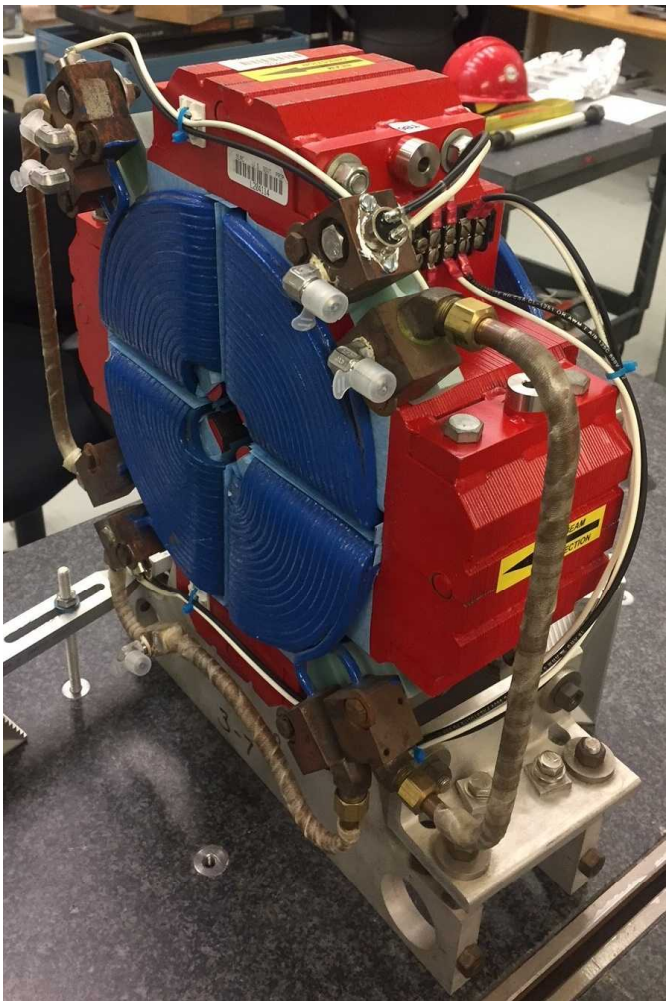
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4119
Mfg. S/N : E052

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.

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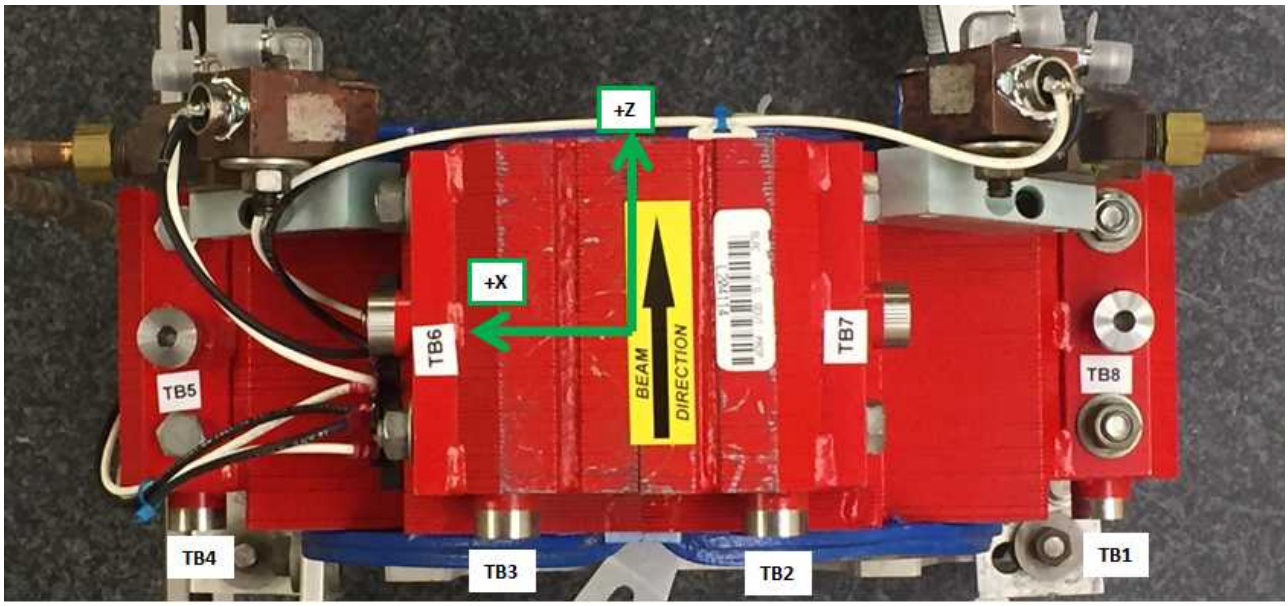
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7693	1.5090	-3.1777
TB 2	-1.5125	5.7623	-3.1764
TB 3	1.4986	5.7729	-3.1772
TB 4	5.7648	1.5169	-3.1852
TB 5	5.8202	4.0061	0.2337
TB 6	3.9940	5.8524	0.2470
TB 7	-4.0086	5.8337	0.2417
TB 8	-5.8637	3.9933	0.2414

