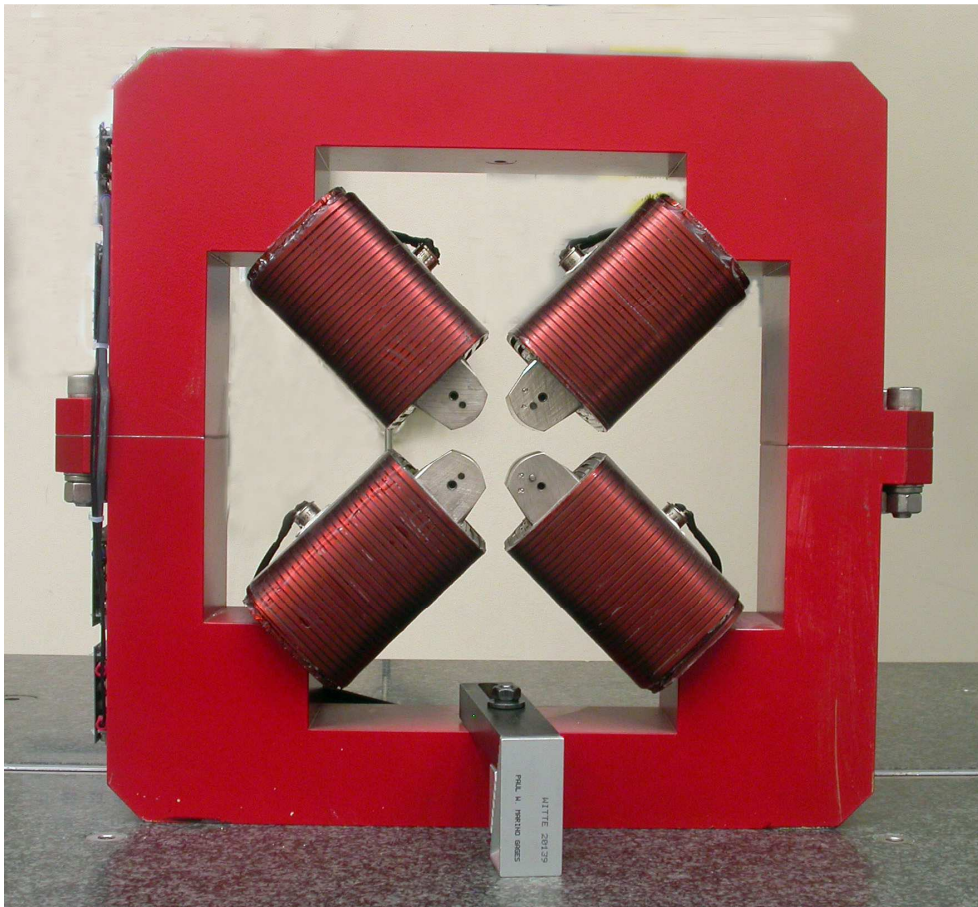


LCLS II Magnet Fiducialization Report

Injector Quadrupole 1.26Q3.5



Inspector : K. Caban

Engineer : J. Amann

Drawing No. : SA-380-309-12 R1

Barcode No.: 4005

Mfg. S/N : 005

Coordinate System Setup

Spatial Alignment

The Spatial Alignment of the magnet is created through a composite best-fit of the pole tips. Each pole tip scanned .150 inch inboard from the upstream magnet face and the downstream magnet face. A composite best-fit of the upstream poles and the downstream poles is made with the nominal pole tip shape and location. An axis is created through the two best-fit centerpoints. This axis is the spatial alignment of the magnet and defines the Z axis.

Planar Alignment

The Planar Alignment of the magnet is created by averaging the rotations of the composite best-fits of the upstream pole tips and downstream pole tips. This direction defines the Y and X directions of the magnet.

