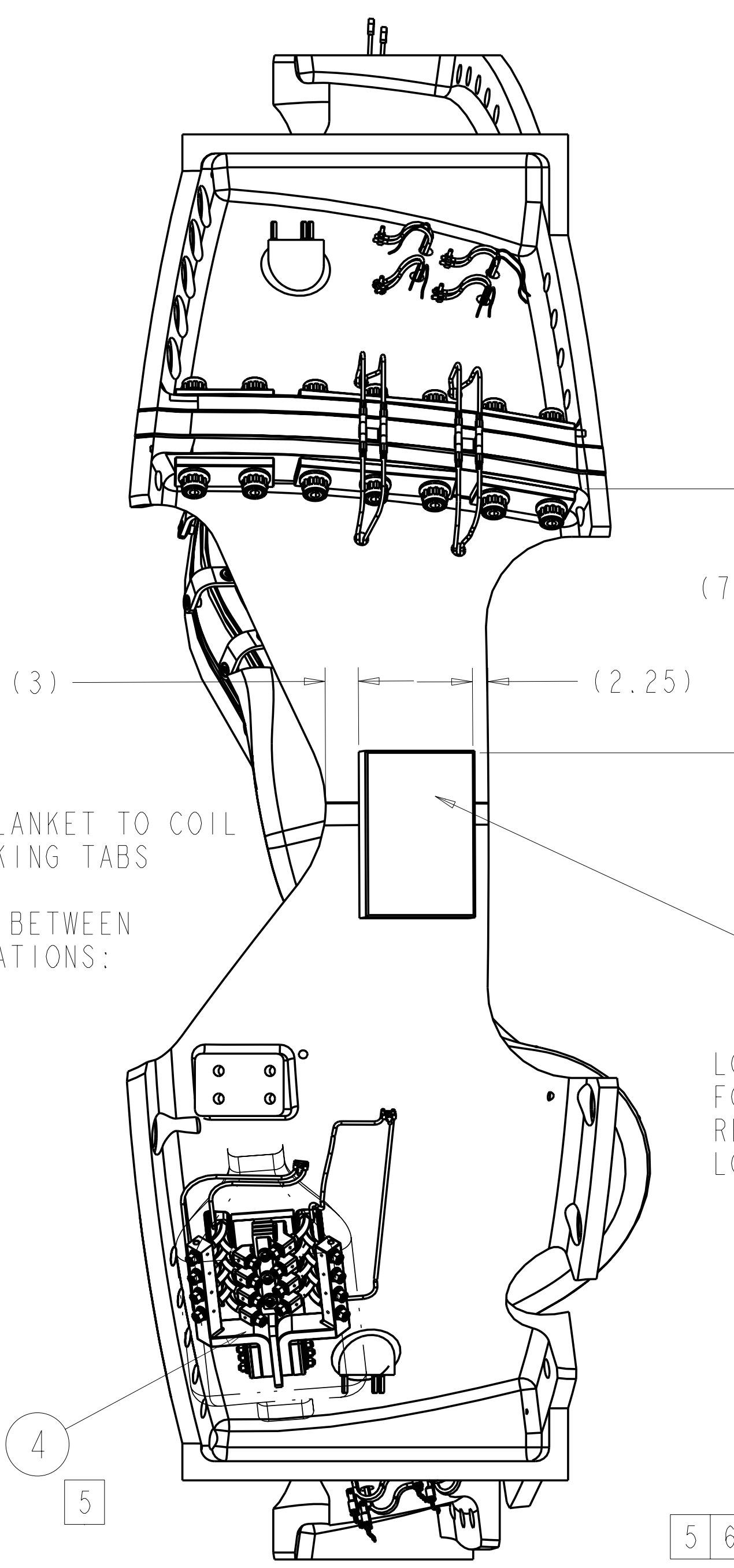
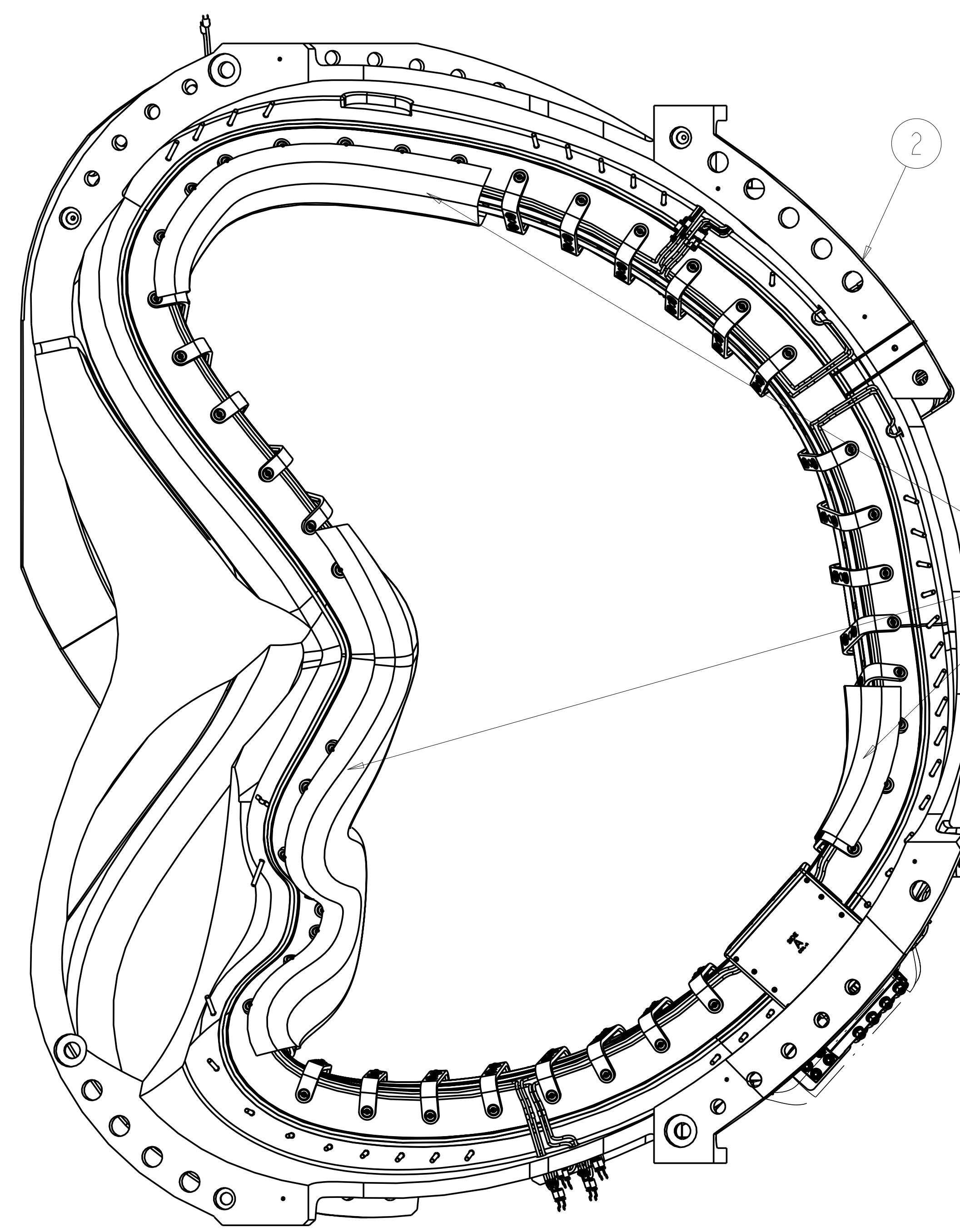
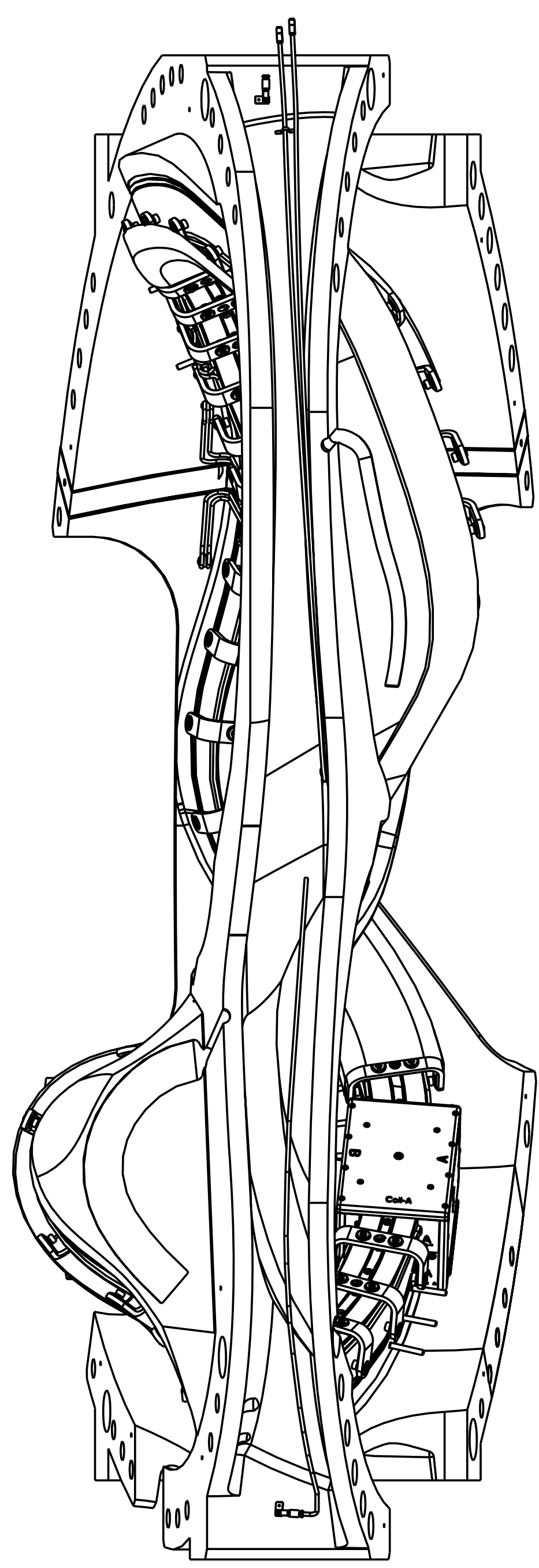


