

DCA311 Assembly Summary

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**MSIM Presentation
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DCA311 is the first FNAL 50 mm Collider Dipole Magnet to be tested cold.

Coil winding began on:..... 5-15-91

Estimated date for shipment to the MTF:..... 11-1-91

A short summary of the progress of DCA311 through each production stage plus a discussion of all major construction anomalies will be given.

Production Stages:

Coil Winding and Curing

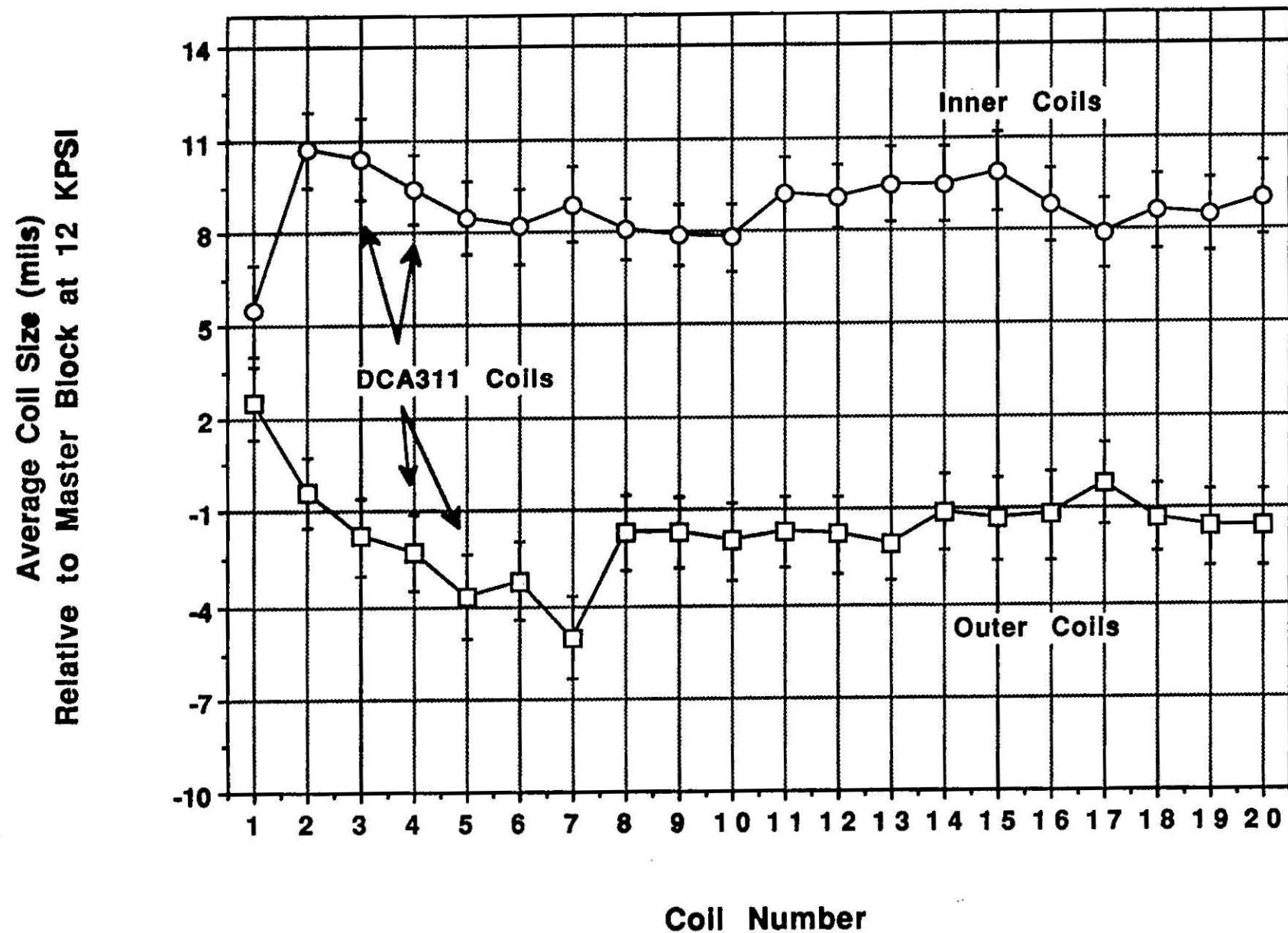
The proper coil size to attain good prestress without shimming was achieved.

