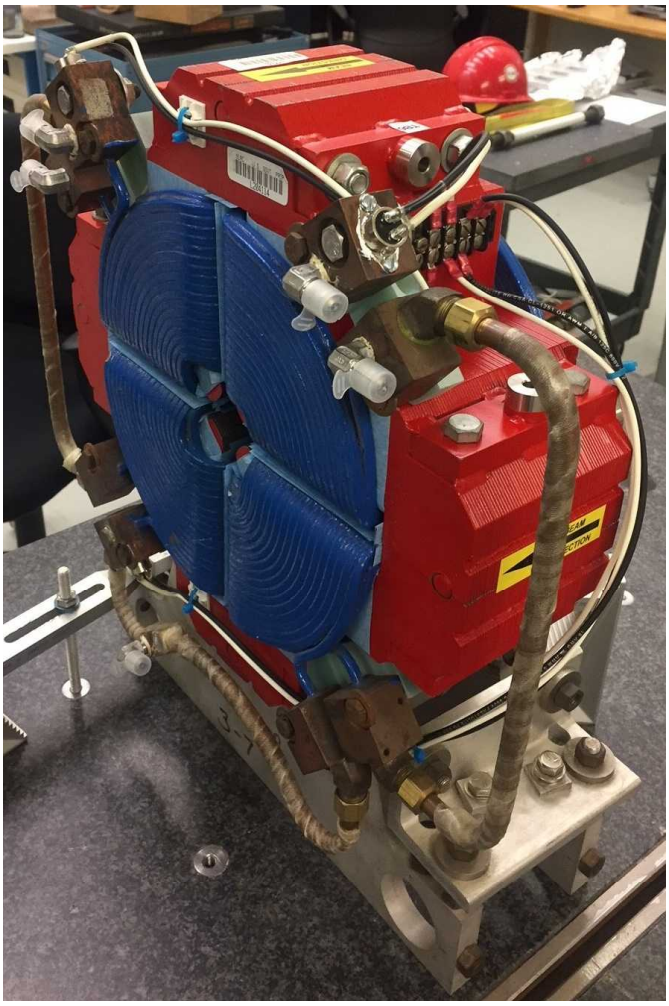
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4132
Mfg. S/N : E068

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 0.100 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 the 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.

