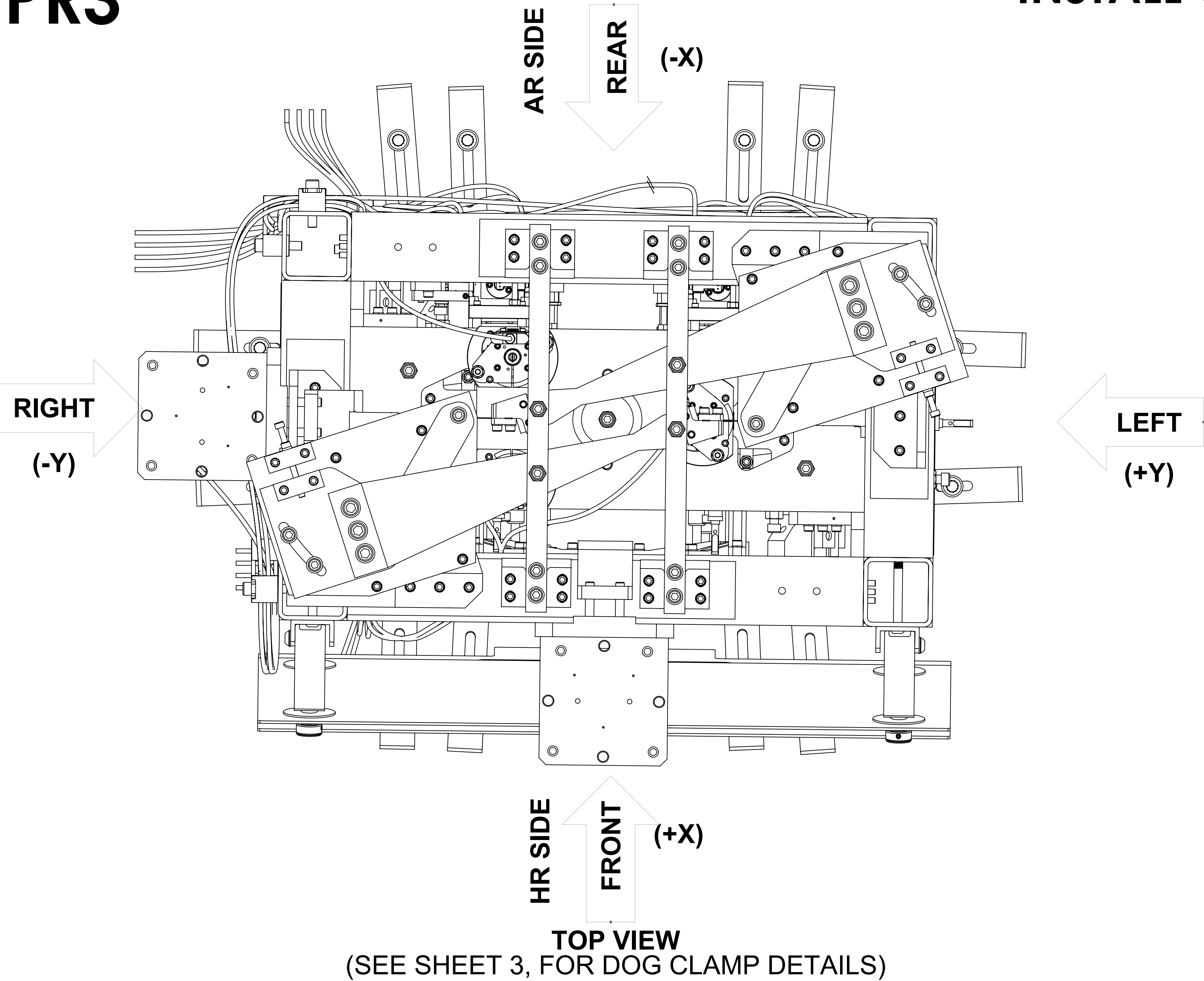


PR3

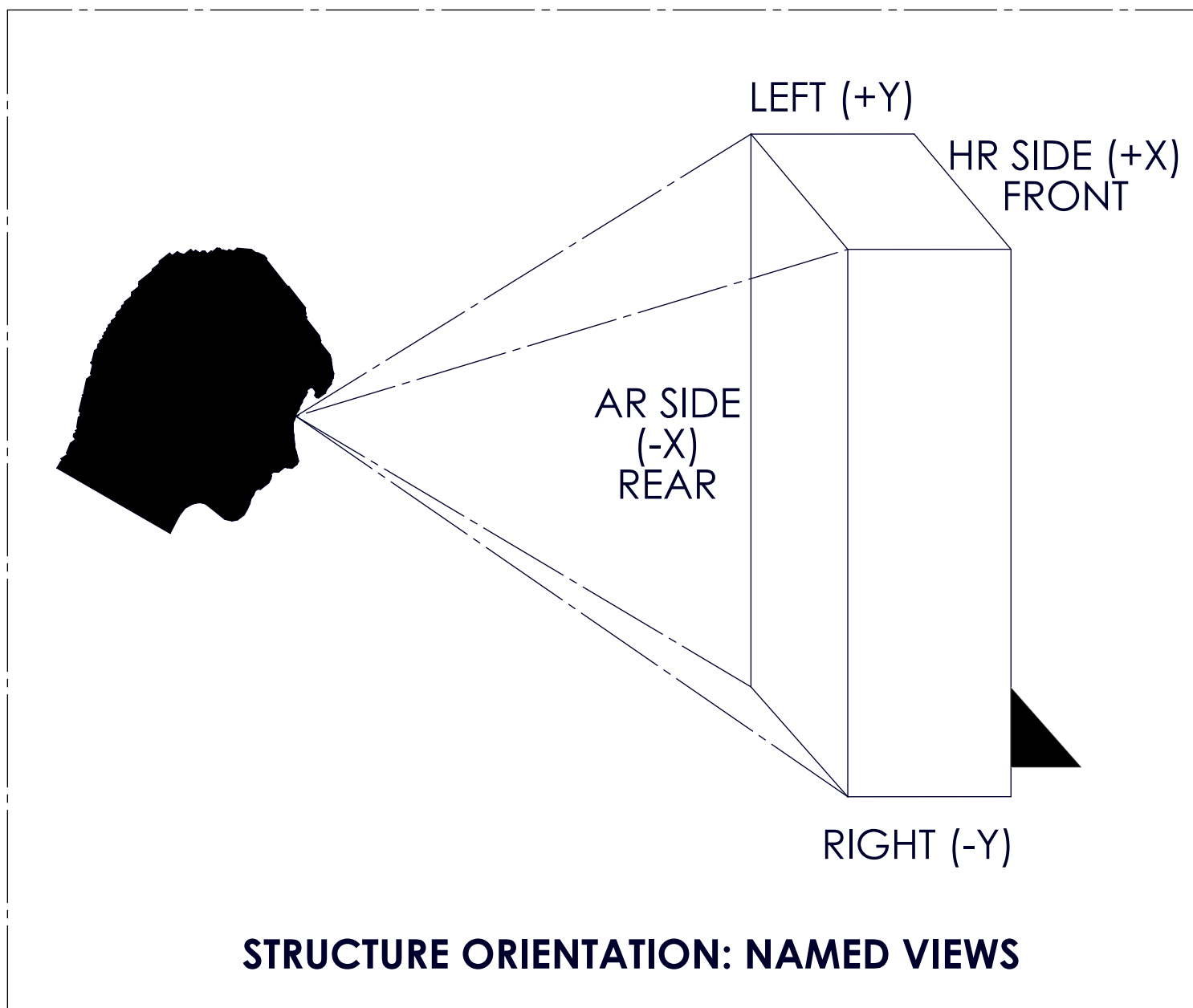
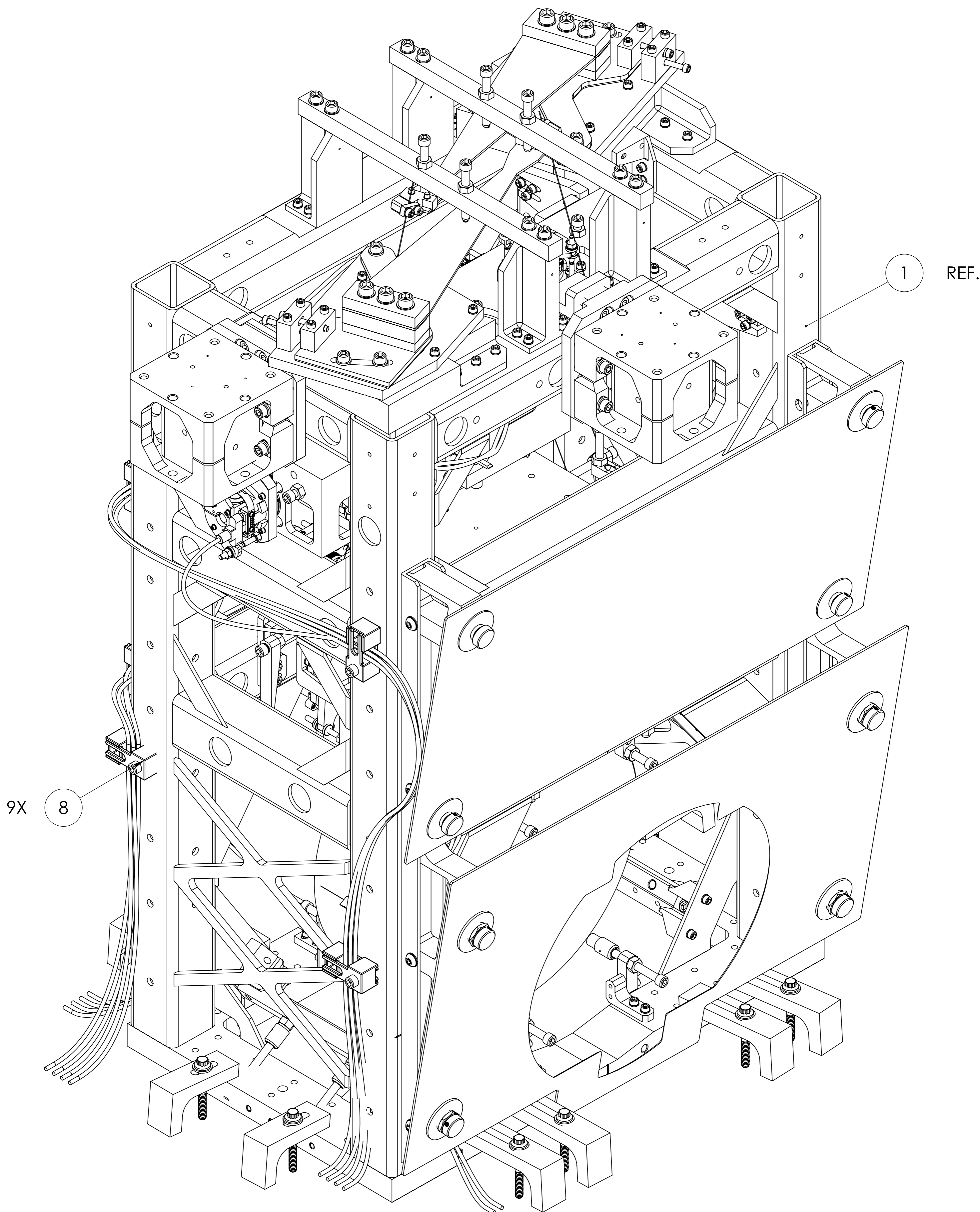
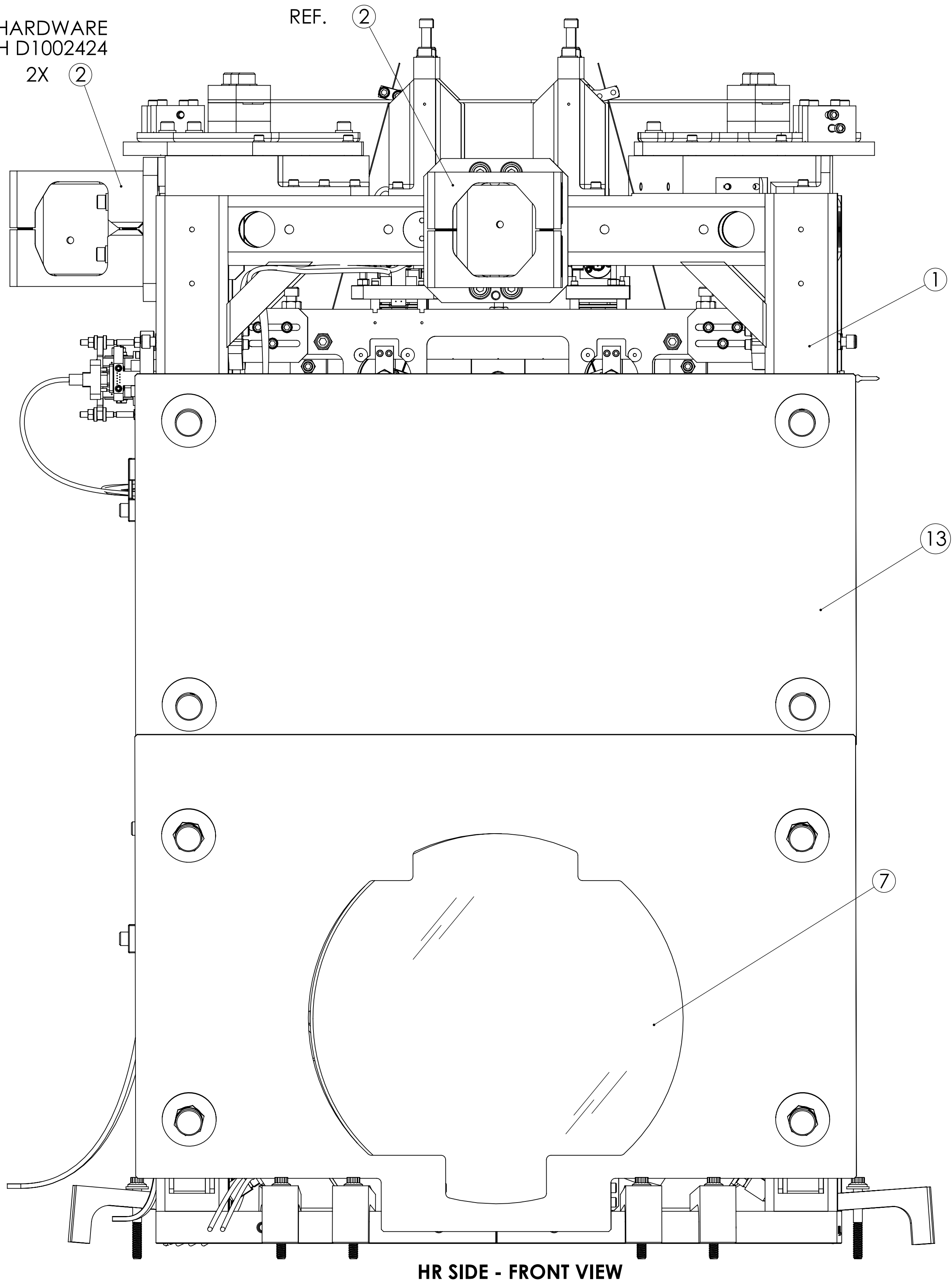
INSTALL CONFIGURATIONS (i.e.:IN CHAMBER - DOORS CLOSED)

REV.	DATE	DCN #	DRAWING TREE #
v1	29 MAY 2012	-	-
v4	01 AUG 2017	E1700274-x0	-
-	-	-	-

- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1 100109, HAM SUS CONTROLS ARRANGEMENT.
 - 1.2 LIGO-D1 101493, OSEM ORIENTATION.
 - 1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
 - 1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
 - 1.5 LIGO-E1 100411, CABLE CLAMP TORQUE.
 - 1.6 LIGO-D1 101296, HAM ISI HOLE TAB.
2. SEE SHEETS 4,5,6,7,AND 8 FOR CABLE ROUTE DETAILS.



