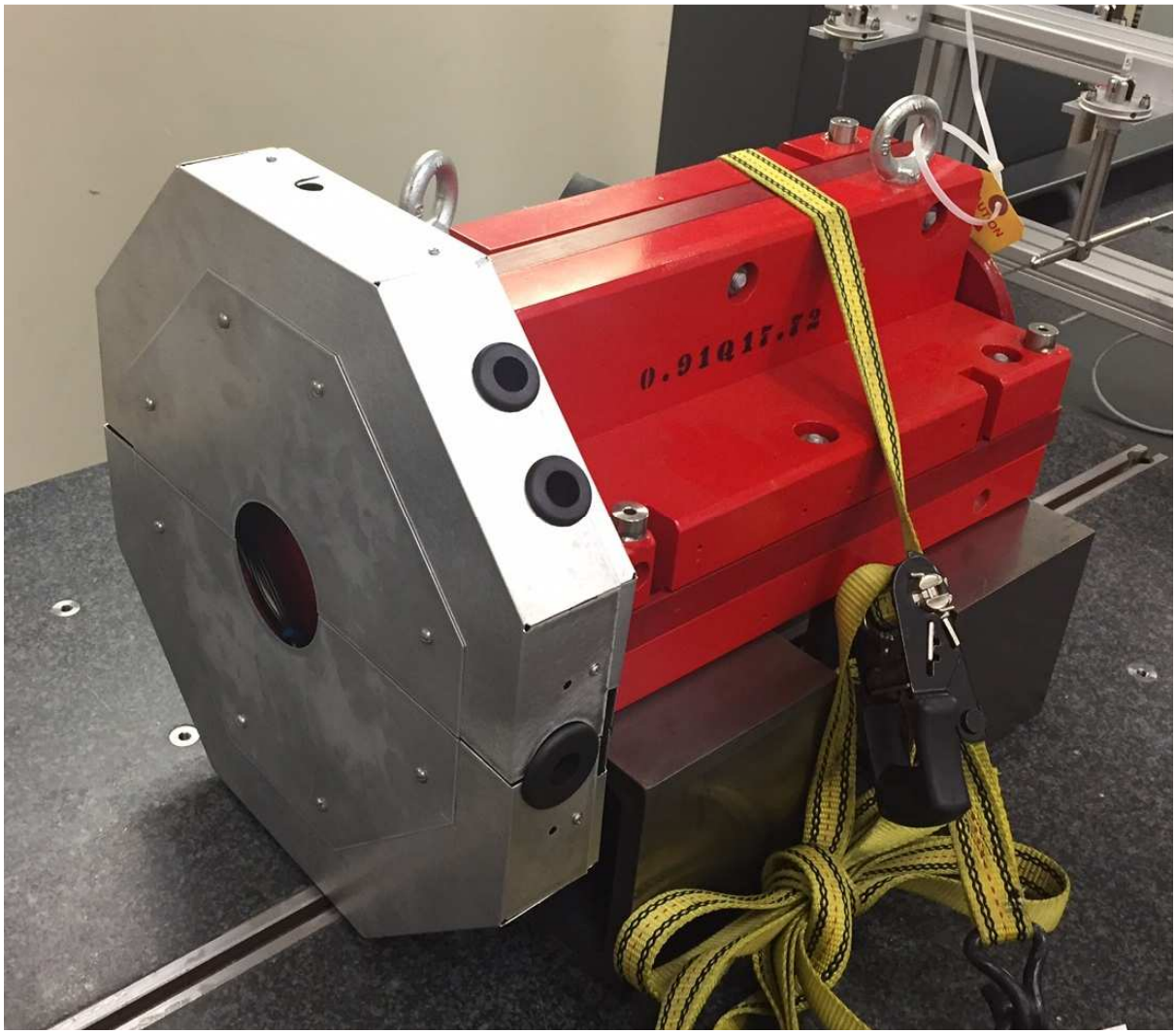
LCLS II 0.91Q17.72 Quadrupole Fiducialization Report



Inspector : K. Caban
Engineer : J. Amann
Drawing No. : SA-380-301-00 R2
Barcode # : 4104
Mfg. S/N :N/A

