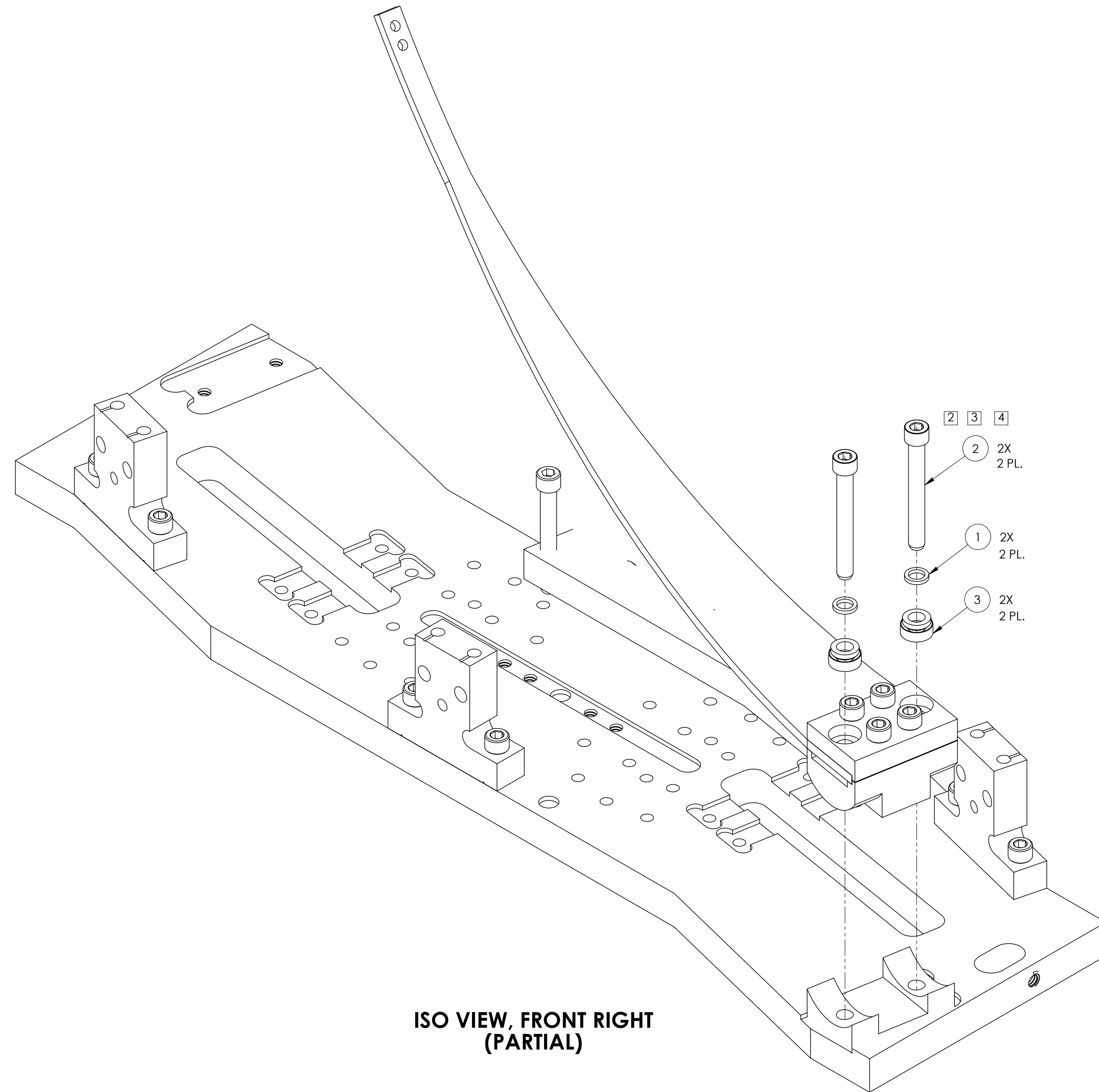
SIZE DWG. NO. **D060375** REV. **v7**

SCALE: 1:1 PROJECTION: SHEET 5 OF 23

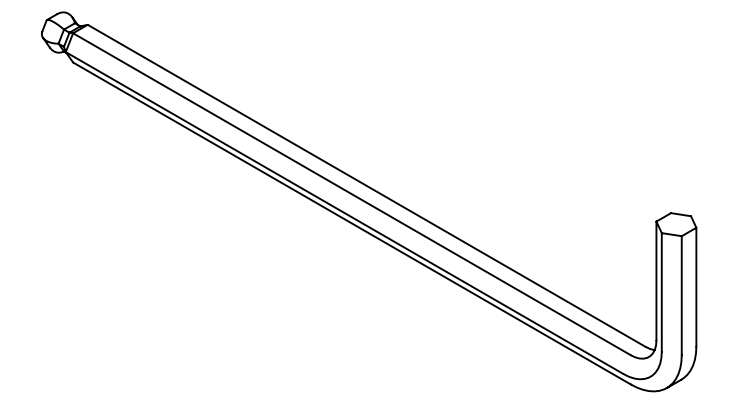
- ☐ TIGHT SUFFICIENTLY TO RETAIN IN PLACE. DO NOT TORQUE.
- ☐ TORQUE TO 16 LB / FT AFTER BLADE ADJUSTMENT

D060375 αLIGO SUS, QUAD UI MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV: X-360, DRAWING PDM REV: X-004

ASSY. STEP 5: ATTACH ONE BLADE TO MASS



ISO VIEW, FRONT RIGHT (PARTIAL)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.

- 3 TIGHT SUFFICIENTLY TO RETAIN IN PLACE. DO NOT TORQUE.
- 4 TORQUE TO 1.6 LB / FT AFTER BLADE ADJUSTMENT

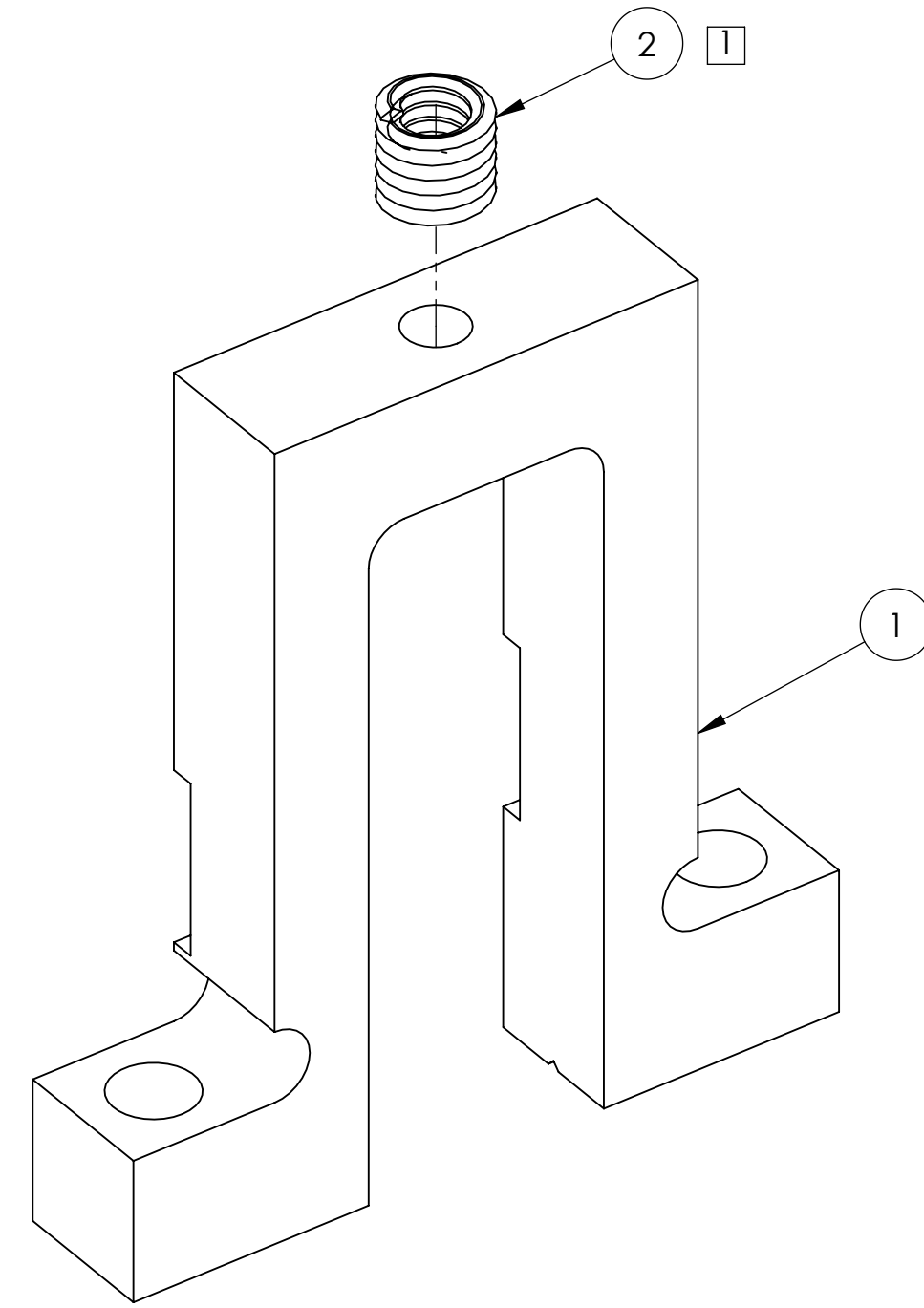
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
3	91944A028 McMASTER-CARR OR EQ.	LEVELING WASHER, 1/4" SCREW SIZE	18-8 SSSL	4
2	C-2032-N UC COMPONENTS OR EQ.	SHCS, 1/4-20 x 2" L, 18-8 SSSL	18-8 SSSL	4
1	D1100785-375	WASHER, FLAT, .25 X .375 O.D.	NITRONIC 60	4

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SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 6 OF 23

D060375 @ LIGO SJS, Q14AD, UJ MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-060, DRAWING PDM REV. X-004

ASSY. STEP 6: HELICOIL BLADE TIP STOPS (4 OFF)

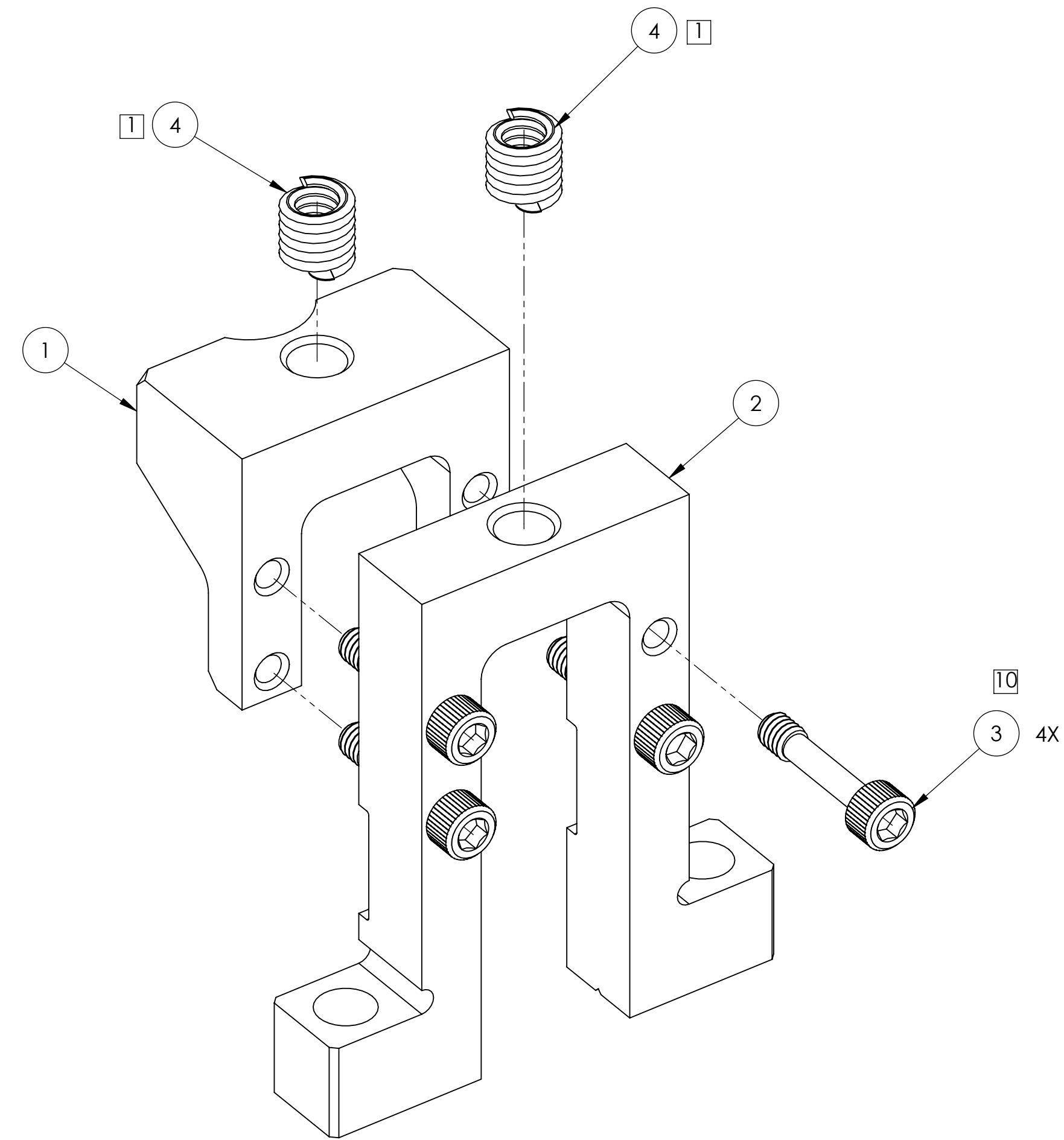


**ISO VIEW, FRONT RIGHT
(PARTIAL)**

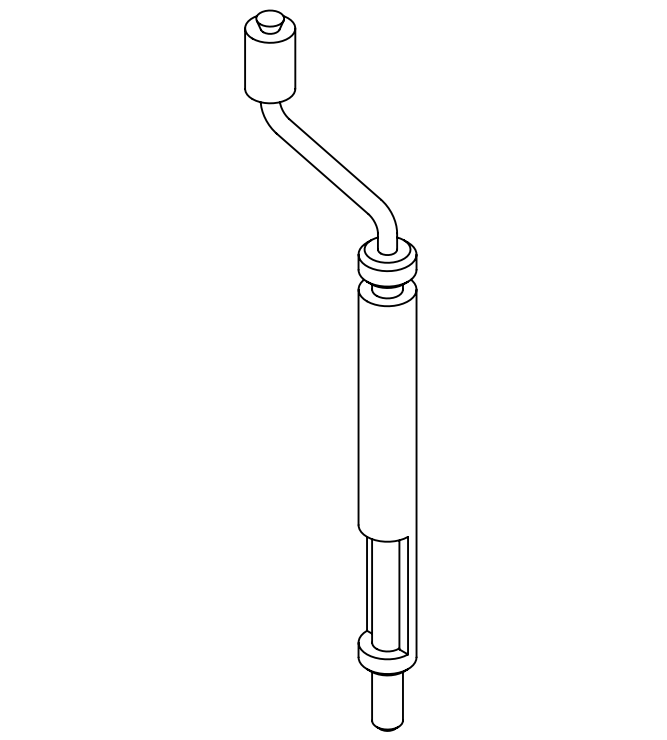
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
2	1185-4EN375 EMHART OR EQ.	HELICOIL, 1/4-20 X .375 LG.	NITRONIC 60	4
1	D060399	gLIGO, SUS, QUAD TOP MASS N-PTYPE, STOP BRIDGE	6061-T6 Al	4
PARTS LIST				

OR

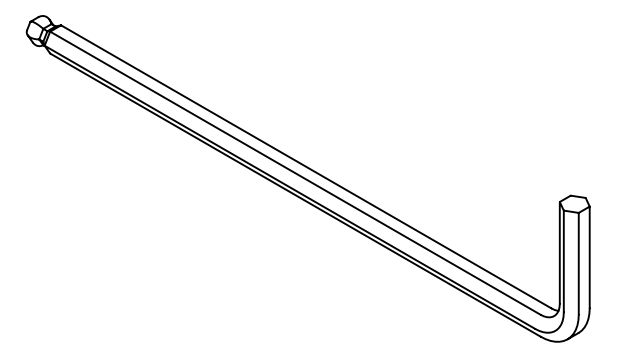
MAIN CHAIN ONLY
(USED ONLY WITH ALTERNATE BRD MT. METHODS #2 AND #3, SEE LIGO D1500228 FOR REFERENCE)



ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
4	1185-4EN375 EMHART OR EQ.	HELICOIL, 1/4-20 X .375 LG.	NITRONIC 60	21
3	95966A332 McMASTER-CARR OR EQ.	SCREW, SHC, 8-32 X .75 LG. (CAPTIVE)	18-8 SSSL	4
2	D1500224-102	QUAD, SUS, UIM STOP BRIDGE (REDESIGNED)	6061-T6 Al	1
1	D1500224-101	QUAD, SUS, UIM STOP BRIDGE, INNER ADAPTER	6061-T6 Al	1
PARTS LIST				



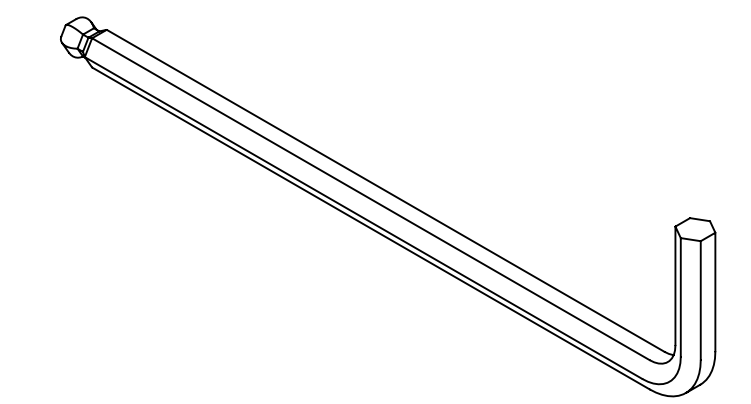
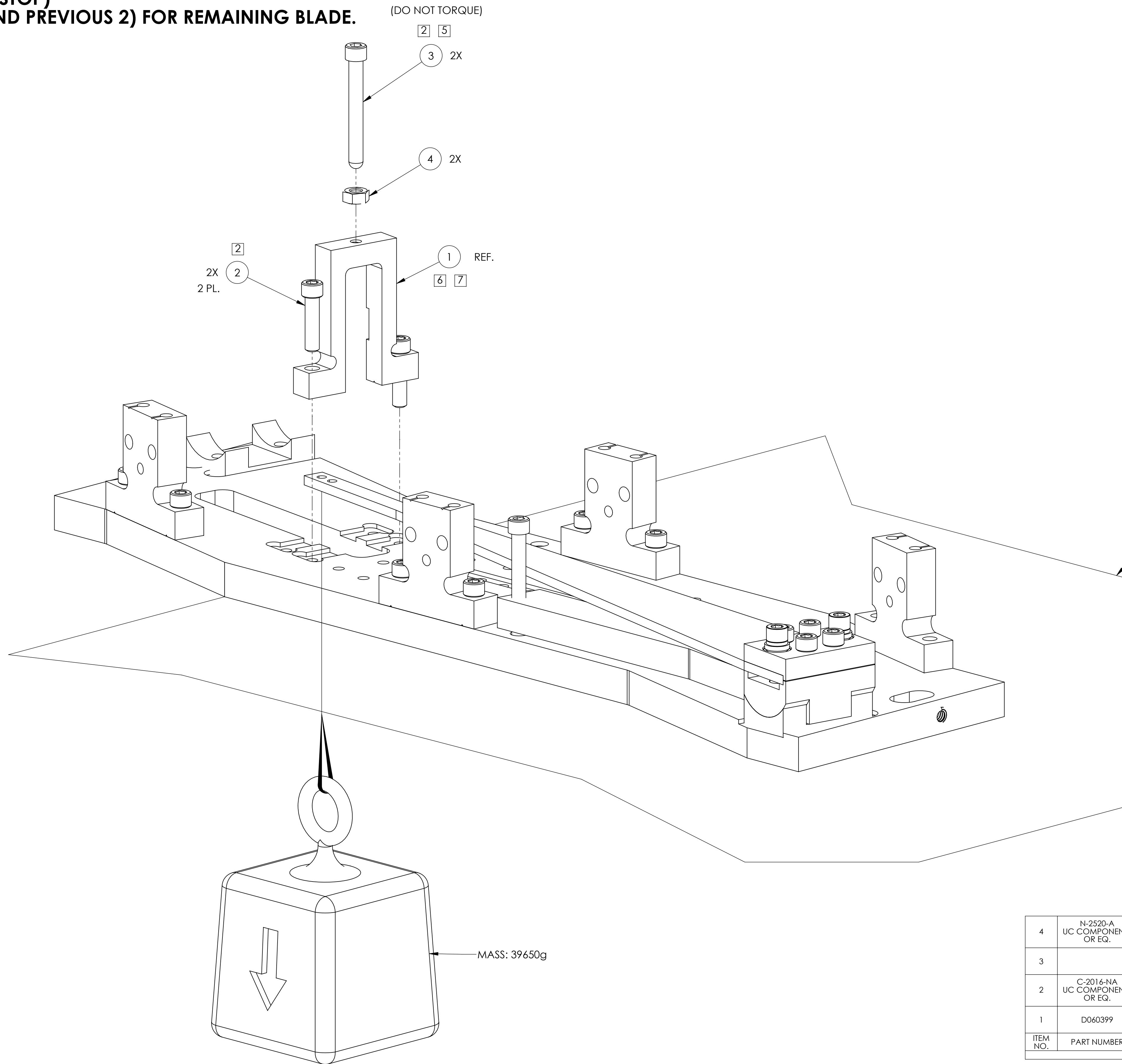
1 1 USE 1/4 HELICOIL INSERTION TOOL



10 USE STANDARD 9/64" HEX L ALLEN WRENCH

**ASSY. STEP 7: PULL BLADE DOWN FLAT AND INSTALL BLADE TIP STOP.
 (NOTE POSITION OF STOP)
 REPEAT THIS STEP (AND PREVIOUS 2) FOR REMAINING BLADE.**

(DO NOT TORQUE)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
 TORQUE TO 10 FT / LB.

