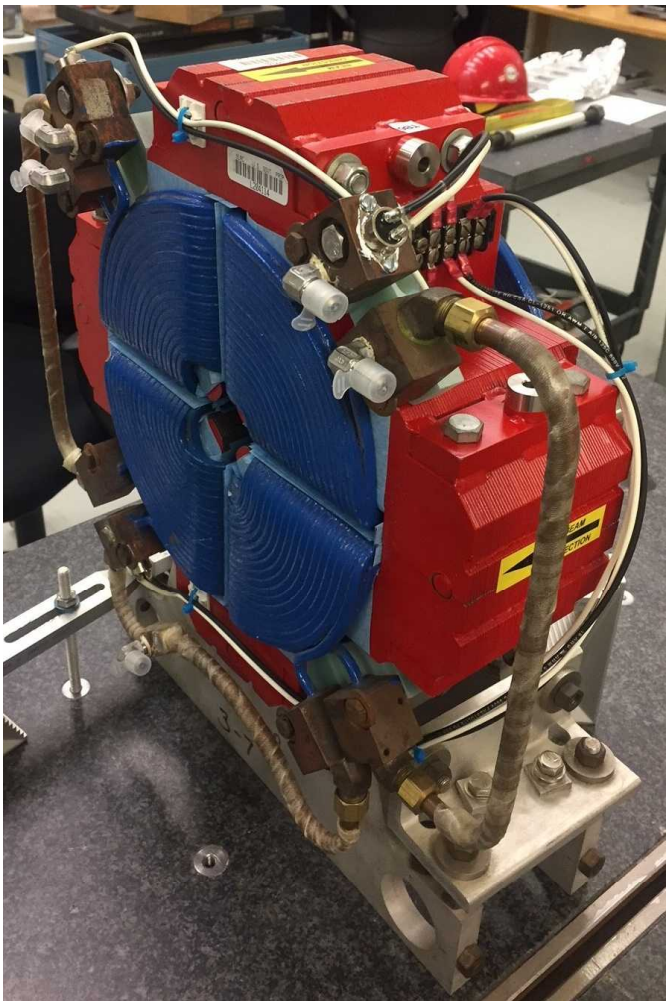
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4116
Mfg. S/N : E082

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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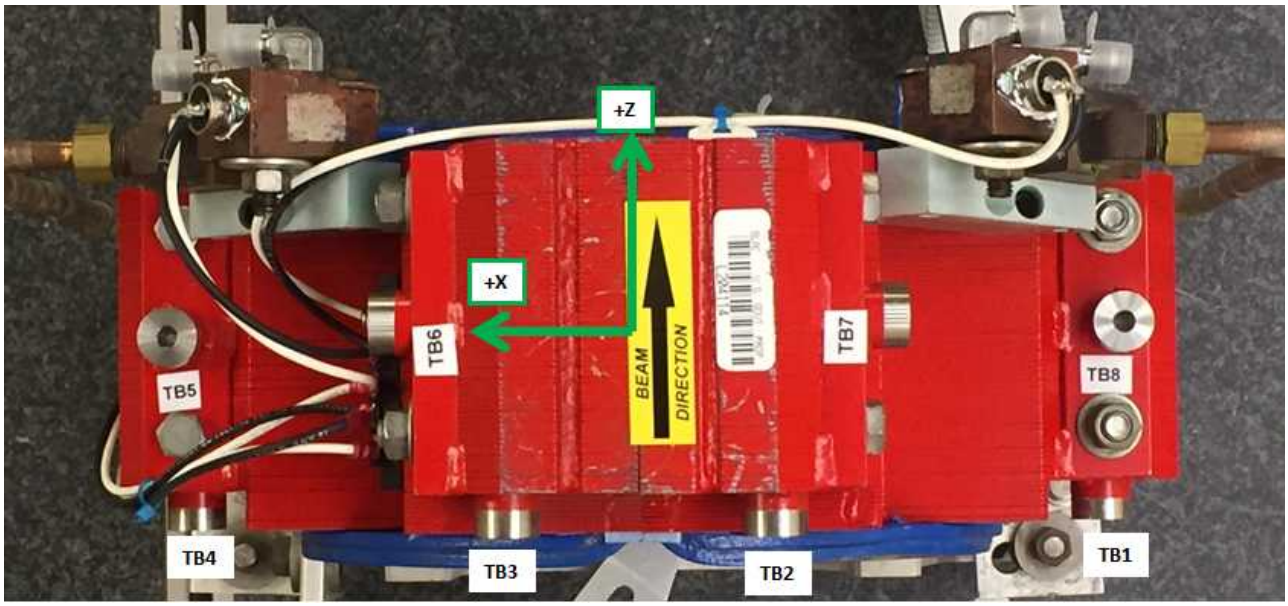
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7577	1.5114	-3.1980
TB 2	-1.5122	5.7451	-3.2116
TB 3	1.5188	5.7518	-3.2127
TB 4	5.7586	1.5055	-3.2047
TB 5	5.8518	4.0042	0.2026
TB 6	3.9969	5.8390	0.2007
TB 7	-4.0073	5.8193	0.1770
TB 8	-5.8531	3.9965	0.2089

