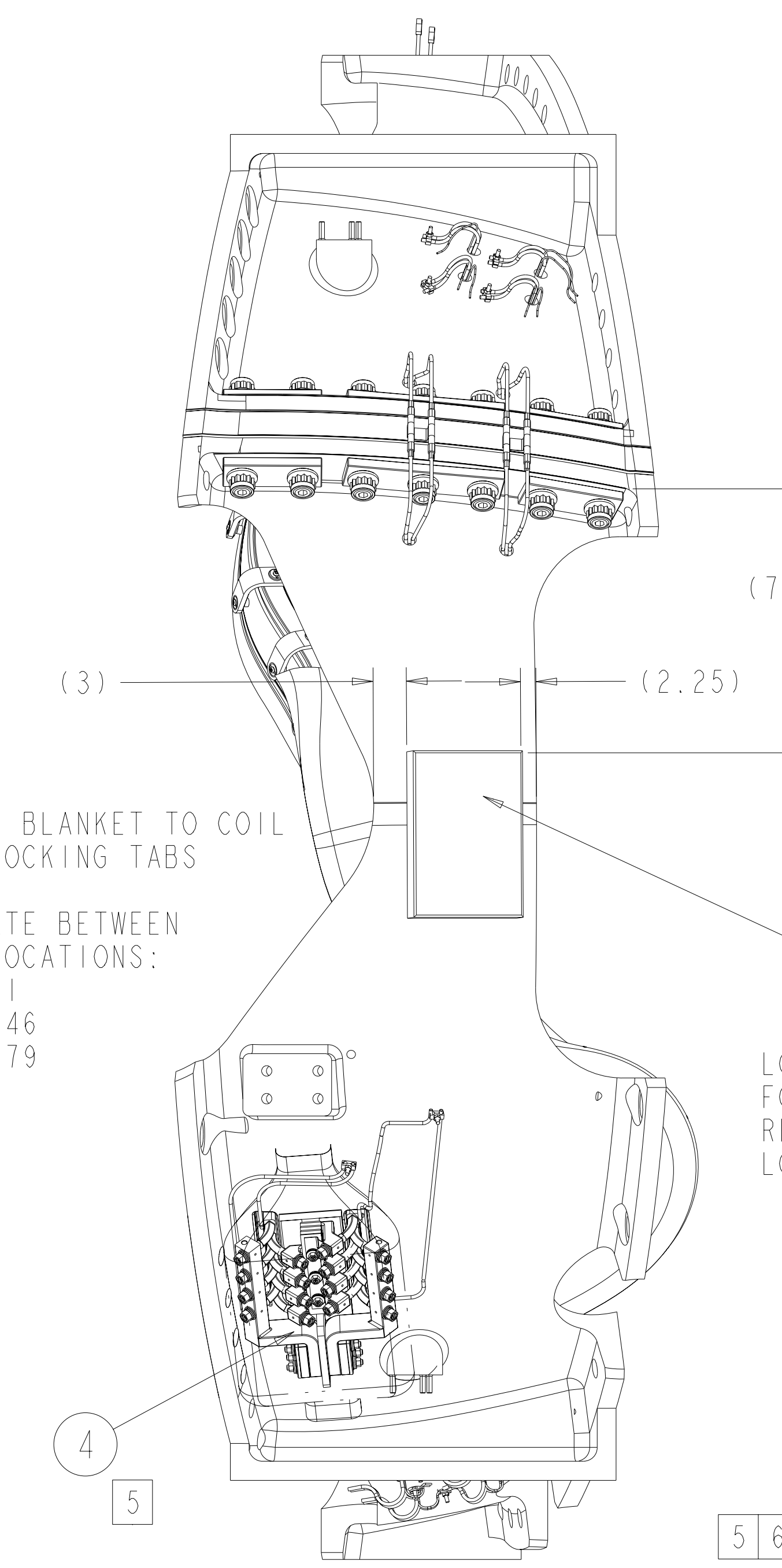
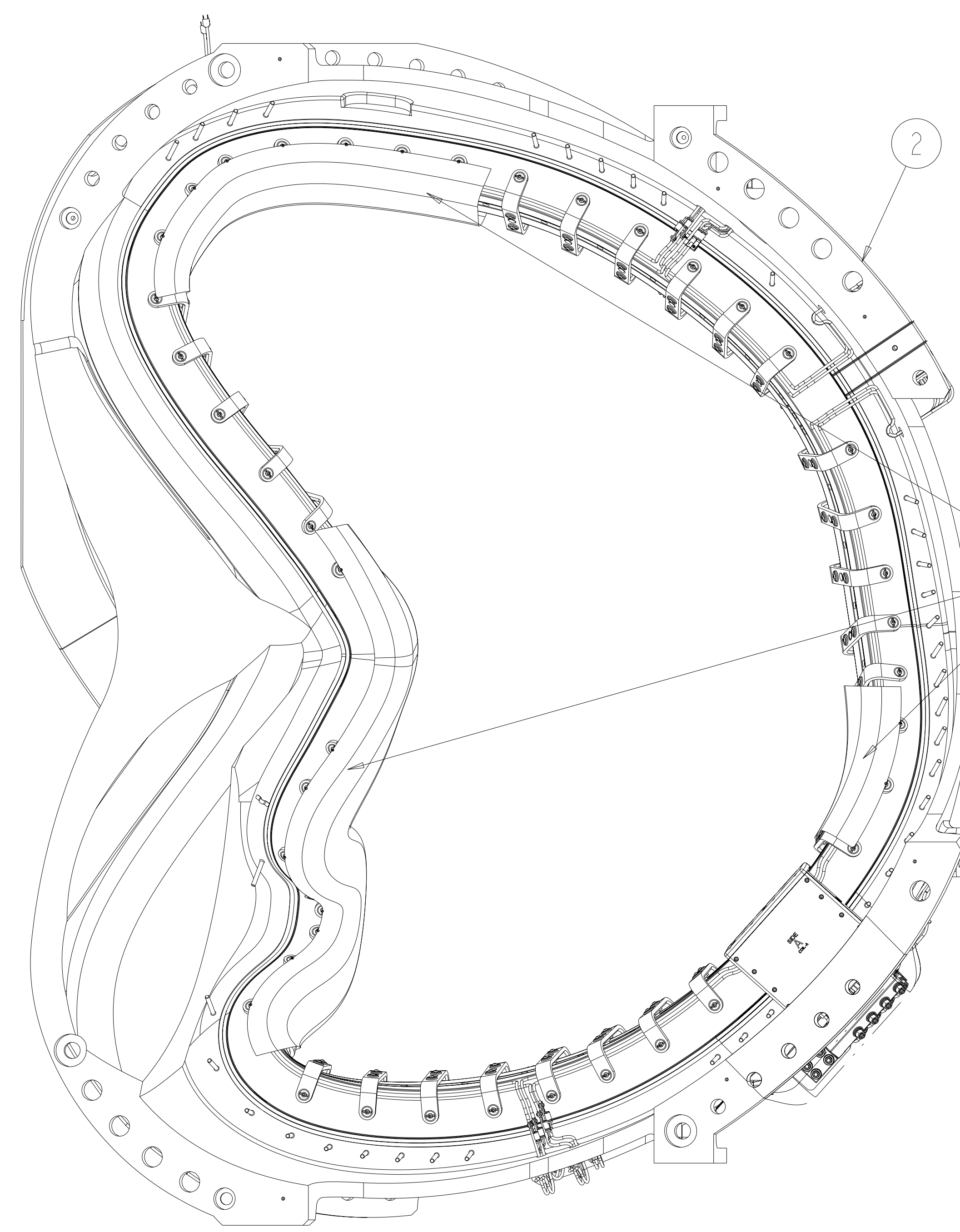
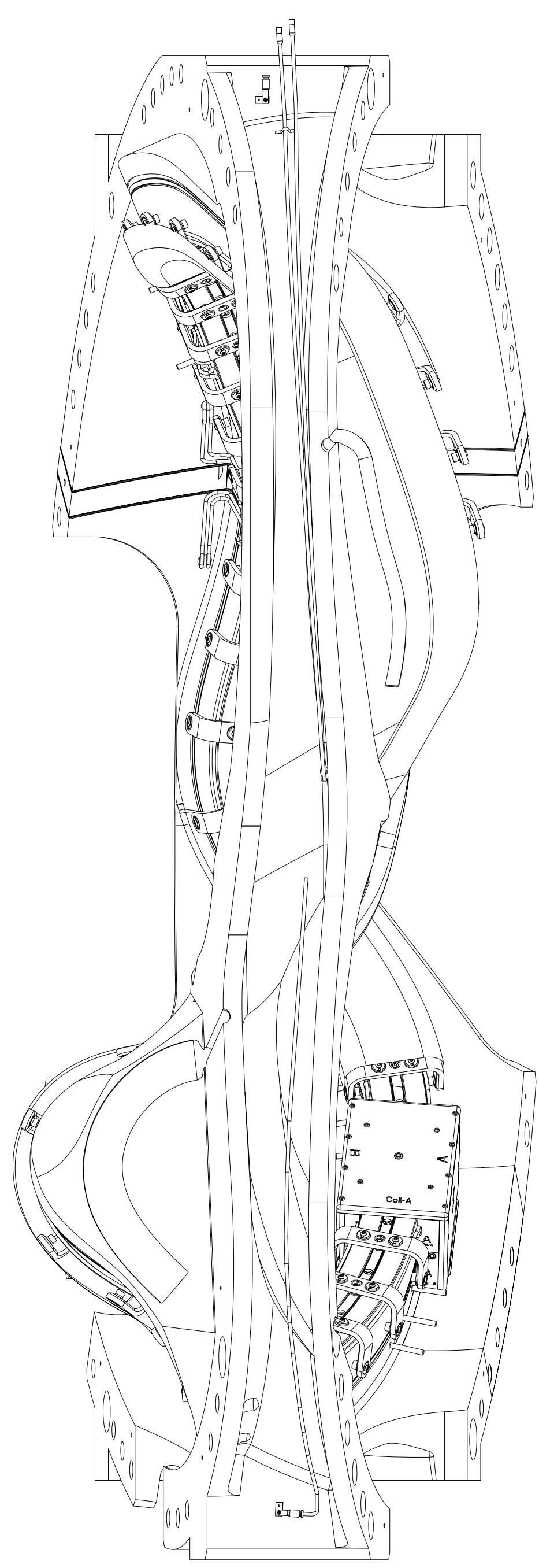


