

LCLS II 2Q4W Fiducialization Report

S30XL Refurb Quadrupole MFD FILE: 38193-2



Inspector : K. Caban
Engineer : A. Ibrahimov
Drawing No. : LCL0370-10763 R00
Barcode # : L204251
Mfg. S/N : QA06

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.

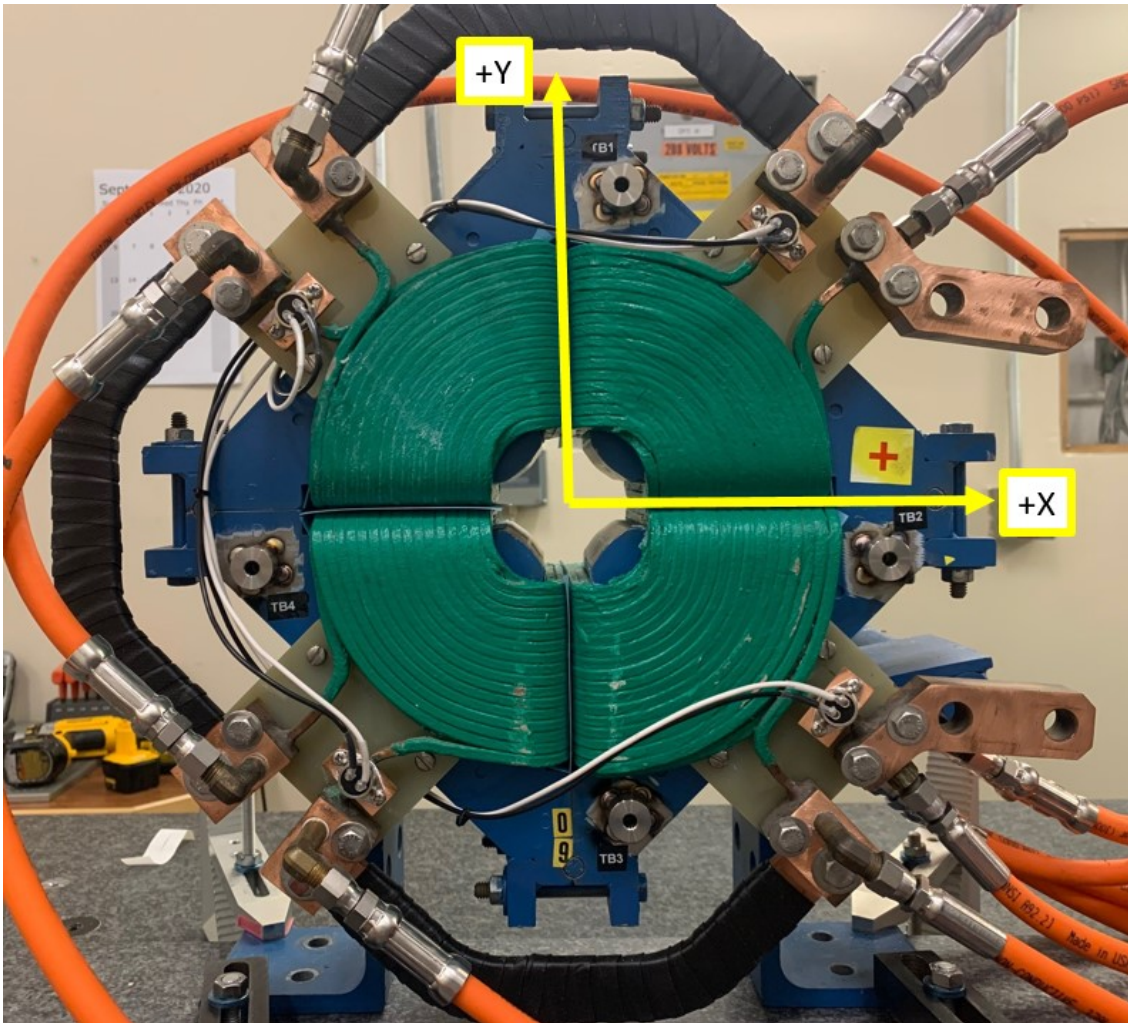