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

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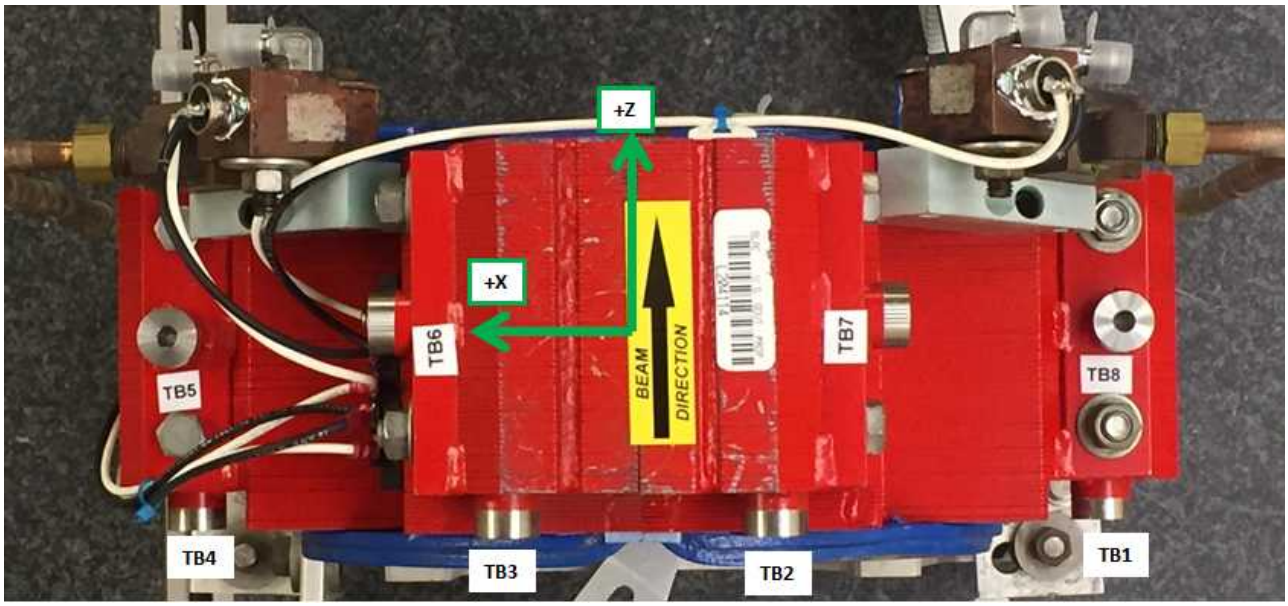
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7570	1.5123	-2.5094
TB 2	-1.5092	5.7512	-2.5232
TB 3	1.5120	5.7527	-2.5242
TB 4	5.7595	1.5063	-2.5168
TB 5	5.8546	3.3163	0.2049
TB 6	3.3358	5.8382	0.1997
TB 7	-3.3196	5.8276	0.1814
TB 8	-5.8496	3.3092	0.2091

