

LCLS II 2Q4W Fiducialization Report

S30XL Refurb Quadrupole MFD FILE: 38193-2



Inspector : K. Caban
Engineer : A. Ibrahimov
Drawing No. : LCL0370-10763 R00
Barcode # : L204252
Mfg. S/N : QA07

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 0.150 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 and +Z points towards Terminal Bus End.

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.

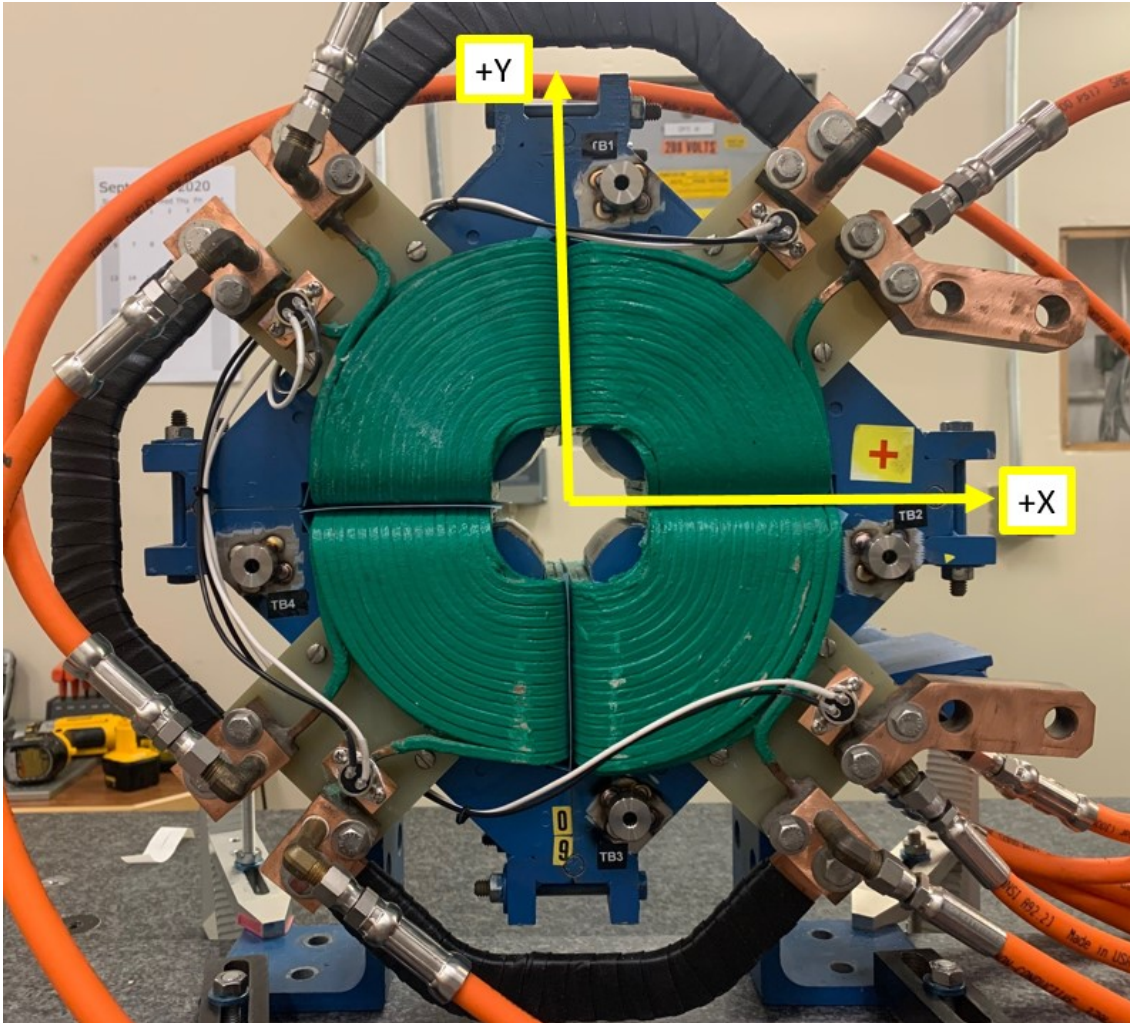
Coordinate Origins

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. +Z points towards Terminal Bus End.

