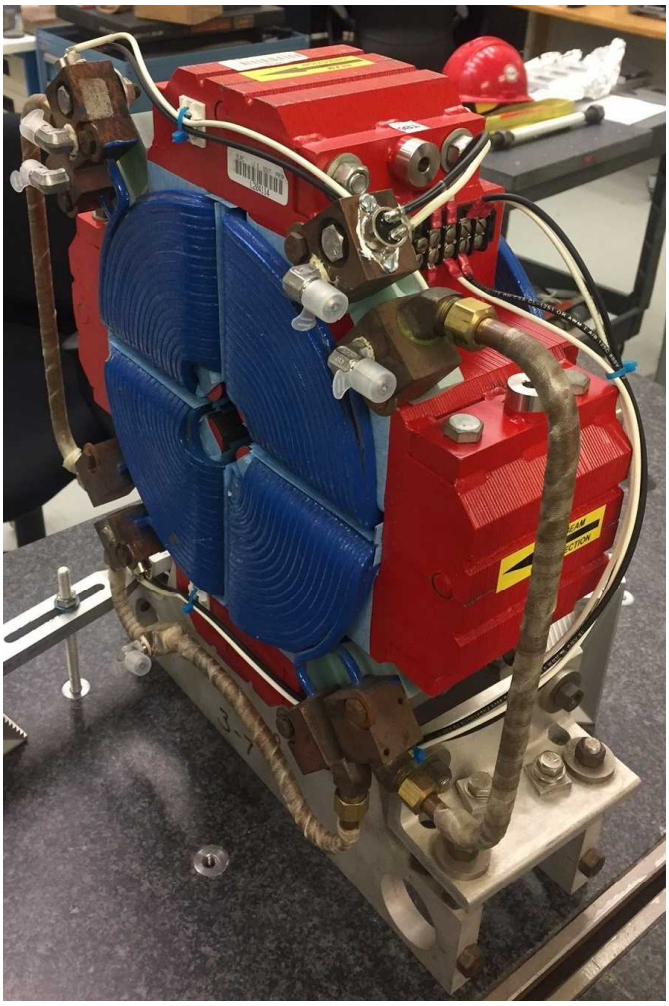
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4126
Mfg. S/N : E051

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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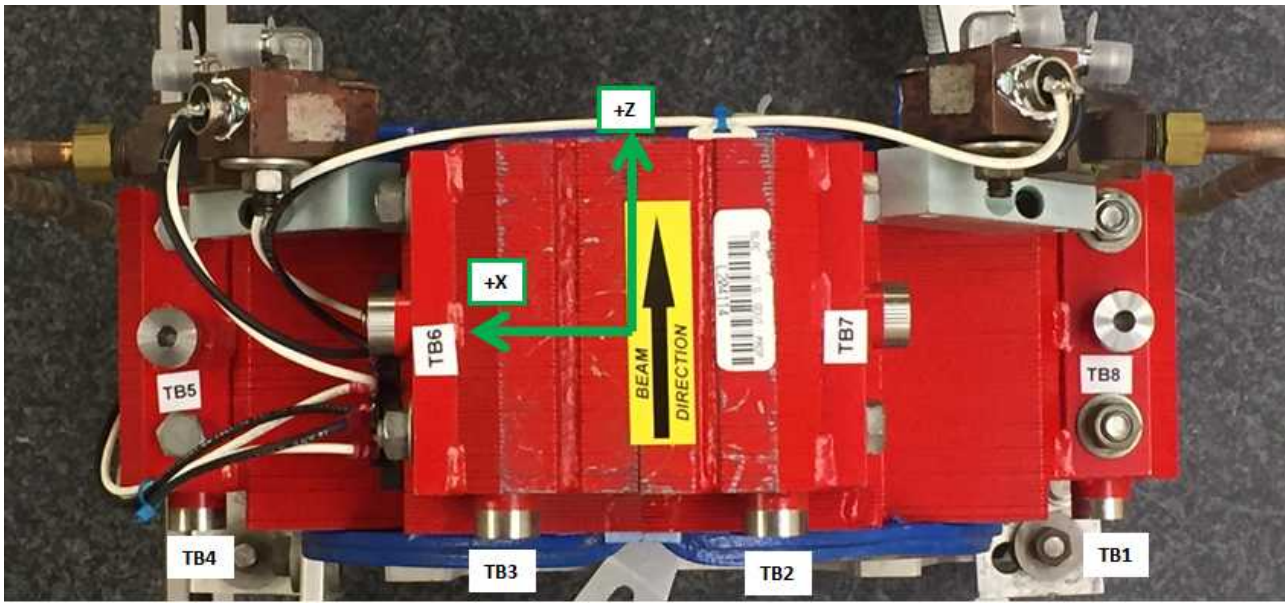
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7766	1.5268	-3.1769
TB 2	-1.4905	5.7385	-3.1787
TB 3	1.3307	6.0919	-3.1774
TB 4	5.7079	1.4797	-3.1839
TB 5	5.8217	4.0073	0.2467
TB 6	3.9982	5.8418	0.2364
TB 7	-4.0057	5.8459	0.2288
TB 8	-5.8195	3.9973	0.2288