ATTACH USING HARDWARE
SUPPLIED WITH D1002424



LOCAL COORDINATES - REFERENCE

Xmm	Ymm	Zmm	YAW °
381.5	-177.40	-94.9	-0.64 °

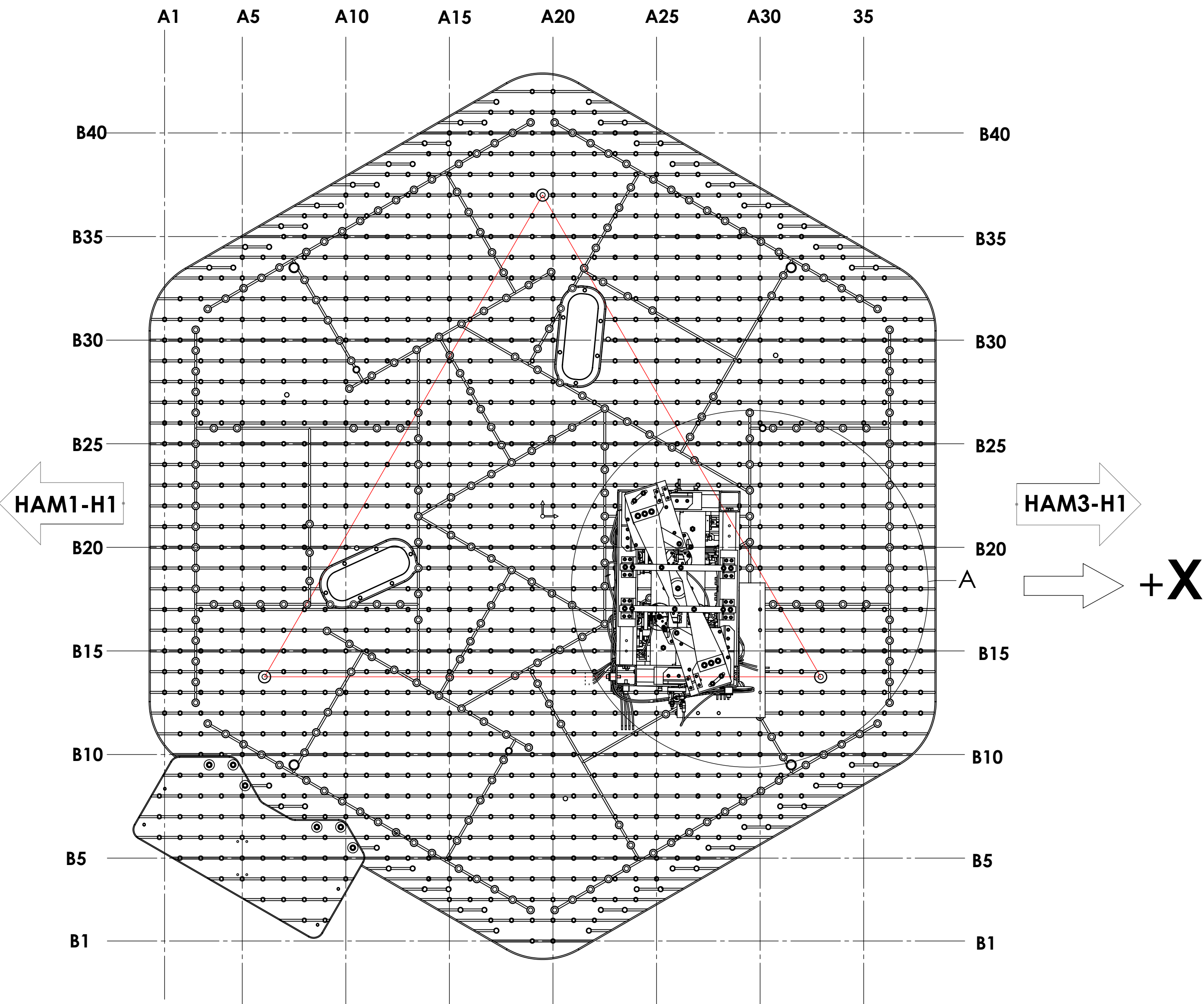
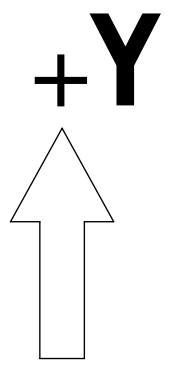
REFER TO DRAWING D1101233 FOR HAM2-L1
INSTALLATION PLATE LAYOUT

TABLE 1: HAM2-H1 PR3 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-1 (SECOND)	A	D1000234	78
	M3-LL (N)		B		
	M3-UR (N)		C		
	M3-LR (S)		D		
2	M2-UL (S)	CB-1 (FIRST)	A	D1000234	60
	M2-LL (N)		B		
	M2-UR (N)		C		
	M2-LR (S)		D		
3	M1-T3 (N)	CB-2 (FIRST)	A	D1000234	66
	M1-LF (N)		B		
	M1-RT (S)		C		
	M1-SD (S)		D		
4	M1-T1 (S)	CB-2 (SECOND)	C	D1000234	78
	M1-T2 (S)		D		
NOTE : ROUTE NO. 4 IS A SHARED CABLE, SEE D0901090 FOR QP LEGS 'A' AND 'B' ROUTING					

ITEM NO.	PART NUMBER	DESCRIPTION	MATERIAL	QTY.
13	D1700239	gLIGO, SLIC, HLTS BAFFLE ASSY.	N/A	1
12	N-2520-A UC COMPONENTS OR EQ.	HEX NUT 1/4-20, Ag PLATED	Ag-PLATED 300 SSSL	1
11	MS15795-810 OR EQ.	WASHER, FLAT, 1/4	300 SSSL	A/R
10	92196A555 OR EQ. McMASTER-CARR	SCREW, SHC, 1/4-20 X 3.25 LG.	300 SSSL	A/R
9	2AL2.00-12SL	1/4-20 X 2.00 12PT BOLT	450 SSSL	12
8	D0902462	CLAMP ASSY., UHV COMPATIBLE	N	9
7	D1101381	PR3 H1 OPTICS ASSEMBLY	N/A	1
6	D1100785-620	WASHER, FLAT, .38 X .620 O.D.	NITRONIC 60	12
5	D1001376-02	AdvLIGO HAM Optics Table Dog Clamp 1.1M	304 SSSL	8
4	D1001376-01	AdvLIGO HAM Optics Table Dog Clamp 1.1S	304 SSSL	4
3	D1000158	L1 H1 PR3 INSTALLATION PLATE	6061 Alloy	1
2	D1002424	VIBRATION ABSORBER ASSEMBLY	N/A	2
1	D070447	HLTS OVERALL ASSEMBLY	N/A	1

NOTES AND TOLERANCES: (UNLESS OTHERWISE SPECIFIED)				PART NAME			
				AdvLIGO SUS HAM2-H1, XYZ Local CS for HLTS (PR3)			
				LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY MASSACHUSETTS INSTITUTE OF TECHNOLOGY			
				SYSTEM ADVANCED LIGO SUB-SYSTEM SUS			
				DESIGNER DRAFTER E.SANCHEZ 29 MAY 2012			
				CHECKER SEE DCC SEE DCC			
				APPROVAL SEE DCC SEE DCC			
				SIZE DWG. NO. E D0901086			
				SCALE: 1:2 PROJECTION: 1			
				REV. v4			

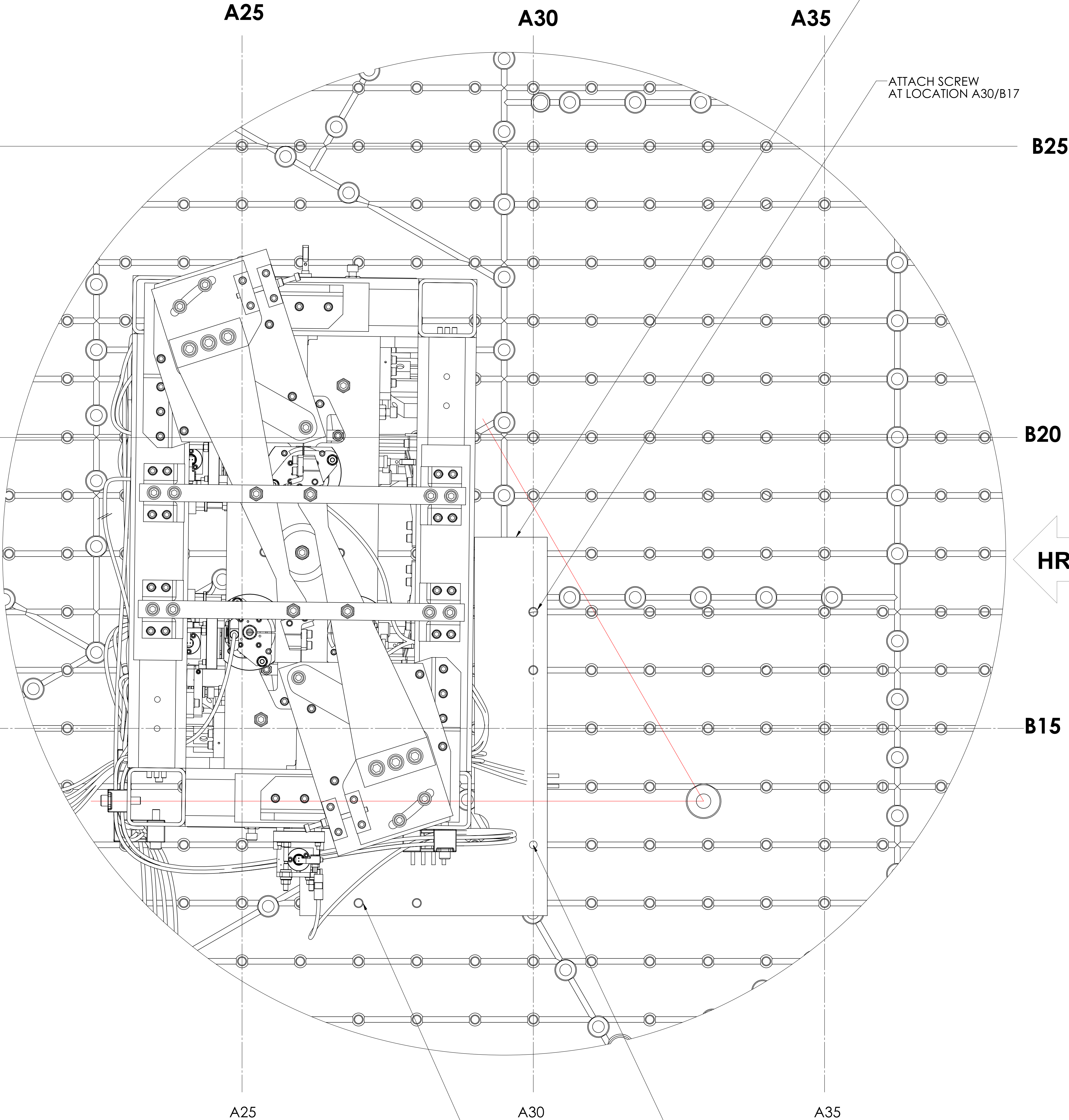
PR3



TOP VIEW (1.6)

REF. TRIANGLE: SEE D1000125 FOR
ISI NAMING AND ORIENTATION CONVENTION

AR SIDE

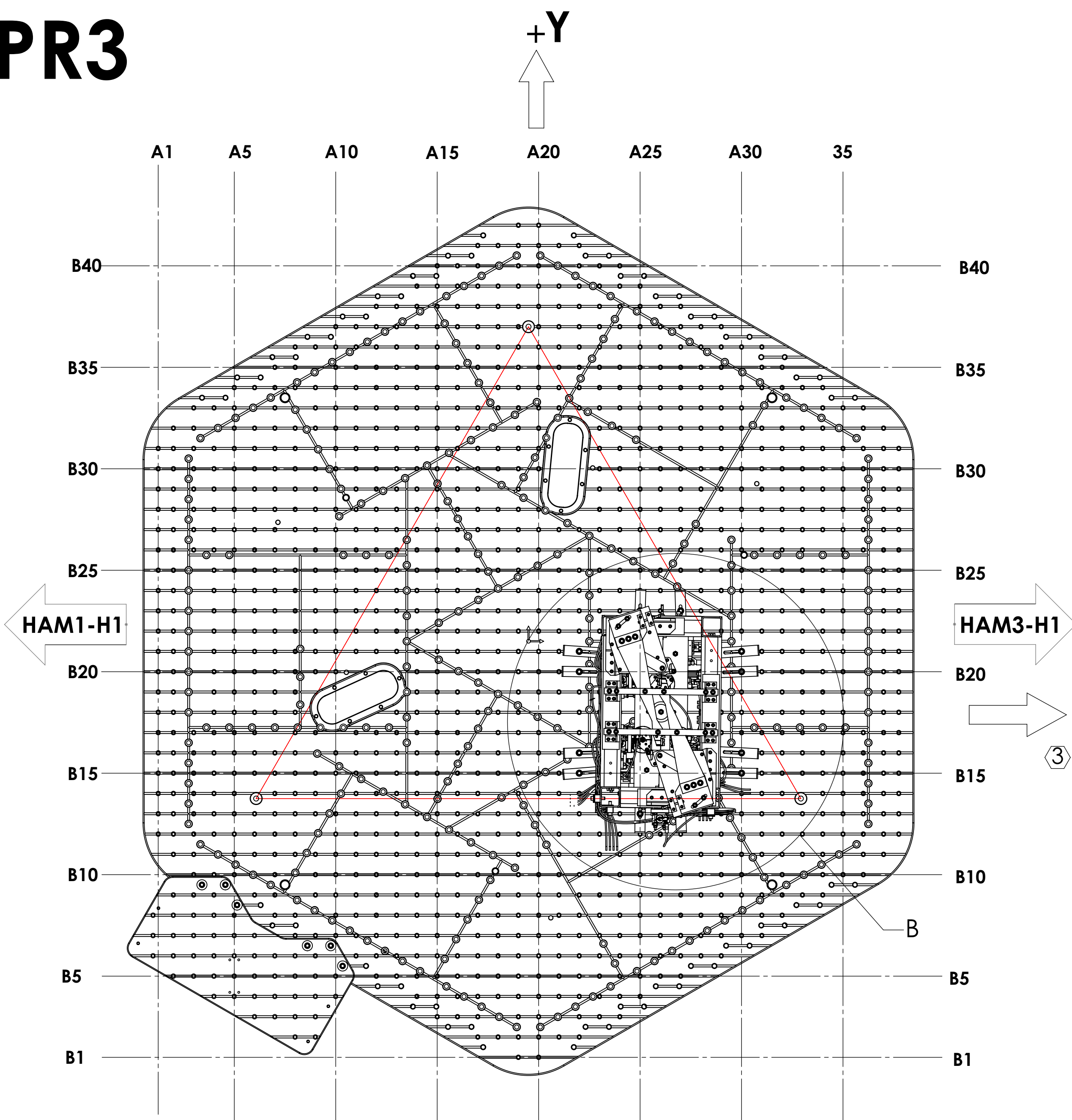


HR SIDE

ALIGNMENT PLATE INSTALLATION / LOCATION

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

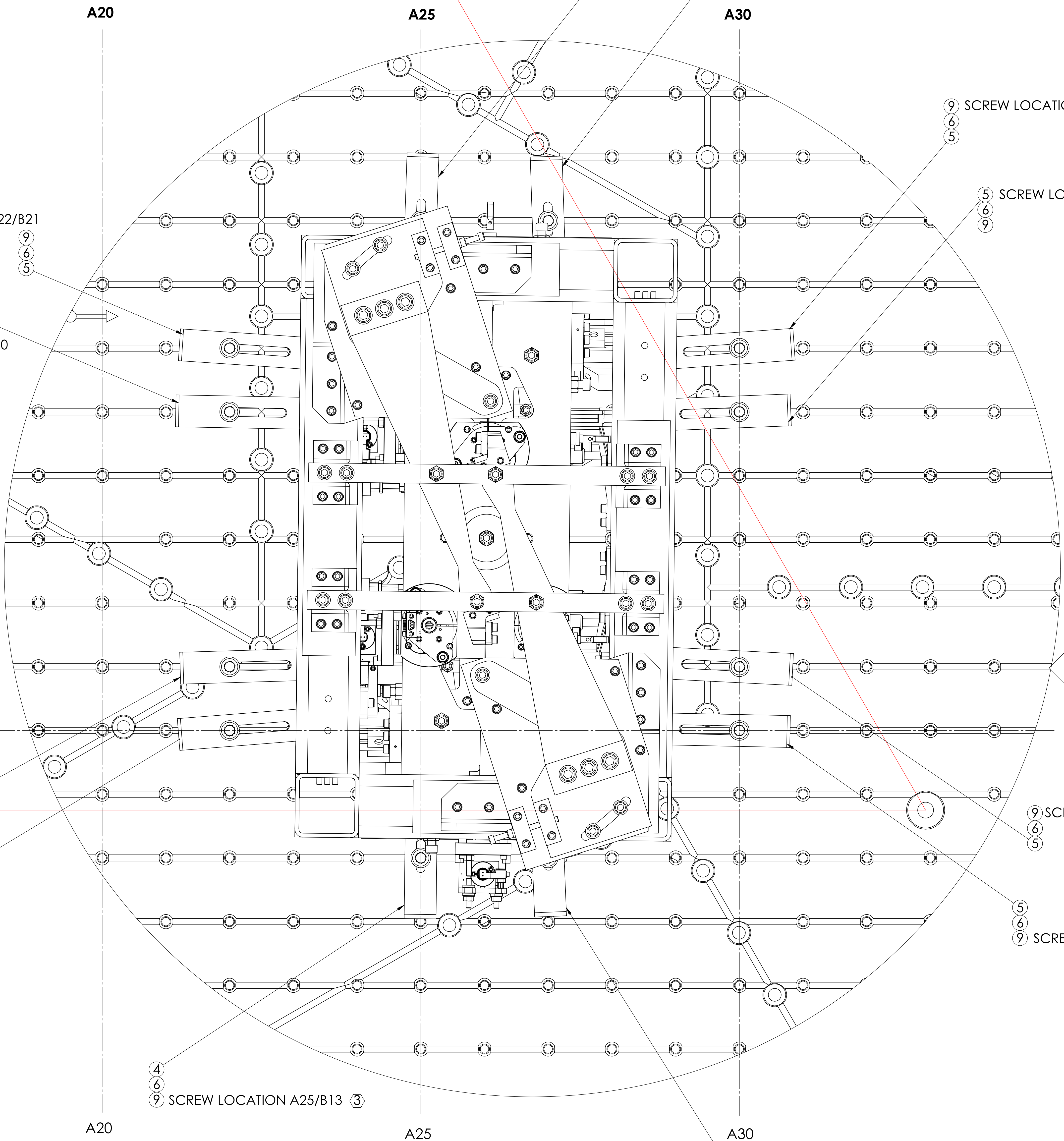
PR3



TOP VIEW (1.6)
REF. TRIANGLE: SEE D1000125 FOR
ISI NAMING AND ORIENTATION CONVENTION

AR SIDE

HR SIDE



TOP VIEW SHOWING DOG CLAMP INSTALLATION
OPTICAL TABLE SHOWN FOR STRUCTURE AND DOG CLAMP
LOCATIONS AND ORIENTATION ONLY.
VIBRATION ABSORBERS REMOVED FOR CLARITY