Coordinate Origins

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



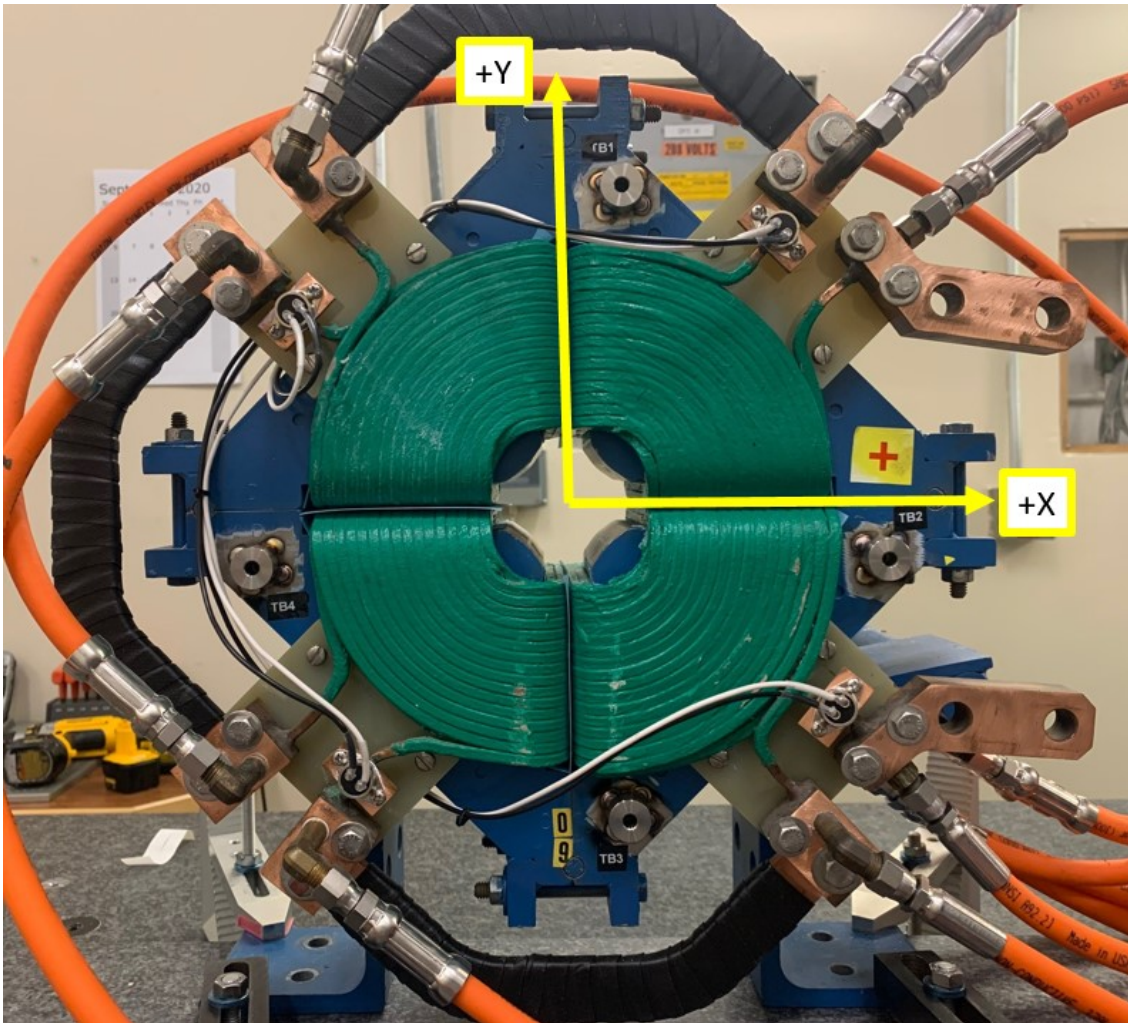
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	0.9815	5.4986	3.4385
TB 2	5.4953	-0.8494	3.4399
TB 3	1.0154	-5.5096	3.4428
TB 4	-5.4931	-0.9870	3.4393