- NOTES:  
 1. DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2000.  
 2. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M  
 3. DIMENSIONS ARE IN INCHES  
 4. DIMENSIONS APPLY AT ROOM TEMPERATURE, OPERATING TEMP 80 K.  
 5 LEADS AREA SHALL BE COVERED WITH AN INSULATING MATERIAL (F/N 41) TO PREVENT DEBRIS FROM CAUSING AN ELECTRICAL SHORT DURING OPERATION.  
 6 VENDOR INFORMATION: WARWICK MILLS  
 NEW IPSWICH NH 03071  
 INQUIRIES@WARWICKMILLS.COM  
 888-477-4675  
 7. SEE PROCEDURE D-NCSX-MCF-001 FOR ADDITIONAL REQUIREMENTS.  
 8. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF PPPL PROCEDURE NO. ENG-037. VISUAL WELD INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE ACCEPTANCE CRITERIA OF AWS D1.6.  
 9 TACK WELD ANY ATTACHED FASTNERS TO SECURE AT LOCATION.  
 10 VENDOR INFORMATION: FISO FIBER OPTICS  
 500 ST. JEAN BAPTISTE AVE SUITE 195  
 QUEBEC QC G2E 5R CANADA  
 418-688-8065 OR WWW.FISO.COM  
 11 VENDOR INFORMATION: OMEGA ENGINEERING CORP  
 ONE OMEGA DRIVE  
 STAMFORD, CT 06907  
 800-848-4286 OR WWW.OMEGA.COM  
 12. SOME PARTS IN THIS ASSEMBLY ARE GRAPHIC REPRESENTATIONS OF ACTUAL PARTS/ASSEMBLIES. FOR MODELED ASSEMBLY SEE SE140-102.ASM  
 13 TYPE "A" COIL: REMOVE NOTED STUDS AFTER CLAMP AND INSULATION BLANKETS ARE ASSEMBLED (POST VPI).  
 14. MAGNETIC PERMEABILITY NOT TO EXCEED 1.02 AS TESTED BY A SEVERN INDICATOR AVAILABLE FROM:  
 SEVERN ENGINEERING  
 355 OLD STAGE ROAD SUITE 14  
 AUBURN, ALABAMA 36830  
 15 FOR WINDINGS AND GROUNDWRAP DETAILS REFER TO MODULAR COIL CONDUCTOR SPECIFICATION NCSX-CSPEC-142-03-05.  
 16 VENDOR INFORMATION: MCMASTER CARR  
 600 COUNTY LINE ROAD  
 ELMHURST IL 60126  
 630-833-0300

