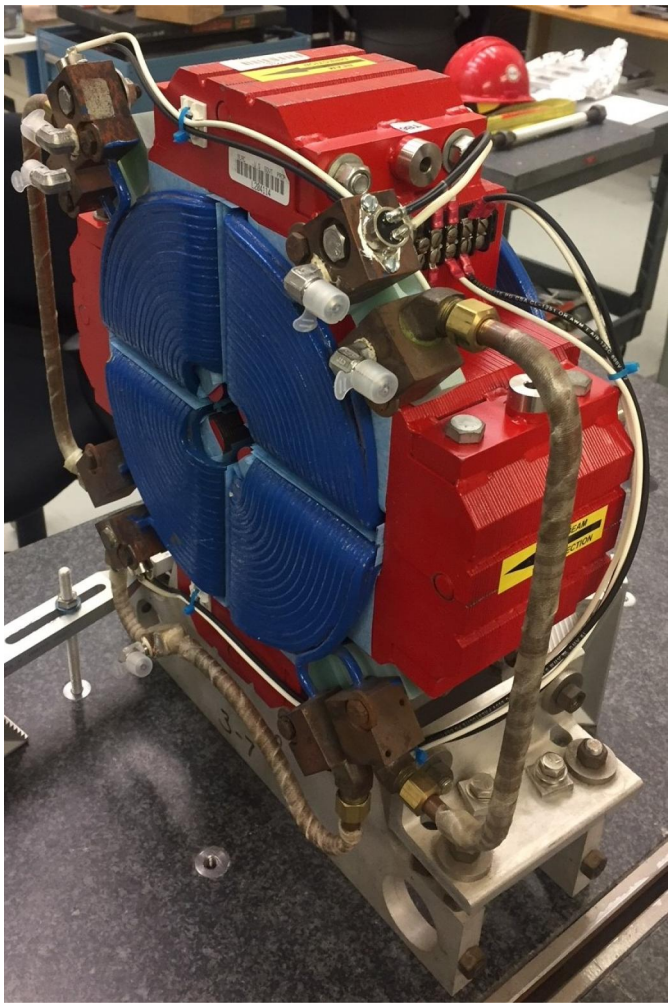
LCLS II 1.085Q4.31 Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-902-675-01
Barcode # : 4114
Mfg. S/N : E054

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 0.040 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.