Anomalies:

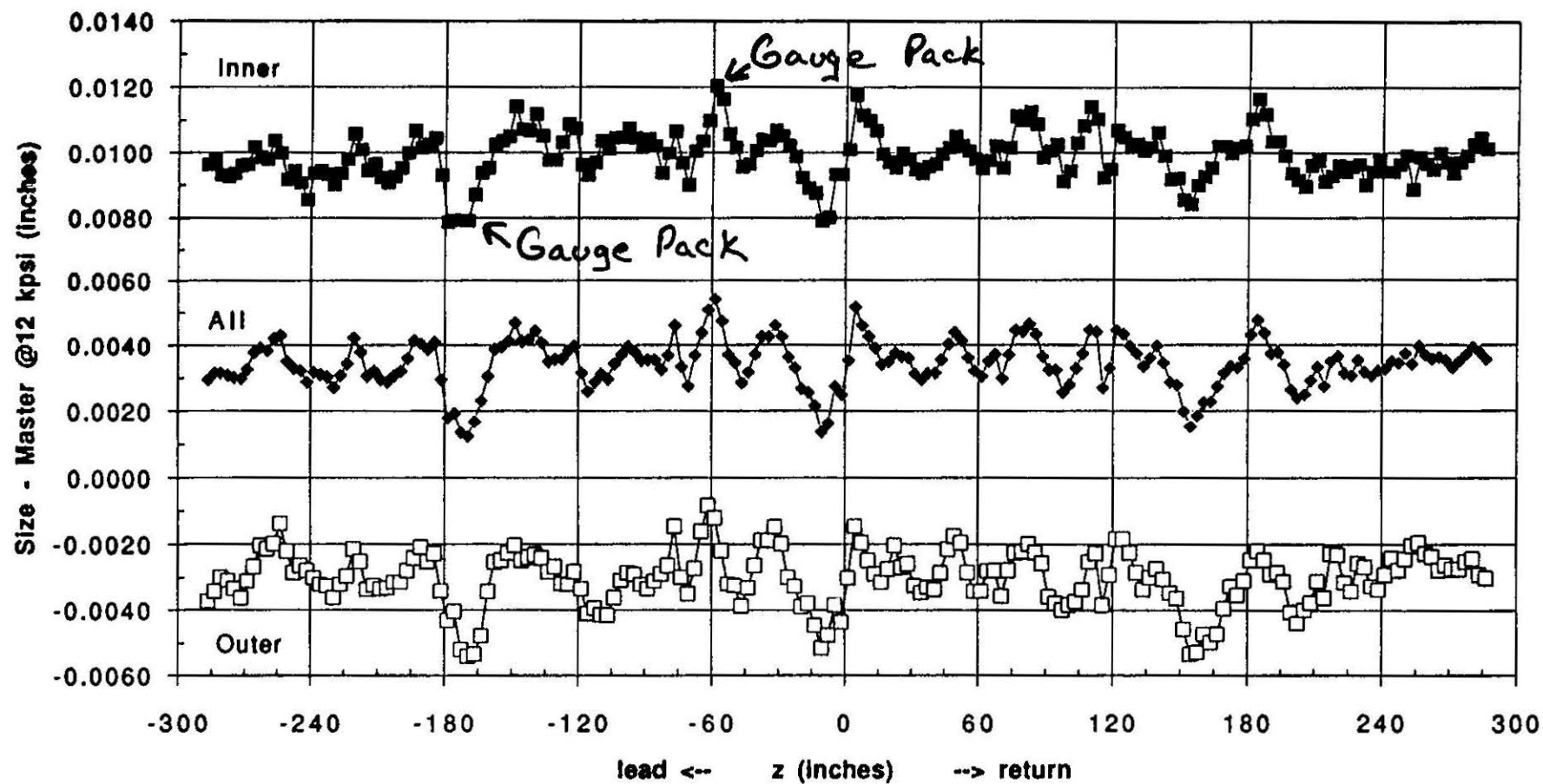
Outer coil 15M-50-2003 was damaged and rejected.

Metal chips were found and removed from two coils.

