Lawrence Berkeley Laboratory - University of California **Engineering Note**		Code SR0205	Serial M7714	STAR Doc # SN363	Page 1 of 2
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Program
Solenoidal Tracker at RHIC
Sub program
Time Projection Chamber - Wheel and Supports
Title
TPC Support Arm Load Test

Introduction:

The TPC is suspended in the STAR Magnet via four aluminum "Arms" bolted to the inner ring of the STAR Magnet. Loading on an individual Support Arm (TPC513) may reach ½ the weight of the TPC (½ of 24,700 lb.) due to flexure of the magnet during the detector's "roll-in" or "roll-out" of the Wide Angle Hall. Nominal arm loads during operation should not exceed 6,200 lb. To assure the soundness of these parts a load test was performed in which the Support Arms were subjected to a load of greater than 1.25 x 12,500 lb. or 15,600 lb. The test load is therefore 25% greater than the worst possible load condition.

Load Test

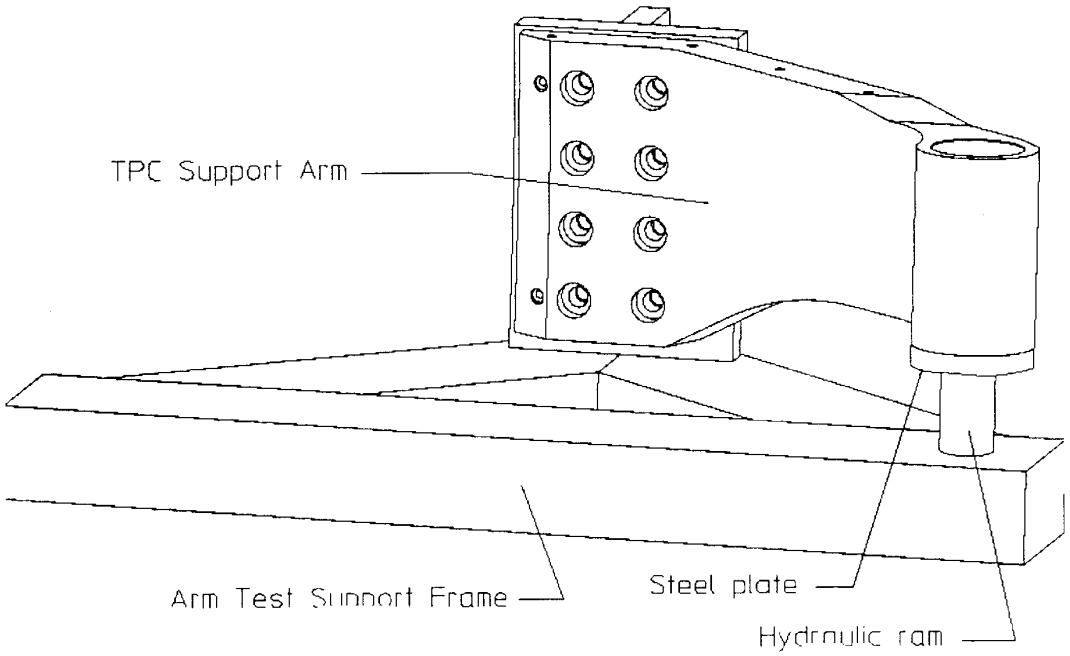
The TPC Support Arm was inverted and bolted to a rigid frame having a mating surface machined to simulate the curvature of the magnet's inner ring ID. The fasteners were the same bolts that will be used in the final assembly. Bolts were tightened to between 400 and 460 ft-lb.

The test load was applied in line with the center of the Arm's 6" diameter bore via a steel cover plate and hydraulic ram resting on the support frame base, refer to the sketch below. The pressure gage was calibrated before testing using a "dead-weight" standard and found to be accurate within 3%. The measured cross sectional area of the hydraulic ram's piston is 2.24 square inches. A pressure of 7000 psi was applied by a hand pump resulting in a test load of 15,800 lb. The load was applied for 3 to 5 minutes. Test loads were applied to all four arms, TPC513 SN I, II, III, and IV.

Test Performed by: Russell Wells Date 9/15/98

Witnessed by: John Bercovitz Date 9/15/98

John Bercovitz, ME Safety Sub Committee



TPC Support Arm Load Test Set-up