- NOTES:
- DRAWING PREPARED IN ACCORDANCE WITH ASME Y14.100-2000.
 - INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M
 - DIMENSIONS ARE IN INCHES
 - DIMENSIONS APPLY AT ROOM TEMPERATURE. OPERATING TEMP 80 K.
 - LEADS AREA SHALL BE COVERED WITH AN INSULATING MATERIAL (F/N 41) TO PREVENT DEBRIS FROM CAUSING AN ELECTRICAL SHORT DURING OPERATION.
 - VENDOR INFORMATION: WARWICK MILLS
NEW IPSWICH NH 03071
INQUIRIES@WARWICKMILLS.COM
888-477-4675
 - SEE PROCEDURE D-NCSX-MCF-001 FOR ADDITIONAL REQUIREMENTS.
 - 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.
 - TACK WELD ANY ATTACHED FASTNERS TO SECURE AT LOCATION.
 - VENDOR INFORMATION: FISO FIBER OPTICS
500 ST. JEAN BAPTISTE AVE SUITE 195
QUEBEC QC G2E 5R CANADA
418-688-8065 OR WWW.FISO.COM
 - VENDOR INFORMATION: OMEGA ENGINEERING CORP
ONE OMEGA DRIVE
STAMFORD, CT 06907
800-848-4286 OR WWW.OMEGA.COM
 - SOME PARTS IN THIS ASSEMBLY ARE GRAPHIC REPRESENTATIONS OF ACTUAL PARTS/ASSEMBLIES. FOR MODELED ASSEMBLY SEE SE140-102.ASM
 - TYPE "A" COIL: REMOVE NOTED STUDS AFTER CLAMP AND INSULATION BLANKETS ARE ASSEMBLED (POST VPI).
 - 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
 - FOR WINDINGS AND GROUNDWRAP DETAILS REFER TO MODULAR COIL CONDUCTOR SPECIFICATION NCSX-CSPEC-142-03-05.
 - VENDOR INFORMATION: MCMASTER CARR
600 COUNTY LINE ROAD
ELMHURST IL 60126
630-833-0300

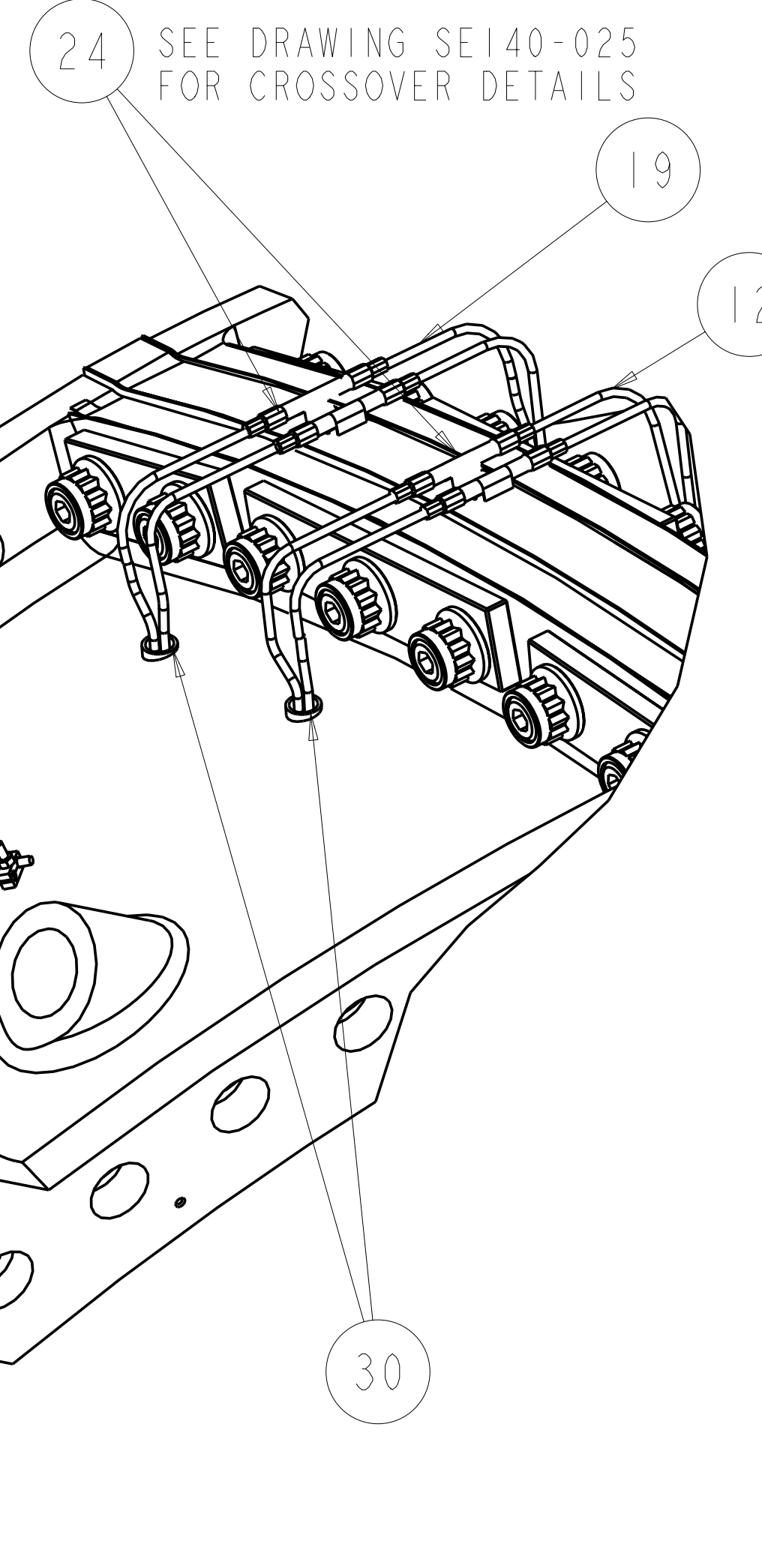
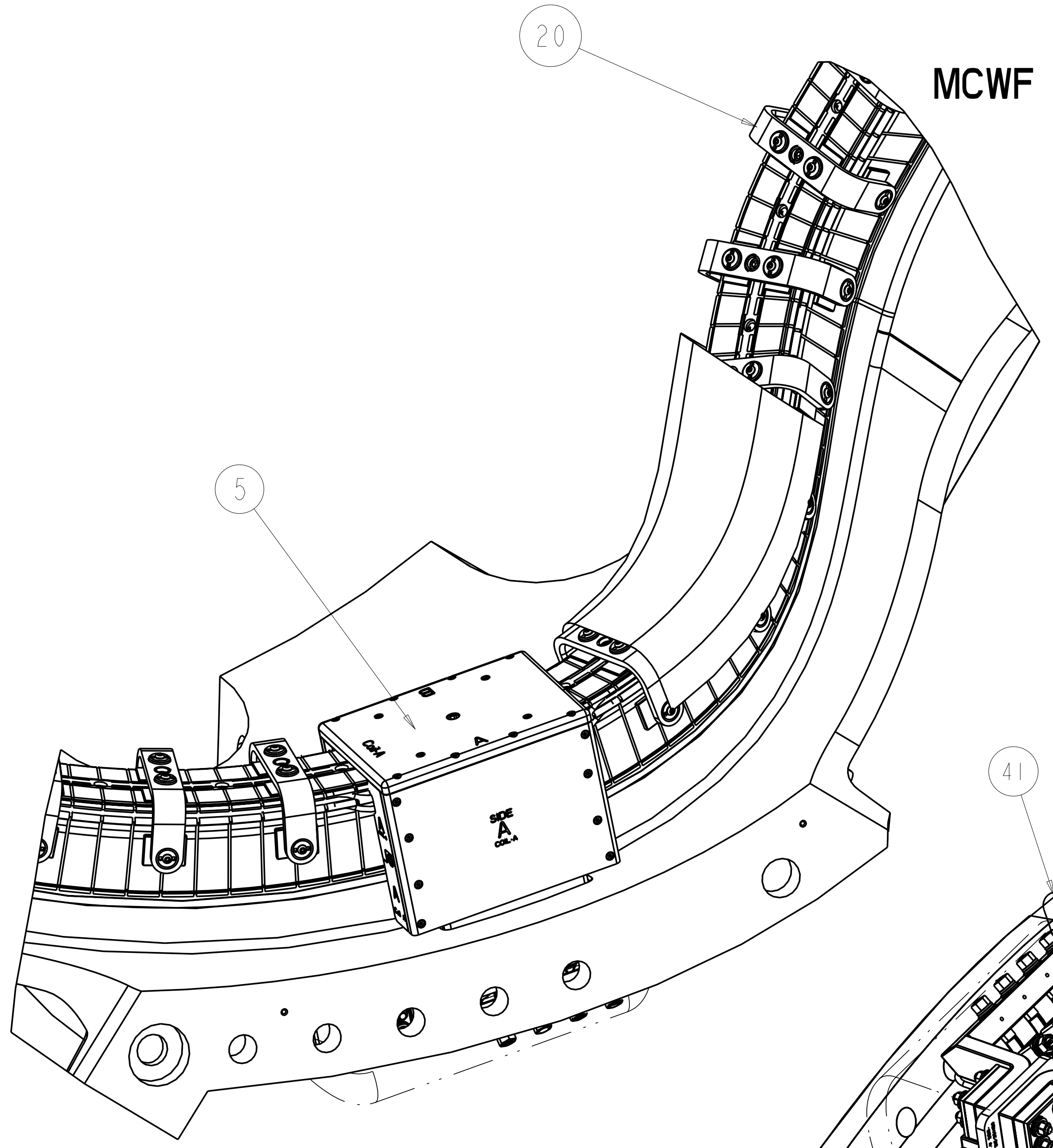