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

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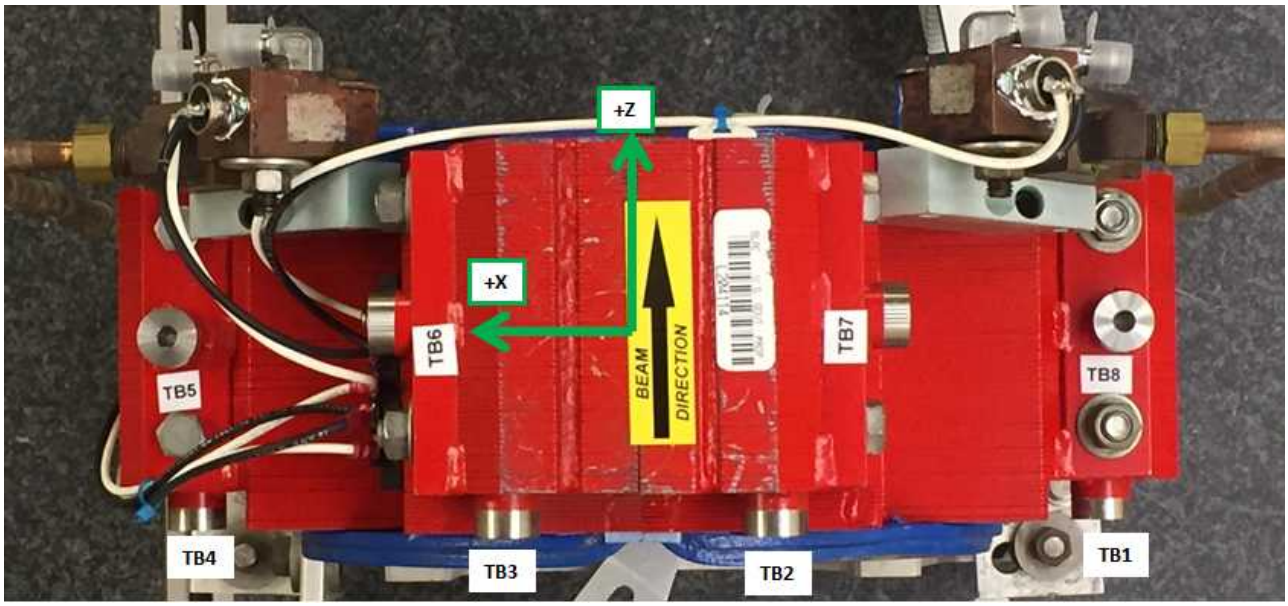
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7786	1.5247	-2.4886
TB 2	-1.4899	5.7416	-2.4905
TB 3	1.3260	6.0887	-2.4902
TB 4	5.7145	1.4834	-2.4958
TB 5	5.8239	3.3201	0.2481
TB 6	3.3106	5.8387	0.2371
TB 7	-3.3169	5.8478	0.2279
TB 8	-5.8178	3.3095	0.2295

