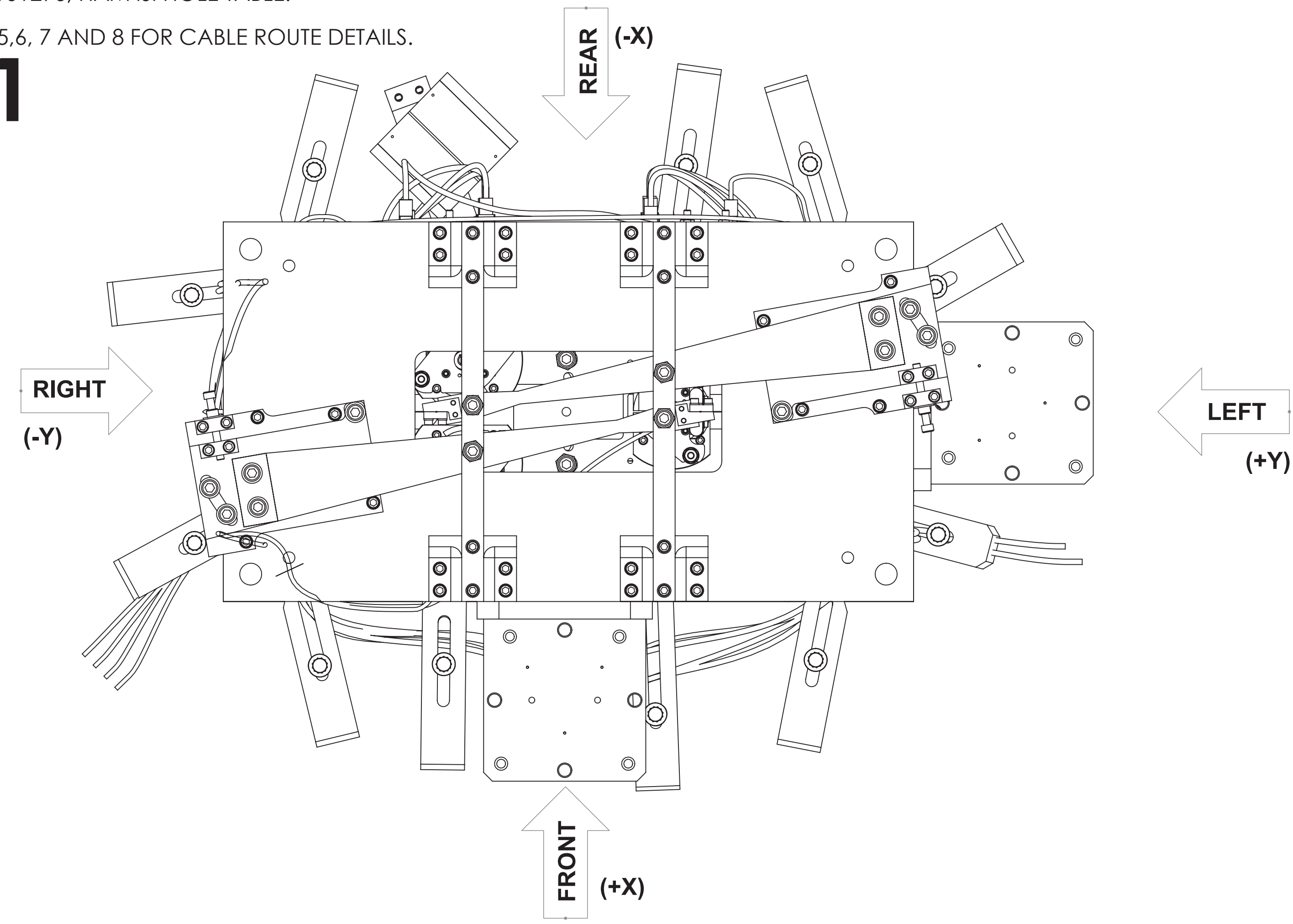


- ① REFERENCED DOCUMENTATION:
 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
 1.2 LIGO-D1101493, OSEM ORIENTATION.
 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.

2. SEE SHEETS 4,5,6, 7 AND 8 FOR CABLE ROUTE DETAILS.

MC1

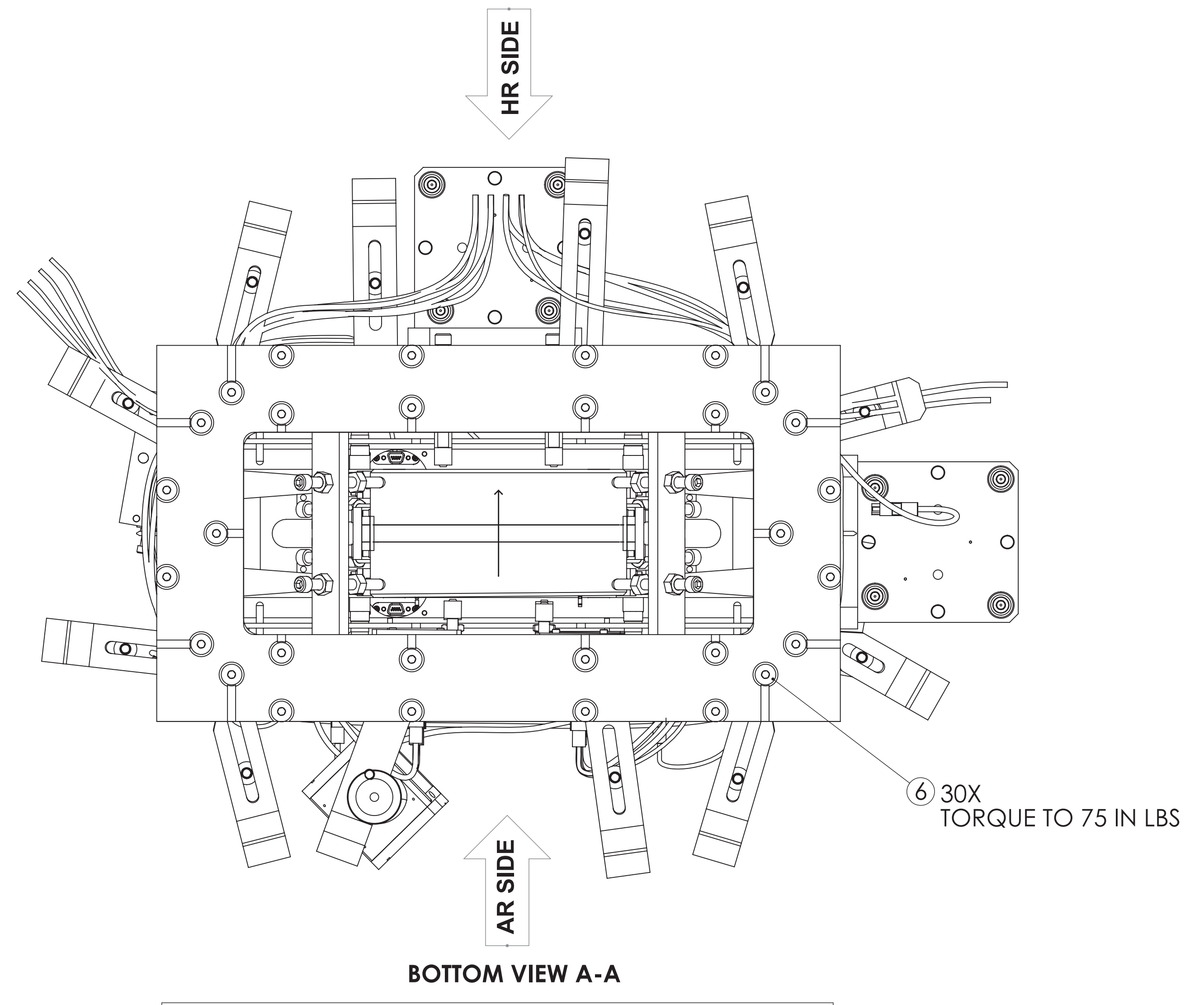


TOP VIEW
(SEE SHEET 3, FOR DOG CLAMP DETAILS)

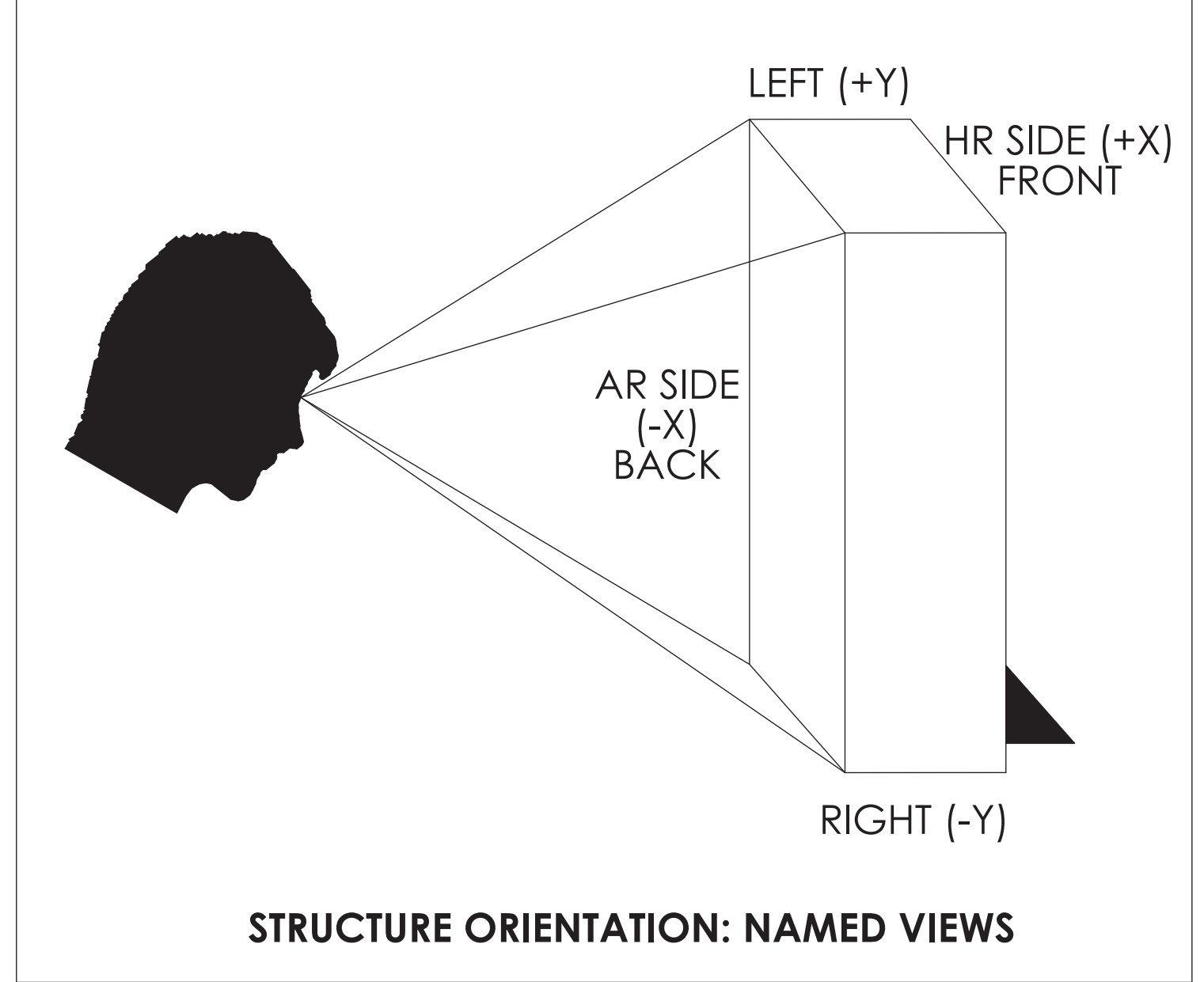
TABLE 1: HAM2-H1 MC1 CABLING SPECIFICATIONS, FROM/TO DES.

ROUTE NO.	FROM OSEM POSITION	TO CB FLOOR DES.	QP LEG DES.	CABLE PART NO.	NOM. CABLE LENGTH (IN)
1	M3-UL (S)	CB-3 (THIRD)	A	D1000234	60
	M3-LL (N)		B		
	M3-UR (N)		C		
	M3-LR (S)		D		
2	M2-UL (S)	CB-3 (SECOND)	A	D1000234	60
	M2-LL (N)		B		
	M2-UR (N)		C		
	M2-LR (S)		D		
3	M1-T1 (S)	CB-3 (FIRST)	A	D1000234	66
	M1-T2 (S)		B		
	M1-T3 (N)		C		
	M1-LF (N)		D		
4	M1-RT (S)	CB-5 (FIRST)	A	D1000234	78
	M1-SD (S)		B		

NOTE : ROUTE NO. 4 IS A SHARED CABLE, SEE D0901089 FOR QP LEGS 'C' AND 'D' ROUTING



BOTTOM VIEW A-A

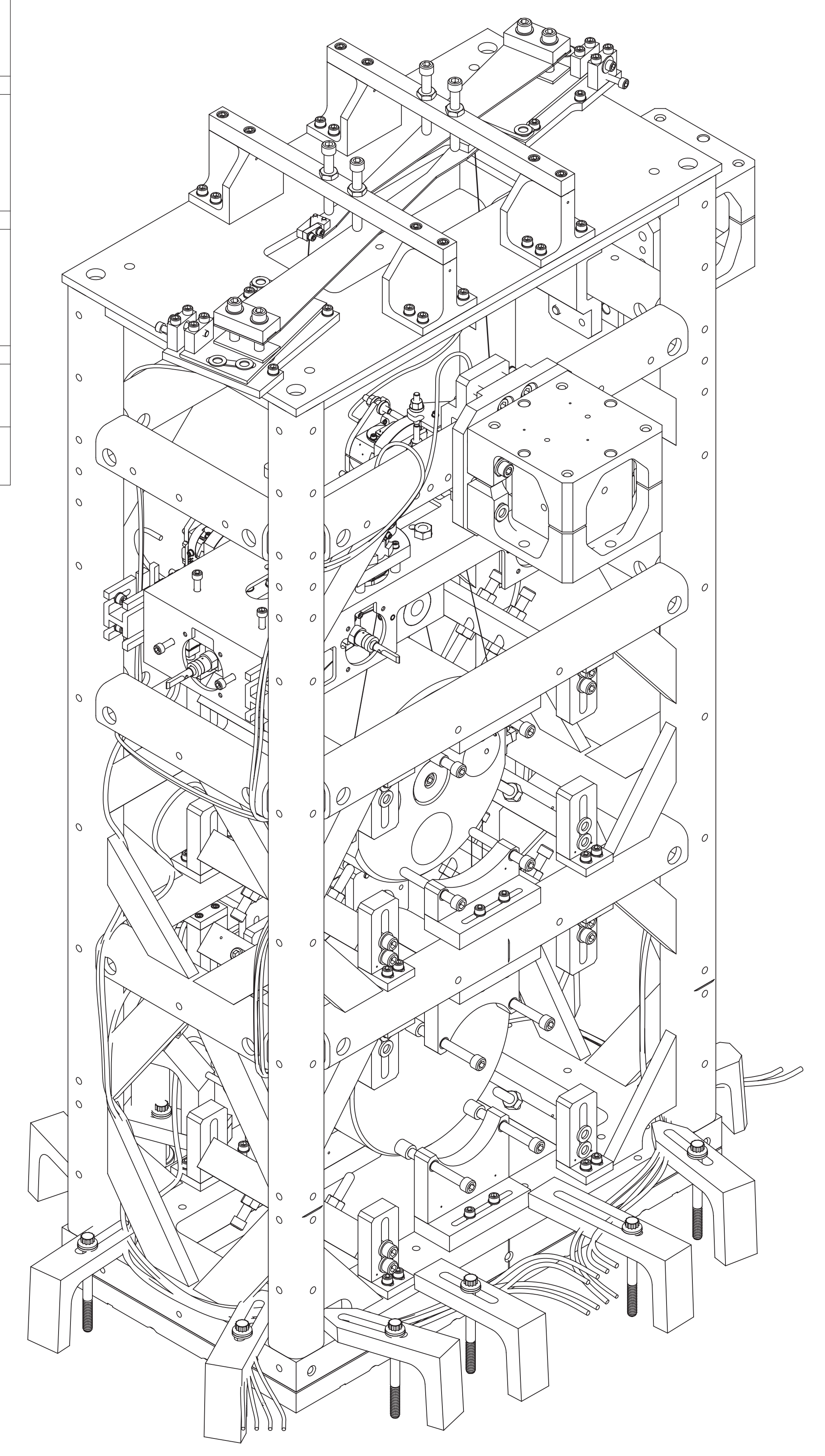


STRUCTURE ORIENTATION: NAMED VIEWS

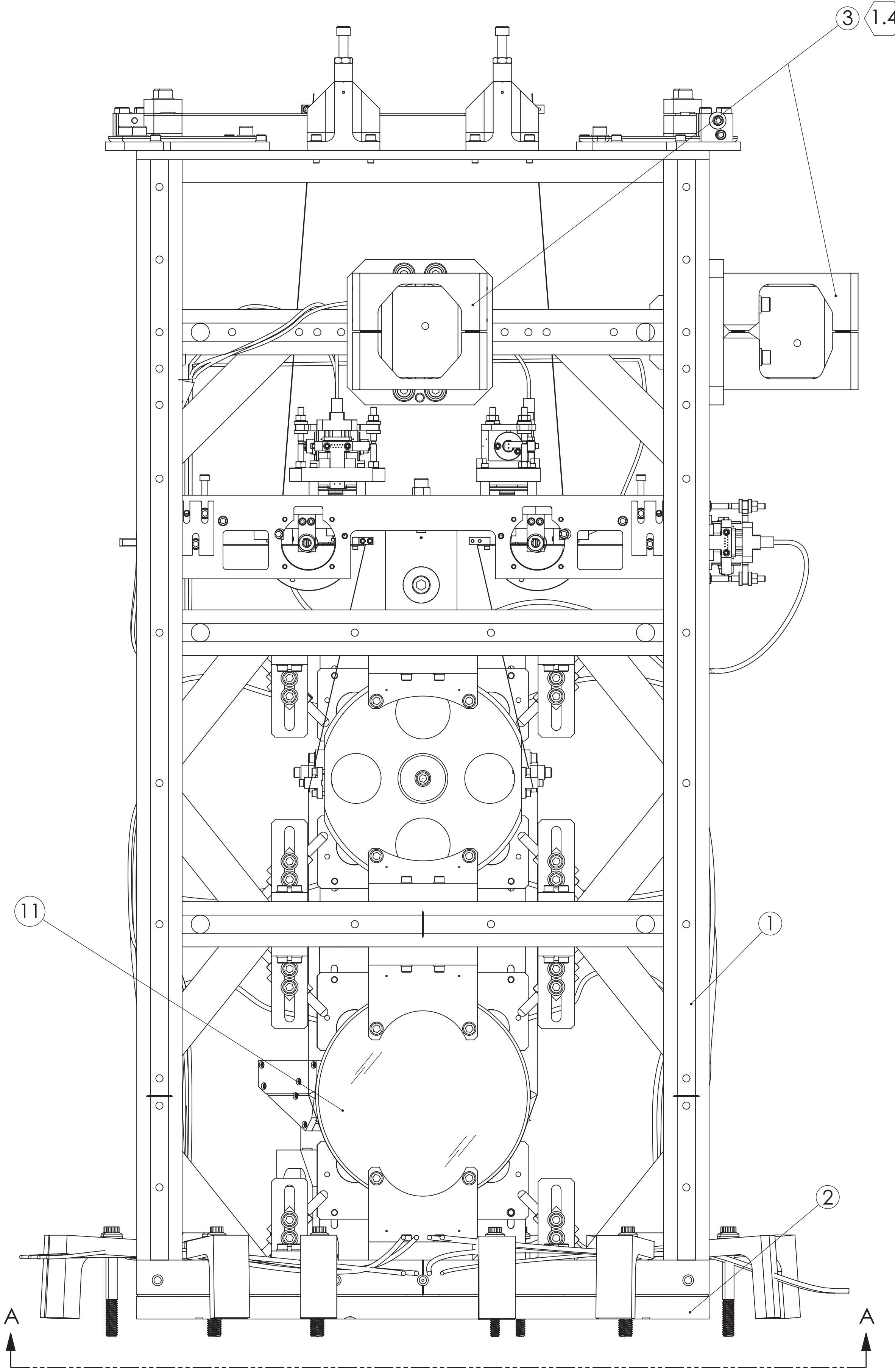
LOCAL COORDINATES - REFERENCE

Xmm	Ymm	Zmm	YAW °
49.25	255.0	-97.4	134.35°

REFER TO DRAWING D1101251 FOR HAM2-H1 INSTALLATION PLATE, LAYOUT



ISO VIEW



HR SIDE - FRONT

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
12	D1201157-2	ALIGO, SUS, DOG CLAMP CHAMFERED ENDS. 1.792 H (CUSTOM)	304 SSSL	1
11	D1101365	MC1 L1 OPTICS ASSEMBLY	N/A	1
10	D1100641-05	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 1.80M	304 SSSL	6
9	D1100641-04	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 1.80S	304 SSSL	1
8	D1001376-06	AdvLIGO HAM Optics Table Dog Clamp 1.8L	304 SSSL	1
7	D1001376-05	AdvLIGO HAM Optics Table Dog Clamp 1.8M	304 SSSL	2
6	FA-2016-NA	.25-20 X 1 FHSC SCREW UC COMPONENTS FA-2016-NA	18-8 SSSL	30
5	D1100785-530	WASHER, FLAT, .25 X .530 O.D.	NITRONIC 60	12
4	2AL2.75-12SL	1/4-20 X 2.75 12PT BOLT	450 SSSL	12
3	D1002424	VIBRATION ABSORBER ASSEMBLY	N/A	2
2	D1001070	HSTS SUS STRUCTURE SPACER 15.8MM	6061-T6 Al	1
1	D020700	HSTS OVERALL ASSEMBLY	N/A	1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SYSTEM: ADVANCED LIGO SUB-SYSTEM: SUS