TABLE
 (SHOWN FOR REF.)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
4	N-2520-A UC COMPONENTS OR EQ.	HEX NUT, 1/4-20 UNC, Ag PLATED	304, 316 OR 302 SSSL	2
3		SCREW, SHC, 1/4-20 X 2.00, ROUNDED END	300 SSSL	2
2	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	4
1	D060399	gLIGO, SUS, QUAD TOP MASS N-PTYPE, STOP BRIDGE	6061-T6 Al	2

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SIZE DWG. NO. REV.
D D060375 v7

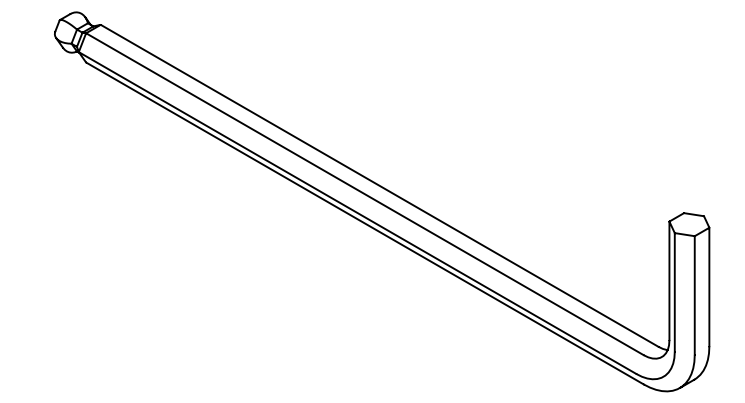
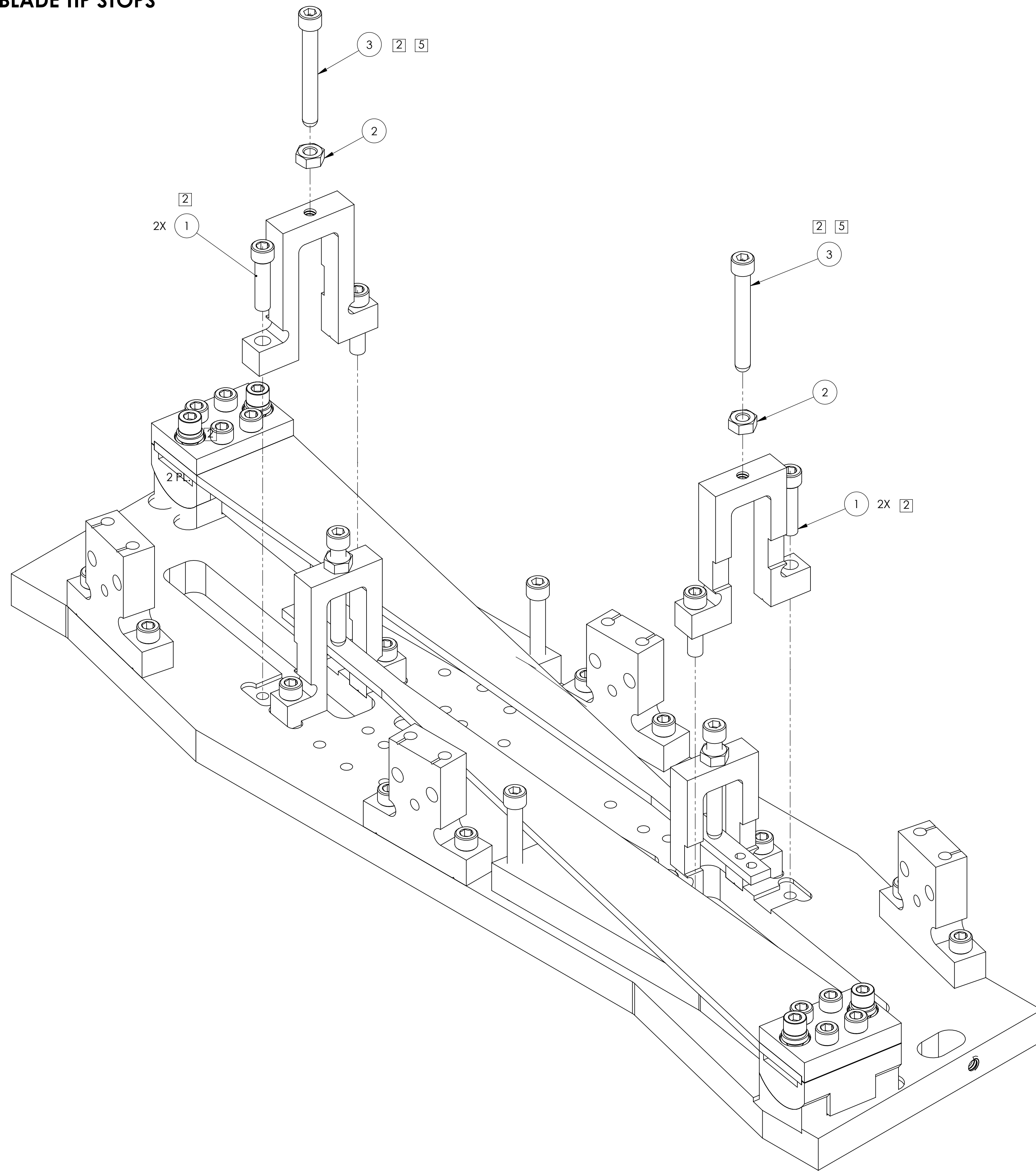
SCALE: 1:1 PROJECTION: SHEET 8 OF 23

- 7 15mm - FROM TOP CUT IN STOP BRIDGE TO BLADE
- 6 USE 5mm BLOCK TO SET BLADE ANGLE TO STOP BRIDGE SIDE TO SIDE
- 5 ITEM NO. 3 ROUND TIP TO TOUCH BLADE.

ISO VIEW, FRONT RIGHT

D060375 gLIGO SUS QUAD TOP MASS MAIN AND REACTION CHAIN ASSY PART PDM REV X-060 DRAWING PDM REV X-004

ASSY. STEP 8: ADD SECONDARY BLADE TIP STOPS



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.

ISO VIEW, FRONT RIGHT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	Qty.
3		SCREW, SHC, 1/4-20 X 2.00 , ROUNDED END	300 SSSL	2
2	N-2520-A UC COMPONENTS OR EQ.	HEX NUT, 1/4-20 UNC, Ag PLATED	304, 316 OR 302 SSSL	2
1	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	4
				Assy. Step 8/QTY.

PARTS LIST

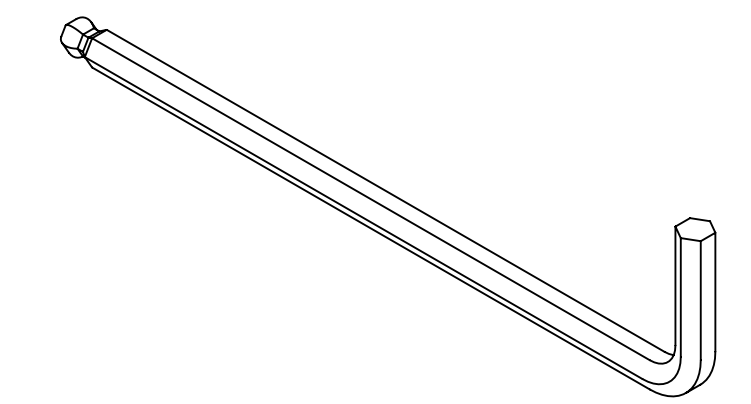
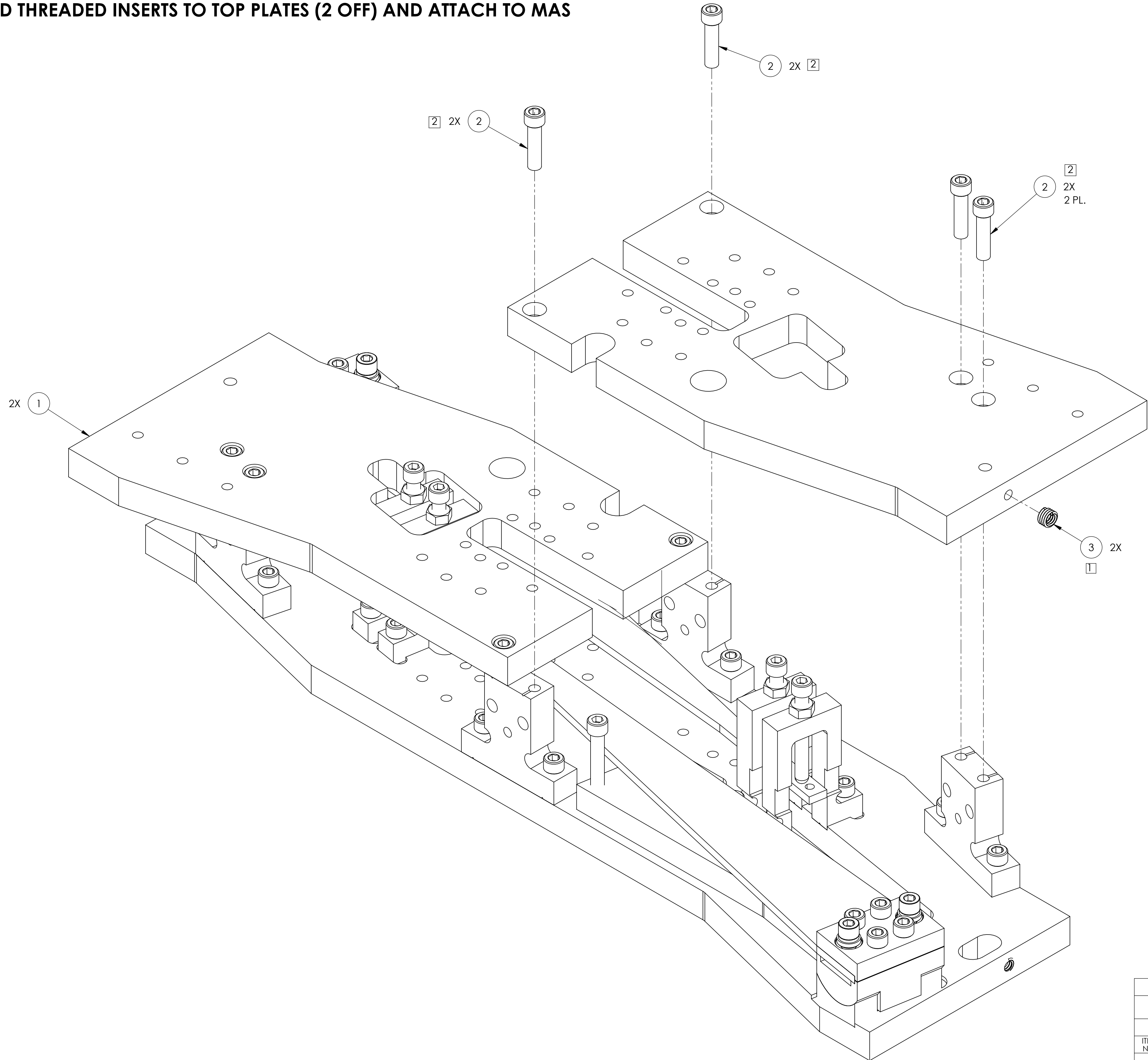
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SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 9 OF 23

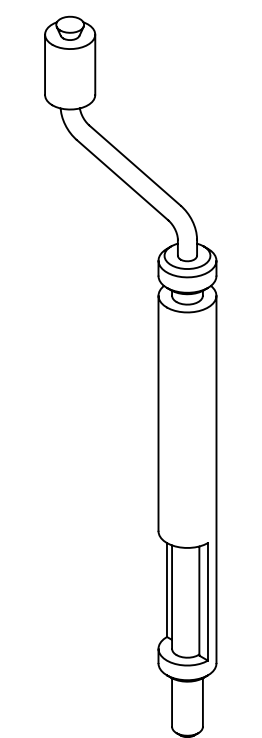
5 ITEM NO. 3 ROUND TIP TO TOUCH BLADE.

D060375 d1G0 S15 Q1A4D. 01 MASS MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-060. DRAWING PDM REV. X-004

ASSY. STEP 9: ADD THREADED INSERTS TO TOP PLATES (2 OFF) AND ATTACH TO MAS



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.



1 USE 1/4 HELICOIL INSERTION TOOL

ISO VIEW, FRONT RIGHT

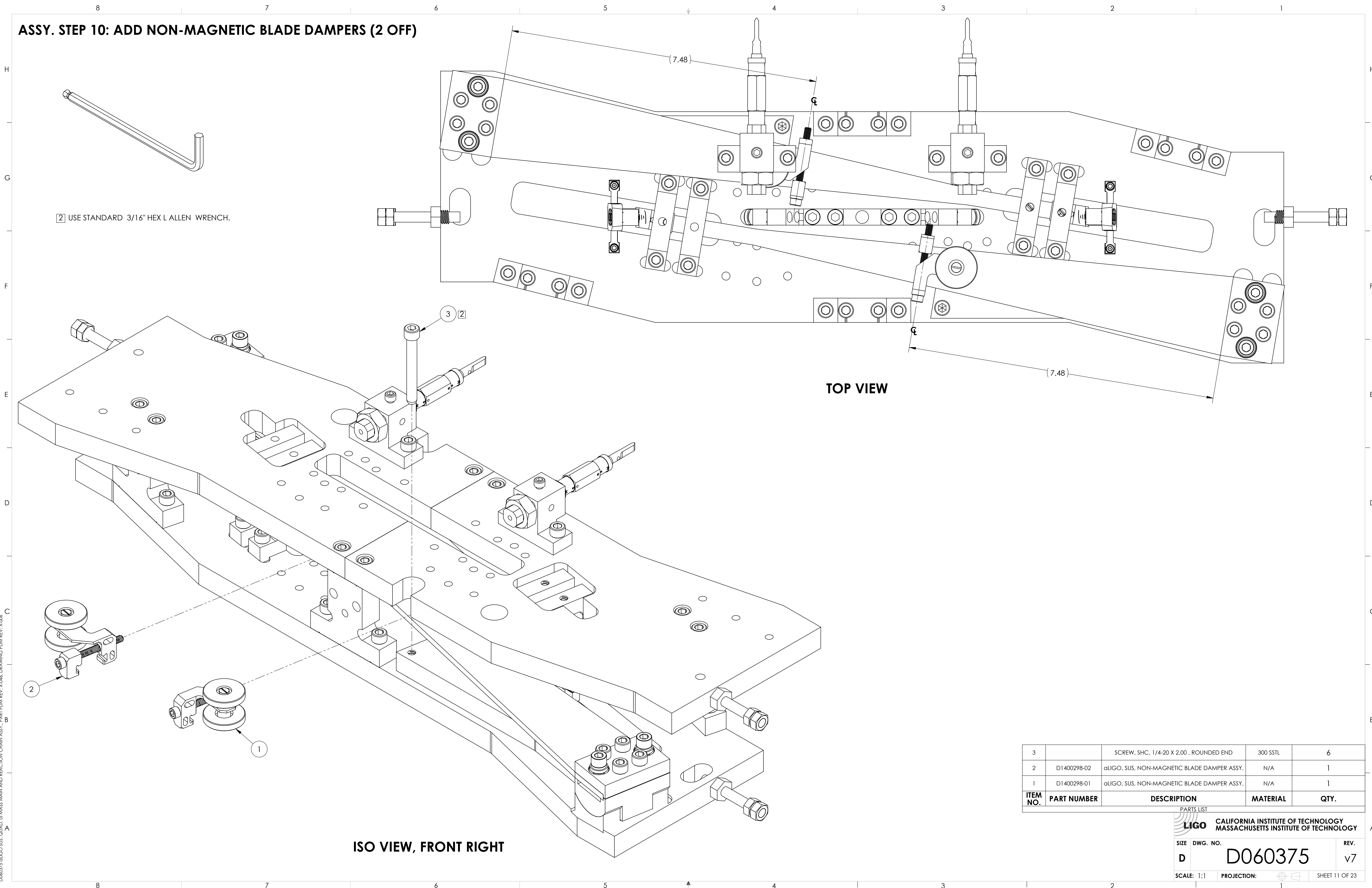
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
3	1185-4EN250 EMHART OR EQ. C-2016-NA UC COMPONENTS OR EQ.	HELICOIL, 1/4-20 X .25 LG.	NITRONIC 60	2
2		SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 S3TL	8
1	D060382	gLIGO, SUS, QUAD N-PTYPE UI MASS, UI MASS TOP PLATE	6061-T6 Al	2

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SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 10 OF 23

D060375 gLIGO SUS, QUAD N-PTYPE UI MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-360, DRAWING PDM REV. X-004

ASSY. STEP 10: ADD NON-MAGNETIC BLADE DAMPERS (2 OFF)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.

TOP VIEW

ISO VIEW, FRONT RIGHT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
3		SCREW, SHC, 1/4-20 X 2.00 , ROUNDED END	300 SSSL	6
2	D1400298-02	αLIGO, SUS, NON-MAGNETIC BLADE DAMPER ASSY.	N/A	1
1	D1400298-01	αLIGO, SUS, NON-MAGNETIC BLADE DAMPER ASSY.	N/A	1

PARTS LIST

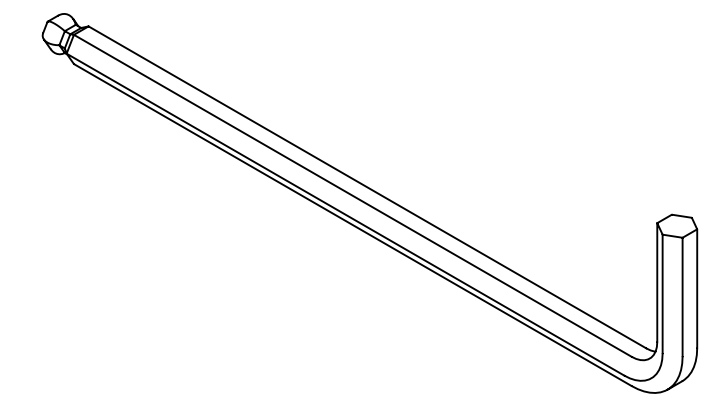
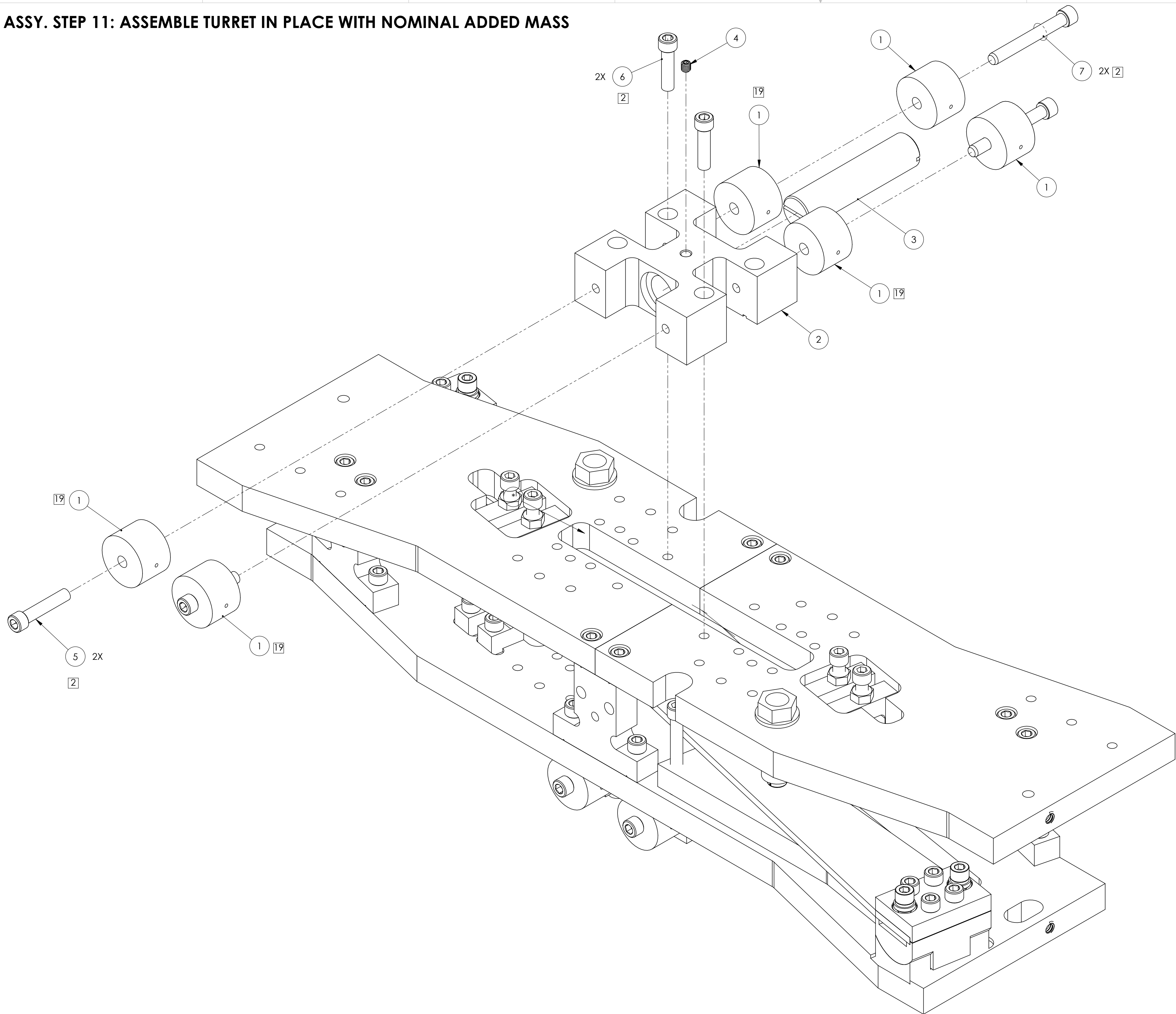
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SIZE DWG. NO. **D060375** REV. **v7**

SCALE: 1:1 PROJECTION: SHEET 11 OF 23

D060375 αLIGO SUS QUAD. W/ MASS MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-046. DRAWING PDM REV. X-004.

