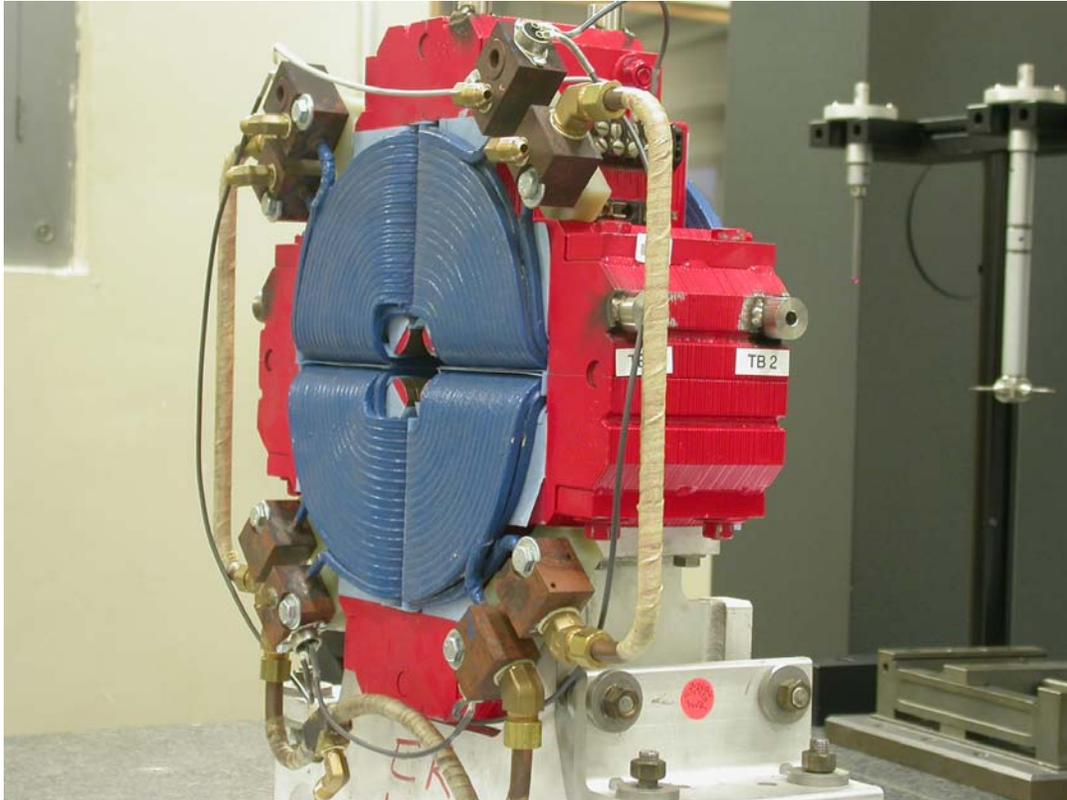


LCLS 'QE' QUADRUPOLE MAGNET FIDUCIALIZATION REPORT



Inspector: Keith Caban
Responsible Engineer: Carl Rago
Date: Tuesday, November 14, 2006
Work Order/Charge No.: 92-4264-2
Serial Number: 000015
URL of Fiducial Report: <\\Web002\www-group\met\Quality\FIDUCIAL REPORTS\LCLS QE QUAD'S\000015.pdf>

Part Set-up – Coordinate System Set-up

Spatial Alignment

- Geometric axis of the poles of the magnet.

Planar Alignment

- A 4 point plane on the top of where 2 arrows indicate in the picture below.