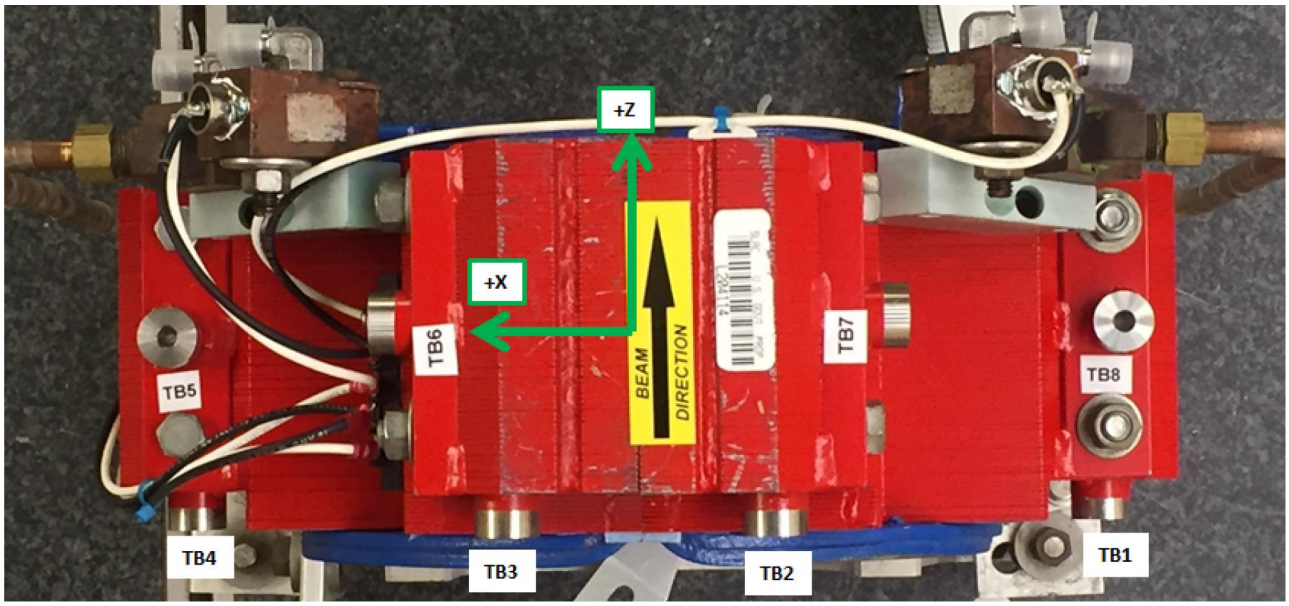
Coordinate Origins

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.

Barcode # : 4114

Mfg. S/N : E054

Tooling Ball Locations



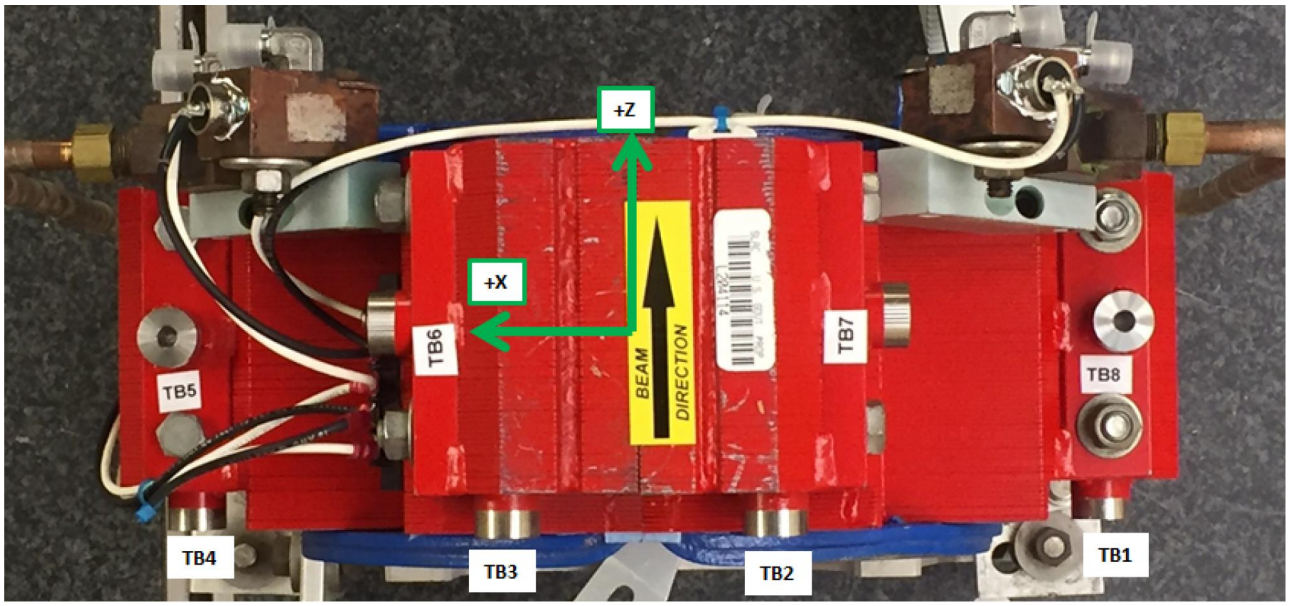
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7613	1.5191	-3.1899
TB 2	-1.4969	5.7530	-3.1982
TB 3	1.5133	5.7527	-3.1897
TB 4	5.7554	1.5068	-3.2008
TB 5	5.8482	3.9896	0.2136
TB 6	4.0102	5.8511	0.2197
TB 7	-3.9915	5.8611	0.2379
TB 8	-5.8492	4.0122	0.2578