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

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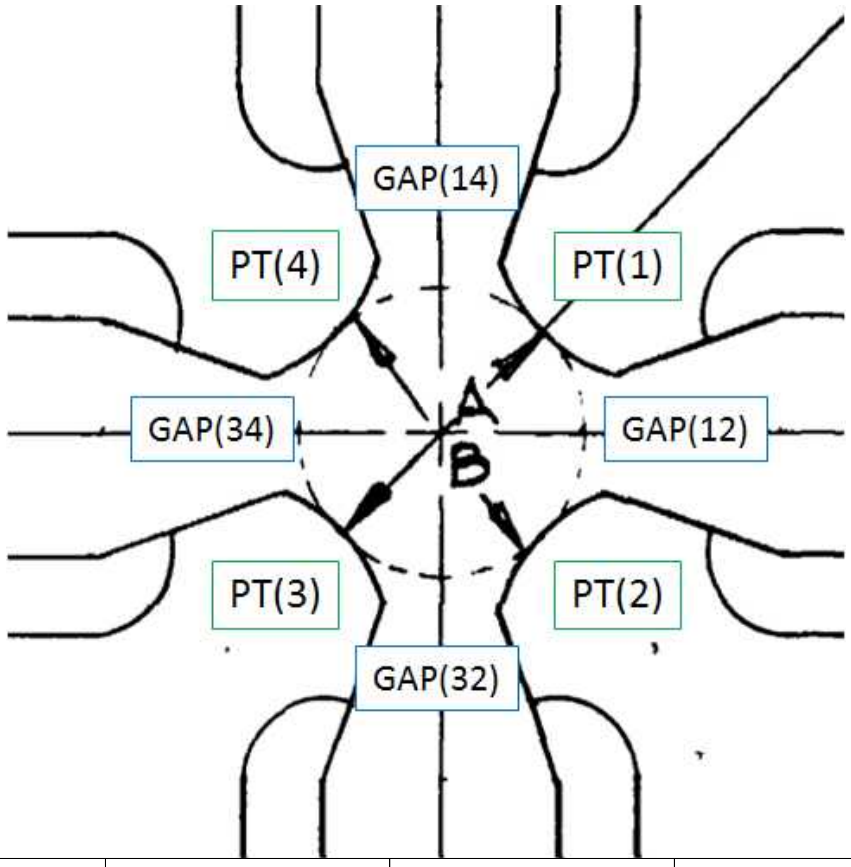
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08593	1.08766
PT Distance 2-4(B)	1.085	1.08665	1.08666
Gap 1-2	0.4546	0.45819	0.45495
Gap 2-3	0.4546	0.45228	0.46205
Gap 3-4	0.4546	0.45495	0.46044
Gap 4-1	0.4546	0.46494	0.46214

