

Fermilab

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SUBJECT: Keying of DC0303: Strain Gage Data

The keying of DC0303 appears to have been quite successful. DC0303 has two strain gage packs located^[1] at the points where the sum of the coil sizes in the four inner coil quadrants are largest ("LE") and the smallest ("RE"). No regard was taken of the outer coil sizes in making the location assignment.

Strain gage data, averaged over the four inner and outer gages at each of the two locations, is displayed in Fig. 1 and Tables Ia and Ib. Several features of the data are worth noting. Despite considerable differences while the coil was in the press, the final prestress is similar if the inner and outer coils at the two locations. The average inner and outer coil prestresses are 8.6 kpsi and 8.5 kpsi respectively. The gage pack at the "high" spot has a lower apparent inner coil prestress than that at the "low" spot. The cause of this is unknown but could result from differences in the outer coil size. It could also be an instrumental effect resulting from, for example, imperfect shimming of the strain gage beams.

The coil stress averaged over the inner and outer coils, is plotted in Fig. 2. The data are quite linear for the "RE" pack, but less so for the "LE" pack. The fit slope $d\sigma/dP_v$ is shown in Tables Ia and Ib. For the "RE" pack the slope does not depend sensitively on the fit region and indicates that about 80% of the coil stress at the mid-plane is transferred to the pole. For the "LE" gages the inferred stress transfer varies from 79% to 93% as the minimum pressure of the fit varies from 1 kpsi to 4 kpsi.

Footnote

[1] W. Koska, TS-SSC note to be published.