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

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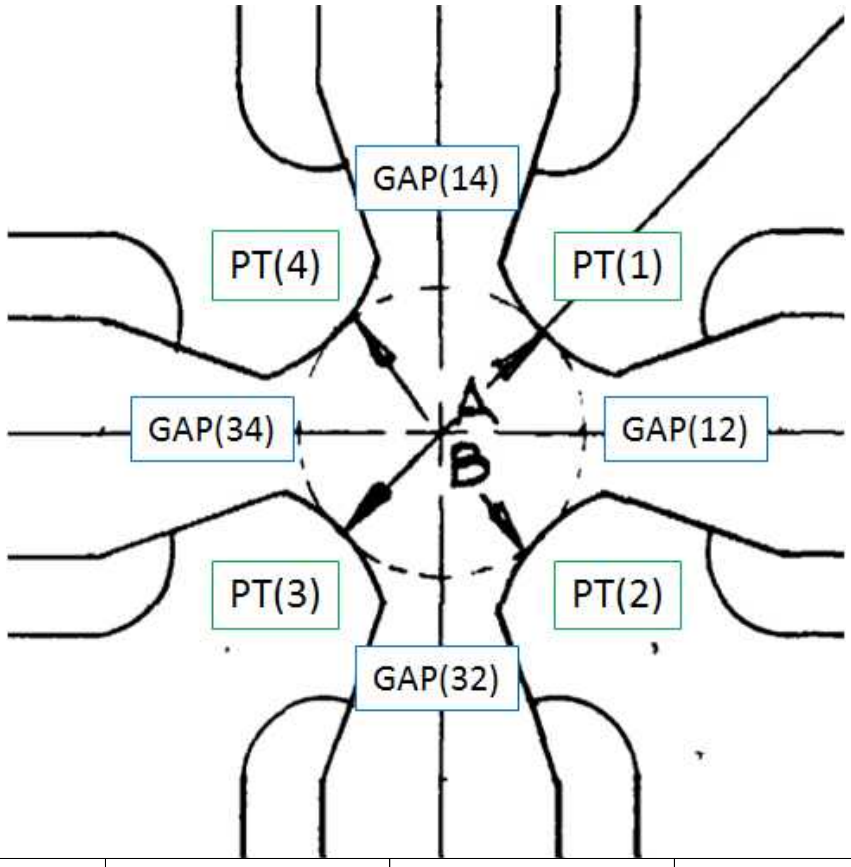
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08486	1.08792
PT Distance 2-4(B)	1.085	1.08377	1.08693
Gap 1-2	0.4546	0.45928	0.46214
Gap 2-3	0.4546	0.46592	0.4609
Gap 3-4	0.4546	0.45086	0.46011
Gap 4-1	0.4546	0.46229	0.46092