ASSY. STEP 11: ASSEMBLE TURRET IN PLACE WITH NOMINAL ADDED MASS



2 USE STANDARD 3/16" HEX L ALLEN WRENCH. TORQUE TO 10 FT / LB.

19 ADD 100g WEIGHTS ONLY. DO NOT USE 200g WEIGHTS AS THESE INTERFERE WITH THE PITCH ADJUSTER

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
7	C-2032-NA UC COMPONENTS OR EQ.	SHCS, 1/4-20 x 2" LG., Ag PLATED	Ag-PLATED 300 SSSL	2
6	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	2
5	C-2020-N UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1-1/4, 18-8 SST	Ag-PLATED 300 SSSL	2
4	92158A367 McMASTER-CARR OR EQ.	SET SCREW 10-32 X .187 LG	316 SSSL	1
3	D1101080	QUAD UIM PITCH ADJUSTER	316 SSSL	1
2	D1101079	QUAD UIM PITCH ADJUSTER TURRET, αLIGO SUS	6061-T6 Al	1
1	D060359-100	MASS, αLIGO SUS	316 SSSL	6

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SIZE DWG. NO. **D060375** REV. **v7**

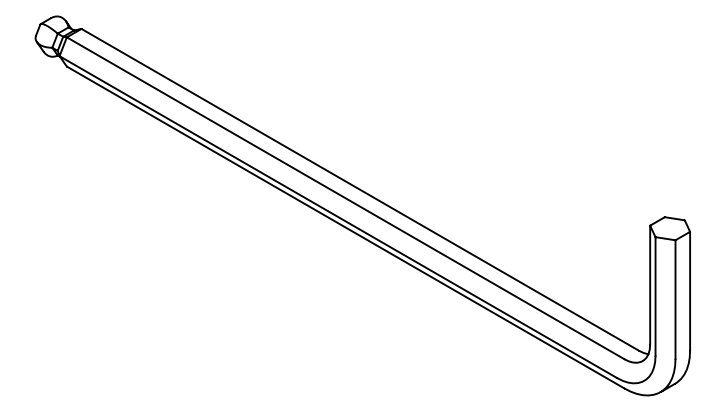
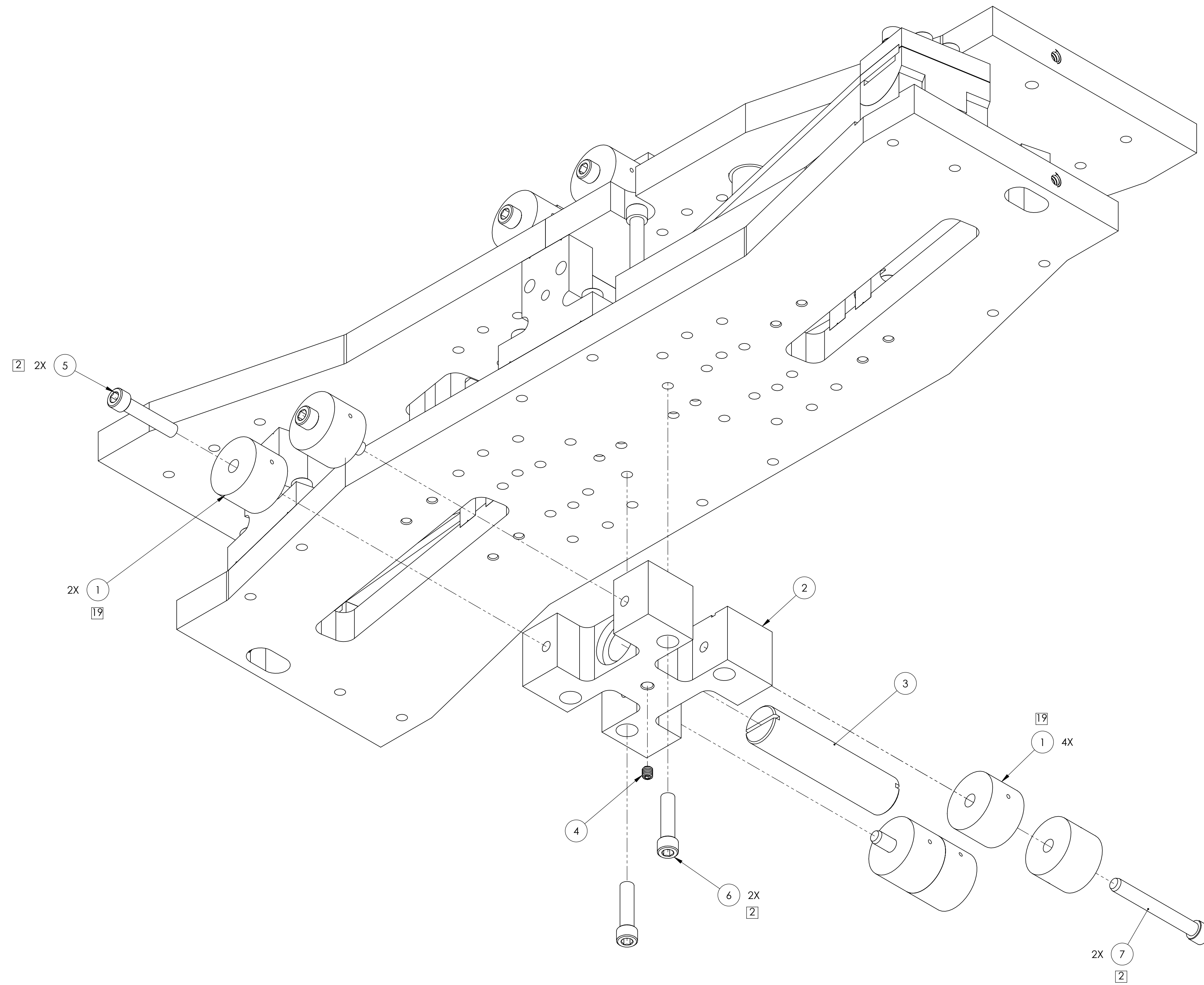
SCALE: 1:1 PROJECTION: SHEET 12 OF 23

REACTION CHAIN MASS

ISO VIEW, FRONT RIGHT

D060375 αLIGO SUS, QUAD. UIM PITCH ADJUSTER AND REACTION CHAIN ASSY. PART PDM REV. X-060. DRAWING PDM REV. X-004

ASSY. STEP 12: ASSEMBLE BOTTOM TURRET AND MASS



2 USE STANDARD 3/16" HEX L ALLEN WRENCH. TORQUE TO 10 FT / LB.

19 ADD 100g WEIGHTS ONLY. DO NOT USE 200g WEIGHTS AS THESE INTERFERE WITH THE PITCH ADJUSTER

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
7	C-2032-NA UC COMPONENTS OR EQ.	SHCS, 1/4-20 x 2" LG., Ag PLATED	Ag-PLATED 300 SSSL	2
6	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	2
5	C-2020-N UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1-1/4, 18-8 SST	Ag-PLATED 300 SSSL	2
4	92158A367 McMASTER-CARR OR EQ.	SET SCREW 10-32 X .187 LG	316 SSSL	1
3	D1101080	QUAD UIM PITCH ADJUSTER	316 SSSL	1
2	D1101079	QUAD UIM PITCH ADJUSTER TURRET, αLIGO SUS	6061-T6 AI	1
1	D060359-100	MASS, αLIGO SUS	316 SSSL	6

REACTION CHAIN MASS

ISO VIEW, FRONT RIGHT (UNDERSIDE)

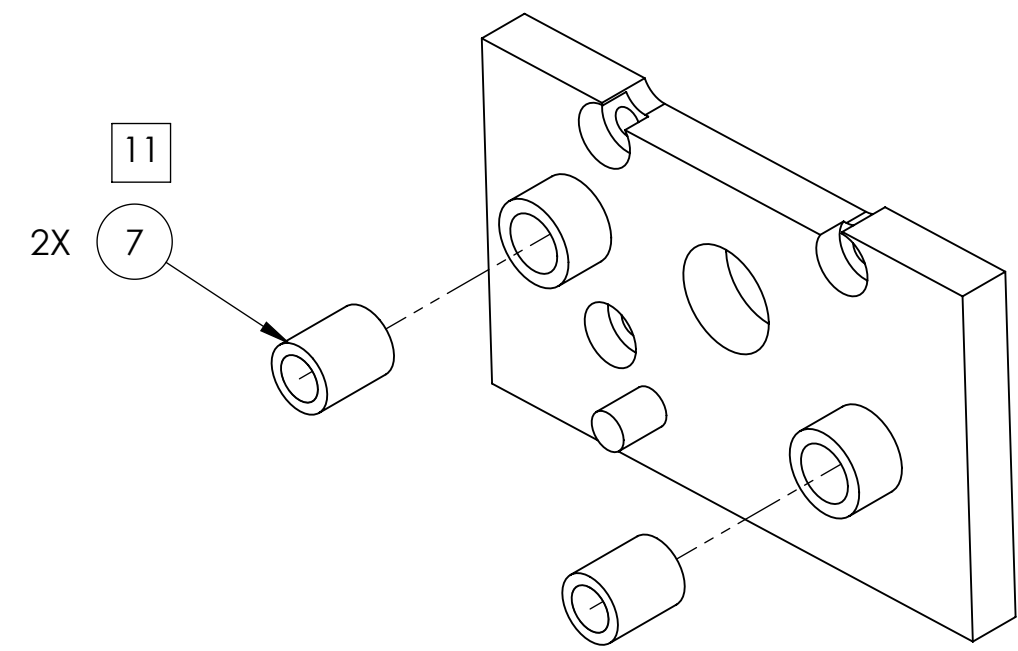
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 MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE DWG. NO. **D060375** REV. **v7**

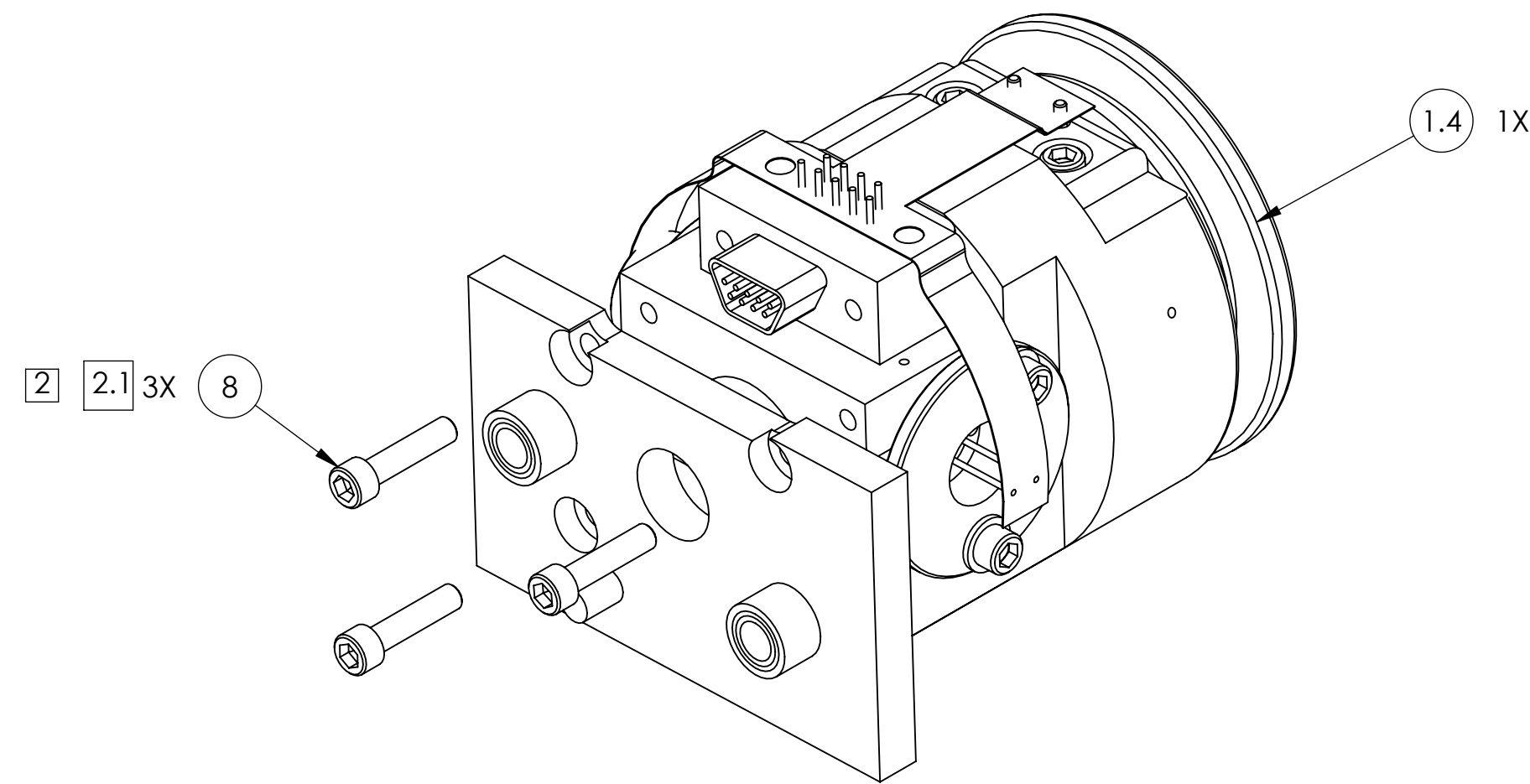
SCALE: 1:1 PROJECTION: SHEET 13 OF 23

D060375 αLIGO SUS, QUAD. UIM PITCH ADJUSTER AND REACTION CHAIN ASSY. PART PDM REV. X-060. DRAWING PDM REV. X-004.

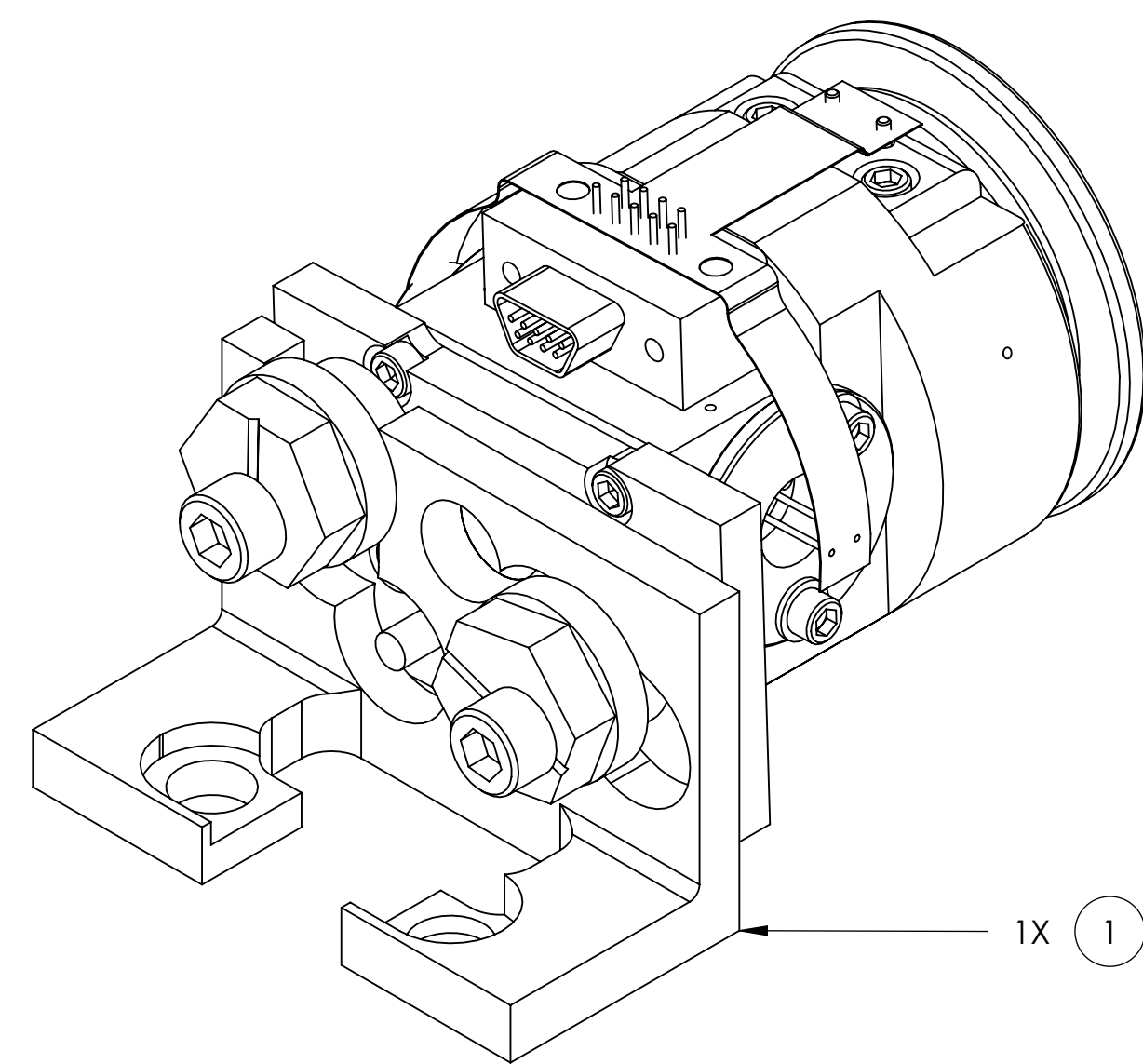
ASSY. STEP 13: ASSEMBLE OSEMS ONTO ADJUSTERS (4 OFF)



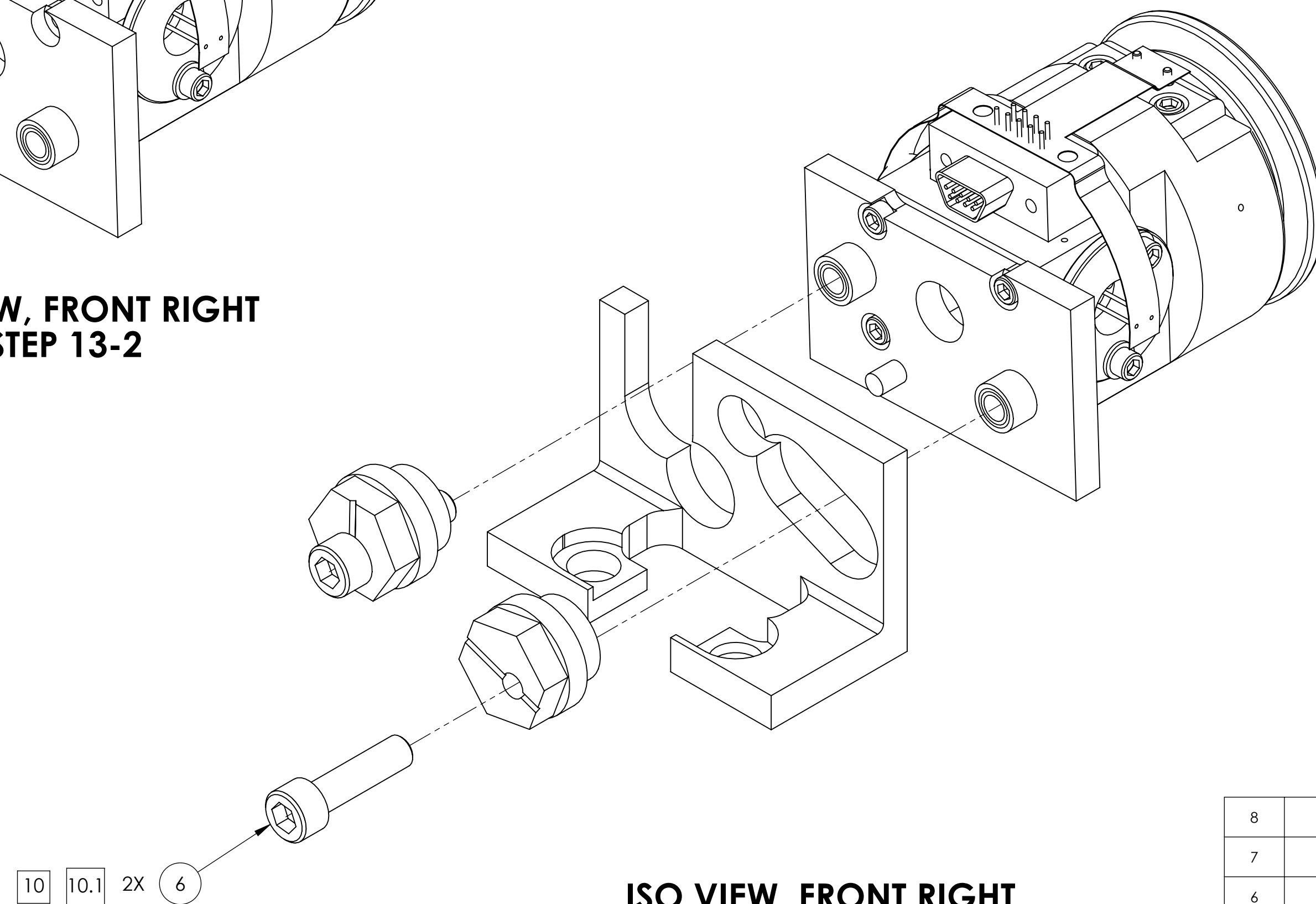
ISO VIEW, FRONT RIGHT
STEP 13-1



ISO VIEW, FRONT RIGHT
STEP 13-2



ISO VIEW, REAR - LEFT
(ASSEMBLED)



ISO VIEW, FRONT RIGHT
STEP 13-3

11 USE #8 HELICOIL INSERTION TOOL

2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
2.1 NIP UP TIGHT.

