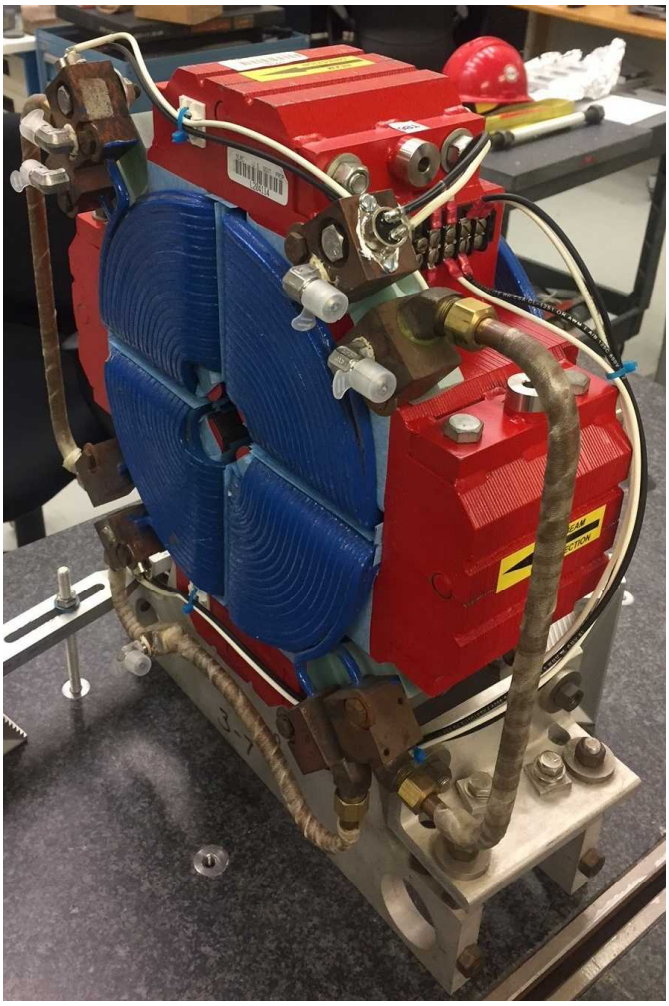
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4121
Mfg. S/N : E055

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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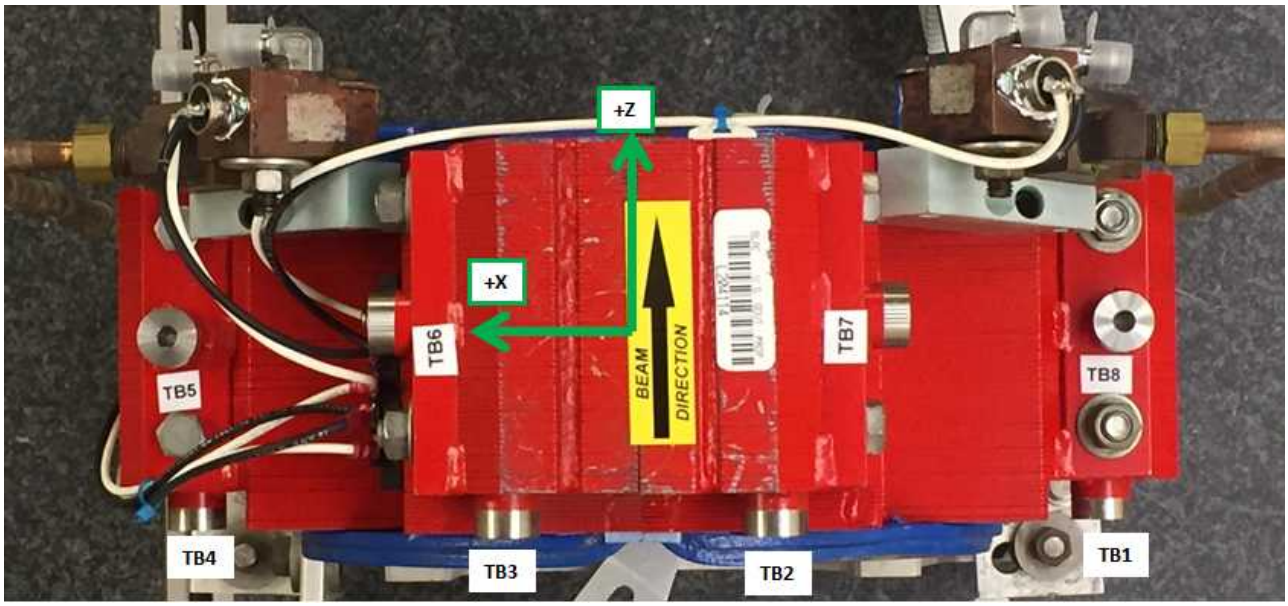
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7634	1.4911	-3.1666
TB 2	-1.5181	5.7478	-3.1745
TB 3	1.5053	5.7668	-3.1653
TB 4	5.7538	1.5097	-3.1763
TB 5	5.8396	4.0089	0.2398
TB 6	3.9908	5.8498	0.2484
TB 7	-4.0118	5.8481	0.2319
TB 8	-5.8787	3.9907	0.2462