Average Inner and Outer Coil Size for Long 50 mm Magnets



DCA311 Average Coil Sizes



Coil Assembly and Collaring

Anomalies:

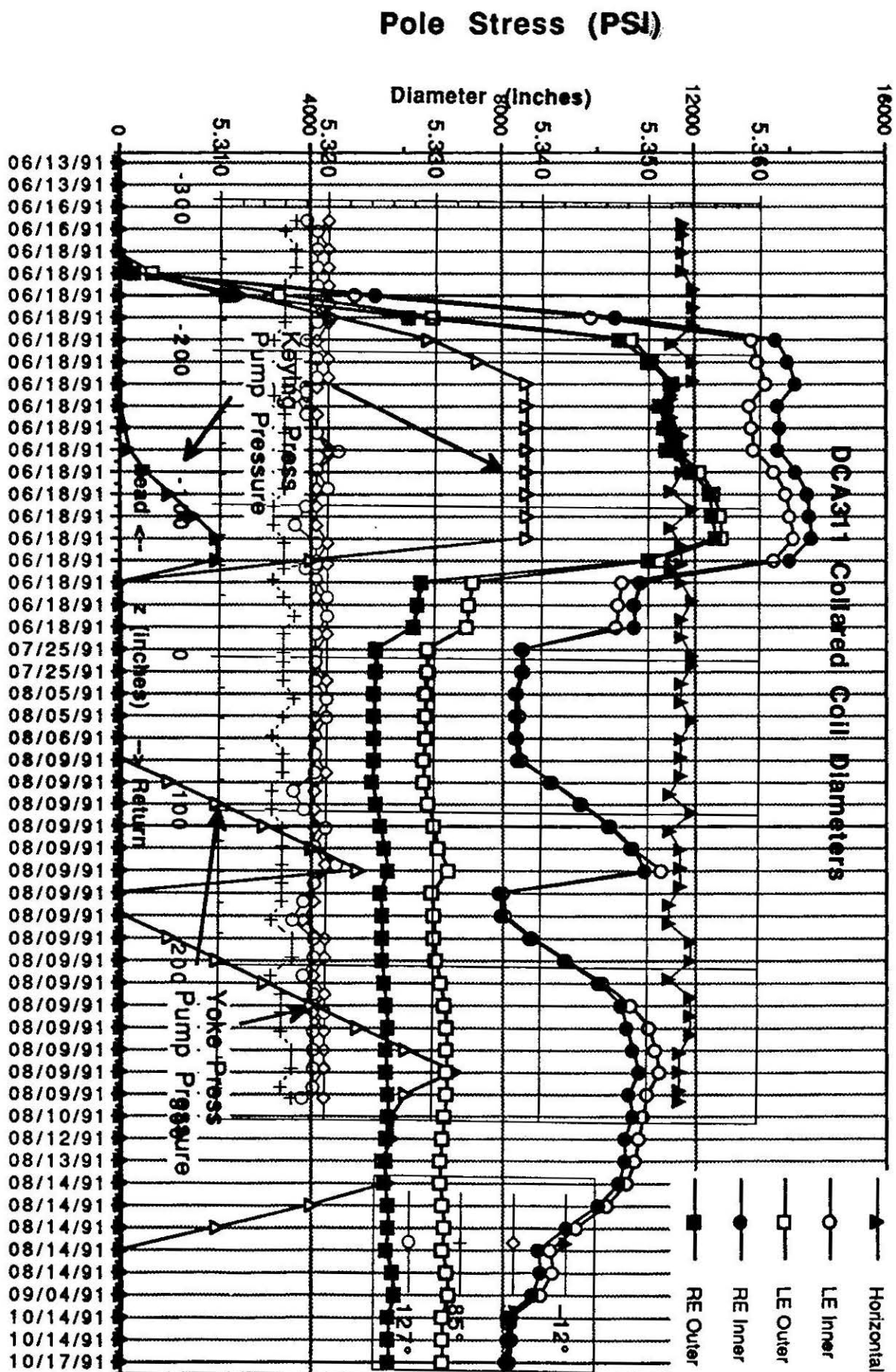
Combination of longitudinal coil shrinkage and early J-splice results in asymmetrical alignment of coils.

**Cut Voltage Tap Wires (Repaired)
Collared Coil 1/2" short relative to shell**

Keying

Adequate prestress achieved.

Courtesy of J. Strait



End Clamp Installation

Return end clamp installed 3 times, lead end 1 time.

Anomalies:

Turn to turn short in the return end of an outer coil appeared during end clamp installation. It was successfully repaired by sliding a piece of kapton between the turns. Probable cause of the short was a popped cable strand.