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

Barcode # : 4114

Mfg. S/N : E054

Tooling Ball Locations



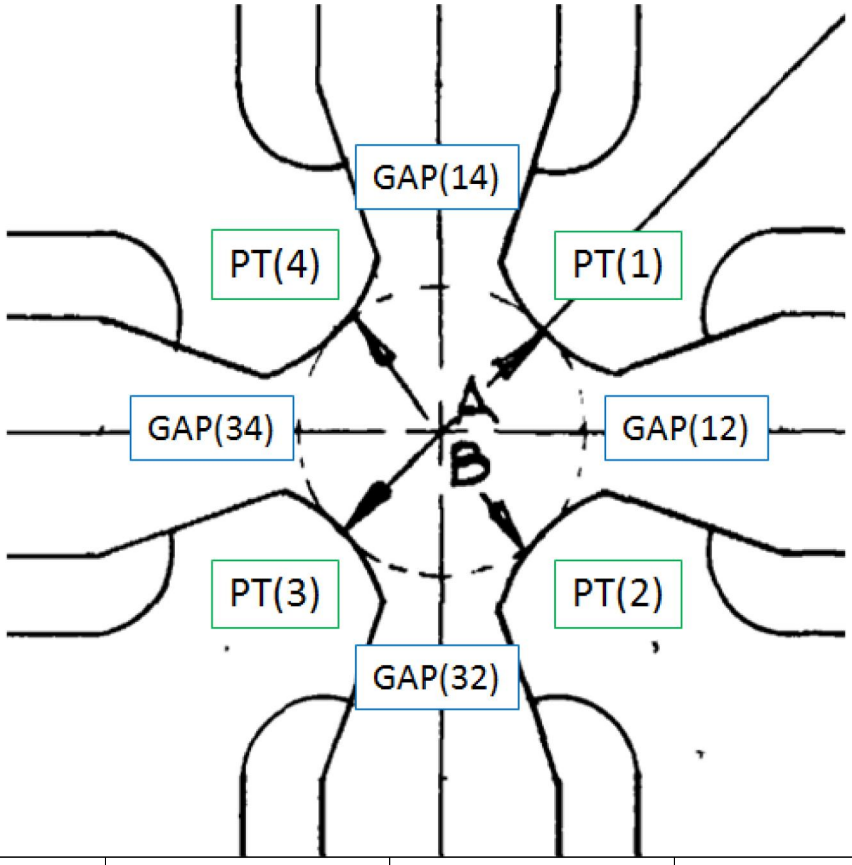
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-5.7572	1.5200	-2.5018
TB 2	-1.4935	5.7554	-2.5103
TB 3	1.5119	5.7524	-2.5021
TB 4	5.7575	1.5082	-2.5123
TB 5	5.8475	3.3018	0.2130
TB 6	3.3228	5.8498	0.2207
TB 7	-3.3038	5.8616	0.2382
TB 8	-5.8495	3.3245	0.2575

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

Barcode # : 4114

Mfg. S/N : E054

Pole Tip Gap Measurements



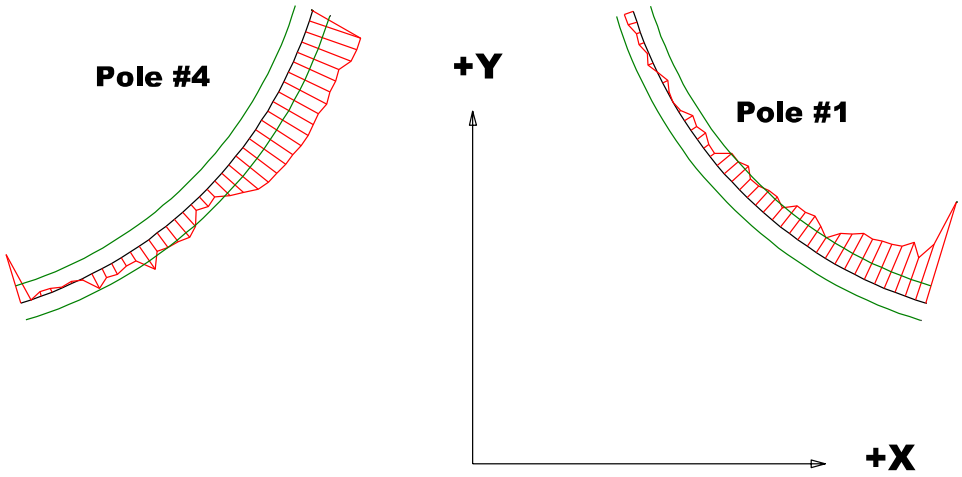
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3(A)	1.085	1.08758	1.08687
PT Distance 2-4(B)	1.085	1.08392	1.08485
Gap 1-2	0.4546	0.45935	0.45284
Gap 2-3	0.4546	0.44746	0.46455
Gap 3-4	0.4546	0.46542	0.46005
Gap 4-1	0.4546	0.45472	0.45813