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

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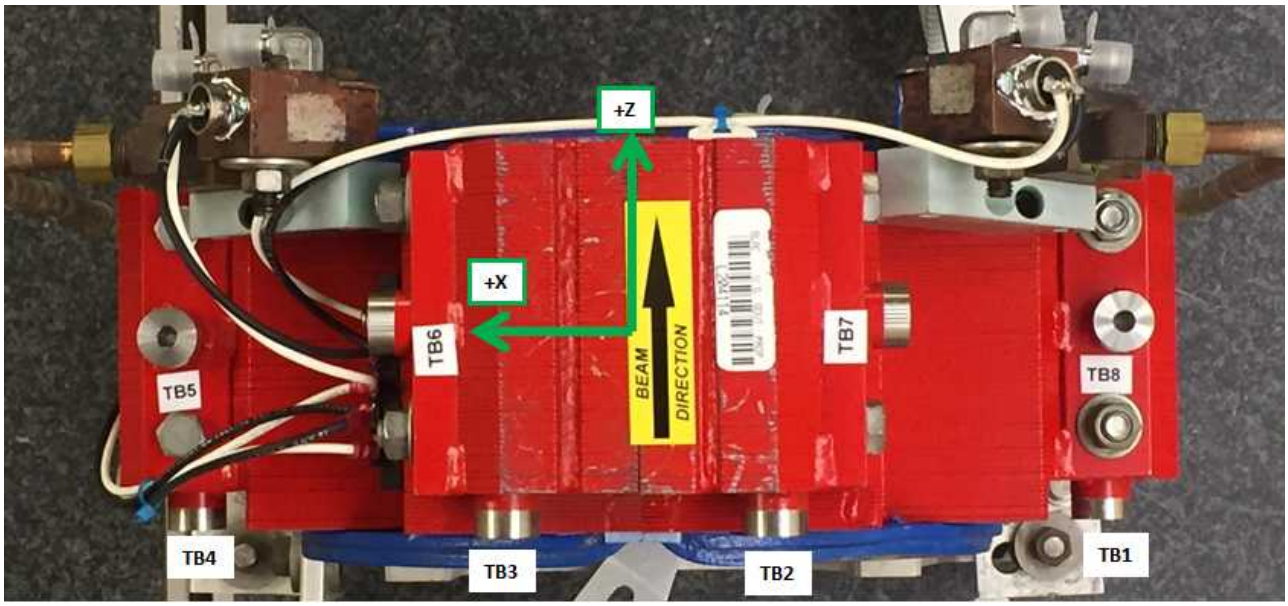
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7628	1.4916	-2.4784
TB 2	-1.5164	5.7519	-2.4841
TB 3	1.5001	5.7676	-2.4771
TB 4	5.7538	1.5115	-2.4876
TB 5	5.8418	3.3217	0.2391
TB 6	3.3021	5.8477	0.2485
TB 7	-3.3221	5.8499	0.2325
TB 8	-5.8758	3.3030	0.2460

