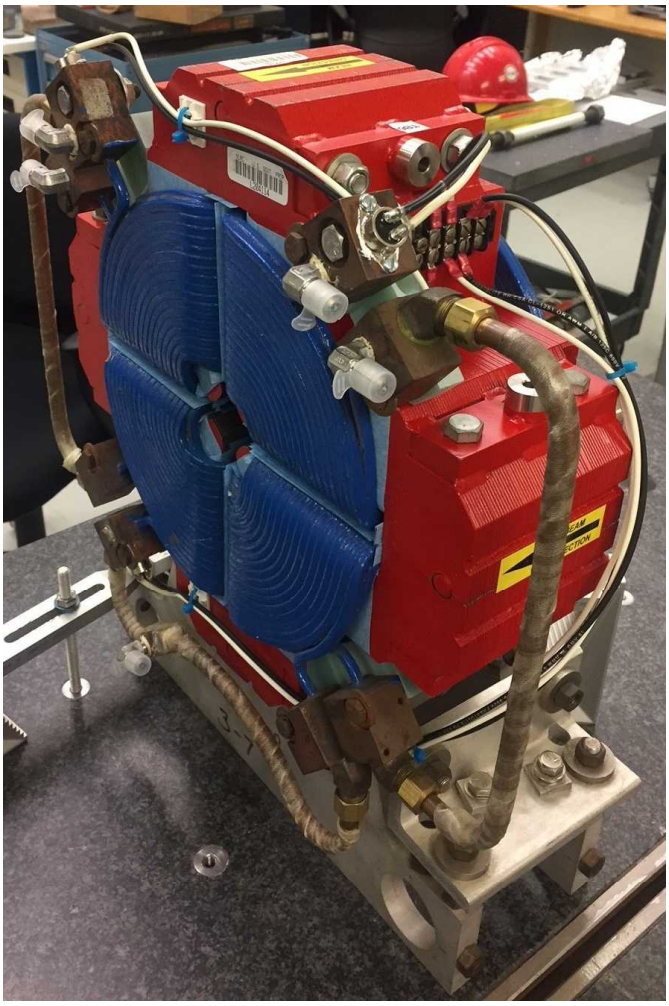
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4122
Mfg. S/N : E074

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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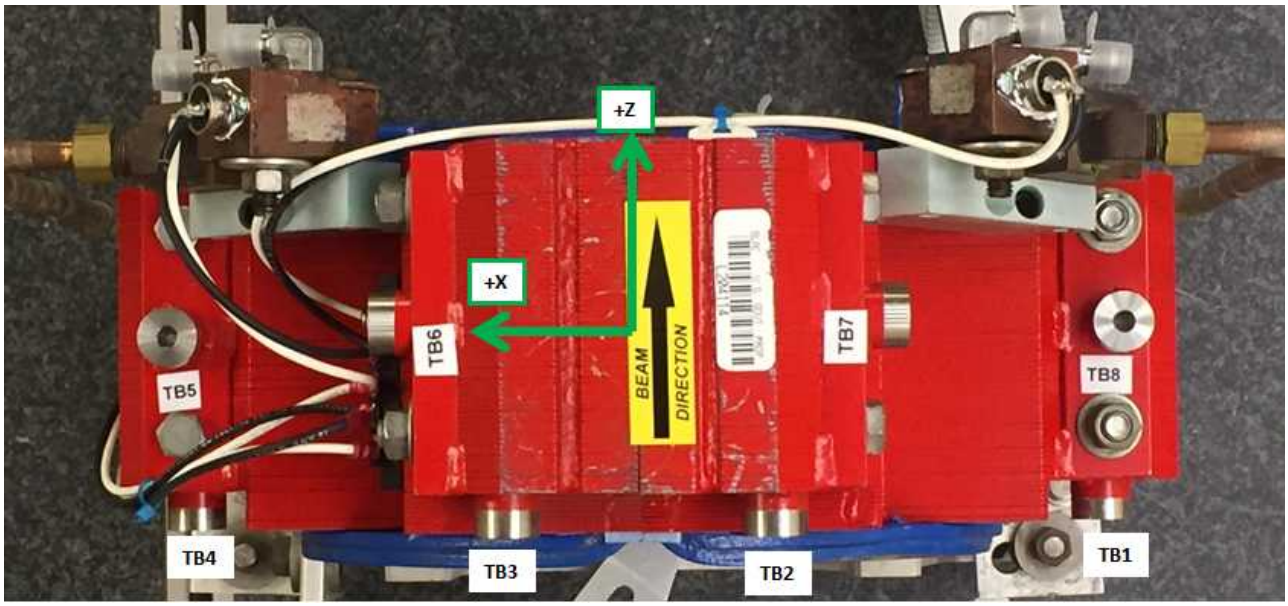
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7657	1.5098	-3.1850
TB 2	-1.5087	5.7403	-3.1927
TB 3	1.5044	5.7572	-3.1828
TB 4	5.7504	1.5097	-3.1849
TB 5	5.8435	4.0055	0.2535
TB 6	3.9969	5.8580	0.2472
TB 7	-4.0063	5.8331	0.2277
TB 8	-5.8724	3.9976	0.2537