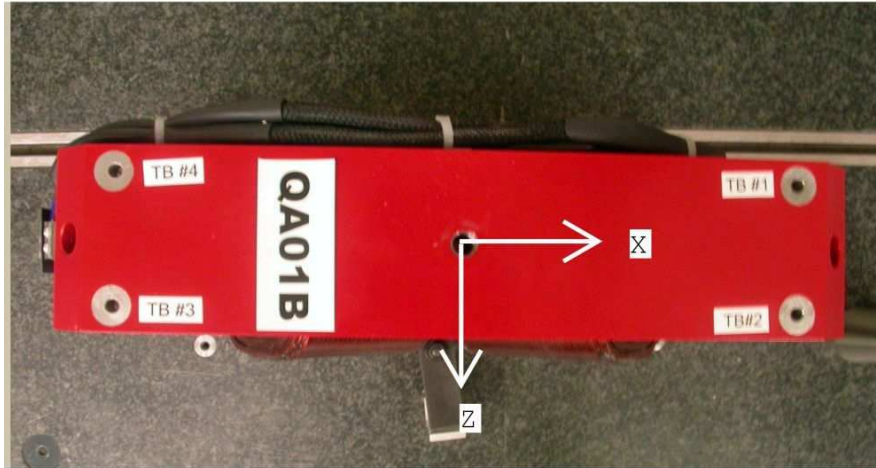
Coordinate Origins

The origins of the magnet coordinate system are as follows. The XY origin lies on the axis of spatial alignment. The Z origin is the intersection of the mid-plane between the upstream and downstream magnet faces and the Z axis.

Barcode # : 4005

Mfg. S/N : 005

Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	6.49457	8.88039	-1.24558
TB 2	6.49377	8.88087	1.25555
TB 3	-6.50450	8.87222	1.25397
TB 4	-6.50519	8.87182	-1.24556
TB A	6.49492	8.19355	-1.24423
TB B	6.49496	8.19350	1.25535
TB C	-6.50420	8.18539	1.25416
TB D	-6.50428	8.18580	-1.24546

Tooling Ball Locations (1-4) are 1 inch above unpainted surface pads
 Tooling Ball Locations (A-D) are 5/16 inch above unpainted surface pads