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Tooling Ball Locations



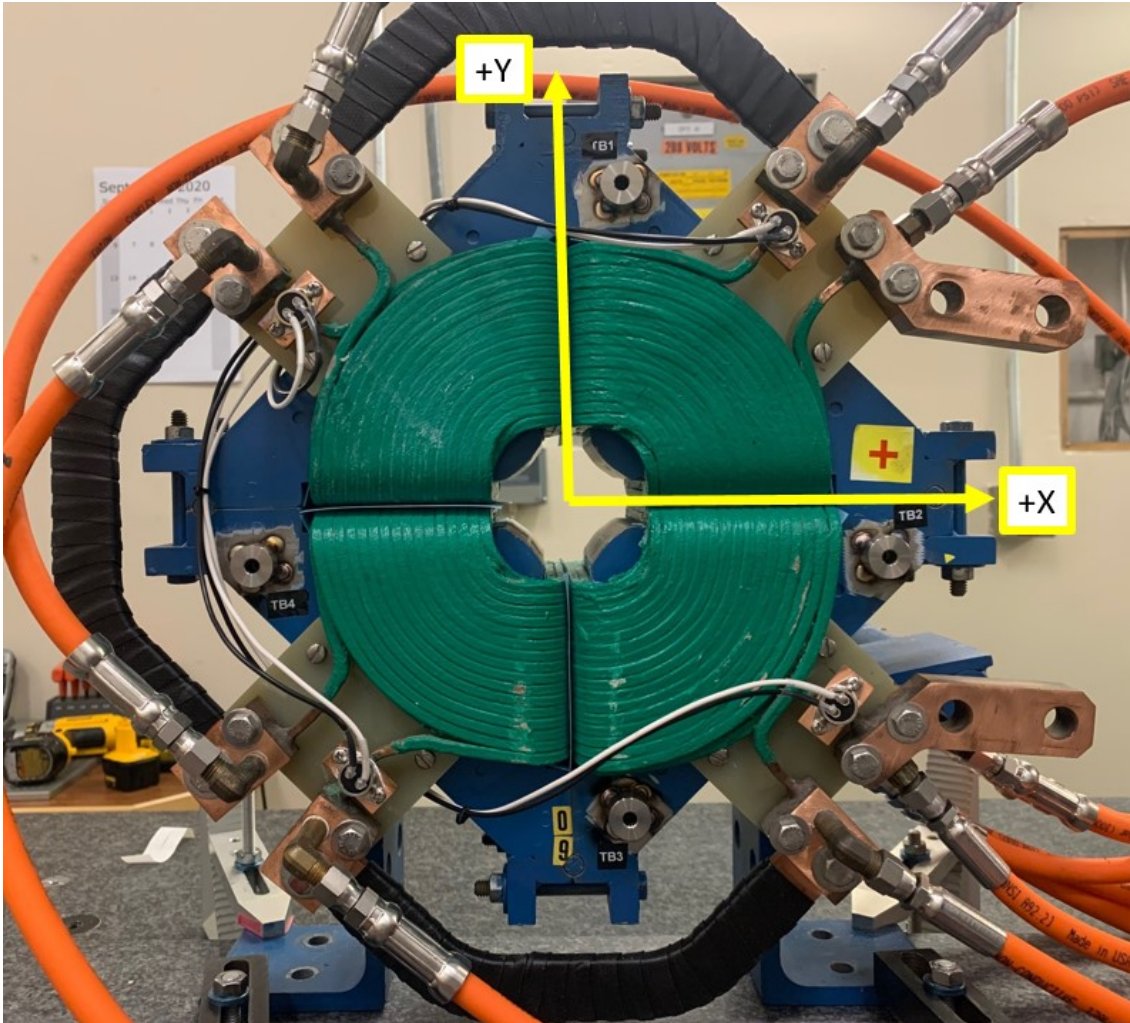
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	1.0152	5.5011	3.4339
TB 2	5.5266	-1.0084	3.4373
TB 3	0.9824	-5.5130	3.4412
TB 4	-5.5226	-1.0342	3.4389