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

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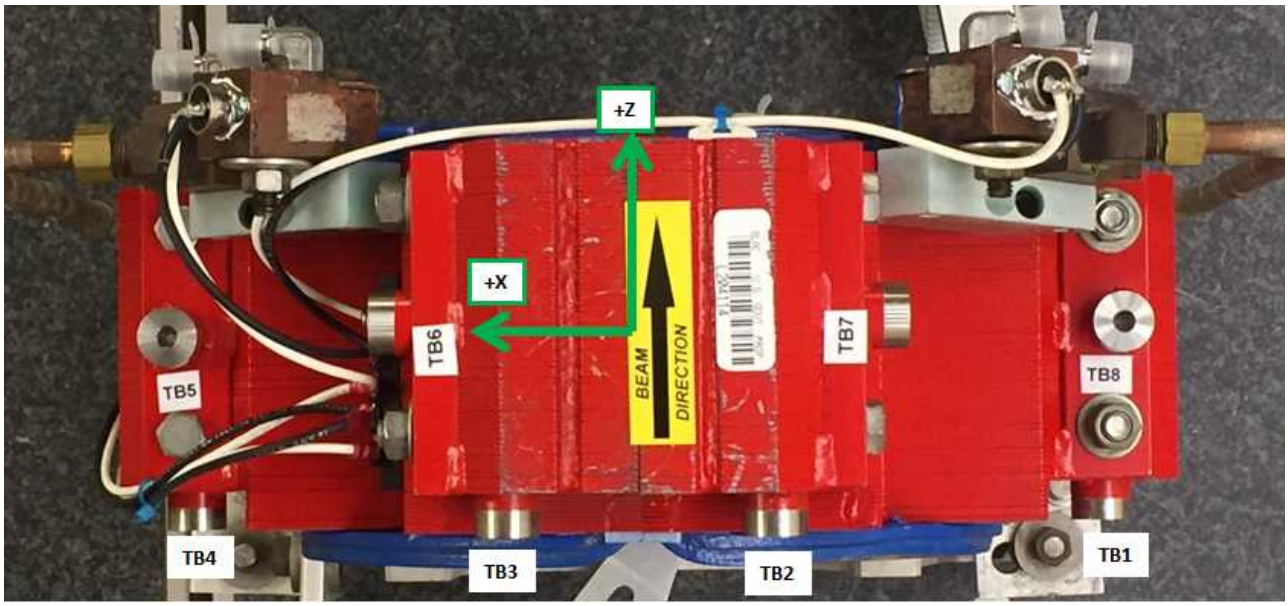
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7624	1.5106	-2.4962
TB 2	-1.5055	5.7468	-2.5047
TB 3	1.4996	5.7569	-2.4937
TB 4	5.7498	1.5093	-2.4967
TB 5	5.8435	3.3187	0.2553
TB 6	3.3093	5.8577	0.2469
TB 7	-3.3182	5.8329	0.2275
TB 8	-5.8703	3.3102	0.2522