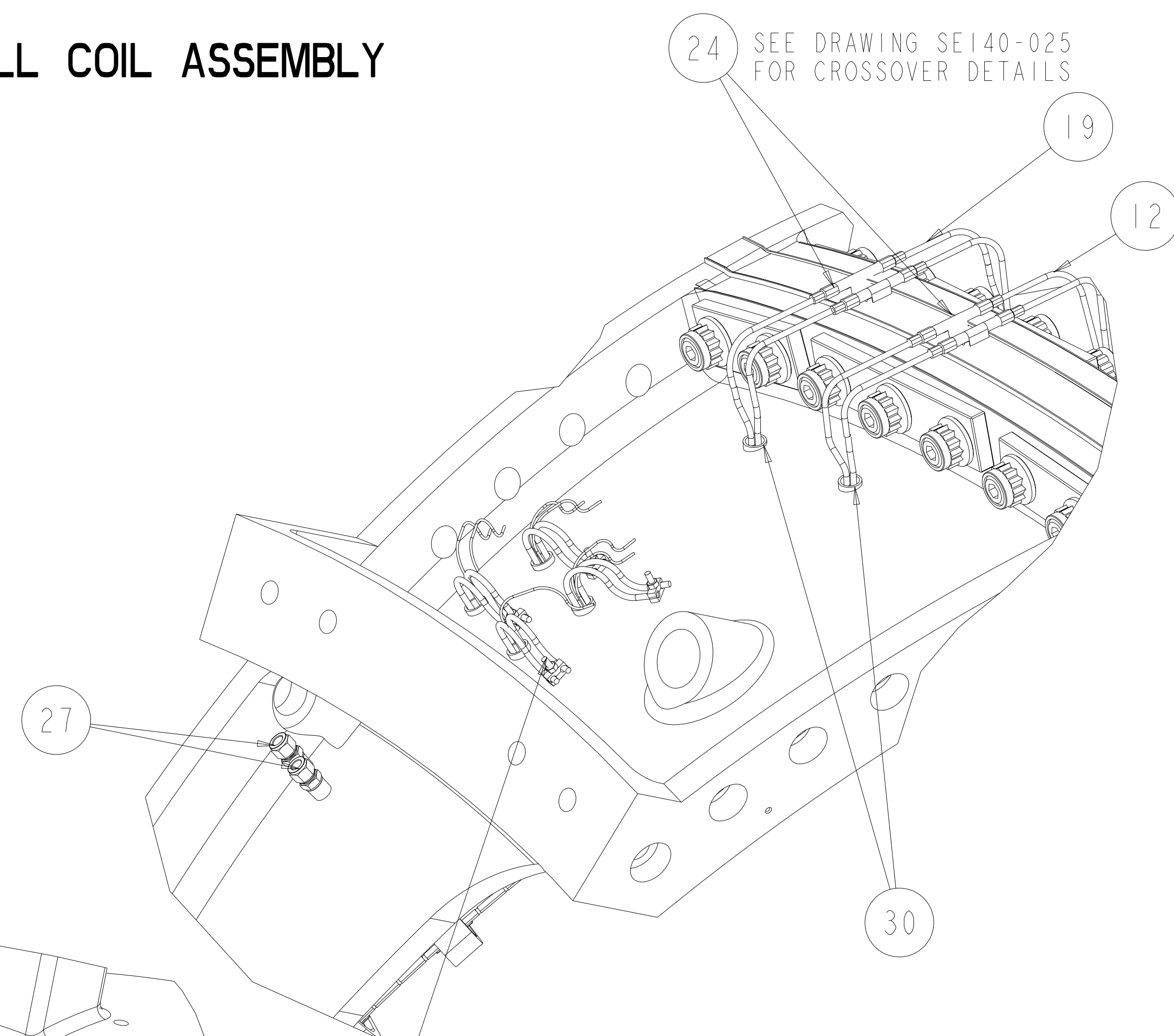
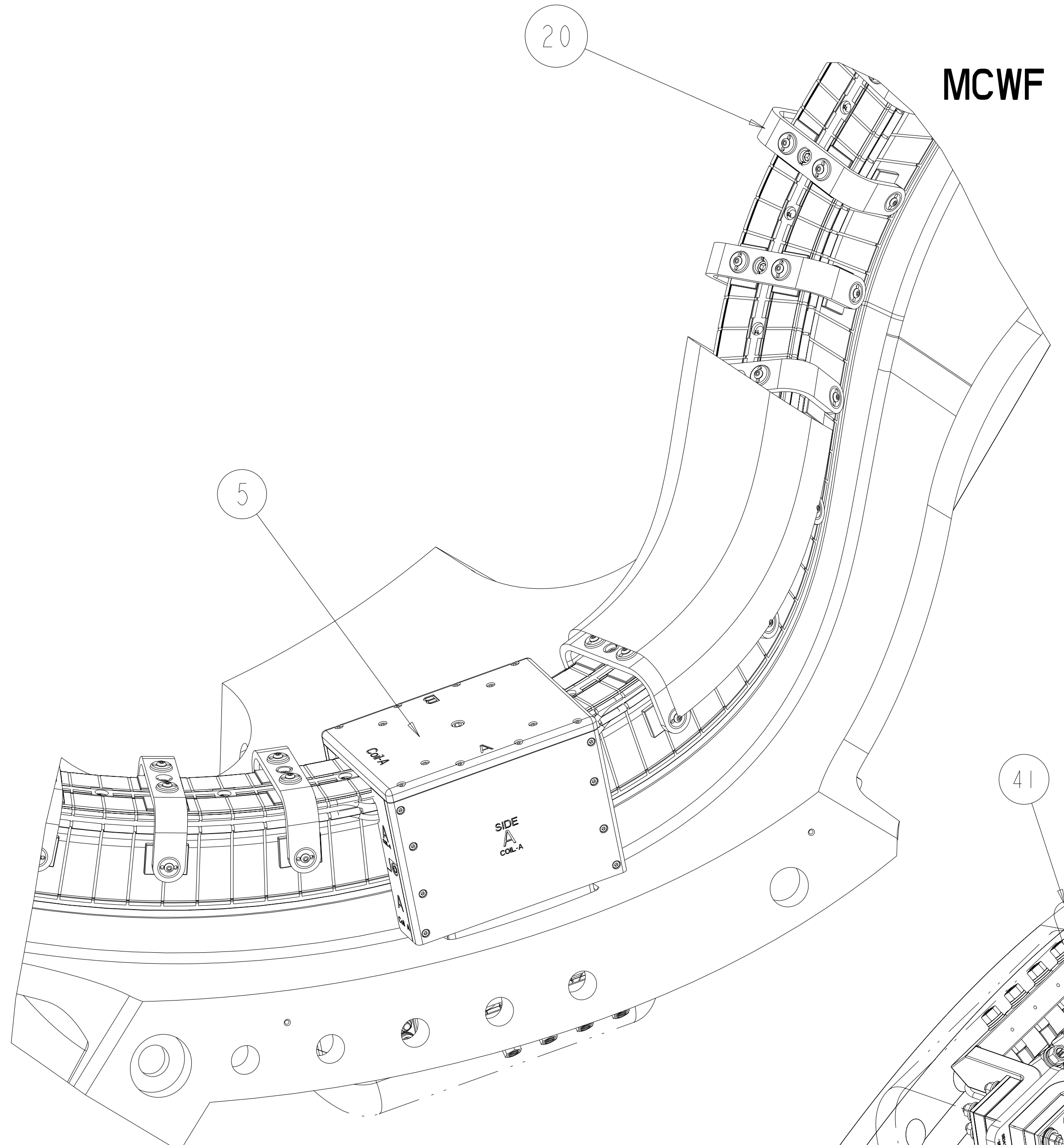


SECURE BLANKET TO COIL WITH LOCKING TABS F/N 40 INSULATE BETWEEN HOLE LOCATIONS:  
 4 TO 11  
 32 TO 46  
 56 TO 79

LOCATING DIMENSIONS FOR FLUX LOOP BOX ARE REFERENCE ONLY. FINAL LOCATION TO BE DETERMINED

MCWF TYP "A" FULL COIL ASSEMBLY

SCALE 0.13



SCALE 0.25

RELEASED FOR FABRICATION / INSTALLATION  
 PPPL Drafting

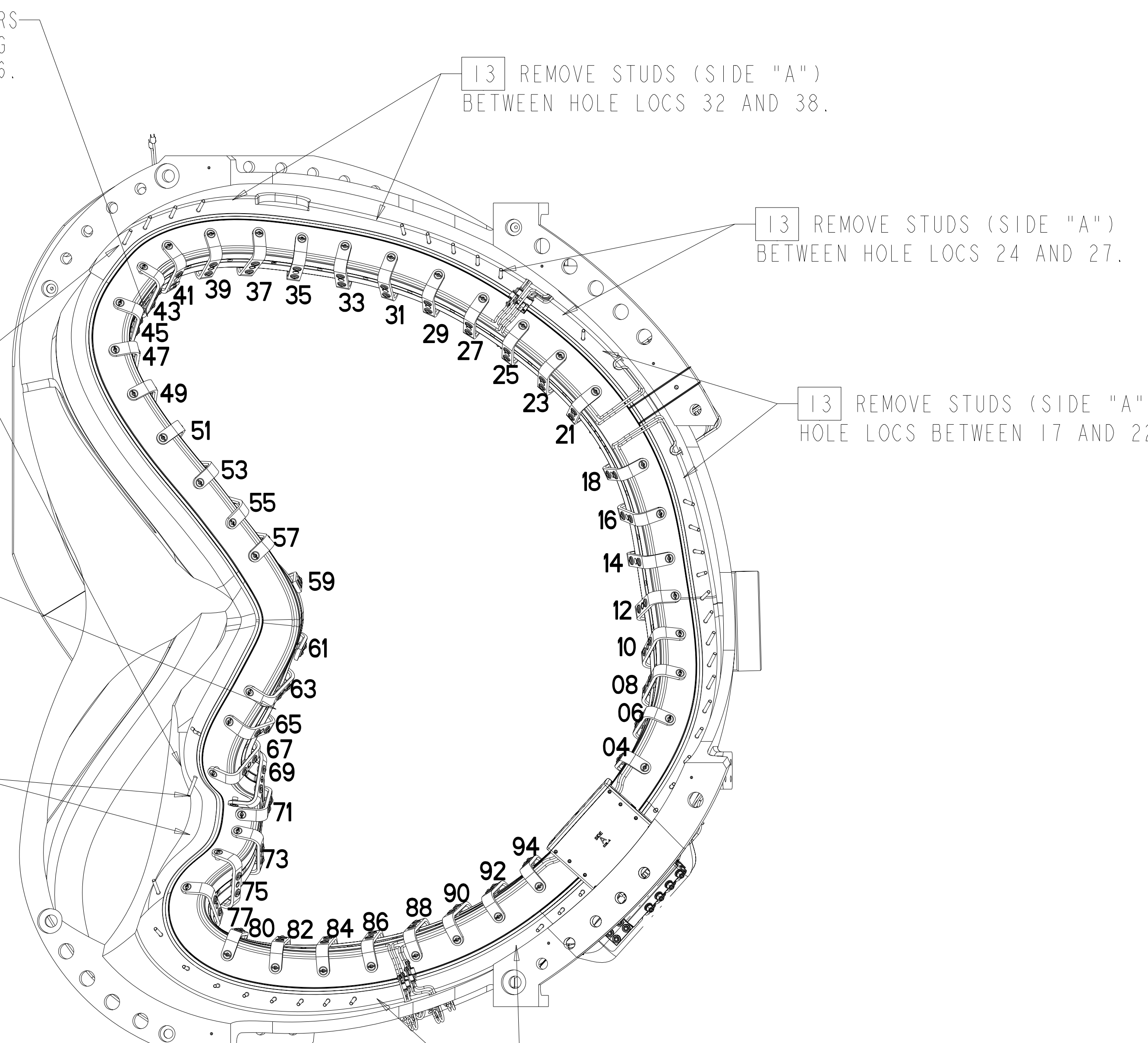
REV	DESCRIPTION	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
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NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF, ANY INFORMATION, APPARATUS, METHOD OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES, AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

