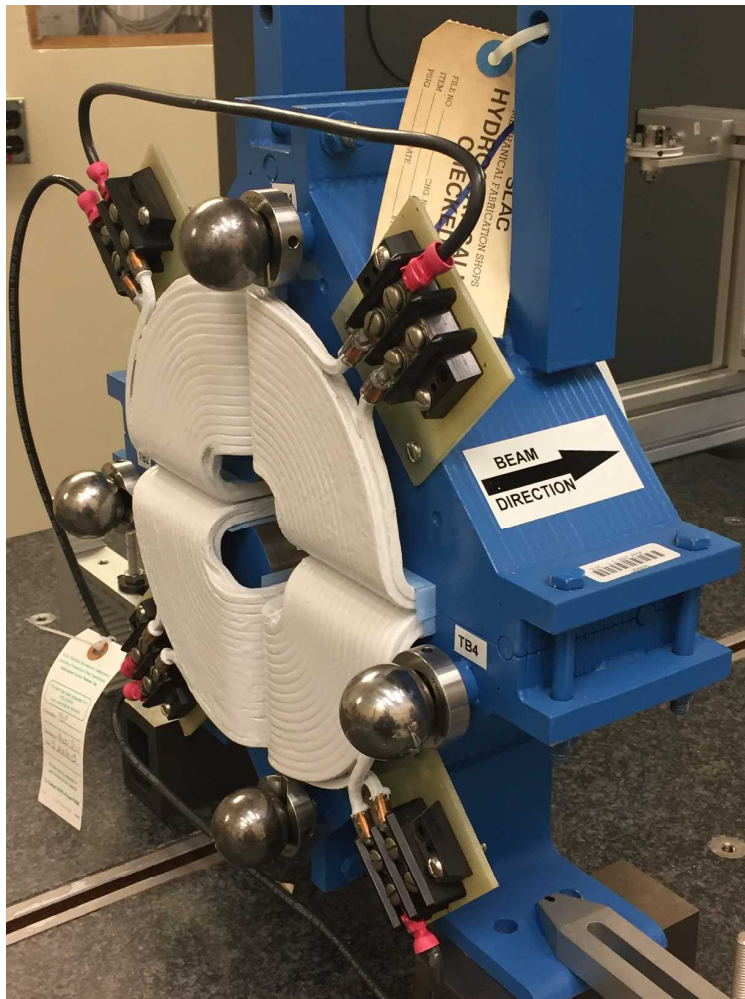


## LCLS II 2Q4 Fiducialization Report



Inspector : K. Caban  
Engineer : J. Amann  
Drawing No. : SA-344-112-01  
Barcode # : 4046  
Old S/N : P17  
Old MAD Element Name : LX05QU9  
Old Unit : QF6930

## 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. The Terminals & Tooling Ball Sockets are UPSTREAM, therefore +Z (DOWNSTREAM) points away from the Terminals & Tooling Ball Sockets.