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

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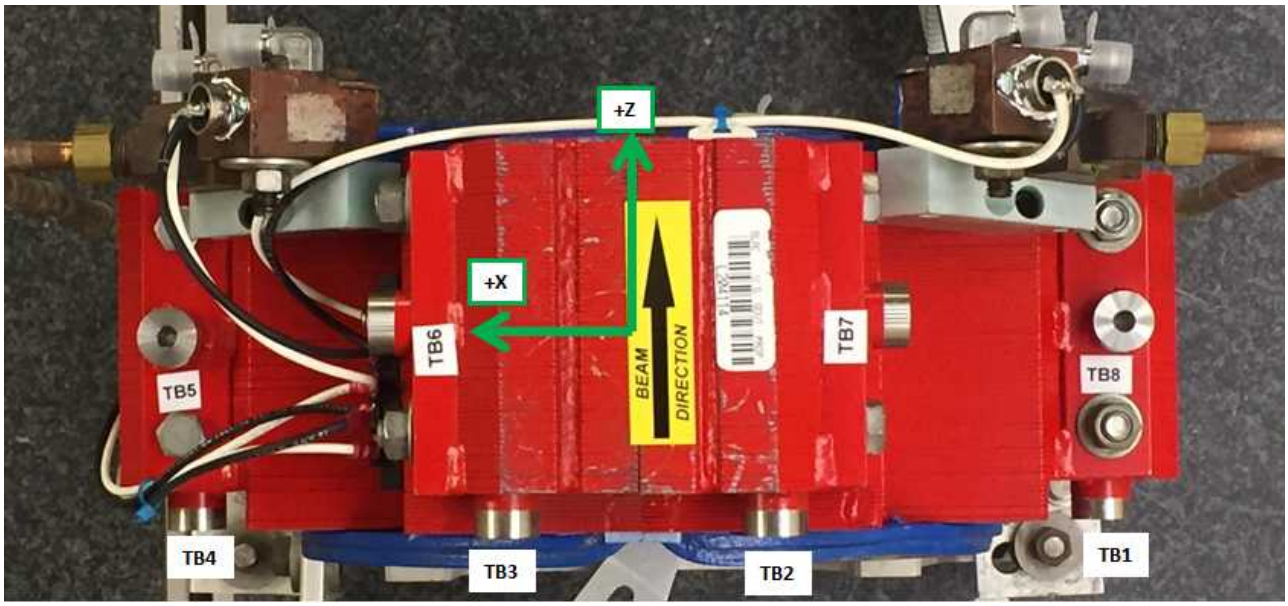
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7714	1.5078	-2.4902
TB 2	-1.5114	5.7677	-2.4876
TB 3	1.4950	5.7743	-2.4883
TB 4	5.7672	1.5157	-2.4972
TB 5	5.8208	3.3192	0.2340
TB 6	3.3033	5.8511	0.2464
TB 7	-3.3205	5.8361	0.2416
TB 8	-5.8605	3.3056	0.2416

