



Fermilab

TS-SSC 91-026

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Subject: DSA321 Collaring and Yoking: Strain Gauge Data

At the time DSA321 was collared (on 12/18/90) the new 84 inch press was not complete. It was collared in the Tevatron collaring press which has insufficient capacity to collar the entire magnet at once. Upper collaring tooling was used both as upper and as lower tooling. To concentrate the press load the tooling covered only somewhat more than half the coil at a time the the coil was keyed in two operations. The keys were inserted by finger and hammer. (For a further discussion, see Reference 1.) The shell was welded on 12/22/90 in the (just commissioned) 84 inch press.

Strain gauge data were recorded during both compressions for collar keying and during the yoking operation. The data are summarized in the attached table and figure which display averages over the four inner and four outer coil gauges. The strain gauge pack, located at the center of the magnet, was compressed on both pressings because the collaring tooling covered somewhat more than half the coil. The final stresses after keying were 9 and 13 kpsi in the inner and outer coils respectively. In the four days between yoking and keying the stresses decreased by a few hundred psi. The welding of the shell around the yoke resulted in a net increase of the inner stress of 0.6 kpsi and an apparent decrease of the outer stress by 0.1 kpsi. This is a smaller change than typically occurs in magnets with horizontally split yokes because the collars are compressed horizontally and are free to expand vertically. The last strain gauge measurement in Table I was taken eleven days after yoking. During this time there was a stress loss of 0.4 kpsi in the inner coil and 0.3 kpsi in the outer coil.

Reference

- [1] R. Bossert, DSA321 Construction Review, TS-SSC 90-007, 1/17/91.

DSA321 Collaring 12/17/90; Yoking 12/22/90