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

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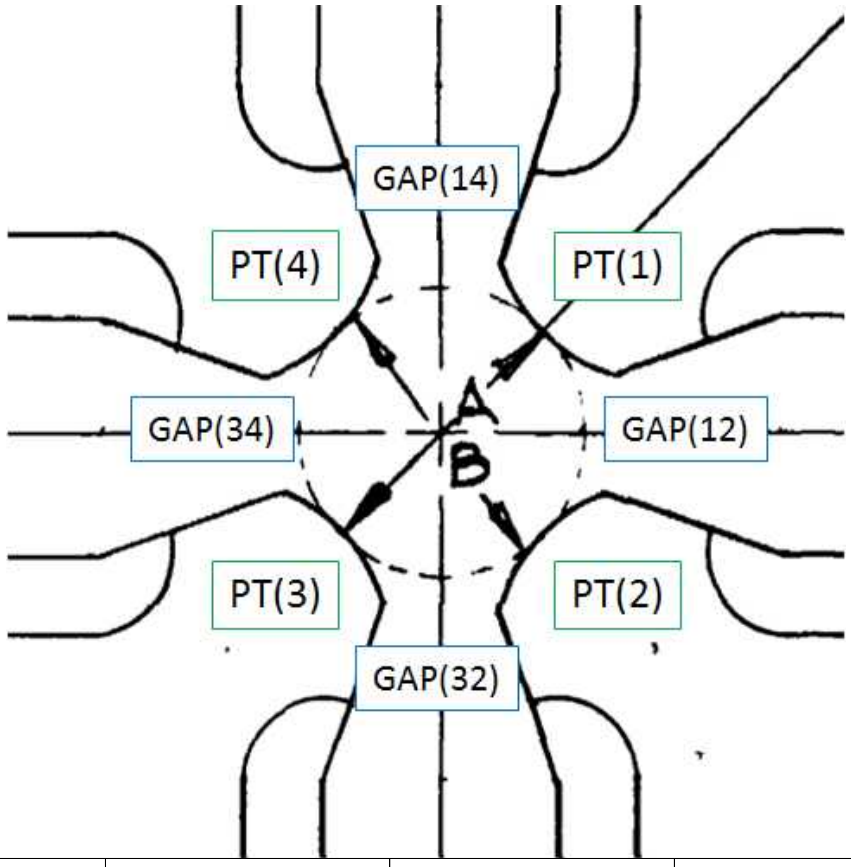
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08497	1.0883
PT Distance 2-4(B)	1.085	1.08579	1.08514
Gap 1-2	0.4546	0.45562	0.46149
Gap 2-3	0.4546	0.45651	0.45854
Gap 3-4	0.4546	0.46175	0.45949
Gap 4-1	0.4546	0.46031	0.46023

Dimensions in Inch

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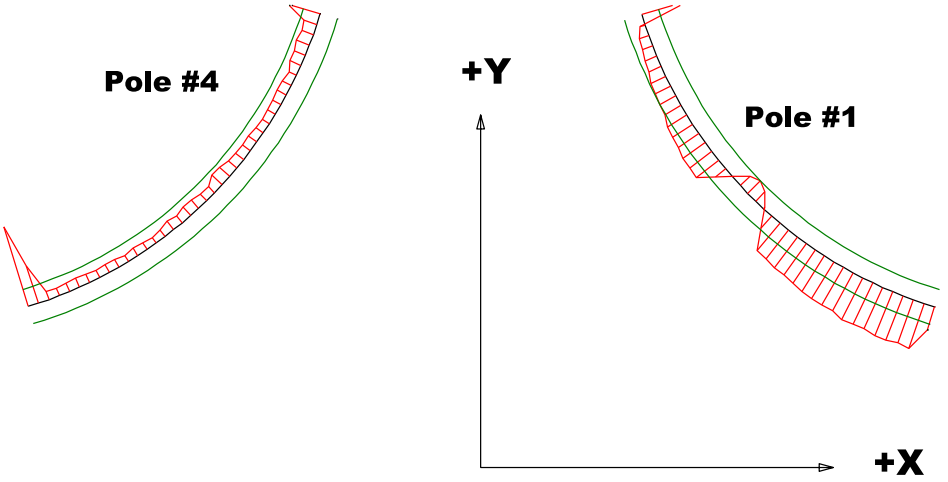
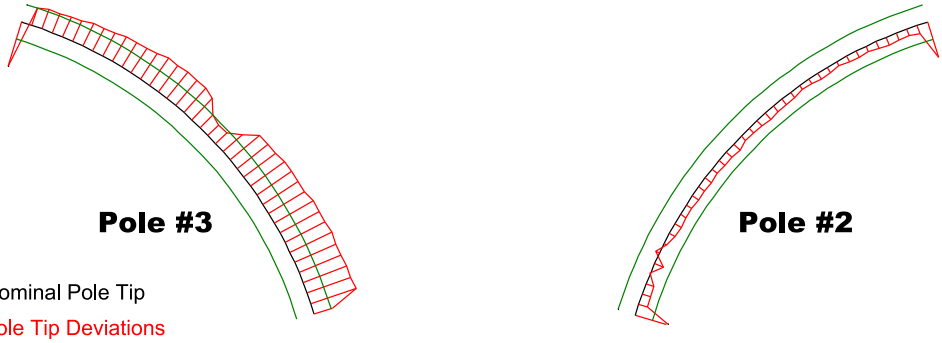
Composite Best-fit of Pole Tips, Downstream





