LCLS II 1.085Q4.31 Fiducialization Report

Inspector : K. Caban
Engineer : A. Ibrahimov
Drawing No. : SA-902-675-01
Barcode # : 4247
Mfg. S/N : E006

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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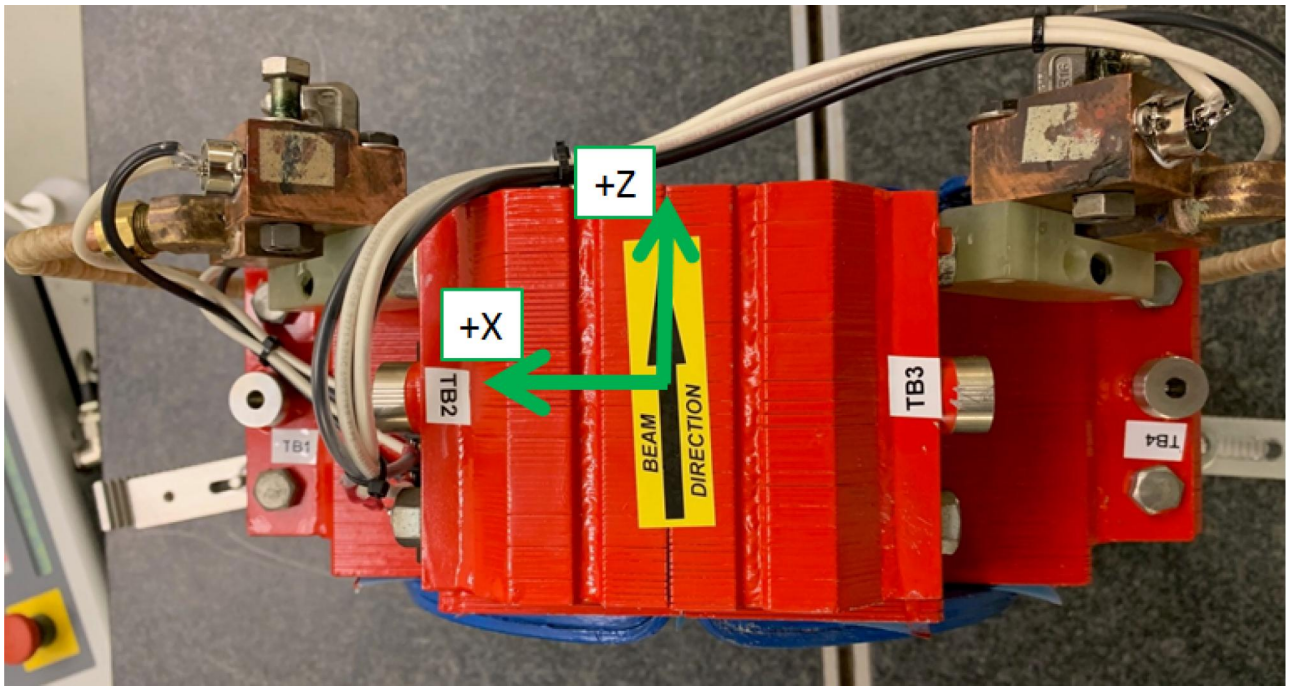
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	5.8473	4.0033	0.2345
TB 2	4.0032	5.8482	0.2575
TB 3	-3.9961	5.8387	0.2365
TB 4	-5.8527	3.9961	0.2766