Dimensions in Inch

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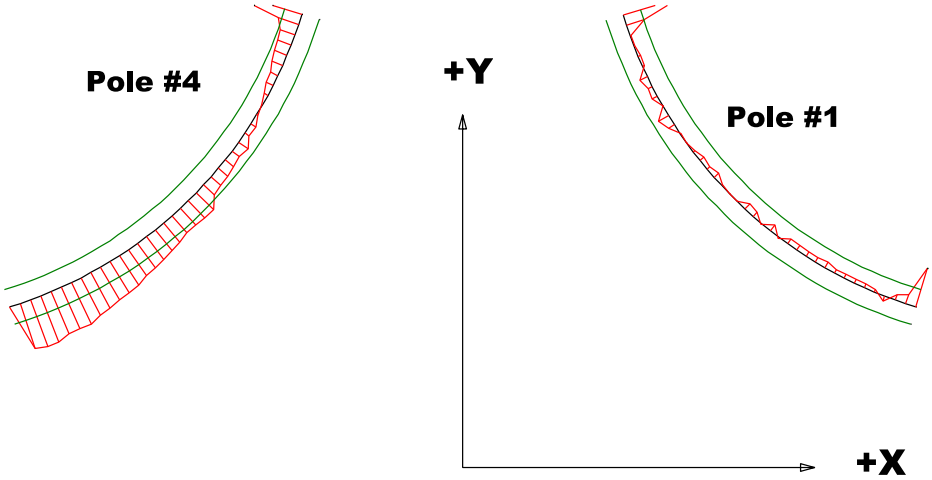
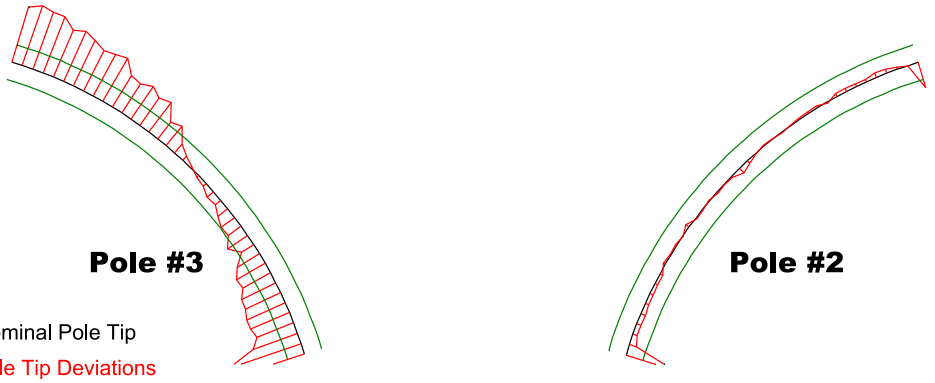
Composite Best-fit of Pole Tips, Downstream





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.	-0.00325	-0.00269	-0.00805	-0.00431
Max. Dev.	0.00063	0.00028	0.00352	0.00279

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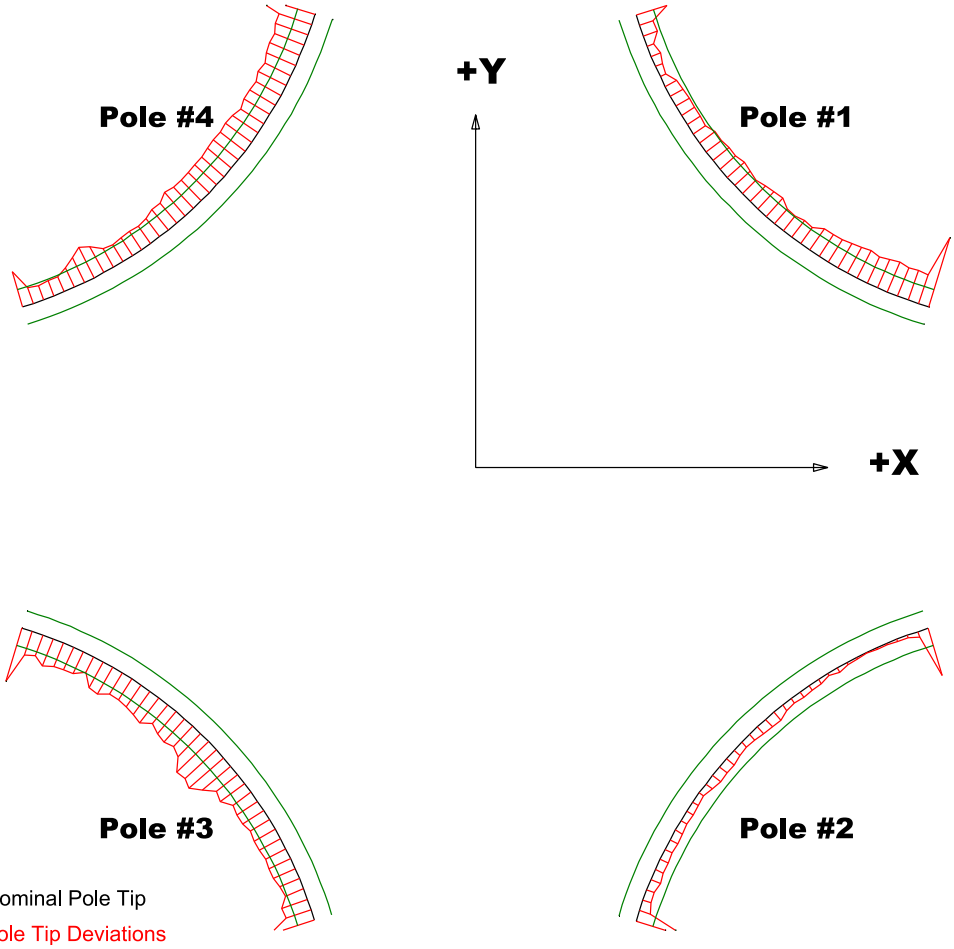
Composite Best-fit of Pole Tips, Upstream



