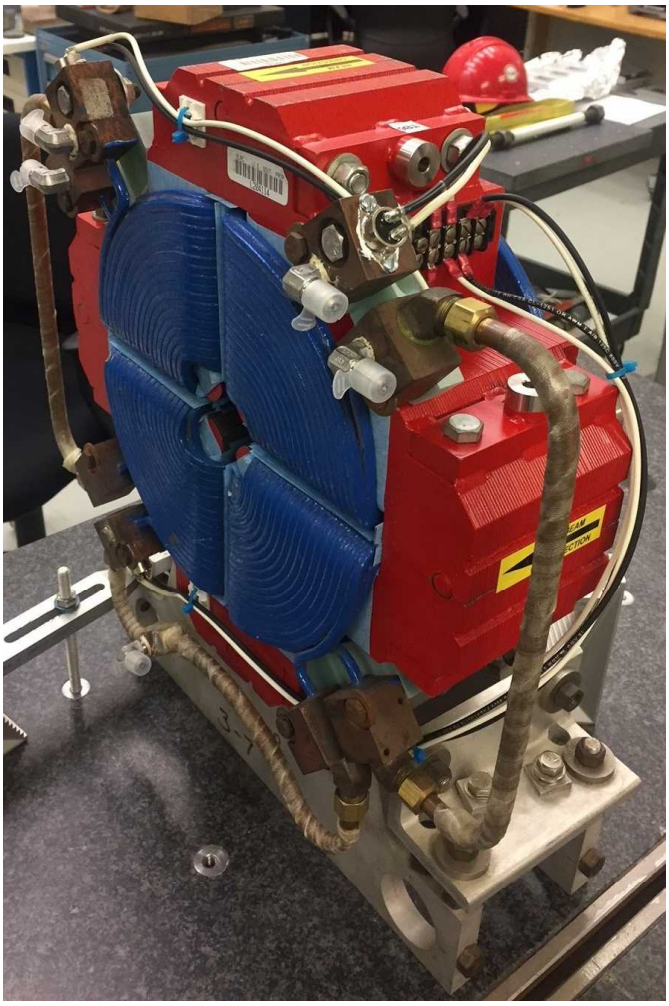
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4124
Mfg. S/N : E045

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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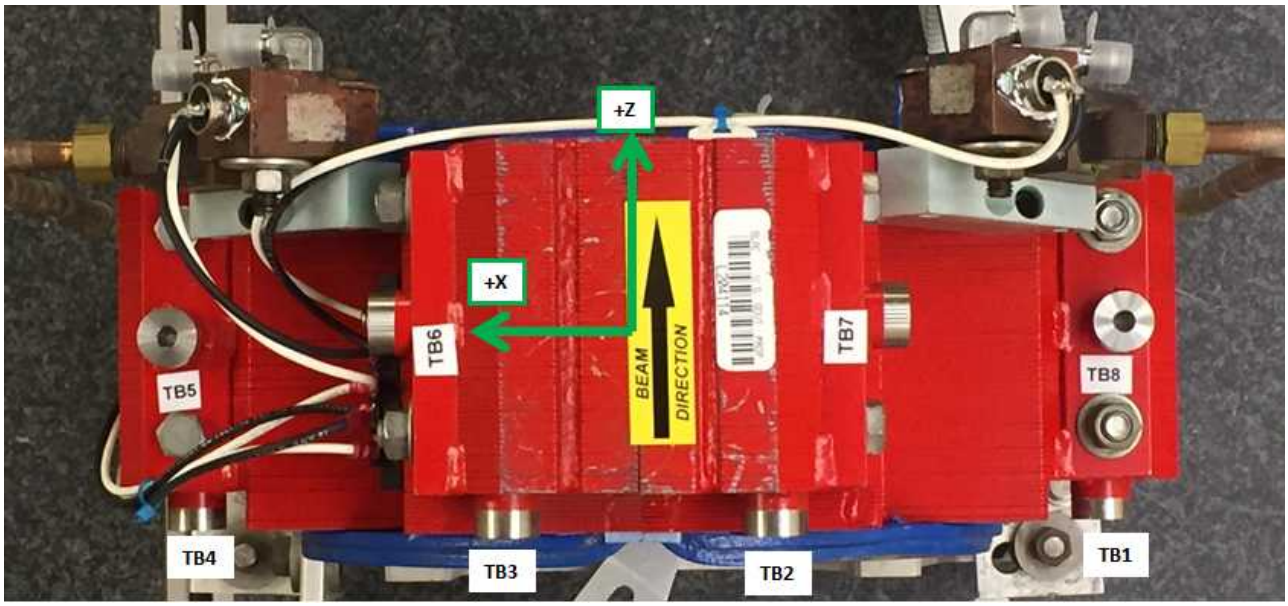
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7713	1.4756	-3.1845
TB 2	-1.5904	5.7418	-3.1818
TB 3	1.4945	5.7458	-3.1644
TB 4	5.7754	1.4986	-3.1626
TB 5	5.8189	4.0110	0.2358
TB 6	4.0041	5.8229	0.2520
TB 7	-4.0125	5.8200	0.2481
TB 8	-5.8235	4.0053	0.2285