Dimensions in Inch

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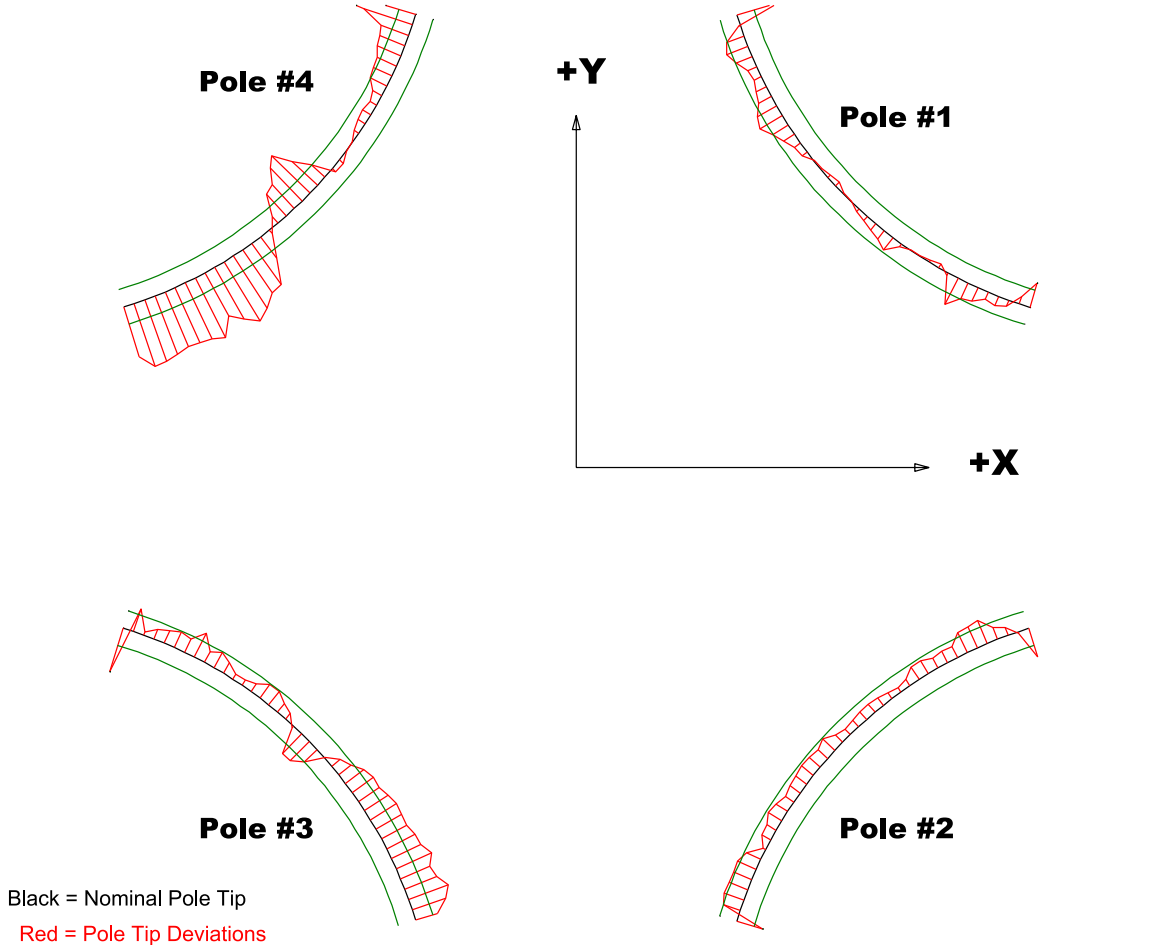
Composite Best-fit of Pole Tips, Downstream



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.	-0.00242	-0.00167	-0.00254	-0.00723
Max. Dev.	0.00163	0.00139	0.00235	0.00388

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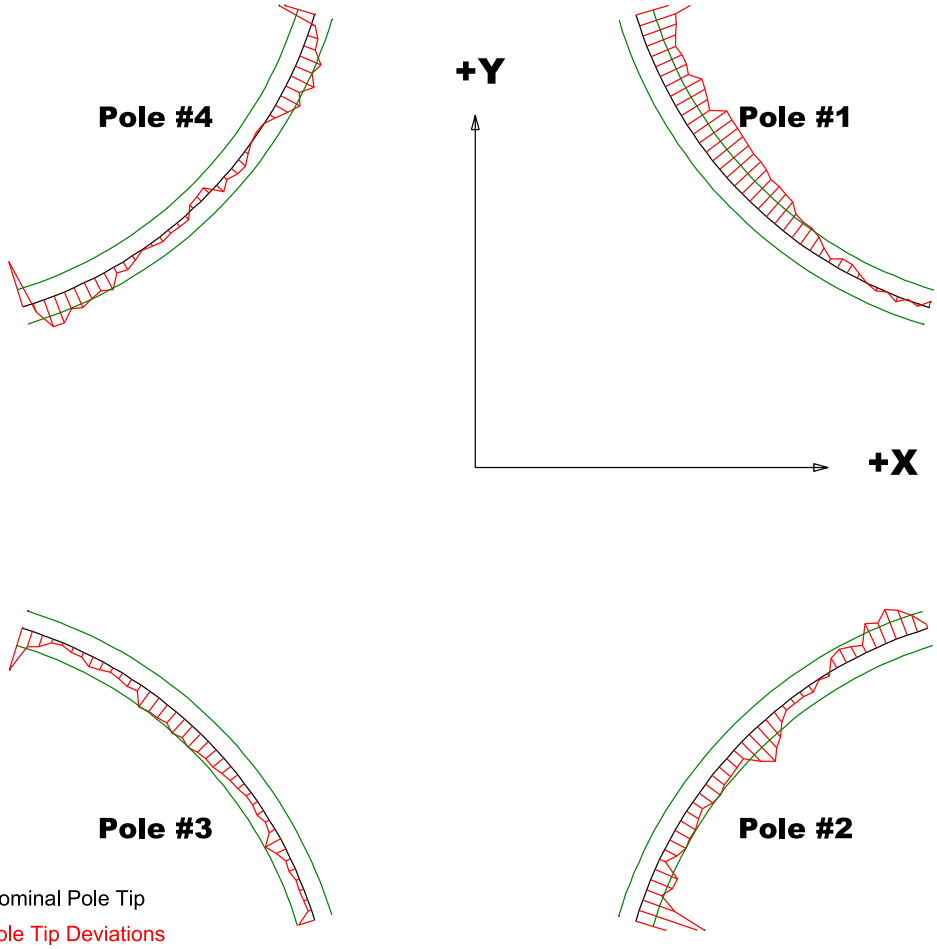
Composite Best-fit of Pole Tips, Upstream