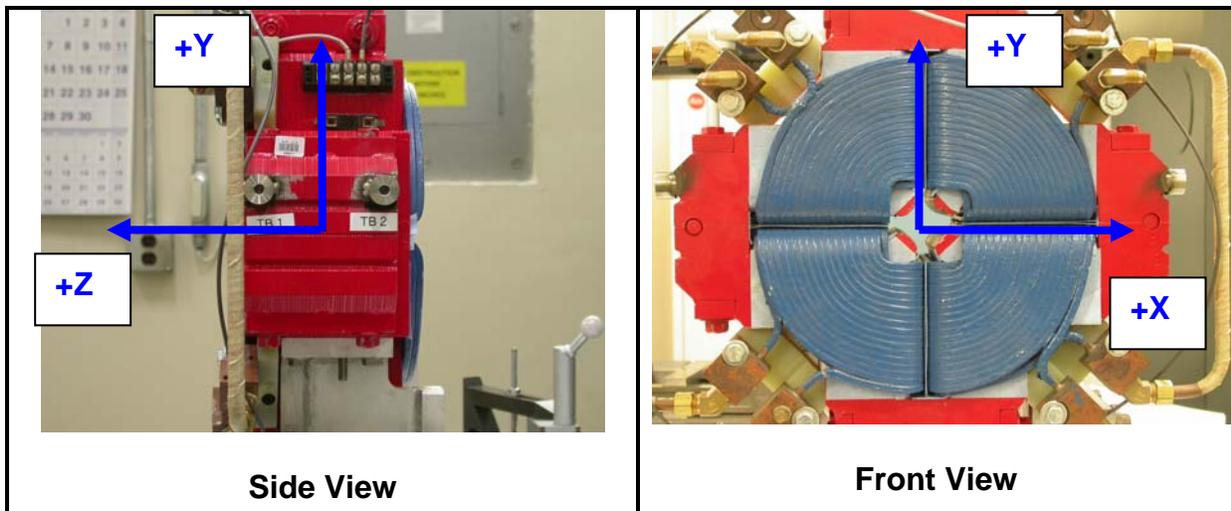


“Z” Zero

- Mid-Plane of the magnet

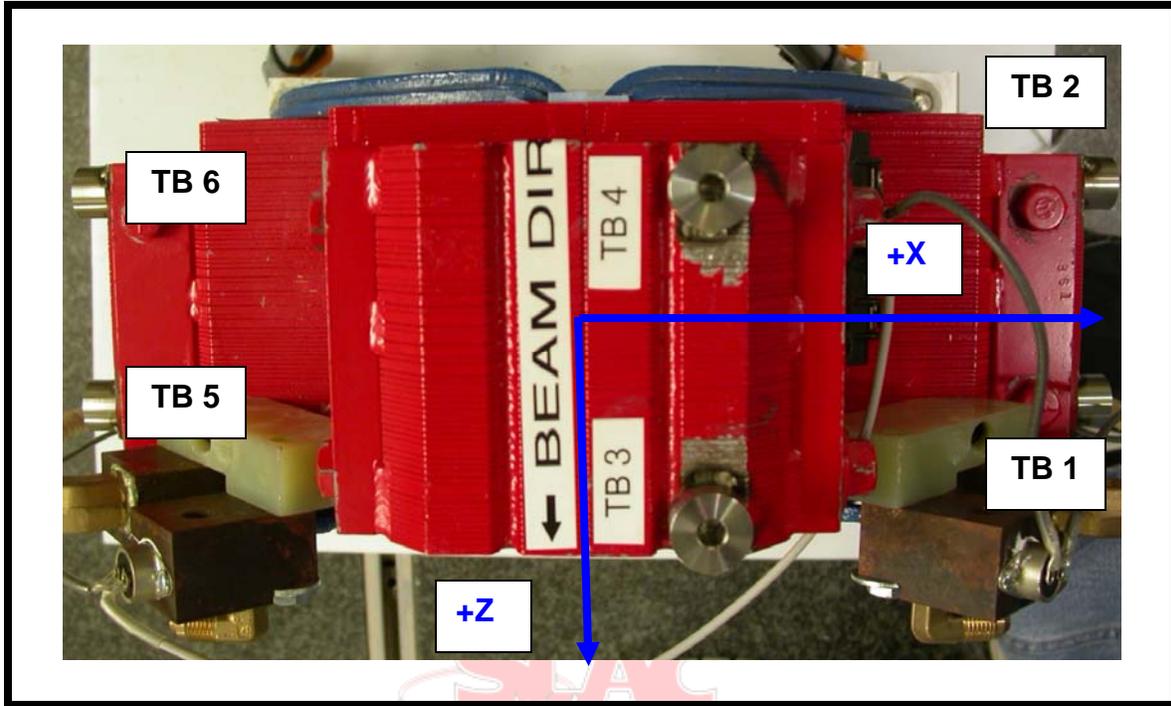
“X” & “Y” Zero

- Geometric Axis of the Poles of the magnet.



Tooling Ball Measurements/Locations

Top of magnet; view from "+Y"



| Tooling Ball | FORM | DIAMETER | X | Y | Z |
|--------------|---------|----------|----------|---------|----------|
| TB 1 | 0.00010 | 0.50000 | 8.24668 | 1.13610 | 1.71458 |
| TB 2 | 0.00025 | 0.49889 | 8.23176 | 1.13999 | -1.34459 |
| TB 3 | 0.00026 | 0.49954 | 1.14859 | 8.24085 | 1.73411 |
| TB 4 | 0.00026 | 0.49921 | 1.12369 | 8.23490 | -1.30530 |
| TB 5 | 0.00006 | 0.49988 | -8.24292 | 1.15281 | 1.75330 |
| TB 6 | 0.00003 | 0.50002 | -8.25464 | 1.12947 | -1.25340 |

Pole Distances

| Pole | +Z side | -Z side | Δ |
|------|---------|-----------|----------|
| A-C | 1.08663 | 1.10042`` | 0.01379 |
| B-D | 1.08646 | 1.08652 | 0.00006 |

*** Points collected approx. 0.125 from each end

*** Picture to the left is looking down from +Z

`` = Extra machined step from where measurement was taken on end of hyperbola. See Part.