10 USE STANDARD 9/64" HEX L ALLEN WRENCH.
10.1 FINGER TIGHT.

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ
8	92185A079	SHCS 2-56 X 3/8" LG.	316 SSTL	3
7	1185-2EN	HELICOIL INSERT 8-32 NITRONIC 60	NITRONIC 60	2
6	92185A196	SHCS 8-32 X 5/8" LG	316 SSTL	2
5	OSEM CORE	UIM OSEM CORE B'HAM TO SUPPLY	N/A	1
4	D060336	ALIGO, SUS, Penre MASS Quad N-Ptype, 2MM CAM, OSEM ADJUSTER	/N/A	2
3	D060389	ADJUSTER UI MASS OSEM MOUNT, αLIGO SUS	6061-T6 Al	1
2	D060388	αLIGO SUS, BRACKET, UI MASS OSEM MOUNT	6061-T6 Al	1
1	D060387	αLIGO SUS, UIM OSEM MOUNT	N/A	1

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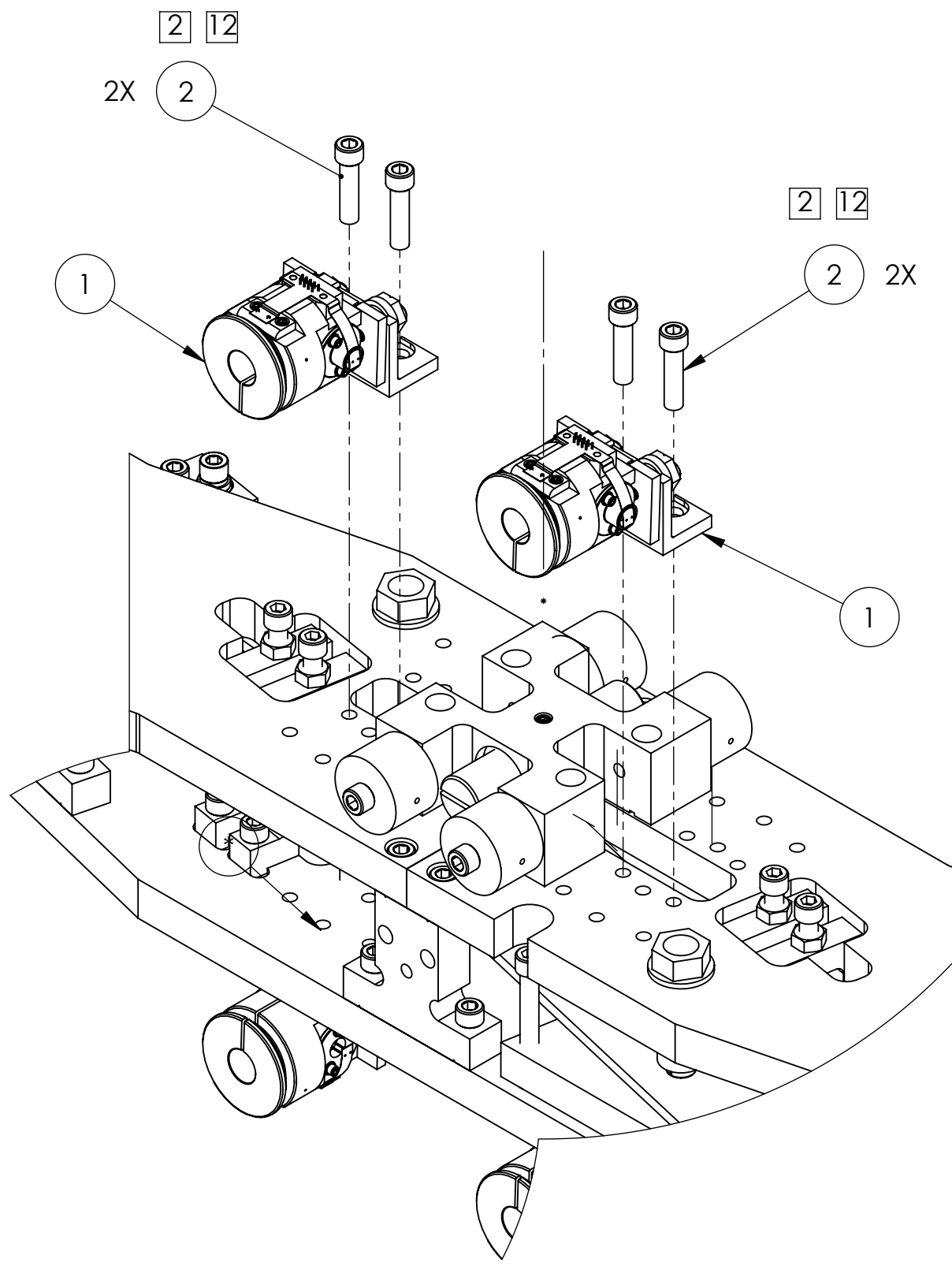
SIZE DWG. NO. REV.
D D060375 v7

SCALE: 2:1 PROJECTION: SHEET 14 OF 23

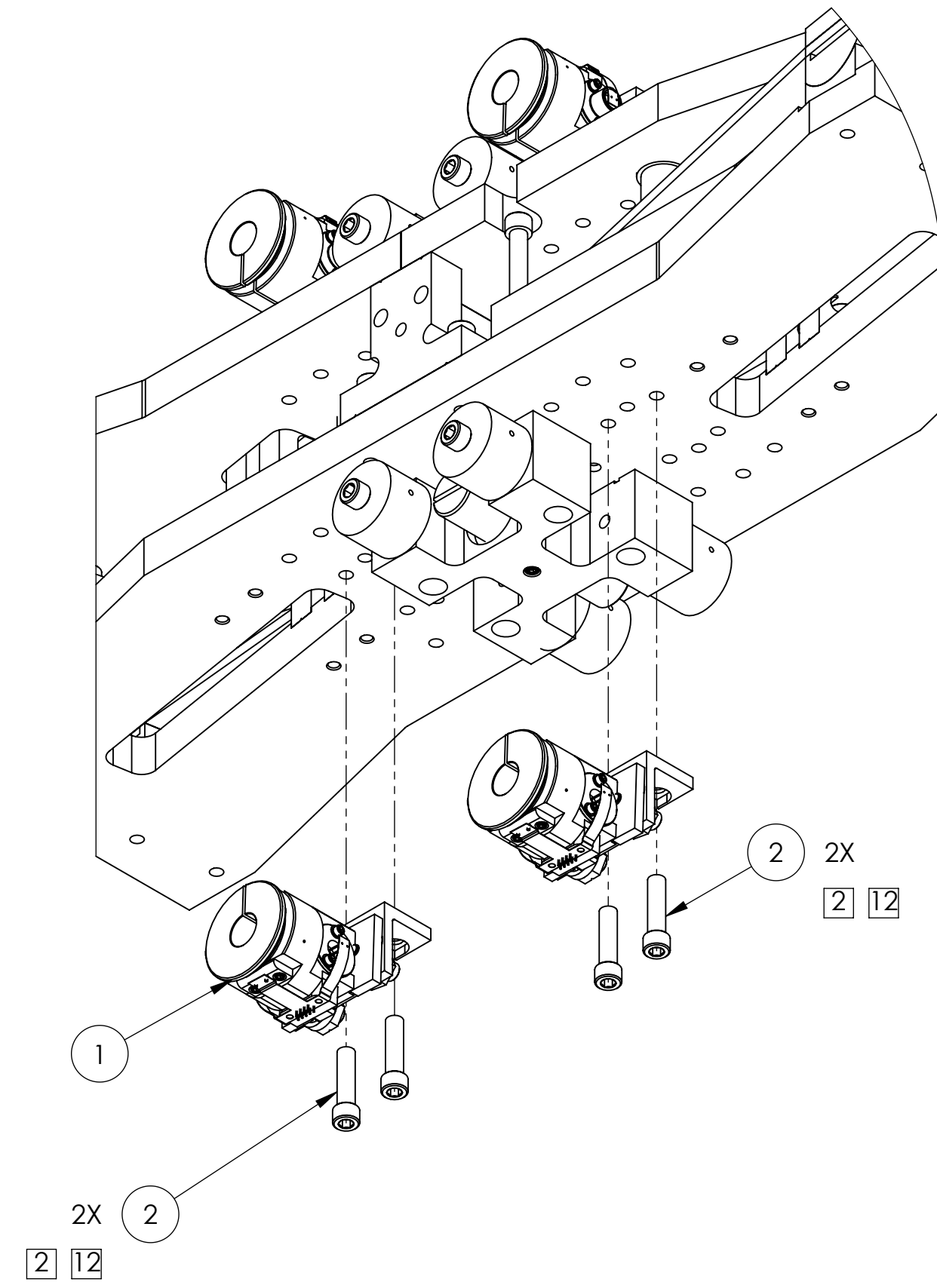
REACTION CHAIN MASS ONLY

D060375 αLIGO SUS, Q1AD, UI MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-060, DRAWING PDM REV. X-004

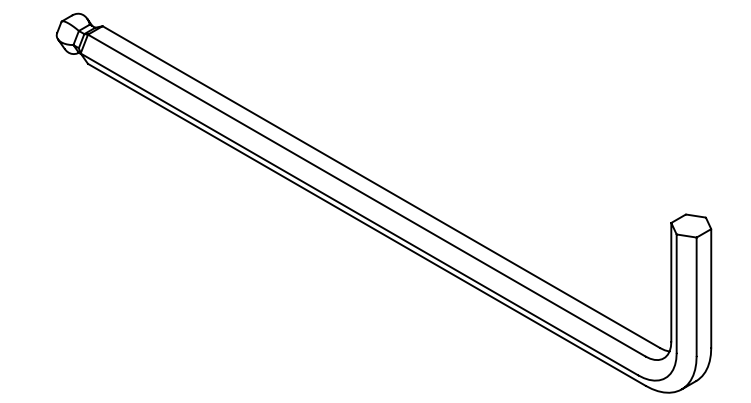
ASSY. STEP 14: ASSEMBLE ALL OSEMS AND COUNTER WEIGHTS TO MASS



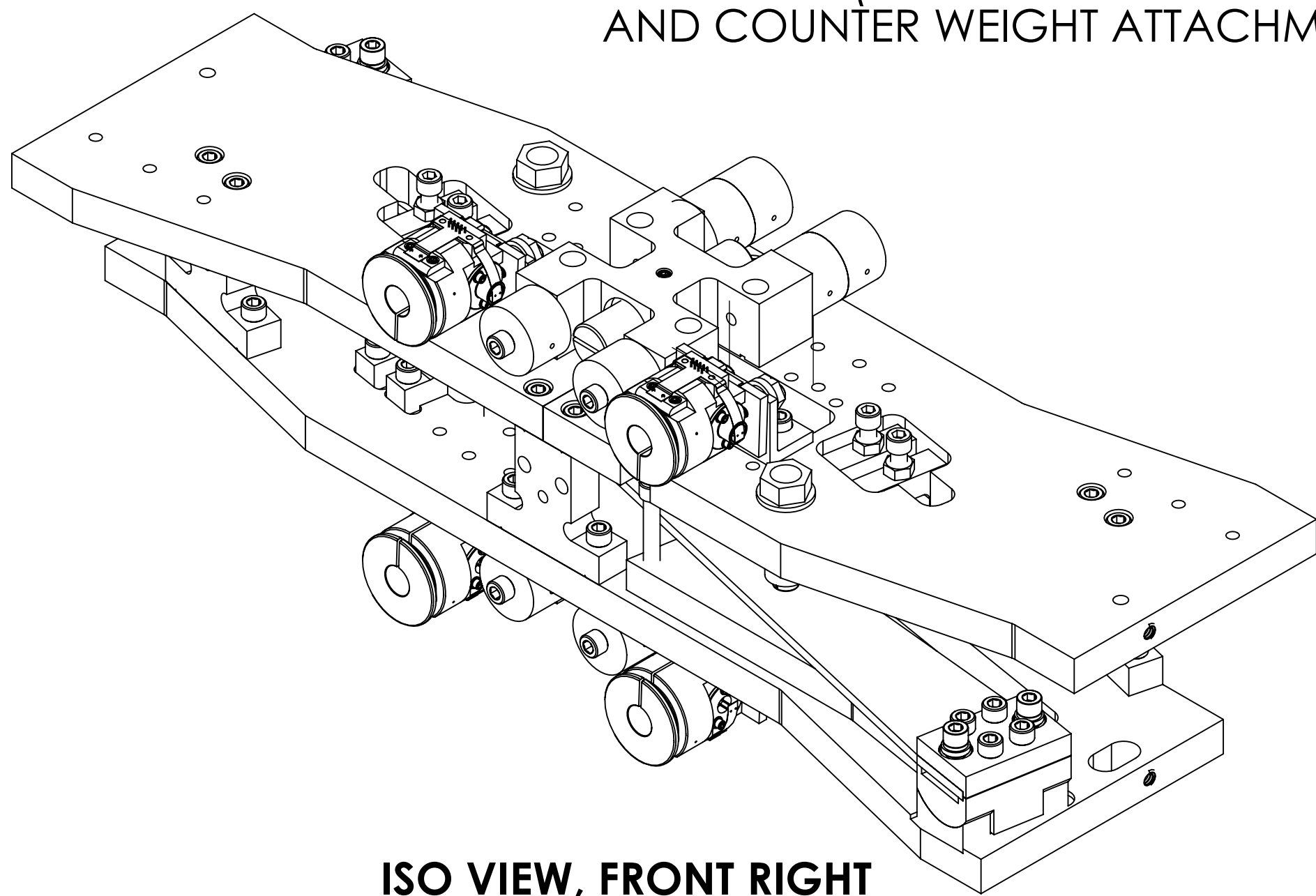
ISO VIEW, FRONT RIGHT
(PARTIAL VIEW SHOWING OSEM
AND COUNTER WEIGHT ATTACHMENT TO TOP OF MASS)



ISO VIEW, REAR LEFT
(PARTIAL VIEW SHOWING OSEM
AND COUNTER WEIGHT ATTACHMENT TO BOTTOM OF MASS)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.
12 INDICATED HARDWARE SUPPLIED AS PART OF
ITEM NO. 2



ISO VIEW, FRONT RIGHT
(ASSEMBLED)

REACTION CHAIN MASS ONLY

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
2	G-2016-NA UC COMPONENTS OR EQ.	SSHC, 1/4-20 X 1.0 Lg., Ag PLATED	Ag PLATED 300 SSSL	8
1	D060387	ALIGO SUS. UIM OSEM MOUNT	N/A	4

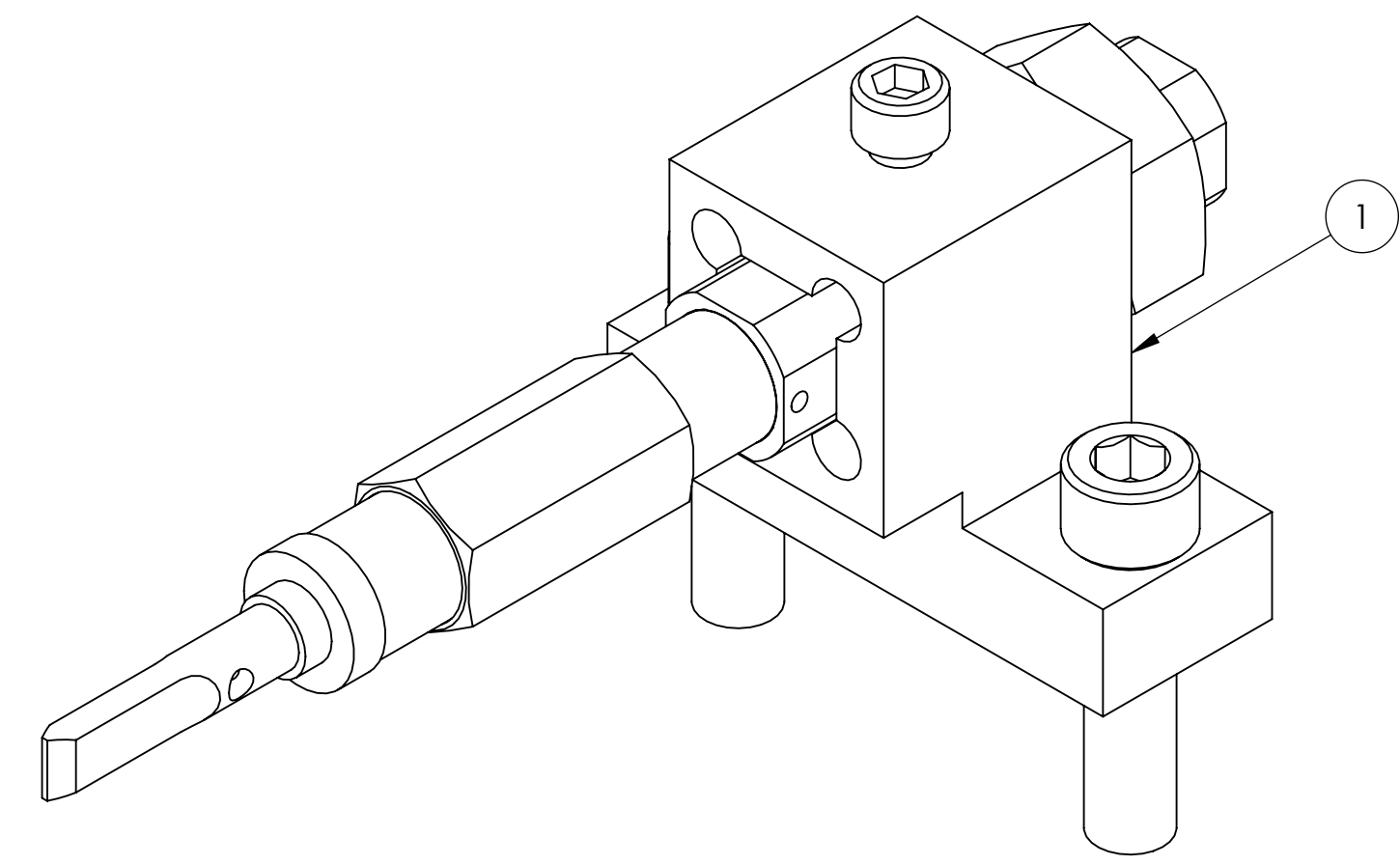
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE DWG. NO. **D060375** REV. **v7**

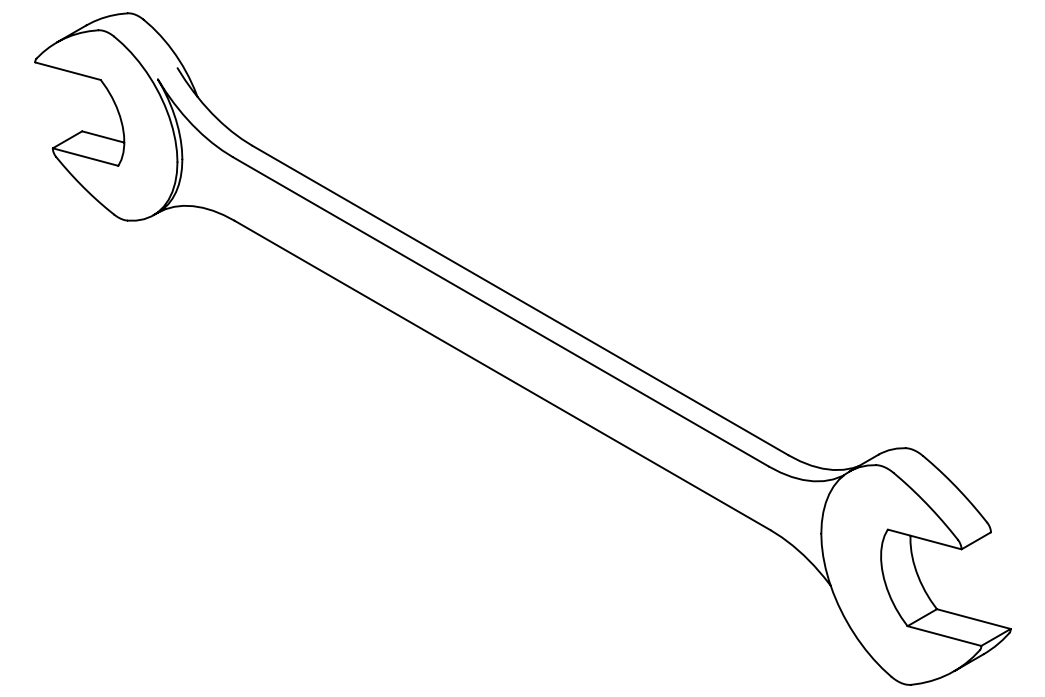
SCALE: 1:2 PROJECTION: SHEET 15 OF 23

D060375 ALIGO SUS. QUAD. UIM MASS MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-060. DRAWING PDM REV. X-004.