DS0303 KEYING

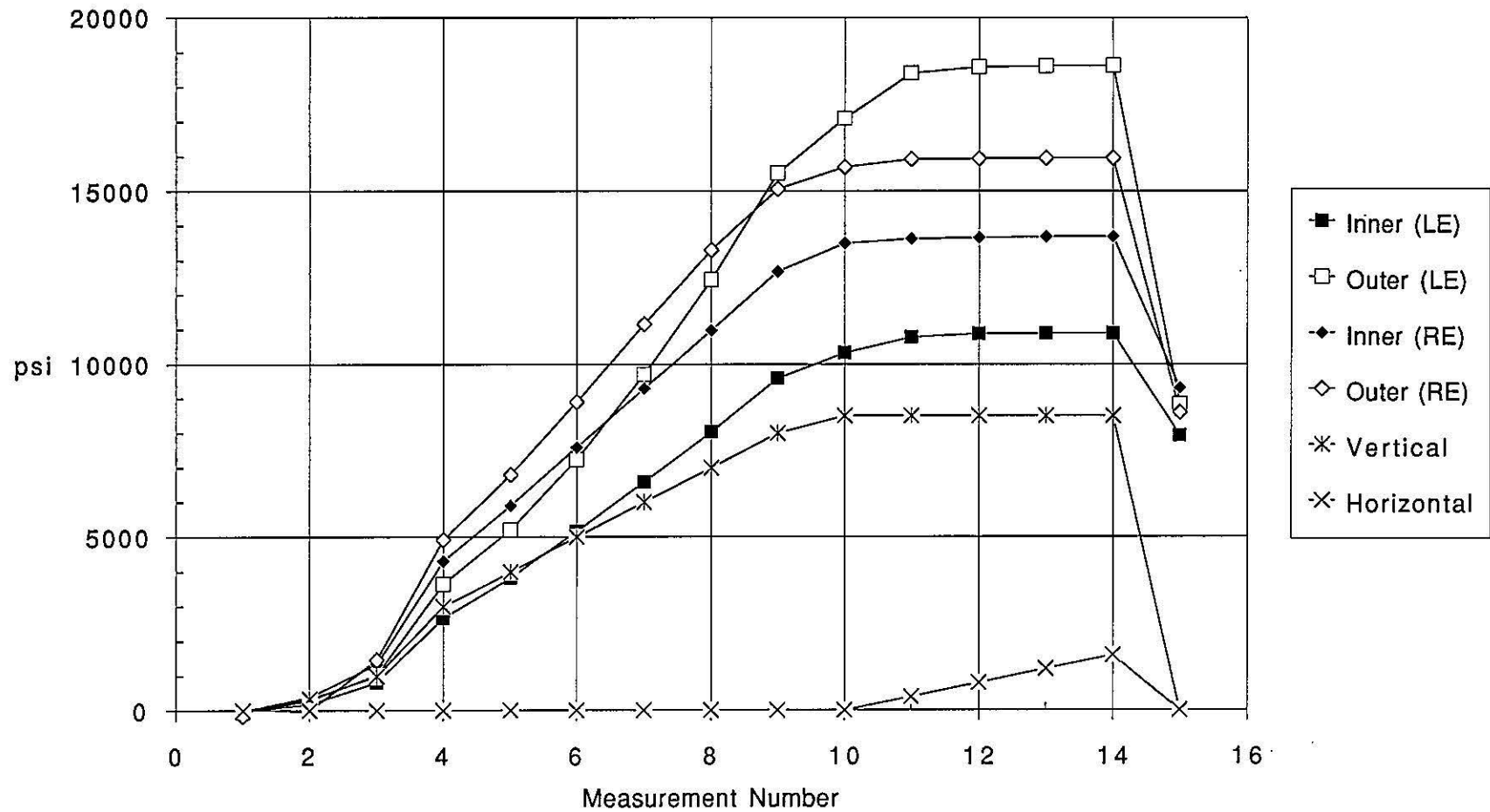


Figure 1

DS0303 KEYING

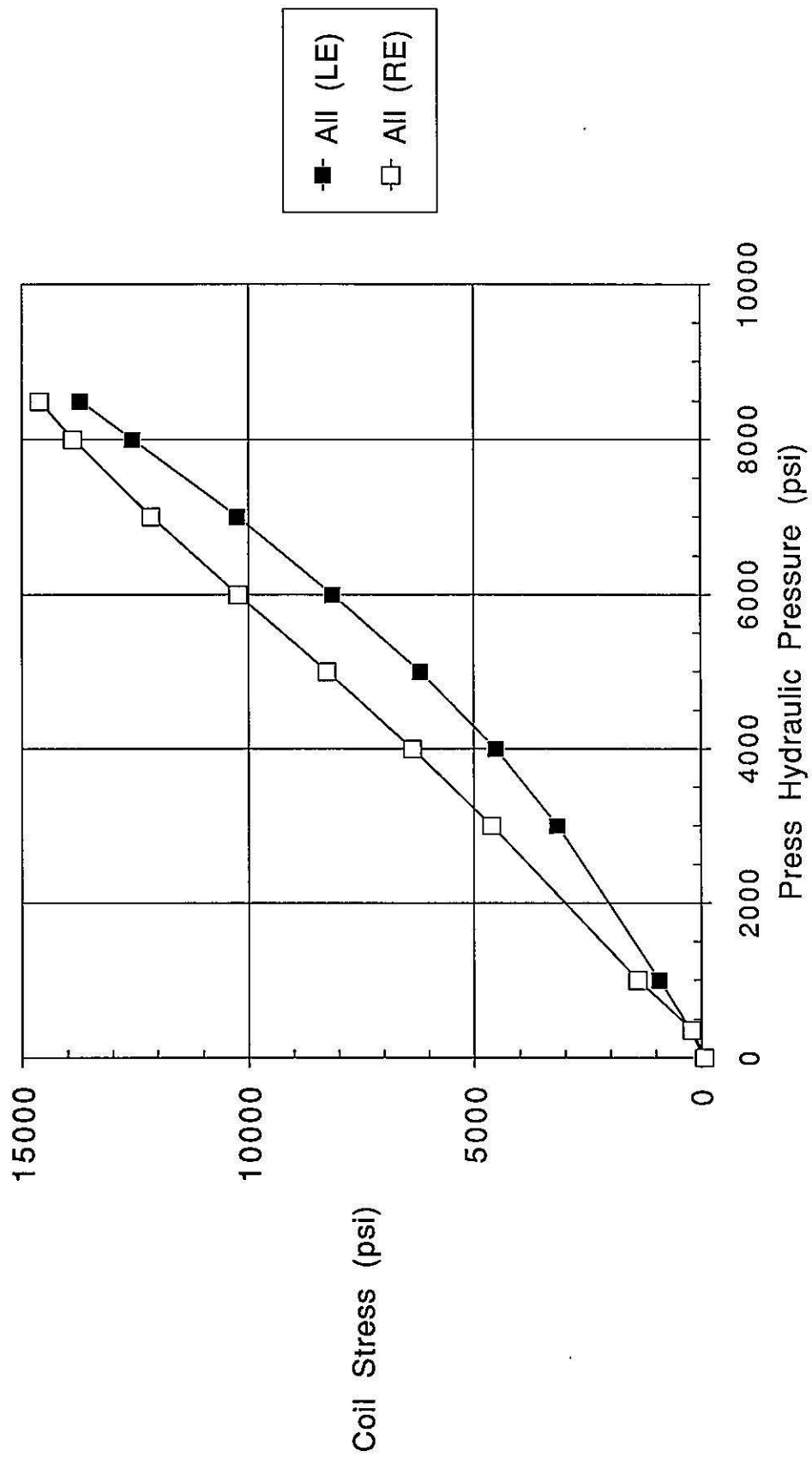


Figure 2.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2													
3													
4				GAGE NO.	TYPE	COIL	Quadrant	Gage Facto	R0 (Ohms)	A0	A1	A2	A3
5				1038	Active	Inner	1	2.02	350.170	-32.7	2.6E+00	2.72E-03	0.00000
6				1034	Active	Inner	2	2.02	350.044	-88.6	1.3E+00	3.76E-03	0.00000
7				267	Comp.	Inner	1&2	2.02	350.330				
8				1043	Active	Inner	3	2.02	350.389	135.7	1.3E+00	3.43E-03	0.00000
9				1044	Active	Inner	4	2.02	350.436	-64.7	6.5E-01	3.76E-03	0.00000
10				264	Comp.	Inner	3&4	2.02	350.328				
11				66	Active	Outer	1	2.02	350.441	-70.7	3.8E-01	5.16E-03	0.00000
12				67	Active	Outer	2	2.02	350.151	-38.3	9.3E-01	5.17E-03	0.00000
13				254	Comp.	Outer	1	2.02	350.290				
14				307	Comp.	Outer	2	2.02	350.235				
15				86	Active	Outer	3	2.02	350.426	-157.3	9.6E-01	4.24E-03	0.00000
16				85	Active	Outer	4	2.02	350.618	24.1	1.9E+00	3.11E-03	0.00000
17				300	Comp.	Outer	3	2.02	349.895				
18				301	Comp.	Outer	4	2.02	349.764				
19													