SECURE BLANKET TO COIL WITH LOCKING TABS F/N 40
INSULATE BETWEEN HOLE LOCATIONS:
4 TO 11
32 TO 46
56 TO 79

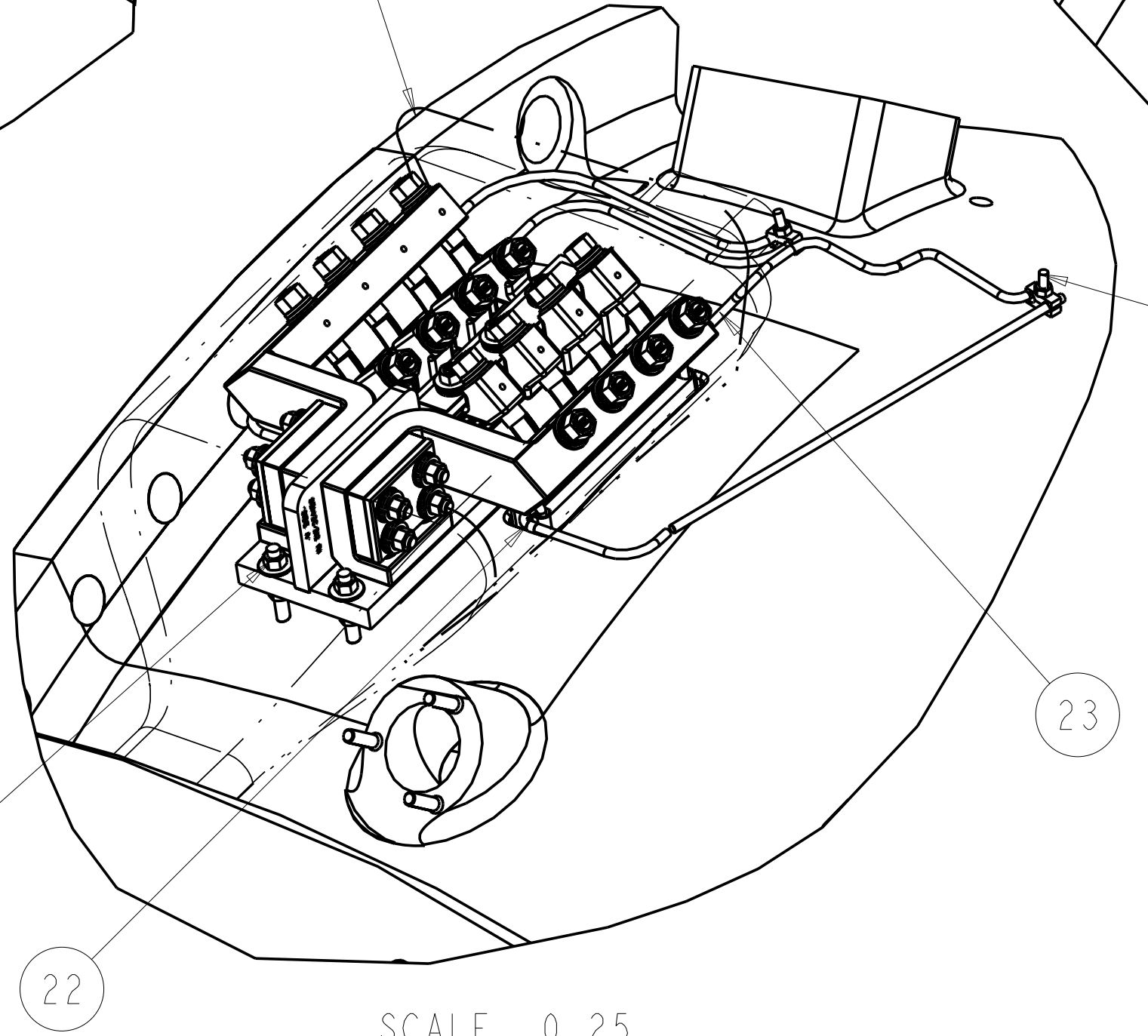
LOCATING DIMENSIONS FOR FLUX LOOP BOX ARE REFERENCE ONLY. FINAL LOCATION TO BE DETERMINED

MCWF TYP "A" FULL COIL ASSEMBLY

SCALE 0.13



SCALE 0.25



SCALE 0.25

REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
1	REVISE ASSEMBLY AND DRAWING PER ECN 5361	GL	05/08									
0	ORIGINAL ISSUE	GL	06/01									
REV	DESCRIPTION	BY	DATE	CHK	DEPT	DATE	PE	REQ	DATE	ORNL	DOE	DATE
REVISION OR ISSUE PURPOSE	REVISION APPROVAL											

CAGE CODE	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL	SPECIFICATION	QTY
5 6	AR SE142B-030	WIRE CLAMP			42
	1	SE140-031	PROTECTIVE COVER	NOMEX OR EQUIV	41
	AR SE142C-306	LOCKING TAB			40
	2	SE123-155	THERMOCOUPLE MTG BLOCK		39
11	1	NCSX-PRL-12-003	THERMOCOUPLE - SURFACE		38
	2		THERMOCOUPLE - PLUG		37
	2		THERMOCOUPLE - SURFACE		36
16	16		THERMOCOUPLE - SURFACE		35
	1		THERMOCOUPLE - SURFACE		34
16	2	91735A46	PAN HEAD SCREW	316 SST	33
16	4	9195A031	3/8 FLAT WASHER	316 SST	32
16	4	94819A049	3/8 - 16UNC HEX NUT	316 SST	31
	AR	DOW GREAT FOAM	INSULATING FOAM	POLYURETHANE DIISOCYANATE PREPOLYMER WITH HYDROCARBON GAS	30
11	1	SE310-032	FLUX LOOP BOX		29
10	AR	SFO-NS-398	FISO FIBER OPTIC STRAIN SENSOR		28
16	2	SS-810-1-8	BLEED VALVE		27
16	16	36892107	1/8" TUBE STRAP	OHFC COPPER	26
10	SE140-030	TUBE BLOCK - CLAMP ASM			25
	2	SE140-025	POL BR CROSSOVER ASSEMBLY		24
16	16	90257A007	6-32 HEX HD NUT	316 SST	23
16	16	92185A147	6-32X3/8 SOC HD CAP SCREW	316 SST	22
6	AR	-21	WINDING FORM INSULATION ASSY	1/8" NOMEX	21
43	SEE CHART (SHT 2)	CLAMP ASSEMBLY			20
	AR	SE142A-248	SIDE B COOLING TUBES (FIELD FIT)	1/4" COPPER TUBING	19
	1	SE142A-242	SIDE "B" CHILL PLATES (SIDE)		18
	1	SE142A-242	SIDE "B" UPPER CHILL PLATES (TOP)		17
15	AR	-16	SIDE "B" GROUNDWRAP		16
15	1	-15	SIDE "B" WINDING ASSEMBLY		15
	1	SE142A-242	SIDE "B" LOWER CLADDING (BASE)		14
	1	SE142A-242	SIDE "B" UPPER CLADDING (SEPTUM)		13
AR	SE142A-258	SIDE A COOLING TUBES (FIELD FIT)	1/4" COPPER TUBING		12
	1	SE142A-252	SIDE A LOWER CHILL PLATES (SIDE)		11
	1	SE142A-252	SIDE A UPPER CHILL PLATES (TOP)		10
15	AR	-9	SIDE-A WP GROUNDWRAP		9
15	1	-8	SIDE "A" WINDINGS ASSEMBLY		8
	1	SE142A-252	SIDE "A" LOWER CLADDING (BASE)		7
	1	SE142A-252	SIDE "A" UPPER CLADDING (SEPTUM)		6
	1	SE142A-080	TYPE "A" LEADS ASSEMBLY		5
	1	SE142C-050	TYPE "A" TERMINAL ASSEMBLY		4
					3
13	1	SE141-121	MOD COIL WINDING FORM ASSEMBLY TYPE-A		2
AR	-1	MCWF-TYPE A ASM			1