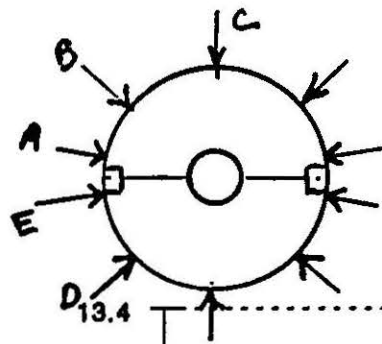
Yoke and Shell Welding

Yoke Pack Configuration:

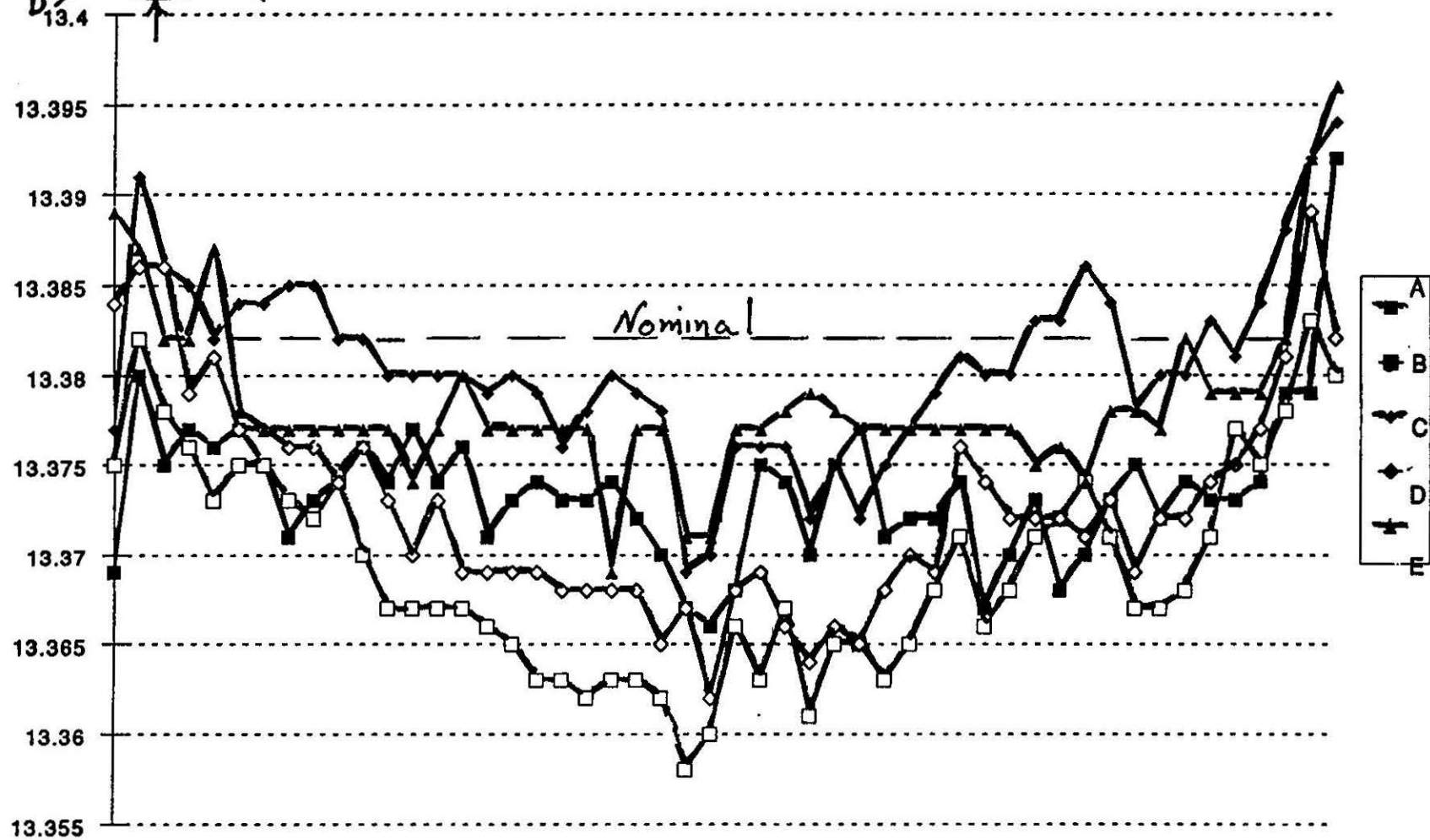
12 foot long yoke packs sandwiched between two 10 inch long monolithic packs.

Anomalies: Probable chevrons of yoke packs.

Courtesy of
Mike Gordon



DCA-311



Final Assembly

Delayed when hipot failures of electrical bus required modifications to be made. G. Tassoto will provide more details.