ASSY. STEP 15: ASSEMBLE FLAG ASSEMBLY (4 OFF)



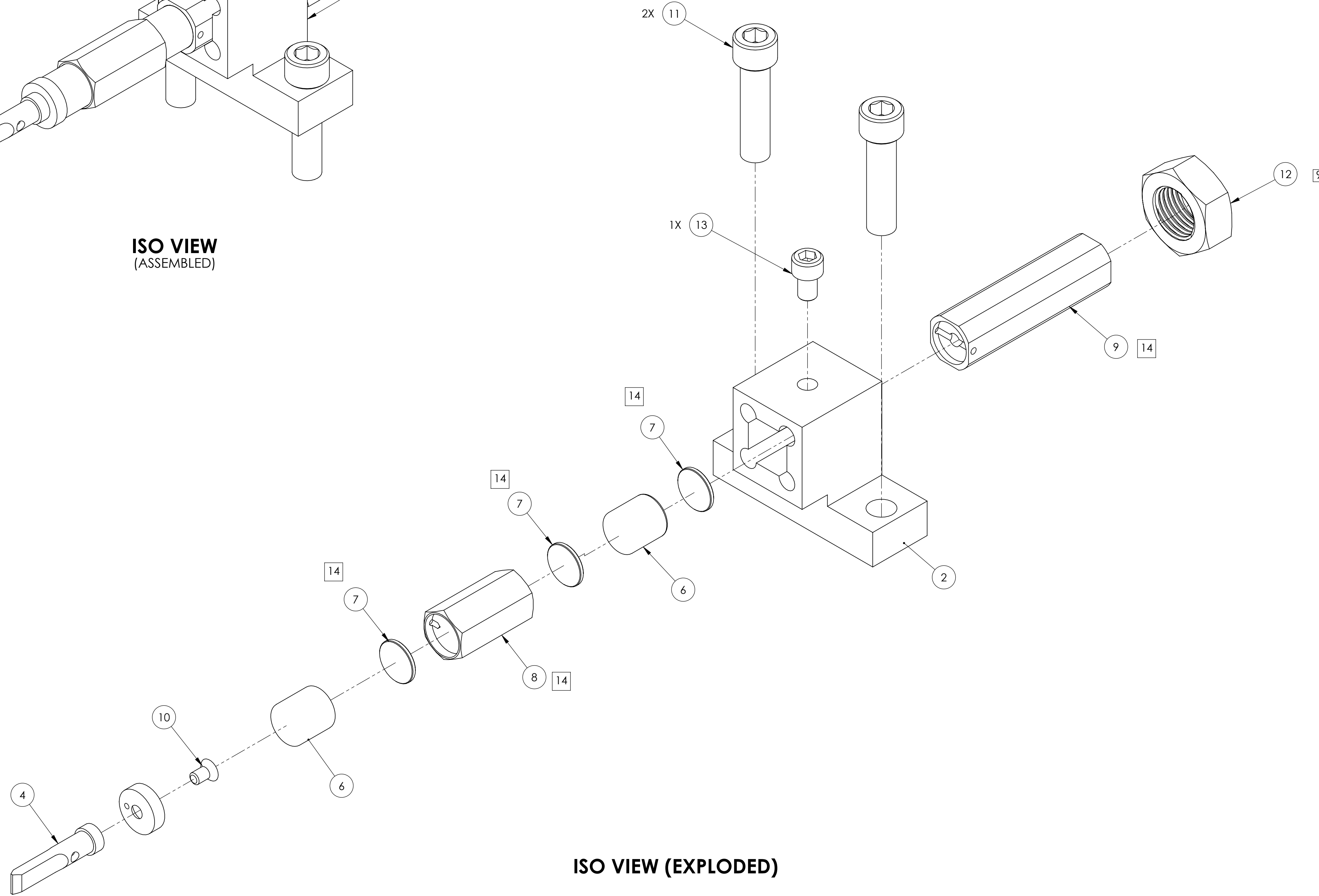
ISO VIEW
(ASSEMBLED)



9 USE STANDARD 1/2" OPEN END WRENCH.
LEAVE LOOSE

13 ITEM NO. 2 THRU ITEM NO. 13, ASSEMBLED AS
PART OF ITEM NO.1

14 PRESS MAGNETIC PLUGS (ITEM NO. 7), INTO ITEM
NO. 8 AND ITEM NO. 9, USING A SMALL BENCH
PRESS.



ISO VIEW (EXPLODED)

MAIN CHAIN ONLY

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
13	MSC_08942039	SCREW 8-32 X 1/4 LG. SHCS	316 SSSL	1
12	McMASTER_94805A 224	HEX NUT, 1/2-20	18-8 SSSL	1
11	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	2
10	McMASTER_96877A 198	SCREW, FLAT HEAD 4-40 X 3/16 LG	18-8 SSSL	1
9	D1100939	MAGNET RETAINER, αLIGO SUS	6061-T6 Al	1
8	D060394	SPACER UI MASS MAGNET AND FLAG, αLIGO SUS	6061-T6 Al	1
7	D060401	MAGNET PLUG, αLIGO SUS	416 SSSL	3
6	D0901344	10 MM DIA X 10 MM MAGNET	NEO 35 (NdFeB)	2
5	D1100574	BOSEM FLAT FLAG DISK αLIGO SUS	416 SSSL	1
4	D1100573	BOSEM FLAG , αLIGO SUS	6061-T6 Al	1
3	D1100937	UI MASS MAGNET AND FLAG MOUNT ASSY, αLIGO SUS	N/A	1
2	D1100945	UI MASS FLAG MOUNT, αLIGO SUS	6061-T6 Al	1
1	D1100938	UI MASS FLAG MOUNT ASSY, αLIGO SUS	SEE BOM	1

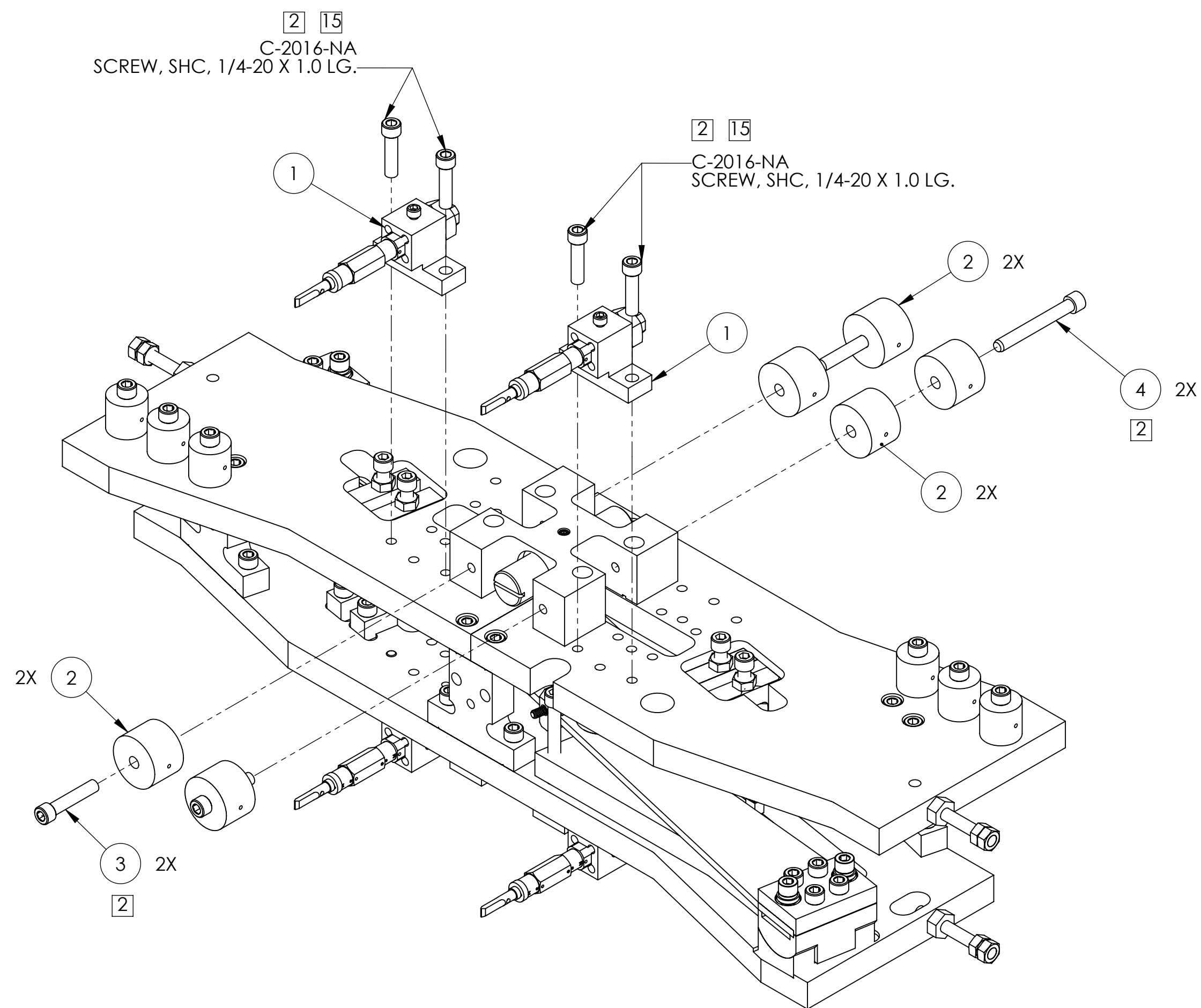
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE DWG. NO. **D060375** REV. **v7**

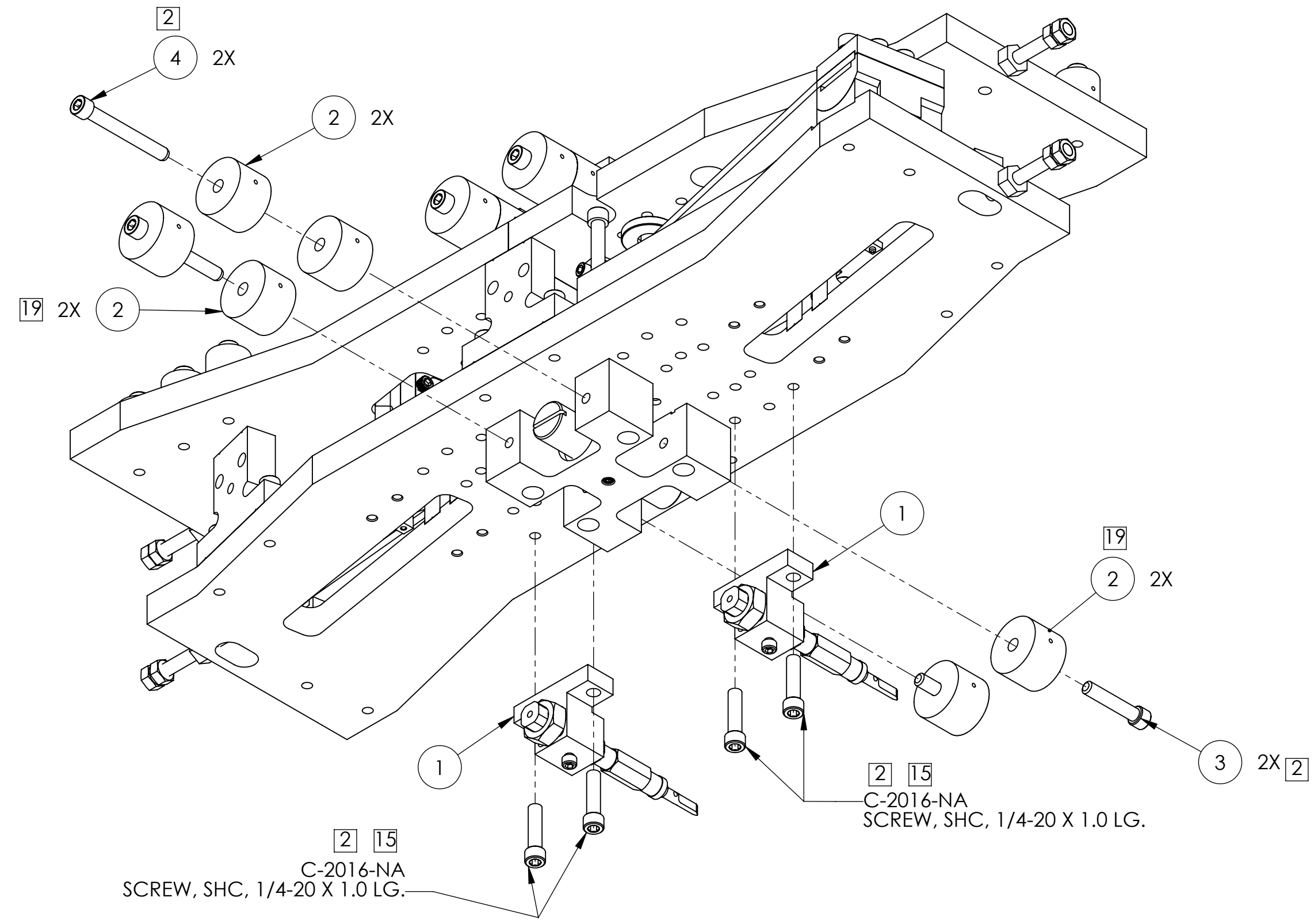
SCALE: 2:1 PROJECTION: SHEET 16 OF 23

D060375 αLIGO SUS, Q14AD, UI MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-002, DRAWING PDM REV. X-004

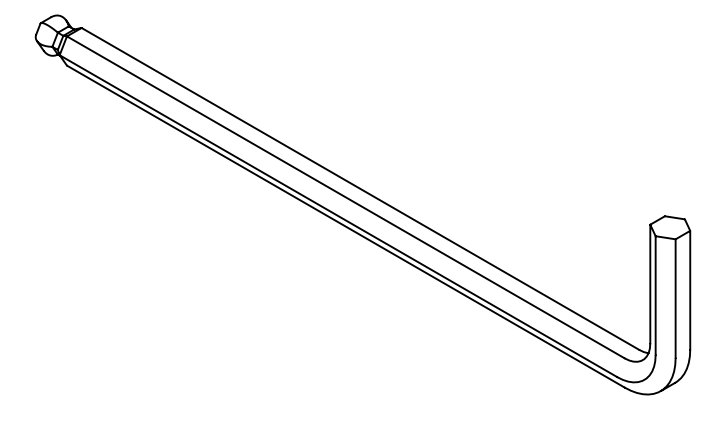
ASSY. STEP 16: ASSEMBLE FLAGS AND COUNTER WEIGHTS TO MASS



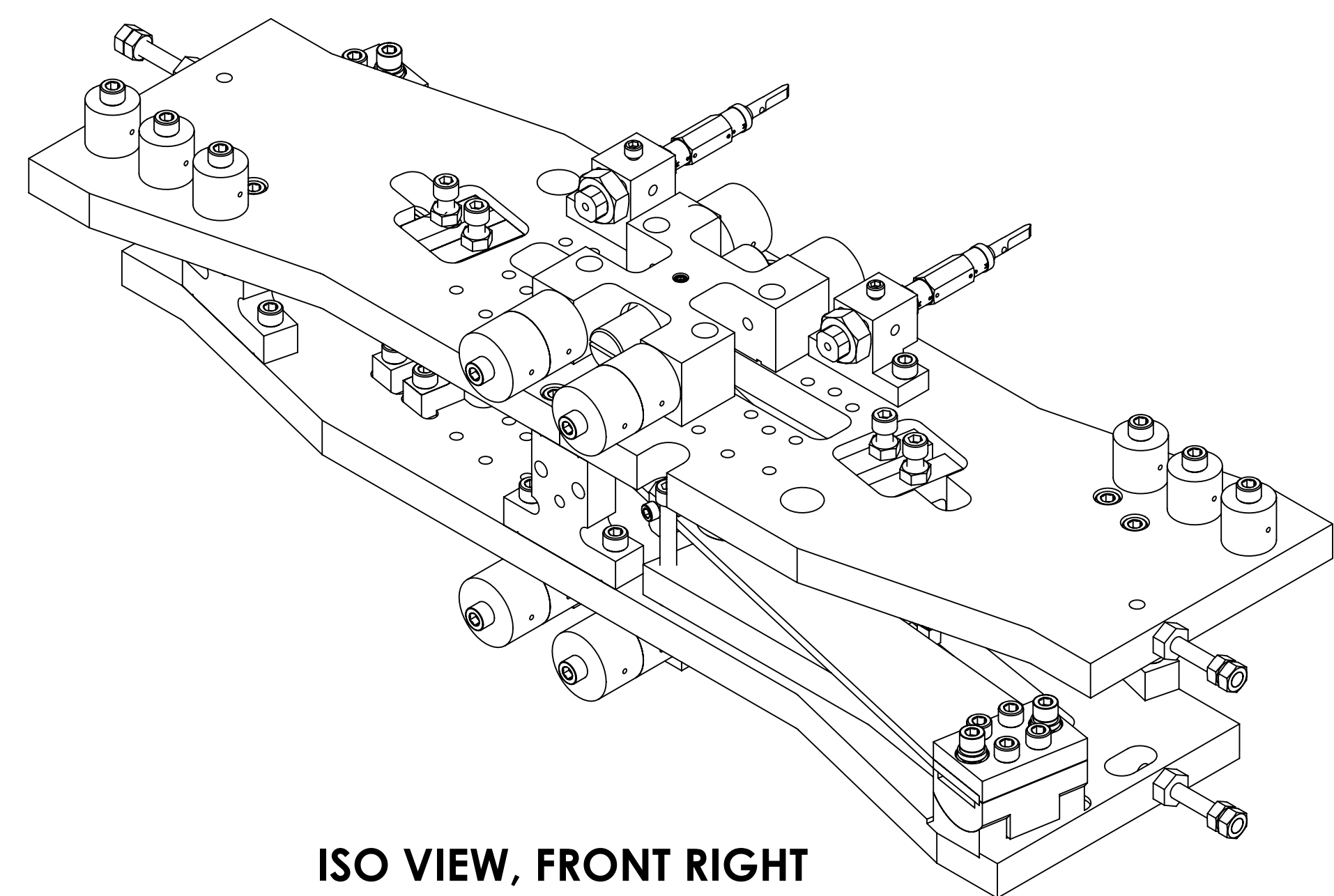
ISO VIEW, REAR LEFT
(PARTIAL VIEW SHOWING FLAGS
AND COUNTER WEIGHT ATTACHMENT TO TOP OF MASS)



ISO VIEW, FRONT RIGHT
(PARTIAL VIEW SHOWING FLAGS
AND COUNTER WEIGHT ATTACHMENT TO BOTTOM OF MASS)



- 2 USE STANDARD 3/16" HEX L ALLEN WRENCH. TORQUE TO 10 FT / LB.
- 15 INDICATED HARDWARE SUPPLIED AS PART OF ITEM NO. 2
- 19 ADD 100g WEIGHTS ONLY. DO NOT USE 200g WEIGHTS AS THESE INTERFERE WITH THE PITCH ADJUSTER



ISO VIEW, FRONT RIGHT

MAIN CHAIN ONLY

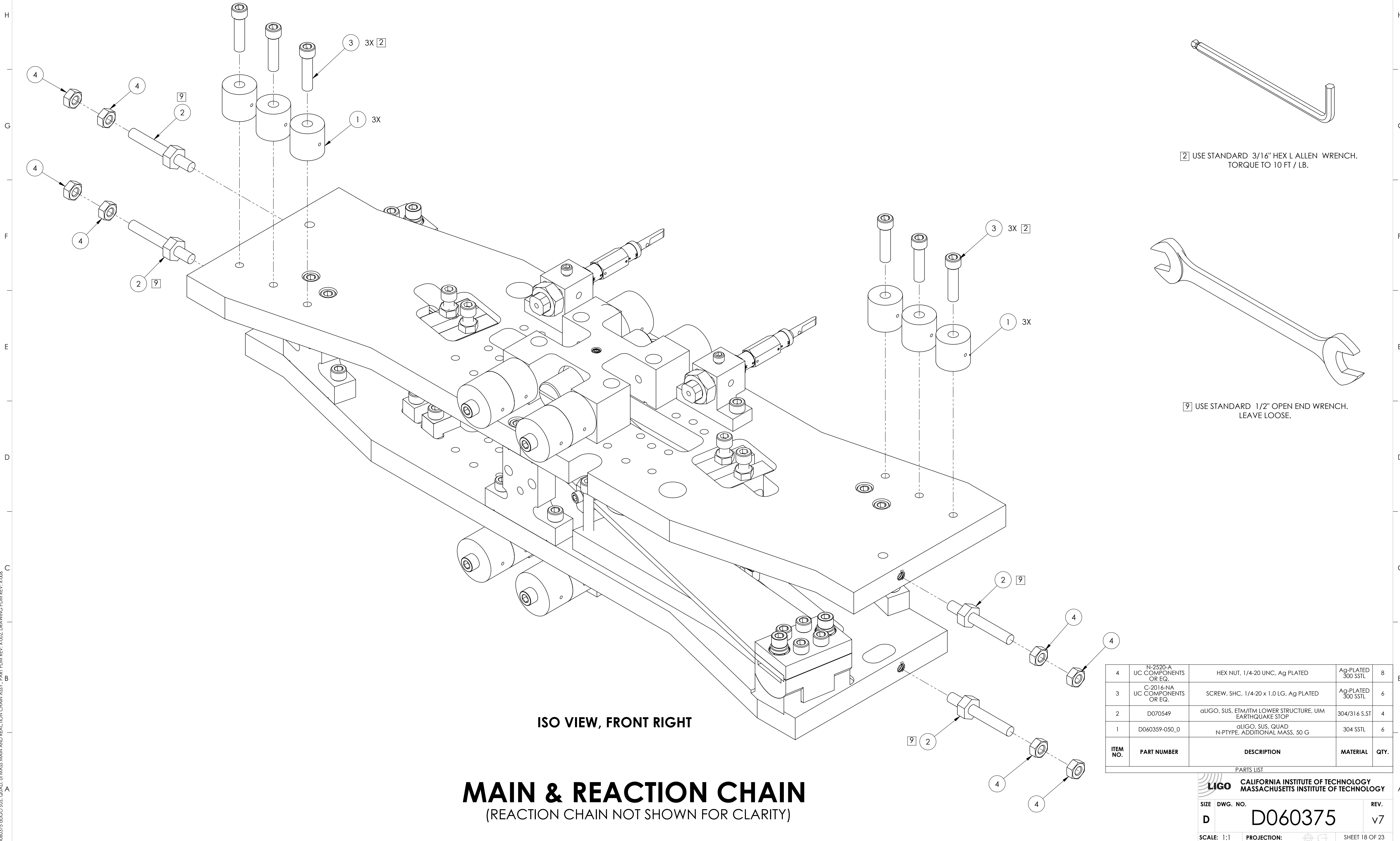
ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
4	C-2032-NA UC COMPONENTS OR EQ.	SHCS, 1/4-20 x 2" LG., Ag PLATED	Ag-PLATED 300 SSSL	4
3	C-2020-N UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1-1/4, 18-8 SST	Ag-PLATED 300 SSSL	4
2	D060359-100	MASS, aLIGO SUS	316 SSSL	12
1	D1100938	UI MASS FLAG MOUNT ASSY, aLIGO SUS	SEE BOM	4

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SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:2	PROJECTION:	SHEET 17 OF 23

D060375 aLIGO SUS, QUAD. UI MASS MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-046, DRAWING PDM REV. X-004

ASSY. STEP 17: ADD NOMINAL ADDABLE / REMOVABLE MASS, AND EQ-STOPS
 (TO BE INSTALLED AFTER UI IS ON LOWER STRUCTURE)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
 TORQUE TO 10 FT / LB.