**P** THIS DRAWING PRODUCED ON PRO-ENGINEER

SCALE NOTED	DES: D WILLIAMSON 07/07	UT-BATTELLE	Oak Ridge National Laboratory managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725 UT-BATTELLE, LLC, Oak Ridge, Tennessee
TOLERANCES UNLESS OTHERWISE SPECIFIED	DRW: S HOMESCU 07/07	PROJECT NAME: NATIONAL COMPACT STELLARATOR EXPERIMENT	
FRACTIONS	CHK: M COLE 07/07	MCWF TYPE "A" FULL COIL ASSEMBLY	
XX DECIMALS ±.01	DEPT:	PPPL DRFT J SIEGLE 07/07	
XXX DECIMALS ±.005	PE: D WILLIAMSON 07/07	VERSION NO.:	89
ANGLES ±0°15'	CR:	PLANT ORNL	5700
BREAK SHARP EDGES .06 MAX	PJ:	BLDG:	3
FINISH .125 UNLESS OTHERWISE SPECIFIED	RD:	FL:	3
	RE:	SHT OF:	3
		TYPE:	S
		CLASS:	U
		REV:	0
		RELEASE LEVEL:	
		DATE:	
		Fabrication:	
		SEI40-101	

SUGGESTED LOCATION FOR CONCENTRATED STRAIN SENSORS  
 ALIGN SENSORS ON LAST FIELD PERIOD ASSEMBLY ON WINDING  
 LAW PLANE BETWEEN HOLE 43-46.

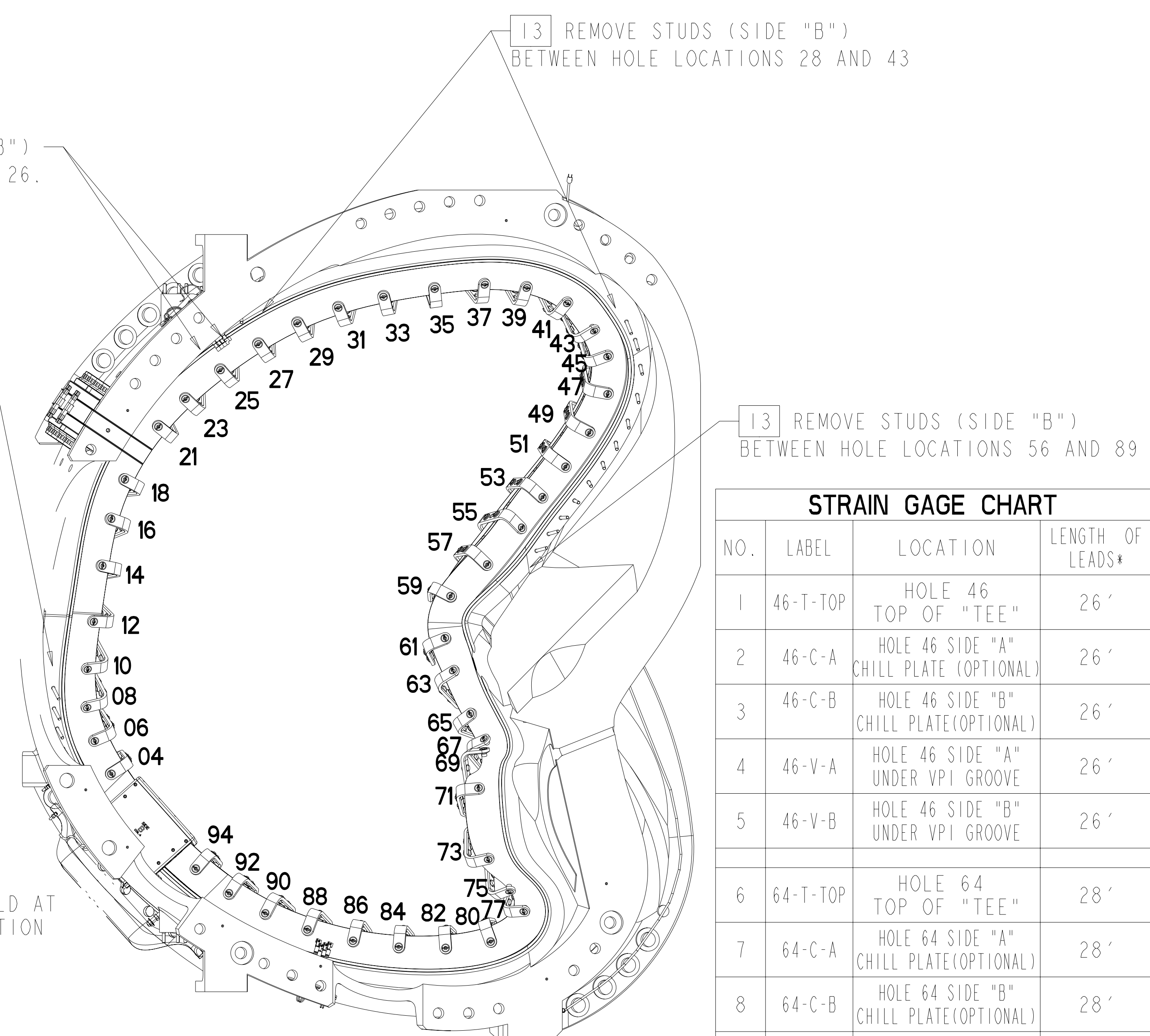


**SIDE "A" VIEW**  
 SCALE 0.100  
**CLAMP / HOLE NUMBER LOCATIONS**

CLAMP CHART		
NO.	HOLE NO.	CLAMP ASSEMBLY
1	04	SE142C-270
2	06	SE142C-270
3	08	SE142C-270
4	10	SE142C-270
5	12	SE142C-270
6	14	SE142C-270
7	16	SE142C-270
8	18	SE142C-270
9	21	SE142C-270
10	23	SE142C-270
11	25	SE142C-270
12	27	SE142C-270
13	29	SE142C-270
14	31	SE142C-270
15	33	SE142C-270
16	35	SE142C-270
17	37	SE142C-270
18	39	SE142C-270
19	41	SE142C-270
20	43	SE142C-270
21	45	SE142C-270
22	47	SE142C-270
23	49	SE142C-270
24	51	SE142C-270
25	53	SE142C-270
26	55	SE142C-270
27	57	SE142C-270
28	59	SE142C-303
29	61	SE142C-303
30	63	SE142C-270
31	65	SE142C-270
32	67	SE142C-270
33	69	SE142C-270
34	71	SE142C-270
35	73	SE142C-270
36	75	SE142C-270
37	77	SE142C-270
38	80	SE142C-270
39	82	SE142C-270
40	84	SE142C-270
41	86	SE142C-270
42	88	SE142C-270
43	90	SE142C-270
44	92	SE142C-270
45	94	SE142C-270