RELEASED FOR FABRICATION / INSTALLATION
PPPL Drafting

SCALE NOTED

DES: D WILLIAMSON 07/07
DRW: S HOMESCU 07/07
CHK: M COLE 07/07
SECT: :
DEPT: :
PE: D WILLIAMSON 07/07
CR: :
PJ: :
RD: :
FINISH: :
BREAK SHARP EDGES 06 MAX :
FINISH: :
UNLESS OTHERWISE SPECIFIED

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

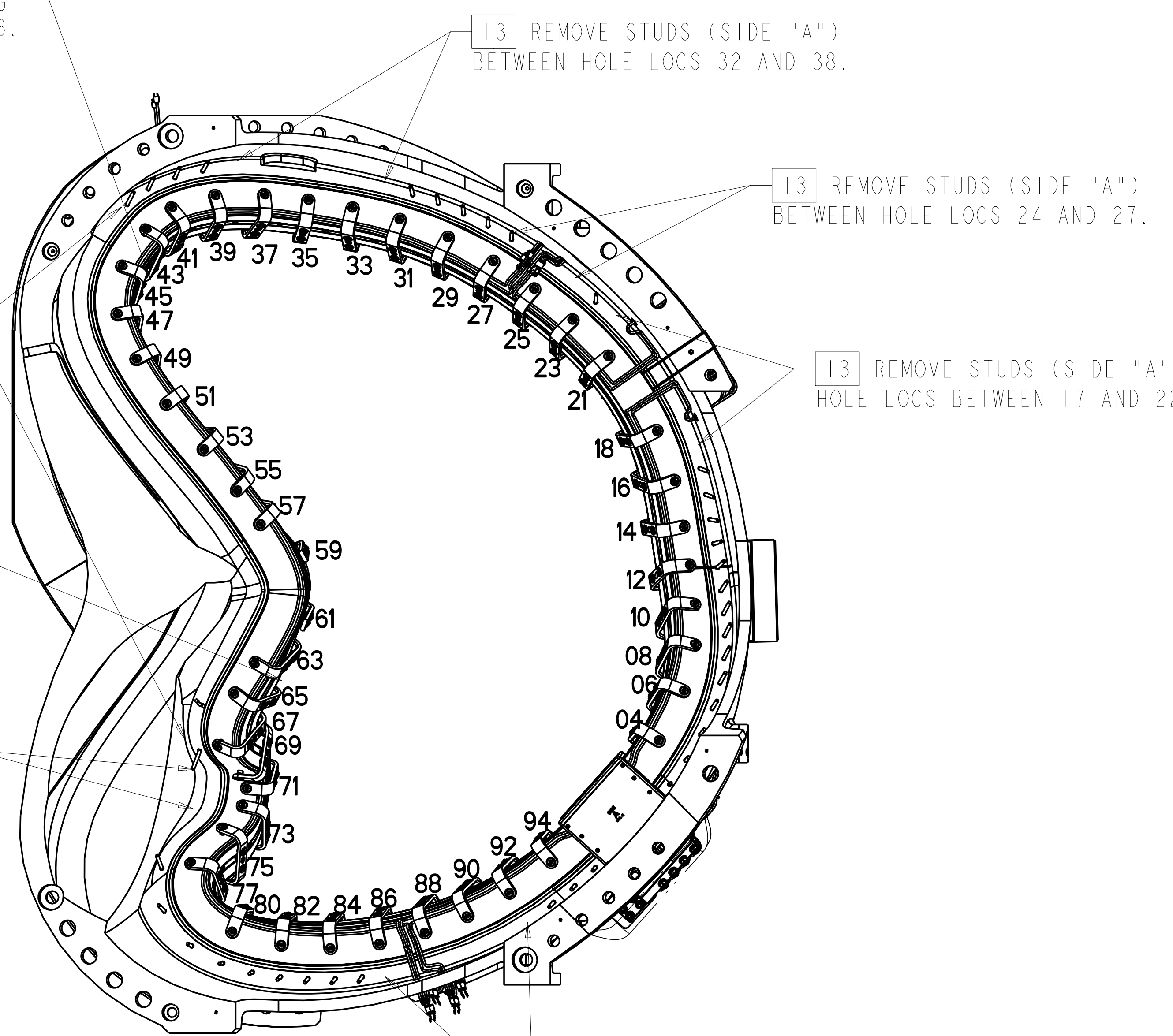
PPPL DRFT J SIEGLE 07/07
VERSION NO. 4
PLANT ORNL
BLDG 5700
FL 3
SHT OF 1
TYPE S
CLASS U
REV 0

RELEASE LEVEL: Fabrication
DRAWING APPROVALS: DATE

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.