DETAIL B
SCALE 1 : 1.5

DOG CLAMPS IDENTIFICATION / INSTALLATION

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

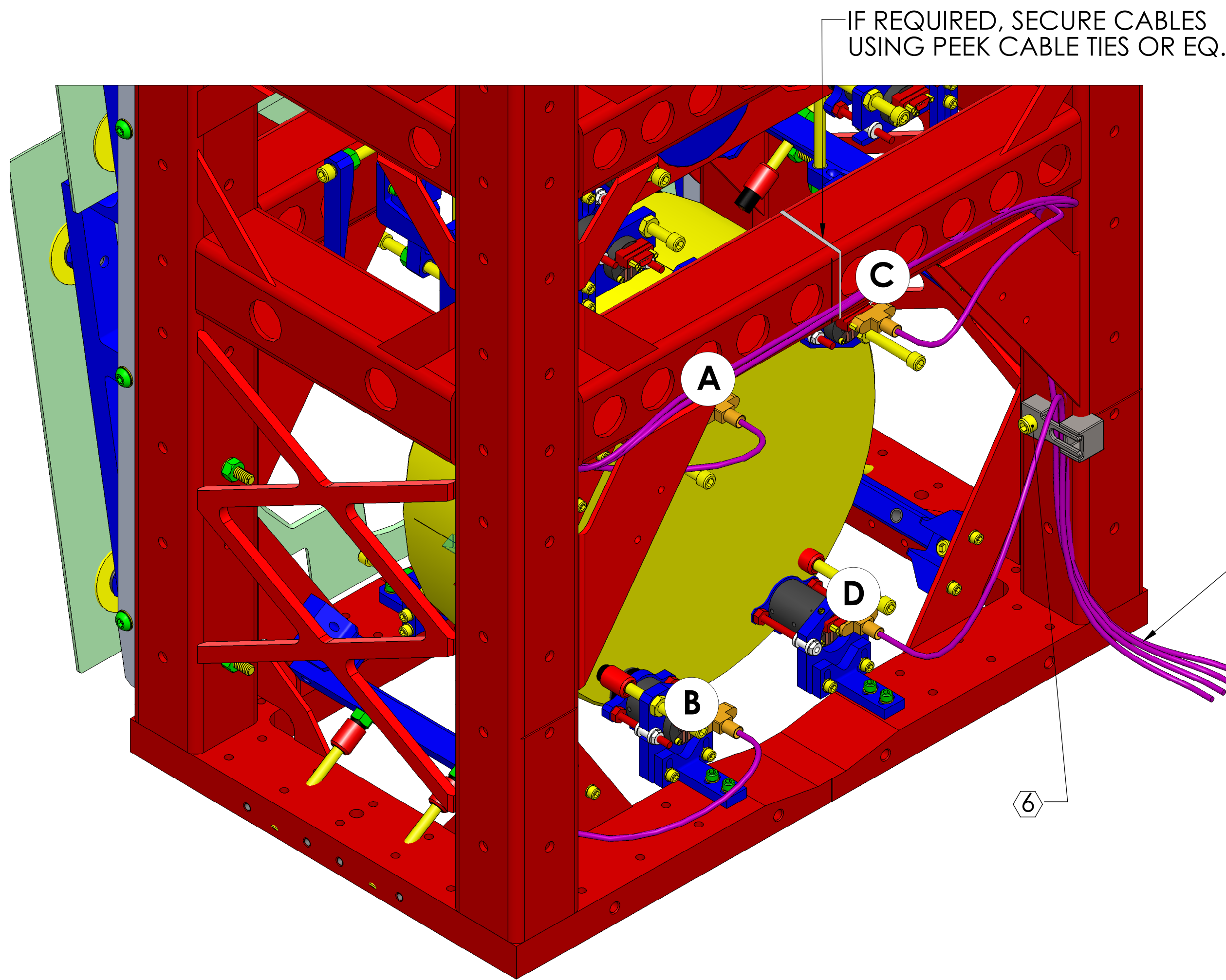
9	2AL2.00-125L	1/4-20 X 2.00 12PT BOLT	12
6	D1100785-620	WASHER, FLAT, .38 X .620 O.D.	12
5	D1001376-02	AdvLIGO HAM Optics Table Dog Clamp 1.1M	8
4	D1001376-01	AdvLIGO HAM Optics Table Dog Clamp 1.1S	4
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.

LIGO CALIFORNIA INSTITUTE OF TECHNOLOGY
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

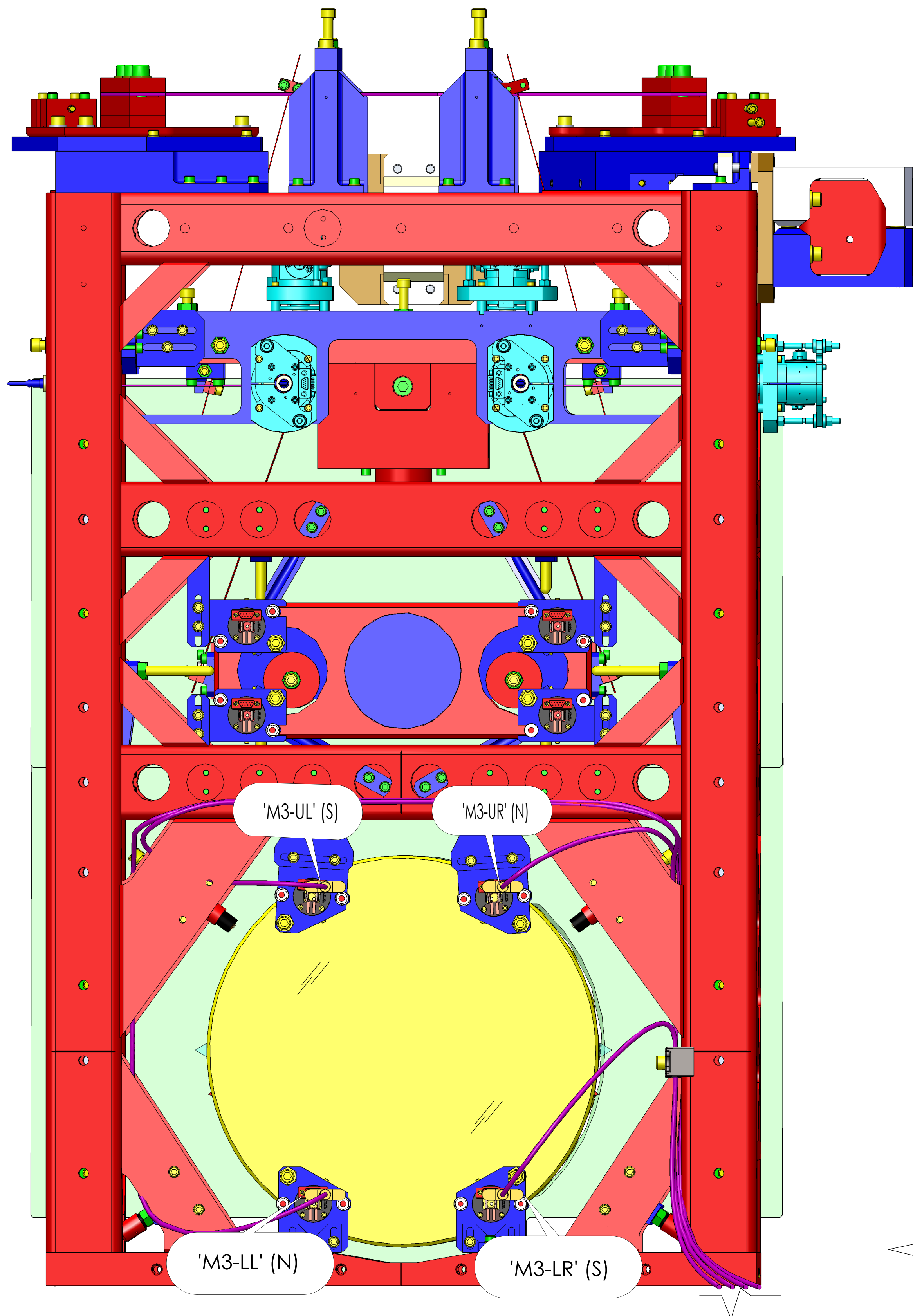
SIZE DWG. NO. REV.
E **D0901086** **v4**

SCALE: 1:8 PROJECTION: SHEET 3 OF 9

PR3



AR SIDE 1.5
ISO VIEW- REAR LEFT (-X)



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

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1000581.

- D QP LEG LACED
- C INSIDE HLTS
- B THROUGH
- A AR SIDE

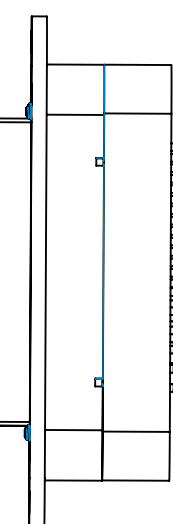


WARNING

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.

- TO M3-LR
- TO M3-UR
- TO M3-LL
- TO M3-UL

D1000234 (78")



TO
CB-1
(SECOND)

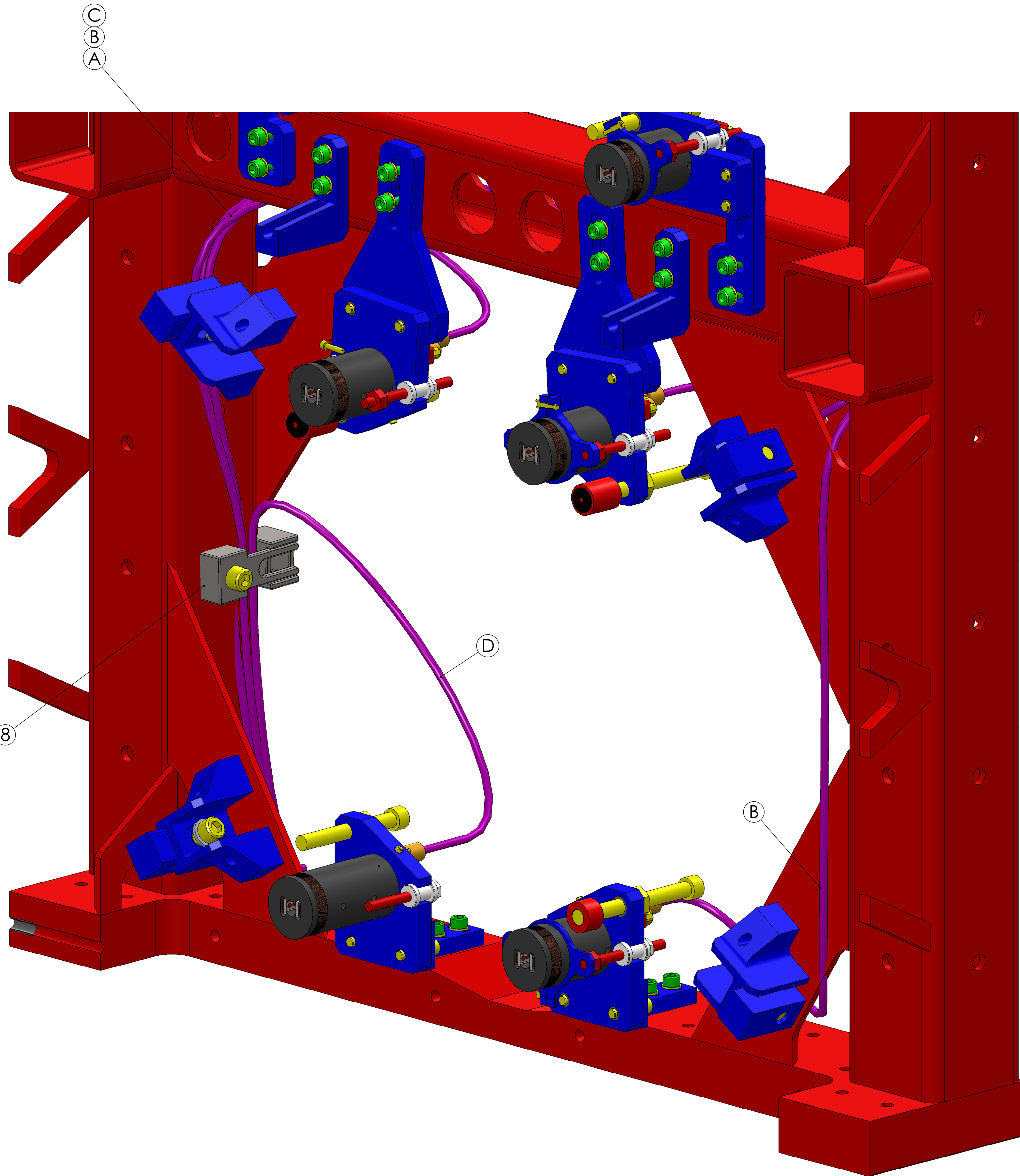
'PIN 1'

- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1100109, HAM SUS CONTROLS 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 TAB.

④ DO NOT CLAMP CABLES TIGHTLY, PROVIDE SUFFICIENT SPACE
FOR THE CABLES TO RUN FREELY BETWEEN CLAMP JAWS.

⑤ SHORTING MAY OCCUR IN QP BOSEM & AOSEM TEFLON CABLES CLAMPED EXCESSIVELY TIGHT.
THEREFORE, THE PEEK CLAMPS (i.e. 'CLP-1' AND CABLE TIES) SHOULD SERVE ONLY AS A GUIDE FOR
THE CABLES TO REACH THEIR DESTINATION , AND SHOULD NOT CLAMP THE CABLES IN PLACE.

⑥ TORQUE TO APPROXIMATELY 20 IN/LBS.