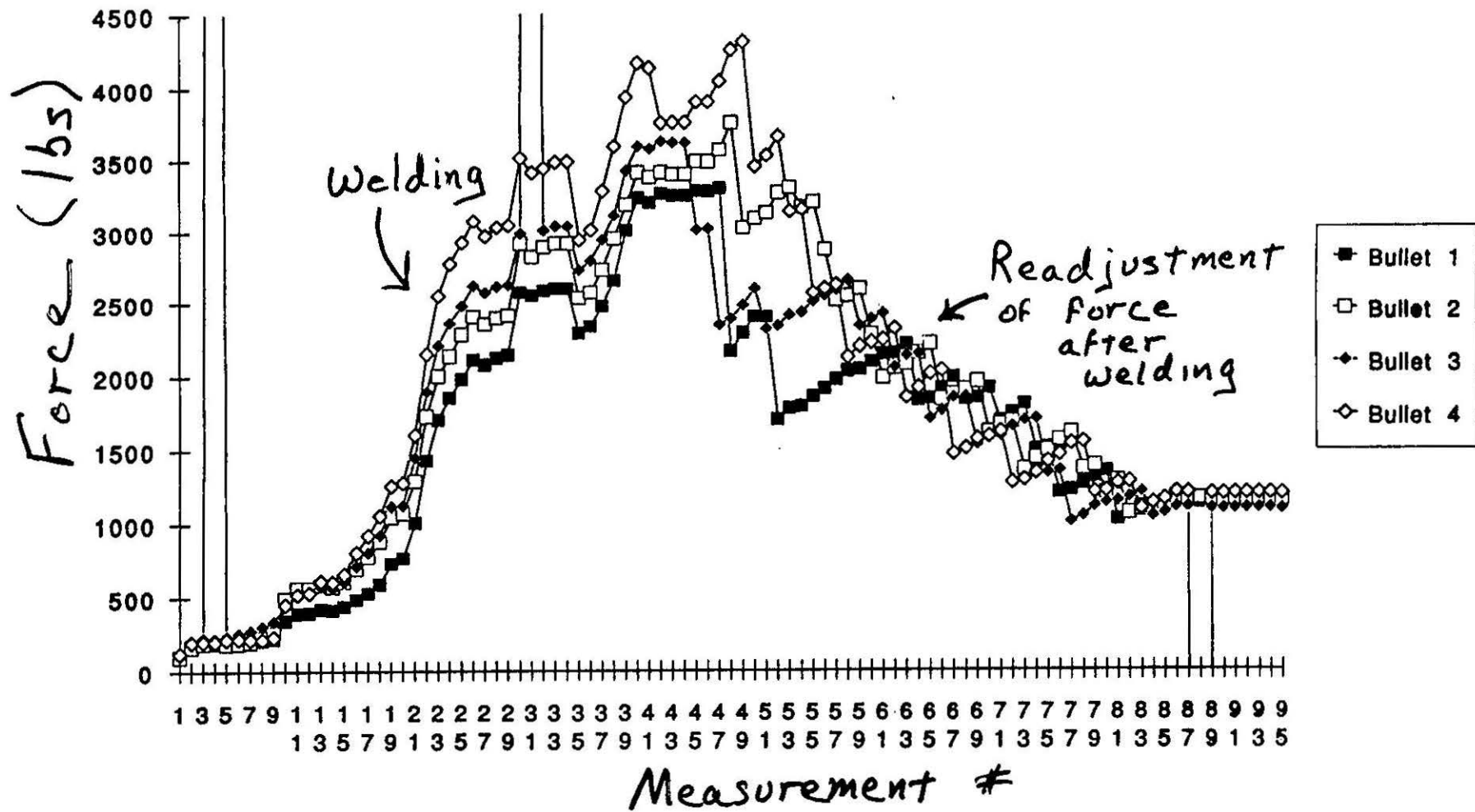
Anomalies:

Warpage of end plate during extension tube welding produces high end forces. The return end bullets were adjusted to produce a total of about 4 Klbs of end force. The lead end set screws were set to try to produce this force also. B. Higinbotham will address this issue in a later presentation.

Cryostating

No major anomalies

DCA311 Bullets (Welding)



Field measurements of collared coils

No major anomalies

Summary

DCA311 should give a good indication of the performance of the 50mm Collider Dipole Magnets. There are no known construction problems which should have any impact on its quench or mechanical behavior.

Courtesy of
S. Delchamps

DCA311 Collared Coil Transfer Function
(10 Amps, BNL B2 Mole, Jul 30, 1991)