9 USE STANDARD 1/2" OPEN END WRENCH.
 LEAVE LOOSE.

ISO VIEW, FRONT RIGHT

MAIN & REACTION CHAIN
 (REACTION CHAIN NOT SHOWN FOR CLARITY)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
4	N-2520-A UC COMPONENTS OR EQ.	HEX NUT, 1/4-20 UNC, Ag PLATED	Ag-PLATED 300 SSSL	8
3	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	6
2	D070549	gLIGO, SUS, ETM/ITM LOWER STRUCTURE, UIM EARTHQUAKE STOP	304/316 S.ST	4
1	D060359-050_0	gLIGO, SUS, QUAD N-PYTP, ADDITIONAL MASS, 50 G	304 SSSL	6

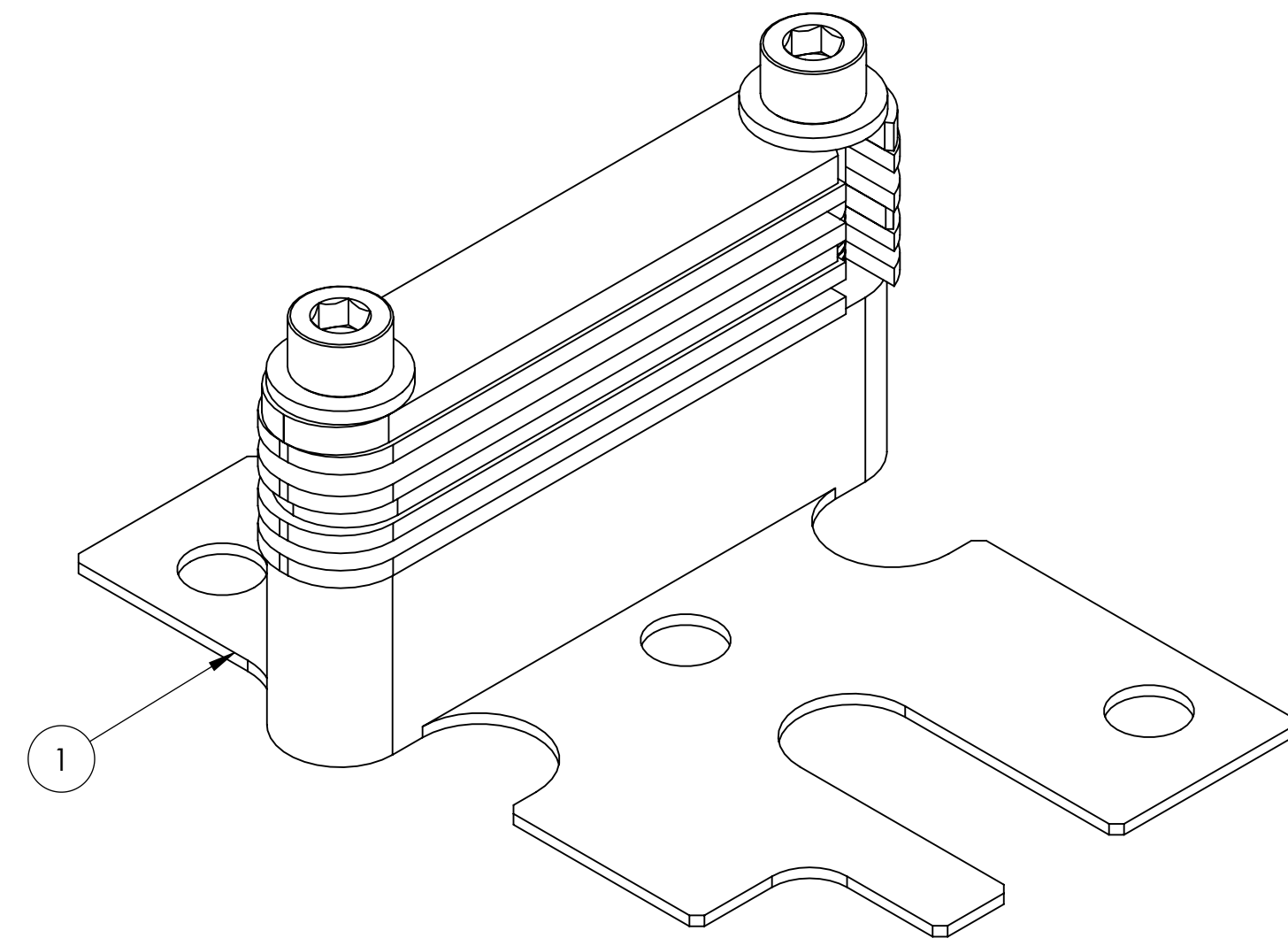
PARTS LIST

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
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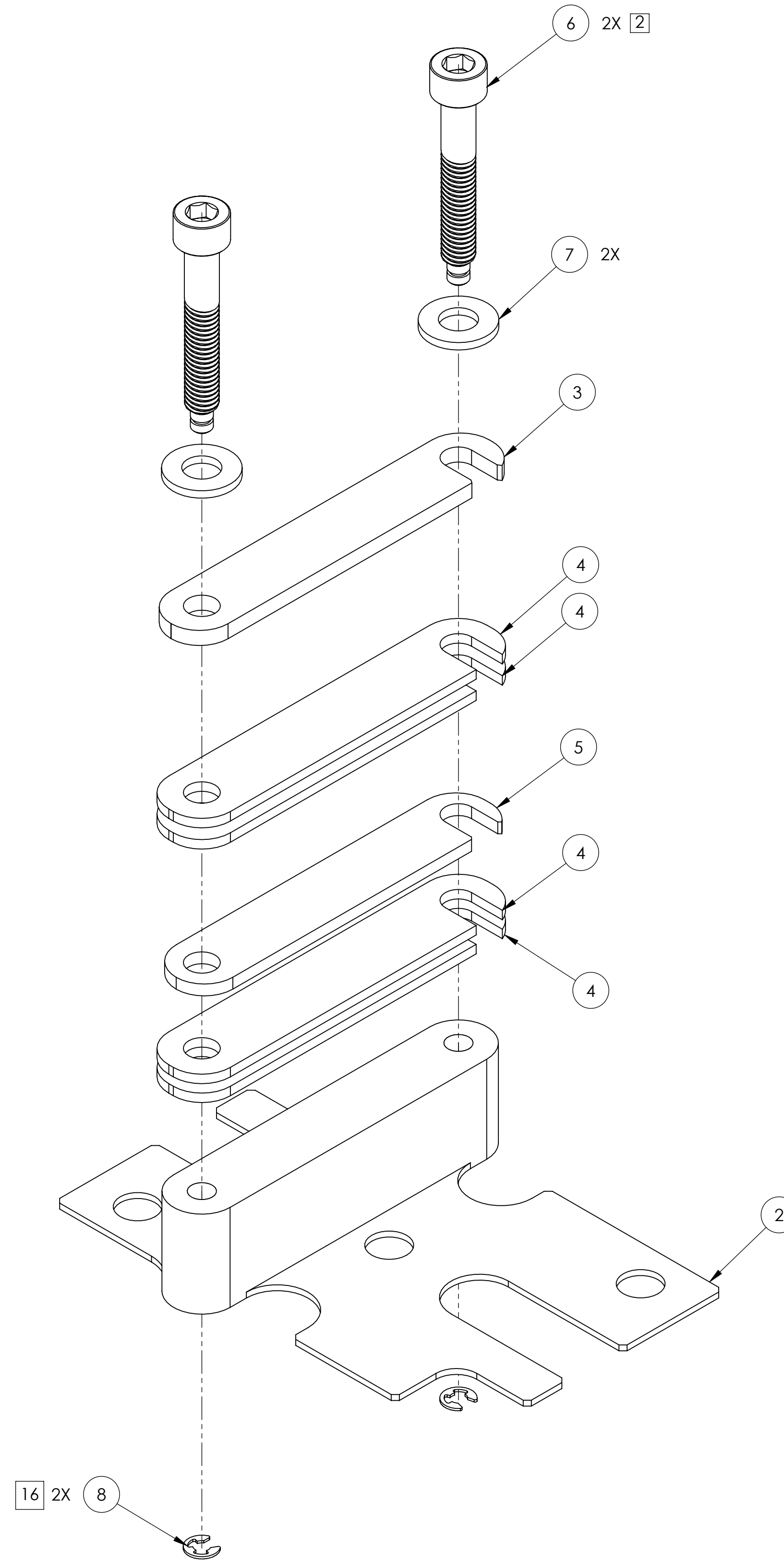
SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 18 OF 23

D060375 gLIGO SUS, QUAD, UIM MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-002, DRAWING PDM REV. X-004

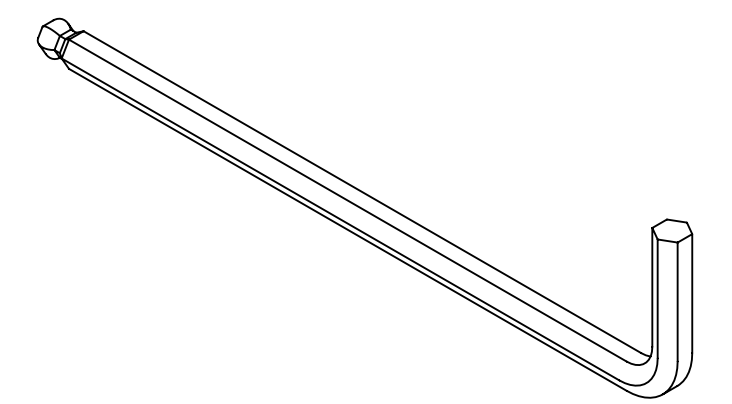
ASSY. STEP 18: ASSEMBLE TOP CABLE CLAMP.



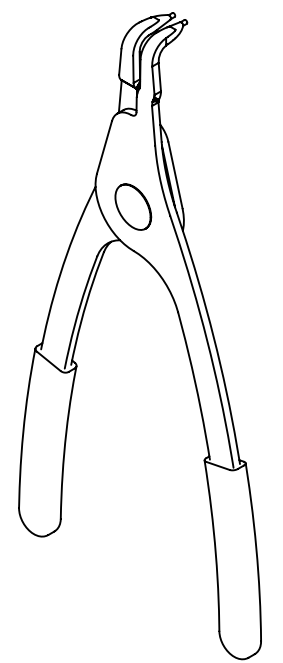
ISO VIEW, FRONT RIGHT
(ASSEMBLED)



ISO VIEW, FRONT RIGHT
(EXPLODED)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.



16 USE STANDARD RETAINING RING PLIERS OR EQ.

17 INDICATED HARDWARE SUPPLIED AS PART OF
ITEM NO. 1

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	REQ
8	94981A120 MCMaster-CARR OR EQ.	RETAINING RING, 1/8 SHAFT, TYPE E, SIDE MT.	304, 316 OR 302 SSSL	2
7	MS15795-808	WASHER, FLAT, #10	300 SSSL	2
6	D1102135	ALIGO, SUS, QUAD, SCREW, SHC, 10-32 X 1.25 LG., OSEM/ESD CABLE CLAMP	300 SSSL	2
5	D1102134	ALIGO, SUS, QUAD, CABLE CLAMP DIVIDER SHIM OSEM/ESD (REDESIGNED)	304, 316 OR 302 SSSL	1
4	D1102147	ALIGO SUS, CABLE CLAMP FLOREL PAD, OSEM/ESD (REDESIGNED)	FLUOROELASTOMER	4
3	D1102136	ALIGO, SUS, QUAD WIRING HARNESS, OSEM/ESD CABLE CLAMP JAW (REDESIGNED)	6061-T6 Al	1
2	D070220	ALIGO, SUS, QUAD NPTYPE WIRING HARNESS, UIM MASS WIRE CLAMP	N/A	1
1	D070221	ALIGO, SUS, QUAD NPTYPE WIRING HARNESS, UIM MASS TOP WIRE CLAMP ASSY.	N/A	1

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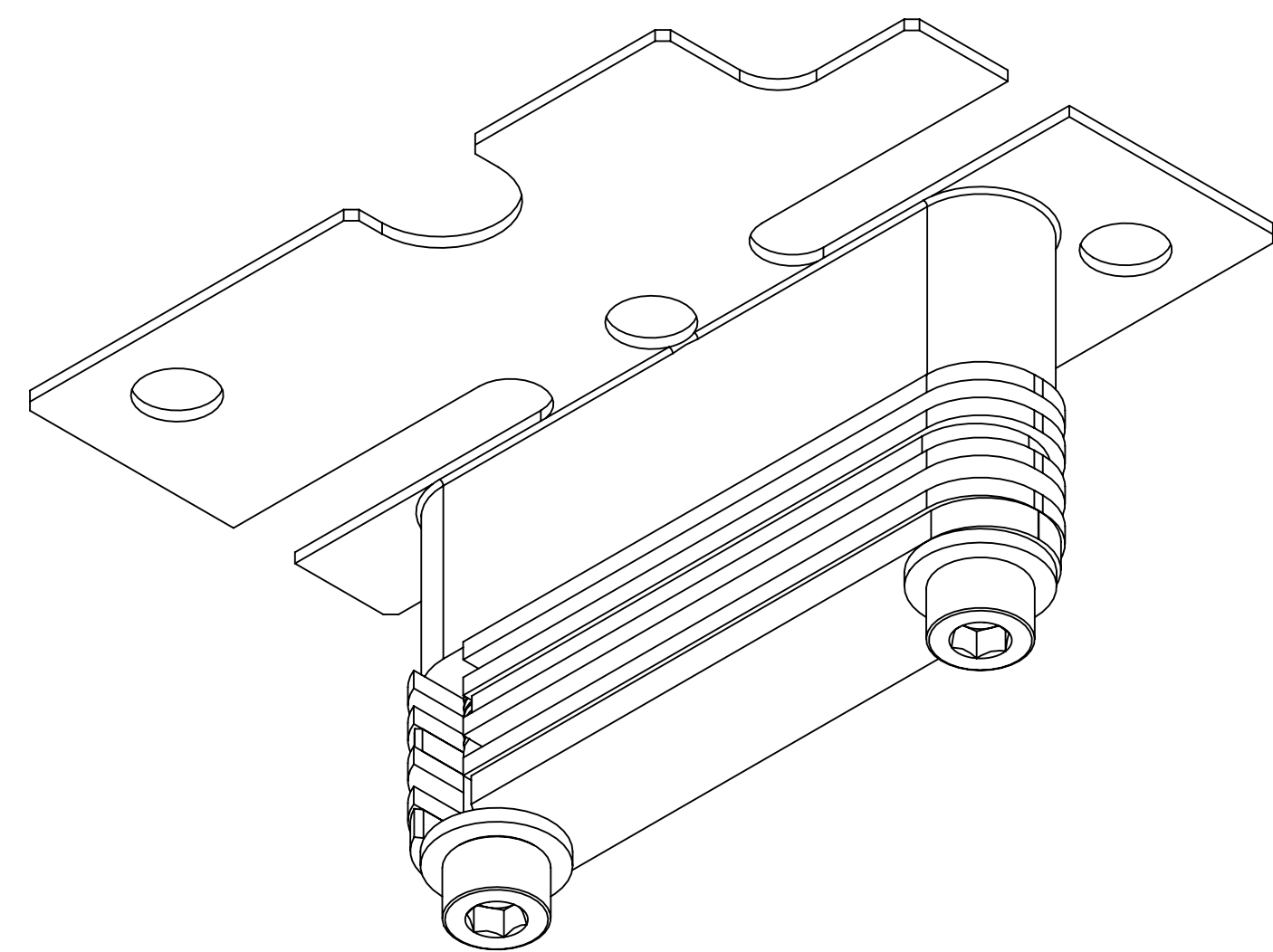
SIZE DWG. NO. **D060375** REV. **v7**

SCALE: 2:1 PROJECTION: SHEET 19 OF 23

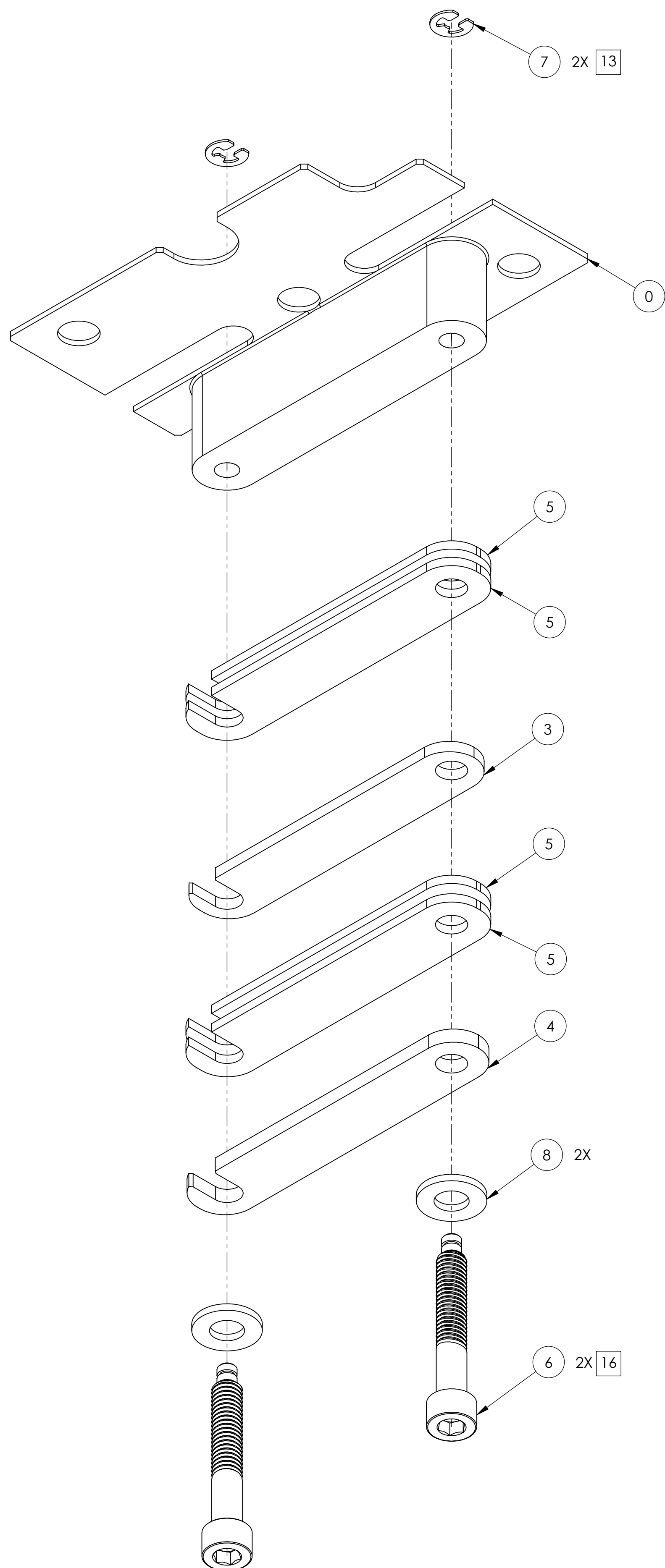
REACTION CHAIN ONLY

D060375 ALIGO SUS, QUAD, UIM MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-002, DRAWING PDM REV. X-004

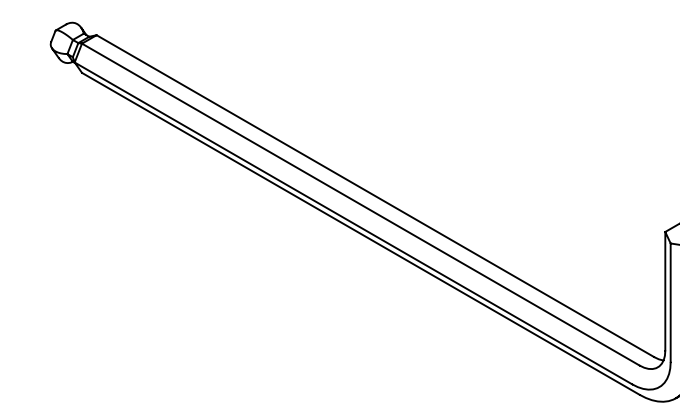
ASSY. STEP 19: ASSEMBLE BOTTOM CABLE CLAMP.



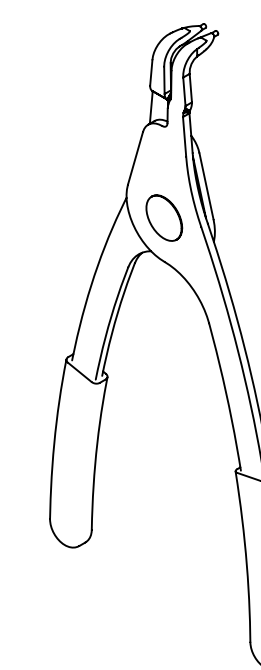
ISO VIEW, FRONT RIGHT
(ASSEMBLED)



ISO VIEW, FRONT RIGHT
(UNDERSIDE)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.