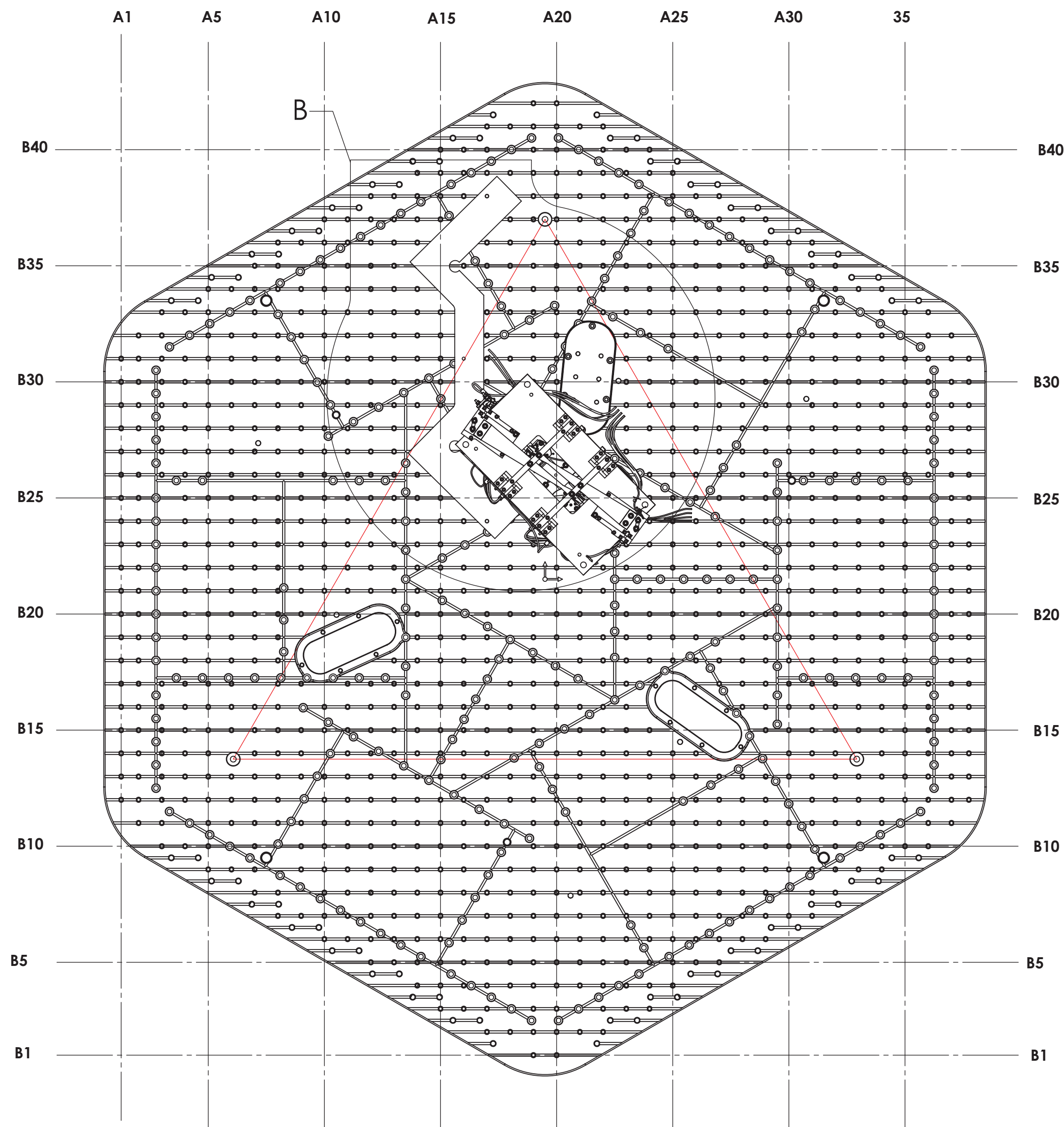
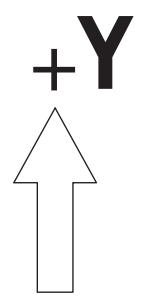
PART NAME: HAM2-H1, XYZ Local CS for HSTS (MC1) Sub-Assy

DESIGNER: E.SANCHEZ DATE: 29 MAY 2012 SIZE: DWG. NO. D0901088 REV. v3

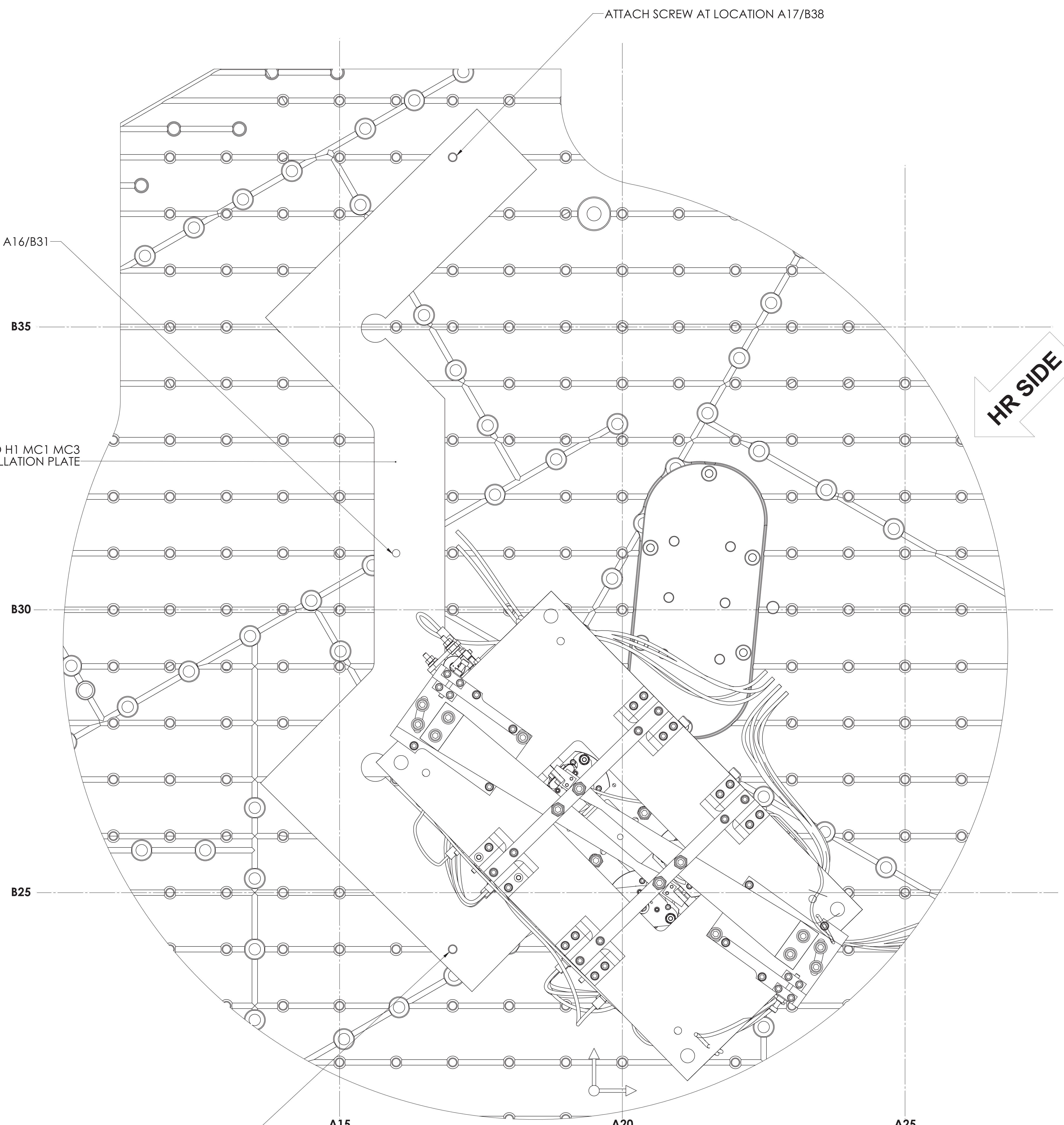
DRAFTER: SEE DCC CHECKER: SEE DCC APPROVAL: SEE DCC

MATERIAL: N/A FINISH: N/A µinch NEXT ASSY: D0901083 SCALE: 1:2 PROJECTION: SHEET 1 OF 10

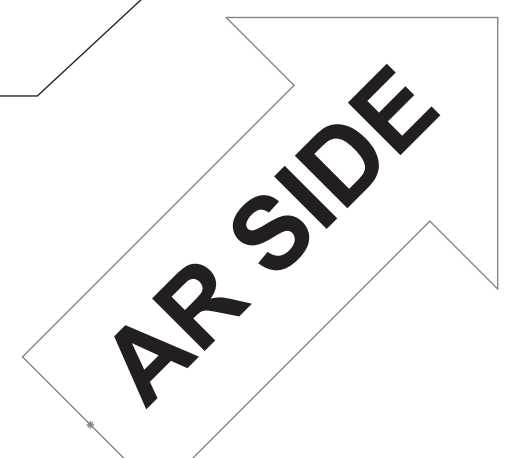
MC1



TOP VIEW (1.6)
REF. TRIANGLE: SEE G1000125
FOR ISI NAMING AND ORIENTATION CONVENTION



ATTACH SCREW AT LOCATION A17/B24

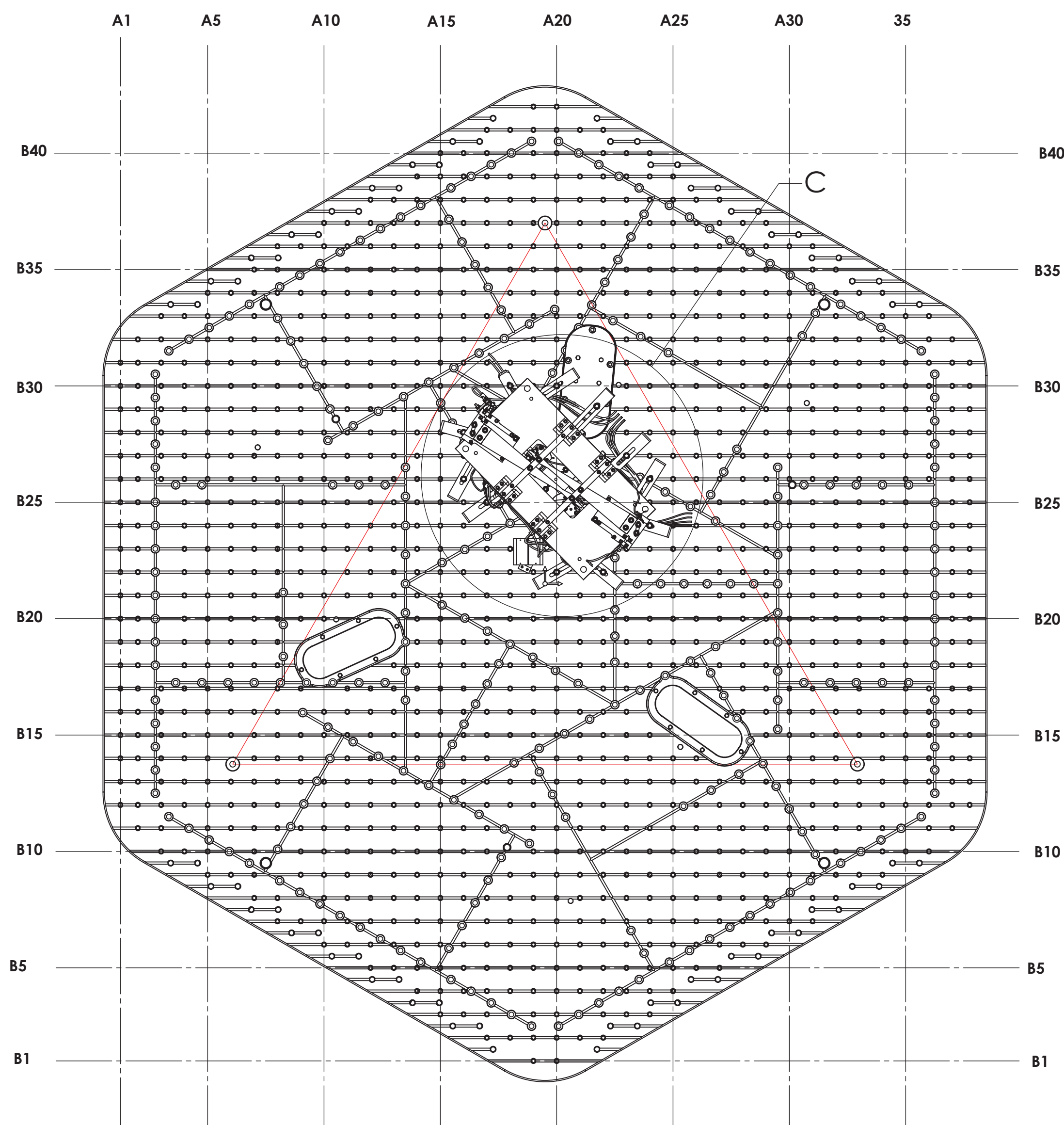
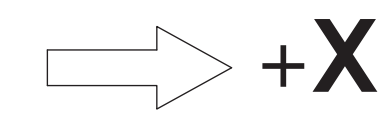
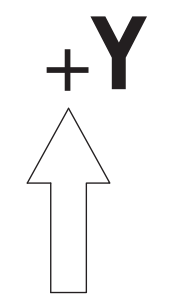


DETAIL B
SCALE 1 : 1.5

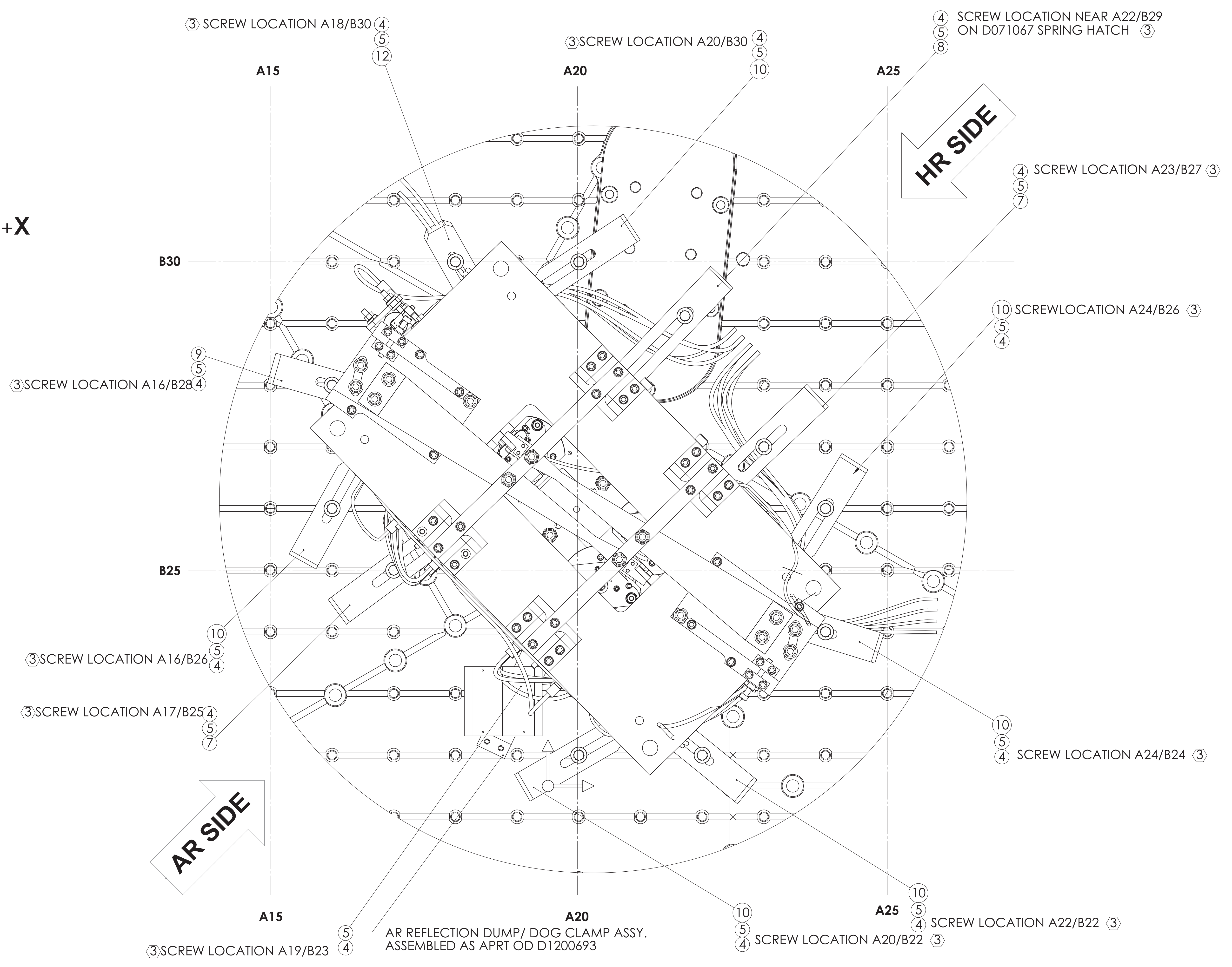
TOP VIEW SHOWING INSTALLATION PLATE LOCATION (1.6)
OPTICAL TABLE SHOWN FOR STRUCTURE LOCATION AND ORIENTATION
DOG CLAMPS VIBRATION ABSORBERS AND HARDWARE REMOVED FOR CLARITY

ALIGNMENT PLATE INSTALLATION / LOCATION

MC1



TOP VIEW 1.6
REF. TRIANGLE: SEE G1000125
FOR ISI NAMING AND ORIENTATION CONVENTION



DETAIL C
SCALE 1 : 1.5
TOP VIEW SHOWING DOG CLAMP INSTALLATION
OPTICAL TABLE SHOWN FOR STRUCTURE AND DOG CLAMP
LOCATIONS AND ORIENTATION ONLY.
VIBRATION ABSORBERS REMOVED FOR CLARITY

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
12	D1201157-2	ALUGO, SUS, DOG CLAMP CHAMFERED ENDS, 1.792 H (CUSTOM)	304 SSSL	1
10	D1100641-05	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 1.80M	304 SSSL	6
9	D1100641-04	AdvLIGO HAM Optics Table Dog Clamp Chamfered End 1.80S	304 SSSL	1
8	D1001376-06	AdvLIGO HAM Optics Table Dog Clamp 1.8L	304 SSSL	1
7	D1001376-05	AdvLIGO HAM Optics Table Dog Clamp 1.8M	304 SSSL	2
5	D1100785-530	WASHER, FLAT, .25 X .530 O.D.	NITRONIC 60	12
4	2AL2.75-12SL	1/4-20 X 2.75 12PT BOLT	450 SSSL	12