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

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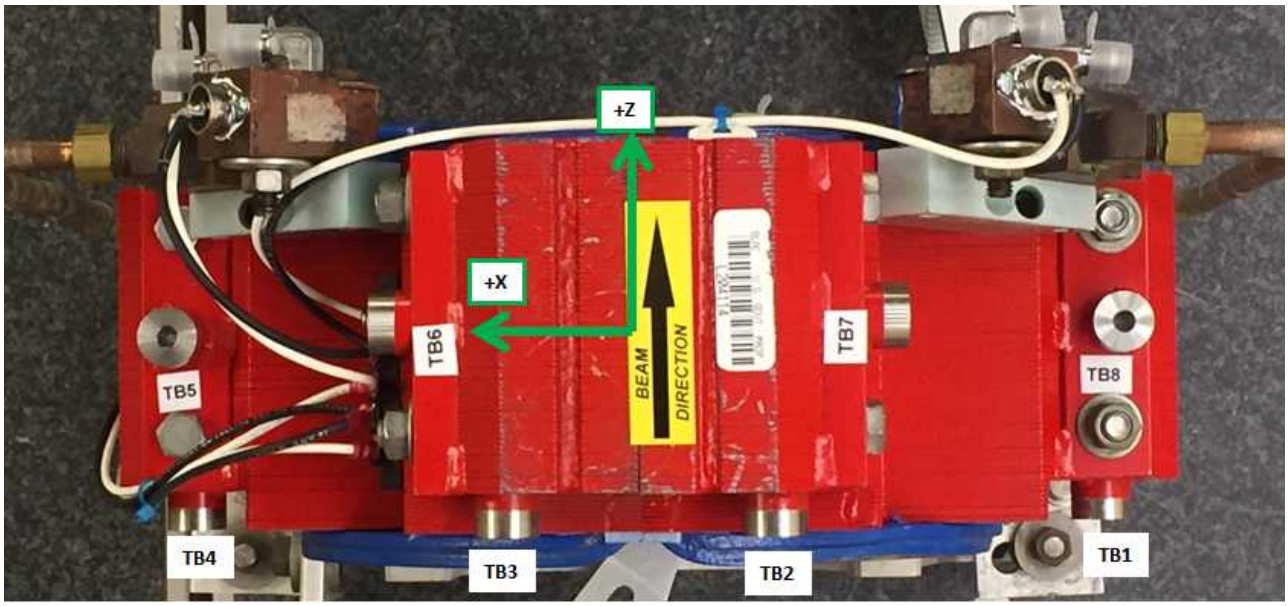
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7685	1.4753	-2.4964
TB 2	-1.5906	5.7429	-2.4938
TB 3	1.4912	5.7479	-2.4765
TB 4	5.7743	1.5001	-2.4745
TB 5	5.8048	3.3240	0.2411
TB 6	3.3161	5.8271	0.2521
TB 7	-3.3248	5.8249	0.2486
TB 8	-5.8213	3.3172	0.2254