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

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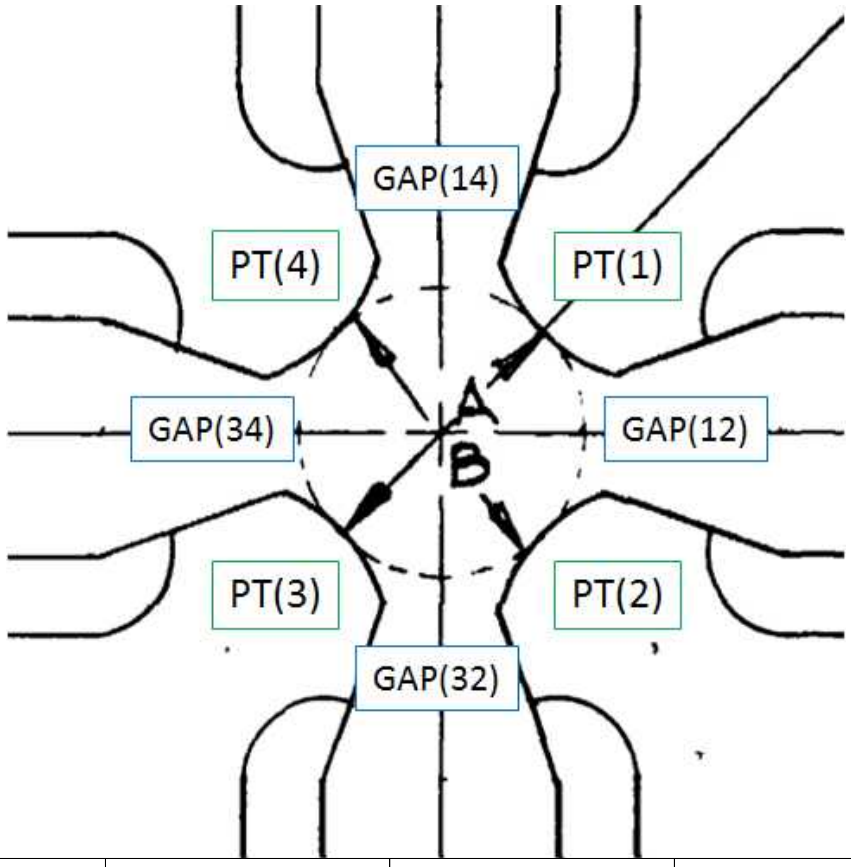
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08455	1.08642
PT Distance 2-4(B)	1.085	1.08465	1.08914
Gap 1-2	0.4546	0.45749	0.4628
Gap 2-3	0.4546	0.45526	0.46042
Gap 3-4	0.4546	0.45491	0.45817
Gap 4-1	0.4546	0.46429	0.46126

Dimensions in Inch

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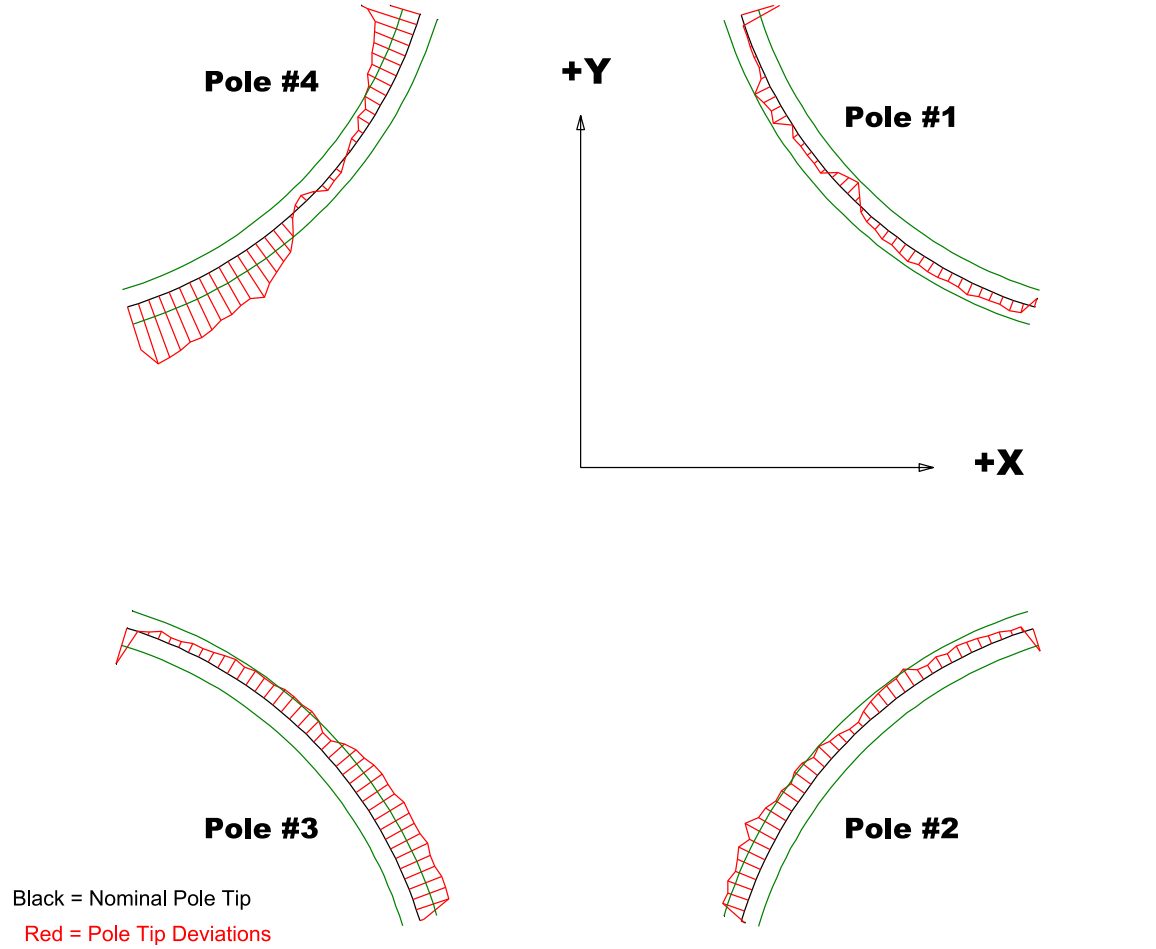
Composite Best-fit of Pole Tips, Downstream