20													
21						Hydraulic Pressure		Average Coil Stress			d(Stress)/dPv		
22			Seq #	Date	Press	Vertical	Horizontal	Inner (LE)	Outer (LE)	All (LE)	Inner	Outer	All
23			1	11/1/90	0	0	0	-11	-51	-31			
24			2	11/1/90	0	350	0	182	298	240			
25			3	11/1/90	0	1000	0	813	1028	920	0.97	1.12	1.05
26			4	11/1/90	0	3000	0	2662	3650	3156	0.92	1.31	1.12
27			5	11/1/90	0	4000	0	3831	5205	4518	1.17	1.55	1.36
28			6	11/1/90	0	5000	0	5158	7236	6197	1.33	2.03	1.68
29			7	11/1/90	0	6000	0	6586	9706	8146	1.43	2.47	1.95
30			8	11/1/90	0	7000	0	8029	12450	10239	1.44	2.74	2.09
31			9	11/1/90	0	8000	0	9587	15520	12553	1.56	3.07	2.31
32			10	11/1/90	0	8500	0	10331	17094	13713	1.49	3.15	2.32
33			11	11/1/90	0	8500	400	10782	18410	14596			
34			12	11/1/90	0	8500	800	10879	18589	14734			
35			13	11/1/90	0	8500	1200	10905	18622	14764			
36			14	11/1/90	0	8500	1600	10905	18631	14768			
37			15	11/1/90	0	0	0	7931	8848	8389			
38													
39						fit d(stress)/dPv		1.30	2.19	1.75	1sPvs8.5 kpsi		
40								1.45	2.67	2.06	4sPvs8.5 kpsi		
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