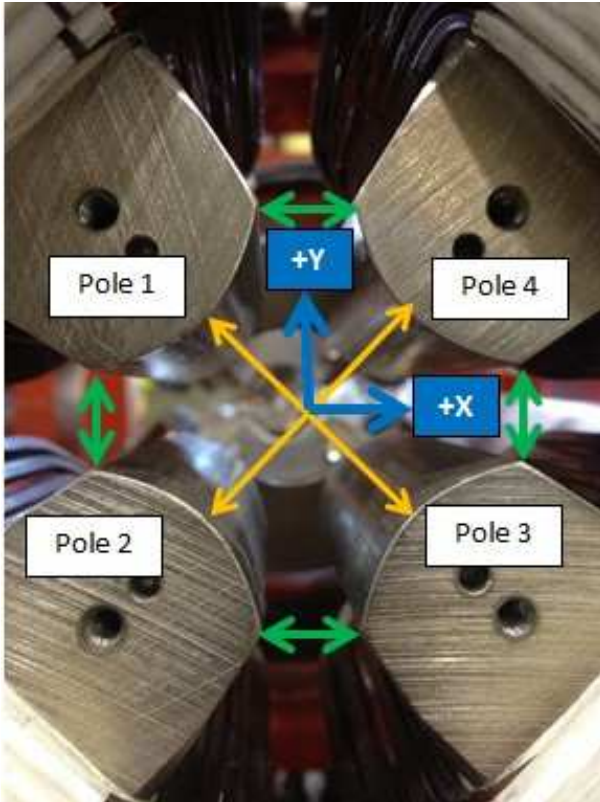
Dimensions in Inch

Barcode # : 4005

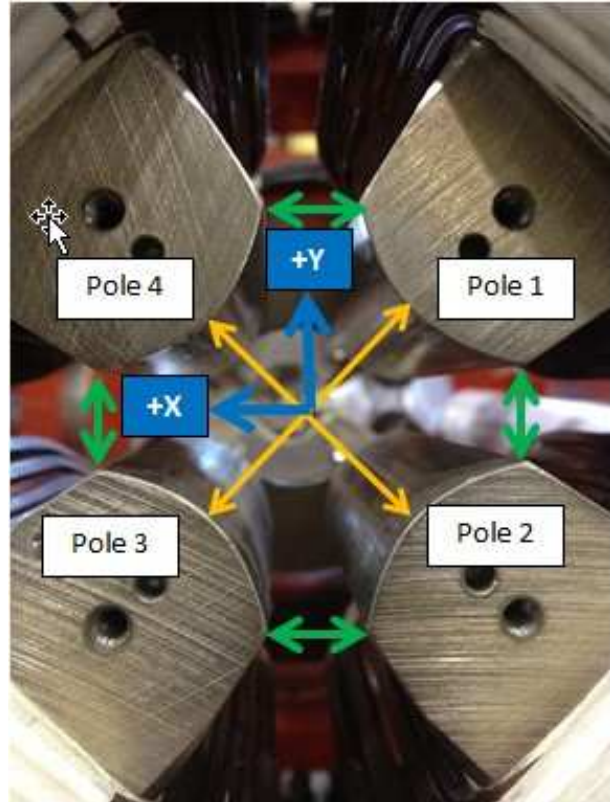
Mfg. S/N : 005

Pole Tip Gap Measurements

Pole Tips View from Downstream



Pole Tips View from Upstream



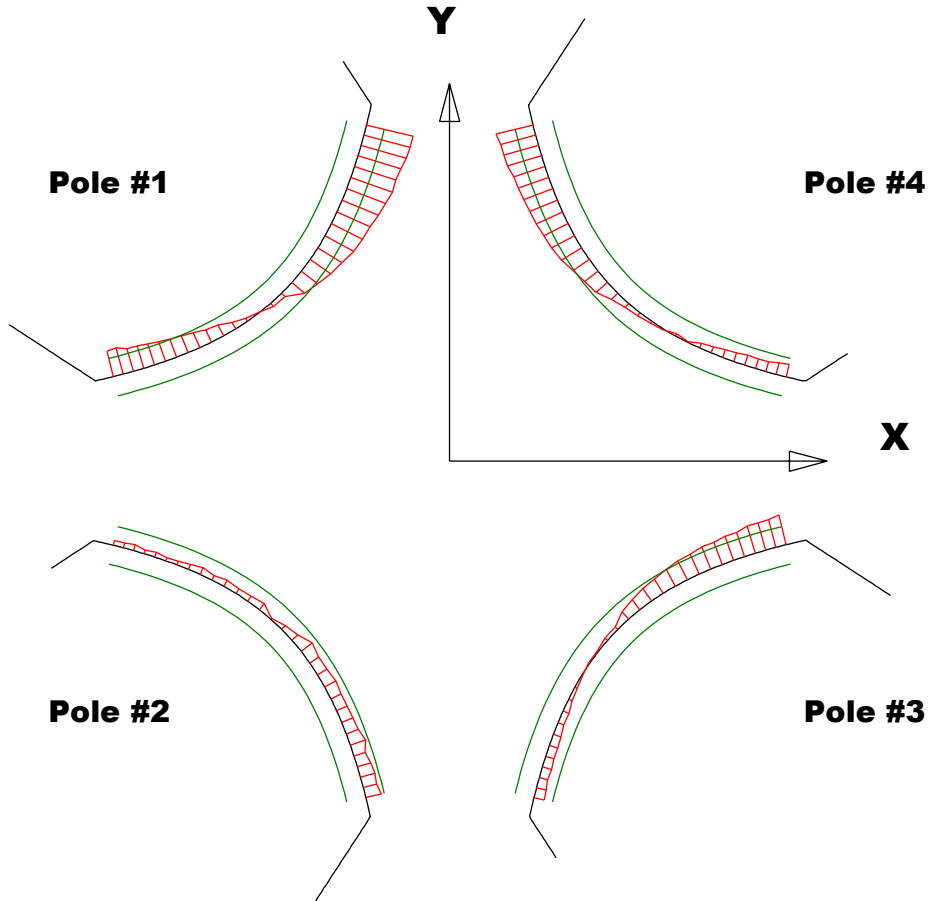
	Nominal Distance	Downstream Pole Ends	Upstream Pole Ends
Pole Tip Distance 1-3	1.260	1.25945	1.25967
Pole Tip Distance 2-4	1.260	1.2592	1.25926
Gap 1-2	.422	0.42359	0.42295
Gap 2-3	.422	0.42258	0.42038
Gap 3-4	.422	0.42232	0.42375
Gap 4-1	.422	0.41757	0.41791