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.	-0.00266	-0.00132	-0.00208	-0.00654
Max. Dev.	0.00097	0.00191	0.00199	0.00354

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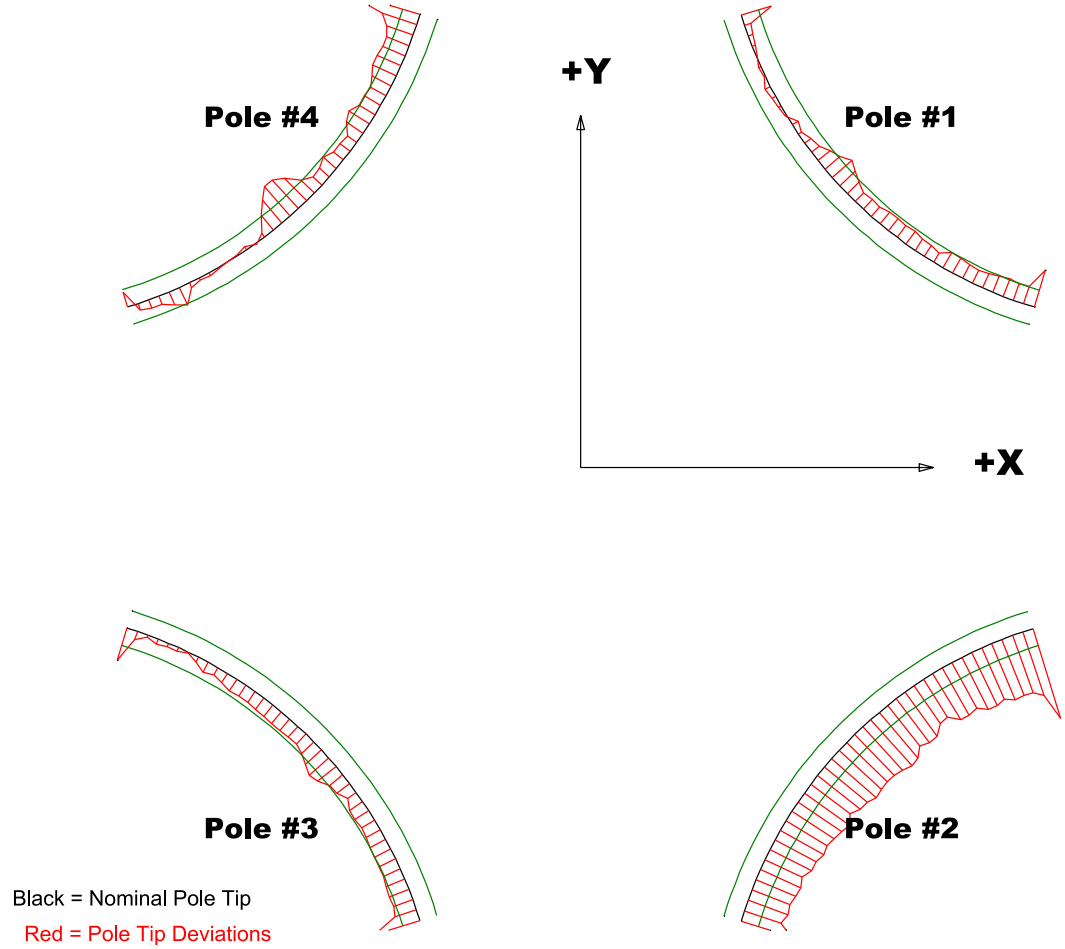
Composite Best-fit of Pole Tips, Upstream