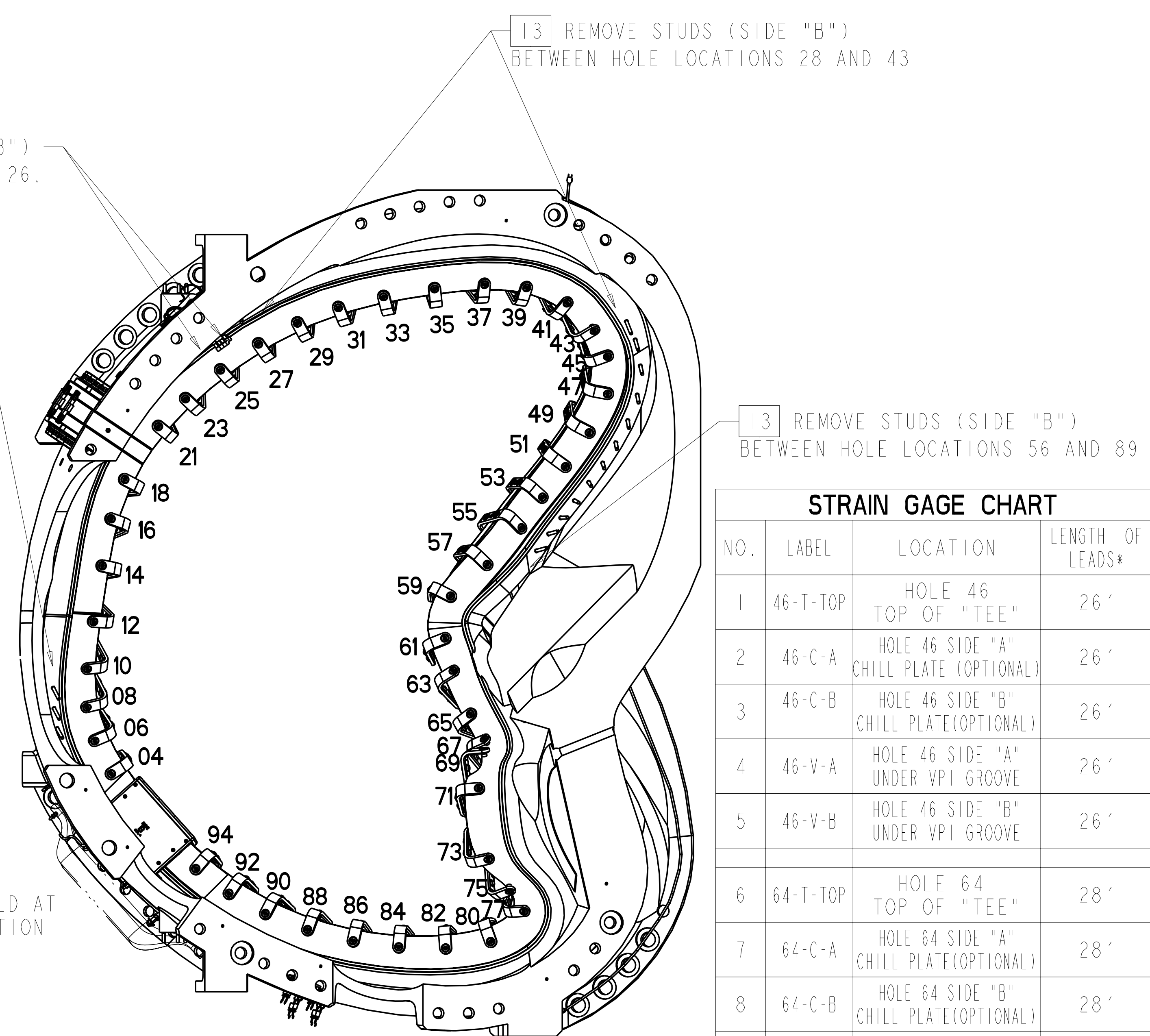
P THIS DRAWING PRODUCED ON PRO-ENGINEER

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

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

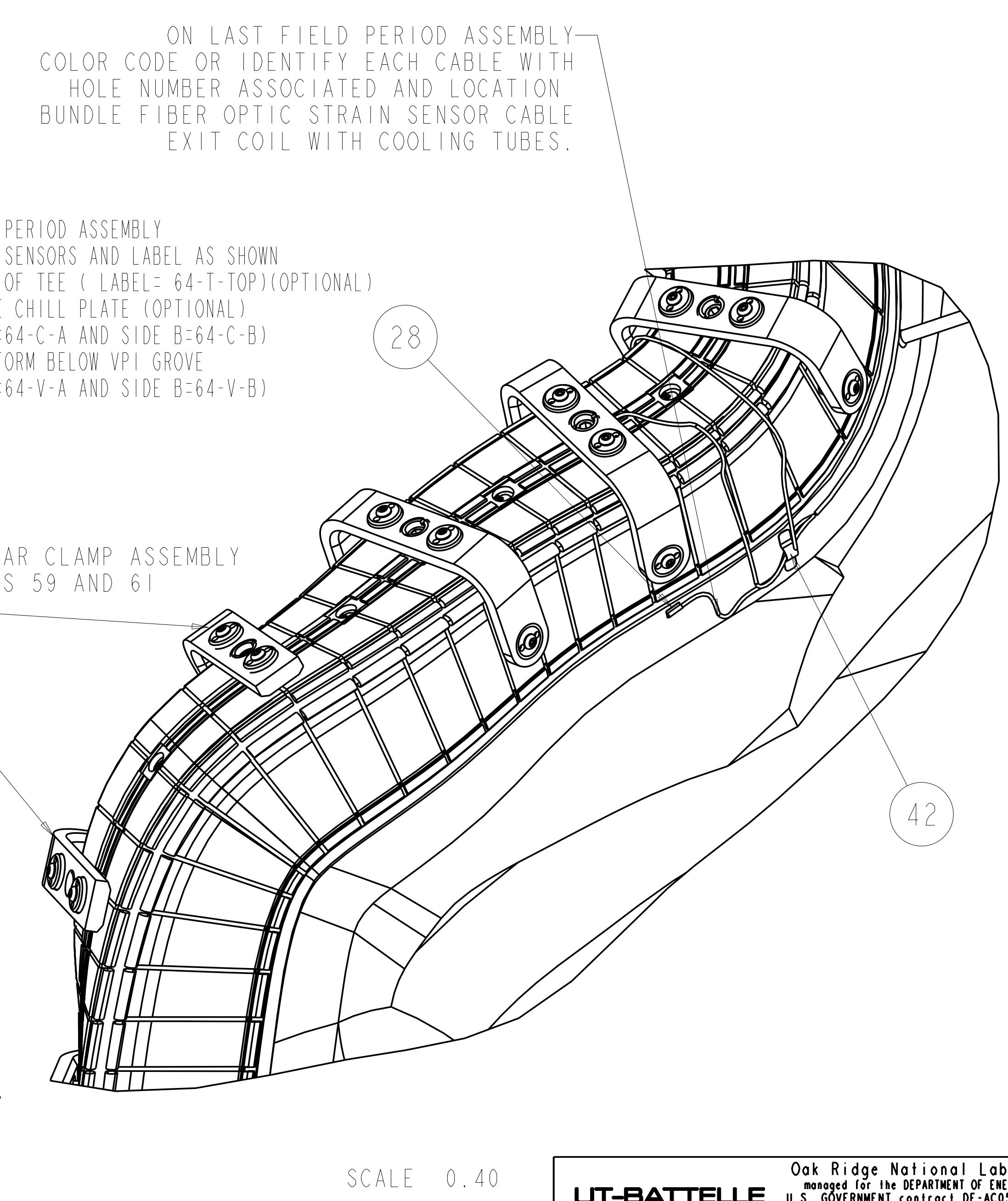
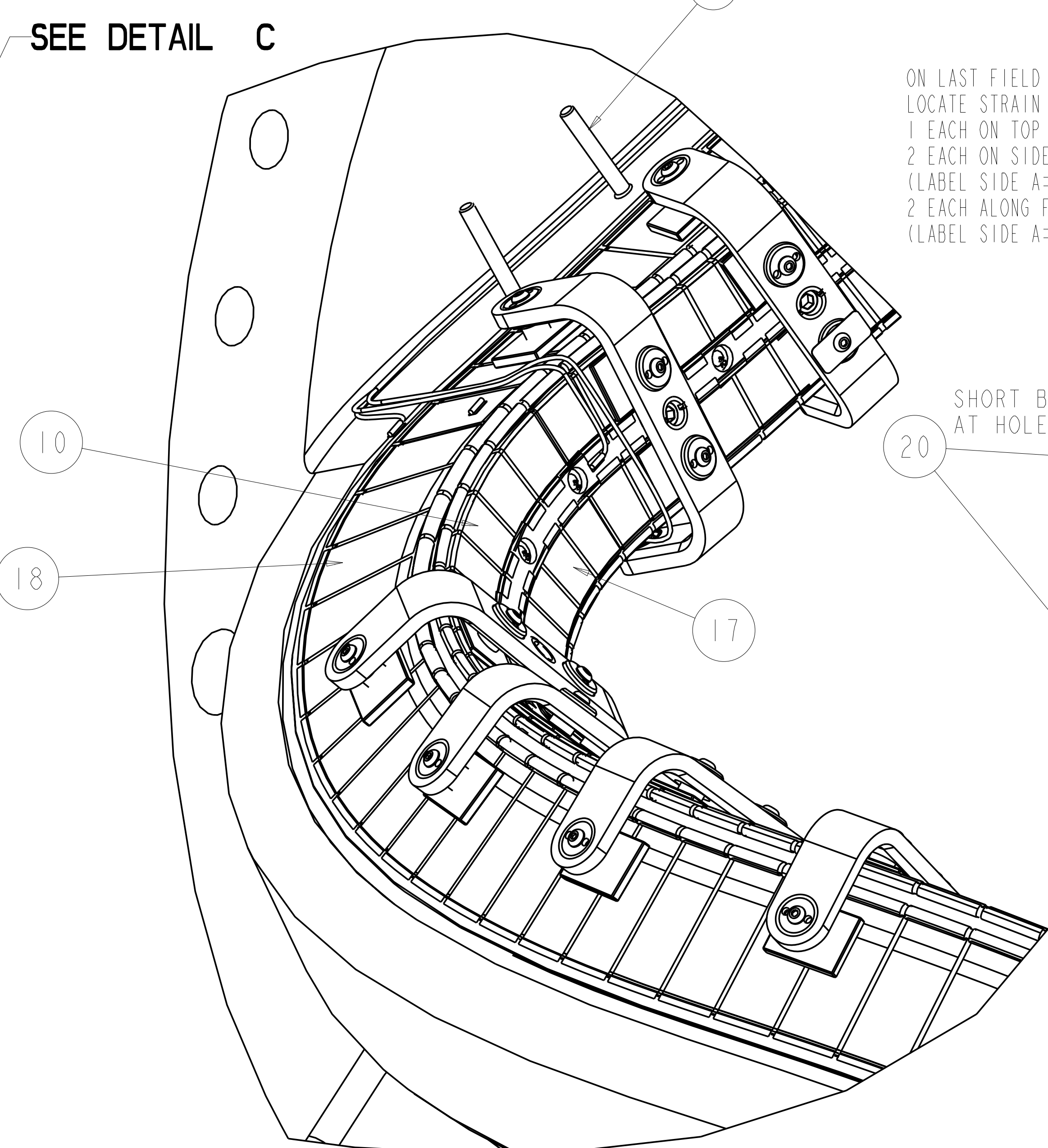
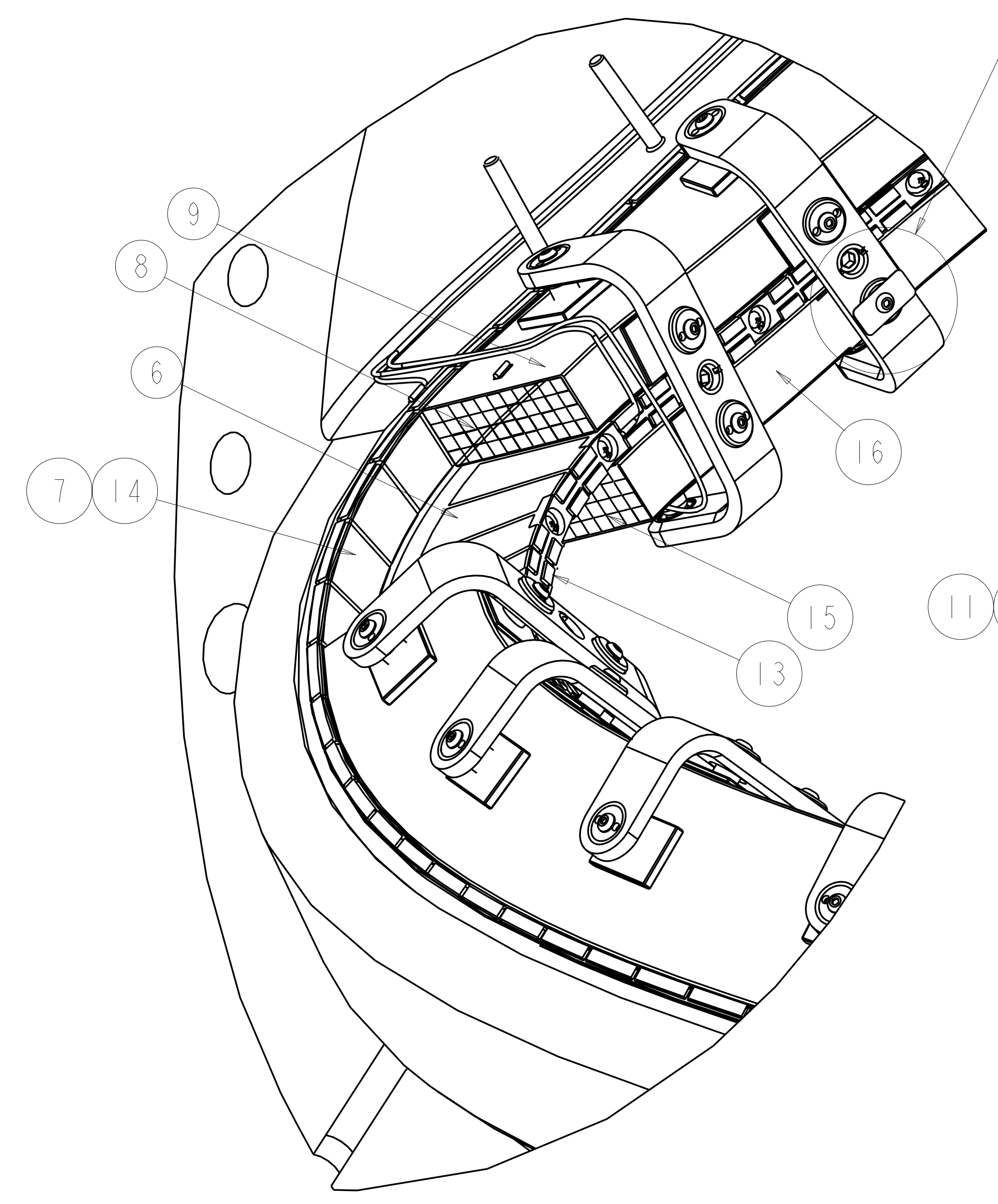
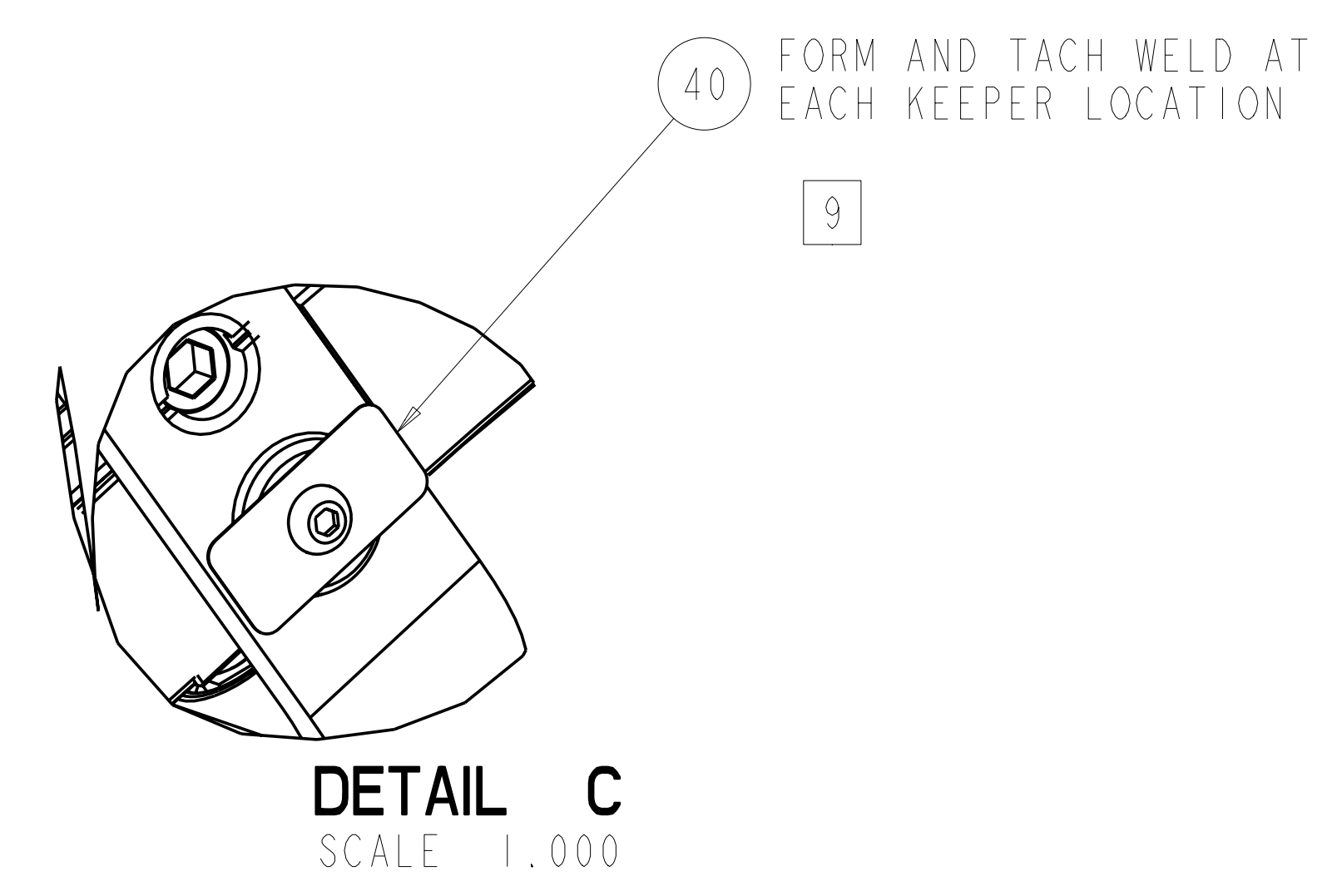