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

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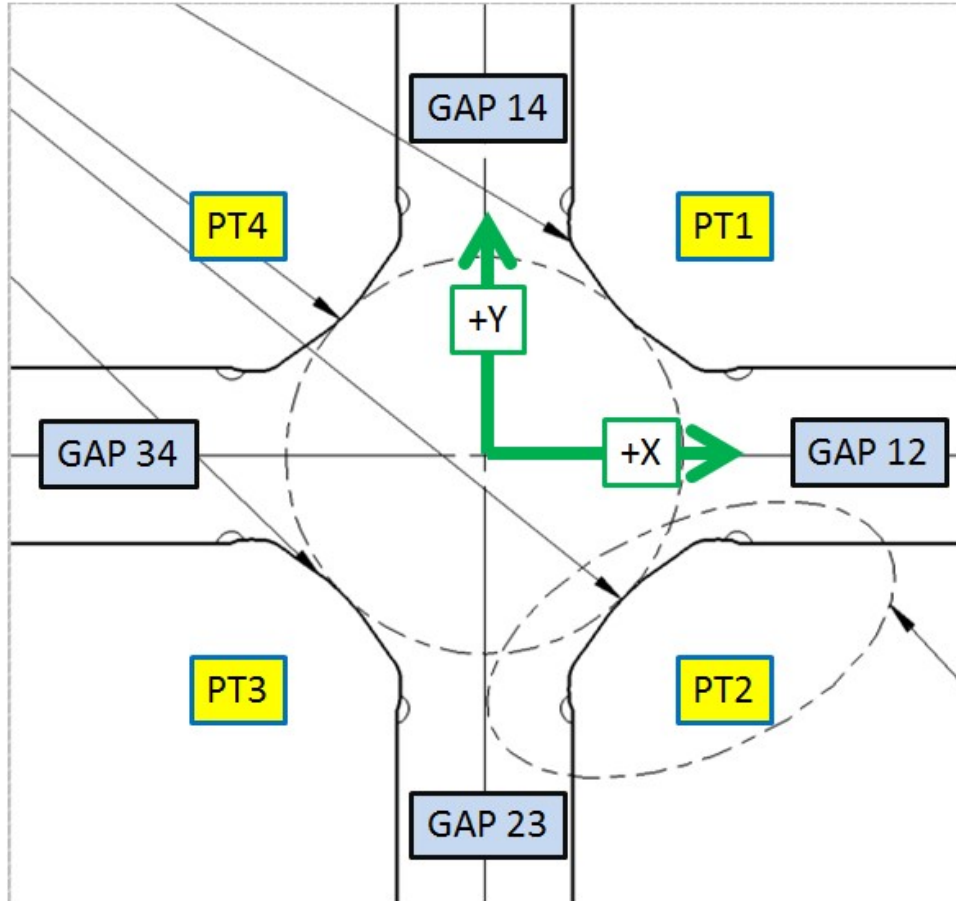
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	1.0171	5.4986	2.7464
TB 2	5.5256	-1.0091	2.7498
TB 3	0.9847	-5.5124	2.7537
TB 4	-5.5189	-1.0352	2.7515

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

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Pole Tip Gap Measurements



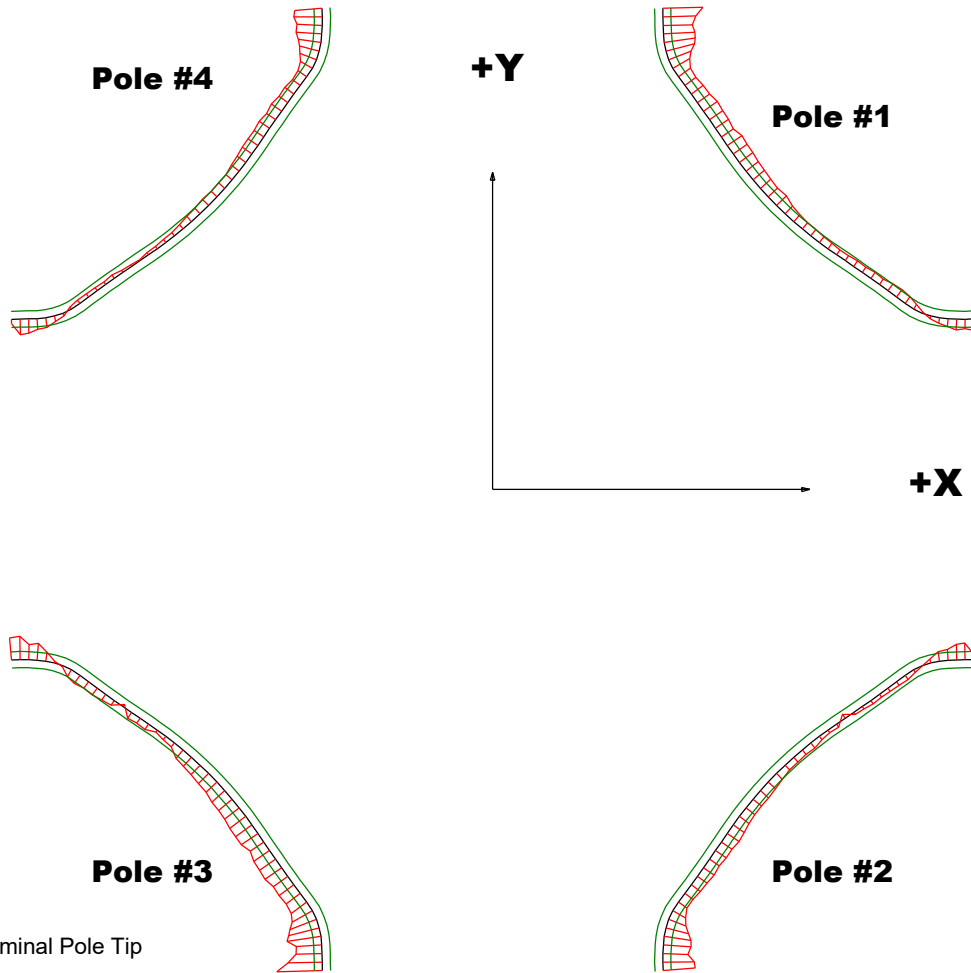
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.0294	2.0298
PT Distance 2-4	2.026	2.0281	2.0296
Gap 1-2	0.8602	0.8556	0.8563
Gap 2-3	0.8602	0.863	0.8668
Gap 3-4	0.8602	0.8536	0.8551
Gap 1-4	0.8602	0.8657	0.8668