Dimensions in Inch

Barcode # : 4114

Mfg. S/N : E054

Composite Best-fit of Pole Tips, Downstream



Black = Nominal Pole Tip
Red = Pole Tip Deviations
Green = +/- .001 Tolerance

Dimensions in Inch

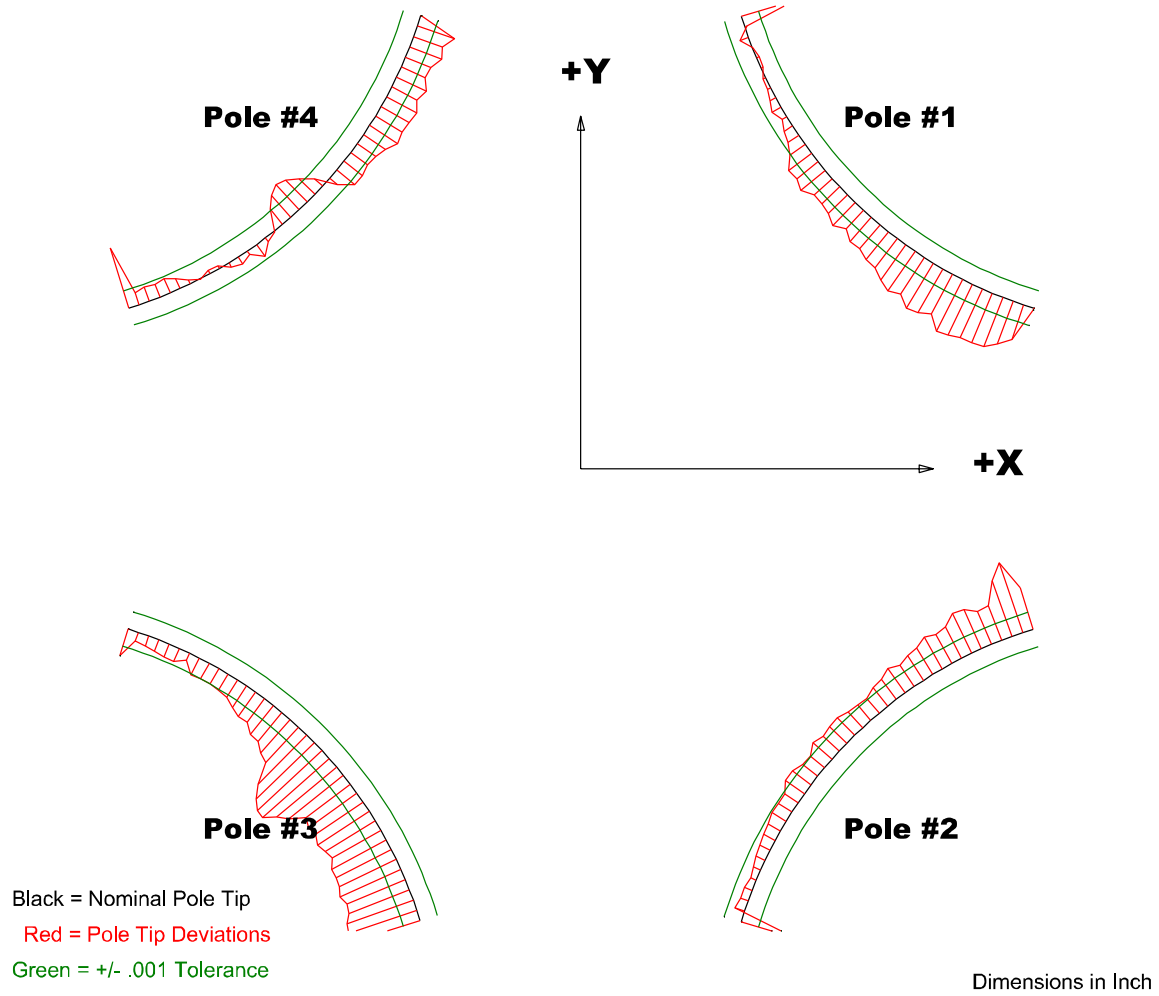
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00592	-0.00389	-0.00802	-0.00284
Max. Dev.	0.00055	0.0032	0.00154	0.00304