16 USE STANDARD RETAINING RING PLIERS OR EQ.

18 INDICATED HARDWARE SUPPLIED AS PART OF
ITEM NO. 1

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
8	MS15795-808	WASHER, FLAT, #10	300 SSSL	2
7	94981A120 McMASTER-CARR	RETAINING RING, 1/8 SHAFT, TYPE E, SIDE MT.	304, 316 OR 302 SSSL	2
6	D1102135	ALIGO, SUS, QUAD, SCREW, SHC, 10-32 X 1.25 LG., OSEM/ESD CABLE CLAMP	300 SSSL	2
5	D1102147	ALIGO SUS, CABLE CLAMP FLOUREL PAD, OSEM/ECD (REDESIGNED)	FLUOROELASTOMER	4
4	D1102136	ALIGO, SUS, QUAD WIRING HARNESS, OSEM/ESD CABLE CLAMP JAW (REDESIGNED)	6061-T6 Al	1
3	D1102134	ALIGO, SUS, QUAD, CABLE CLAMP DIVIDER SHIM OSEM/ESD (REDESIGNED)	304, 316 OR 302 SSSL	1
2	D1102133	ALIGO, SUS, QUAD NPTYPE WIRING HARNESS, MASS WIRE CLAMP	N/A	1
1	D070218	ALIGO, SUS, QUAD, WIRING HARNESS, MASS WIRE CLAMP	N/A	1

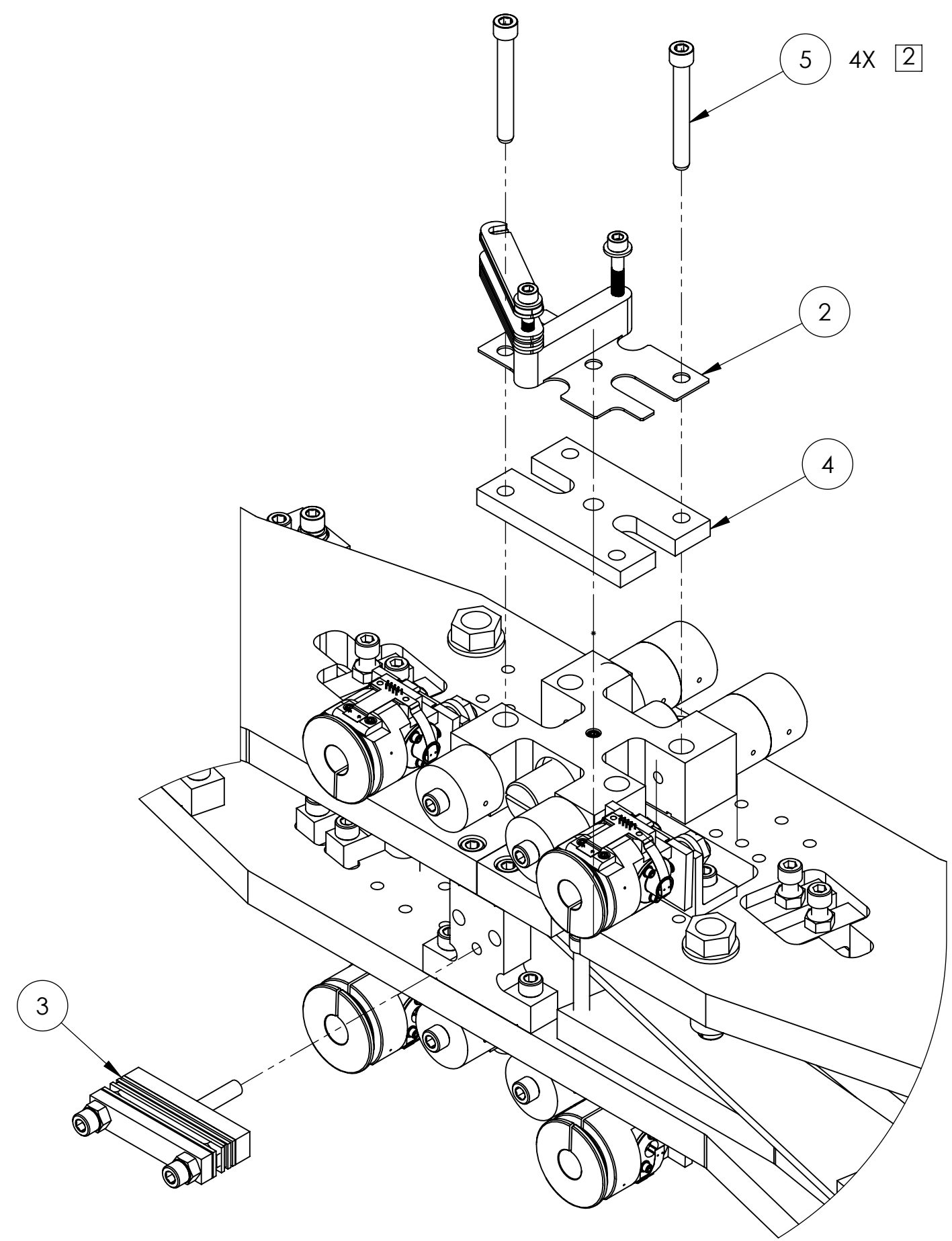
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SIZE DWG. NO. REV.
D D060375 v7
SCALE: 2:1 PROJECTION: SHEET 20 OF 23

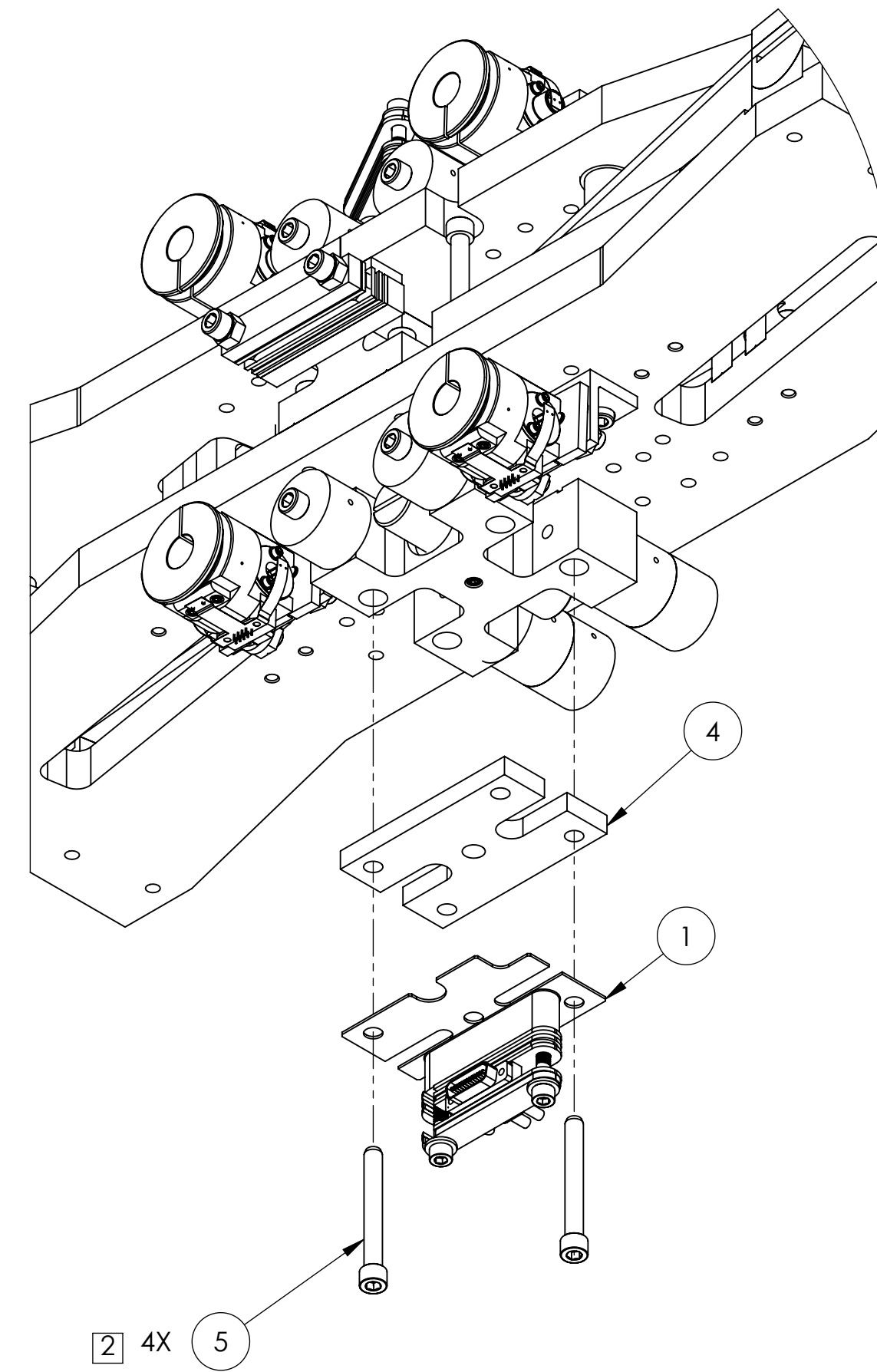
REACTION CHAIN ONLY

D060375 ALIGO SUS, QUAD, WIRING HARNESS AND REACTION CHAIN ASSY, PART PDM REV. X-002, DRAWING PDM REV. X-004

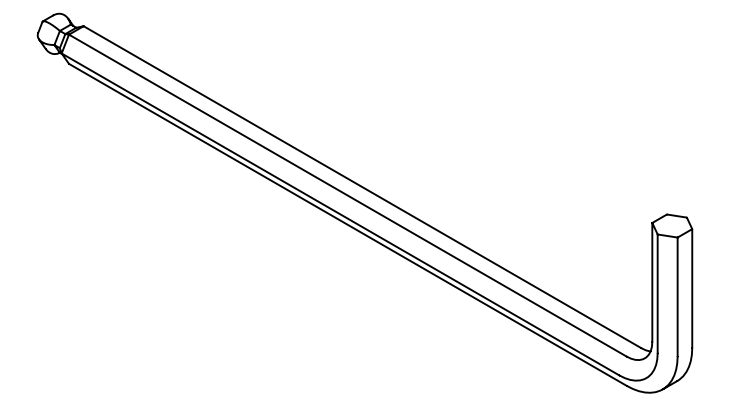
ASSY. STEP 20: ASSEMBLE CABLE CLAMPS TO REACTION CHAIN MASS



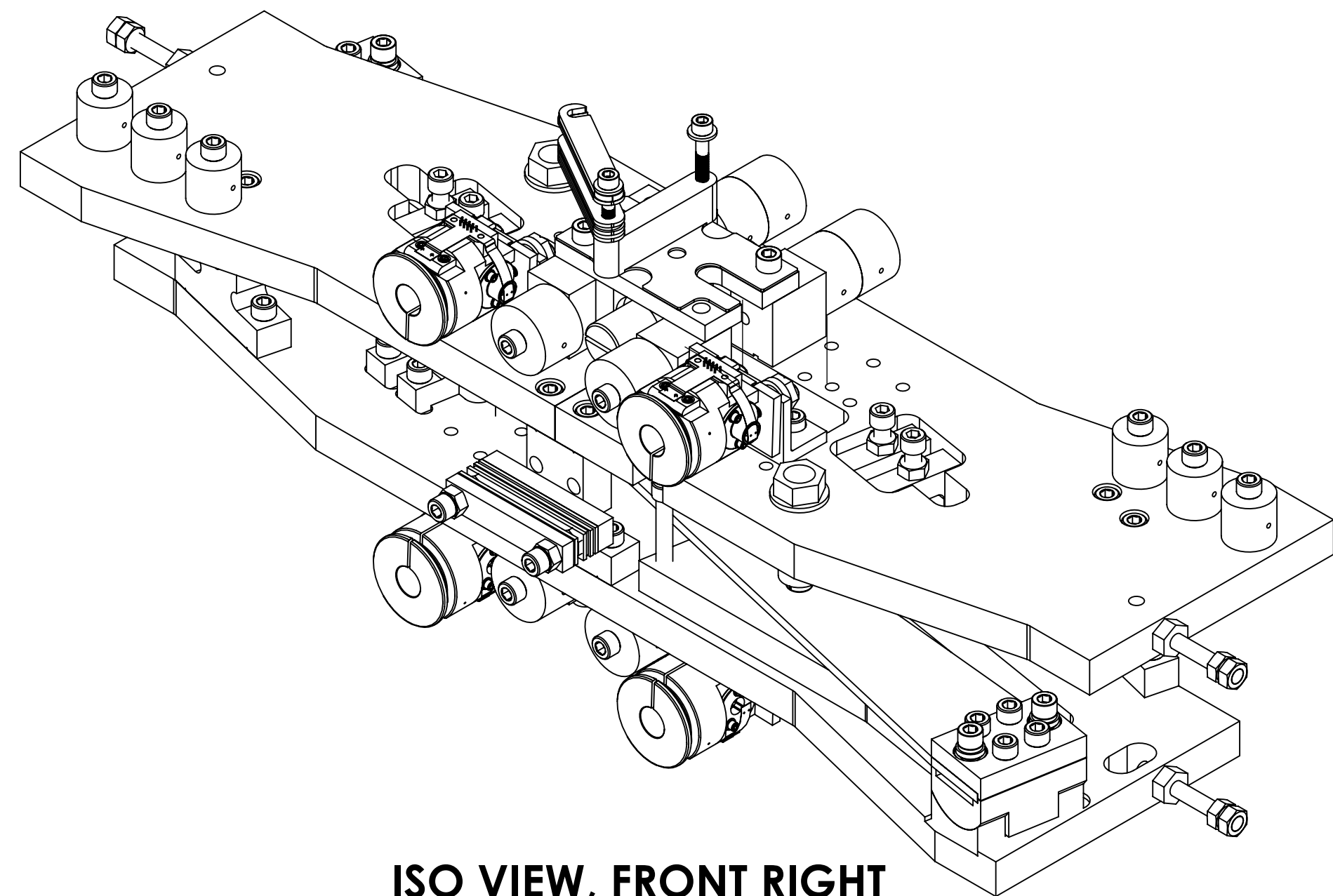
ISO VIEW, FRONT RIGHT
(TOP SIDE)



ISO VIEW, REAR LEFT
(UNDERSIDE)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.



ISO VIEW, FRONT RIGHT
(ASSEMBLED)

REACTION CHAIN MASS ONLY

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
5	C-2032-NA UC COMPONENTS OR EQ.	SHCS, 1/4-20 x 2" LG., Ag PLATED	Ag-PLATED 304 SSSL	4
4	D1101081	QUAD UIM MASS, gLIGO SUS	304 SSSL	2
3	D070225	gLIGO, SUS, QUAD WIRING HARNESS, WIRE CLAMP	N/A	1
2	D070221	ALIGO, SUS, QUAD NPTYPE WIRING HARNESS, UIM MASS TOP WIRE CLAMP ASSY.	N/A	1
1	D070218	ALIGO, SUS, QUAD, WIRING HARNESS, MASS WIRE CLAMP	N/A	1

PARTS LIST

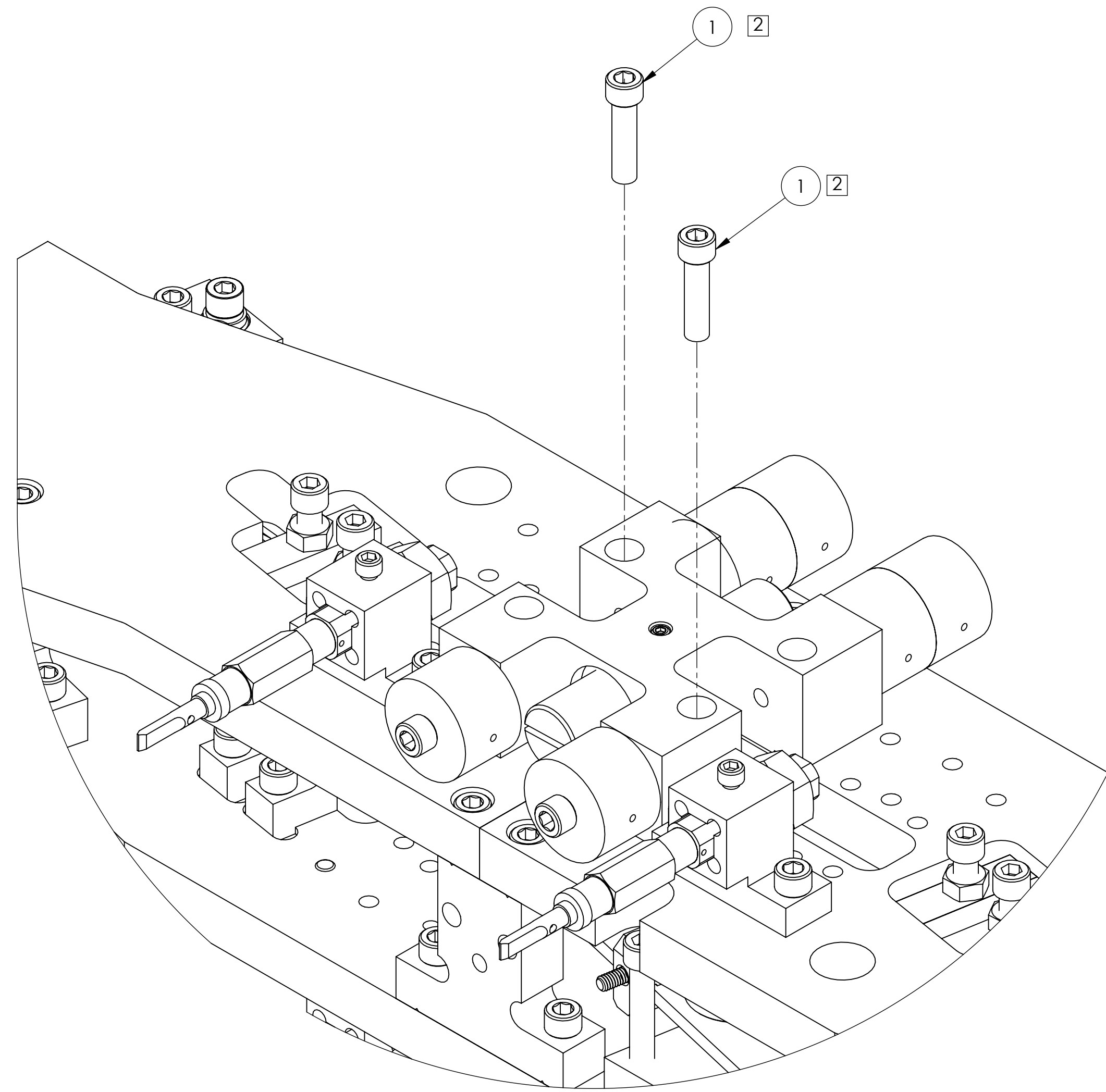
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
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SIZE DWG. NO. REV.
D D060375 v7

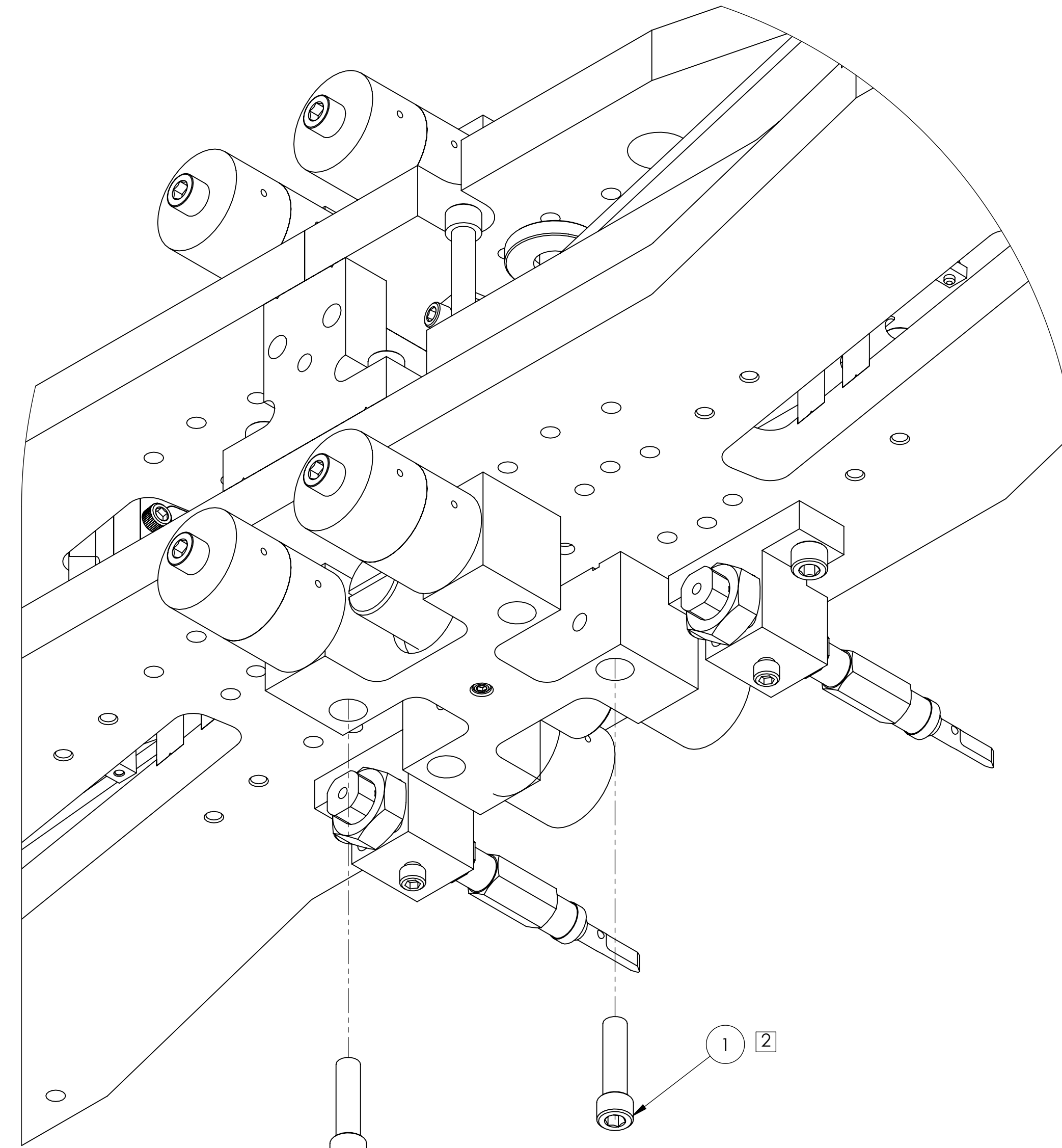
SCALE: 1:2 PROJECTION: SHEET 21 OF 23

D060375 gLIGO SUS, QUAD, UIM MASS MAIN AND REACTION CHAIN ASSY, PART PDM REV. X-060, DRAWING PDM REV. X-004

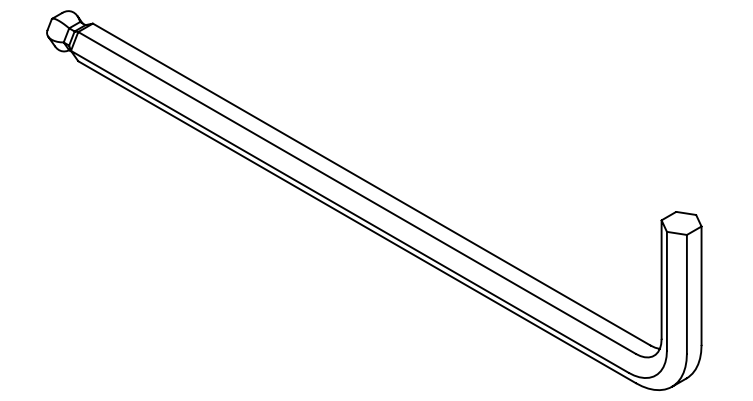
ASSY. STEP 21: ADD SCREWS TO THE MAIN CHAIN MASS