13 REMOVE STUDS (SIDE "B")  
 AT HOLE LOCATIONS 25 AND 26.

13 REMOVE STUDS (SIDE "B")  
 BETWEEN HOLES 10 AND 23

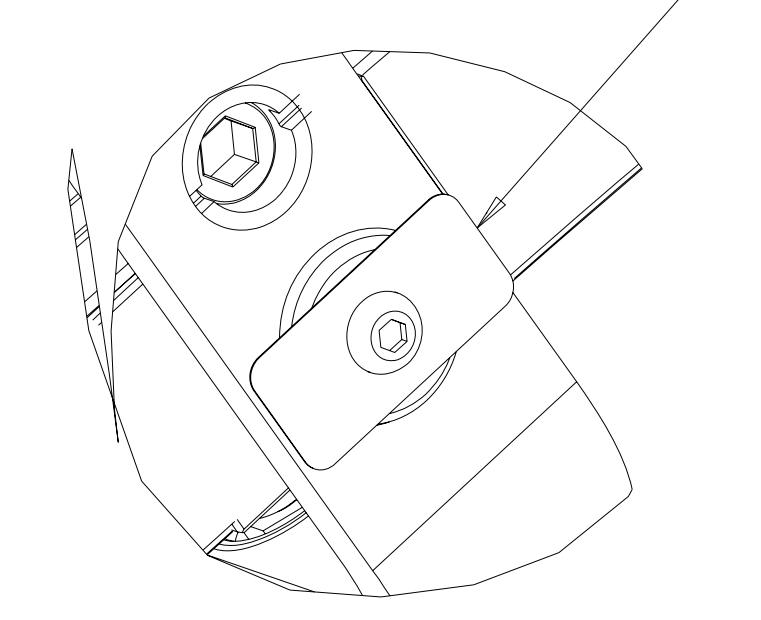


**SIDE "B" VIEW**  
 SCALE 0.100  
**CLAMP / HOLE NUMBER LOCATIONS**

STRAIN GAGE CHART			
NO.	LABEL	LOCATION	LENGTH OF LEADS*
1	46-T-TOP	HOLE 46 TOP OF "TEE"	26'
2	46-C-A	HOLE 46 SIDE "A" CHILL PLATE (OPTIONAL)	26'
3	46-C-B	HOLE 46 SIDE "B" CHILL PLATE (OPTIONAL)	26'
4	46-V-A	HOLE 46 SIDE "A" UNDER VPI GROOVE	26'
5	46-V-B	HOLE 46 SIDE "B" UNDER VPI GROOVE	26'
6	64-T-TOP	HOLE 64 TOP OF "TEE"	28'
7	64-C-A	HOLE 64 SIDE "A" CHILL PLATE (OPTIONAL)	28'
8	64-C-B	HOLE 64 SIDE "B" CHILL PLATE (OPTIONAL)	28'
9	64-V-A	HOLE 64 SIDE "A" UNDER VPI GROOVE	28'
10	64-V-B	HOLE 64 SIDE "B" UNDER VPI GROOVE	28'

\*BUNDLE AND SECURE LEADS ROUTE AT FIELD PERIOD ASSEMBLY

40 FORM AND TACH WELD AT EACH KEEPER LOCATION

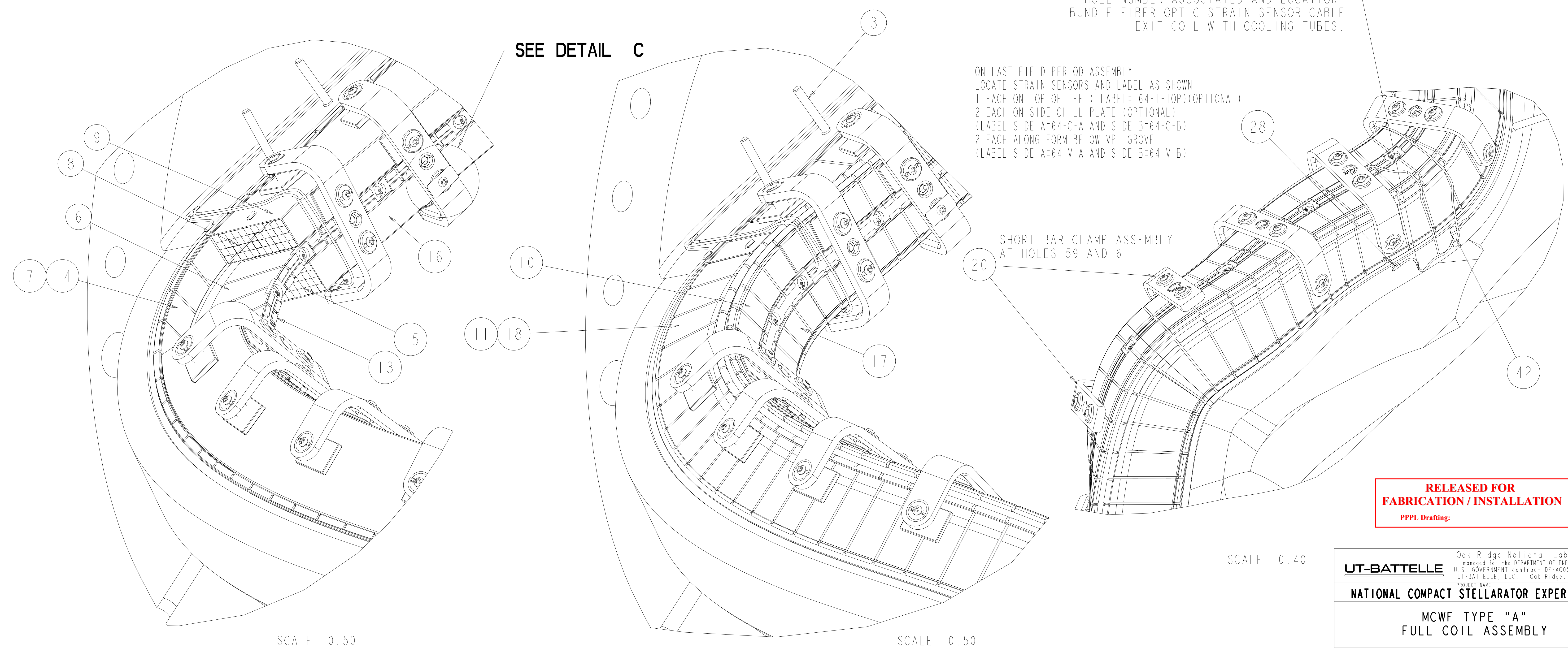


**DETAIL C**  
 SCALE 1.000

ON LAST FIELD PERIOD ASSEMBLY  
 COLOR CODE OR IDENTIFY EACH CABLE WITH  
 HOLE NUMBER ASSOCIATED AND LOCATION  
 BUNDLE FIBER OPTIC STRAIN SENSOR CABLE  
 EXIT COIL WITH COOLING TUBES.

ON LAST FIELD PERIOD ASSEMBLY  
 LOCATE STRAIN SENSORS AND LABEL AS SHOWN  
 1 EACH ON TOP OF TEE ( LABEL= 64-T-TOP)(OPTIONAL)  
 2 EACH ON SIDE CHILL PLATE (OPTIONAL)  
 (LABEL SIDE A=64-C-A AND SIDE B=64-C-B)  
 2 EACH ALONG FORM BELOW VPI GROOVE  
 (LABEL SIDE A=64-V-A AND SIDE B=64-V-B)