DOG CLAMP IDENTIFICATION / INSTALLATION

3 TORQUE TO 100 IN LBS (USE STANDARD 12 PT SOCKET)

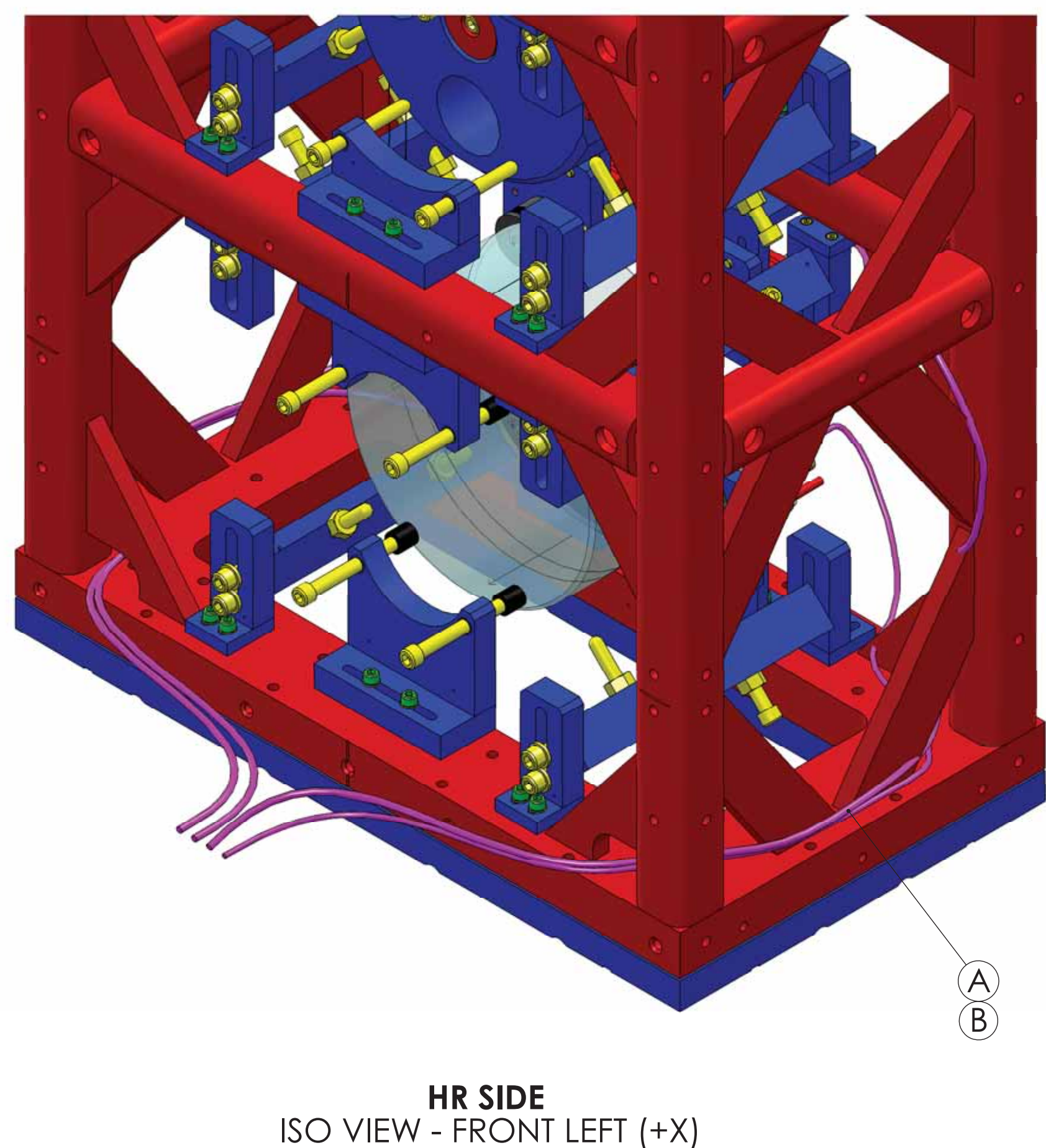
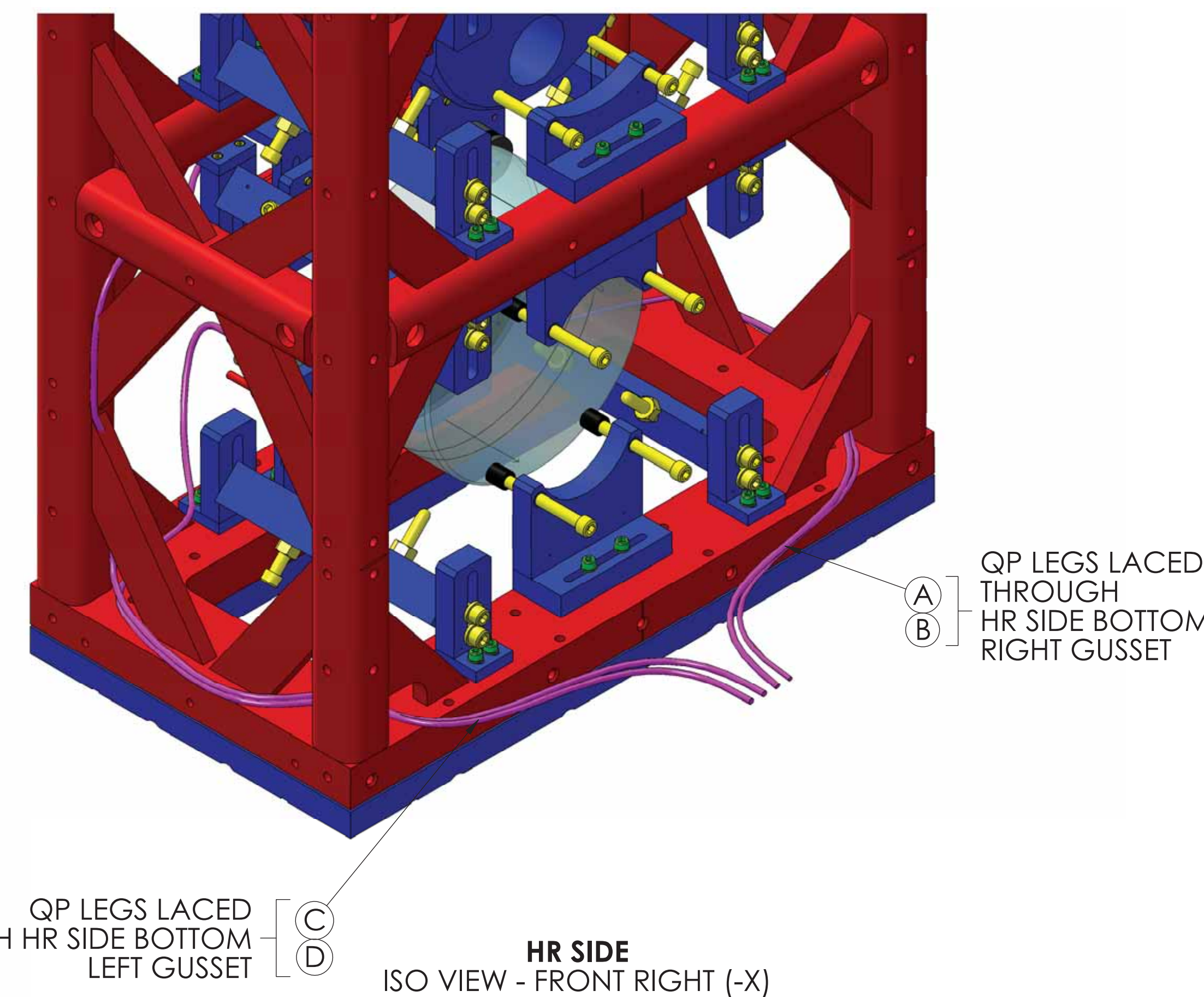
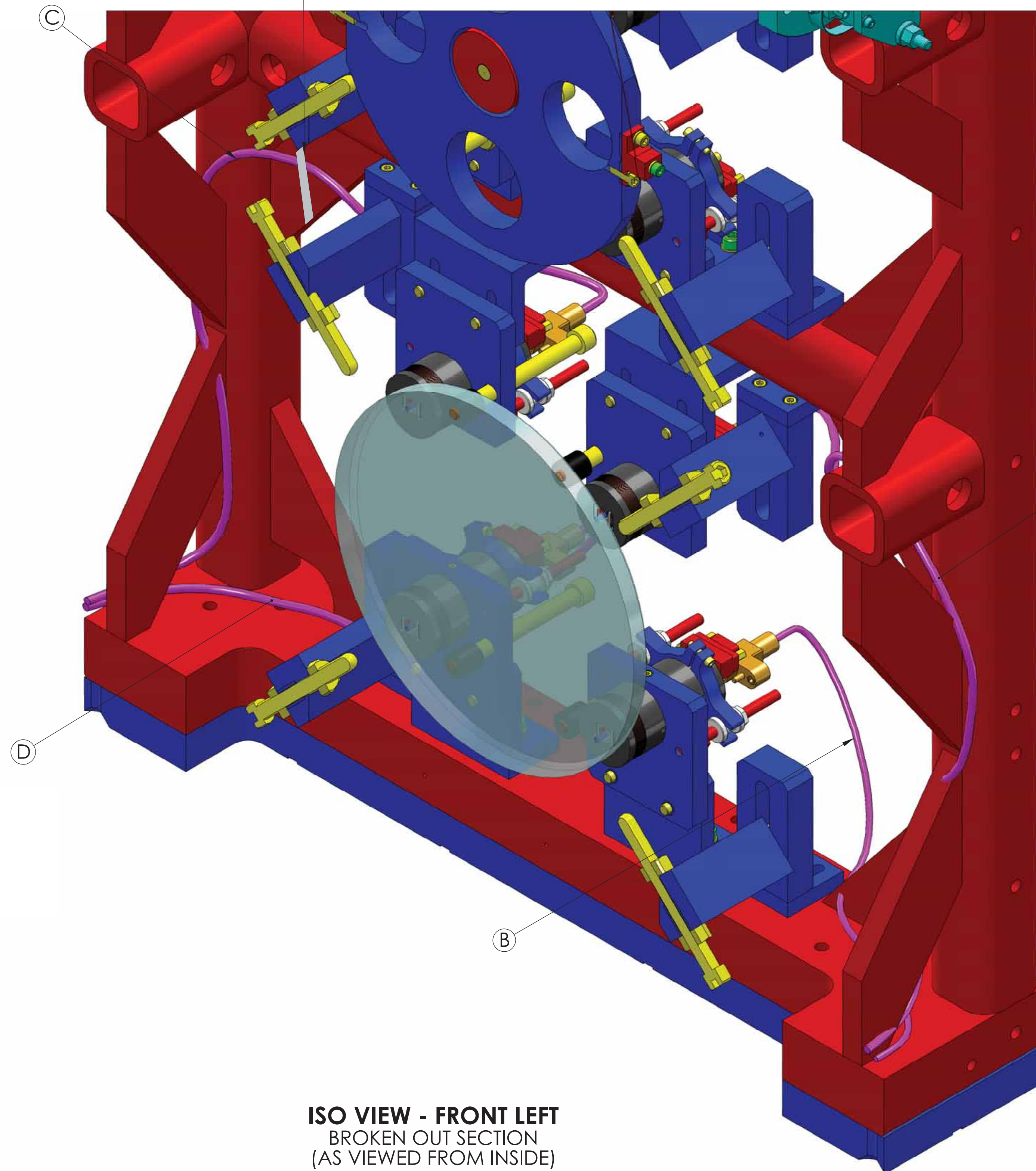
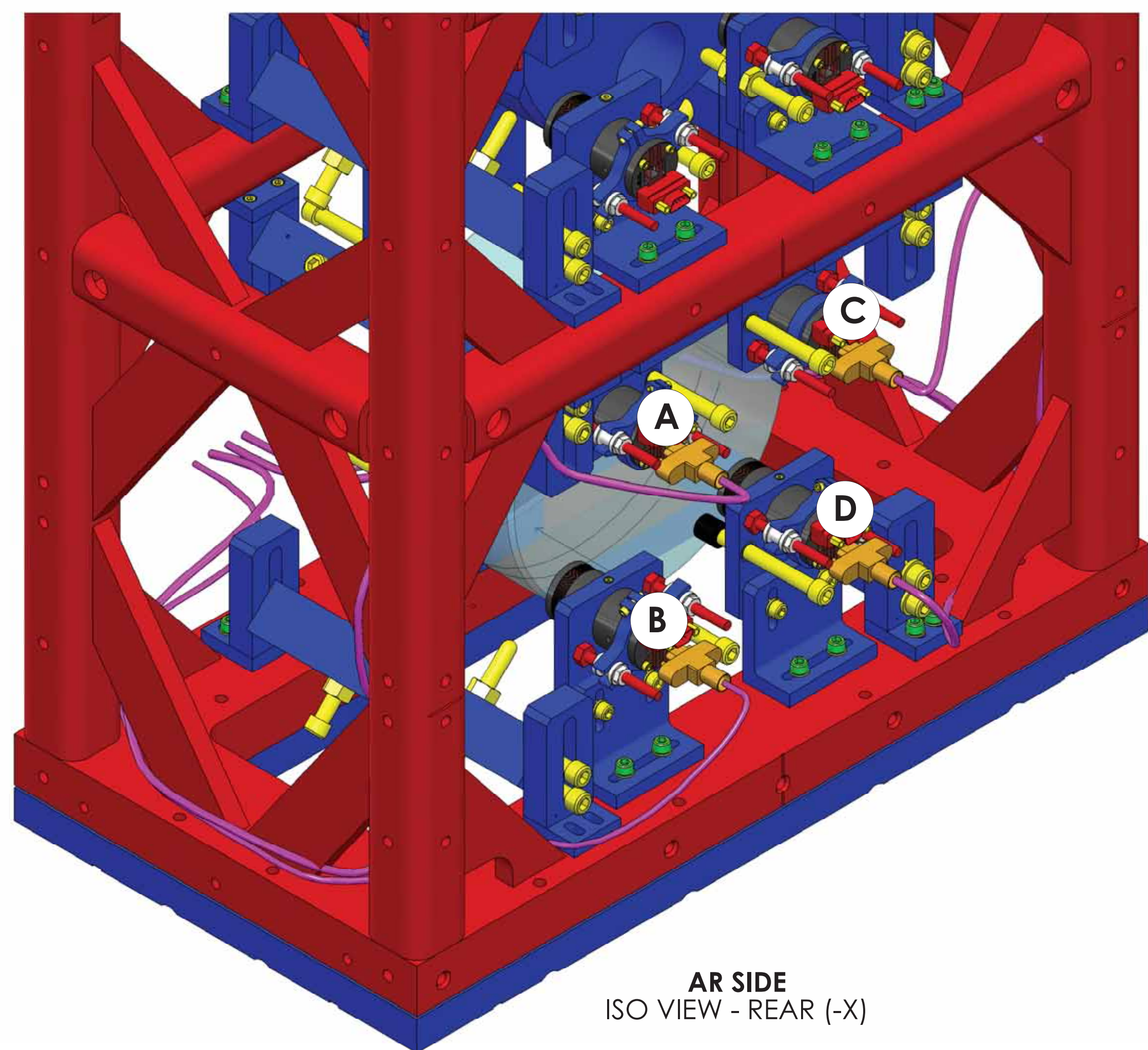
LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

SIZE DWG. NO. **D0901088** REV. **v3**

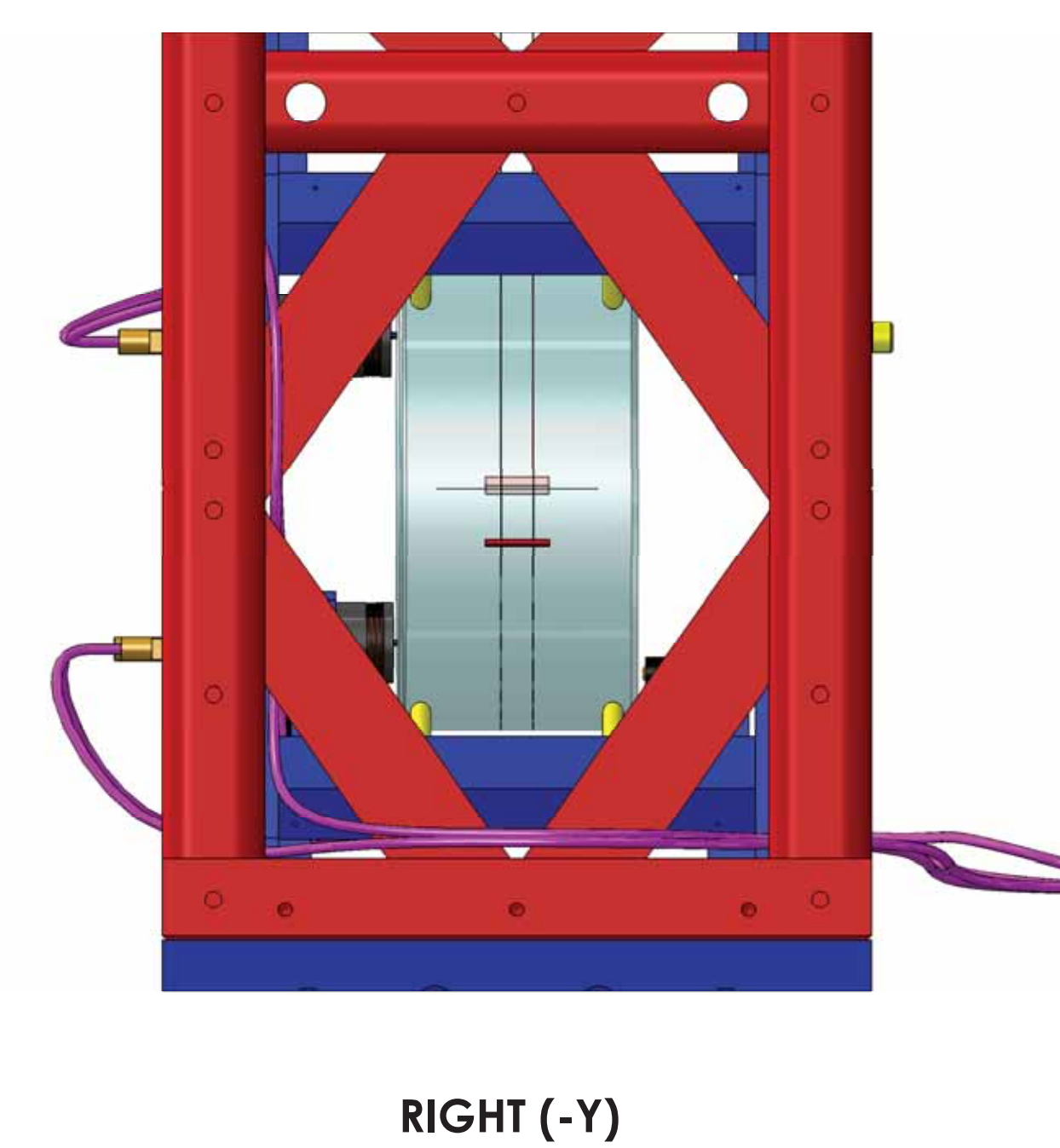
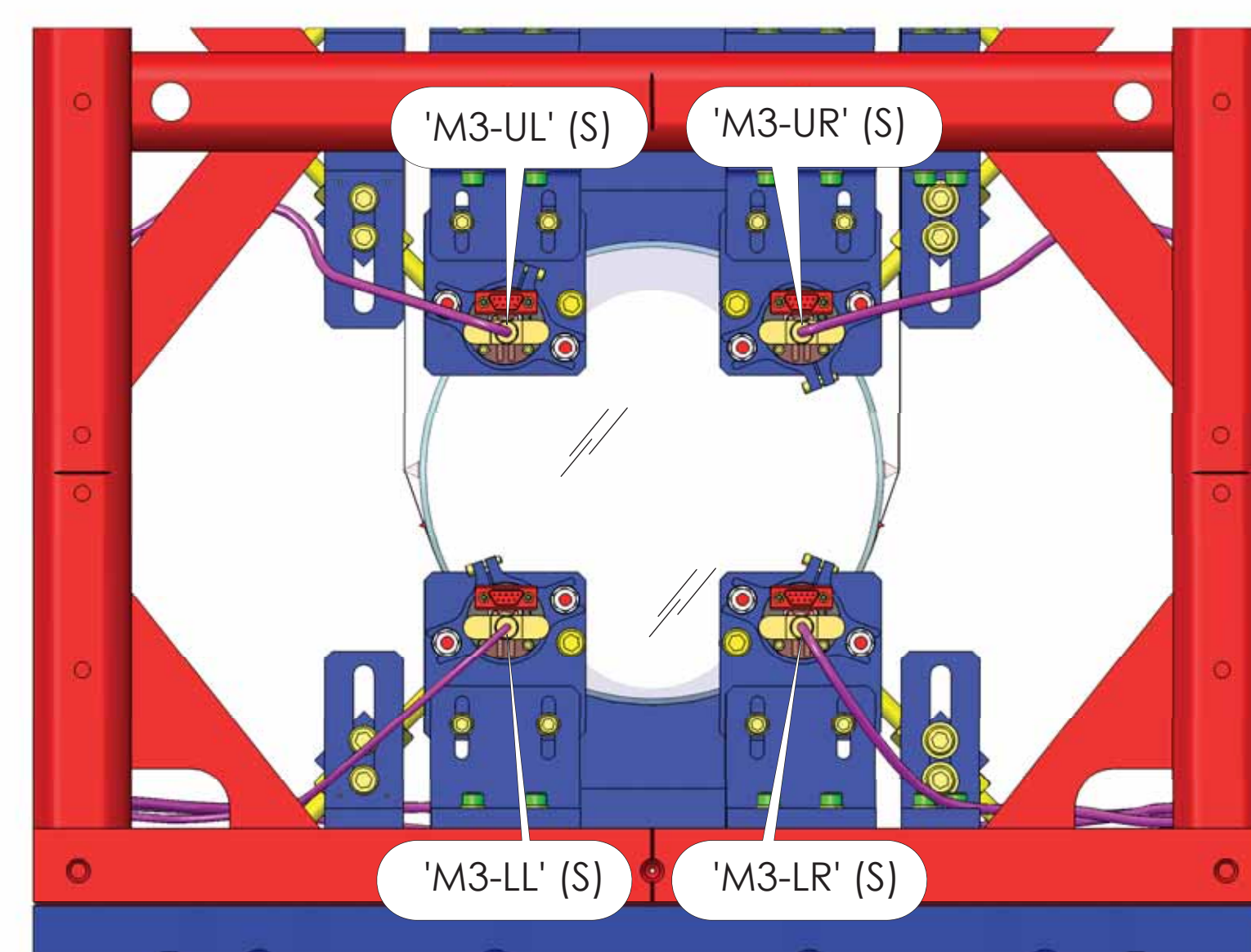
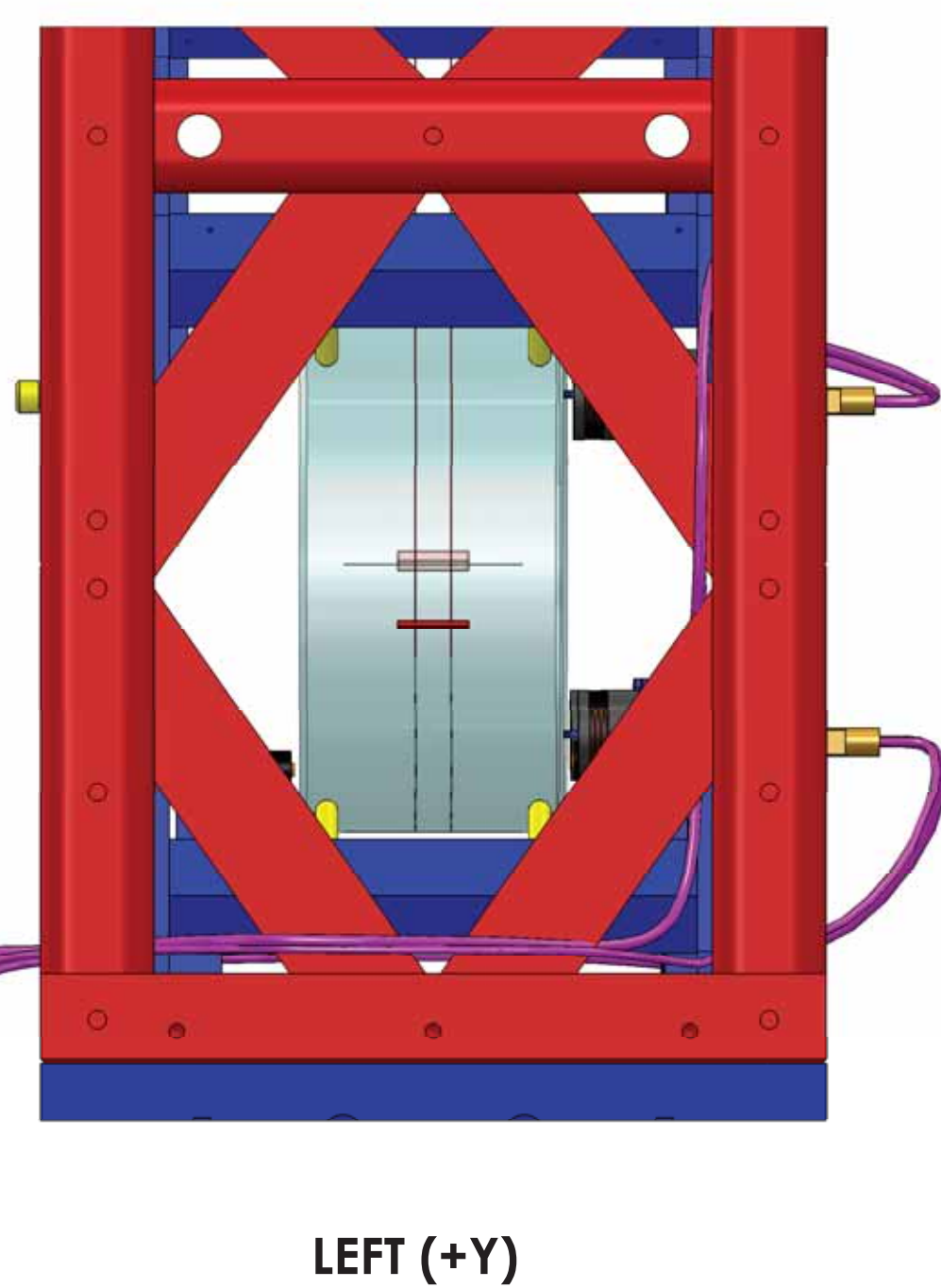
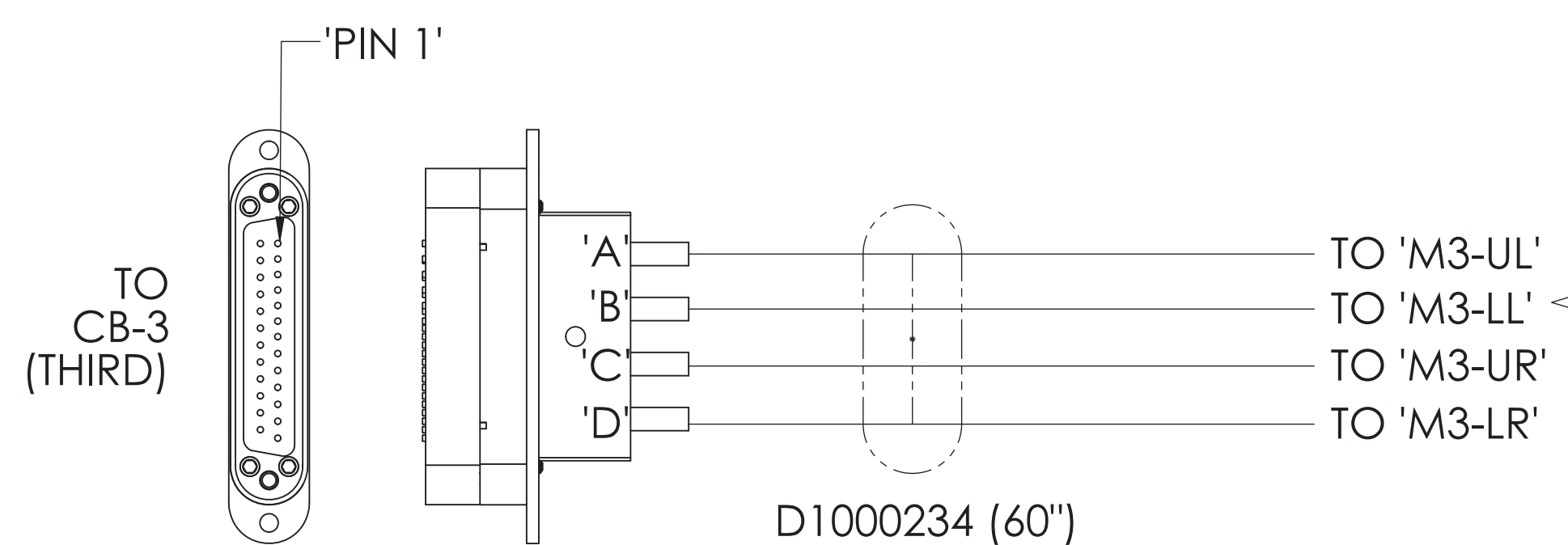
SCALE: 1:8 PROJECTION: SHEET 3 OF 10

MC1

IF REQUIRED, SECURE CABLES USING PEEK CABLE TIES OR EQ. 4 PLACES.



CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.



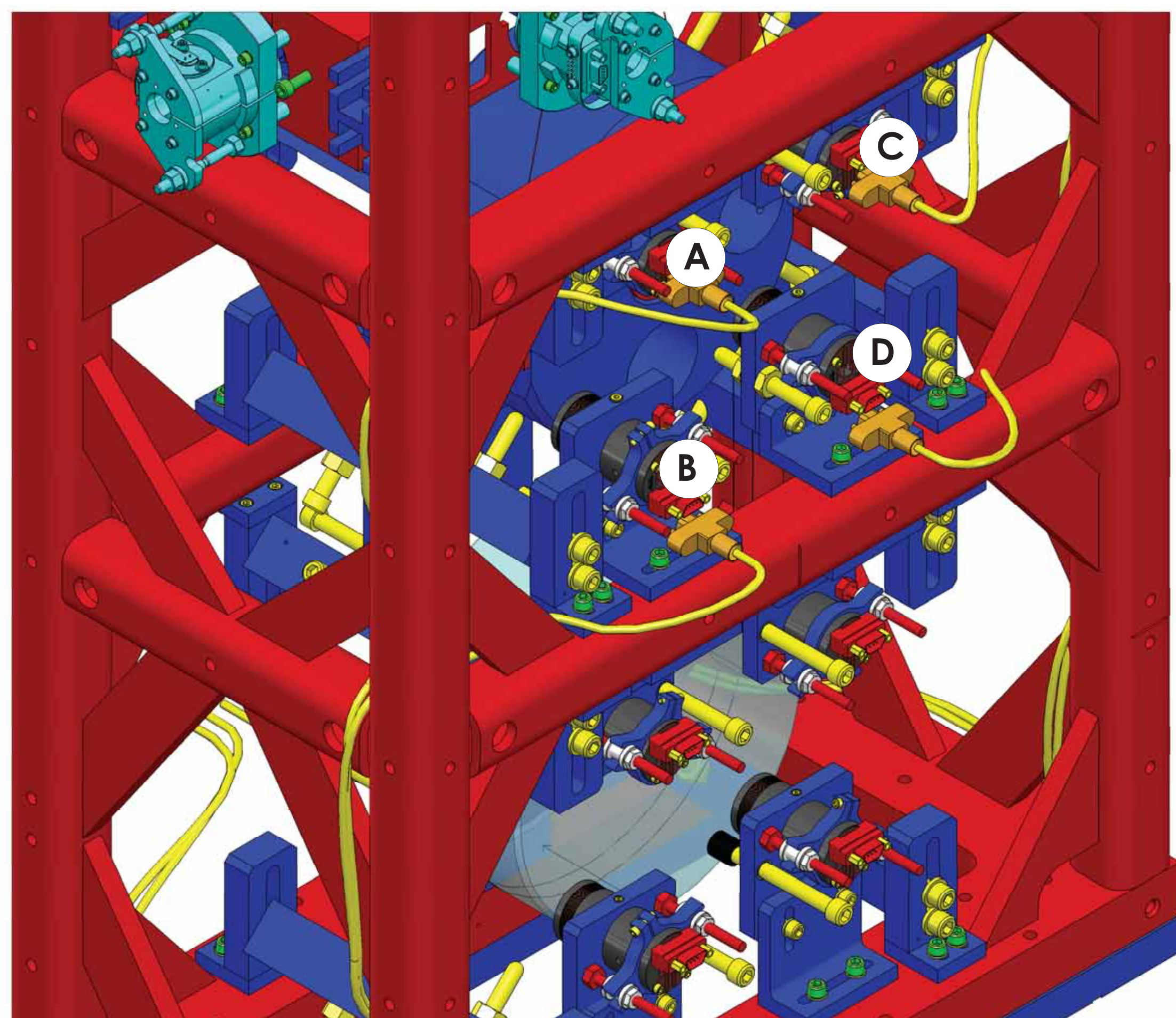
ROUTE NO.1

SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

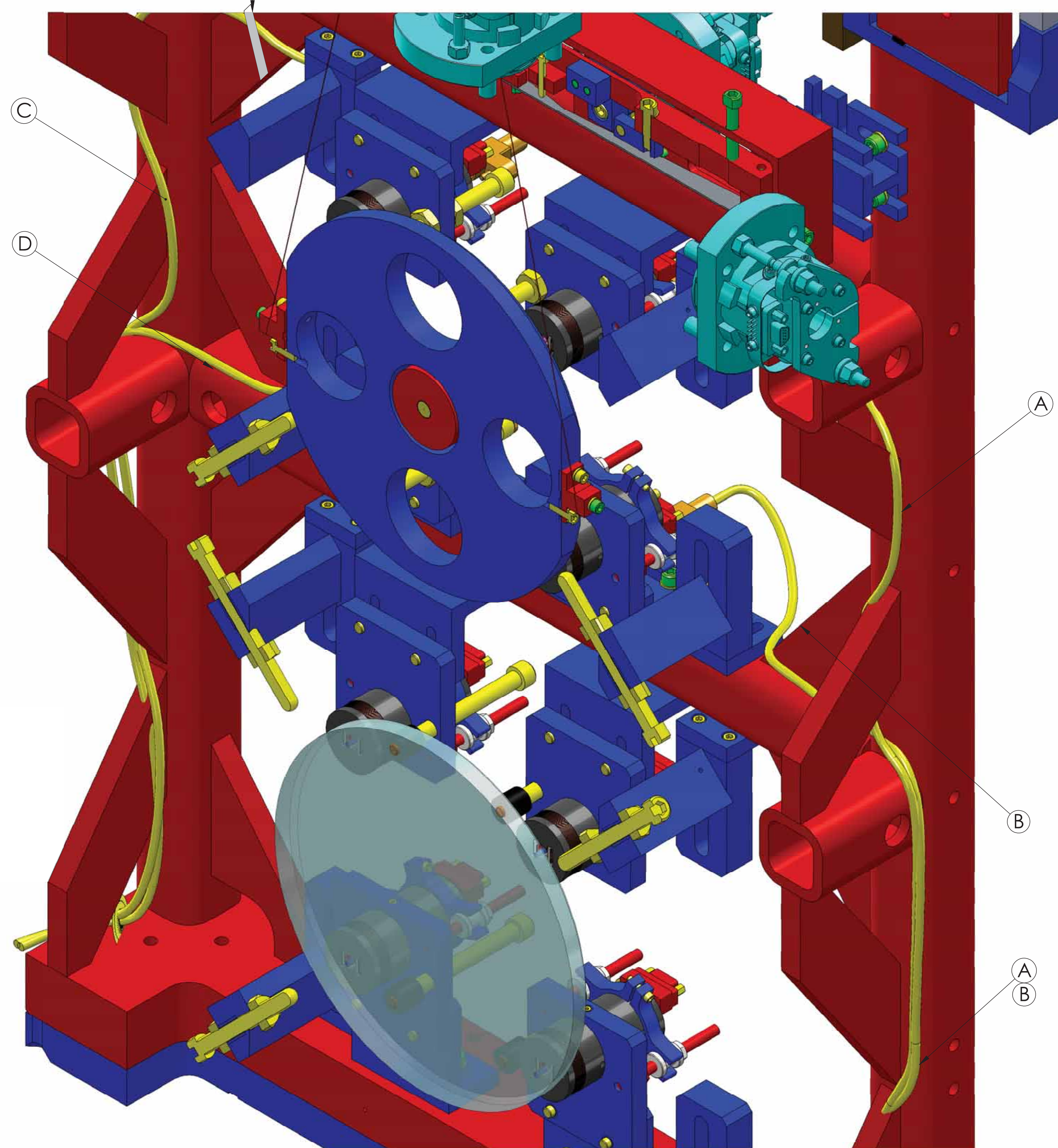
- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
 - 1.2 LIGO-D1101493, OSEM ORIENTATION.
 - 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
 - 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
 - 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
 - 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.

MC1

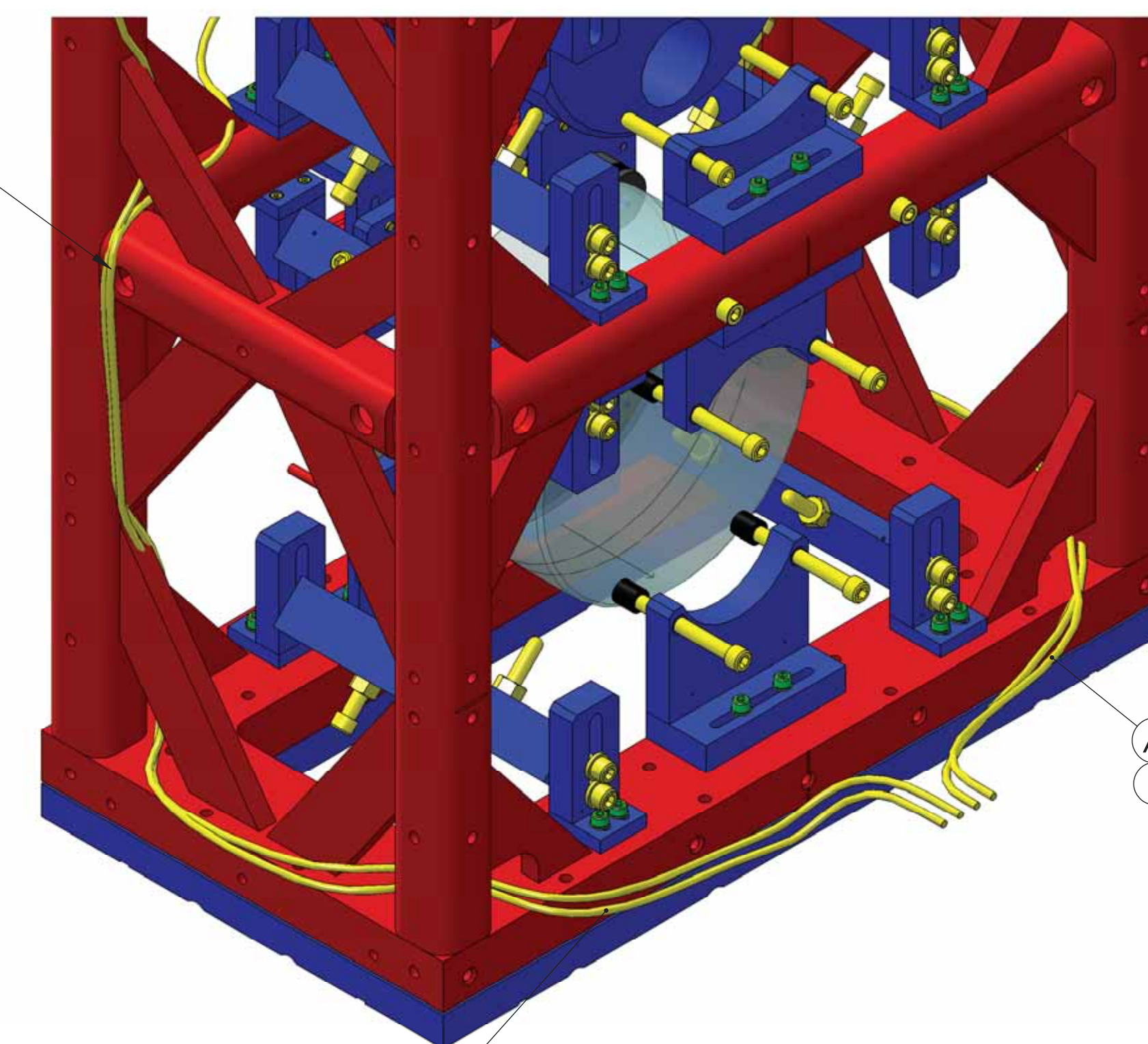
IF REQUIRED, SECURE CABLES USING PEEL CABLE TIES OR EQ. 4 PLACES.



AR SIDE
ISO VIEW - REAR (-X)



ISO VIEW - FRONT LEFT
BROKEN OUT SECTION
(AS VIEWED FROM INSIDE)



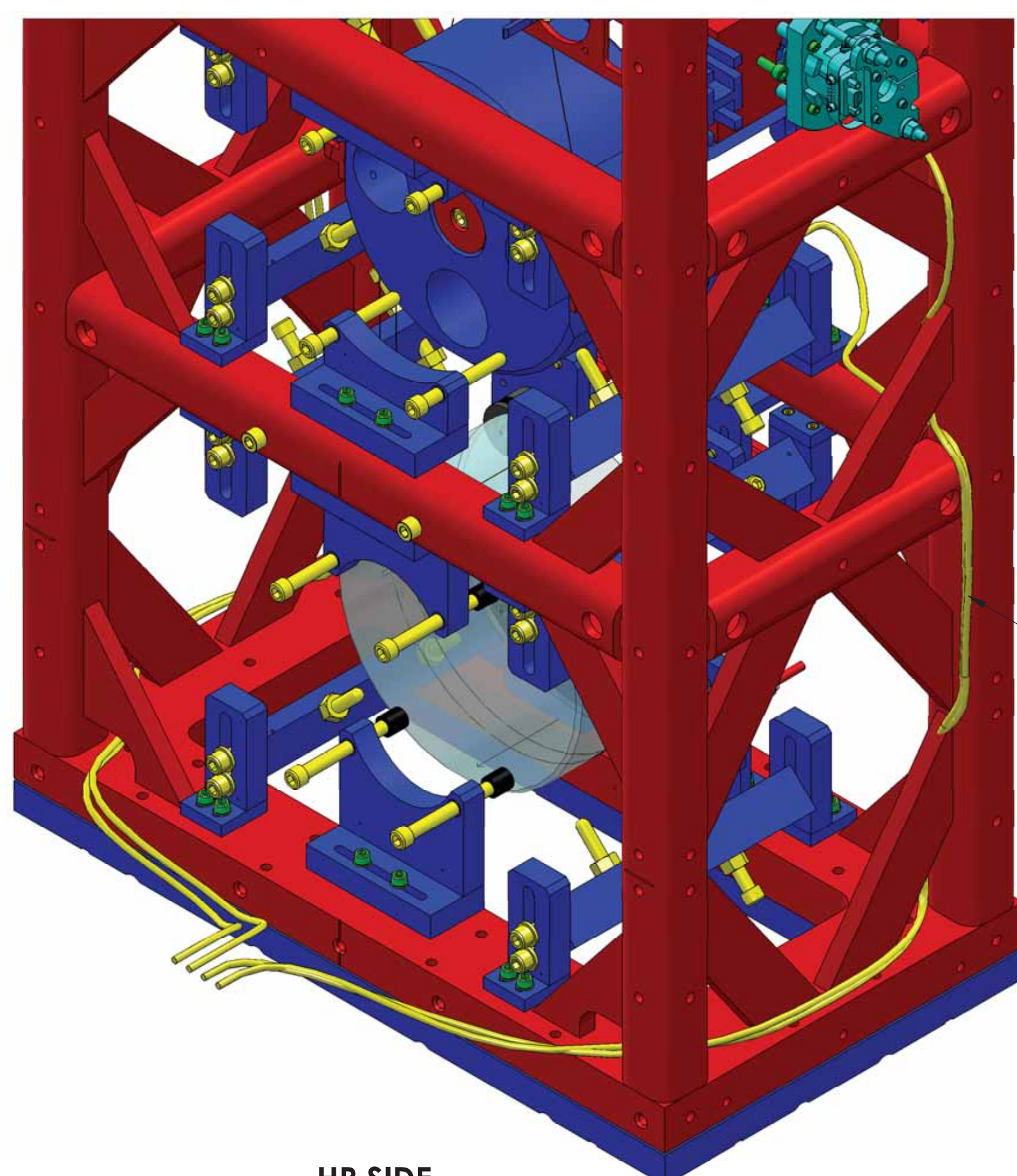
HR SIDE
ISO VIEW - FRONT RIGHT (-X)

QP LEGS LACED THROUGH HR SIDE BOTTOM RIGHT GUSSET

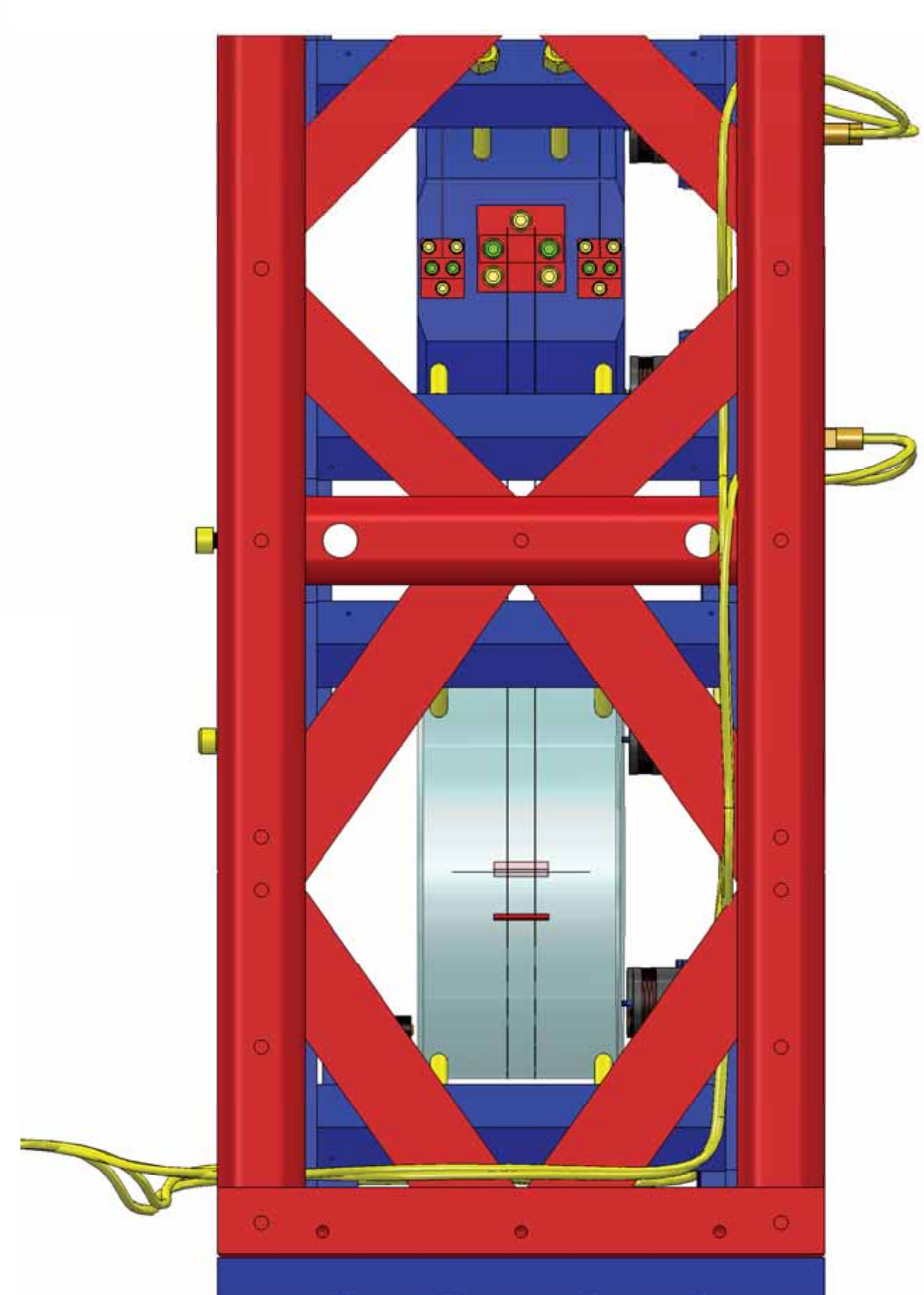
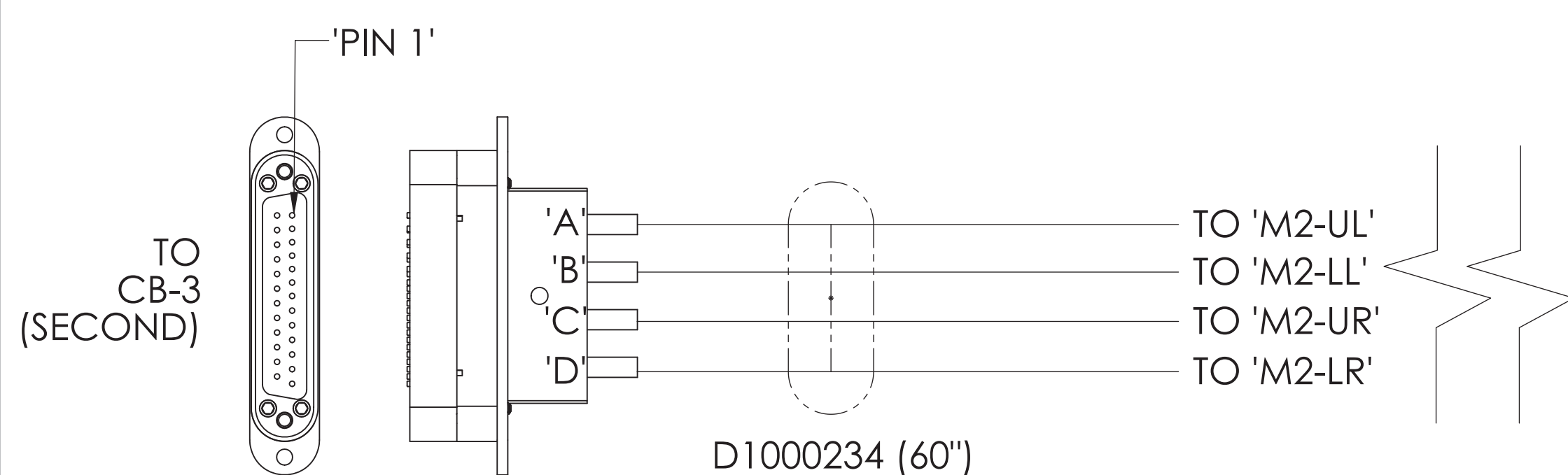