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

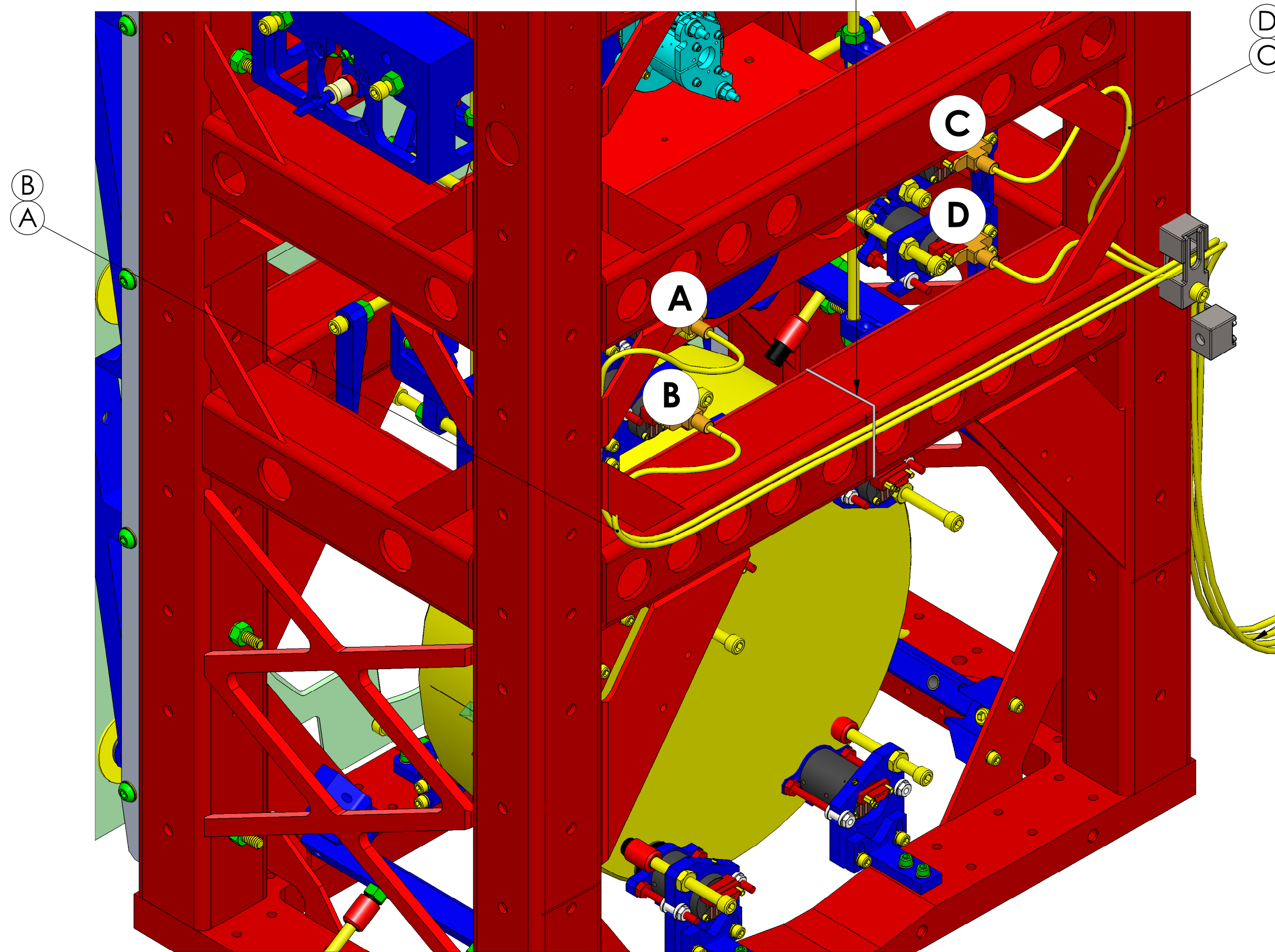
ROUTE NO. 1
SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

SEE SHEET 1, TABLE 1; FOR CABLING SPECIFICATIONS.

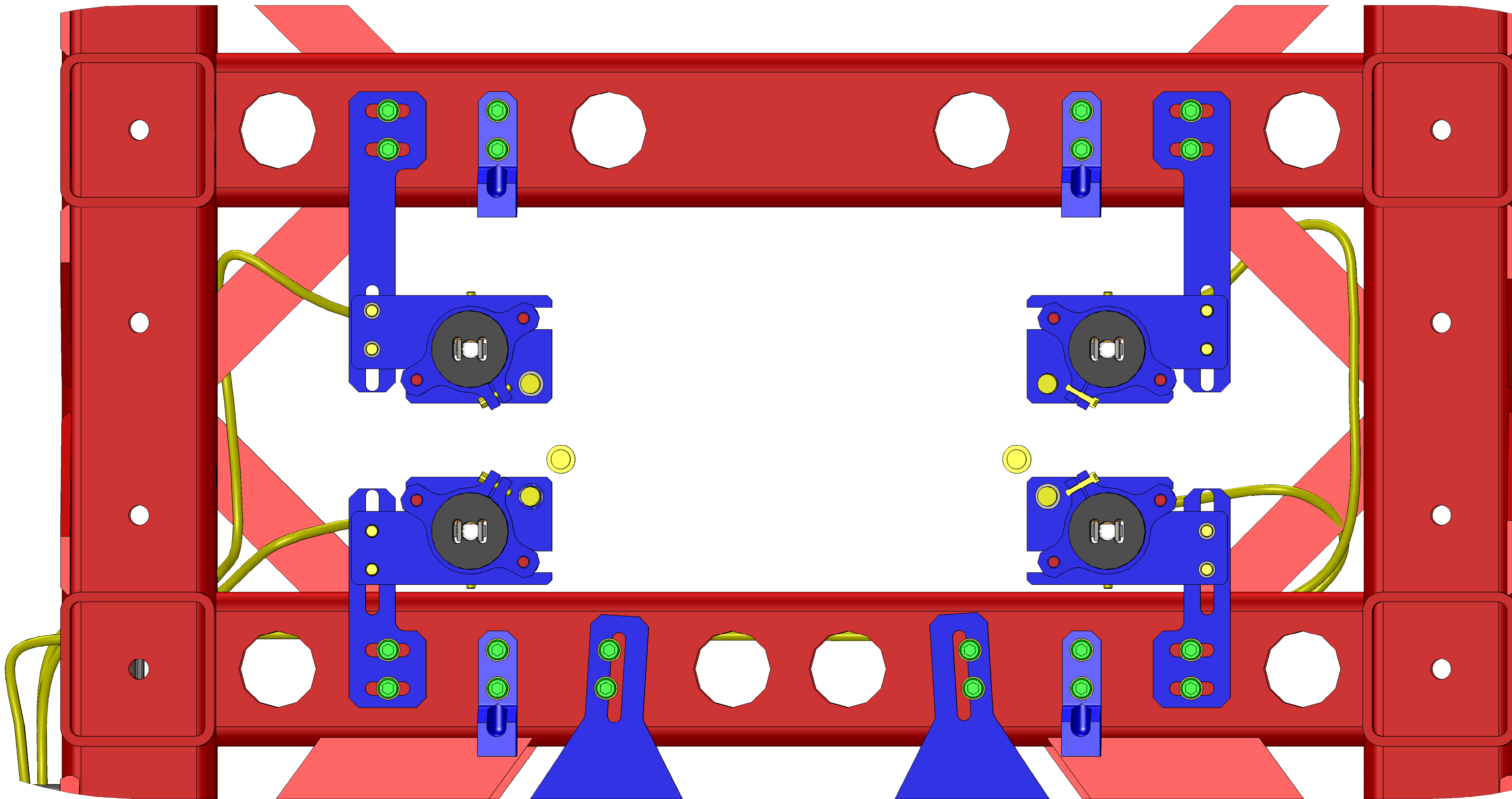
IF REQUIRED, SECURE CABLES
USING PEEK CABLE TIES OR EQ.

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1000581.

PR3



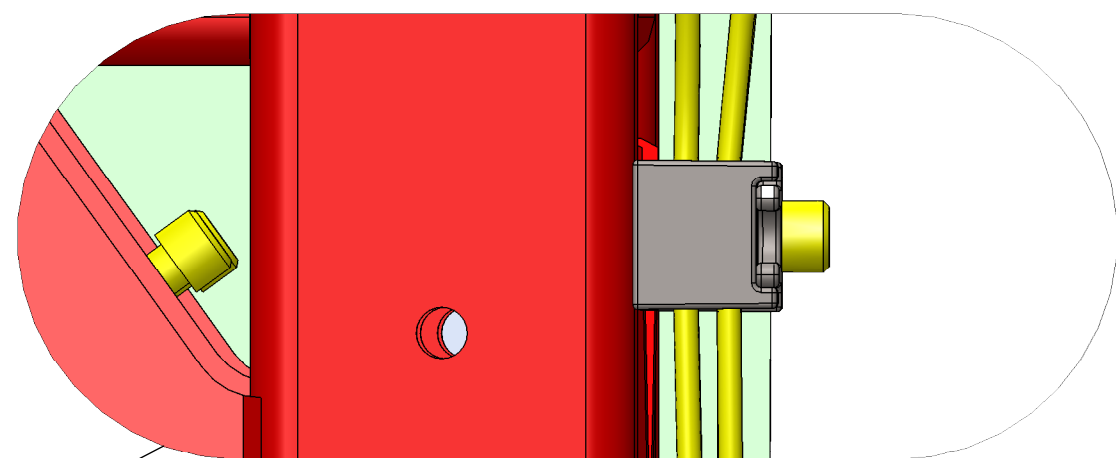
AR SIDE (-X)
ISO VIEW - REAR LEFT (-X)



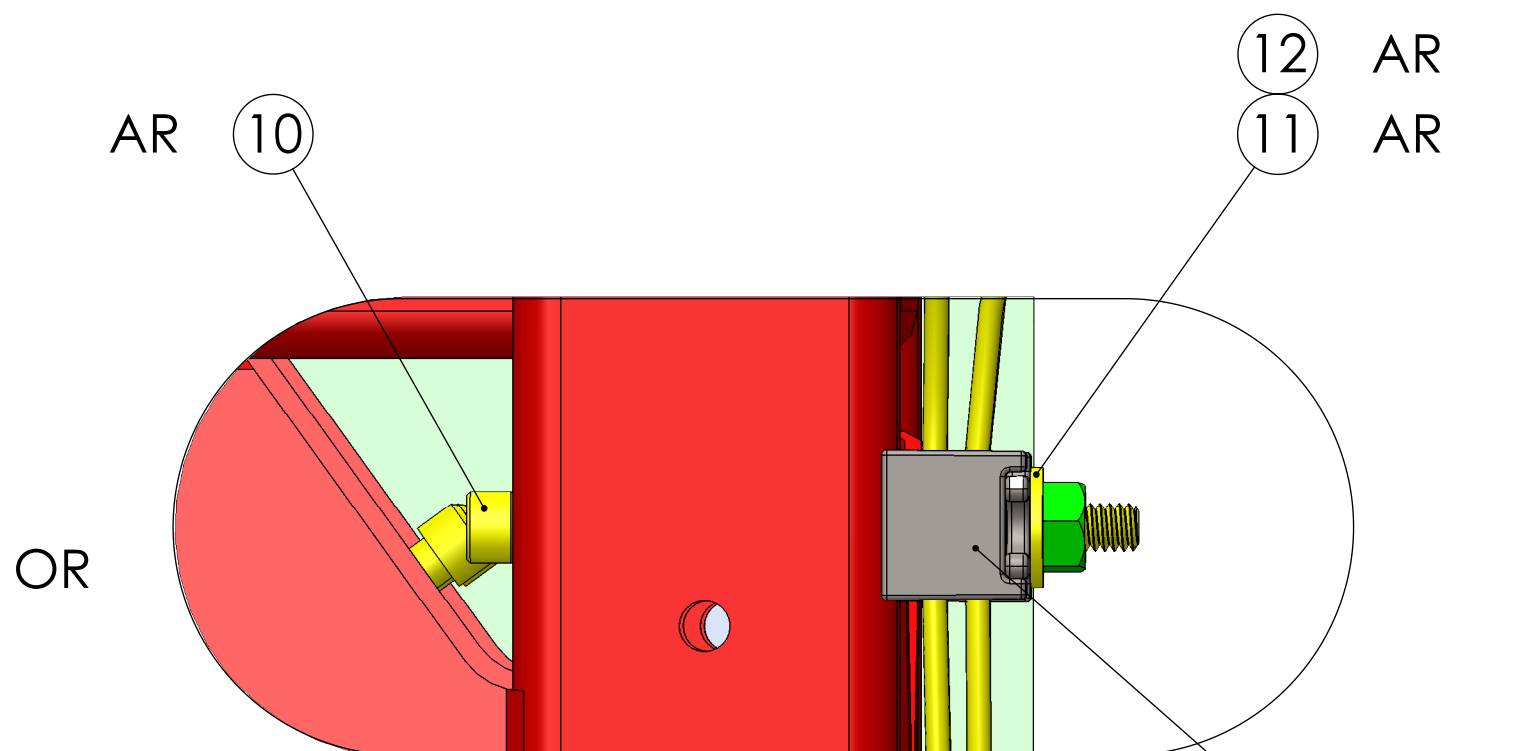
HR SIDE - FRONT (+X)
BROKEN QUOT SECTION VIEW
(AS VIEWED FROM INSIDE)



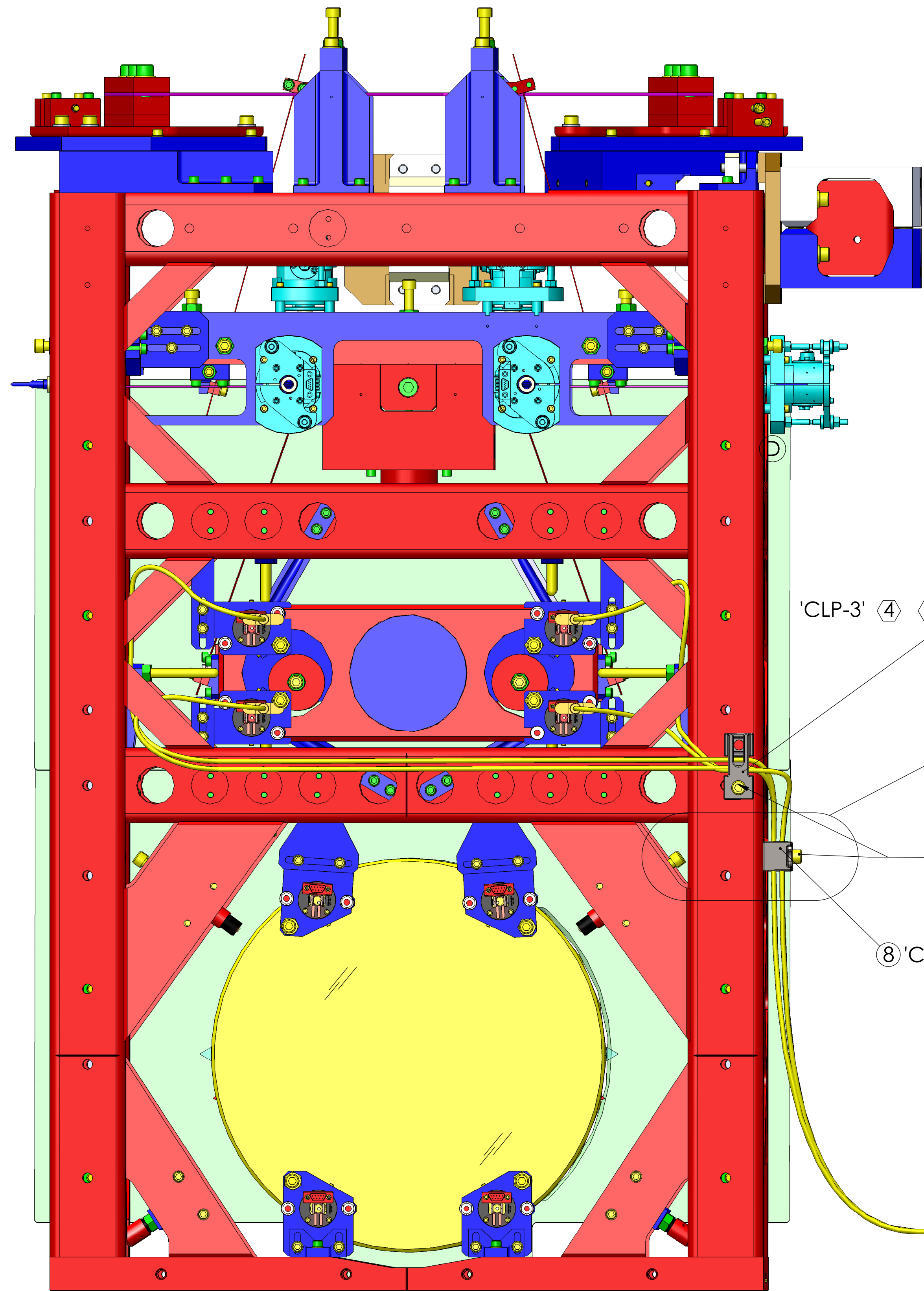
CABLE ROUTING:
ROUTE ALL CABLES IN ACCORDANCE
WITH LIGO-T1200203 AND T1200318.
CABLE ROUTES DEPICTED
IN THIS DOCUMENT ARE NOT MANDATORY, BUT
RATHER A CONSIDERED ROUTE AIMED TO
CLEAR LASER BEAM PATHS.
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ARE ACCEPTABLE, BUT SHOULD BE HANDLED
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LOCATION OF MATING CABLE BRACKET,
AND LASER BEAM PATH PRIOR TO
ROUTING / LACING VIA A NEW PATH.