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.	-0.00404	-0.00279	-0.0031	-0.00376
Max. Dev.	-0.00033	-0.00006	-0.00095	-0.00082

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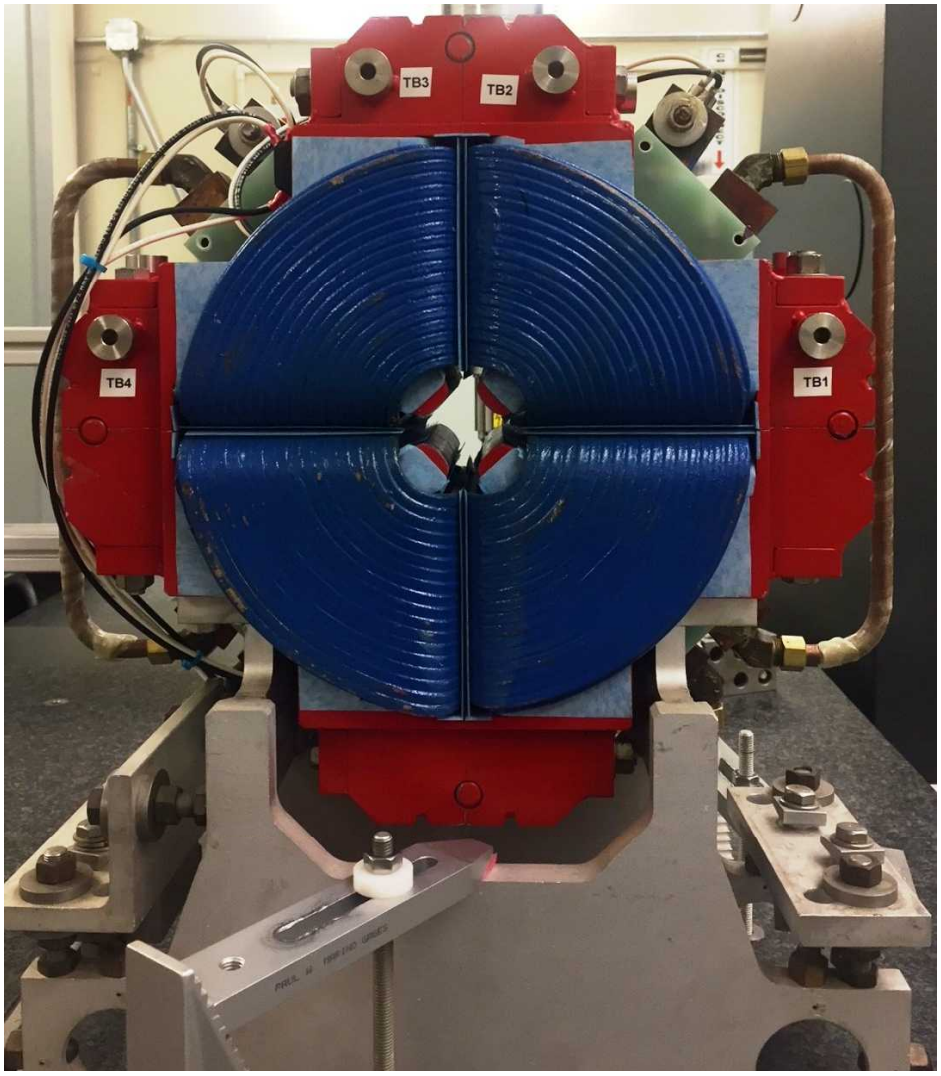
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.05881

Angle in Milliradians :-1.02638

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