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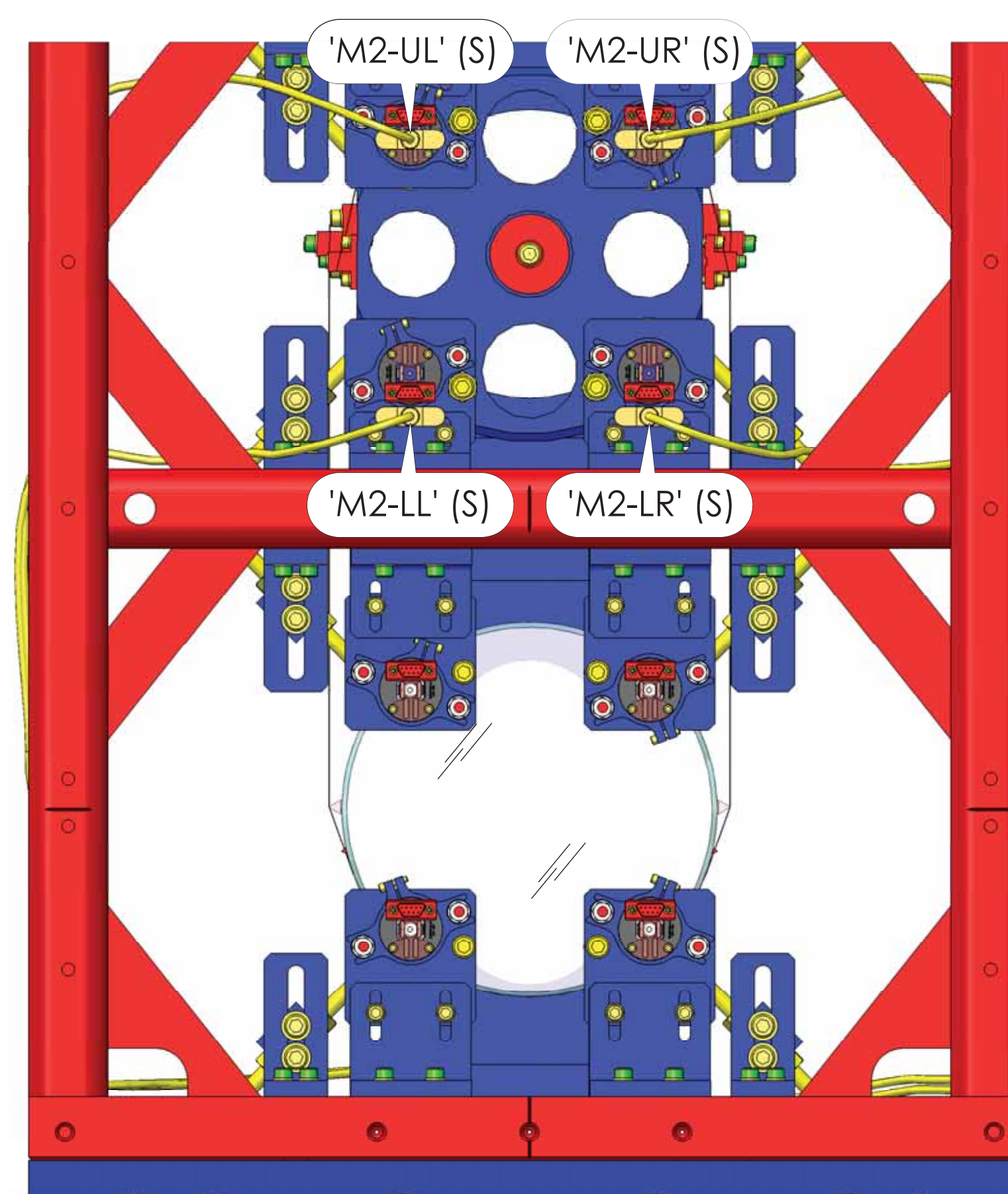
CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.



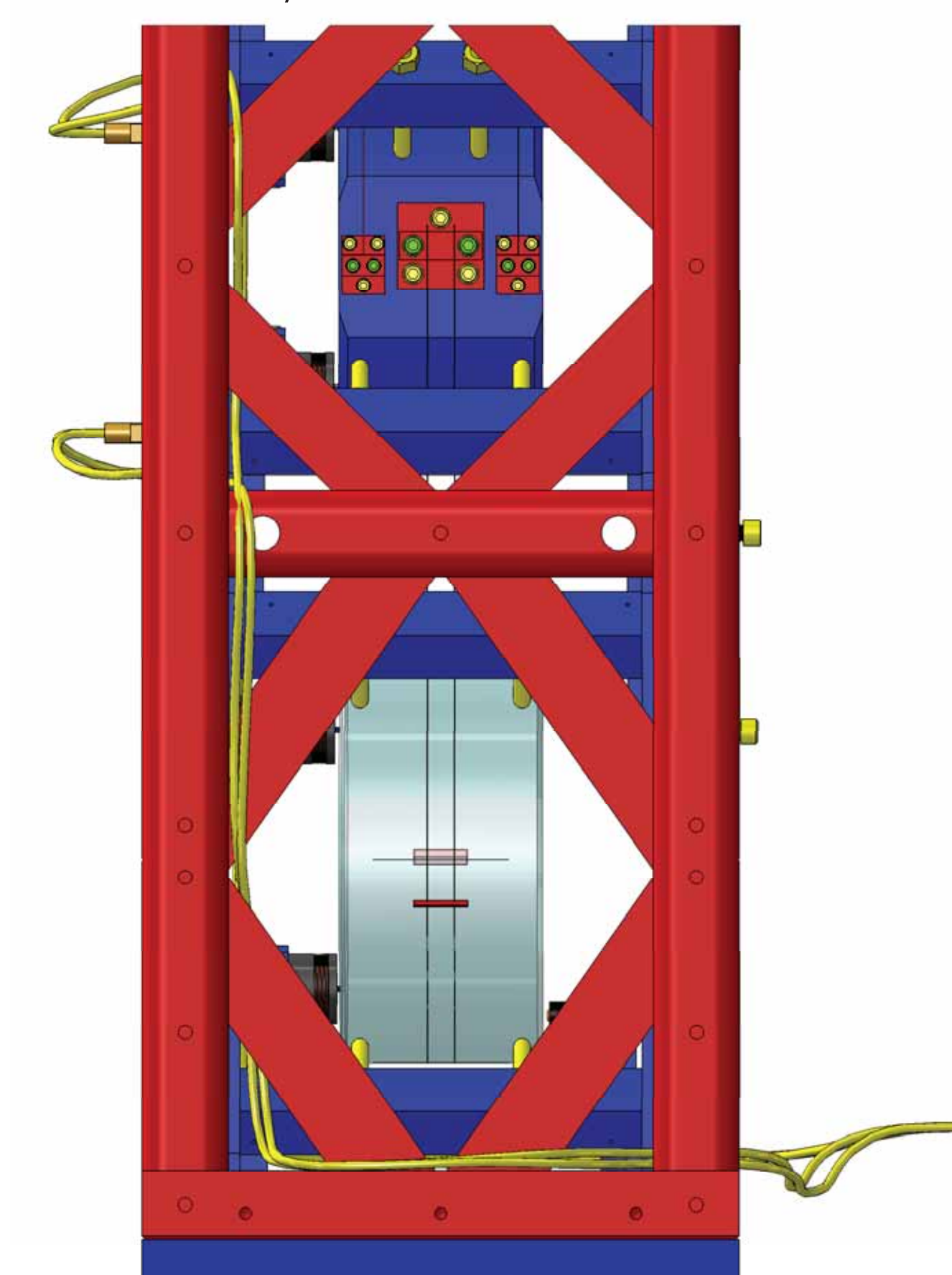
HR SIDE
ISO VIEW - FRONT LEFT (+X)



LEFT (+Y)



AR SIDE - REAR (-X) (1.1) (1.2)
(END CONNECTORS, NOT SHOWN FOR CLARITY)



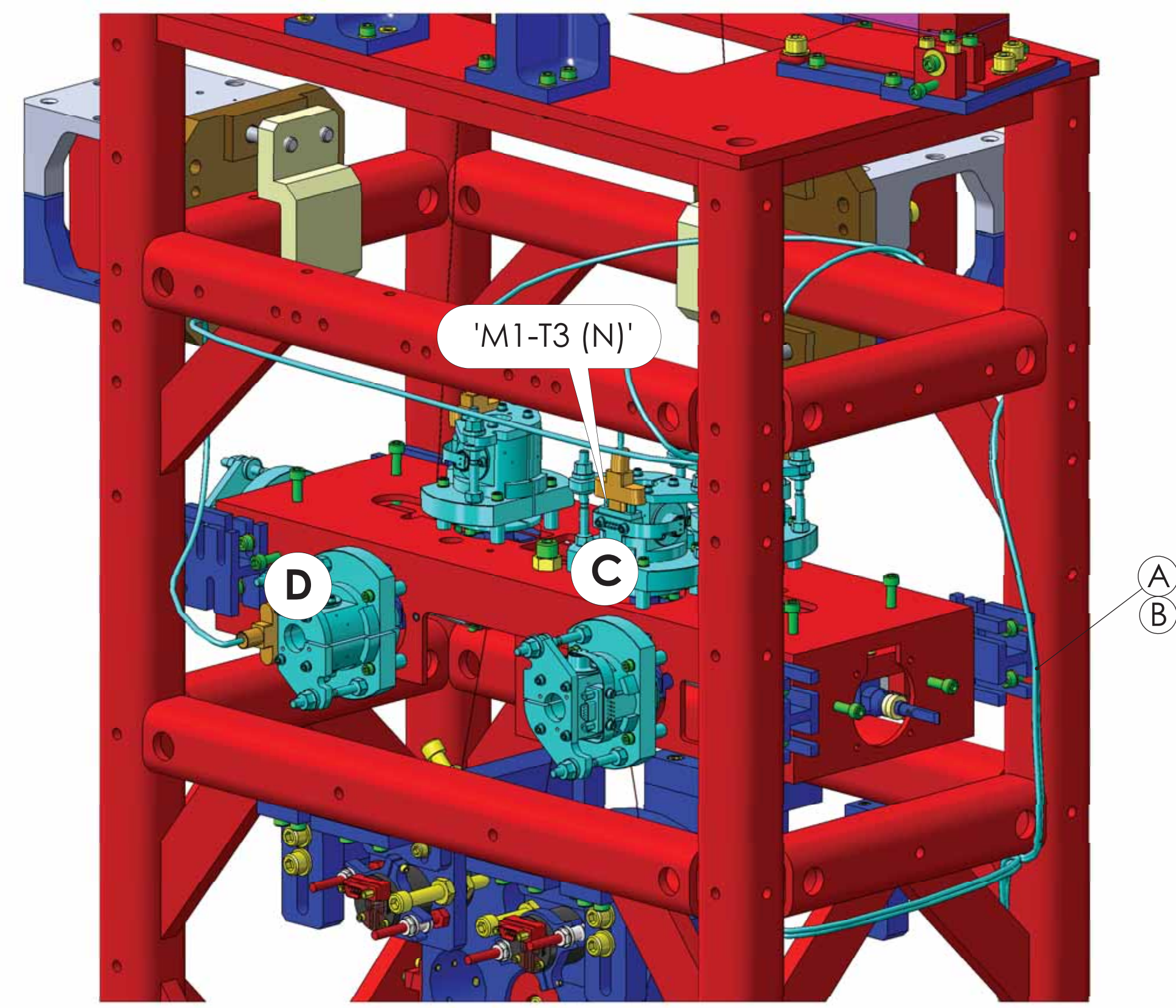
RIGHT (-Y)

ROUTE NO.2

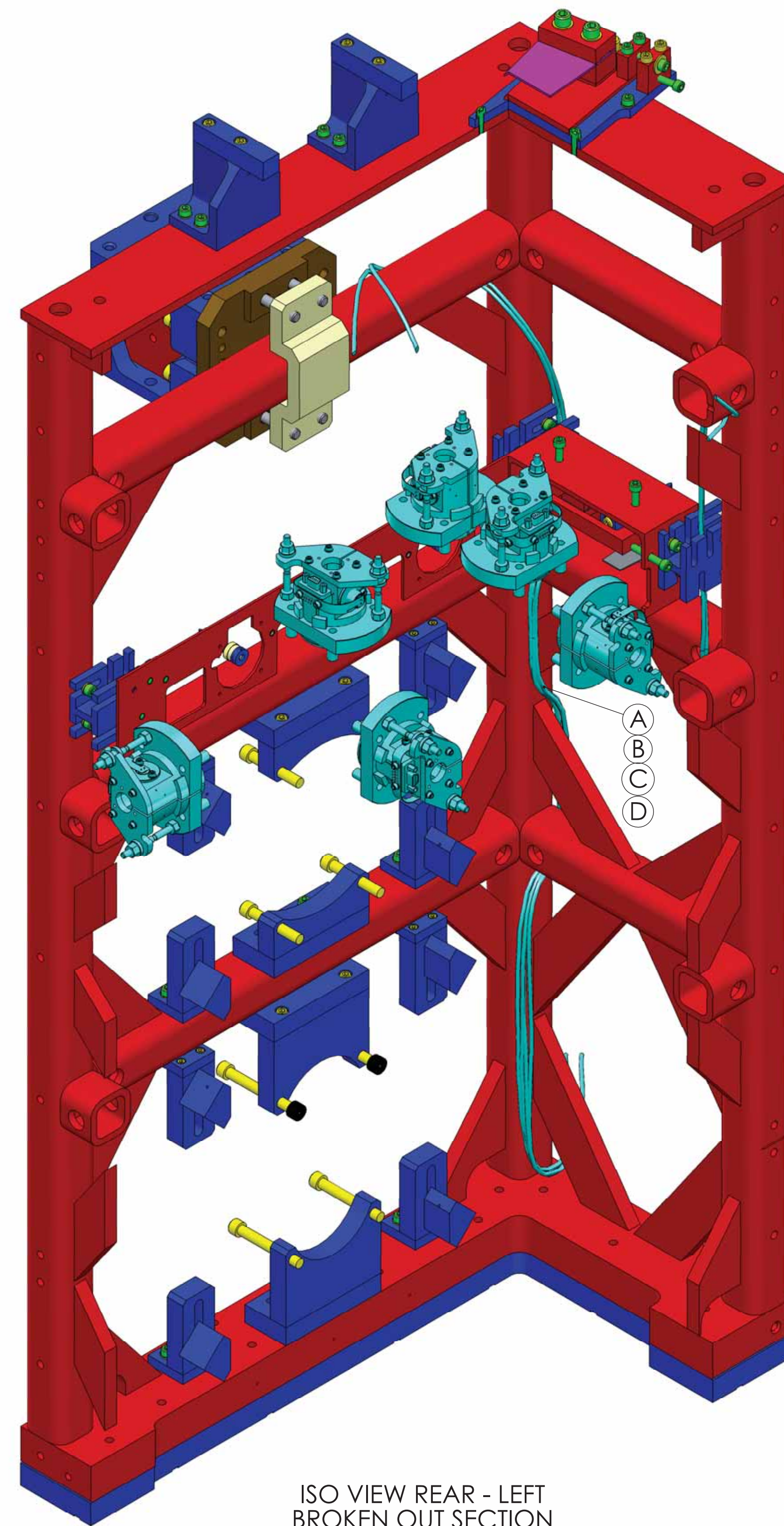
SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
 - 1.2 LIGO-D1101493, OSEM ORIENTATION.
 - 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
 - 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
 - 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
 - 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.

MC1

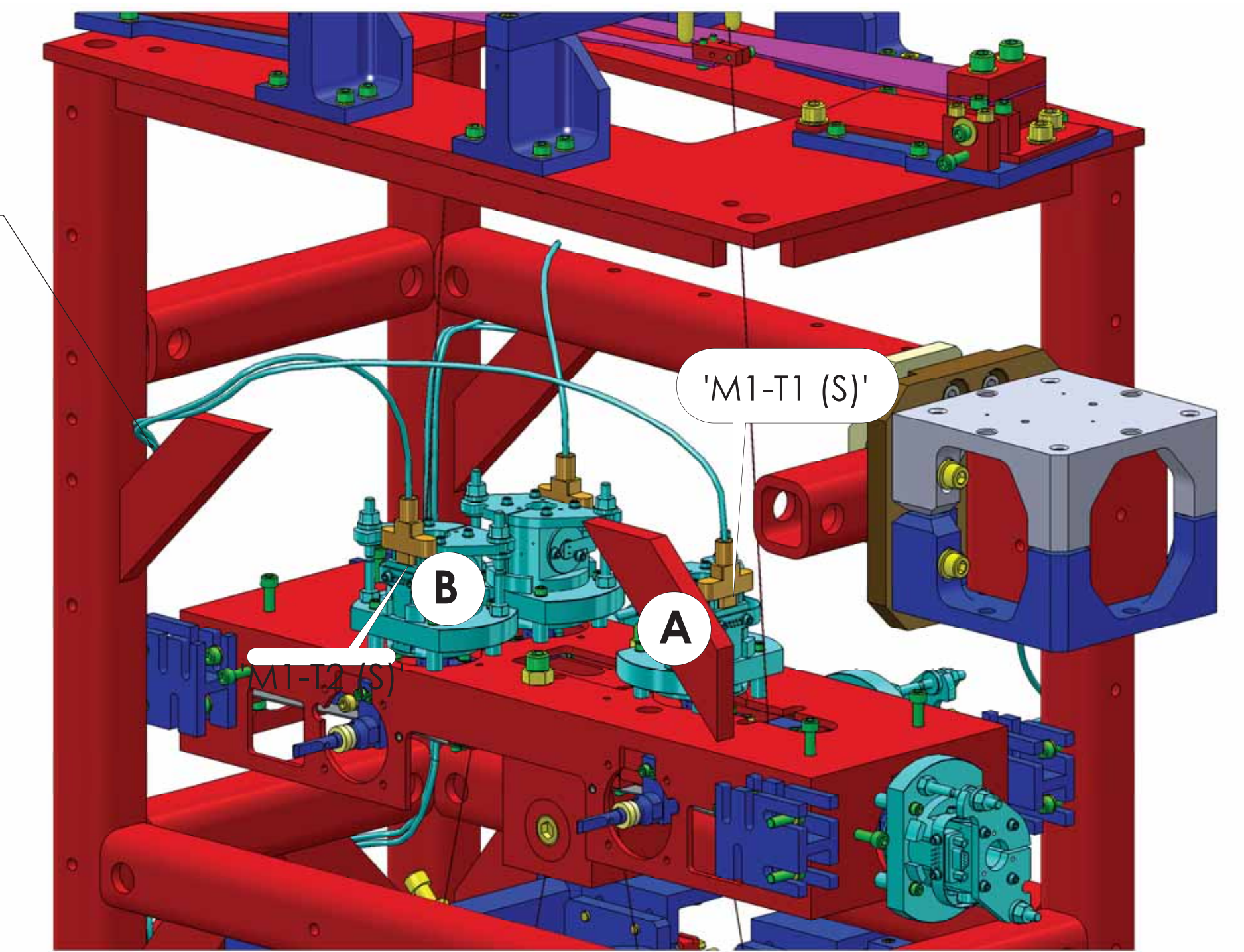


AR SIDE (1.1) (1.2)
ISO VIEW, REAR - RIGHT (-X)

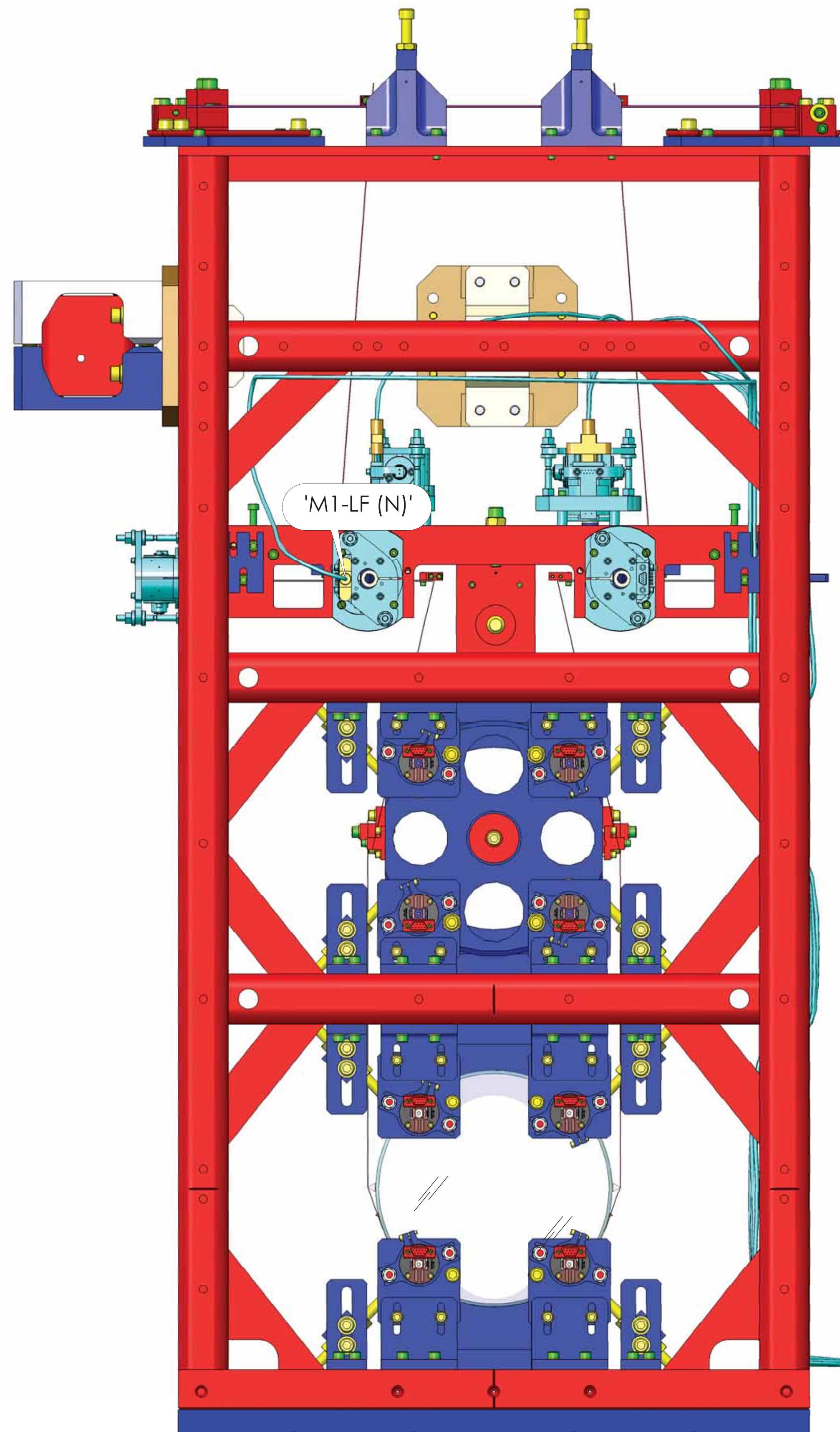


ISO VIEW REAR - LEFT
BROKEN OUT SECTION
(AS VIEWED FROM INSIDE)