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.	-0.0029	-0.00206	-0.00259	-0.00466
Max. Dev.	0.00266	0.00022	0.00267	-0.00035

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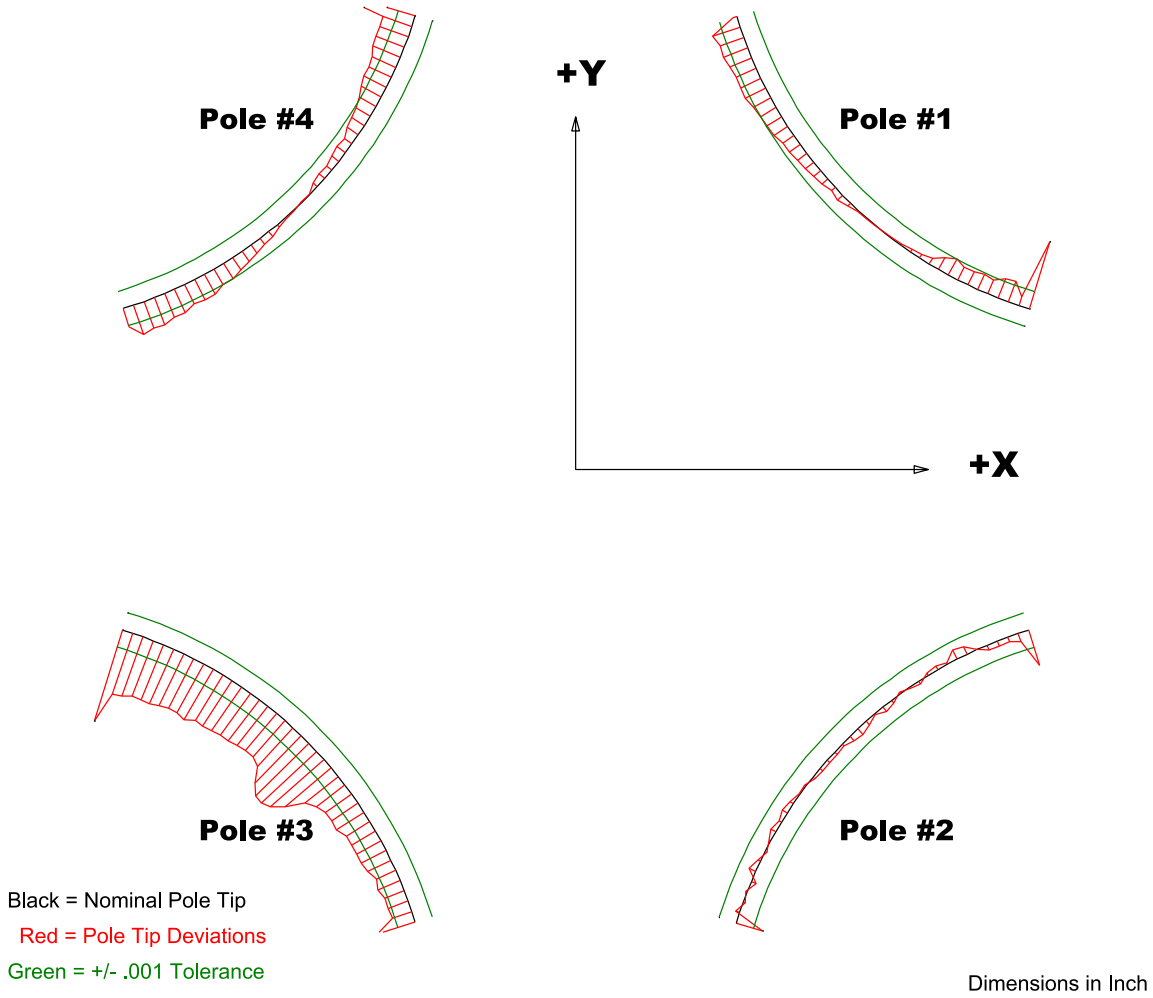
Composite Best-fit of Pole Tips, Upstream