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

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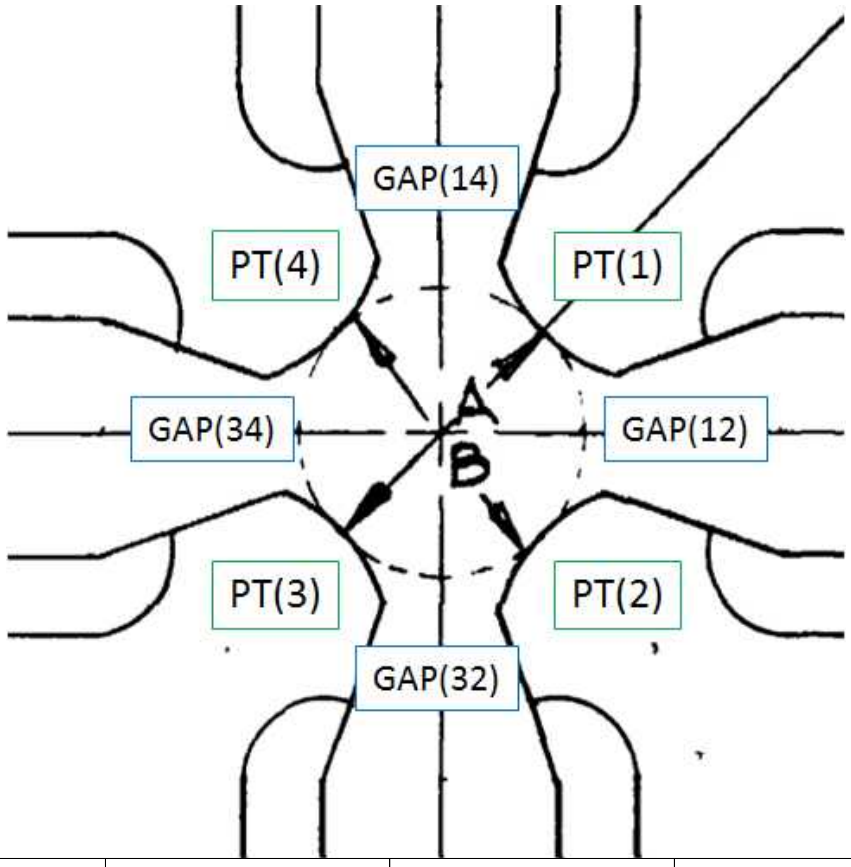
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08293	1.08586
PT Distance 2-4(B)	1.085	1.08362	1.08781
Gap 1-2	0.4546	0.46146	0.45776
Gap 2-3	0.4546	0.45858	0.46356
Gap 3-4	0.4546	0.45537	0.46165
Gap 4-1	0.4546	0.4551	0.46166