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 .250 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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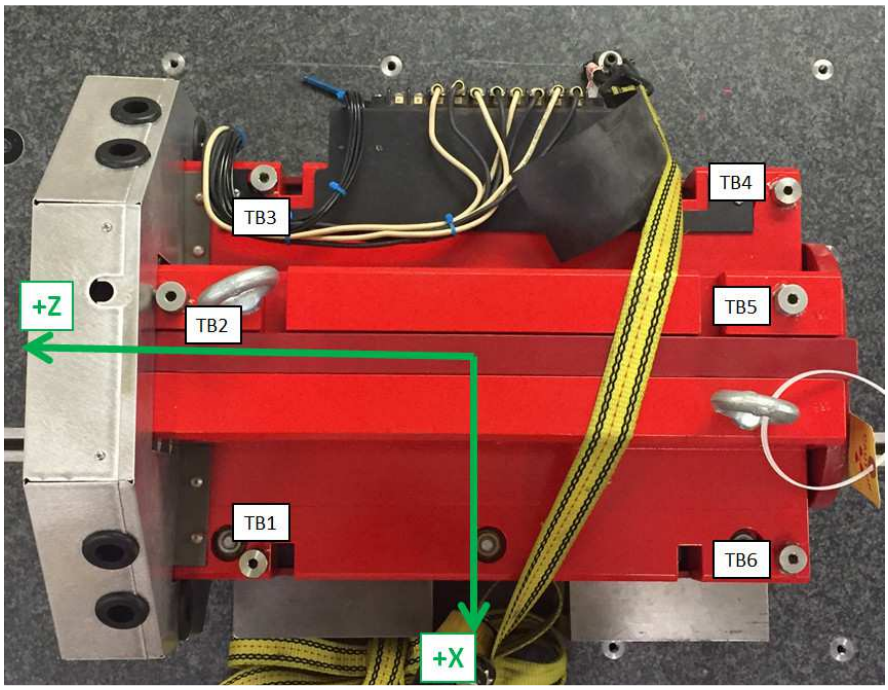
Tooling Ball Locations



Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	5.35861	3.73238	6.31299
TB 2	-1.33832	7.31965	8.07966
TB 3	-5.22504	3.67090	6.28449
TB 4	-5.02632	3.67241	-8.36279
TB 5	-1.42425	7.31694	-7.44653
TB 6	5.11567	3.73777	-8.24464
TB A	5.36239	3.04496	6.31237
TB B	-1.33345	6.63058	8.07978
TB C	-5.22209	2.98364	6.28403
TB D	-5.02253	2.98499	-8.36177
TB E	-1.42010	6.62980	-7.44703
TB F	5.12938	3.05075	-8.25242

Tooling Ball Locations (1-6) are 1 inch above Tooling Ball Adapter Plane
Tooling Ball Locations (A-F) are 5/16 inch above Tooling Ball Adapter Plane
Dimensions in Inch