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

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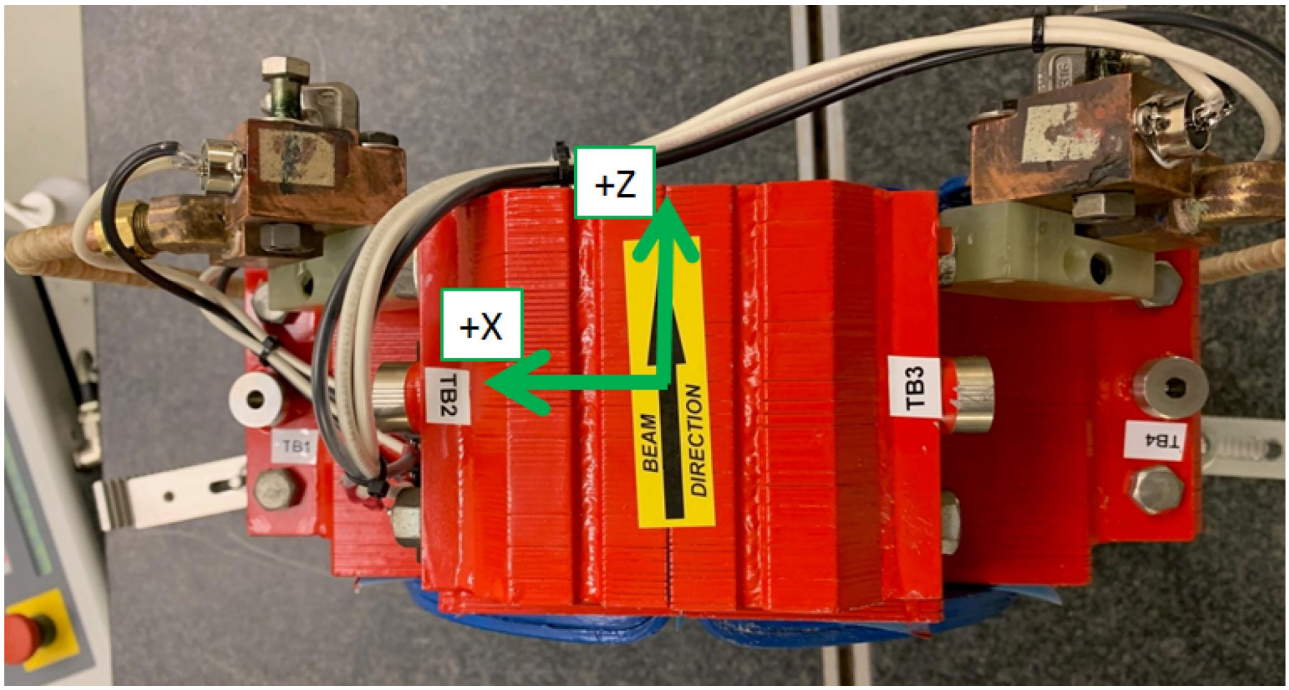
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	5.8442	3.3160	0.2373
TB 2	3.3149	5.8459	0.2569
TB 3	-3.3081	5.8392	0.2346
TB 4	-5.8490	3.3091	0.2765

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

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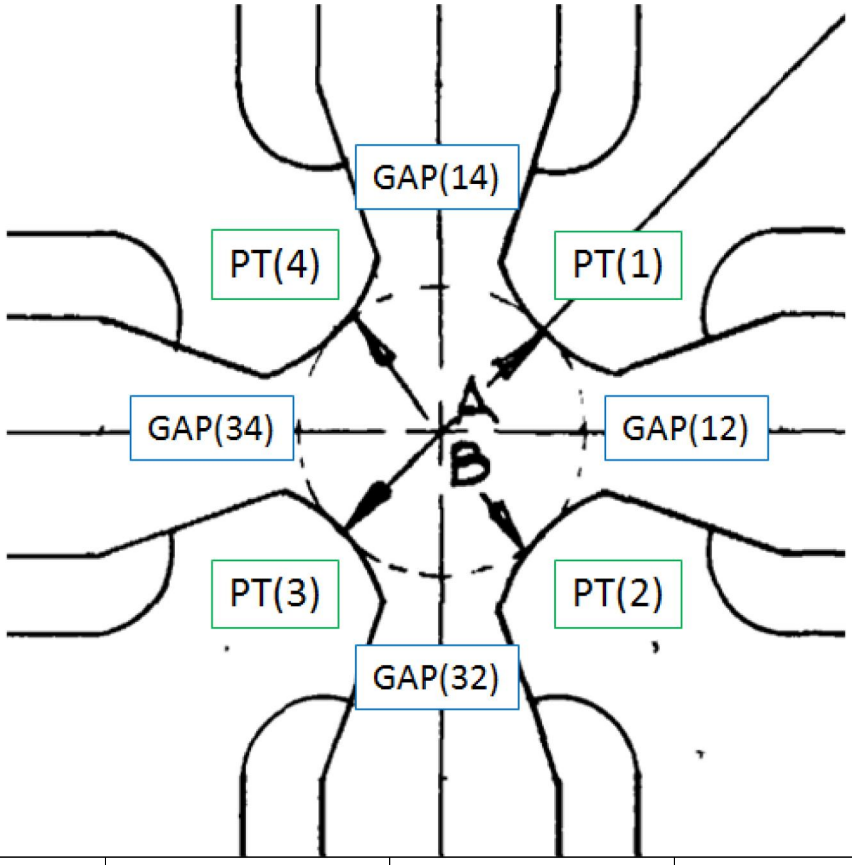
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08579	1.08652
PT Distance 2-4(B)	1.085	1.0851	1.08521
Gap 1-2	0.4546	0.45847	0.45926
Gap 2-3	0.4546	0.45879	0.46018
Gap 3-4	0.4546	0.457	0.46062
Gap 4-1	0.4546	0.45623	0.46325