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

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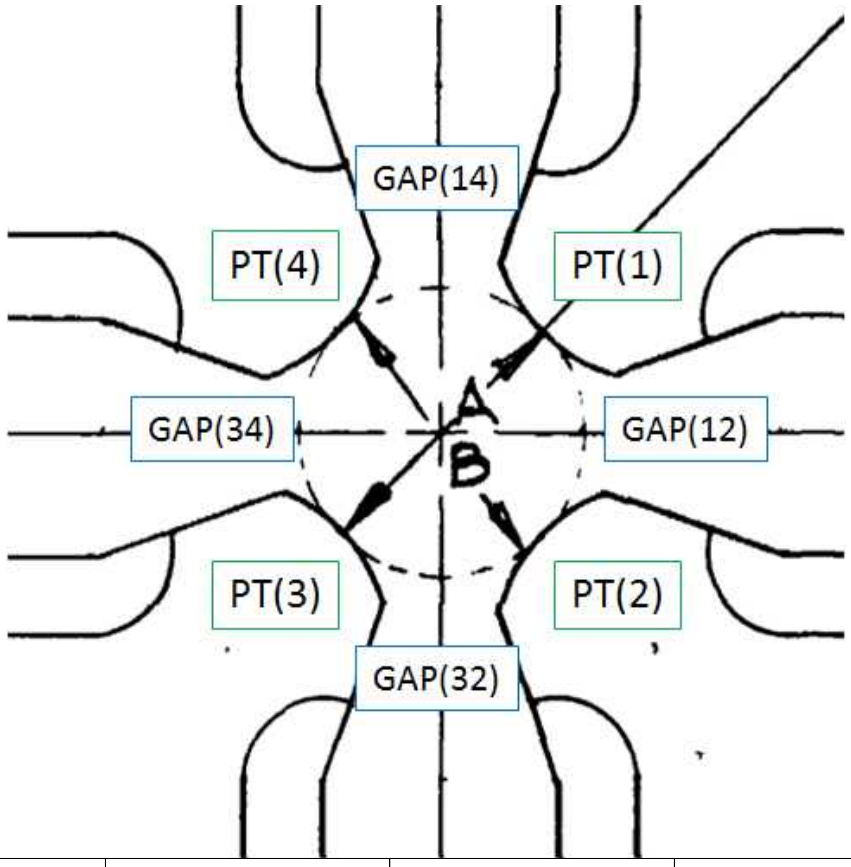
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.084	1.08591
PT Distance 2-4(B)	1.085	1.08529	1.09055
Gap 1-2	0.4546	0.4639	0.45922
Gap 2-3	0.4546	0.46001	0.45931
Gap 3-4	0.4546	0.44265	0.46392
Gap 4-1	0.4546	0.45561	0.461

Dimensions in Inch

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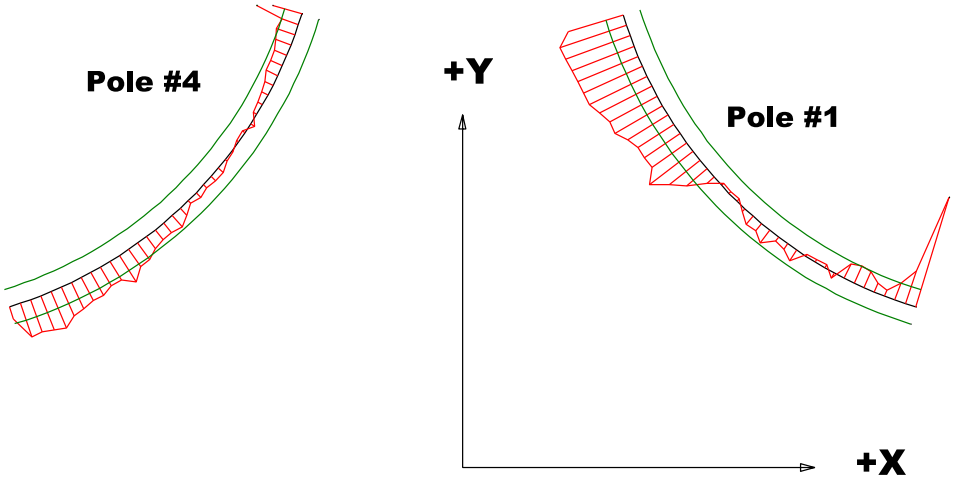
Composite Best-fit of Pole Tips, Downstream