Barcode # : 4114

Mfg. S/N : E054

Composite Best-fit of Pole Tips, Upstream



Black = Nominal Pole Tip
Red = Pole Tip Deviations
Green = +/- .001 Tolerance

Dimensions in Inch

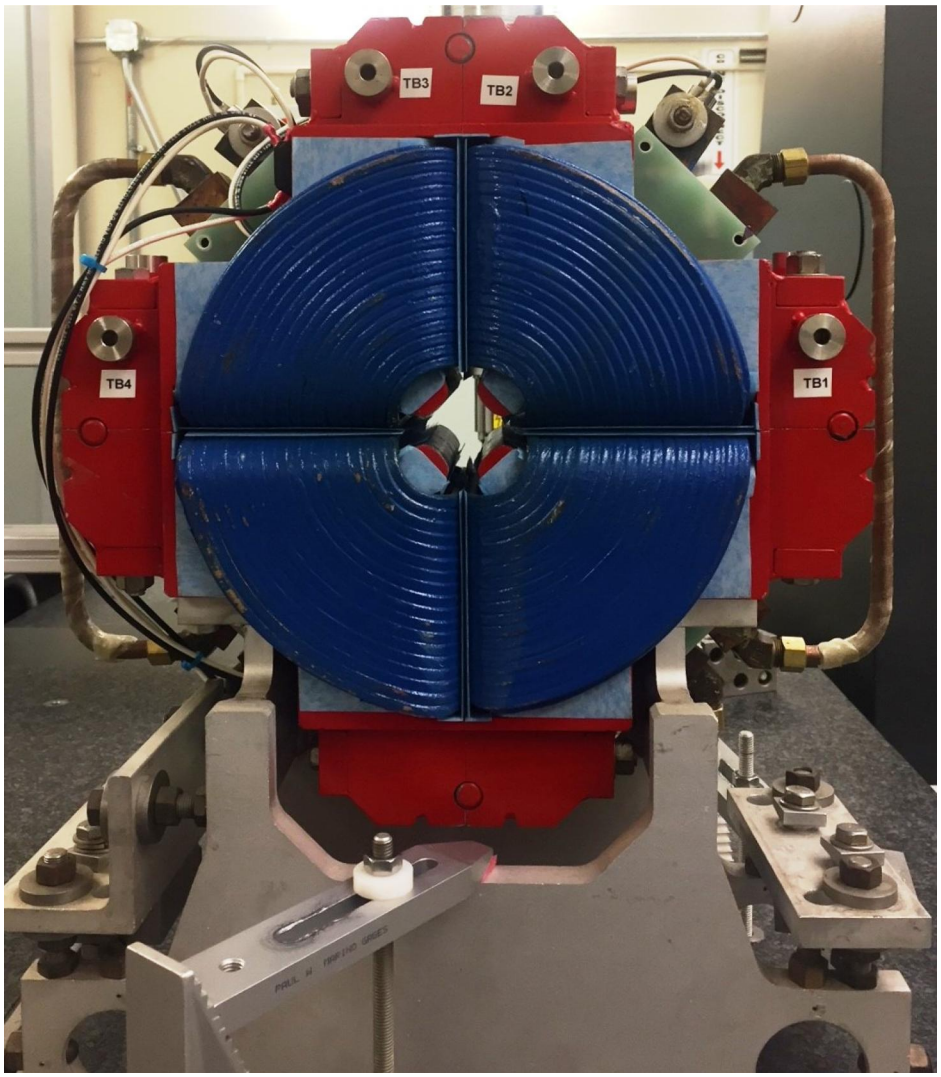
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00307	-0.00324	-0.00607	-0.0035
Max. Dev.	0.00323	0.00412	-0.00043	0.00221

Barcode # : 4114

Mfg. S/N : E054

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



Angle in Decimal Degrees ° :0.11207

Angle in Milliradians :1.95599

Barcode # : 4114

Mfg. S/N : E054