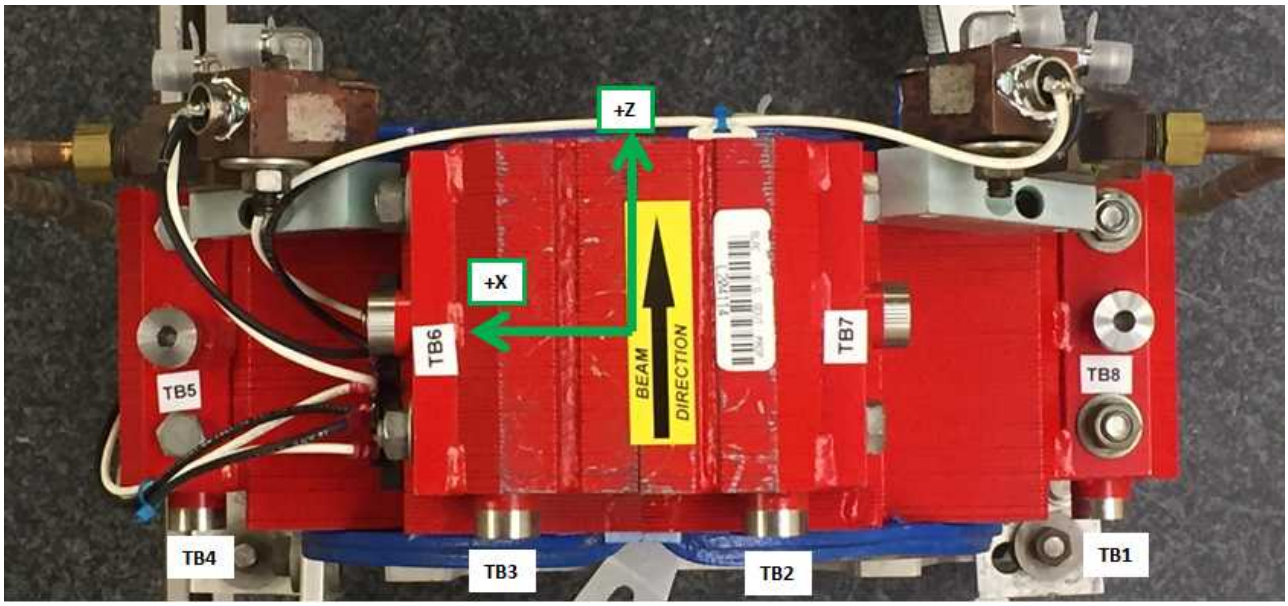
Coordinate Origins

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 # : 4132

Mfg. S/N : E068

Tooling Ball Locations



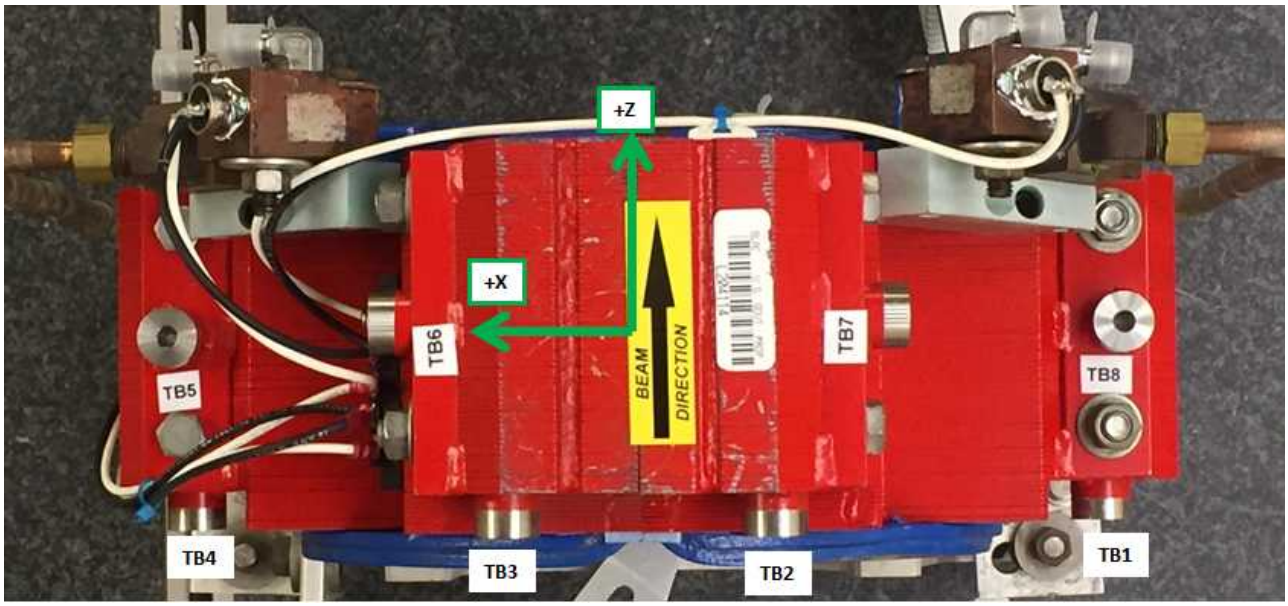
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7577	1.5061	-3.1761
TB 2	-1.5255	5.7439	-3.1815
TB 3	1.5067	5.7498	-3.1690
TB 4	5.7463	1.5059	-3.1684
TB 5	5.8654	4.0025	0.2347
TB 6	3.9997	5.8711	0.2533
TB 7	-4.0034	5.8571	0.2372
TB 8	-5.8814	3.9979	0.2492

Tooling Ball Locations are 1 inch above Tooling Ball Adapter Plane
Dimensions in Inch