SIDE "B" VIEW
 SCALE 0.100
CLAMP / HOLE NUMBER LOCATIONS

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

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



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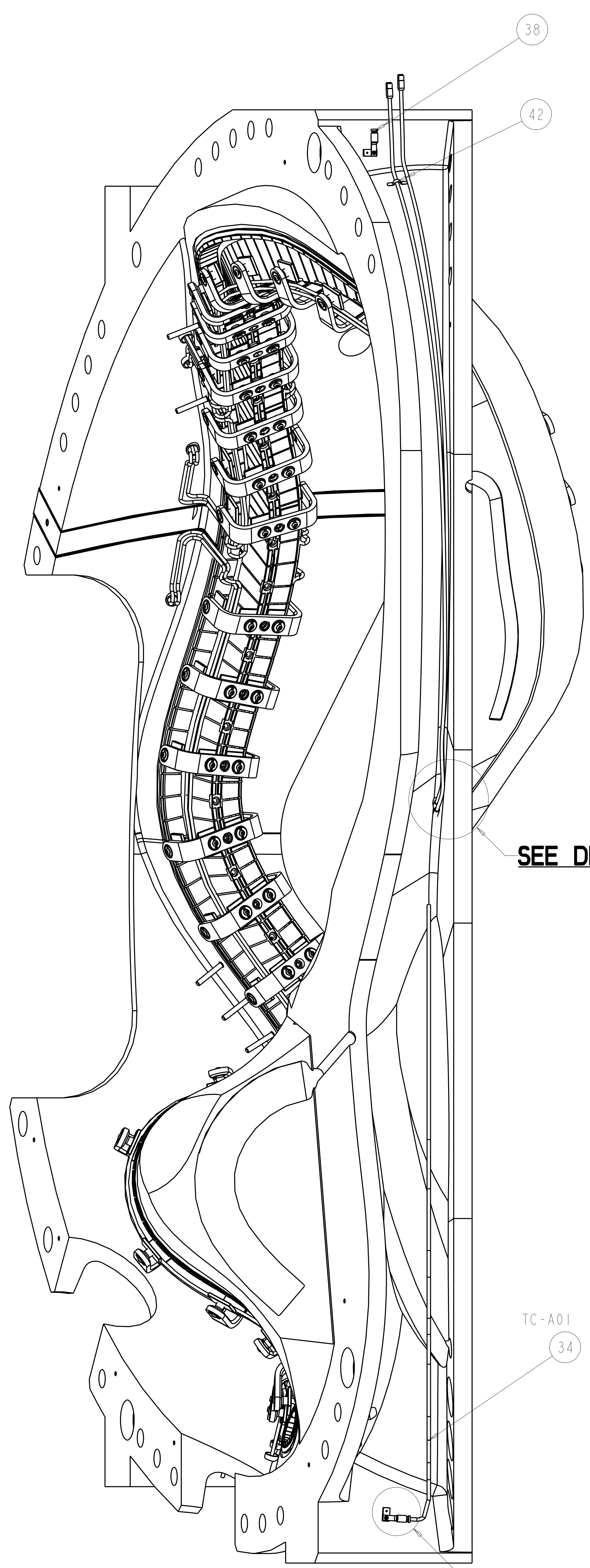
Oak Ridge National Laboratory
 managed for the DEPARTMENT OF ENERGY under
 U.S. GOVERNMENT contract DE-AC05-00OR22725
 UT-BATTELLE, LLC. Oak Ridge, Tennessee