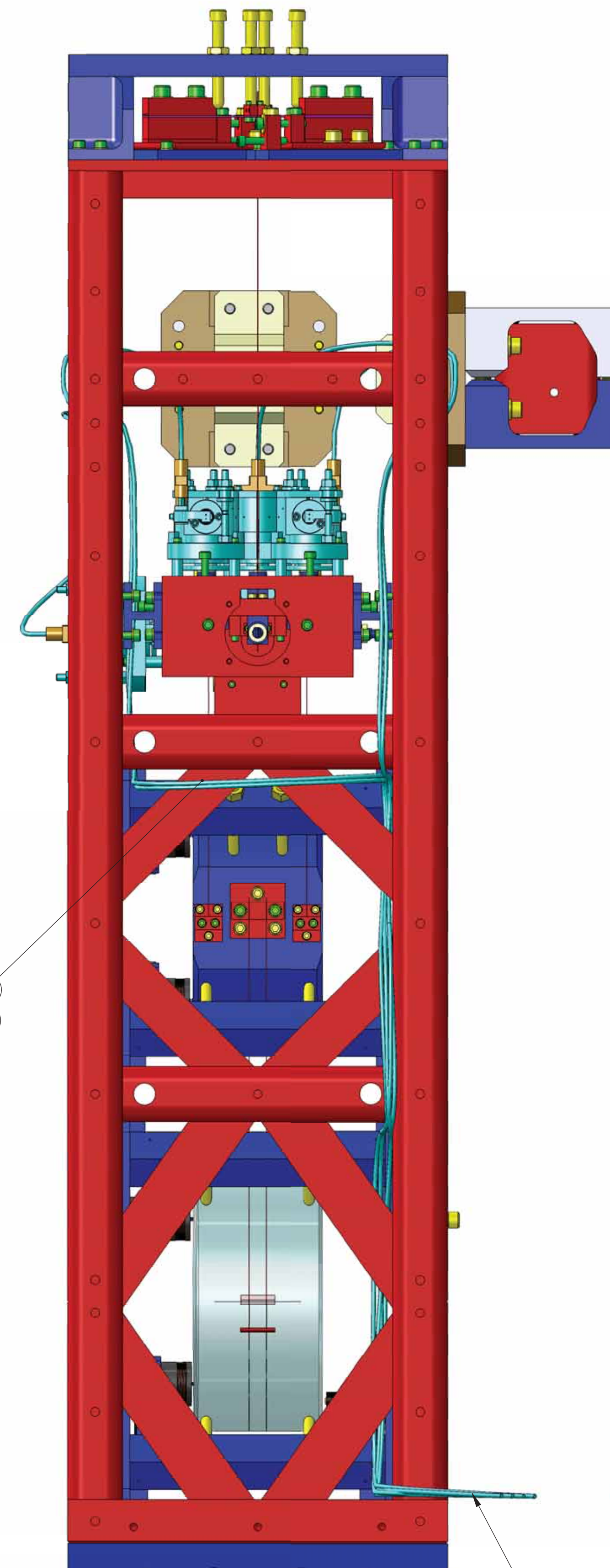
IF REQUIRED,
SECURE CABLES
USING PEEK CABLE TIES
OR EQ.



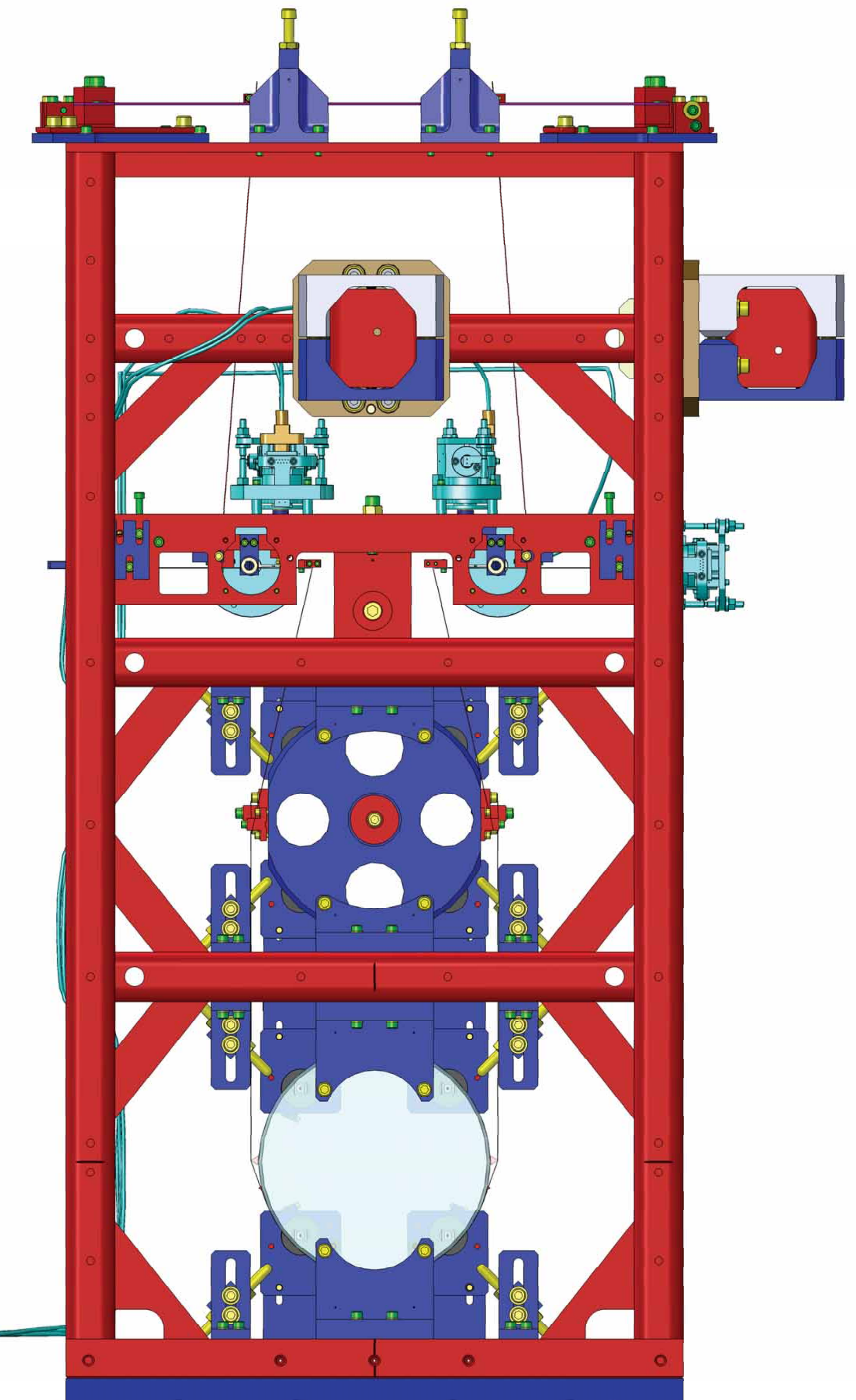
HR SIDE (1.1) (1.2)
ISO VIEW, FRONT - RIGHT (+X)



AR SIDE - REAR (-X) (1.1) (1.2)
(END CONNECTORS, NOT SHOWN FOR CLARITY)



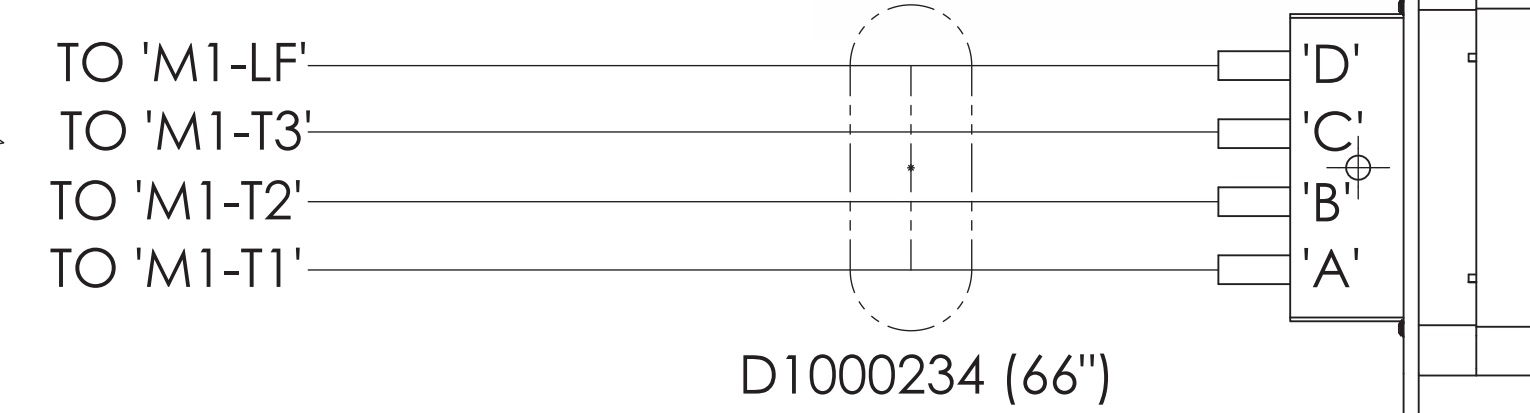
RIGHT SIDE (-Y)



HR SIDE - FRONT (+X)
(END CONNECTORS, NOT SHOWN FOR CLARITY)



CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.



ROUTE NO.3
SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

① REFERENCED DOCUMENTATION:

- 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
- 1.2 LIGO-D1101493, OSEM ORIENTATION.
- 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
- 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
- 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
- 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.

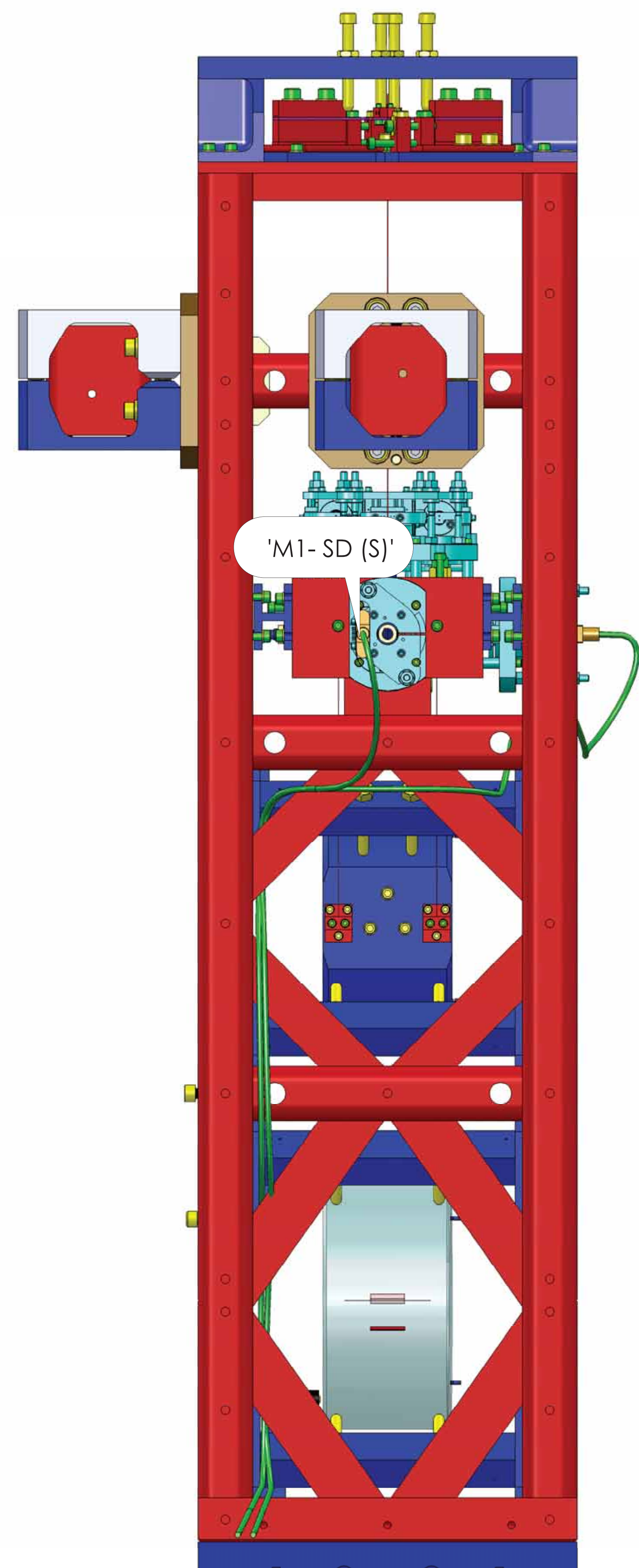
MC1

(SHARED)

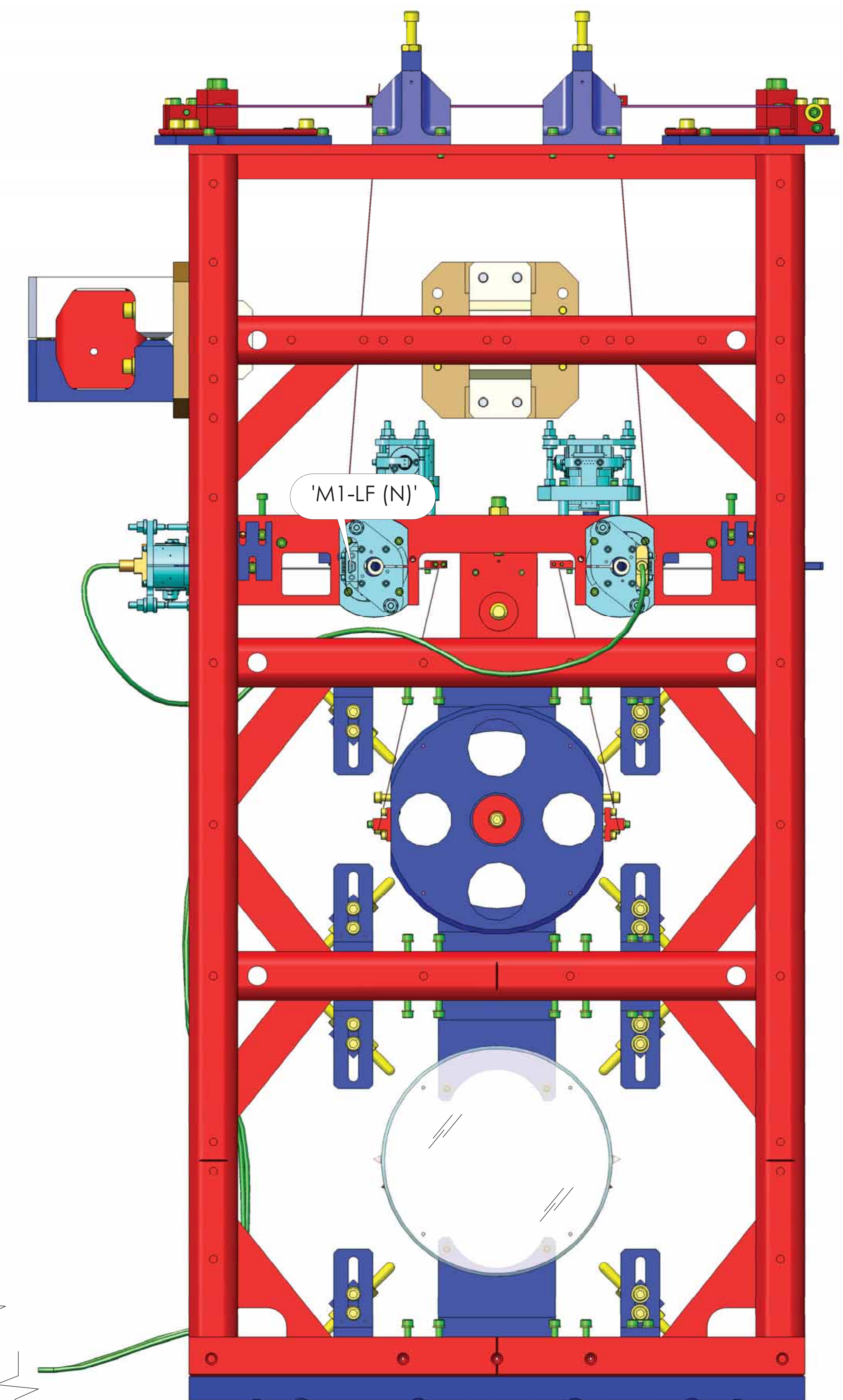
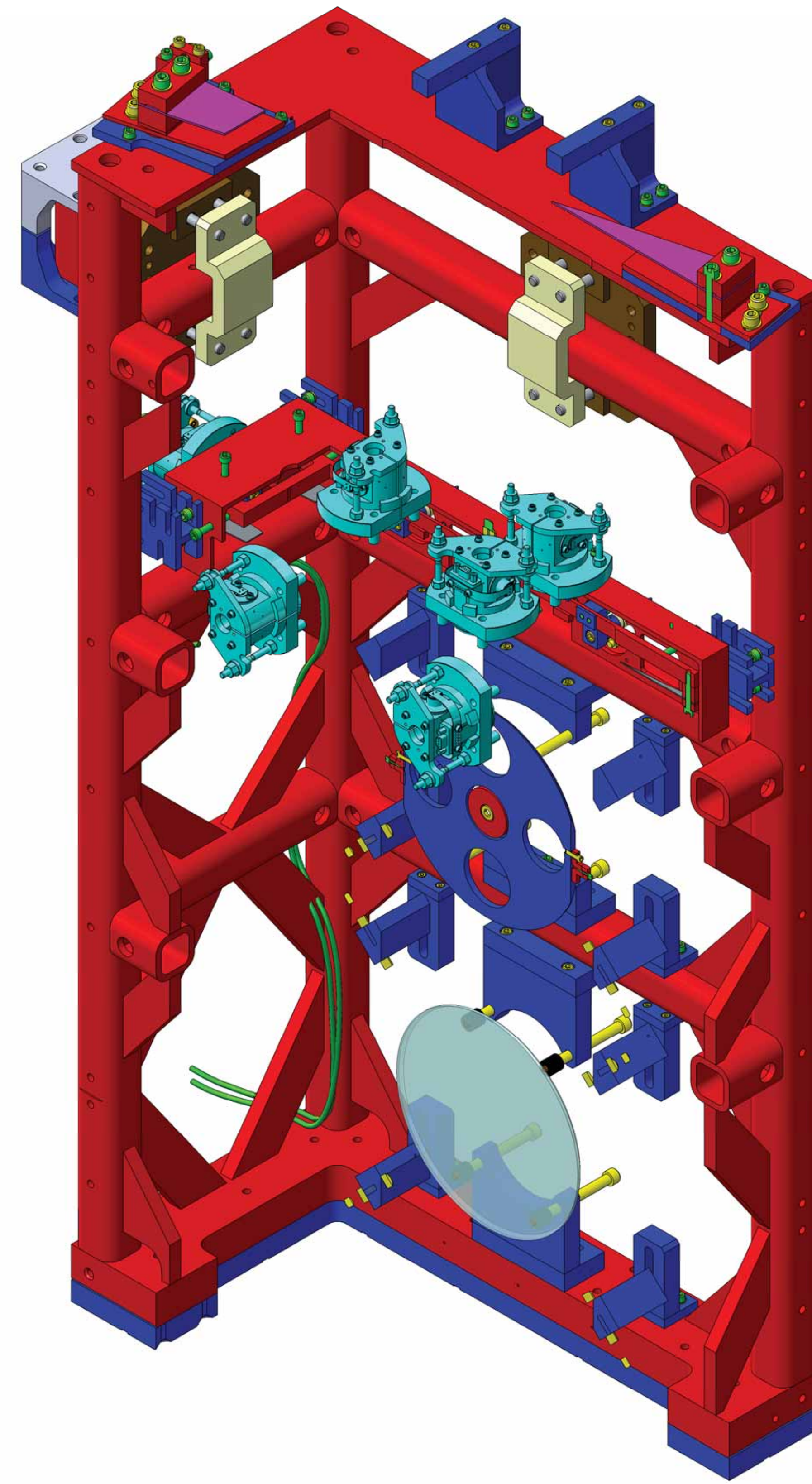


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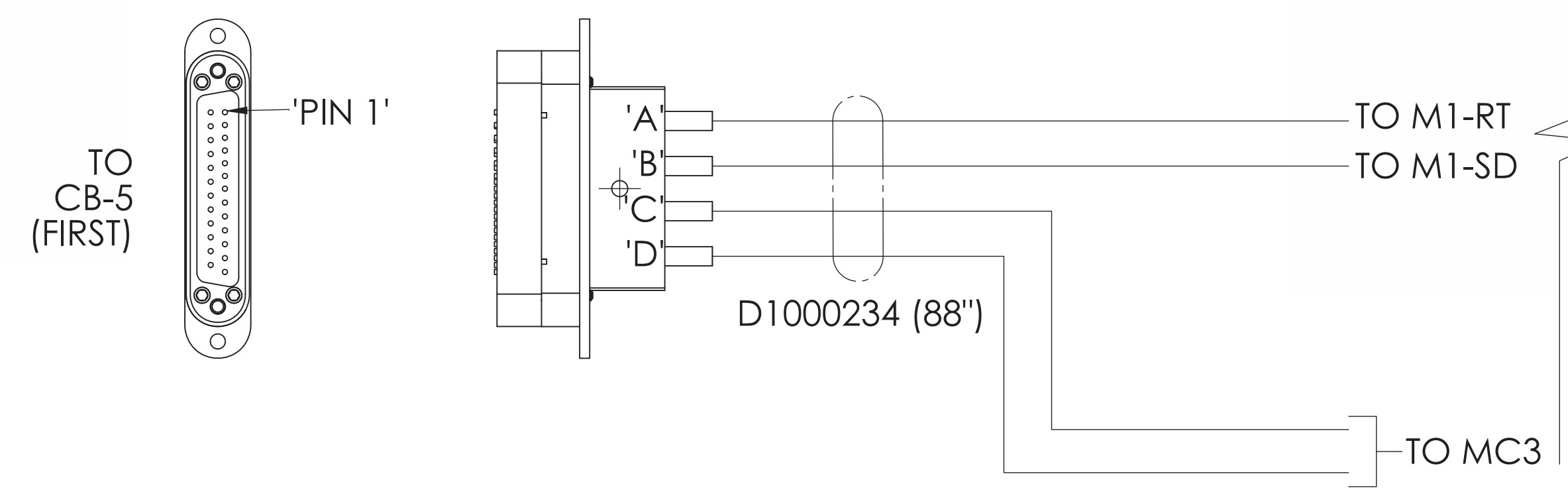
CABLE ROUTING:
 ROUTE ALL CABLES IN ACCORDANCE WITH LIGO-T1200203 AND T1200318. CABLE ROUTES DEPICTED IN THIS DOCUMENT ARE NOT MANDATORY, BUT RATHER A CONSIDERED ROUTE AIMED TO CLEAR LASER BEAM PATHS. ALTERNATE ROUTES FOR PROBLEMATIC AREAS ARE ACCEPTABLE, BUT SHOULD BE HANDLED IN A CASE BY CASE SITUATION. IT IS IMPERATIVE TO CONSIDER THE LENGTH OF THE CABLE, THE LOCATION OF MATING CABLE BRACKET, AND LASER BEAM PATH PRIOR TO ROUTING / LACING VIA A NEW PATH.