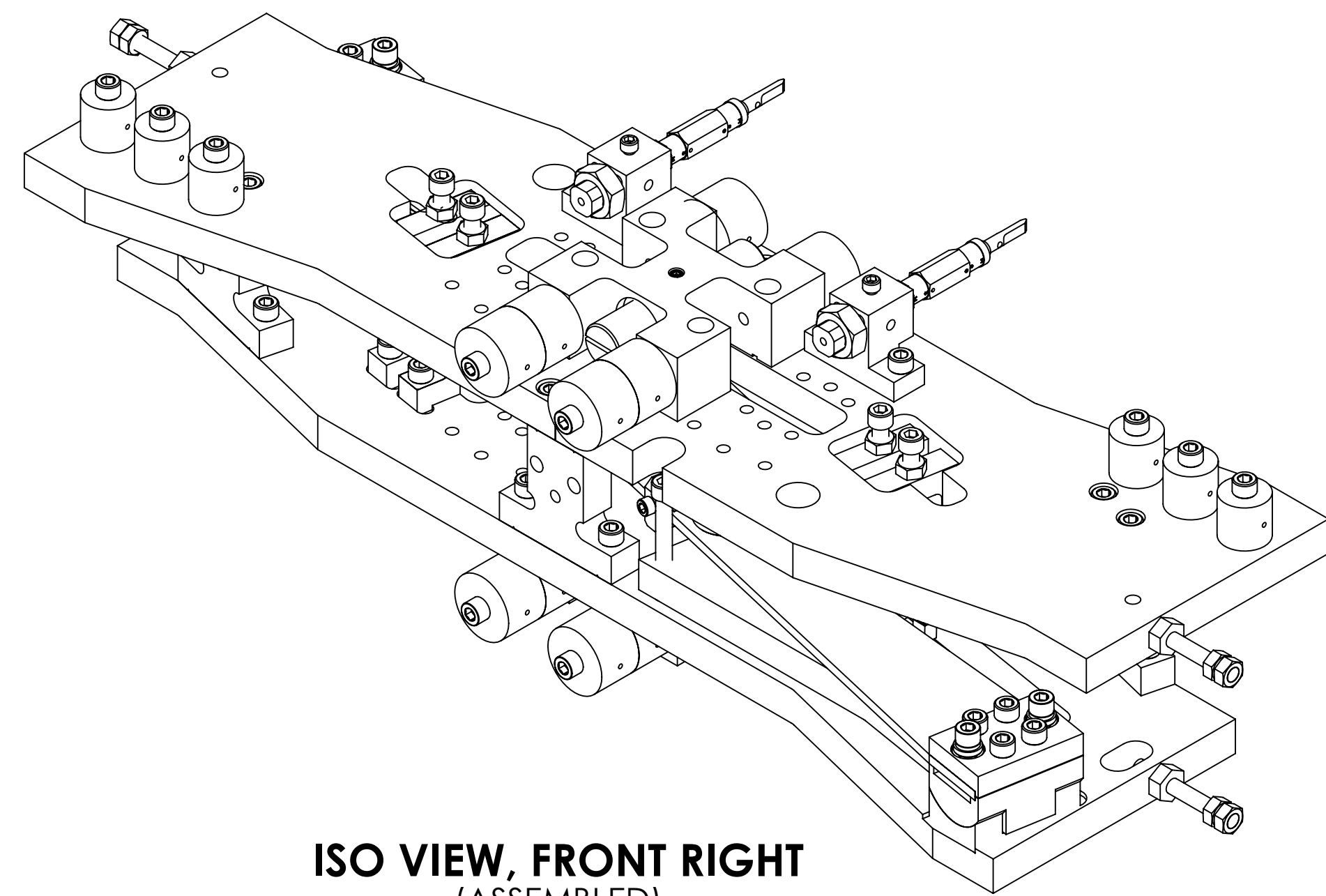
ISO VIEW, REAR LEFT
(TOP SIDE)



ISO VIEW, FRONT RIGHT
(UNDERSIDE)



2 USE STANDARD 3/16" HEX L ALLEN WRENCH.
TORQUE TO 10 FT / LB.



ISO VIEW, FRONT RIGHT
(ASSEMBLED)

MAIN CHAIN ONLY

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
7	95966A332 McMASTER-CARR OR EQ.	SCREW, SHC, 8-32 X .75 LG. (CAPTIVE)	18-8 SSSL	4
6	D1500224-102	QUAD, SUS, UIM STOP BRIDGE (REDESIGNED)	6061-T6 Al	1
5	D1500224-101	QUAD, SUS, UIM STOP BRIDGE, INNER ADAPTER	6061-T6 Al	1
4	D1500228-01	QUAD, SUS, BOUNCE & ROLL MODE DAMPER	N/A	2
3	D1400298-02	αLIGO, SUS, NON-MAGNETIC BLADE DAMPER ASSY.	N/A	1
2	D1400298-01	αLIGO, SUS, NON-MAGNETIC BLADE DAMPER ASSY.	N/A	1
1	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	4

PARTS LIST

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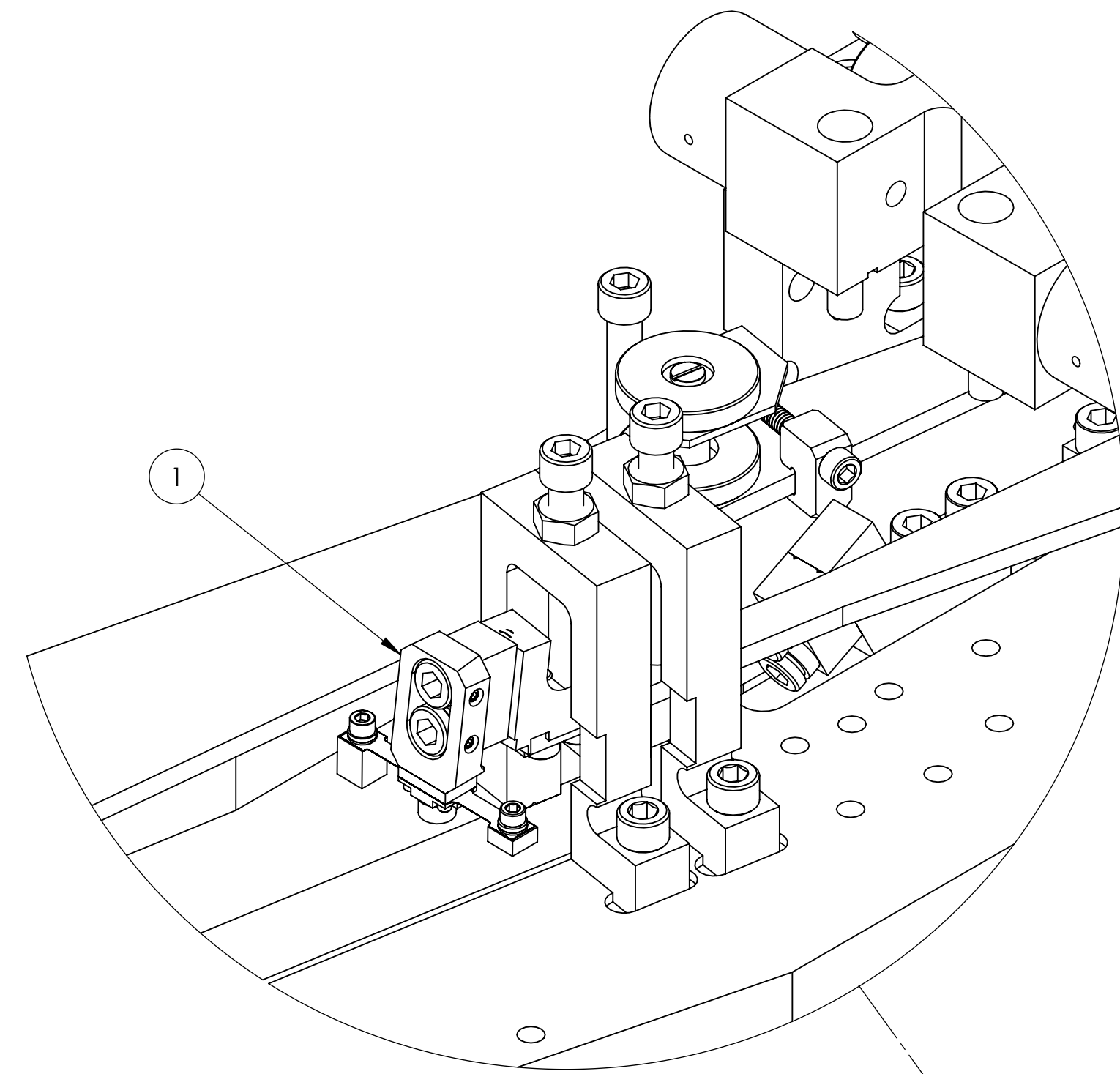
SIZE	DWG. NO.	REV.
D	D060375	v7
SCALE: 1:1	PROJECTION:	SHEET 22 OF 23

D060375 αLIGO SUS, QUAD, UIM MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-046, DRAWING PDM REV. X-004

ASSY. STEP 22: ADD BOUNCE & ROLL MODE DAMPER (2 OFF)

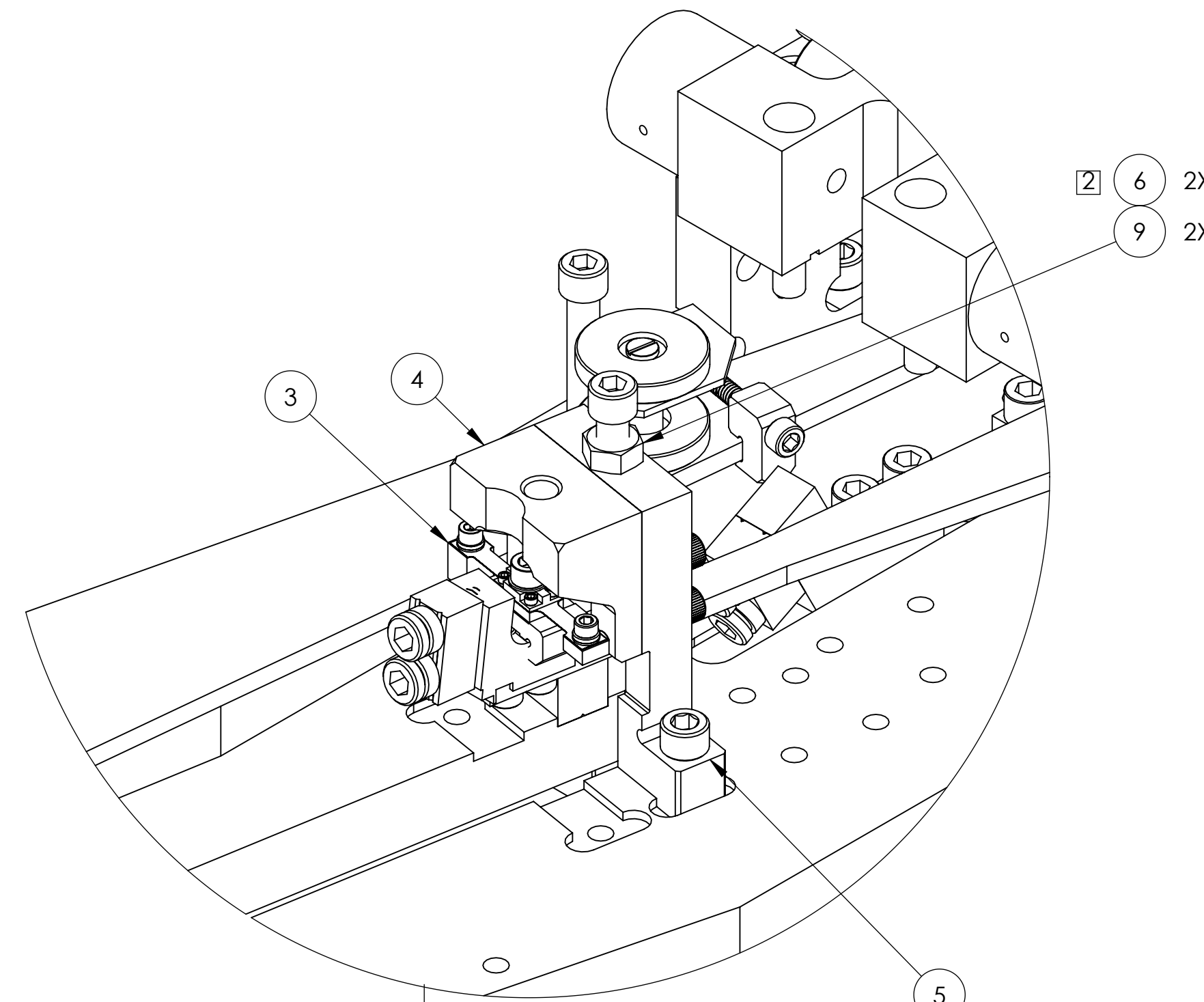
ALTERNATE MT. METHOD #1

ALTERNATE MT. METHOD #2

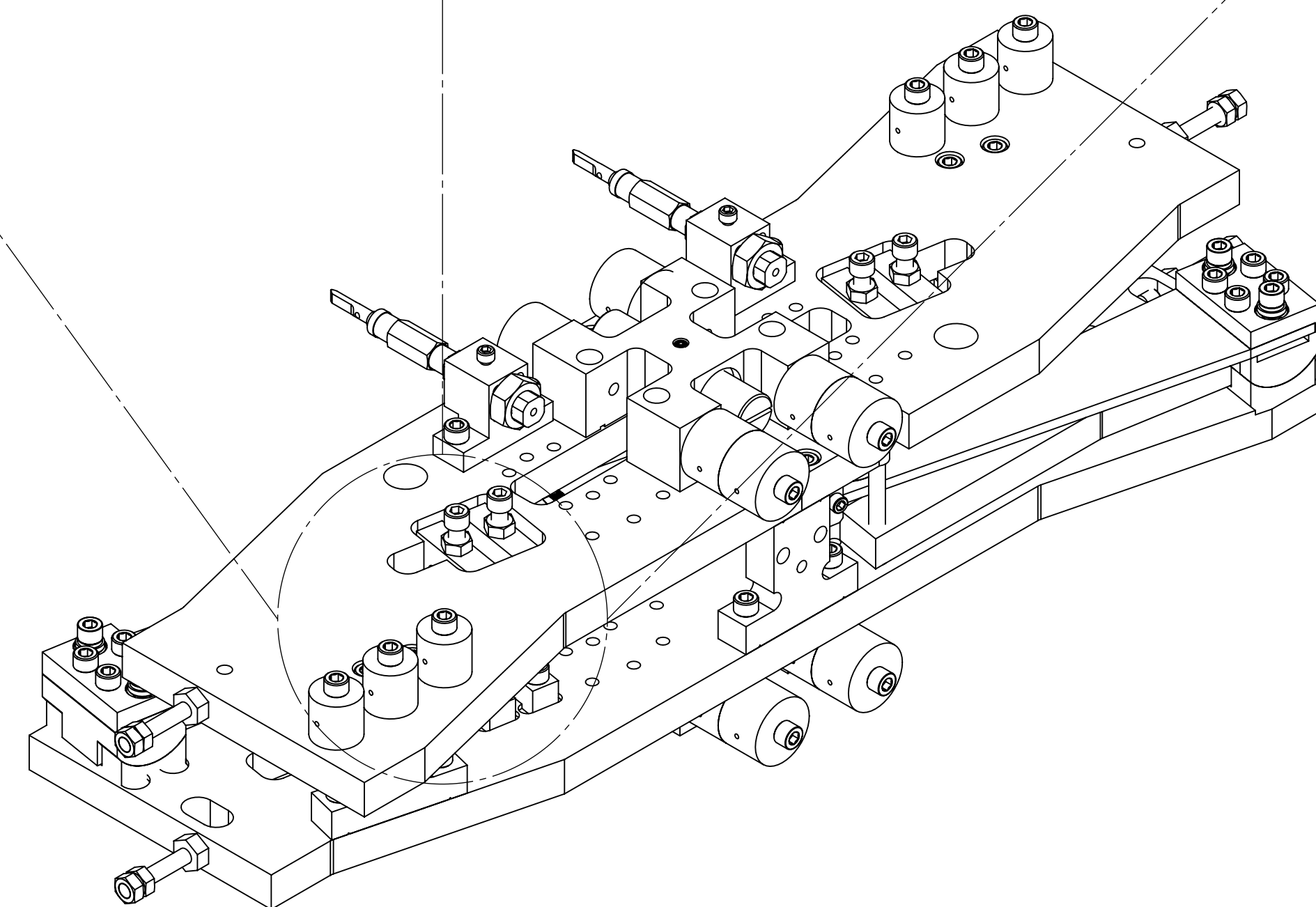
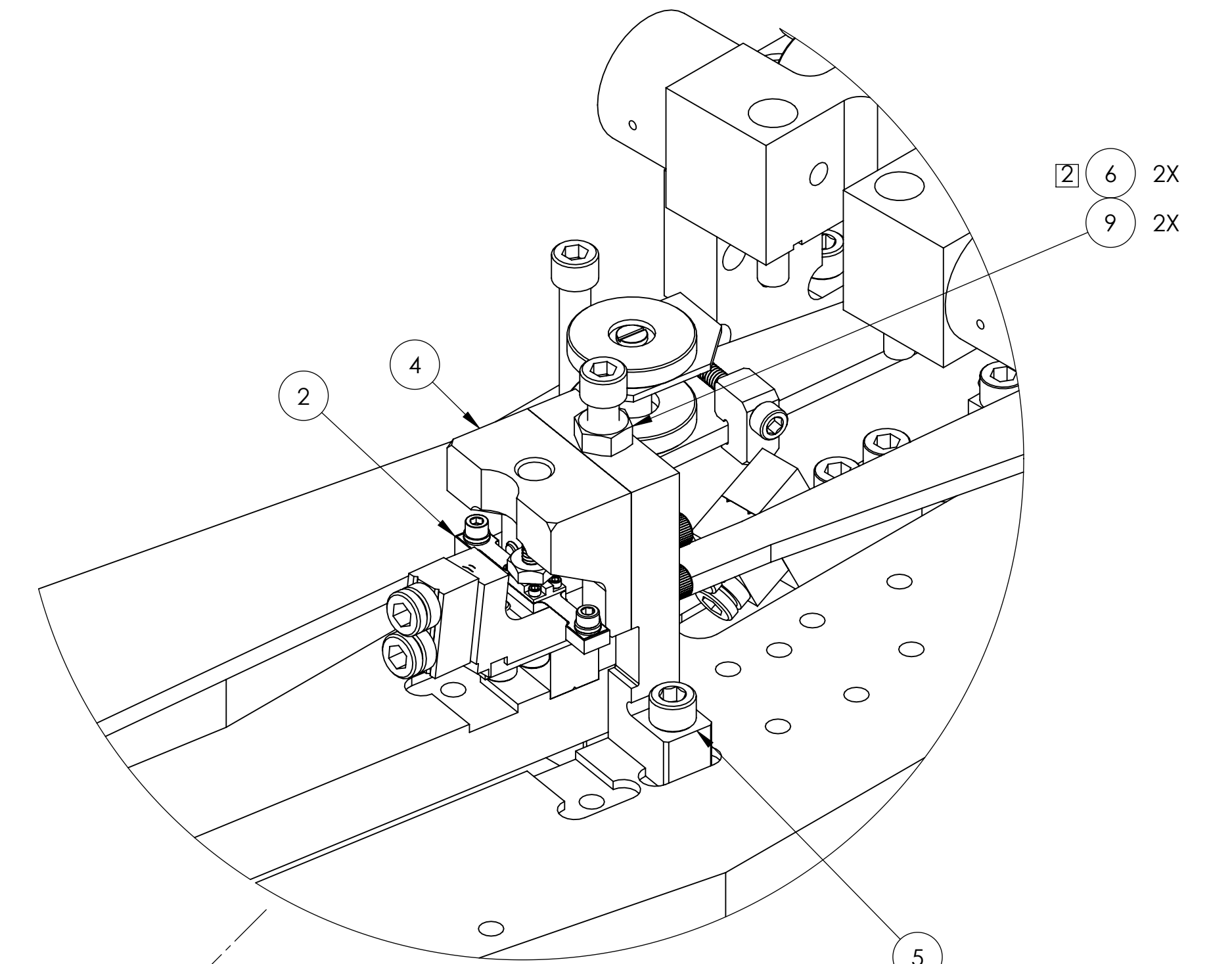


DESIGN CONFIG.

OR



OR



ISO VIEW, FRONT LEFT
(ASSEMBLED)

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
9	N-2520-A UC COMPONENTS OR EQ.	HEX NUT, 1/4-20 UNC, Ag PLATED	304, 316 OR 302 SSSL	12
8	C-2016-NA UC COMPONENTS OR EQ.	SCREW, SHC, 1/4-20 x 1.0 LG, Ag PLATED	Ag-PLATED 300 SSSL	46
7	95966A332 McMASTER-CARR OR EQ.	SCREW, SHC, 8-32 X .75 LG. (CAPTIVE)	18-8 SSSL	4
6		SCREW, SHC, 1/4-20 X 2.00 , ROUNDED END (REDESIGNED)	300 SSSL	6
5	D1500224-102	QUAD, SUS, UIM STOP BRIDGE	6061-T6 Al	1
4	D1500224-101	QUAD, SUS, UIM STOP BRIDGE, INNER ADAPTER	6061-T6 Al	1
3	D1500228-02	QUAD, SUS, BOUNCE & ROLL MODE DAMPER	N/A	2
2	D1500228-03	QUAD, SUS, BOUNCE & ROLL MODE DAMPER	N/A	2
1	D1500228-01	QUAD, SUS, BOUNCE & ROLL MODE DAMPER	N/A	2

PARTS LIST

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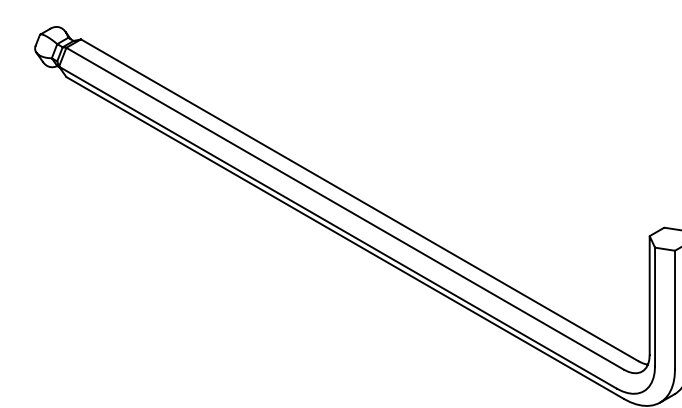
SIZE DWG. NO. REV.

D D060375 v7

SCALE: 1:1 PROJECTION: SHEET 23 OF 23



.050 HEX L ALLEN WRENCH



2 USE STANDARD 3/16" HEX L ALLEN WRENCH. TORQUE TO 10 FT / LB.

MAIN CHAIN ONLY

D060375 Q150 S15 Q145 D11 MASS MAIN AND REACTION CHAIN ASSY. PART PDM REV. X-002. DRAWING PDM REV. X-004.