Barcode # : 4132

Mfg. S/N : E068

Tooling Ball Locations



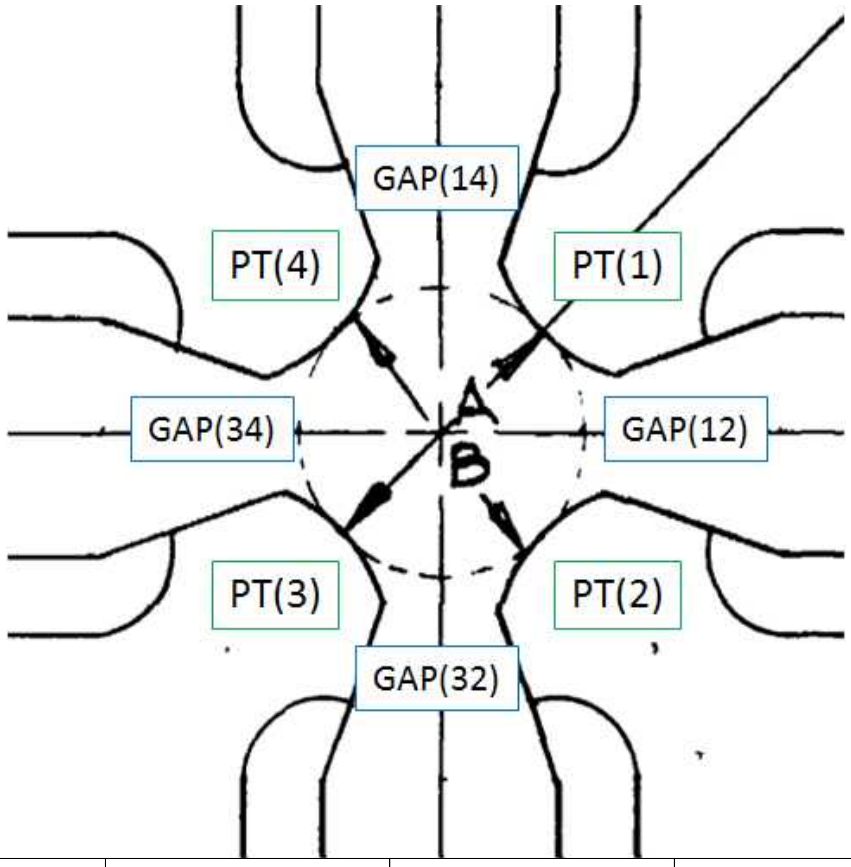
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7586	1.5056	-2.4877
TB 2	-1.5246	5.7483	-2.4925
TB 3	1.5043	5.7527	-2.4805
TB 4	5.7496	1.5068	-2.4805
TB 5	5.8646	3.3150	0.2333
TB 6	3.3106	5.8713	0.2523
TB 7	-3.3148	5.8587	0.2379
TB 8	-5.8766	3.3106	0.2487

Tooling Ball Locations are 5/16 inch above Tooling Ball Adapter Plane
Dimensions in Inch

Barcode # : 4132

Mfg. S/N : E068

Pole Tip Gap Measurements



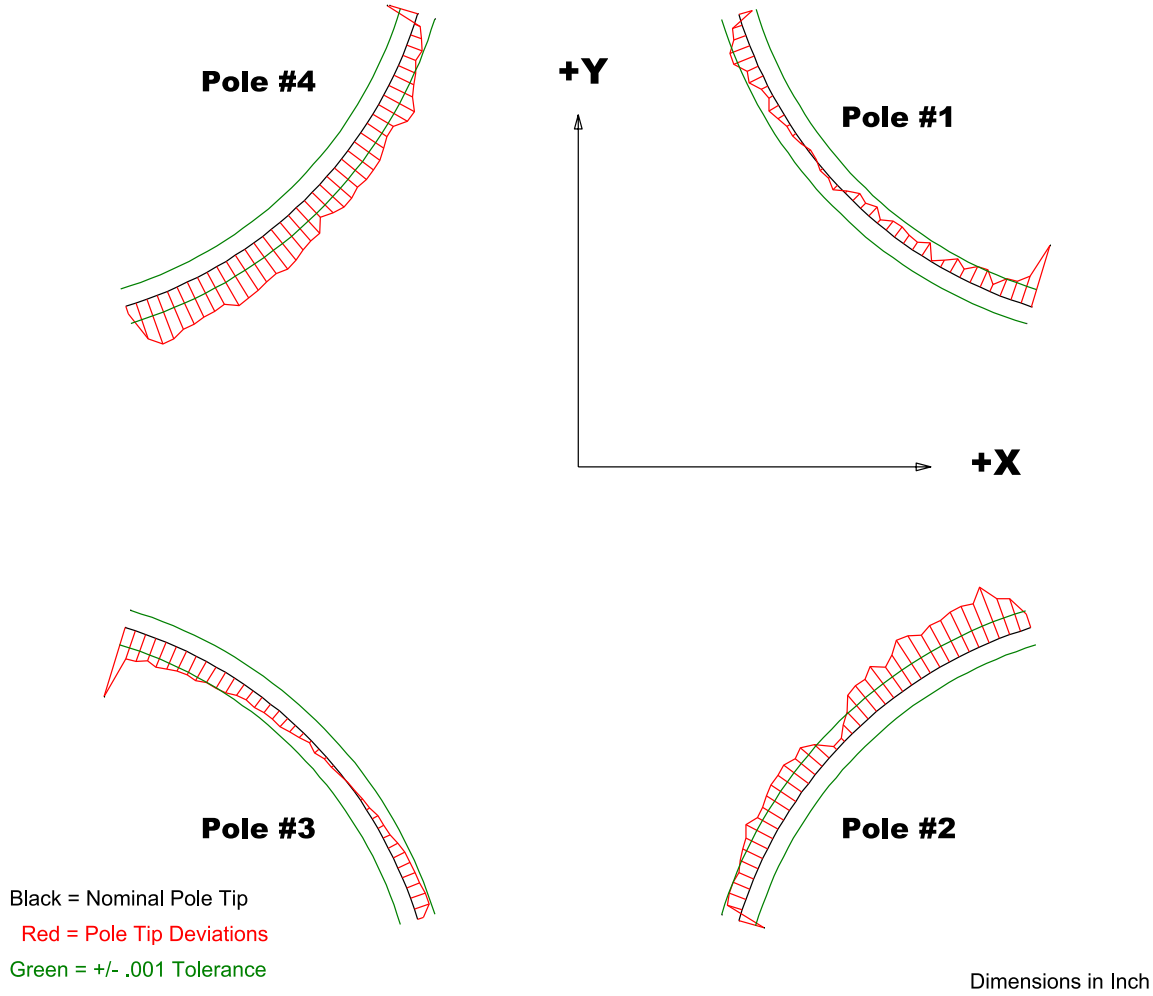
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08519	1.08559
PT Distance 2-4(B)	1.085	1.08276	1.08524
Gap 1-2	0.4546	0.45822	0.45921
Gap 2-3	0.4546	0.45644	0.45593
Gap 3-4	0.4546	0.45889	0.4605
Gap 4-1	0.4546	0.45814	0.45856