SHORT BAR CLAMP ASSEMBLY  
 AT HOLES 59 AND 61



**RELEASED FOR FABRICATION / INSTALLATION**  
 PPPL Drafting:

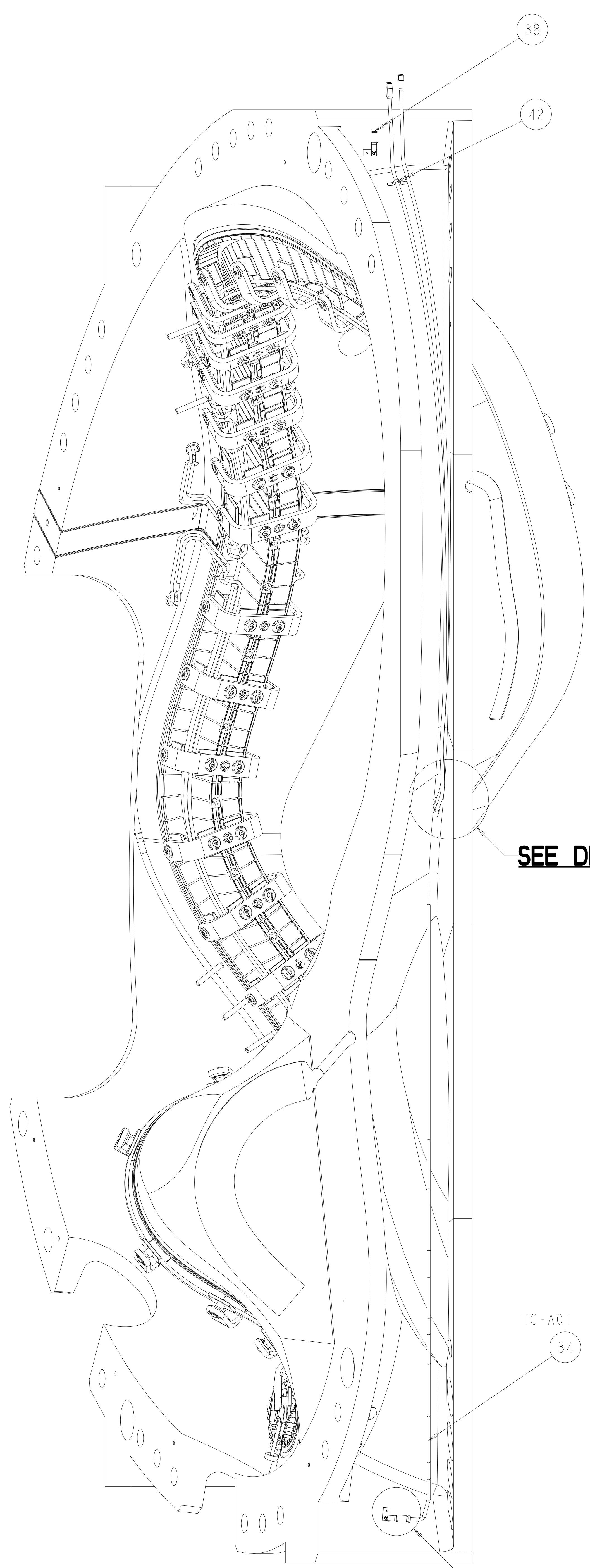
UT-BATTELLE  
 Oak Ridge National Laboratory  
 managed for the DEPARTMENT OF ENERGY under  
 U.S. GOVERNMENT contract DE-AC05-00OR22725  
 UT-BATTELLE, LLC, Oak Ridge, Tennessee

**NATIONAL COMPACT STELLARATOR EXPERIMENT**

**MCWF TYPE "A"  
 FULL COIL ASSEMBLY**

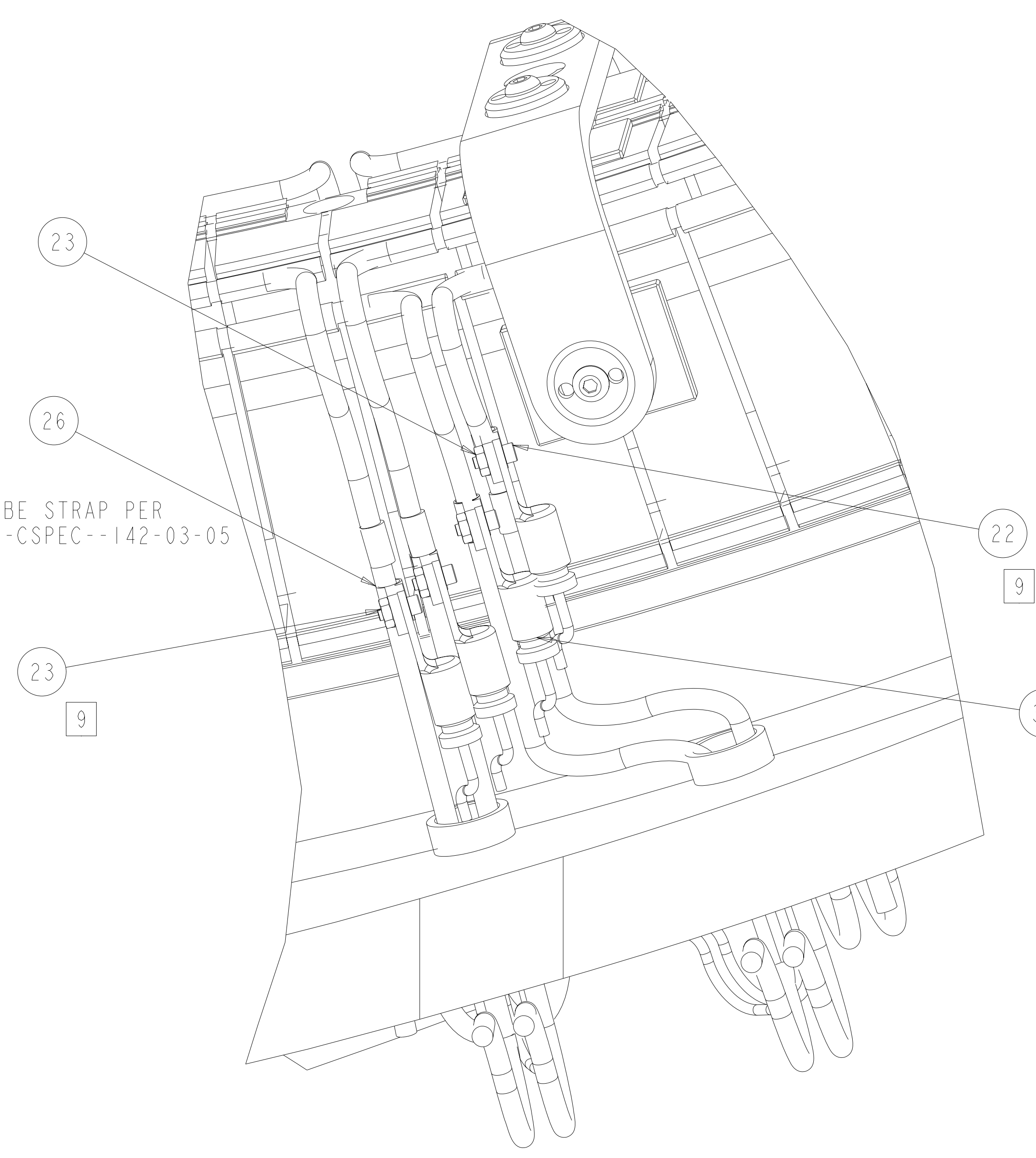
VERSION NO. 90	PLANT ORNL	BLDG 5700	FL 3	SHT OF 2	TYPE 3	CLASS S
RELEASE LEVEL Fabrication	SE140-101			U	REV	0