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

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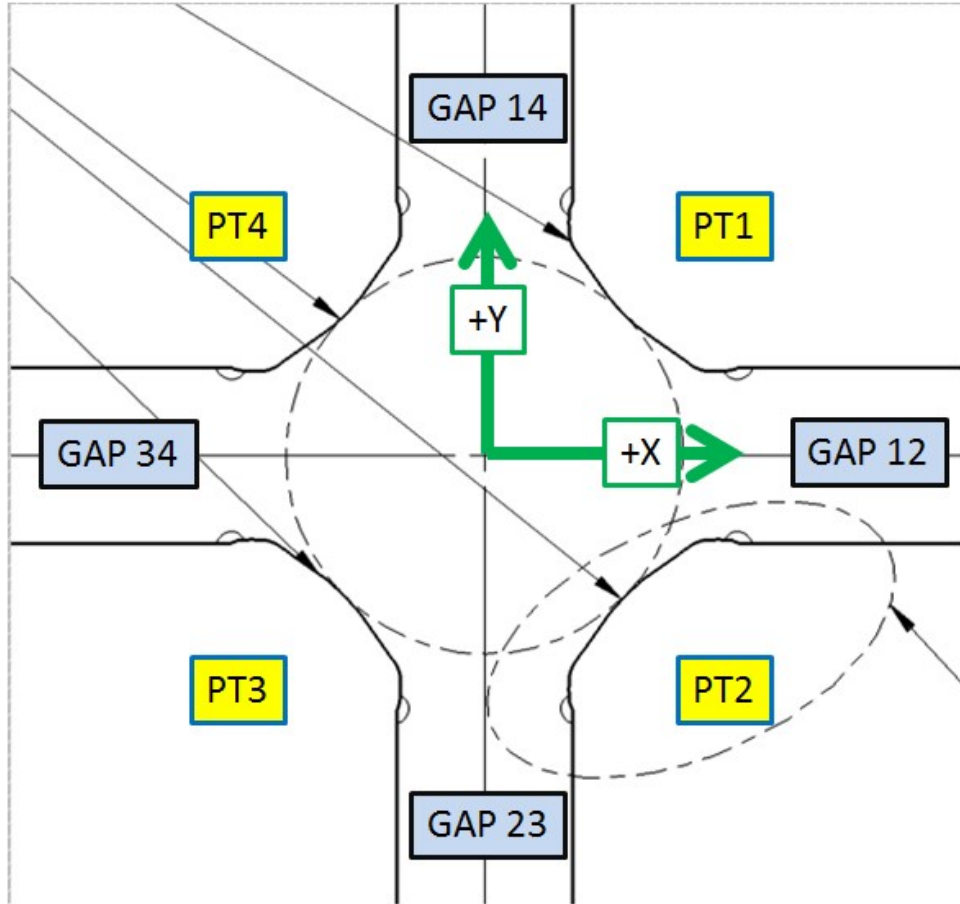
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	0.9842	5.4940	2.7511
TB 2	5.4890	-0.8589	2.7525
TB 3	1.0115	-5.5137	2.7553
TB 4	-5.4931	-0.9877	2.7518

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

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Pole Tip Gap Measurements



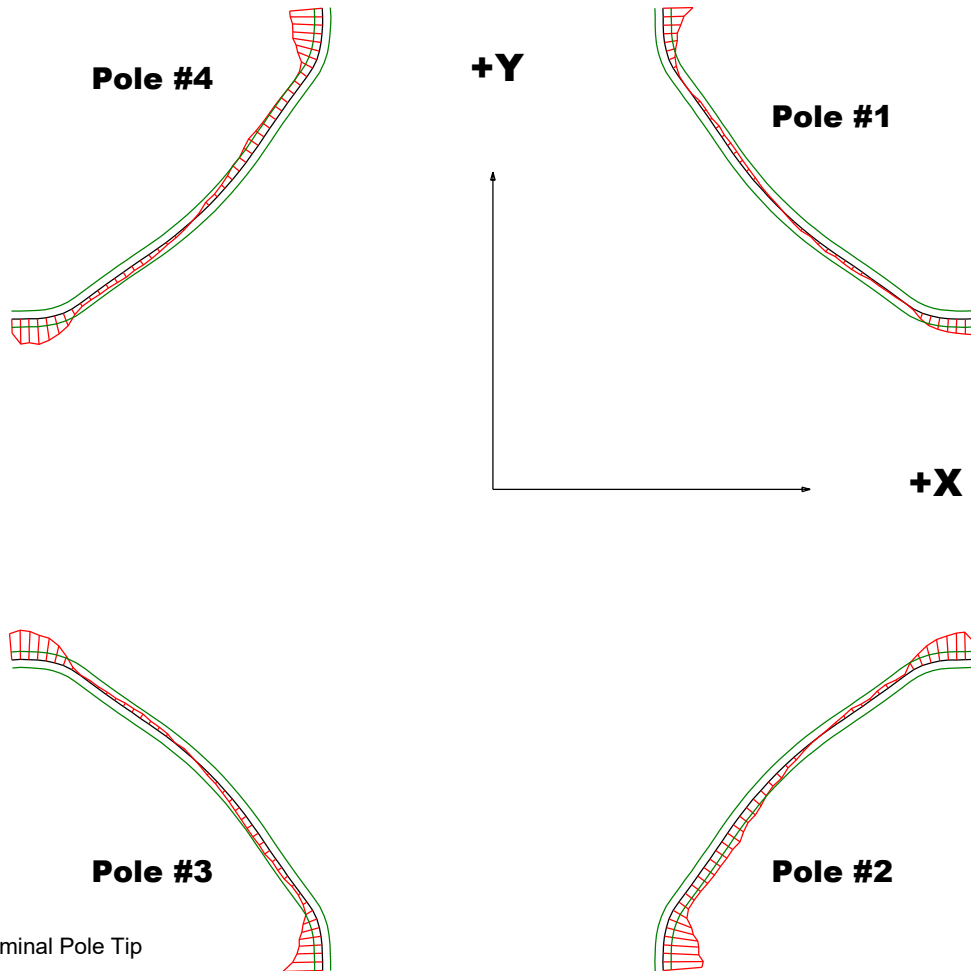
	Nominal Distance	Downstream Pole End	Upstream Pole End
PT Distance 1-3	2.026	2.0264	2.0274
PT Distance 2-4	2.026	2.0273	2.0294
Gap 1-2	0.8602	0.8541	0.8573
Gap 2-3	0.8602	0.8665	0.8638
Gap 3-4	0.8602	0.8516	0.8571
Gap 1-4	0.8602	0.8645	0.8643