Dimensions in Inch

Barcode # : 4132

Mfg. S/N : E068

Composite Best-fit of Pole Tips, Downstream



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

Dimensions in Inch

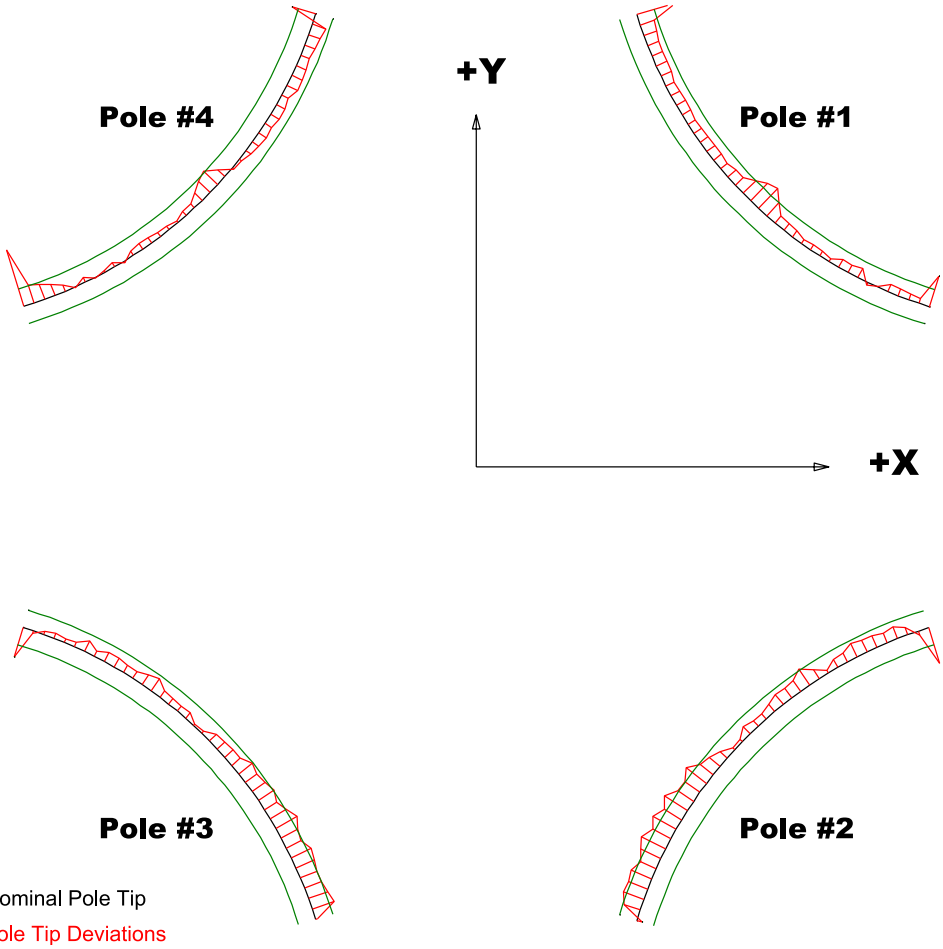
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00356	-0.00147	-0.00402	-0.00194
Max. Dev.	0.00124	0.0031	0.0009	0.00266