H  
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E  
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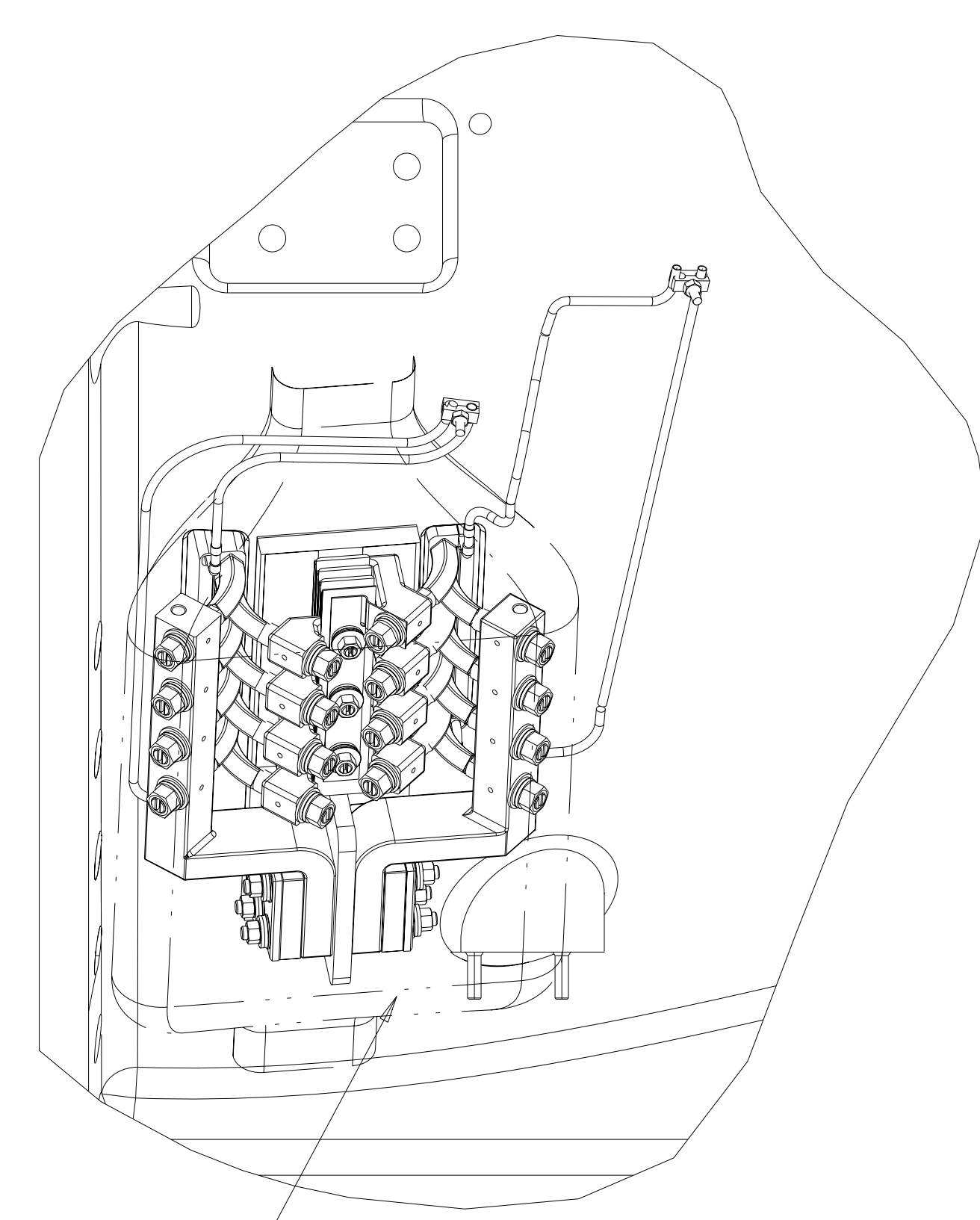
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SEE DETAIL D



PARTIAL FRONT VIEW

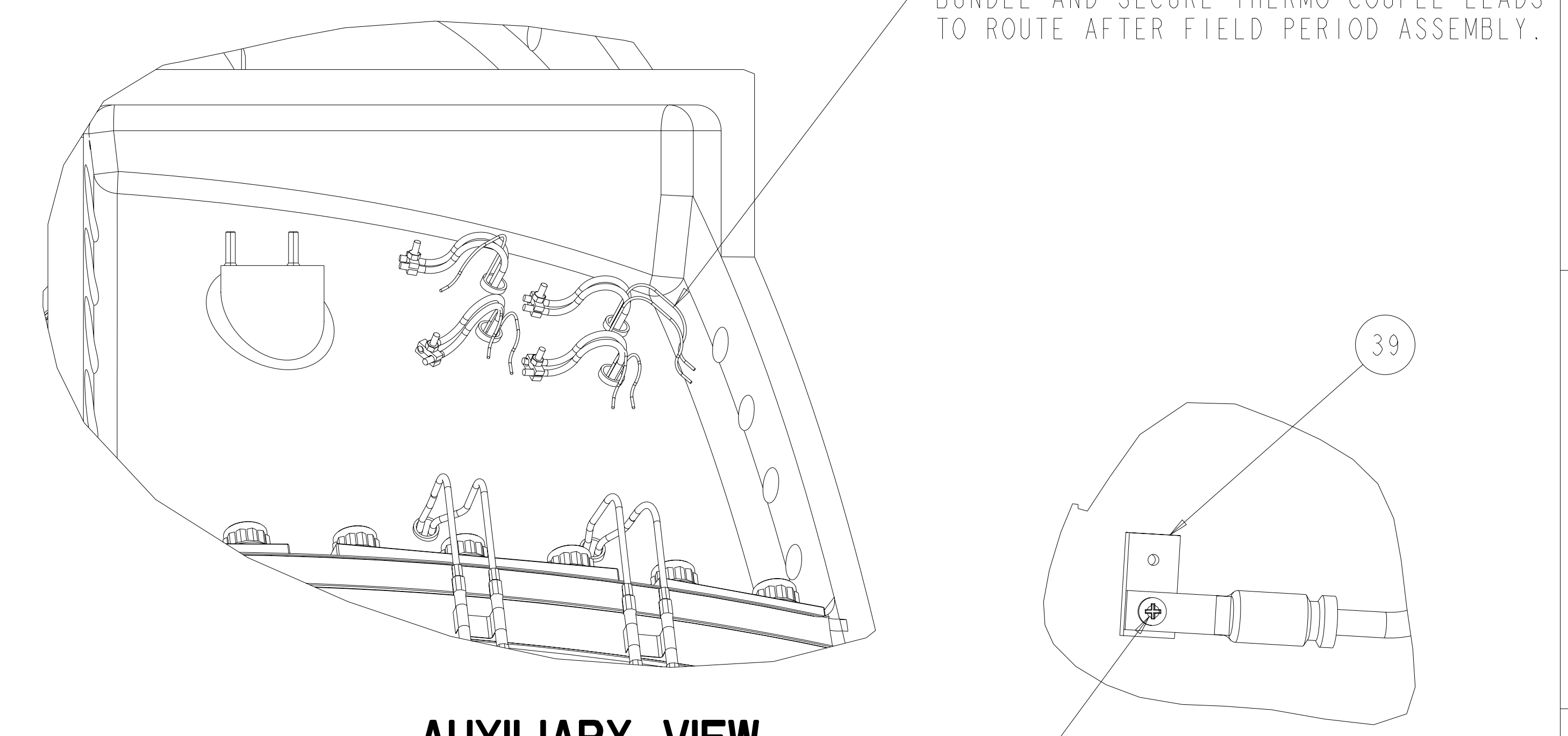
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PARTIAL RIGHT VIEW