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

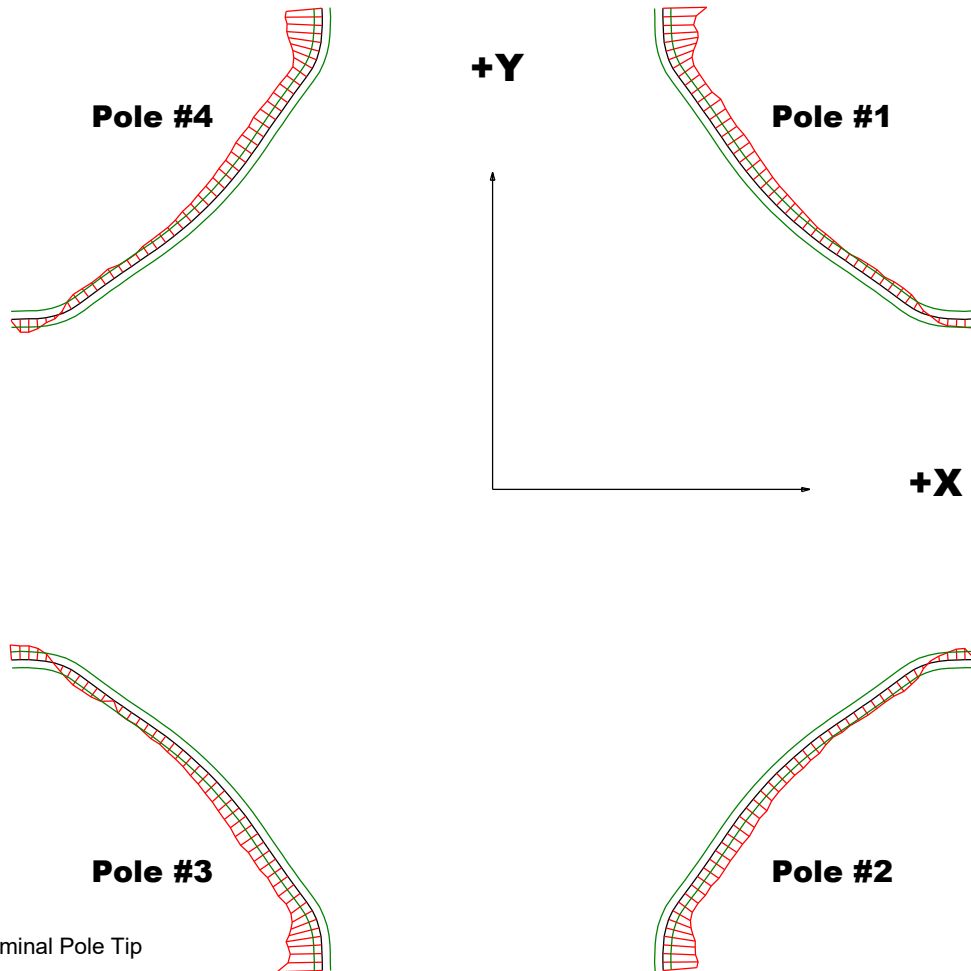
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.005	-0.004	-0.0057	-0.0036
Max. Dev.	0.0015	0.0021	0.0029	0.0019