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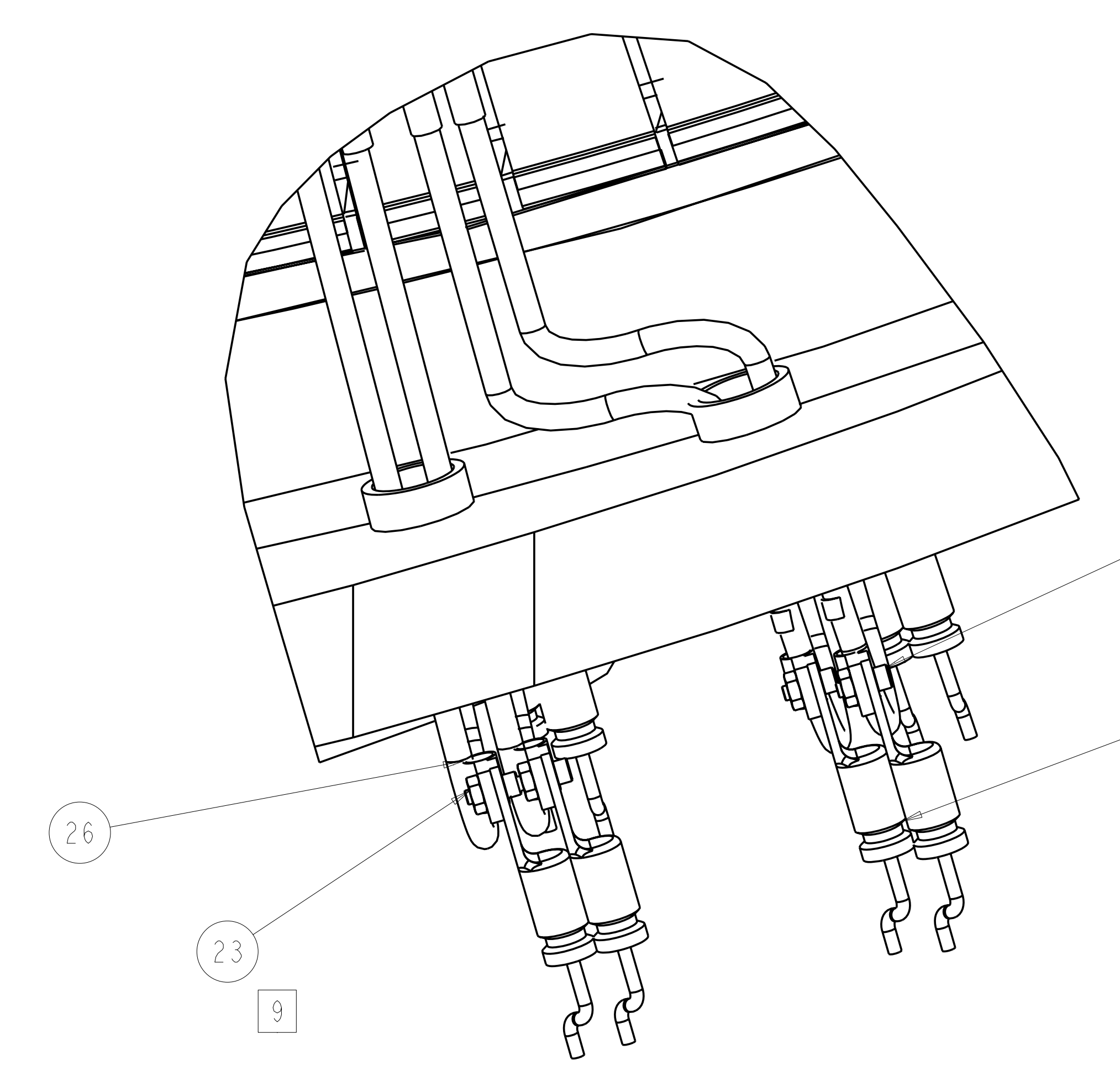
**MCWF TYPE "A"
 FULL COIL ASSEMBLY**