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.	-0.00213	-0.00525	-0.00268	-0.00422
Max. Dev.	0.00034	-0.00217	-0.00007	0.00108

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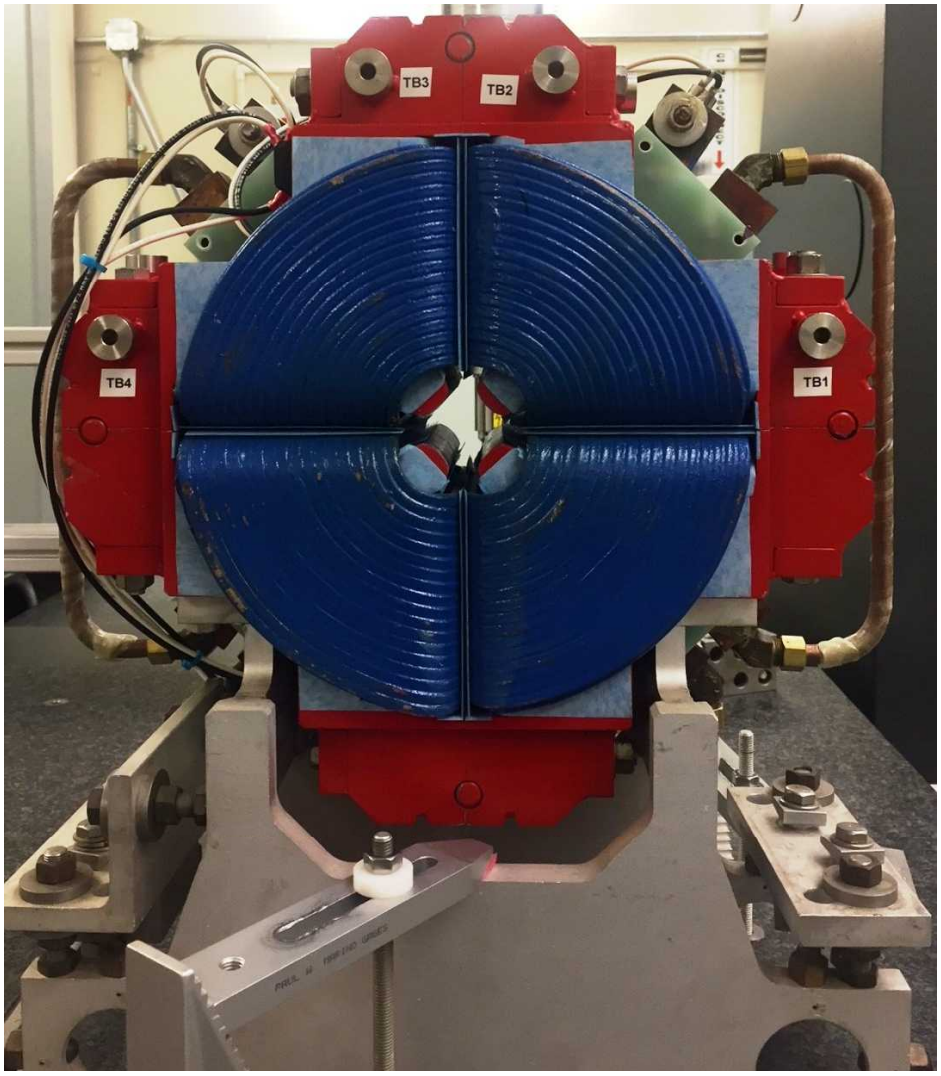
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.07485

Angle in Milliradians :-1.30639

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