Dimensions in Inch

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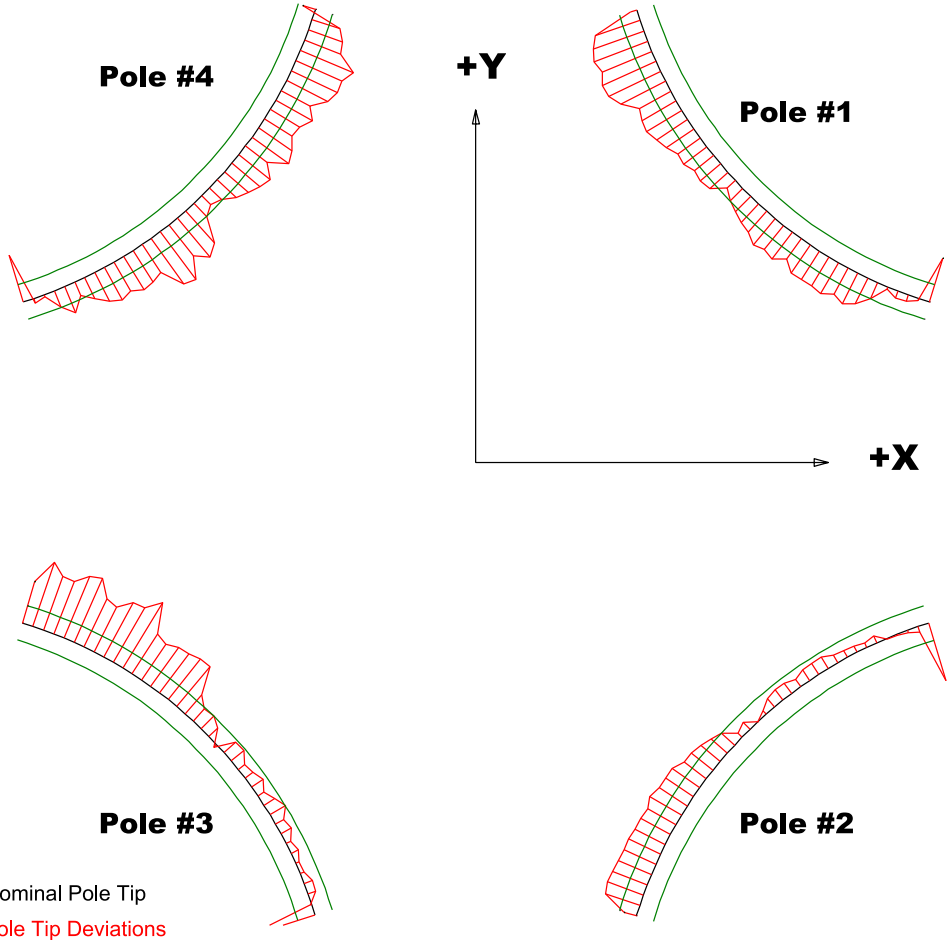
Composite Best-fit of Pole Tips, Downstream



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.	-0.00255	-0.00335	-0.00396	-0.0027
Max. Dev.	0.00329	0.00214	0.00425	0.00335

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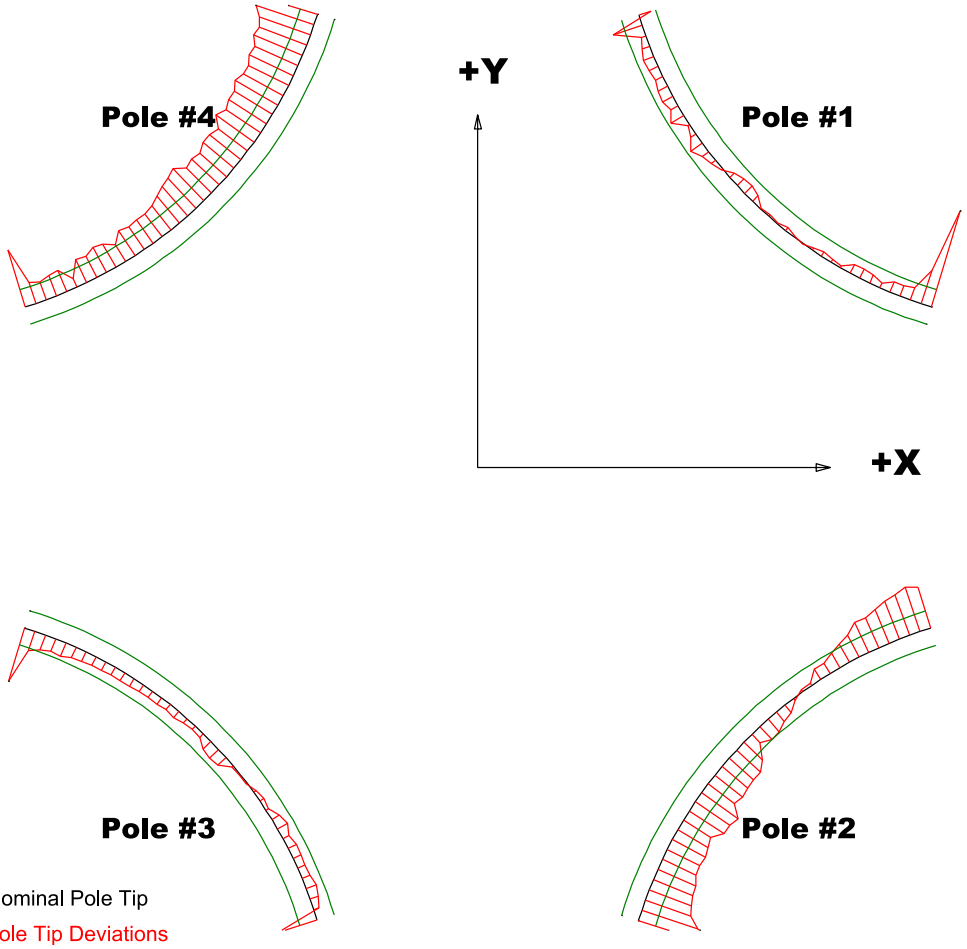
Composite Best-fit of Pole Tips, Upstream