### 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.

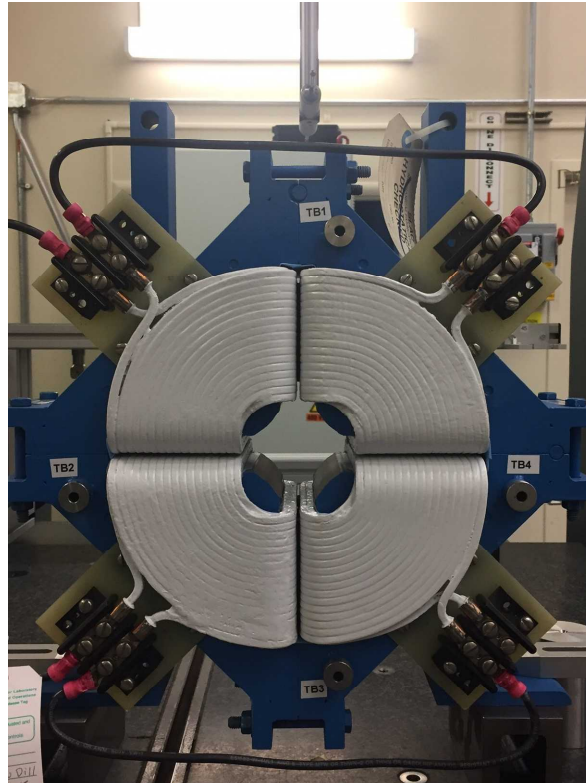
### Coordinate Origins

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 # : 4046**

**Mfg. S/N : P17**

## Tooling Ball Locations



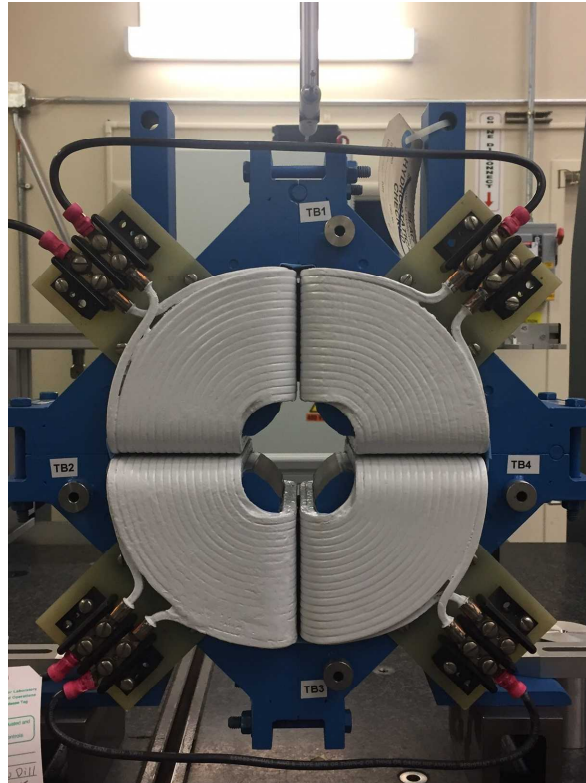
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0012	5.4947	-3.4302
TB 2	5.5055	-0.9958	-3.4301
TB 3	-0.9994	-5.5006	-3.4346
TB 4	-5.5011	-0.9995	-3.4364

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

**Barcode # : 4046**

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## Tooling Ball Locations



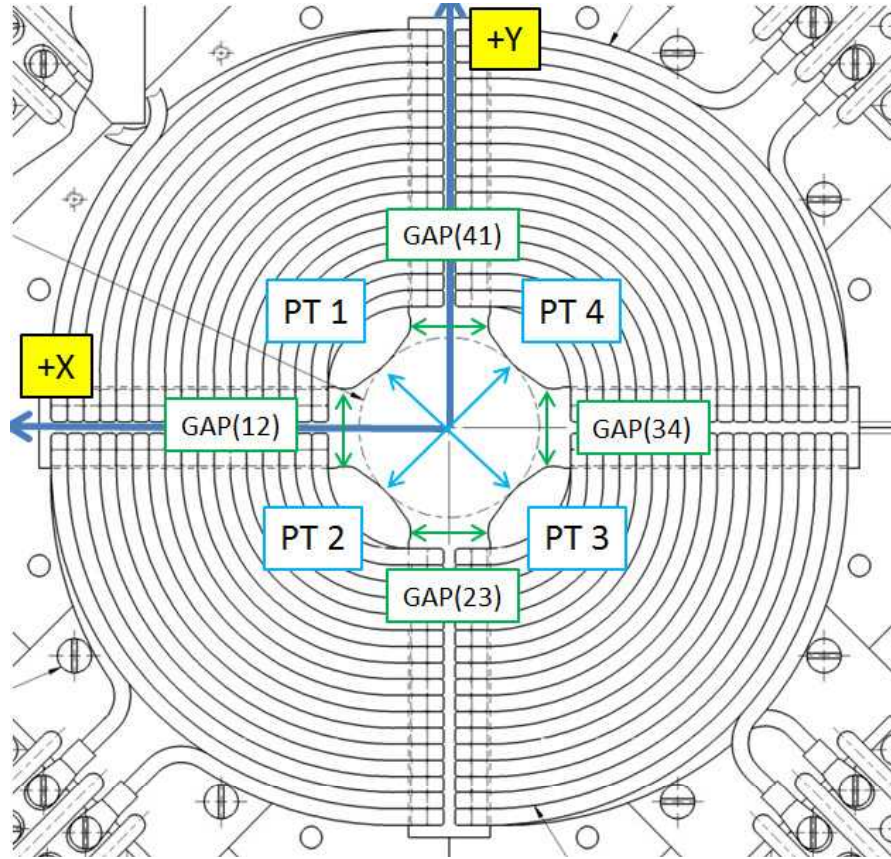
Tooling Ball	X Coord.	Y Coord.	Z Coord.
TB 1	-1.0024	5.4961	-2.7427
TB 2	5.5031	-0.9950	-2.7426
TB 3	-1.0002	-5.4998	-2.7473
TB 4	-5.5017	-0.9995	-2.7494