Dimensions in Inch

Barcode # : 4005

Mfg. S/N : 005

Composite Best-fit of Pole Tips, Downstream



Black = Nominal Pole Tip
 Red = Pole Tip Deviations
 Green = +/- .001 Tolerance

Dimensions in Inch

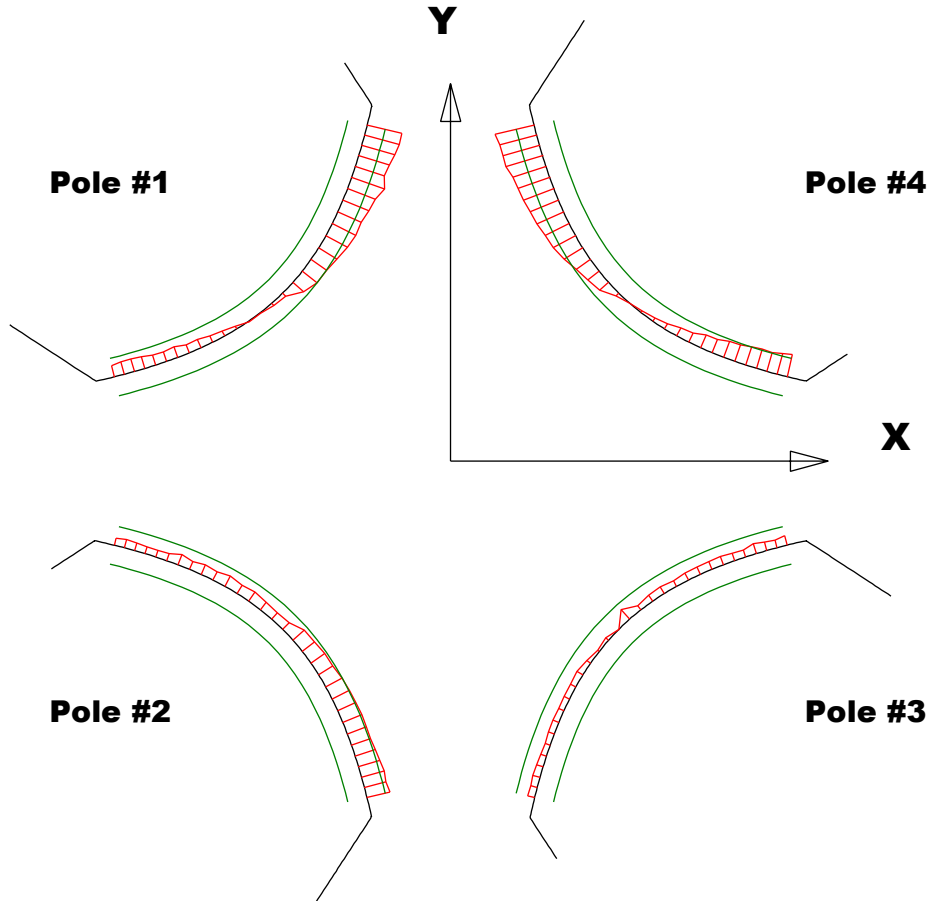
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00145	0.00006	-0.00055	-0.00068
Max. Dev.	0.00255	0.00086	0.00164	0.00203