Dimensions in Inch

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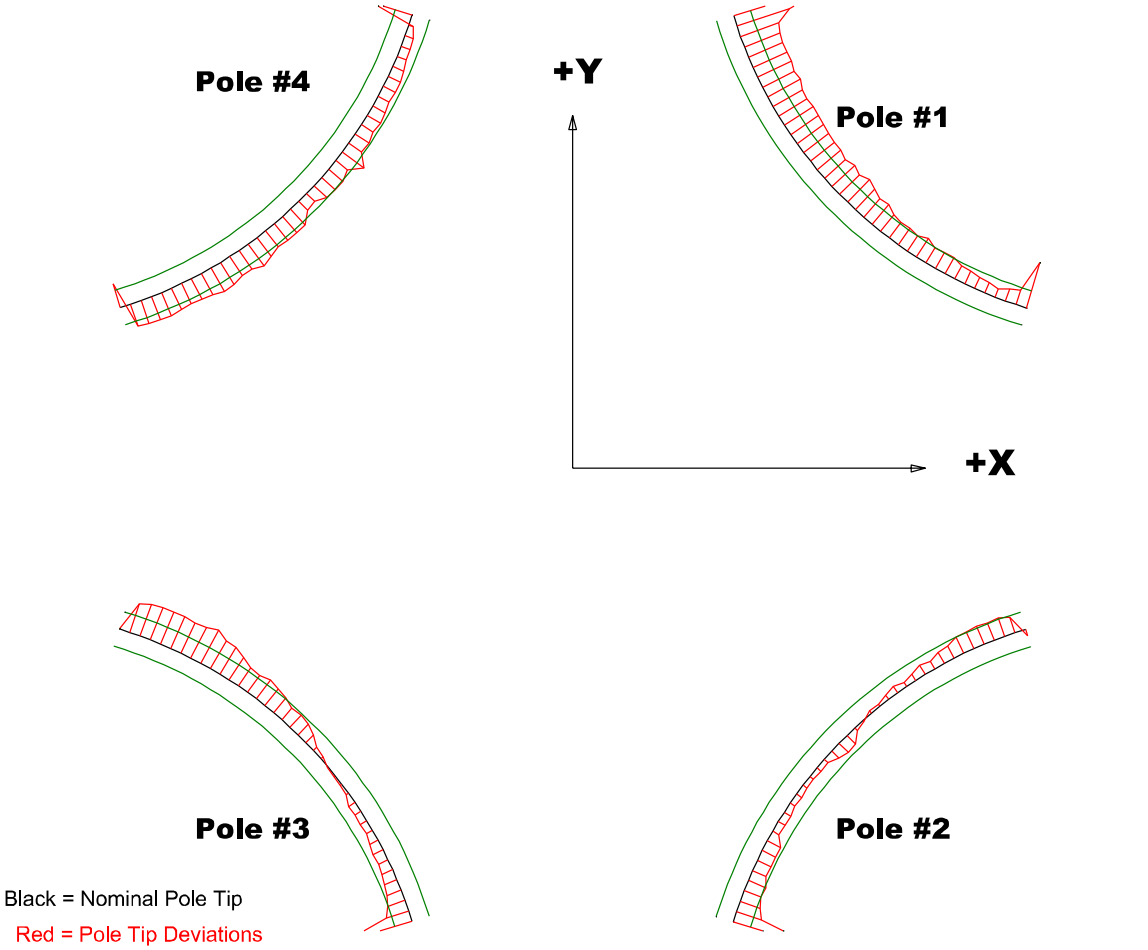
Composite Best-fit of Pole Tips, Downstream



Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00549	-0.00472	-0.00387	-0.00226
Max. Dev.	-0.00049	0.00109	0.00211	0.00152

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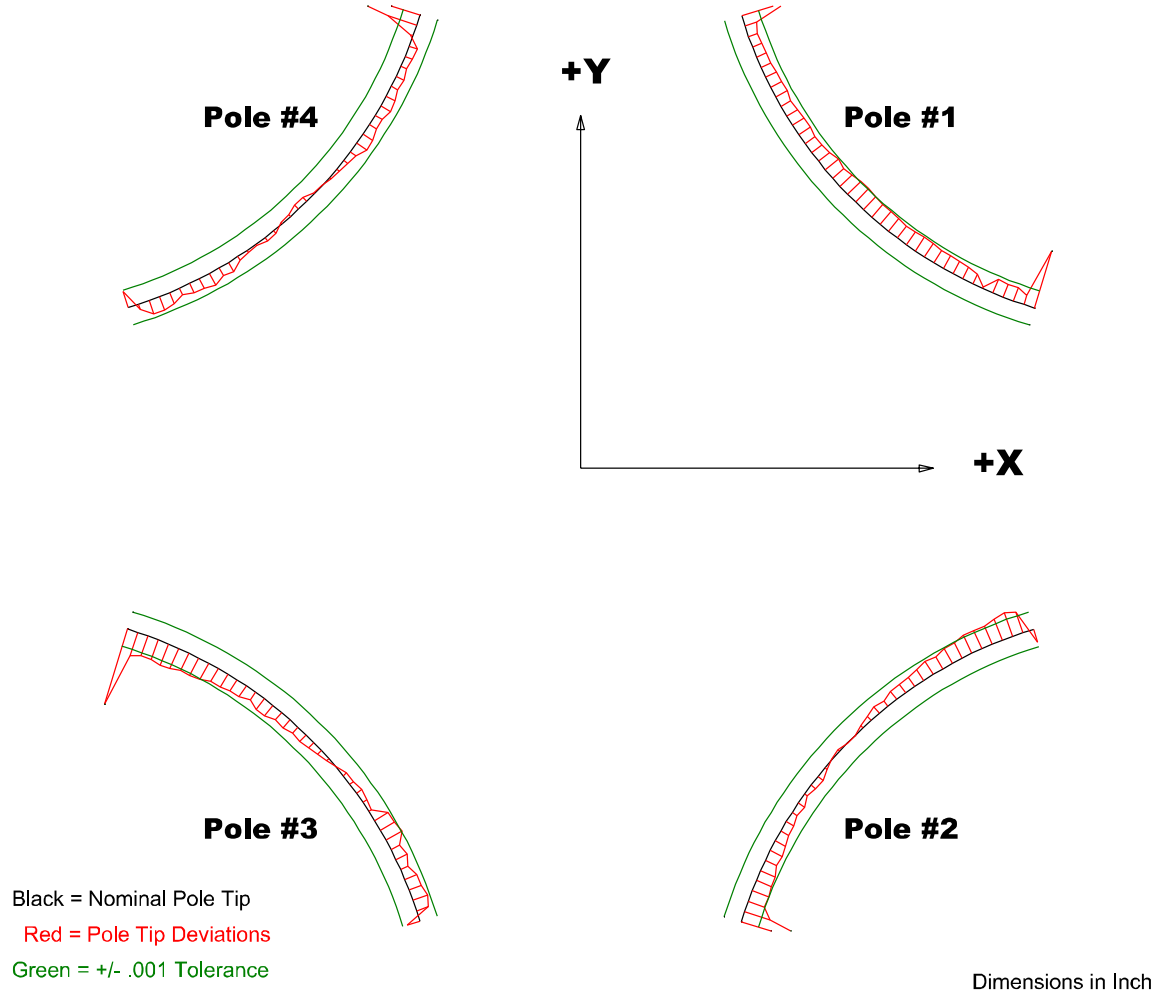
Composite Best-fit of Pole Tips, Upstream