LEFT SIDE (+Y) (1.1) (1.2)



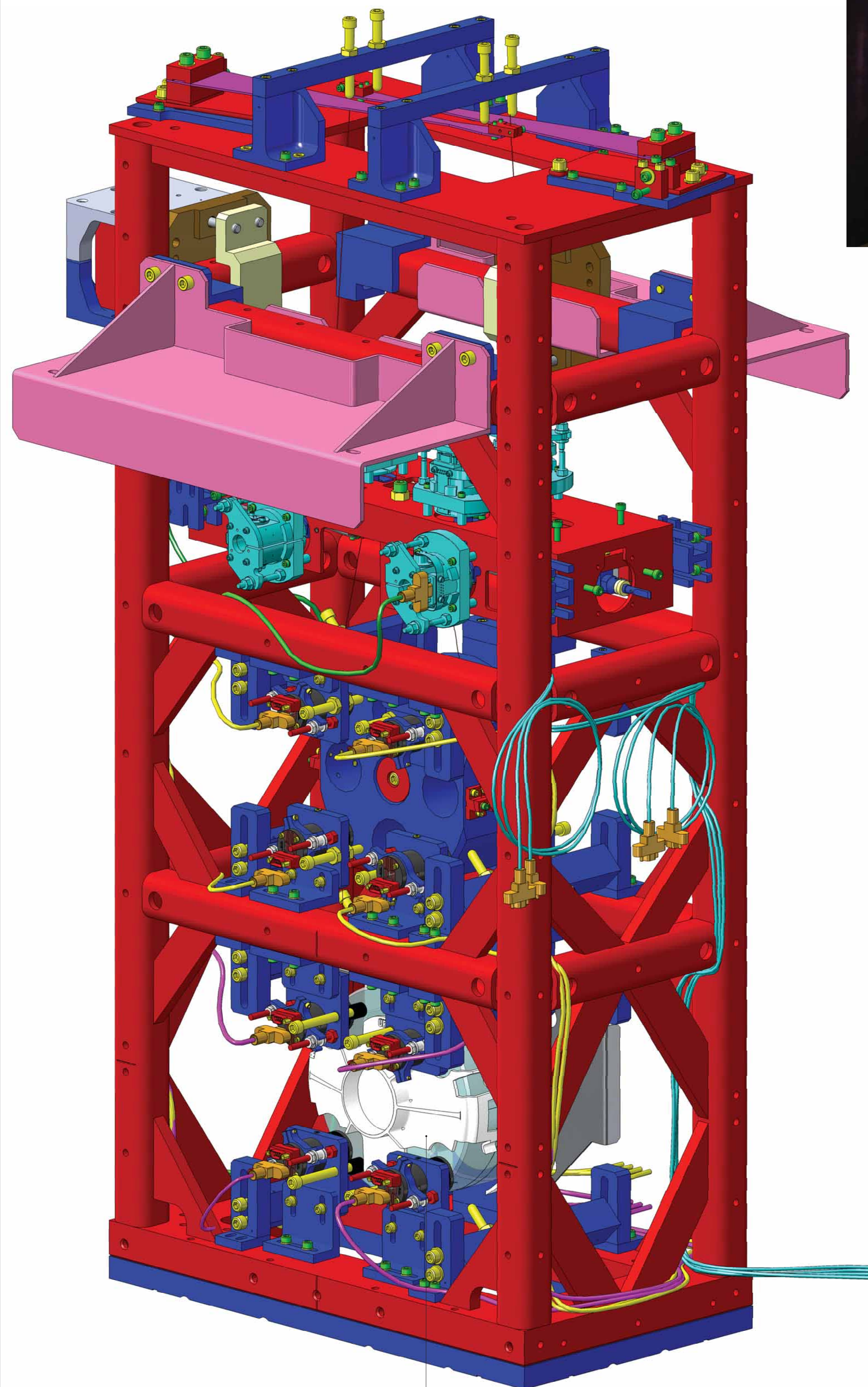
AR SIDE - REAR (-X) (1.1) (1.2)
 (END CONNECTORS, NOT SHOWN FOR CLARITY)



ROUTE NO.4
 SEE LIGO T1200318
 FOR STEP BY STEP CABLING GUIDE

- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1100109, HAM SUS CONTROL ARRANGEMENT.
 - 1.2 LIGO-D1101493, OSEM ORIENTATION.
 - 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
 - 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
 - 1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
 - 1.6 LIGO-D1101296, HAM ISI HOLE TABLE.

MC1



D1102299 (7)
AR OPTIC CAP

AR SIDE
ISO VIEW, REAR - LEFT (-X)

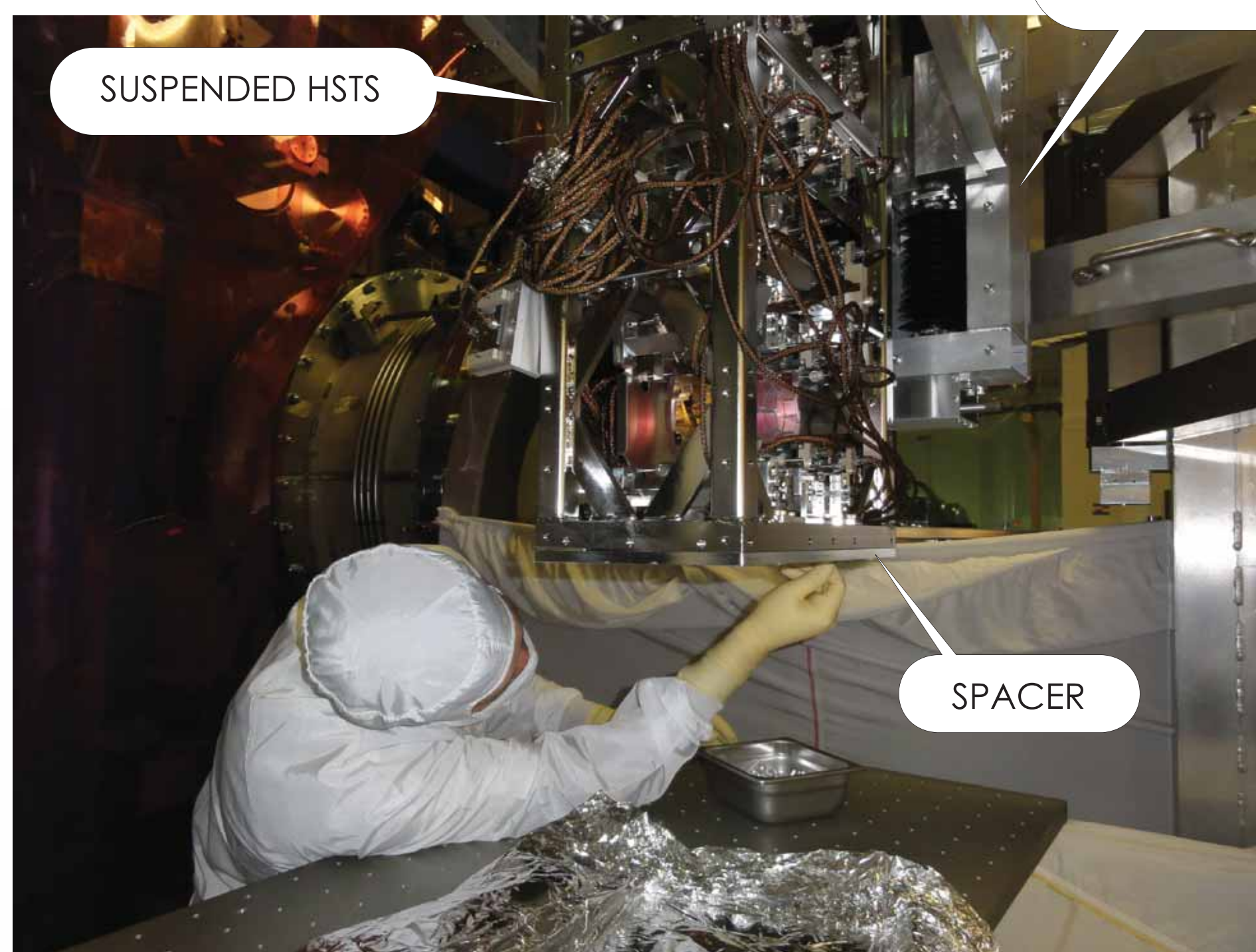
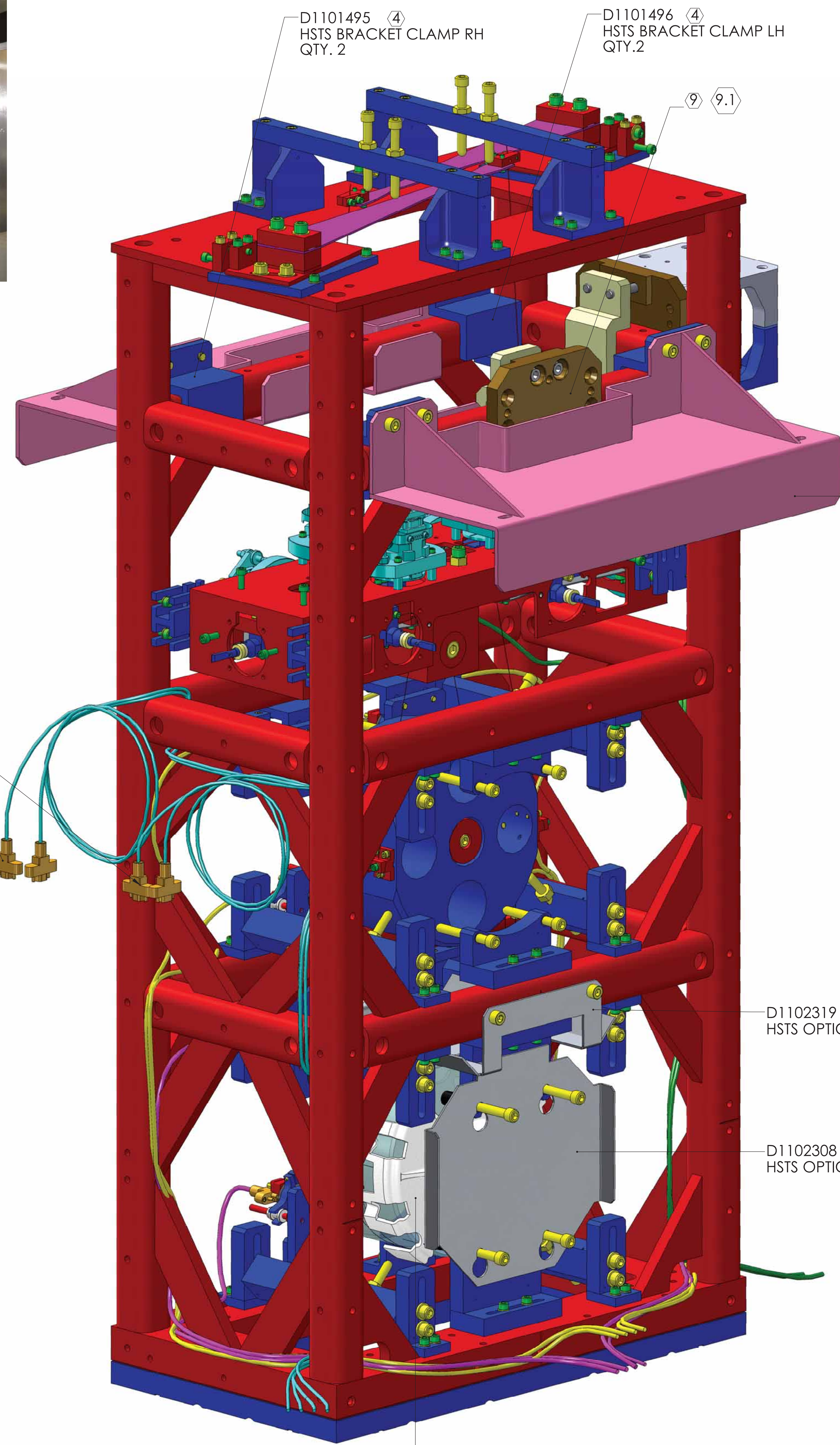


FIG 1.0: SPACER INSTALLATION (10)

BUNDLE CABLES (5)
AND ATTACH AS SHOWN
TO THE SIDE OF THE STRUCTURE
FOR TRANSPORTATION
PURPOSES ONLY
(SEE SHEET 6, FOR ROUTE DETAILS)



D1101143 (7)
HSTS OPTICS CAP

HR SIDE
ISO VIEW, FRONT - RIGHT (+X)

- (7) INDICATED ITEMS FOR TRANSPORTATION PURPOSES ONLY. AND ARE NOT PART OF FINISHED ASSEMBLY. SEE D1101674 FOR REFERENCE.
- (8) REMOVE INDICATED ITEMS FOR TRANSPORTATION PURPOSES. BUNDLE CABLES AS SHOWN.
- (9) REMOVE VIBRATION ABSORBER ON FRONT SIDE TO AVOID INTERFERENCE WITH BRACKET.
9.1 LOCKING PINS: RETAIN IN PLACE FOR TRANSPORTATION AND INSTALLATION ONLY. REMOVE BEFORE CHAMBER DOORS ARE CLOSED.
- (10) LIFT STRUCTURE VIA INSTALLATION ARM AT CHAMBER SIDE. ATTACH ITEM 2 (SPACER) USING ITEM 6 (SCREW). TORQUE TO 75 IN LB. SEE FIG 1.0 FOR REFERENCE.

D1101495 (4)
HSTS BRACKET CLAMP RH
QTY. 2

D1101496 (4)
HSTS BRACKET CLAMP LH
QTY. 2

D1001788 (4)
HSTS LIFT BRACKET
QTY. 2

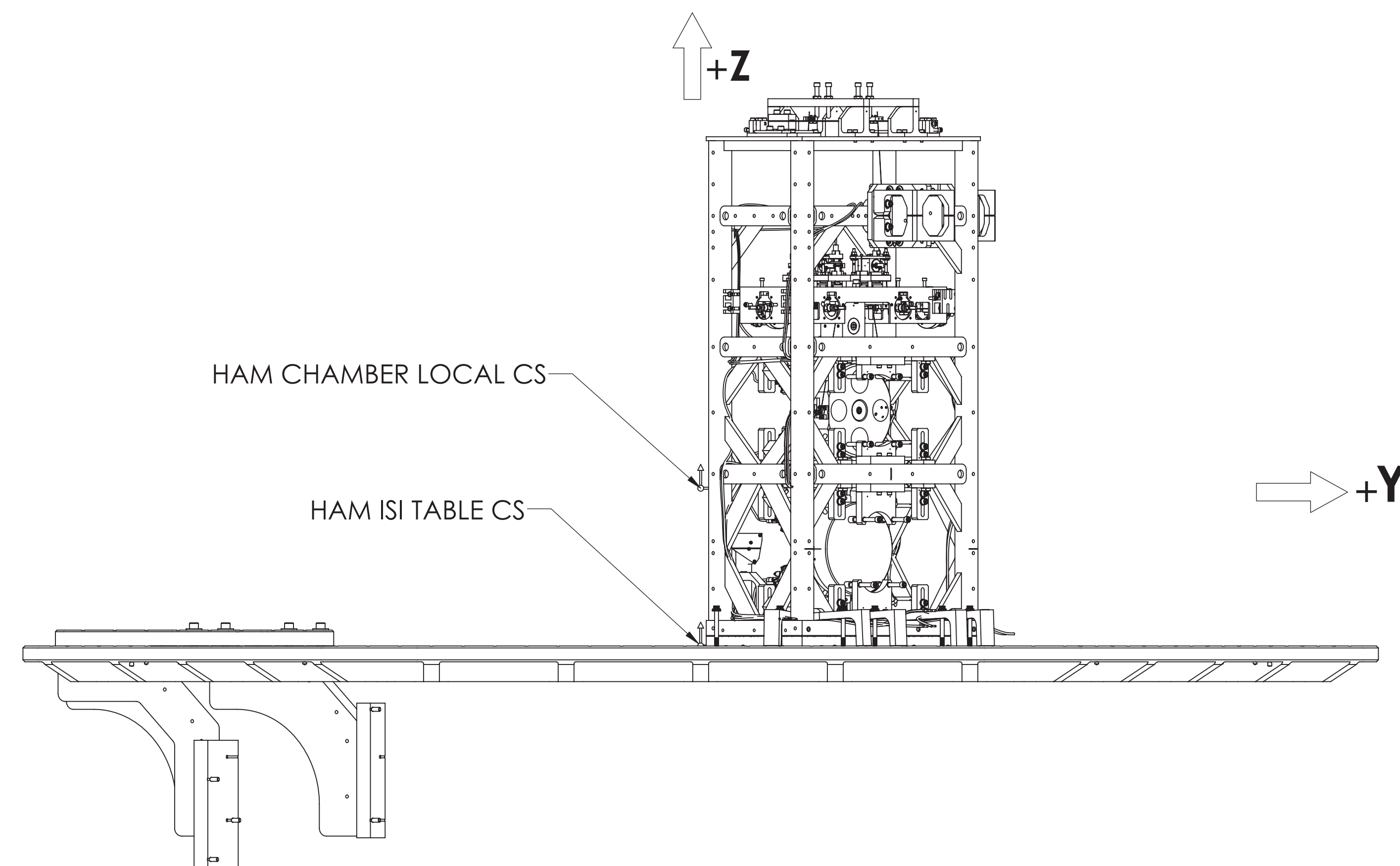
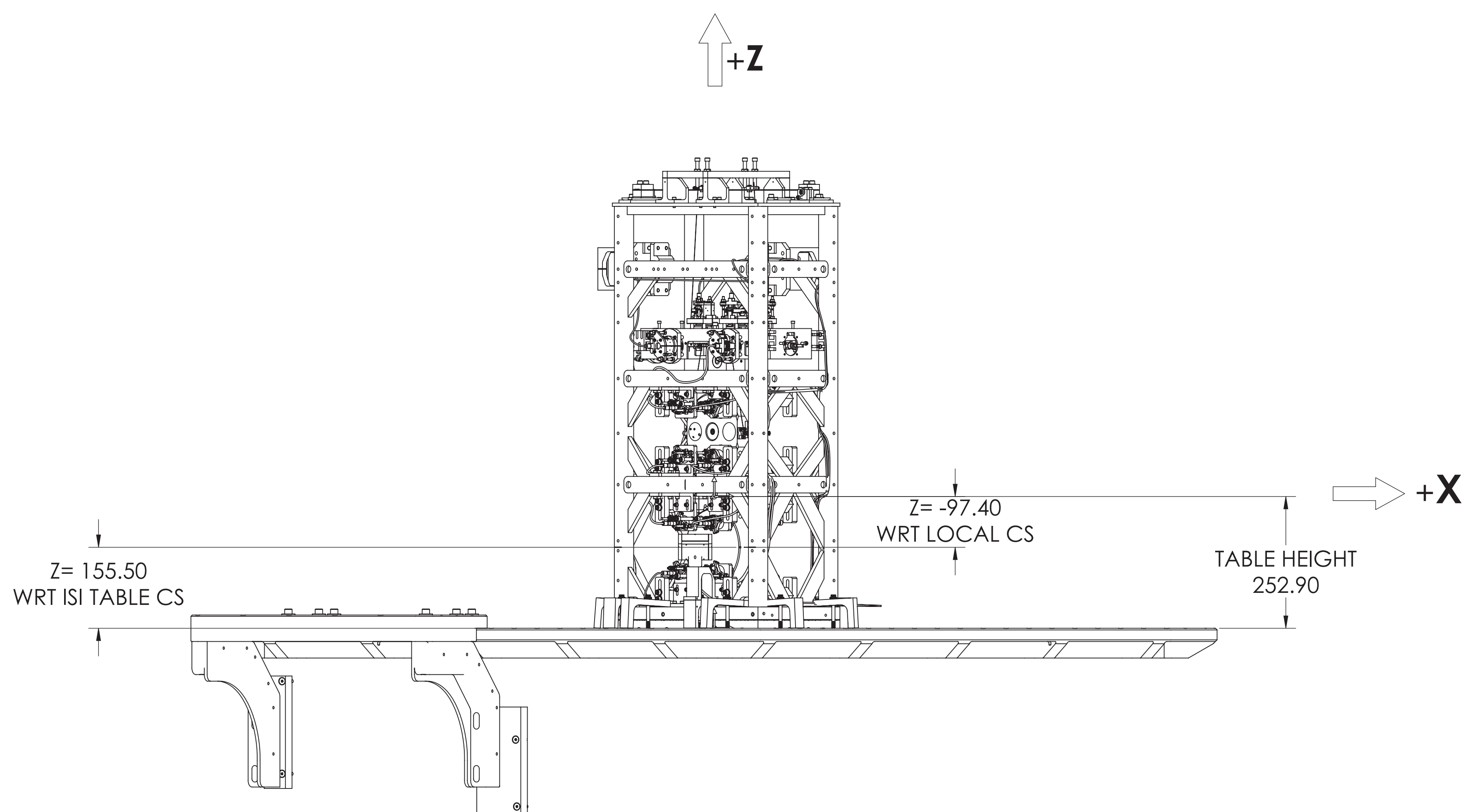
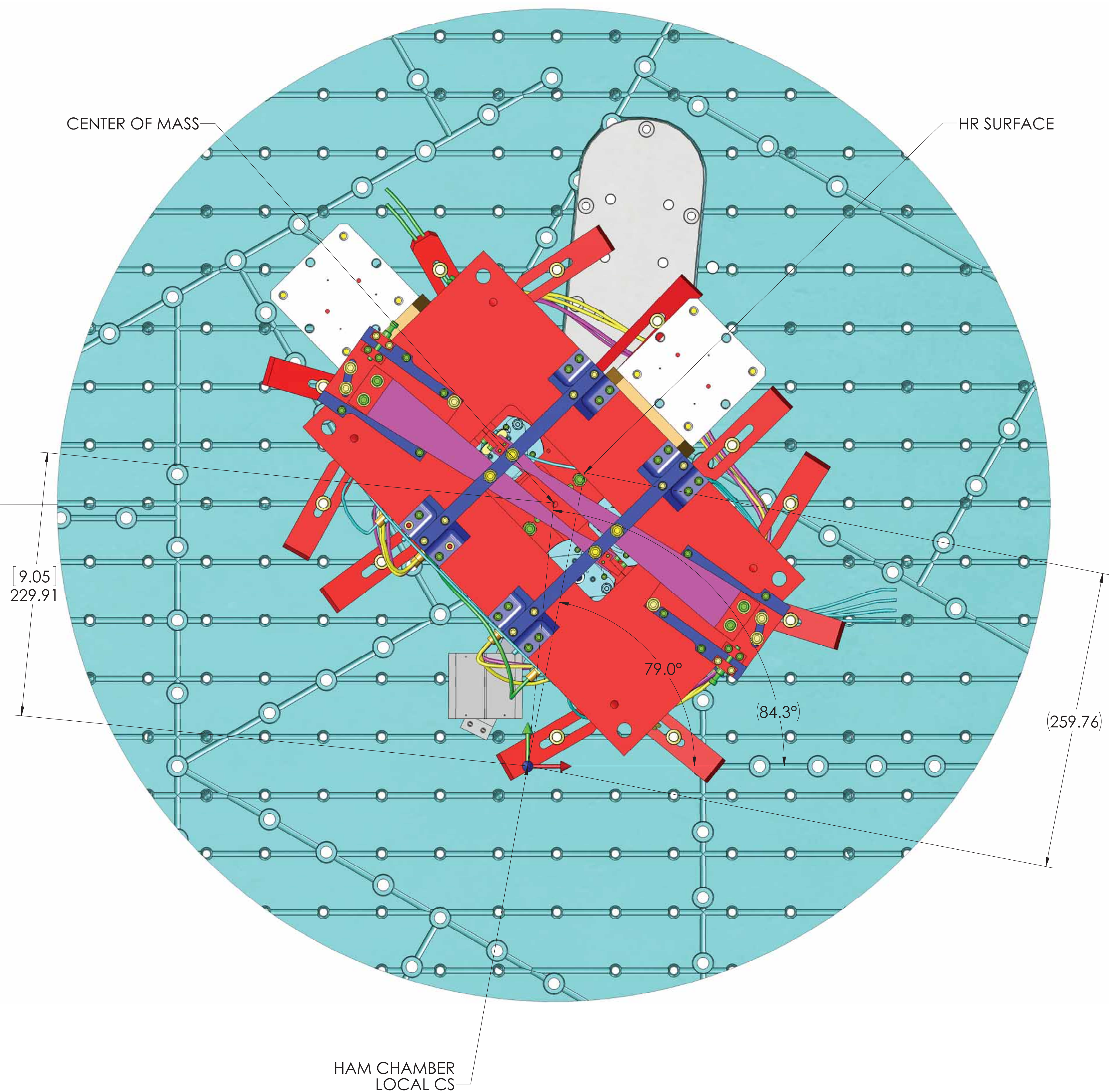
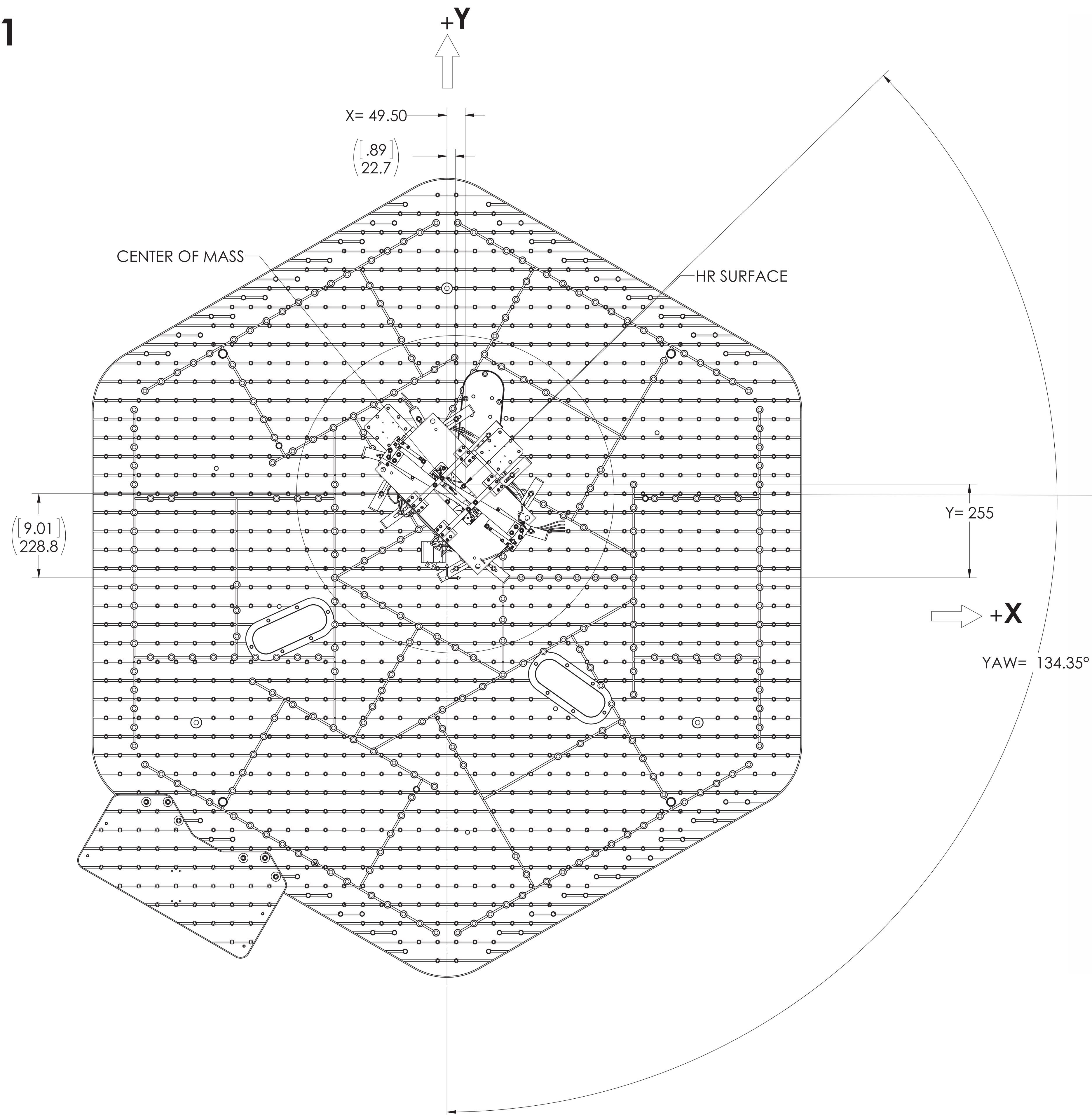
D1102319 (7)
HSTS OPTICS TOP SHIELD