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.	-0.00457	-0.00659	-0.00243	-0.00267
Max. Dev.	0.00031	0.0018	-0.00015	0.0016

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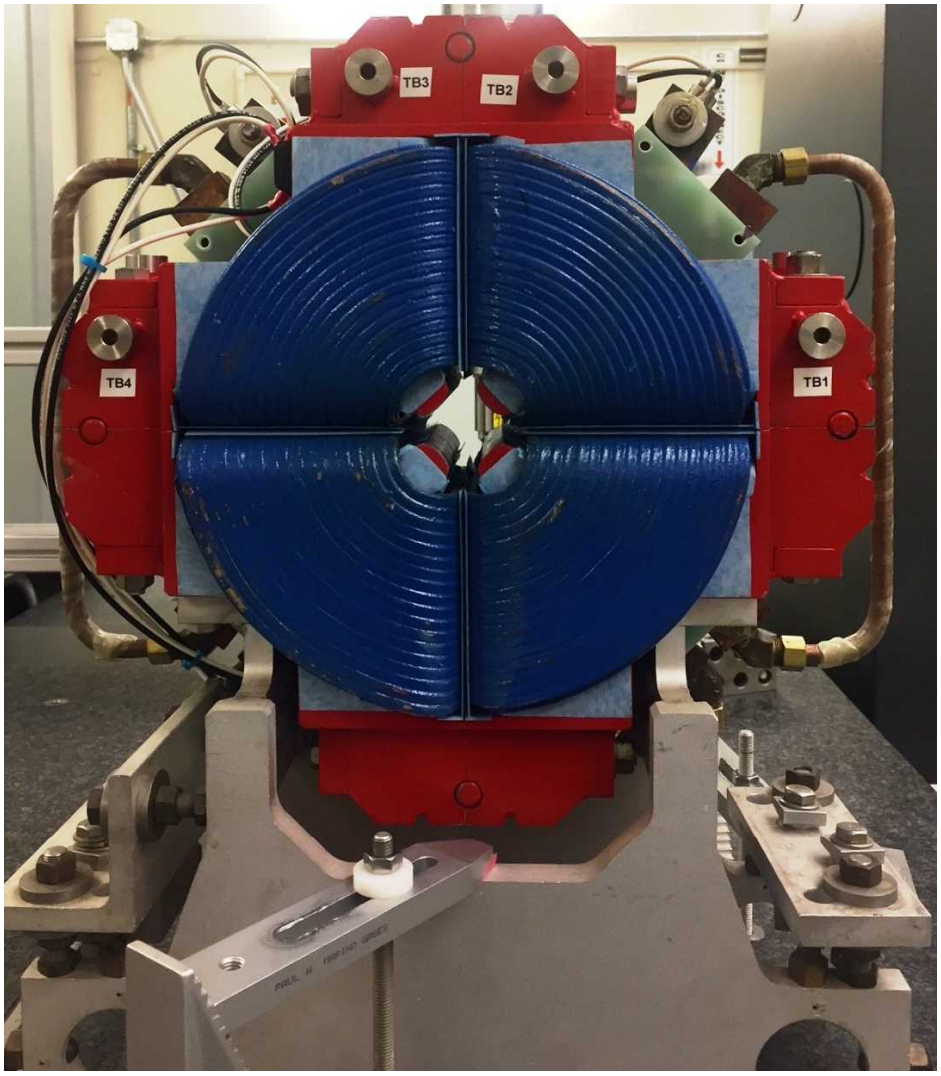
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.02052

Angle in Milliradians :-0.35816

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