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.	-0.00637	-0.00278	-0.00272	-0.00388
Max. Dev.	0.0039	-0.0001	0.00342	0.00221

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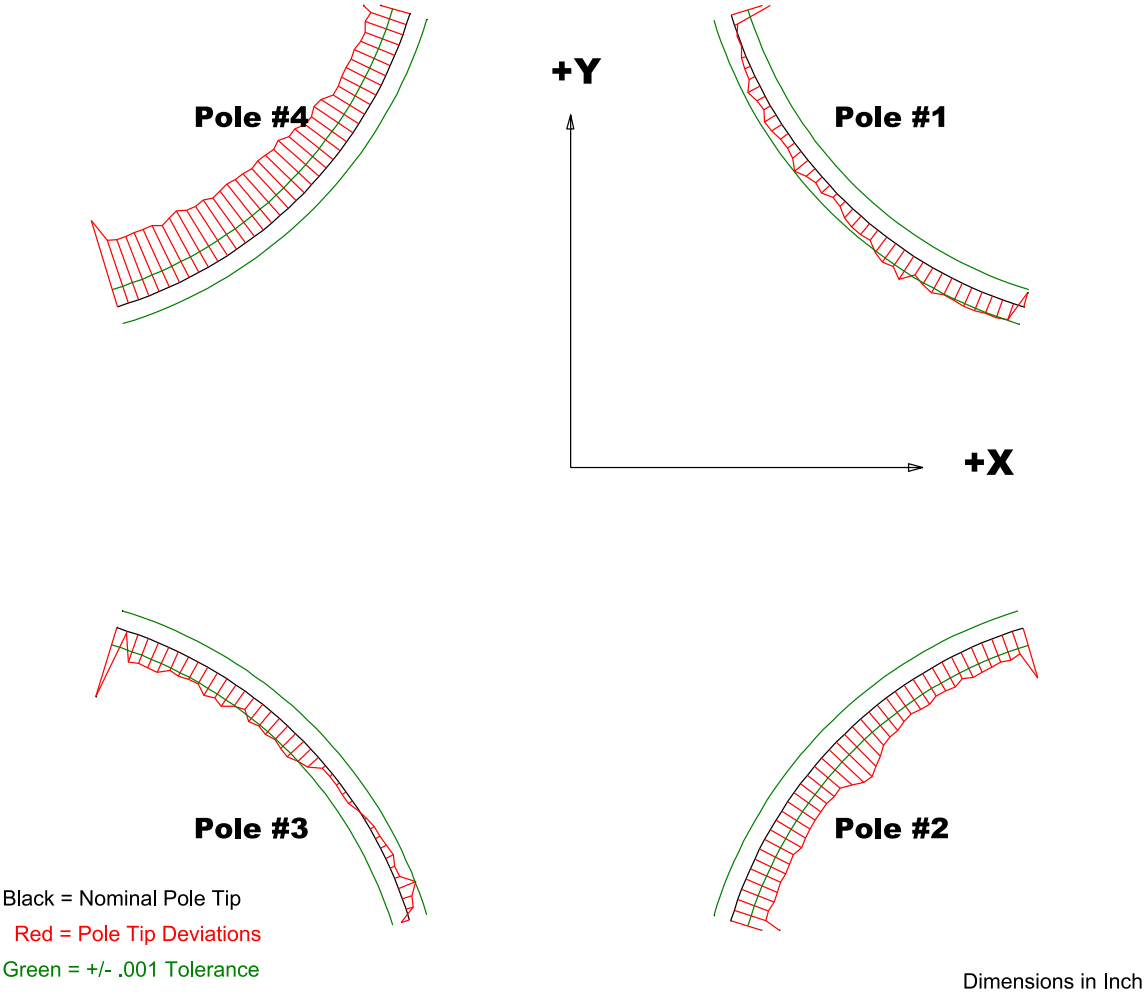
Composite Best-fit of Pole Tips, Upstream