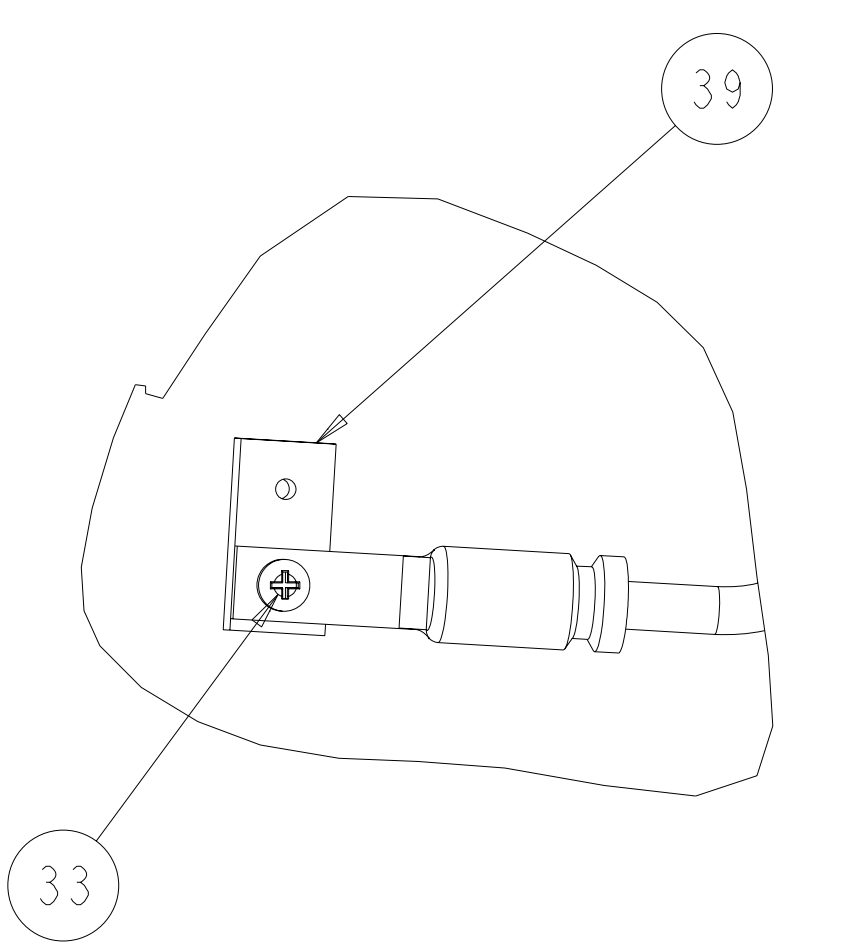
SCALE 0.250

TC-A13 & TC-A14 (ITEM 36) NOT SHOWN. TO BE LOCATED ON LEADS AND FIELD ROUTED AT ASSEMBLY



AUXILIARY VIEW

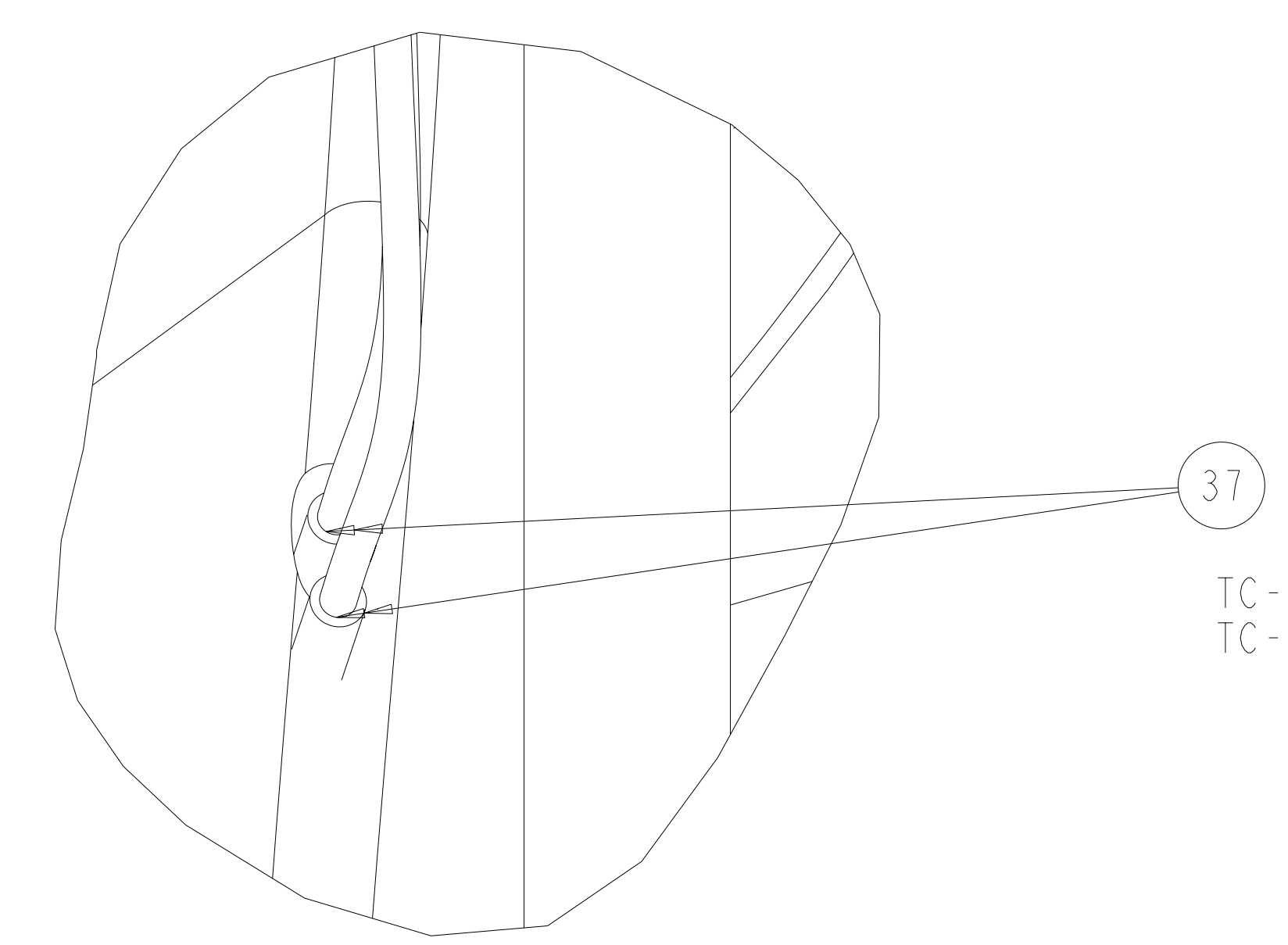
SCALE 0.250



DETAIL D

SCALE 1.000

- TC-A05 TC-A15
  - TC-A06 TC-A16
  - TC-A07 TC-A17
  - TC-A08 TC-A18
  - TC-A09 TC-A19
  - TC-A10 TC-A20
  - TC-A11 TC-A21
  - TC-A12 TC-A22
- TYP TOP AND BOTTOM



DETAIL A

SCALE 1.000

THERMOCOUPLE CHART			
NO.	LABEL	LOCATION	LEAD LENGTH (FT)*
1	TC-A01	INBOARD LOWER SUPPORT	33'
2	TC-A02	INBOARD T/C HOLE	31'
3	TC-A03	INBOARD T/C HOLE (DUPLICATE)	31'
4	TC-A04	INBOARD UPPER SUPPORT	26'
5	TC-A05	COOLING LINE OUTLET 1	21'
6	TC-A06	COOLING LINE OUTLET 2	21'
7	TC-A07	COOLING LINE OUTLET 3	21'
8	TC-A08	COOLING LINE OUTLET 4	21'
9	TC-A09	COOLING LINE OUTLET 5	21'
10	TC-A10	COOLING LINE OUTLET 6	21'
11	TC-A11	COOLING LINE OUTLET 7	21'
12	TC-A12	COOLING LINE OUTLET 8	21'
13	TC-A13	LEADS	25'
14	TC-A14	LEADS	25'
15	TC-A15	COOLING LINE OUTLET 9	21'
16	TC-A16	COOLING LINE OUTLET 10	21'
17	TC-A17	COOLING LINE OUTLET 11	21'
18	TC-A18	COOLING LINE OUTLET 12	21'
19	TC-A19	COOLING LINE OUTLET 13	21'
20	TC-A20	COOLING LINE OUTLET 14	21'
21	TC-A21	COOLING LINE OUTLET 15	21'
22	TC-A22	COOLING LINE OUTLET 16	21'

\* FIELD FIT AND LABEL LEADS

RELEASED FOR FABRICATION/INSTALLATION  
 PPL Drafting

Oak Ridge National Laboratory  
 managed for the DEPARTMENT OF ENERGY under  
 U.S. GOVERNMENT contract DE-AC05-00OR22725  
 UT-BATTELLE, LLC, Oak Ridge, Tennessee

**UT-BATTELLE**

**NATIONAL COMPACT STELLARATOR EXPERIMENT**

MCWF TYPE "A"  
 FULL COIL ASSEMBLY

VERSION NO.	PLANT	BLDG	FL	SHT OF	TYPE	CLASS
90	ORNL	5700	3	3 3	S	U
RELEASE LEVEL	Fabrication					
SEI40-101						
						0

SEI40-101