DETAIL C
CABLE CLAMP MT. (STANDARD)
SCALE 1 : 1

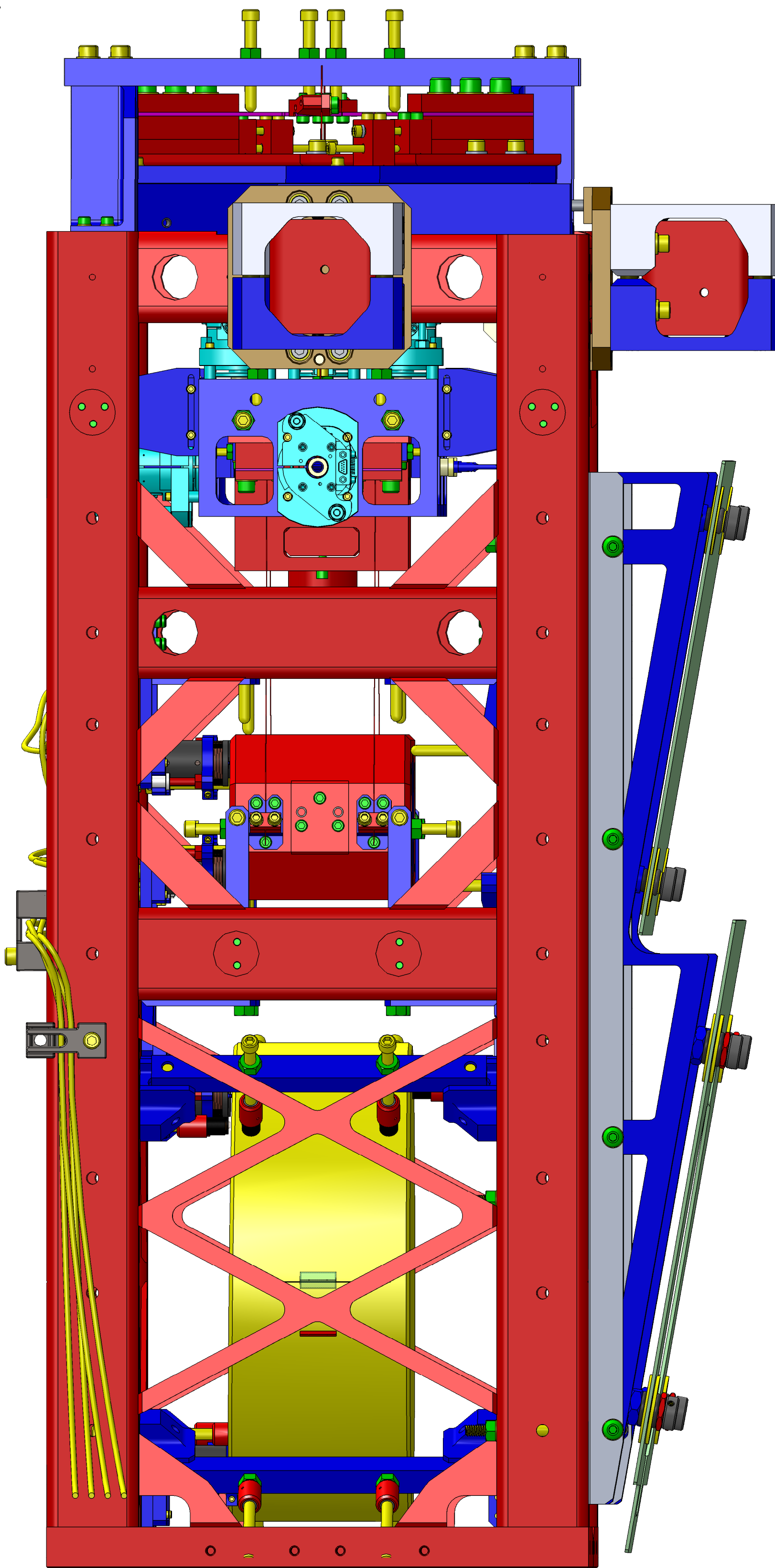
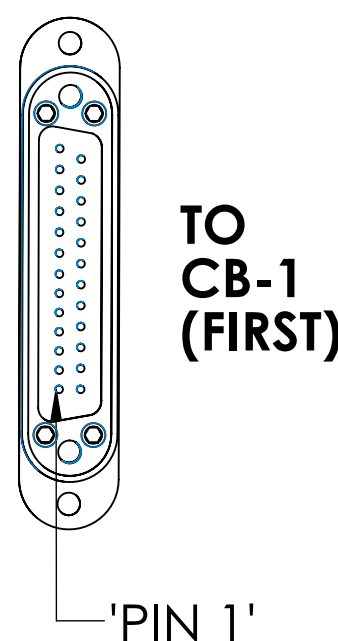
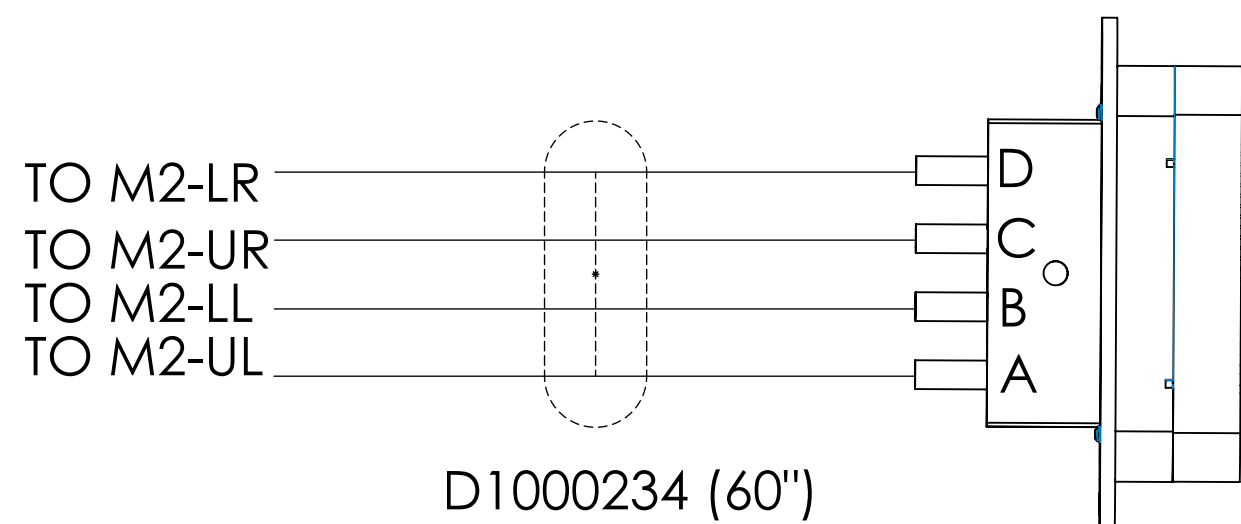


DETAIL C
CABLE CLAMP MT. (ALTERNATE)
SCALE 1 : 1



AR SIDE - REAR (-X) 1.1 1.2

(END CONNECTORS, NOT SHOWN FOR CLARITY)



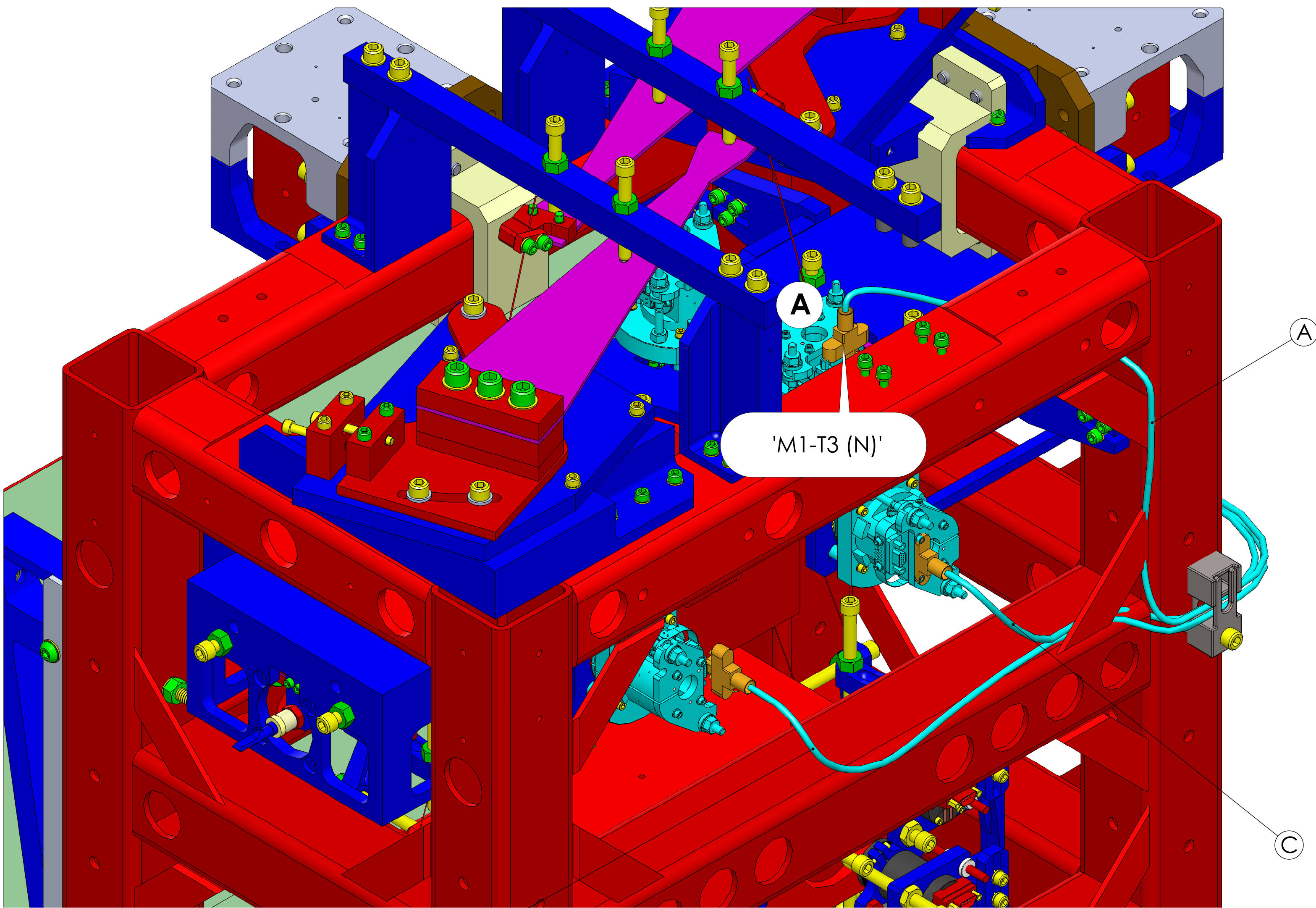
RIGHT SIDE (-Y)

- ① REFERENCED DOCUMENTATION:
- 1.1 LIGO-E1100109, HAM SUS CONTROLS 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 TAB.

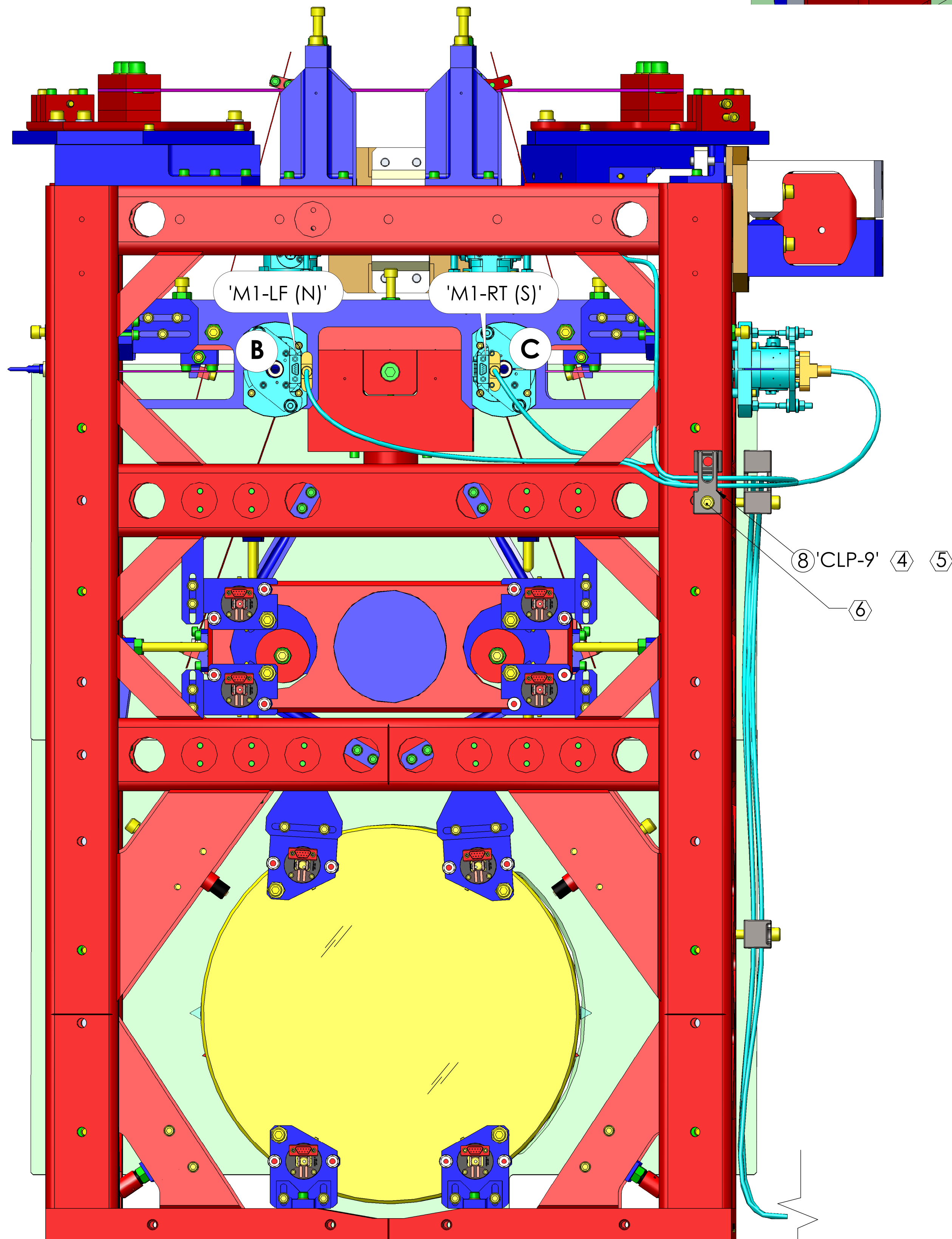
- ④ DO NOT CLAMP CABLES TIGHTLY. PROVIDE SUFFICIENT SPACE
FOR THE CABLES TO RUN FREELY BETWEEN CLAMP JAWS.
- ⑤ SHORTING MAY OCCUR IN QP BOSEM & AOSEM TEFLON CABLES CLAMPED EXCESSIVELY TIGHT.
THEREFORE, THE PEEK CLAMPS (i.e. 'CLP-1' AND CABLE TIES) SHOULD SERVE ONLY AS A GUIDE FOR
THE CABLES TO REACH THEIR DESTINATION, AND SHOULD NOT CLAMP THE CABLES IN PLACE.
- ⑥ TORQUE TO APPROXIMATELY 20 IN/LBS.

ROUTE NO. 2
SEE LIGO T1200318
FOR STEP BY STEP CABLING GUIDE

PR3



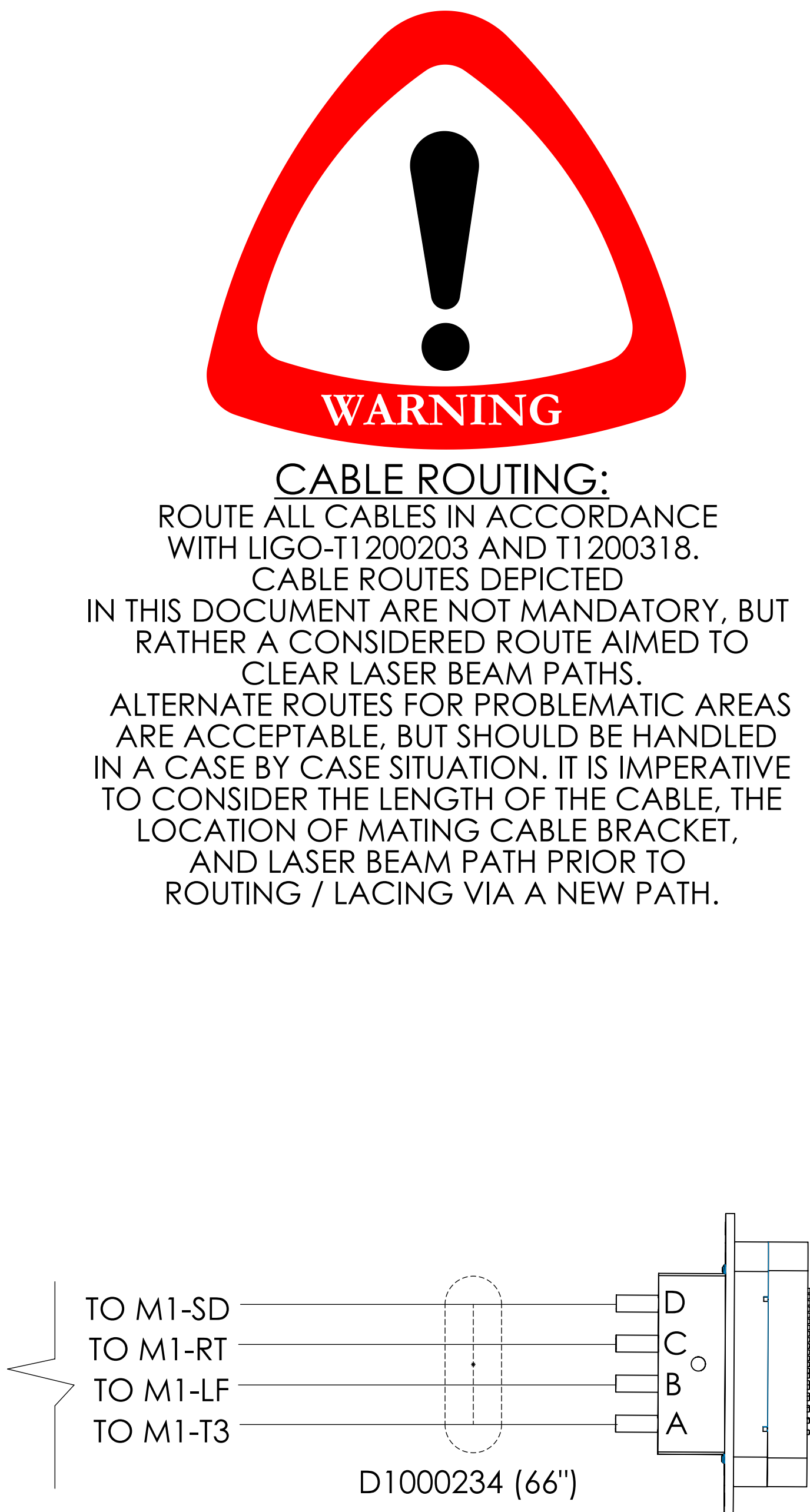
ISO VIEW REAR - LEFT



AR SIDE - REAR (-X) 1.1 1.2

(END CONNECTORS, NOT SHOWN FOR CLARITY)

FOR SYSTEM CABLING DIAGRAM, CABLE BRACKET LOCATION/ORIENTATION WRT CHAMBER, & ROUTING LAYOUT SEE D1000581.