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.	-0.00331	-0.00448	-0.00441	-0.00536
Max. Dev.	-0.00008	0.00138	0.00102	0.0008

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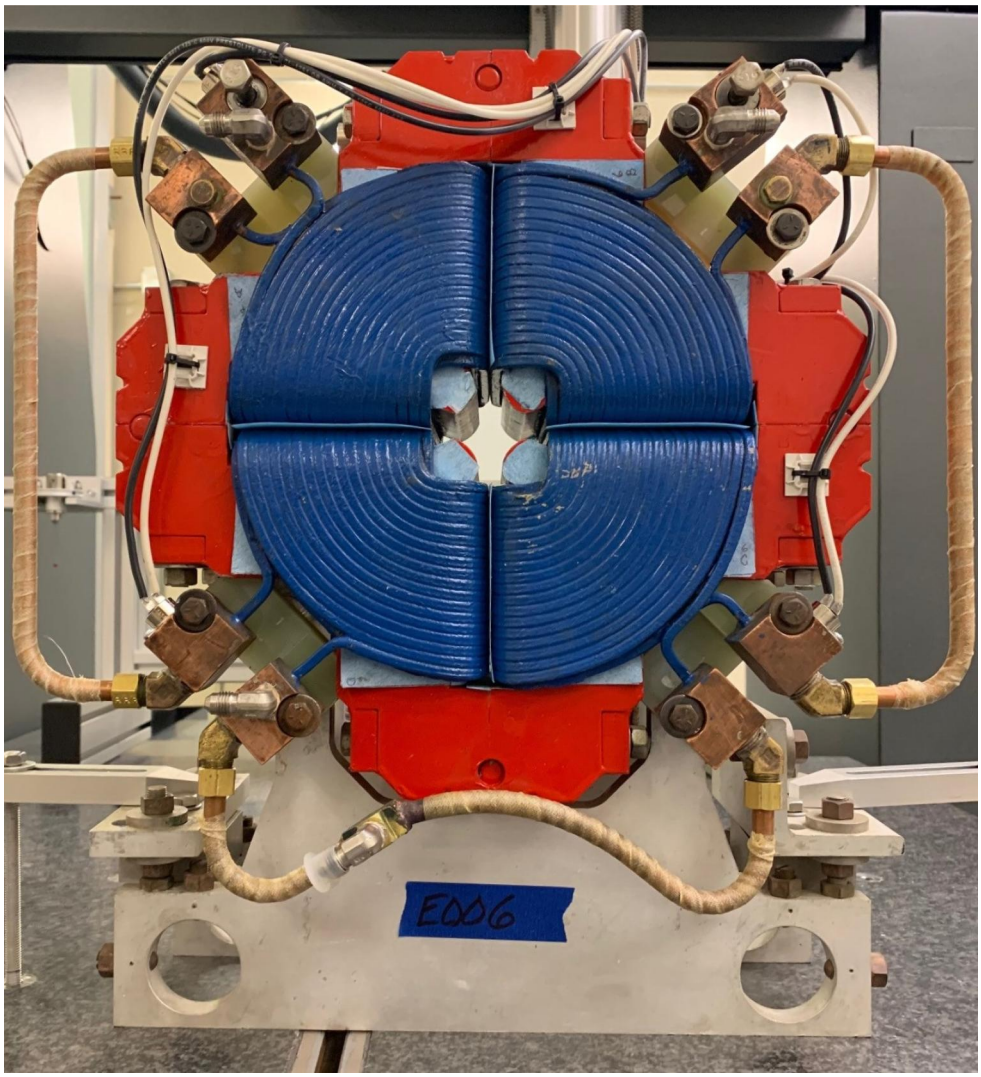
Angle of the Composite Pole Tip Best-Fit



Angle in Decimal Degrees ° :-0.07338

Angle in Milliradians :-1.28066

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