Barcode # : 4132

Mfg. S/N : E068

Composite Best-fit of Pole Tips, Upstream



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

Dimensions in Inch

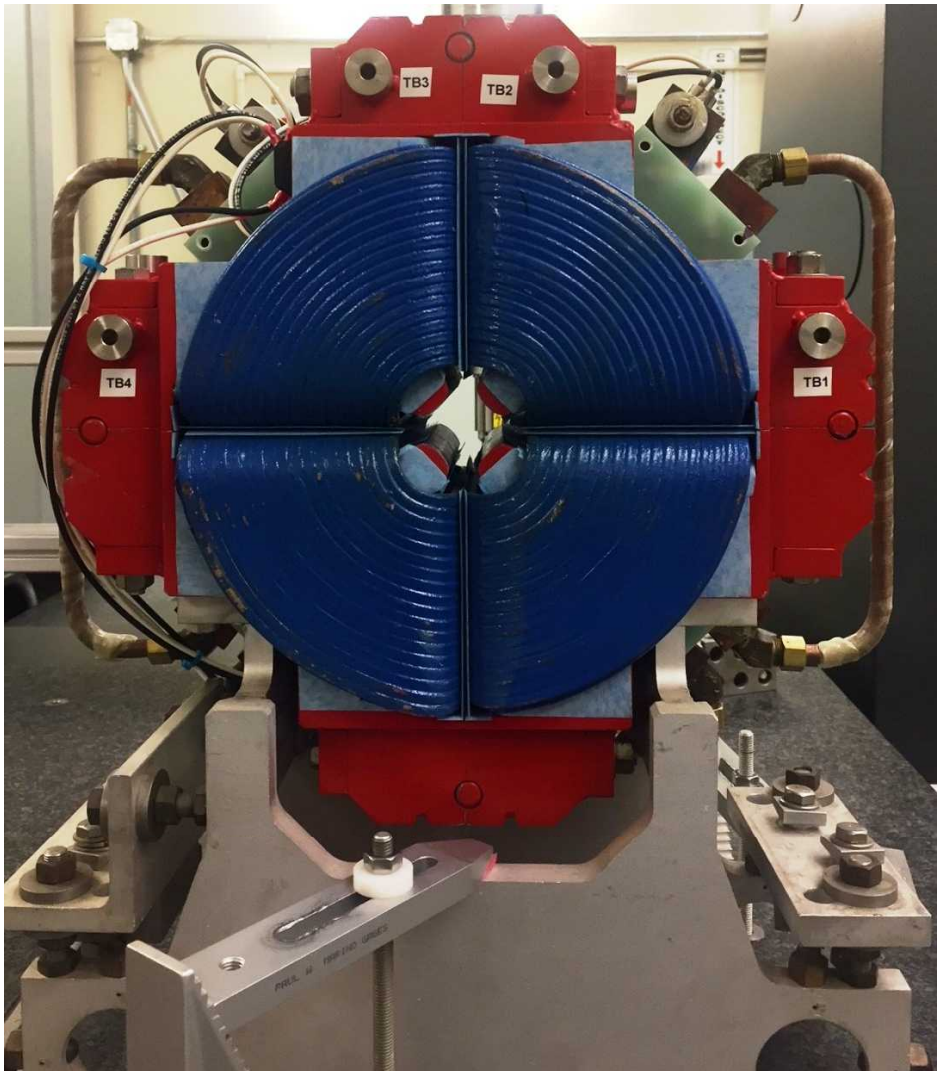
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00224	-0.00207	-0.00173	-0.00328
Max. Dev.	0.00017	0.00153	0.00137	0.00081

Barcode # : 4132

Mfg. S/N : E068

Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :0.00709

Angle in Milliradians :0.12378

Barcode # : 4132

Mfg. S/N : E068