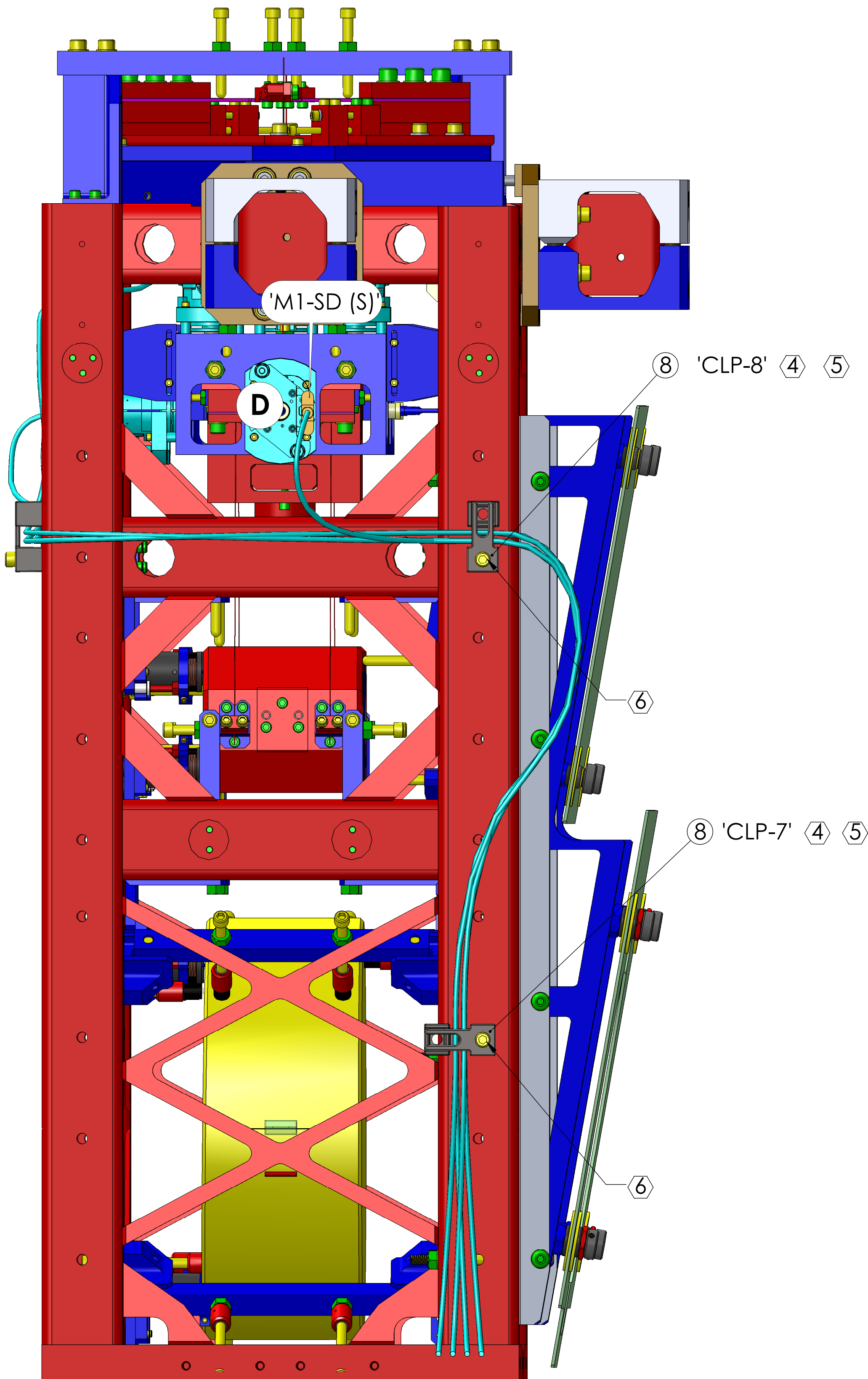


ROUTE NO. 3

SEE LIGO T1200308
FOR STEP BY STEP CABLING GUIDE

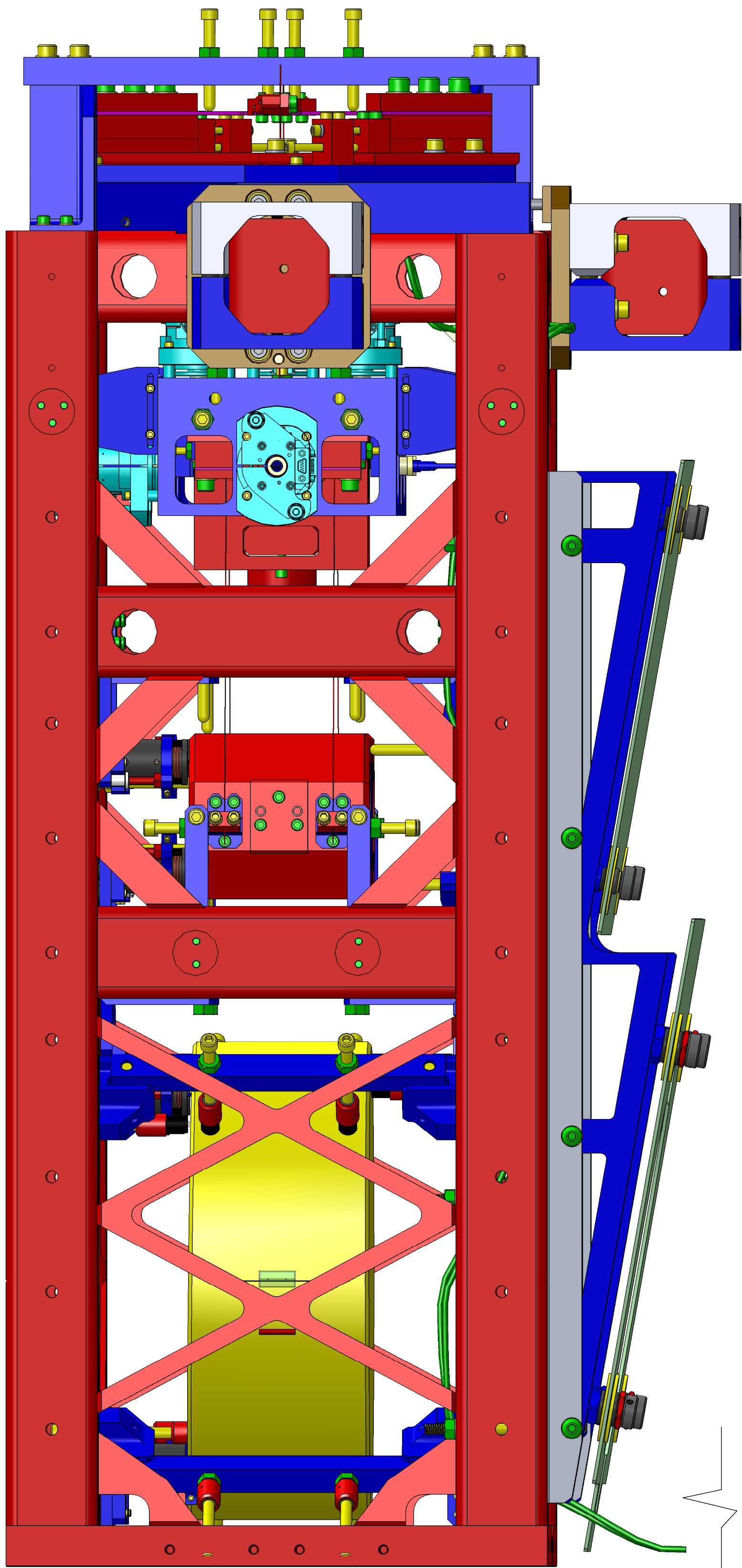
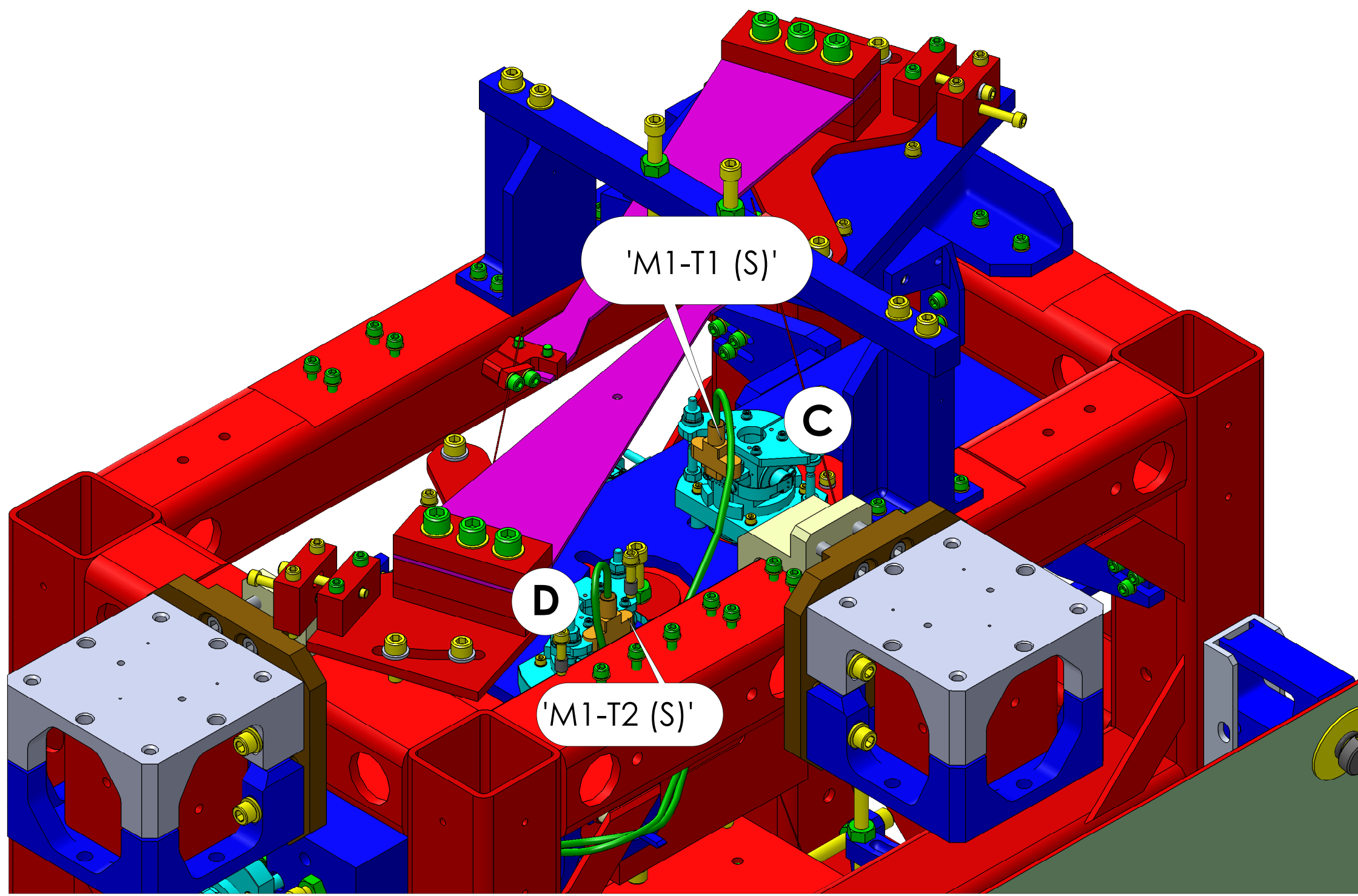
- 1 REFERENCED DOCUMENTATION:
1.1 LIGO-E1100109, HAM SUS CONTROLS ARRANGEMENT.
1.2 LIGO-D1101493, OSEM ORIENTATION.
1.3 LIGO-D1000581, SYSTEM CABLING DIAGRAM.
1.4 LIGO-D1002424, VIBRATION ABSORBER ORIENTATION.
1.5 LIGO-E1100411, CABLE CLAMP TORQUE.
1.6 LIGO-D1101296, HAM ISI HOLE TAB.

- 4 DO NOT CLAMP CABLES TIGHTLY, PROVIDE SUFFICIENT SPACE FOR THE CABLES TO RUN FREELY BETWEEN CLAMP JAWS.
5 SHORTING MAY OCCUR IN QP BOSEM & AOSEM TEFLON CABLES CLAMPED EXCESSIVELY TIGHT. THEREFORE, THE PEEK CLAMPS (i.e. 'CLP-1' AND CABLE TIES) SHOULD SERVE ONLY AS A GUIDE FOR THE CABLES TO REACH THEIR DESTINATION , AND SHOULD NOT CLAMP THE CABLES IN PLACE.
6 TORQUE TO APPROXIMATELY 20 IN/LBS.



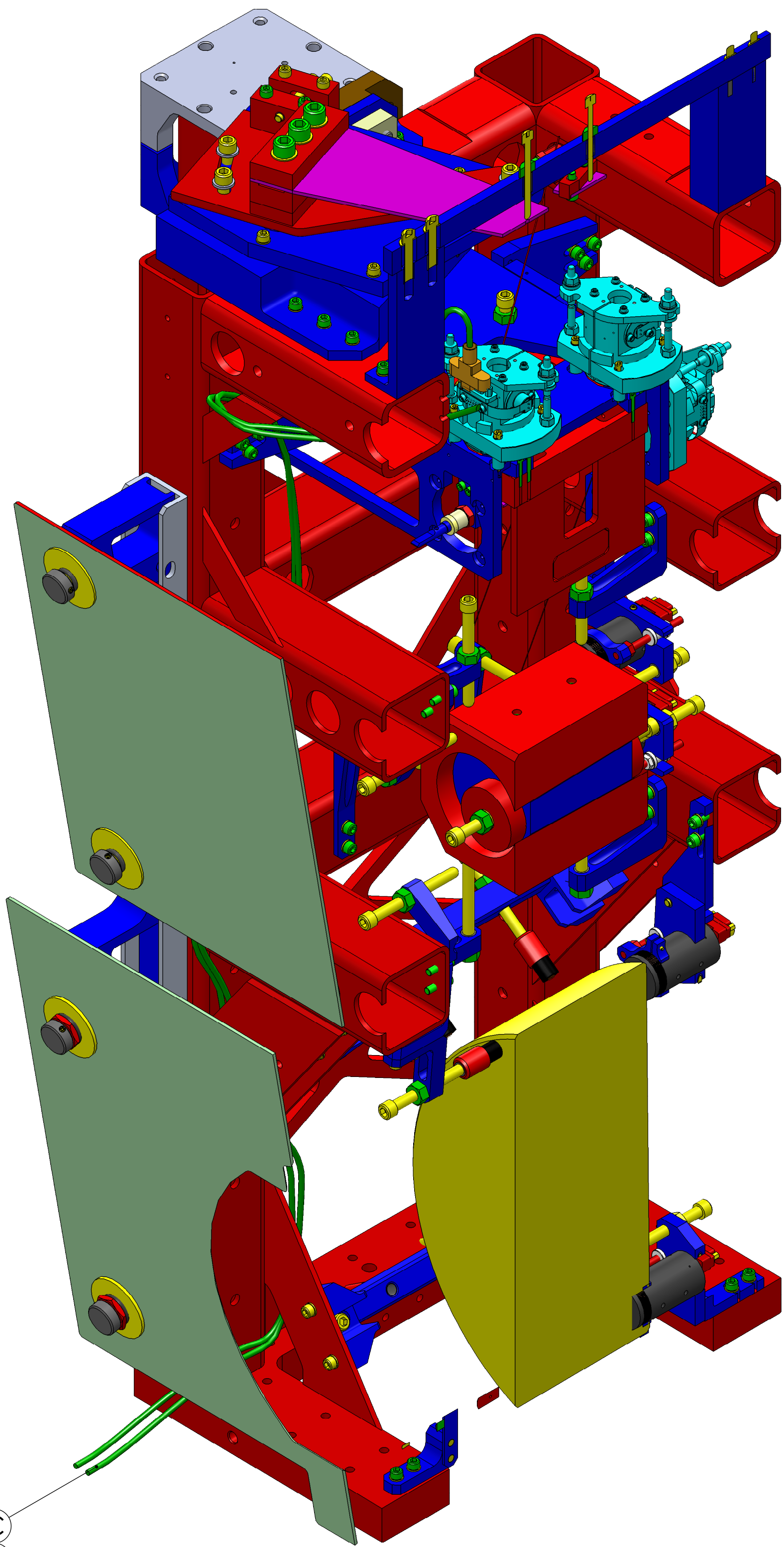
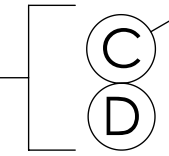
RIGHT SIDE (-Y)