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.	-0.00274	-0.00364	-0.00403	-0.00504
Max. Dev.	0.00154	-0.00131	0.00104	-0.00203

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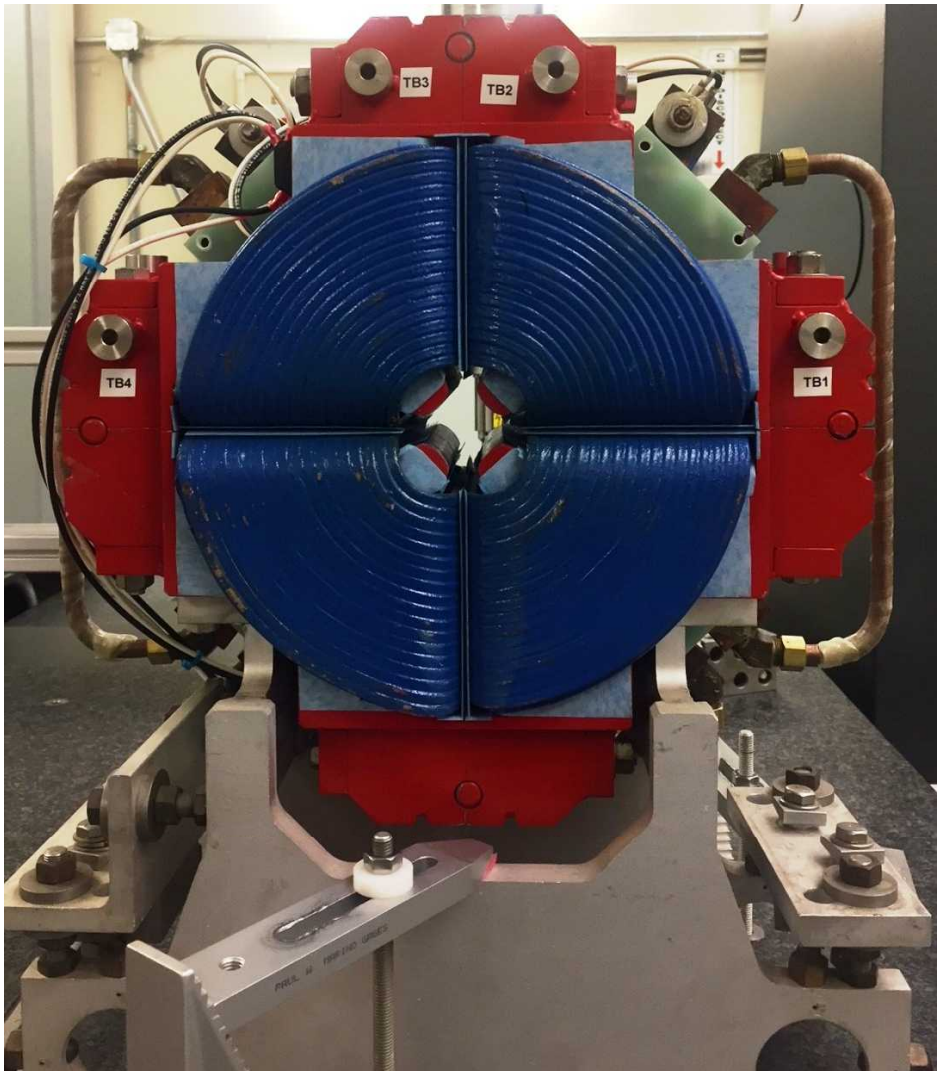
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.01557

Angle in Milliradians :-0.27177

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