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



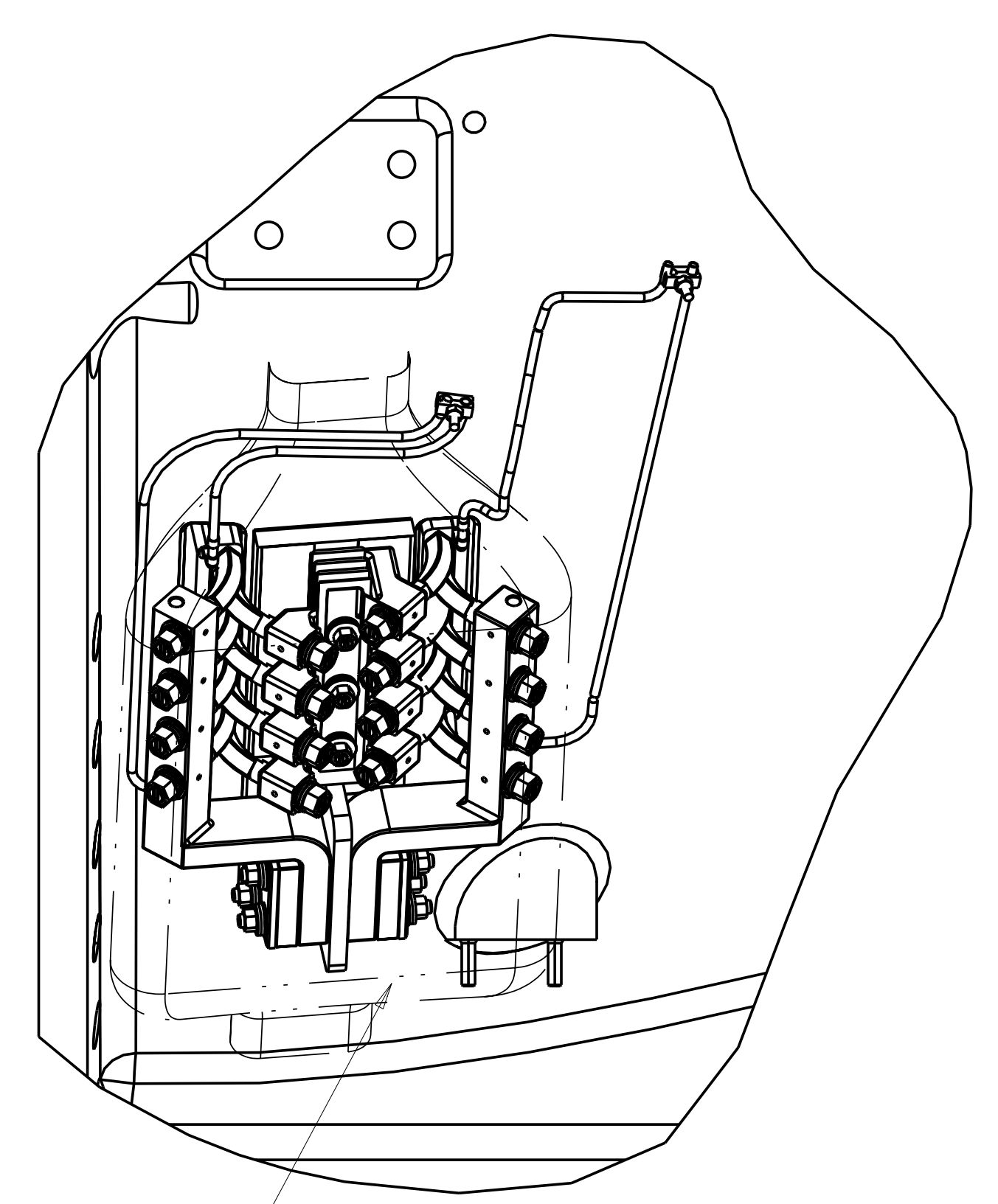
SCALE 0.250

SEE DETAIL D



PARTIAL FRONT VIEW

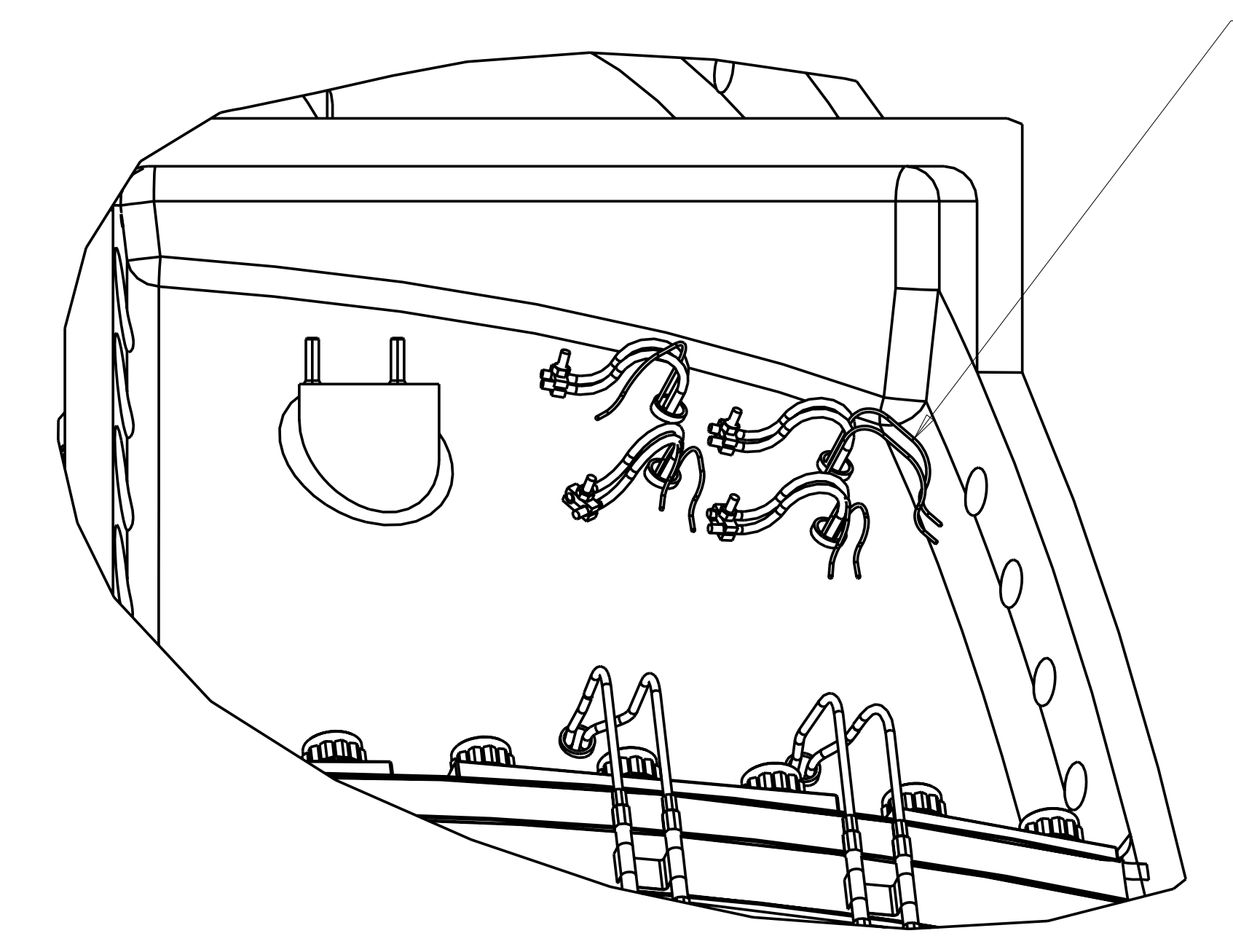
SCALE 1.0



PARTIAL RIGHT VIEW

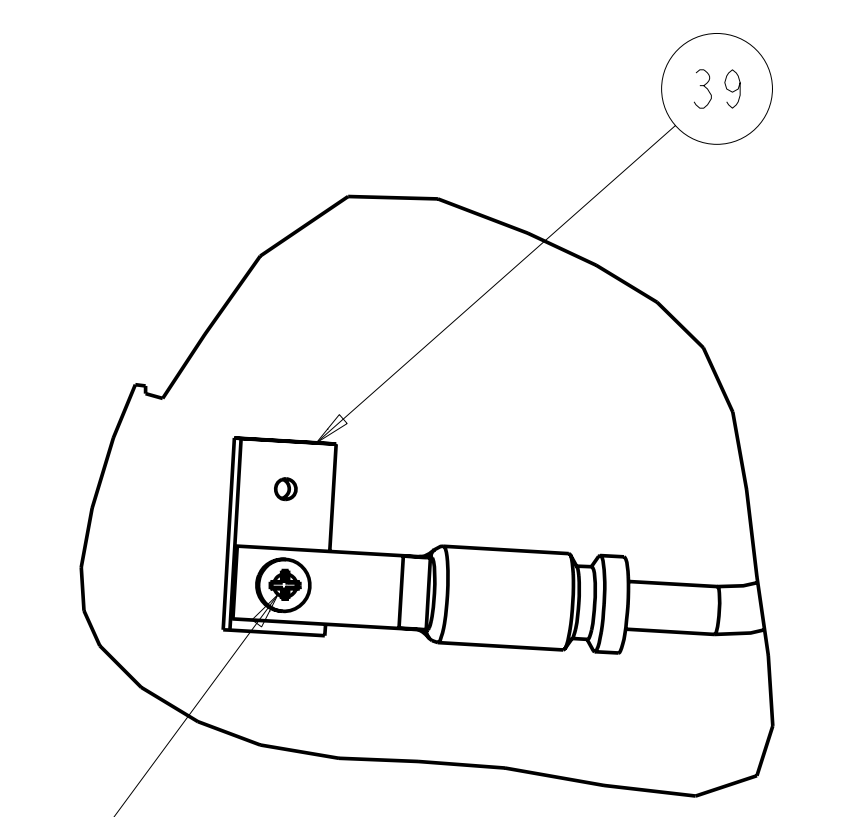
SCALE 0.250

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



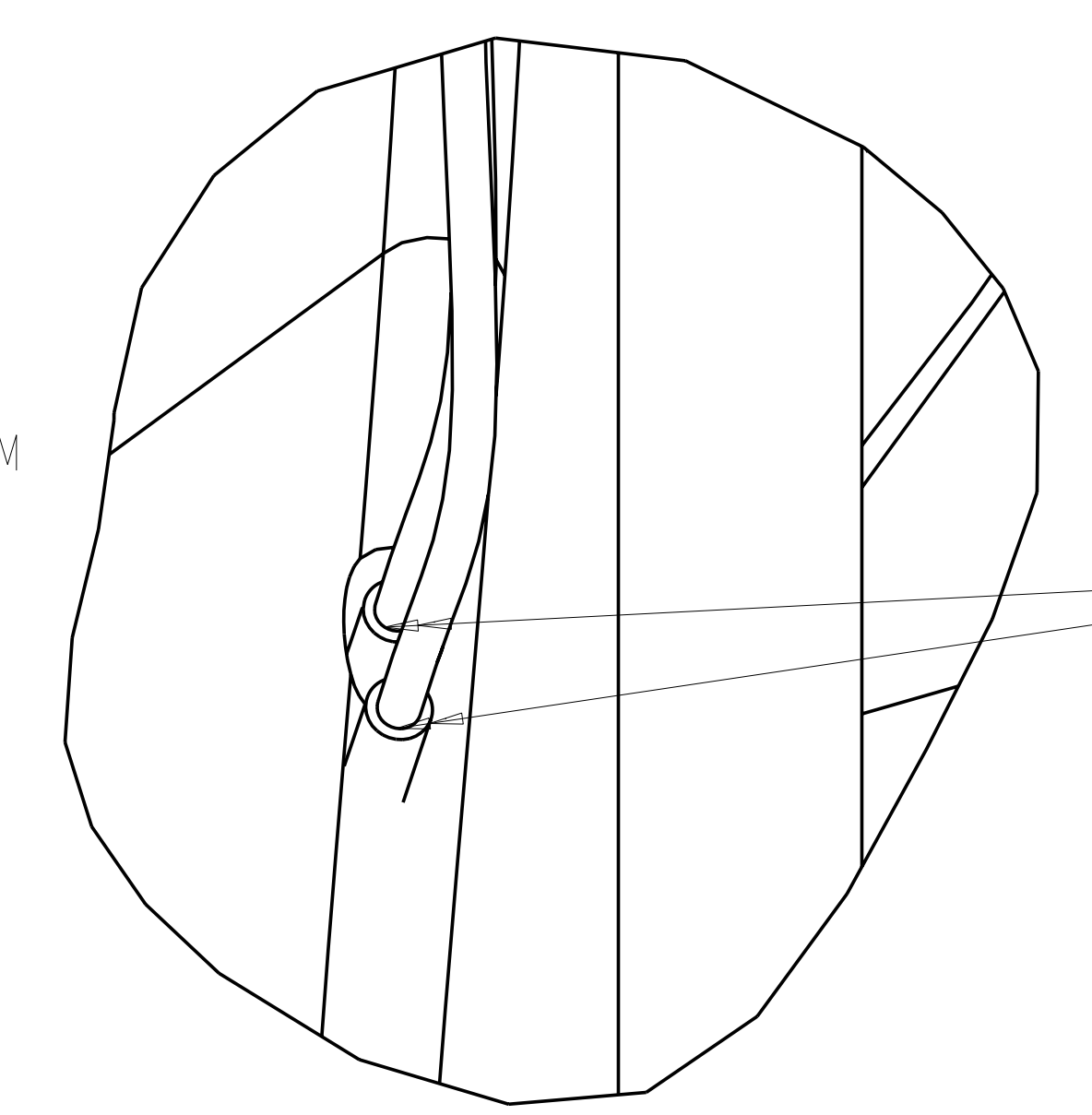
AUXILIARY VIEW

SCALE 0.250



DETAIL D

SCALE 1.000



DETAIL A

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

1 MOUNT INSIDE COIL WHEN COOLING LINES ARE SITUATED TO THE TOP
 OUTSIDE COIL WHEN COOLING LINES ARE SITUATED TO EXIT AT THE BOTTOM
 SOLDER TUBE STRAP PER MCWF NCSX-CSPEC--142-03-05

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

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MCWF TYPE "A"
 FULL COIL ASSEMBLY

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

SEI40-101