D1102308 (7)
HSTS OPTICS FACE SHIELD

HSTS STRUCTURE TRANSPORT

VIBRATION ABSORBER ON FRONT SIDE NOT SHOWN
(REMOVED FOR TRANSP. PURPOSES)

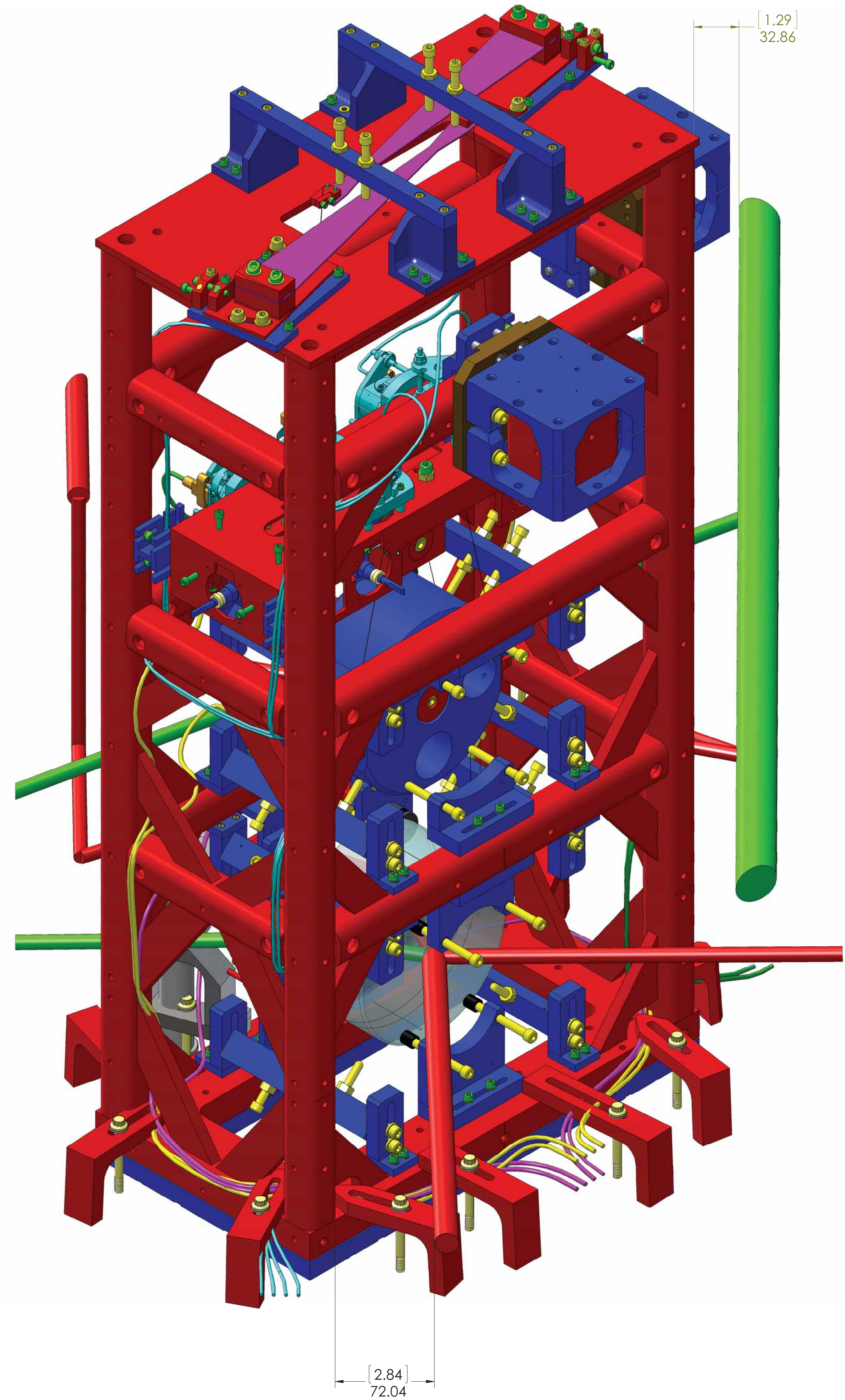
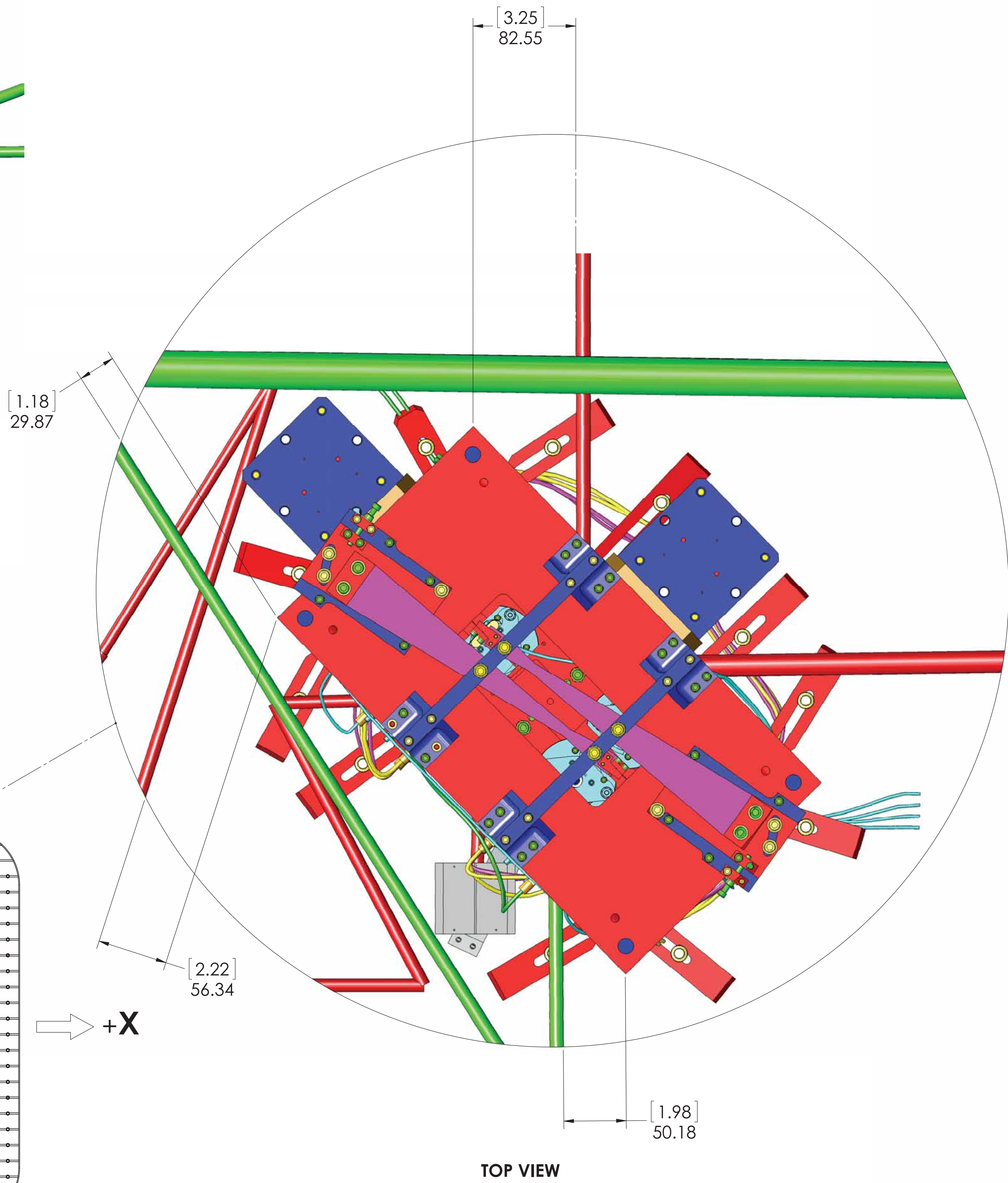
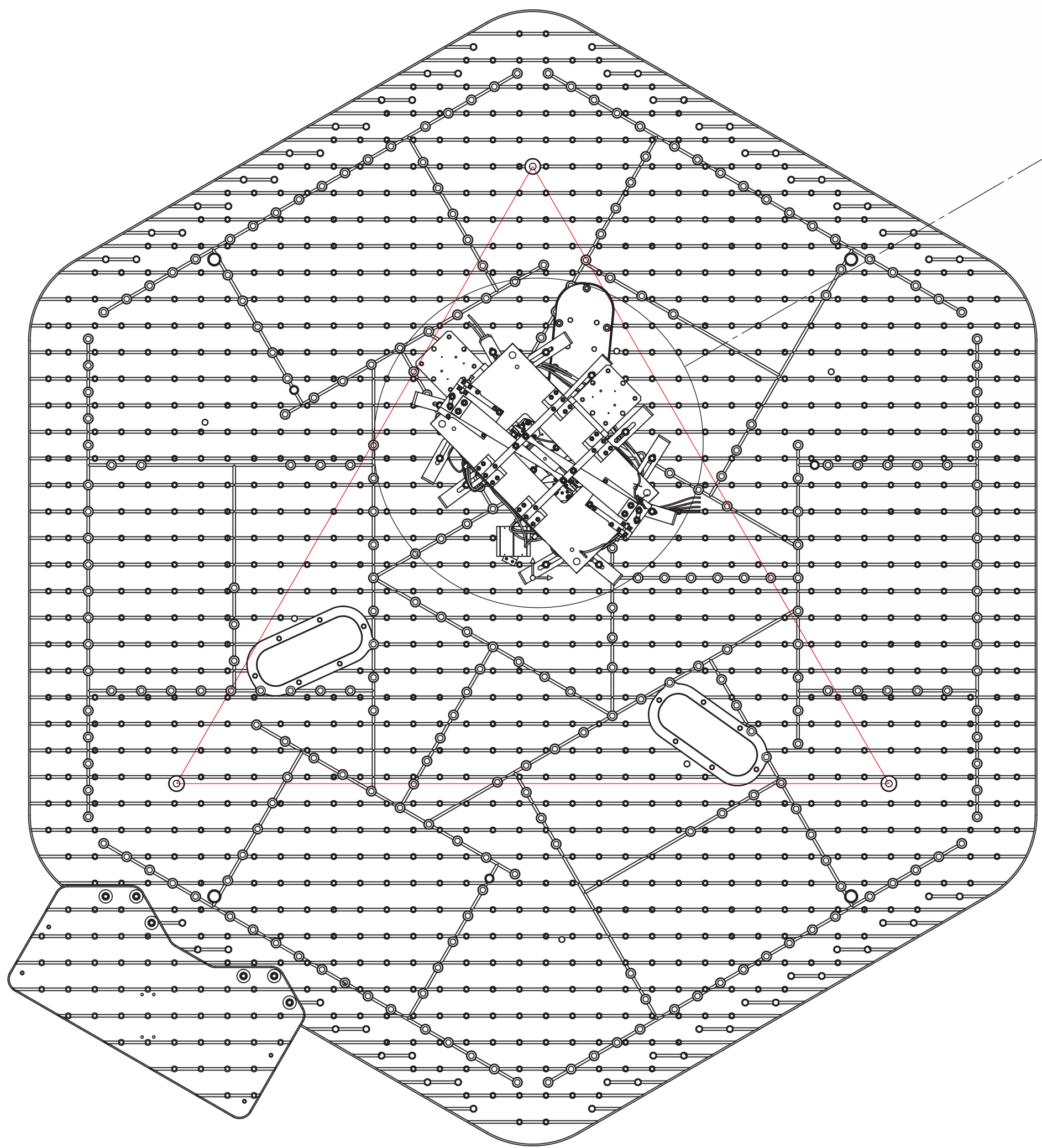
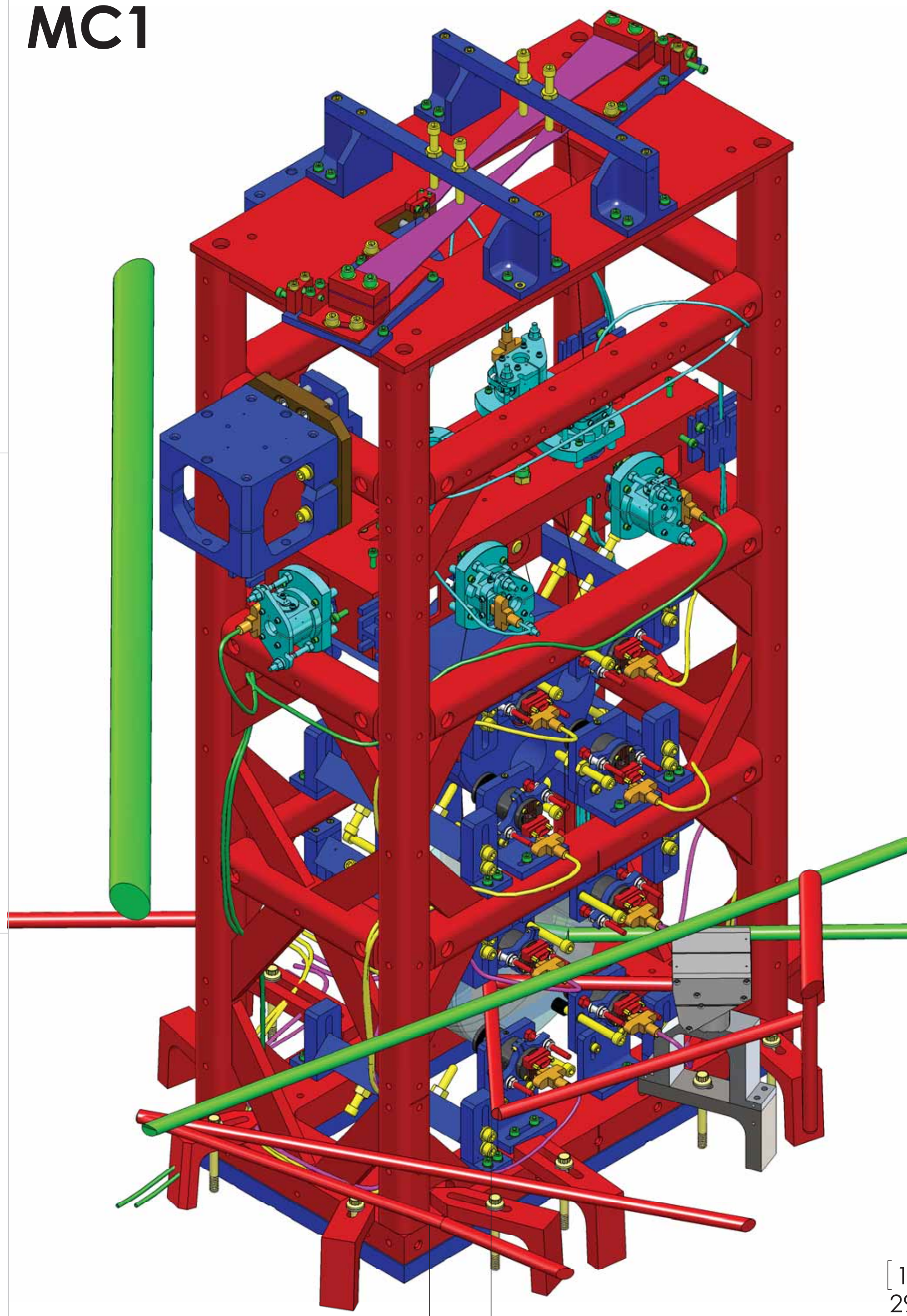
MC1



LOCAL COORDINATES DEFINITIONS

NOTE: DIMENSION IN PARENTHESIS (REFERENCE DIMENSIONS), ARE FROM CENTER OF MASS.

MC1



LASER BEAM CLEARANCES
(ALL DIMENSIONS ARE FOR REFERENCE ONLY)