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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

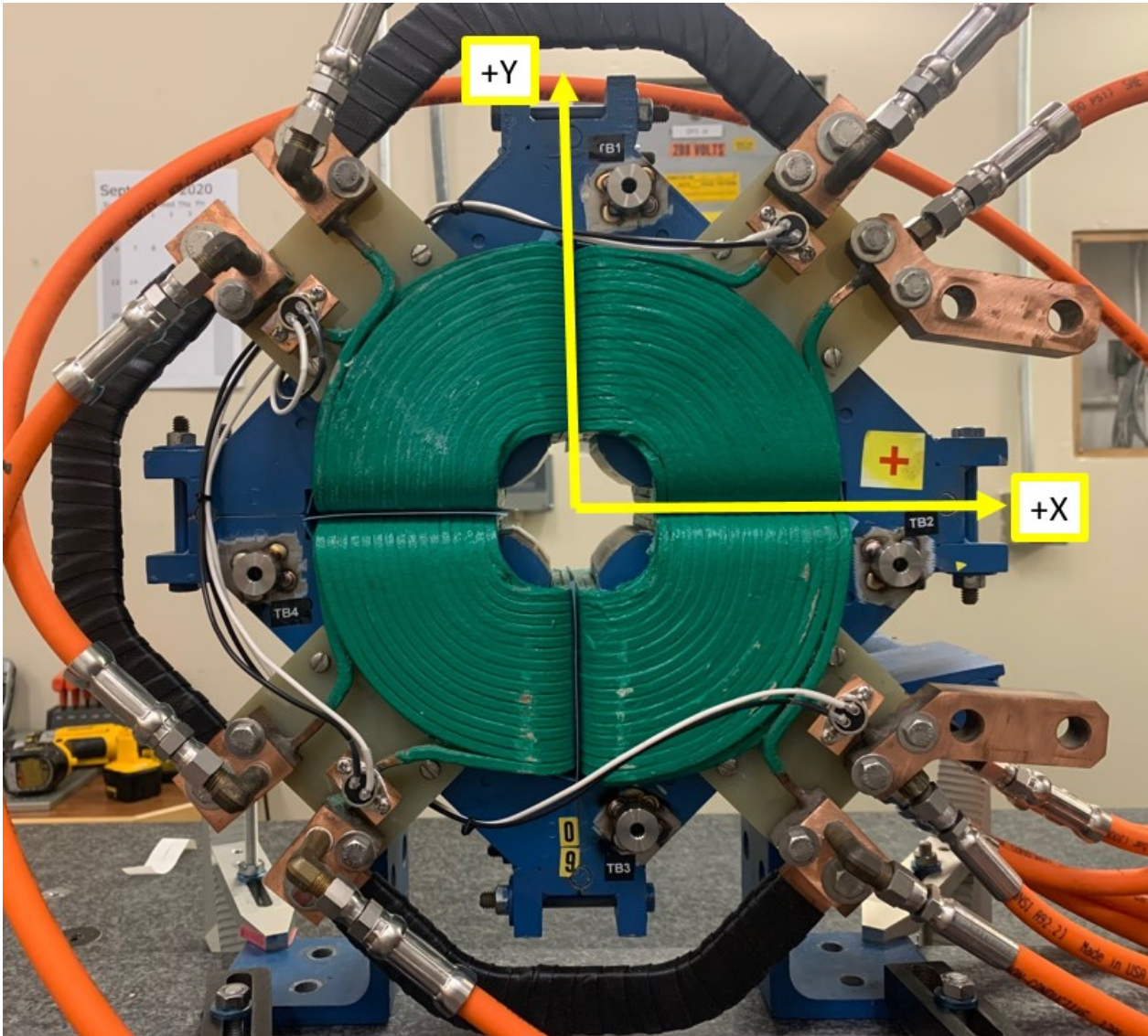
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0055	-0.0044	-0.0056	-0.0046
Max. Dev.	0.0011	0.0014	0.0019	0.0016

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Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° : -0.02267
 Angle in Milliradians : -0.39570

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