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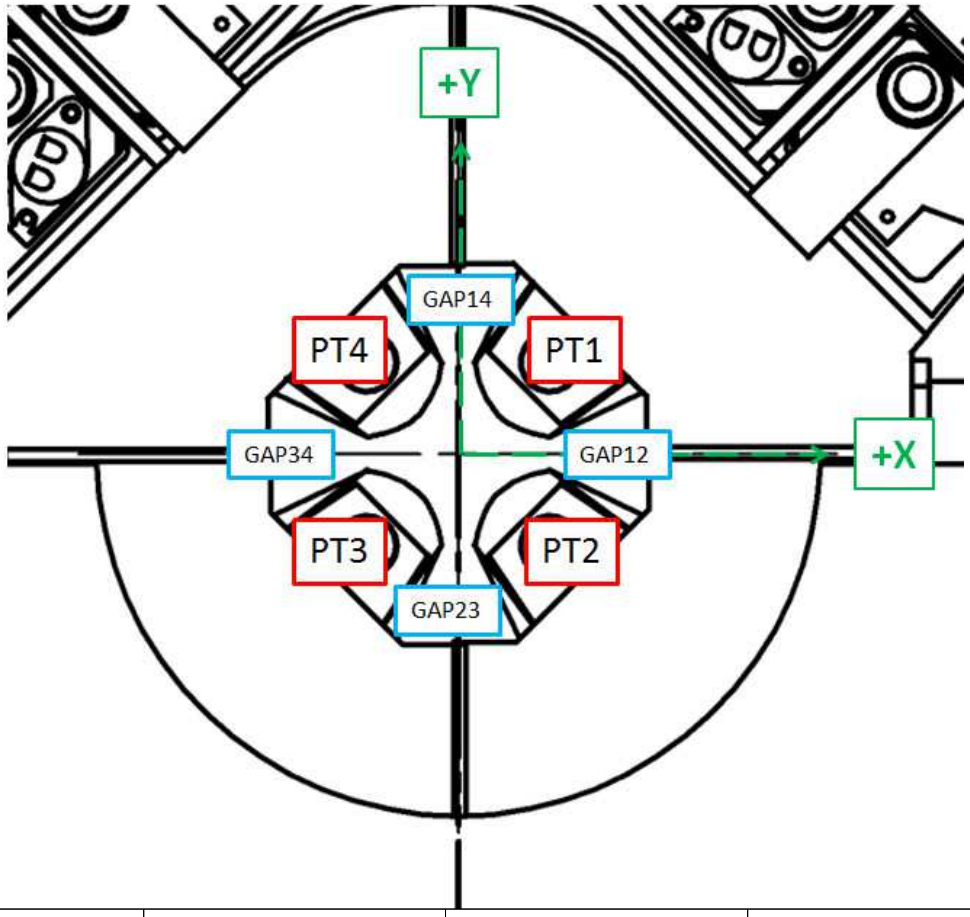
Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	0.905 ± 0.001	0.90493	0.90581
Pole Tip Distance 2-4	0.905 ± 0.001	0.90557	0.90532
Gap 1-2	0.274 ± 0.005	0.26958	0.27003
Gap 2-3	0.274 ± 0.005	0.26942	0.26823
Gap 3-4	0.274 ± 0.005	0.26896	0.26966
Gap 1-4	0.274 ± 0.005	0.26959	0.26245

Dimensions in Inch

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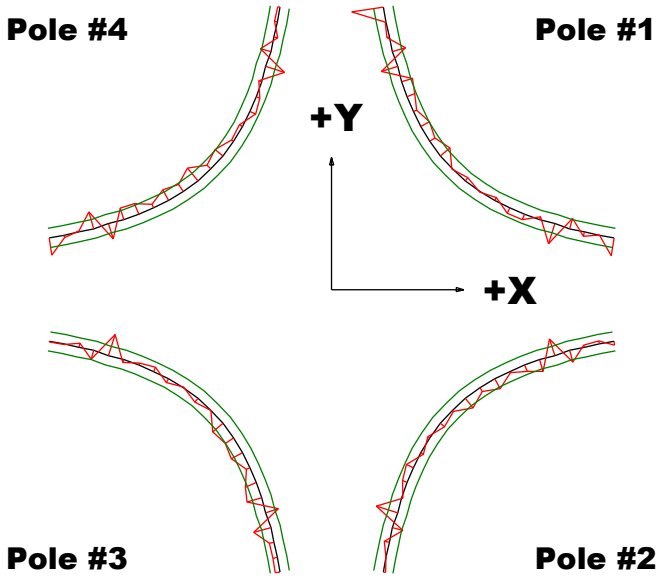
Composite Best-fit of Pole Tips, Downstream



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

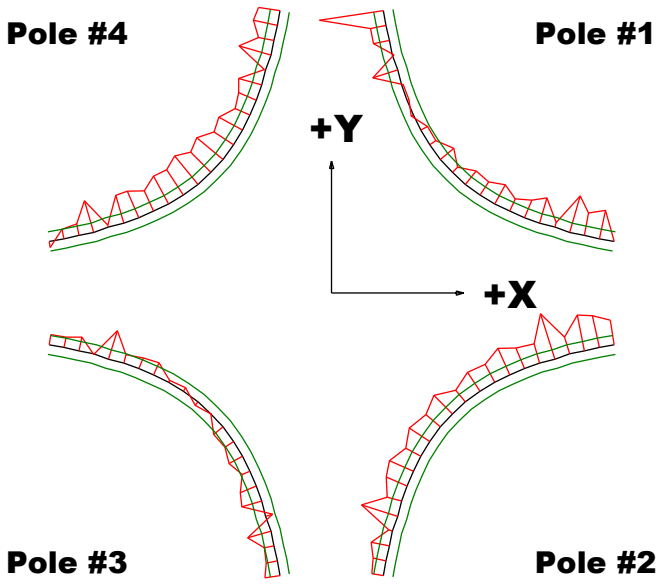
Dimensions in Inch

Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00335	-0.00234	-0.00231	-0.00205
Max. Dev.	0.00142	0.0013	0.00184	0.00182