PR3

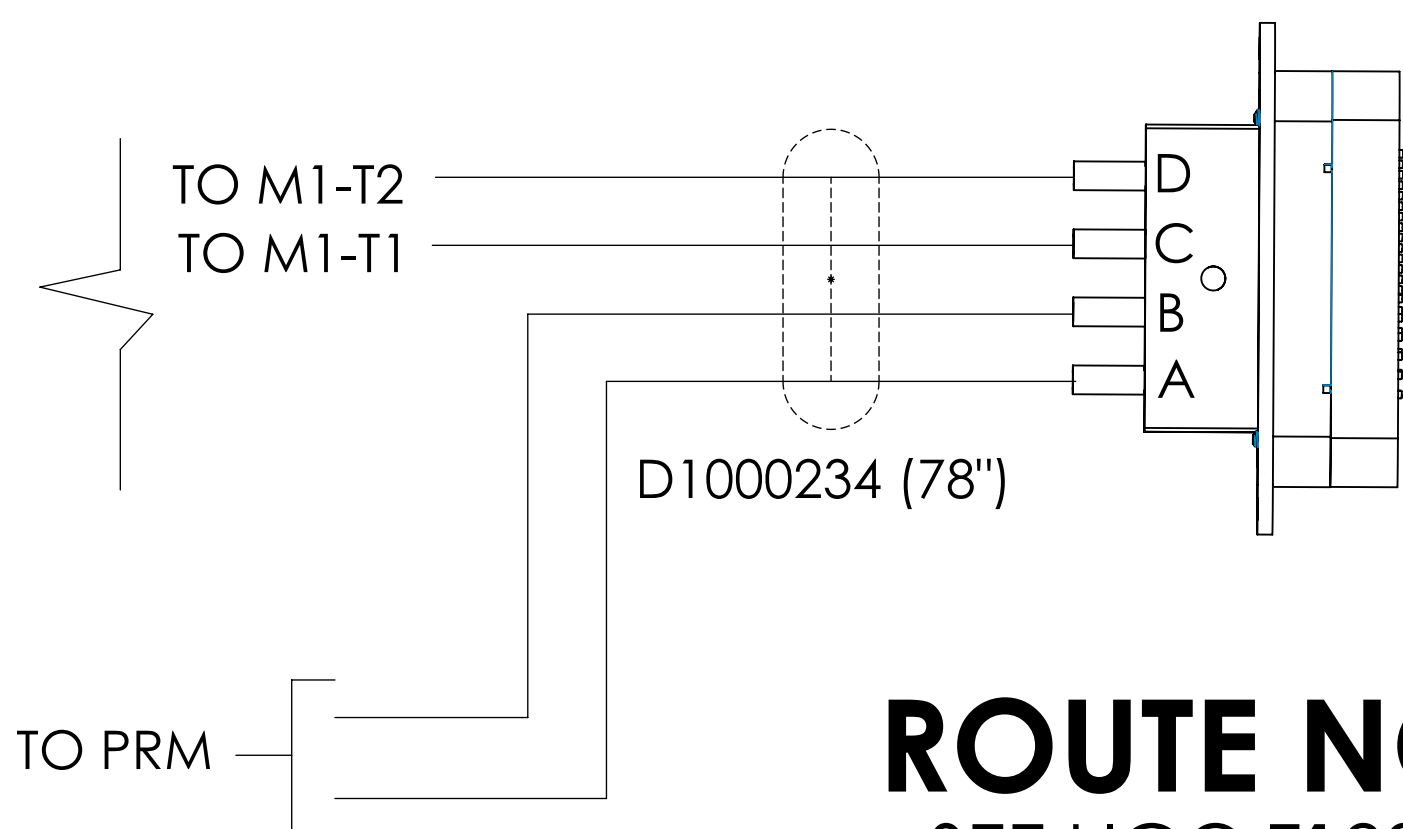


RIGHT SIDE (-Y)

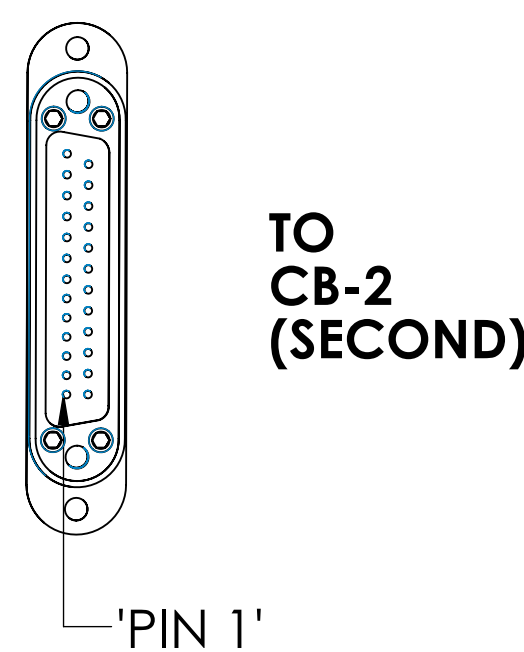
QP LEGS
LACED
THROUGH HR SIDE
BOTTOM LEFT GUSSET



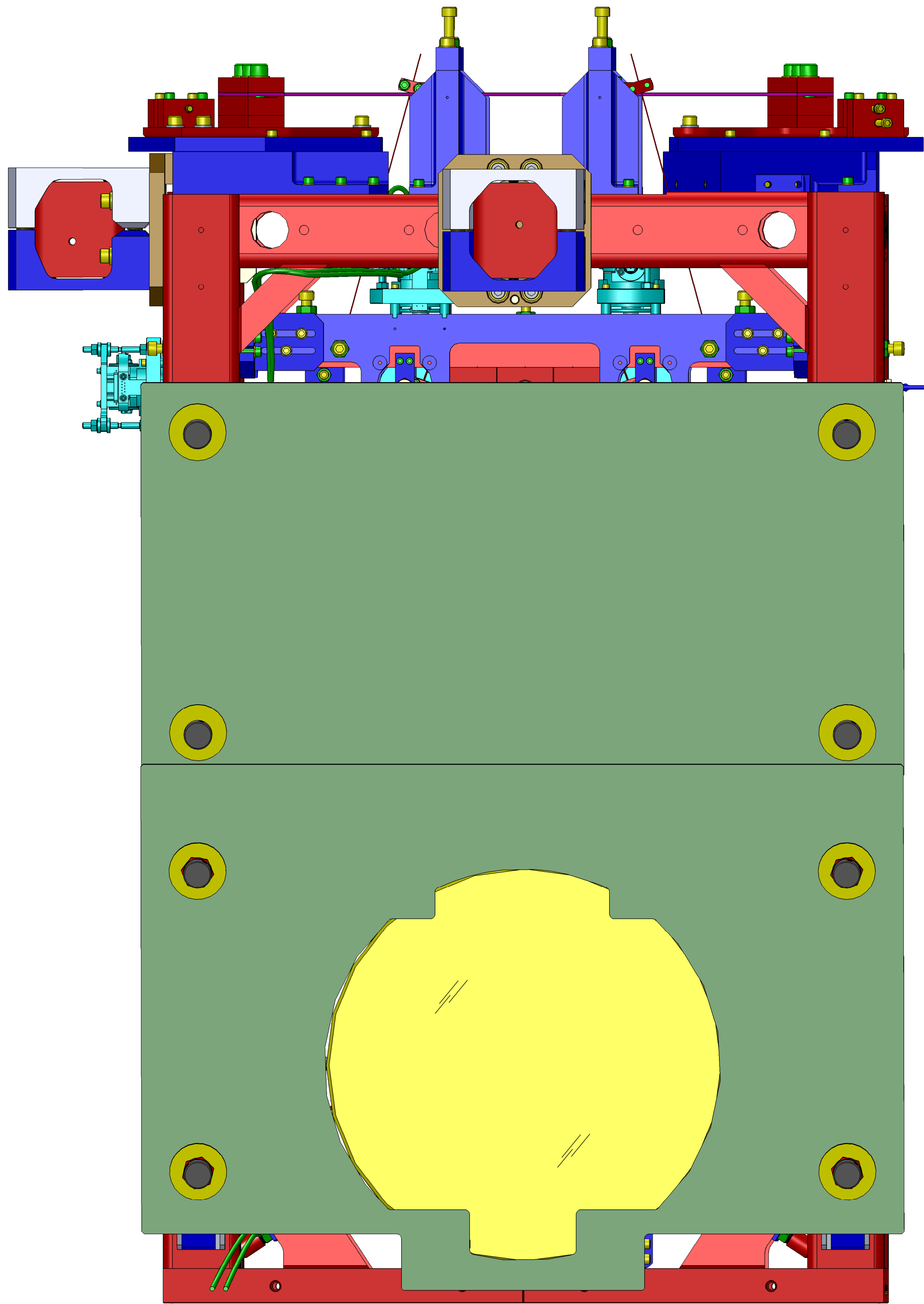
ISO VIEW FRONT - RIGHT
BROKEN OUT SECTION
(AS VIEWED FROM THE INSIDE)



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



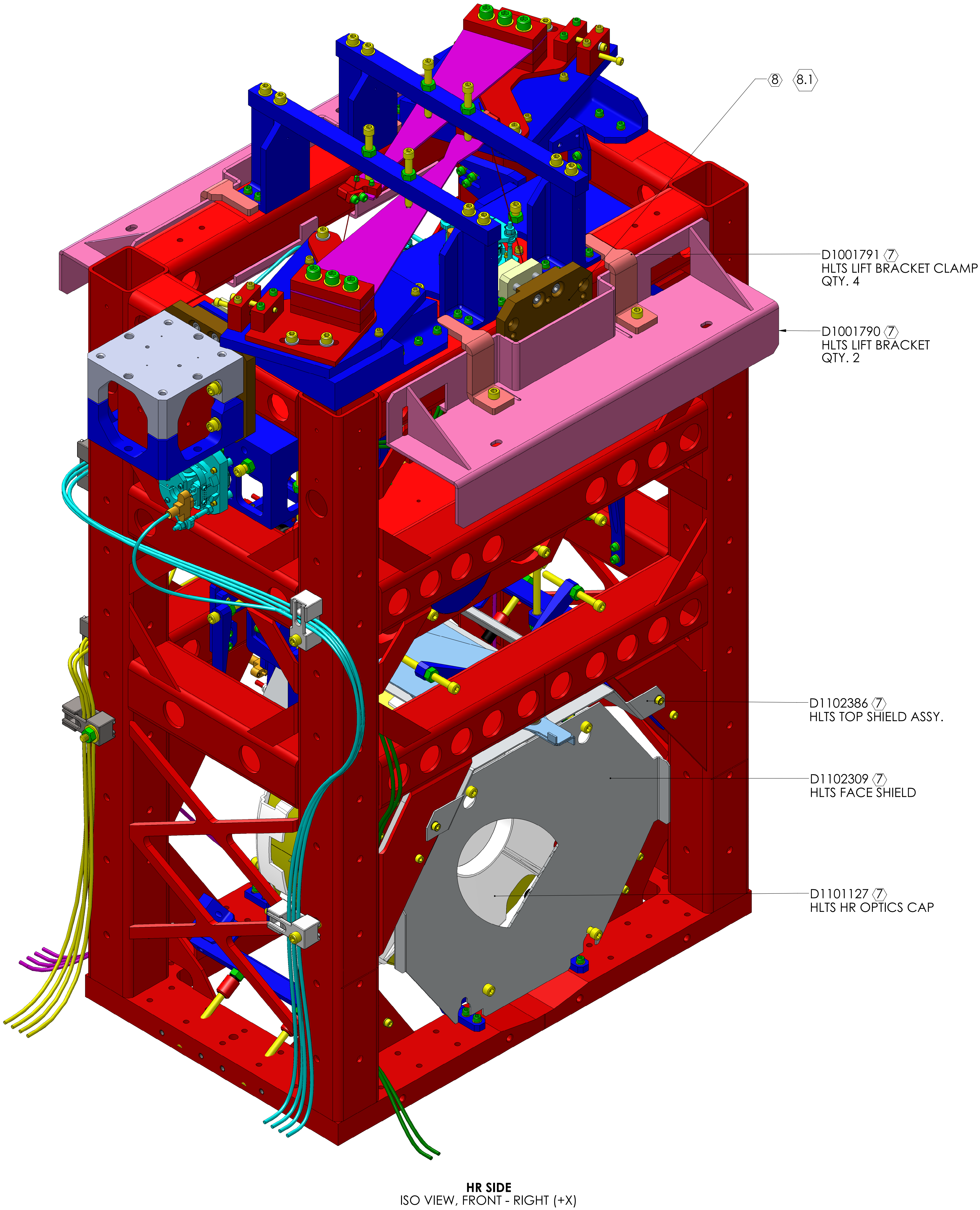
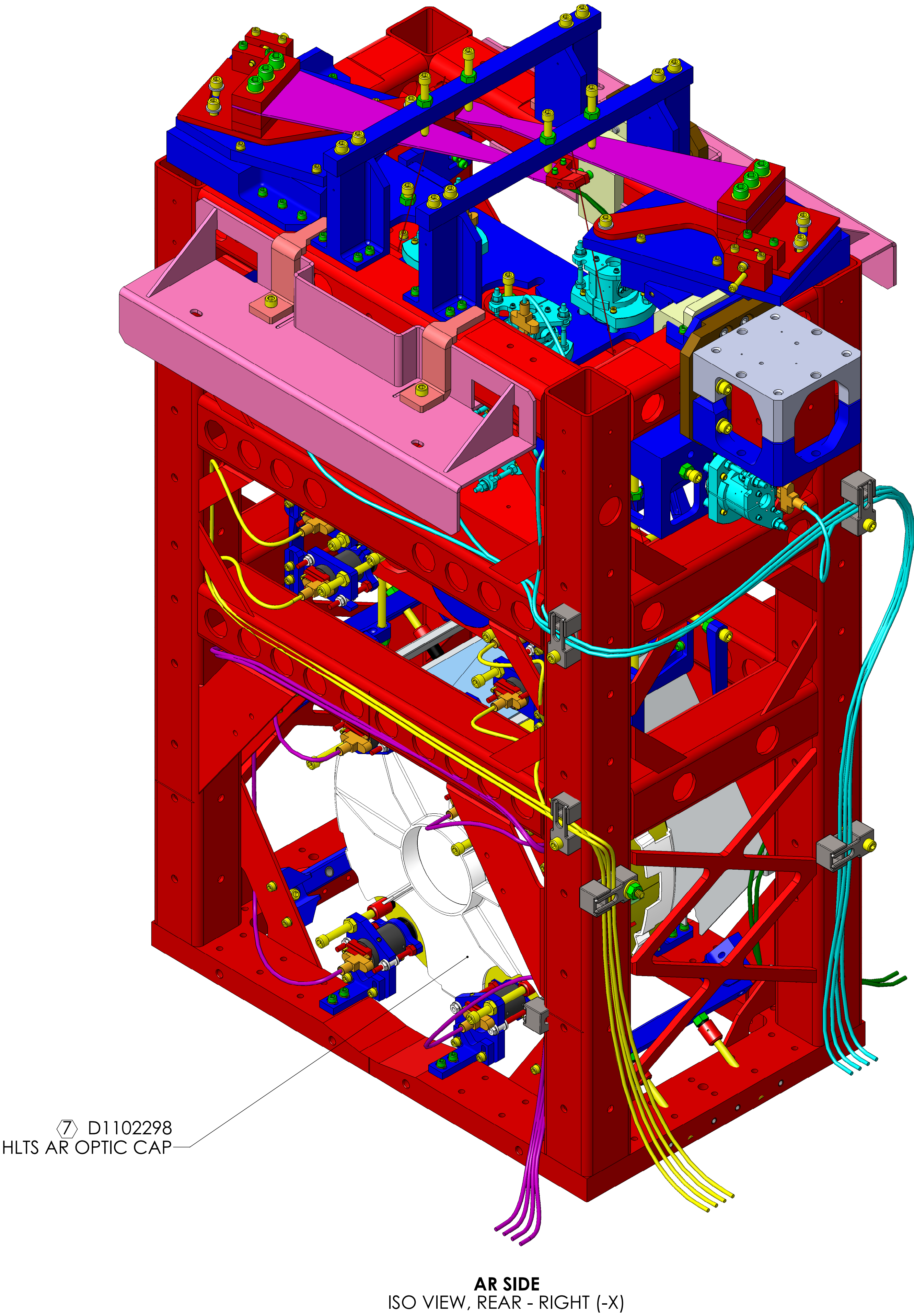
CABLE ROUTING:
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AND LASER BEAM PATH PRIOR TO
ROUTING / LACING VIA A NEW PATH.