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

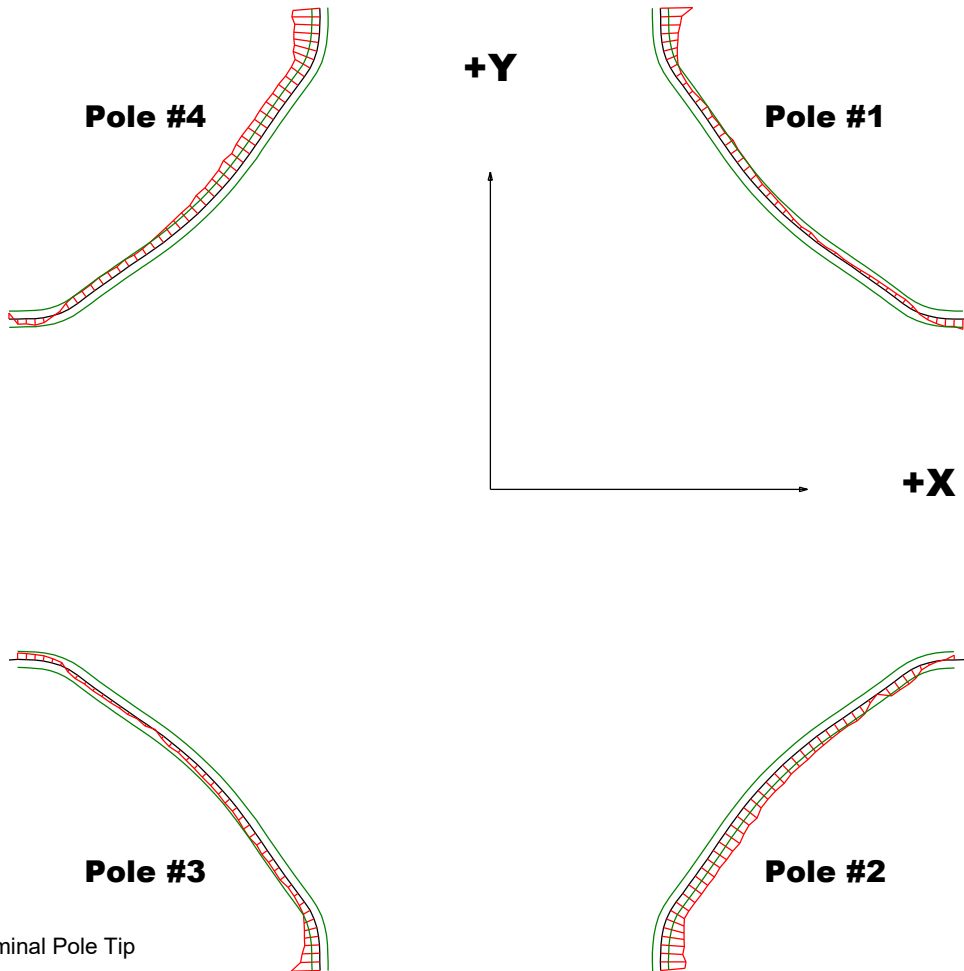
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.0037	-0.005	-0.0049	-0.0041
Max. Dev.	0.002	0.0034	0.0036	0.0032