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.	-0.00391	-0.00207	-0.00531	-0.00506
Max. Dev.	0.0016	0.00059	-0.00112	0.00173

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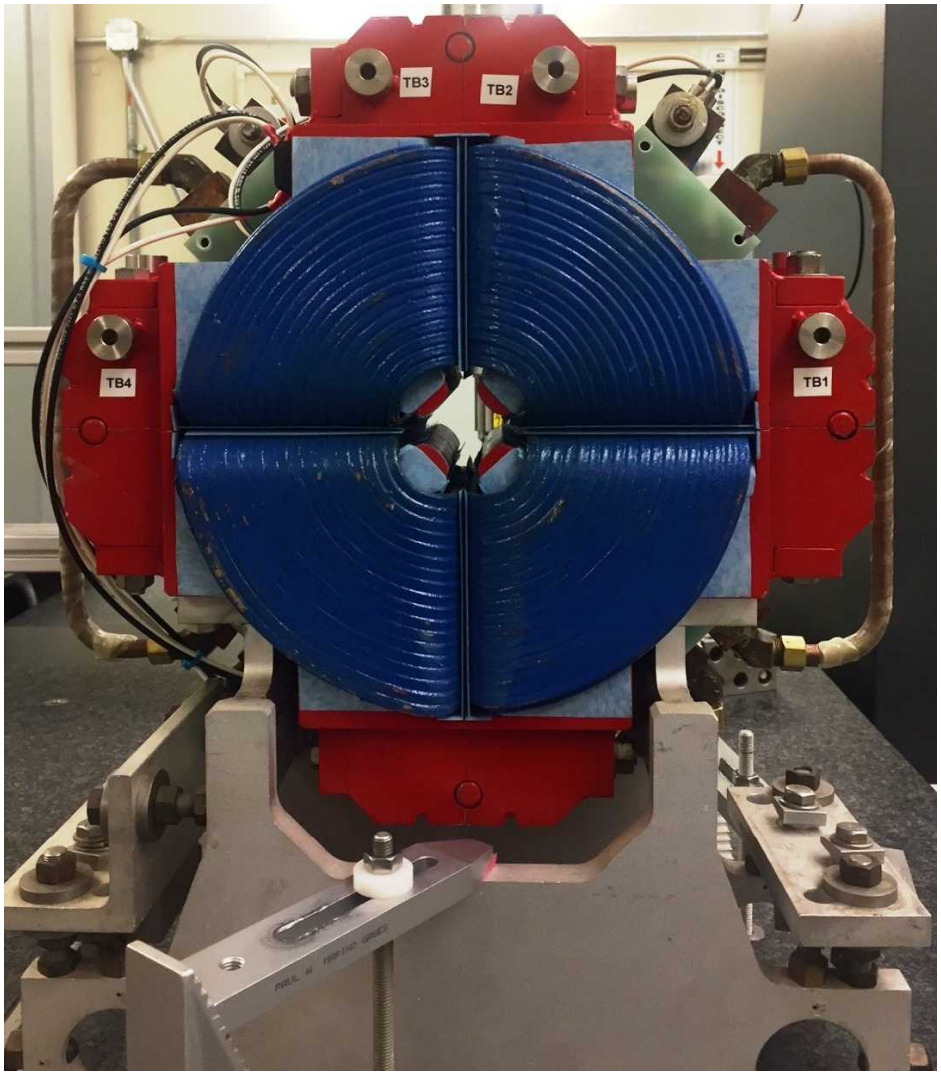
Angle of the Composite Pole Tip Best-Fit In Relation to TB 5 Plate and TB 8 Plate



Angle in Decimal Degrees ° :-0.09649

Angle in Milliradians :-1.68401

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