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

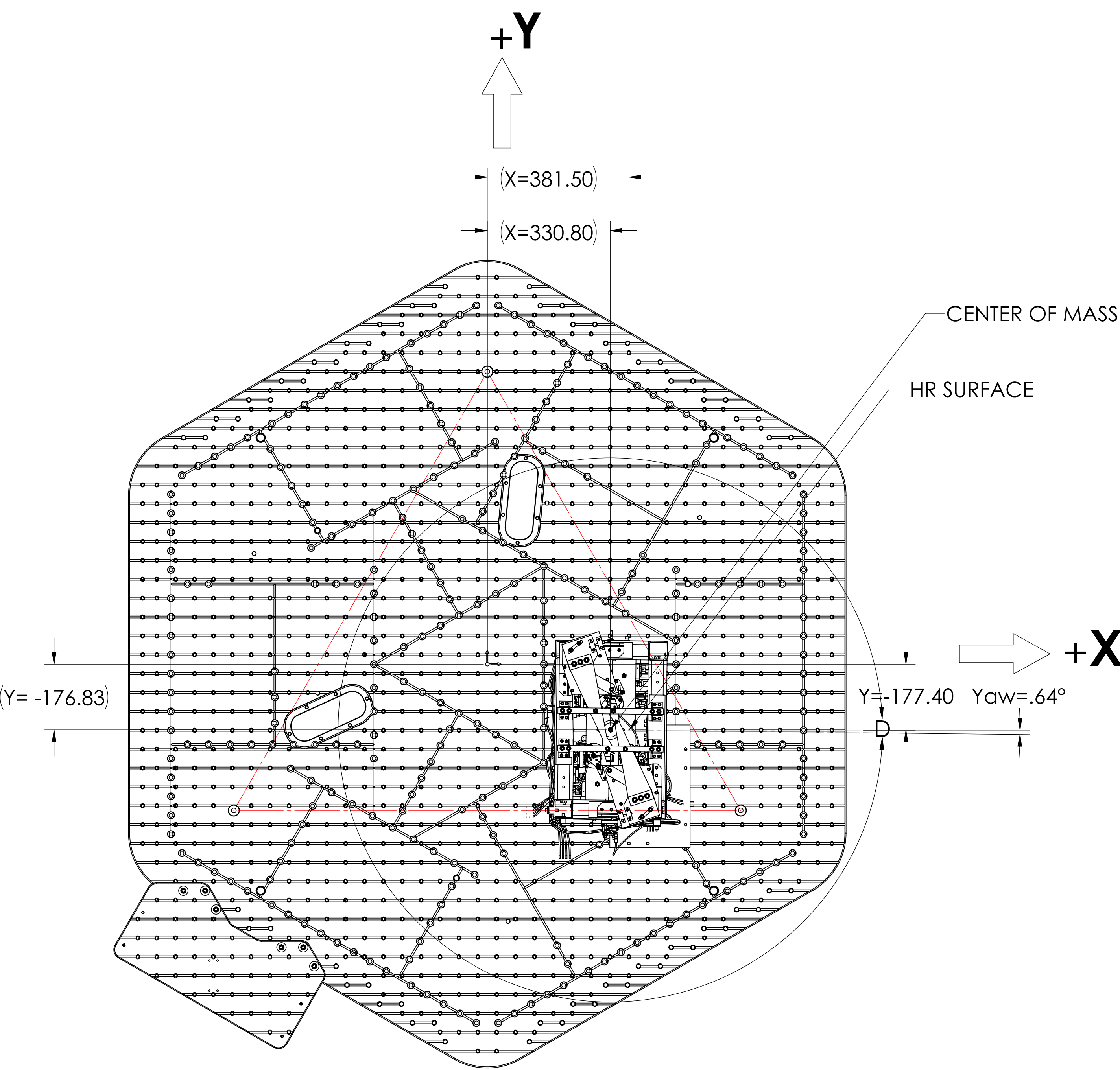
PR3

- ⑦ INDICATED ITEMS FOR TRANSPORTATION PURPOSES ONLY. AND ARE NOT PART OF FINISHED ASSEMBLY. SEE D1101674 FOR REFERENCE.
- ⑧ REMOVE VIBRATION ABSORBER ON FRONT SIDE TO AVOID INTERFERENCE WITH LIFT BRACKET.
- 8.1 LOCKING PINS: RETAIN IN PLACE FOR TRANSPORTATION ANAD INSTALLATION ONLY. REMOVE BEFORE CHAMBER DOORS ARE CLOSED.

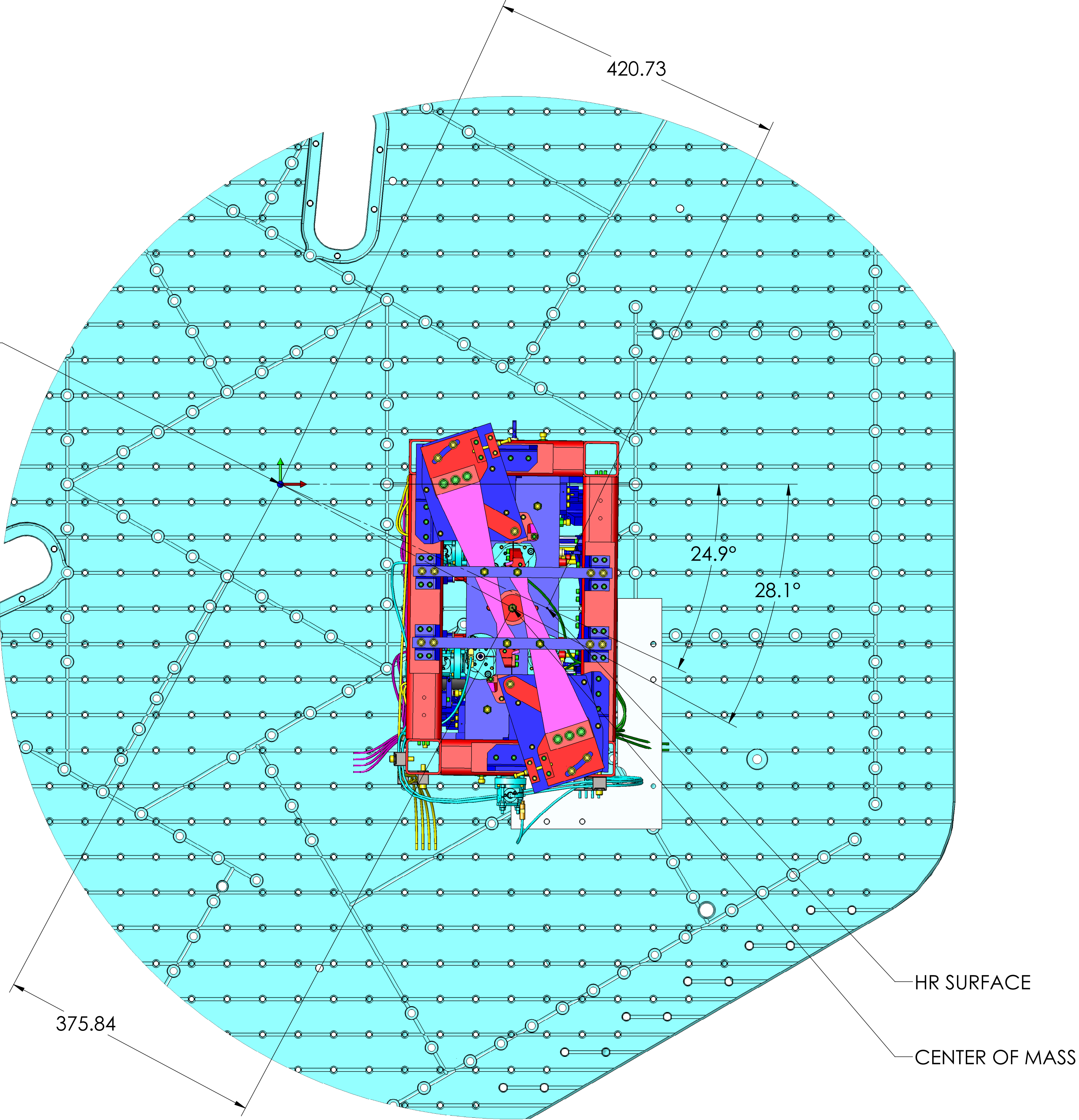


HLTS STRUCTURE TRANSPORT
VIBRATION ABSORBERS ON FRONT SIDE NOT SHOWN
(REMOVED FOR TRANSP. PURPOSES)

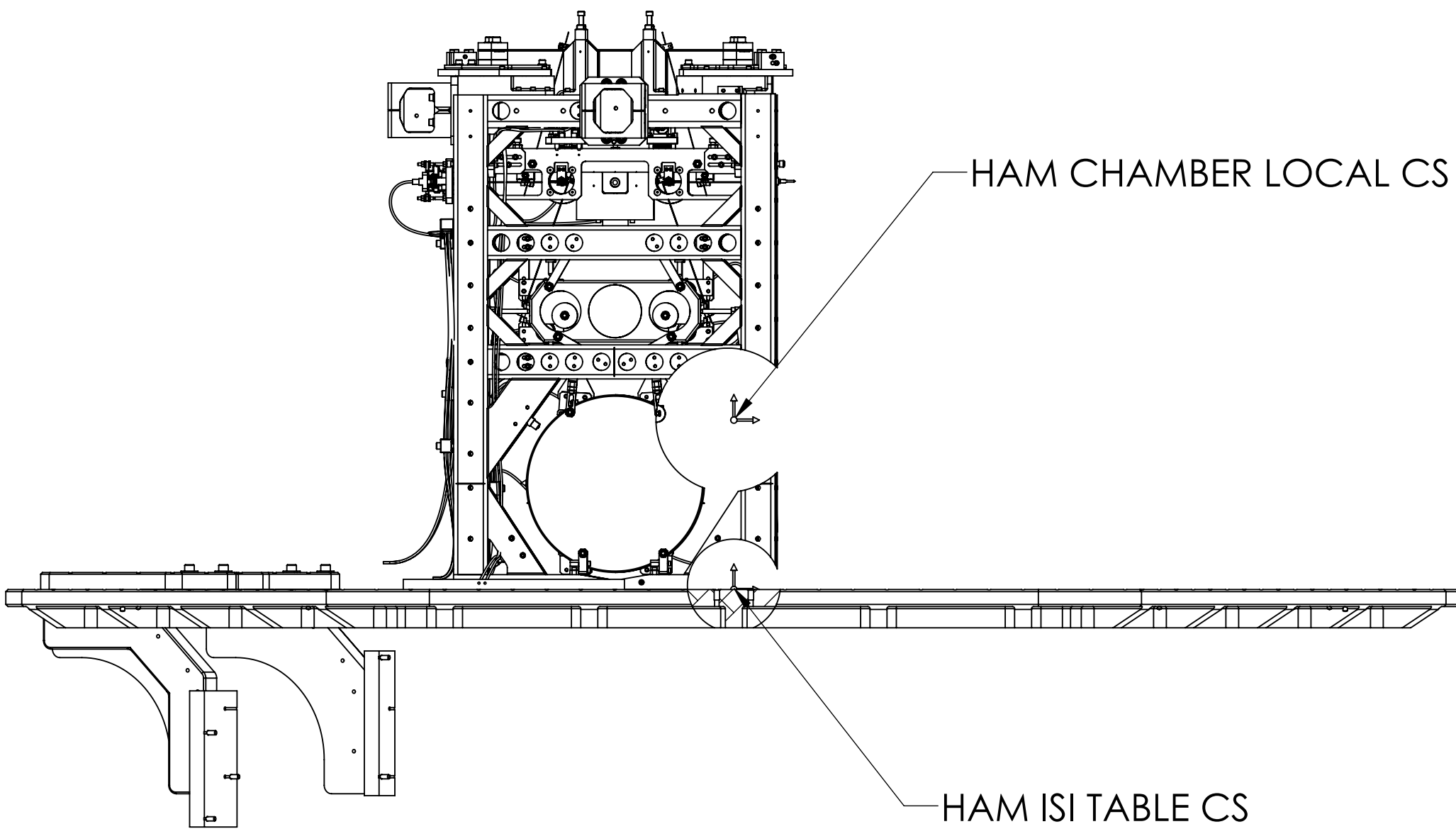
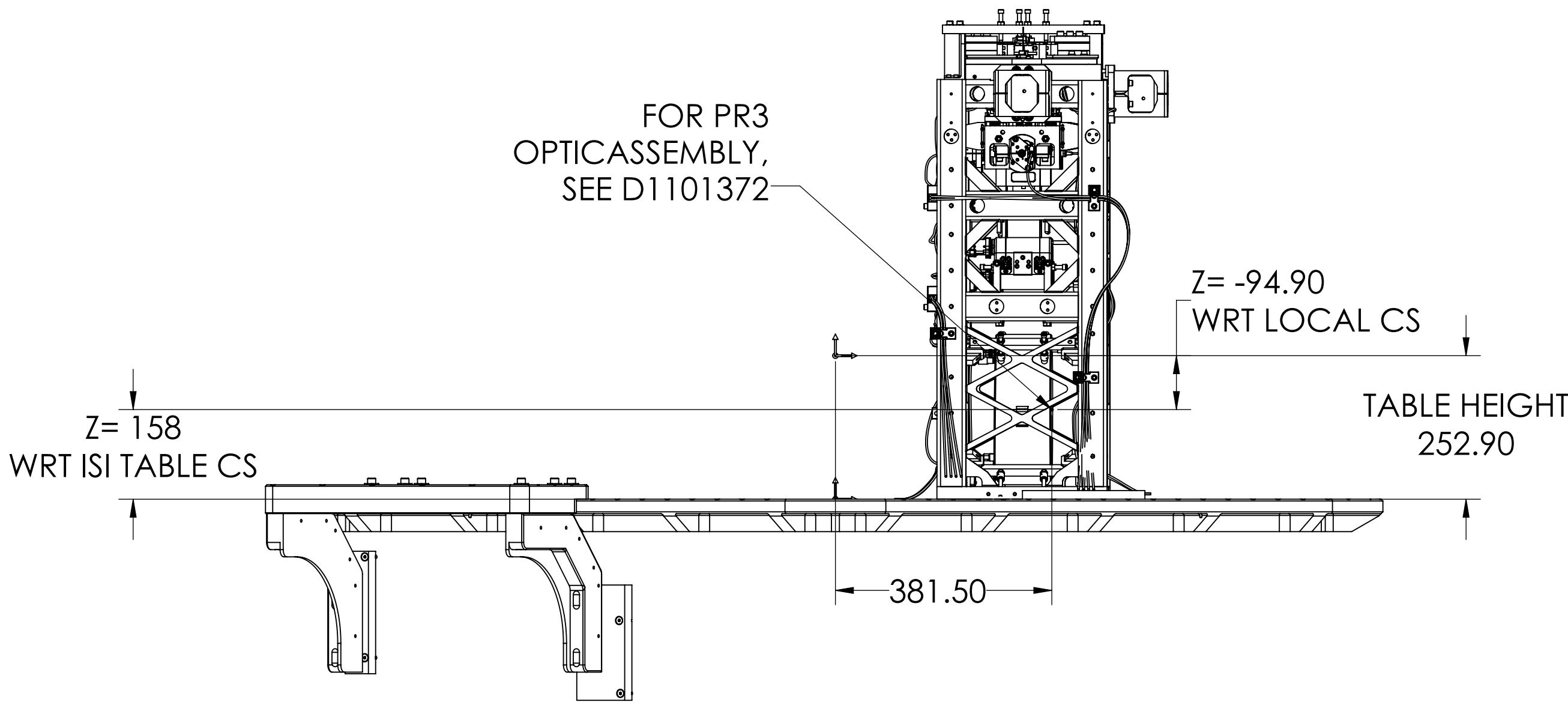
PR3



HAM CHAMBER
LOCAL CS



DETAIL D
SCALE 1 : 4



LOCAL COORDINATES DEFINITIONS

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