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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

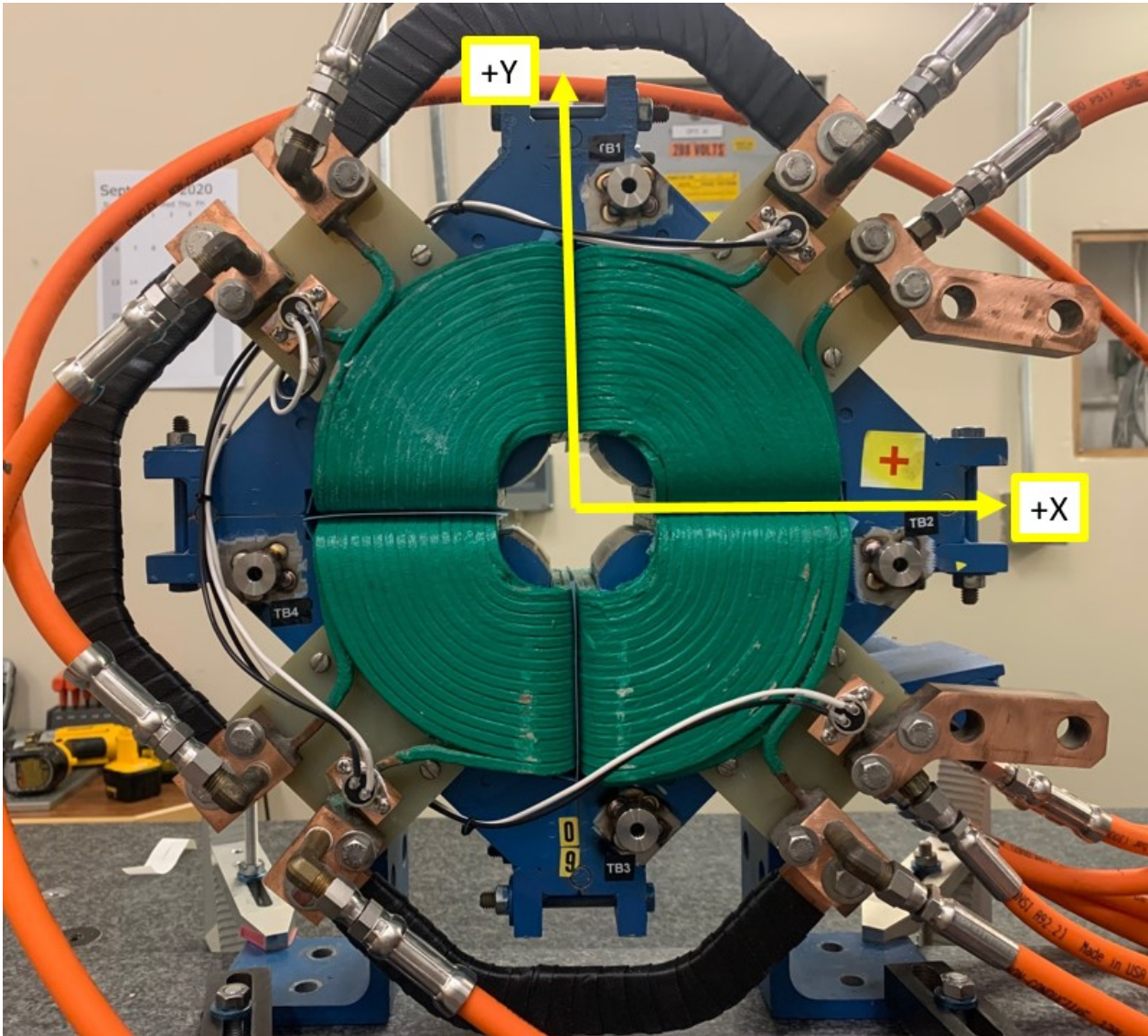
Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.004	-0.0032	-0.0036	-0.0035
Max. Dev.	0.0013	0.0006	0.0008	0.0008

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Angle of the Composite Pole Tip Best-Fit



in Decimal Degrees ° : -0.03248
Angle in Milliradians : -0.56684

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