Barcode # : 4005

Mfg. S/N : 005

Composite Best-fit of Pole Tips, Upstream



Black = Nominal Pole Tip
Red = Pole Tip Deviations
Green = +/- .001 Tolerance

Dimensions in Inch

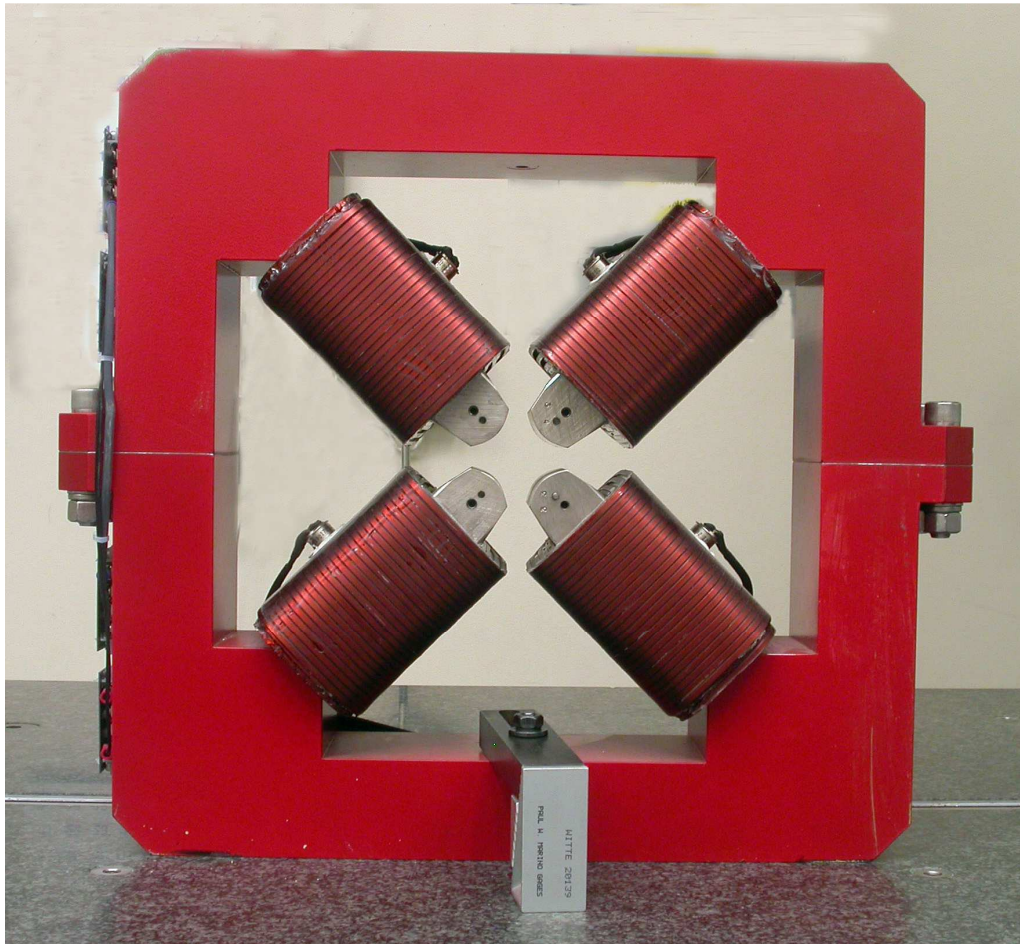
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0007	0.00037	-0.00001	-0.00122
Max. Dev.	0.00191	0.00126	0.00068	0.00213

Barcode # : 4005

Mfg. S/N : 005

Angle of the Composite Pole Tip Best-Fit In Relation to Tooling Ball Plane



Angle in Decimal Degrees ° = -0.03733

Angle in Milliradians = -0.65153

Barcode # : 4005

Mfg. S/N : 005