Barcode # : 4104
Mfg. S/N : N/A

Composite Best-fit of Pole Tips, Upstream



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

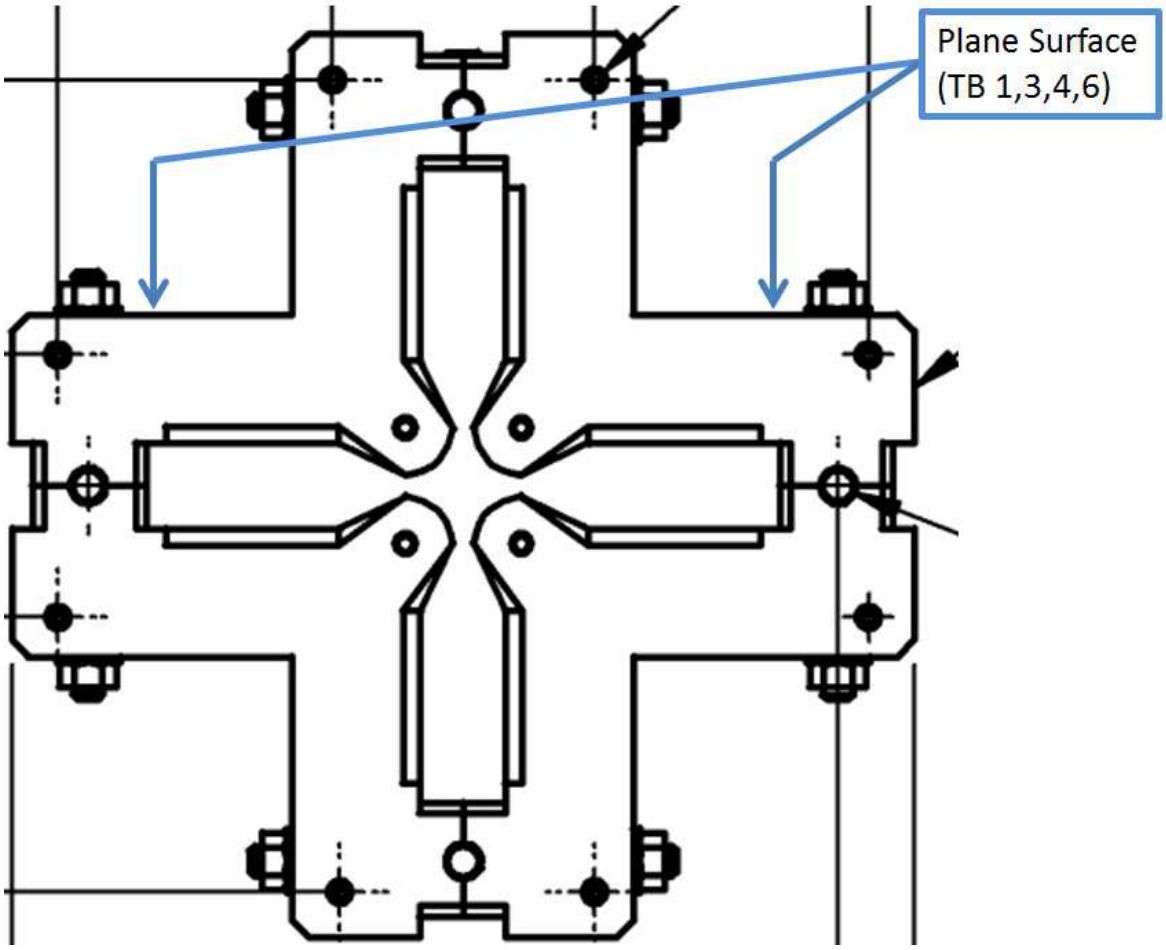
Dimensions in Inch

Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00674	-0.00497	-0.0031	-0.00064
Max. Dev.	0.00396	-0.0004	0.00251	0.00382

Barcode # : 4104
Mfg. S/N : N/A

Angle of the Composite Pole Tip Best-Fit In Relation to Plane Surface of TB 1,3,4,6



Angle in Decimal Degrees ° :-0.32785

Angle in Milliradians :-5.72215

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Mfg. S/N : N/A