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.	-0.0056	-0.00669	-0.00312	-0.0057
Max. Dev.	0.00168	0.00261	0.00064	-0.00051

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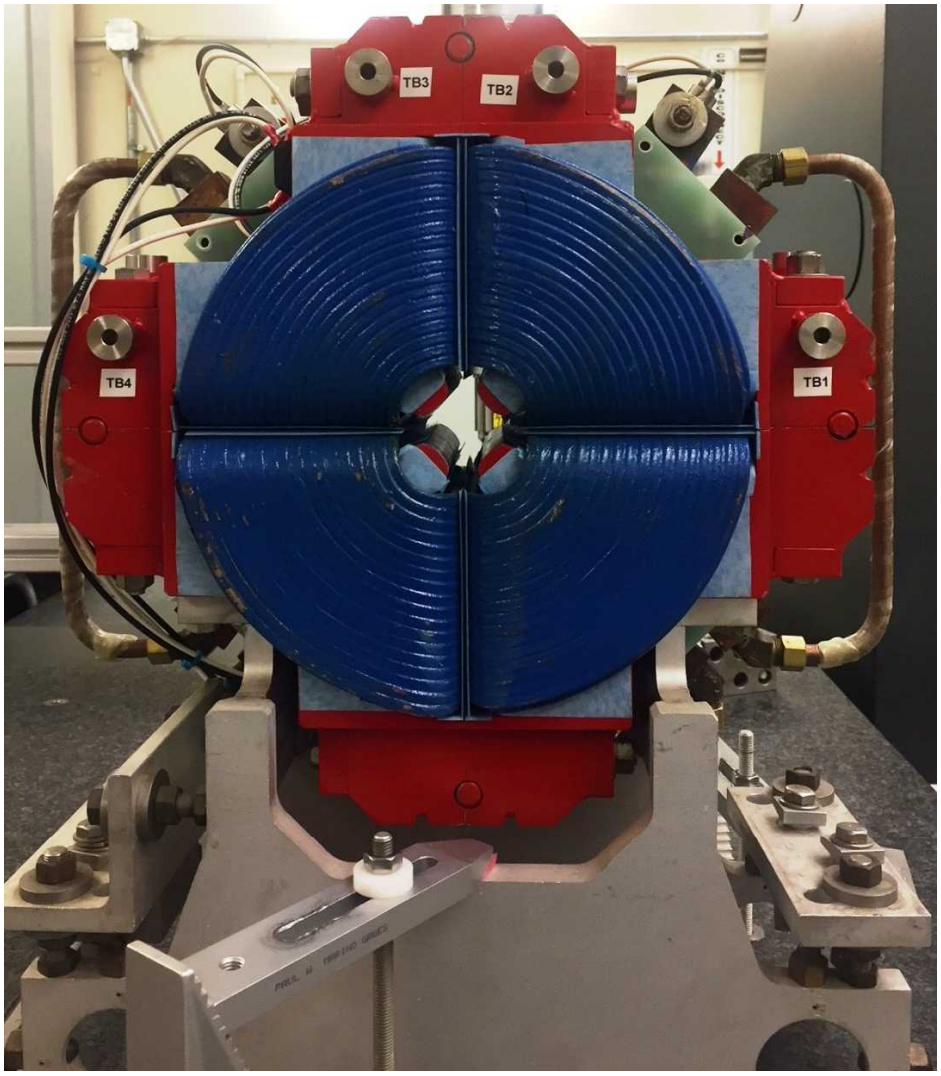
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.04091

Angle in Milliradians :-0.71398

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