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

**Barcode # : 4046**

**Mfg. S/N : P17**

## Pole Tip Gap Measurements



	Nominal Distance	Downstream Pole End	Upstream Pole End
Pole Tip Distance 1-3	2.086 ± .002	2.08299	2.08558
Pole Tip Distance 2-4	2.086 ± .002	2.0849	2.08627
Gap 1-2	0.900	0.89492	0.89586
Gap 2-3	0.900	0.9024	0.90547
Gap 3-4	0.900	0.89701	0.8968
Gap 4-1	0.900	0.90412	0.90506

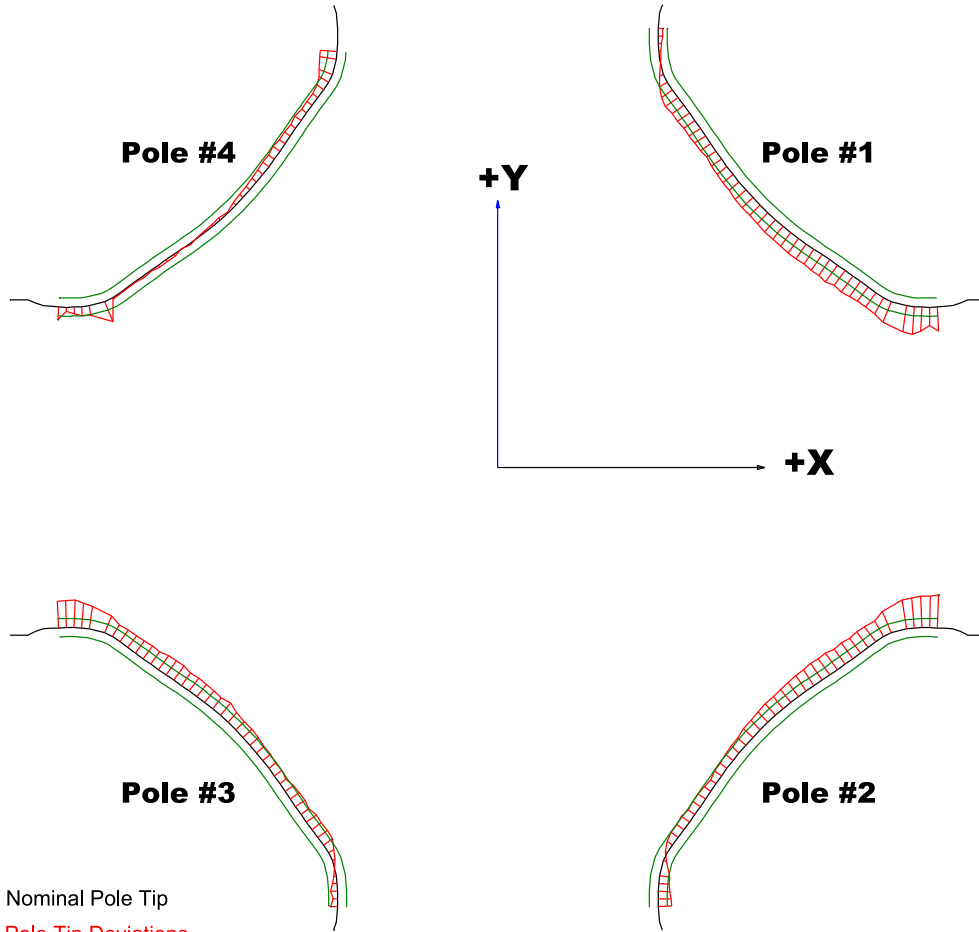
**Barcode # : 4046**

Dimensions in Inch

**Mfg. S/N : P17**



## Composite Best-fit of Pole Tips, Downstream



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

Dimensions in Inch

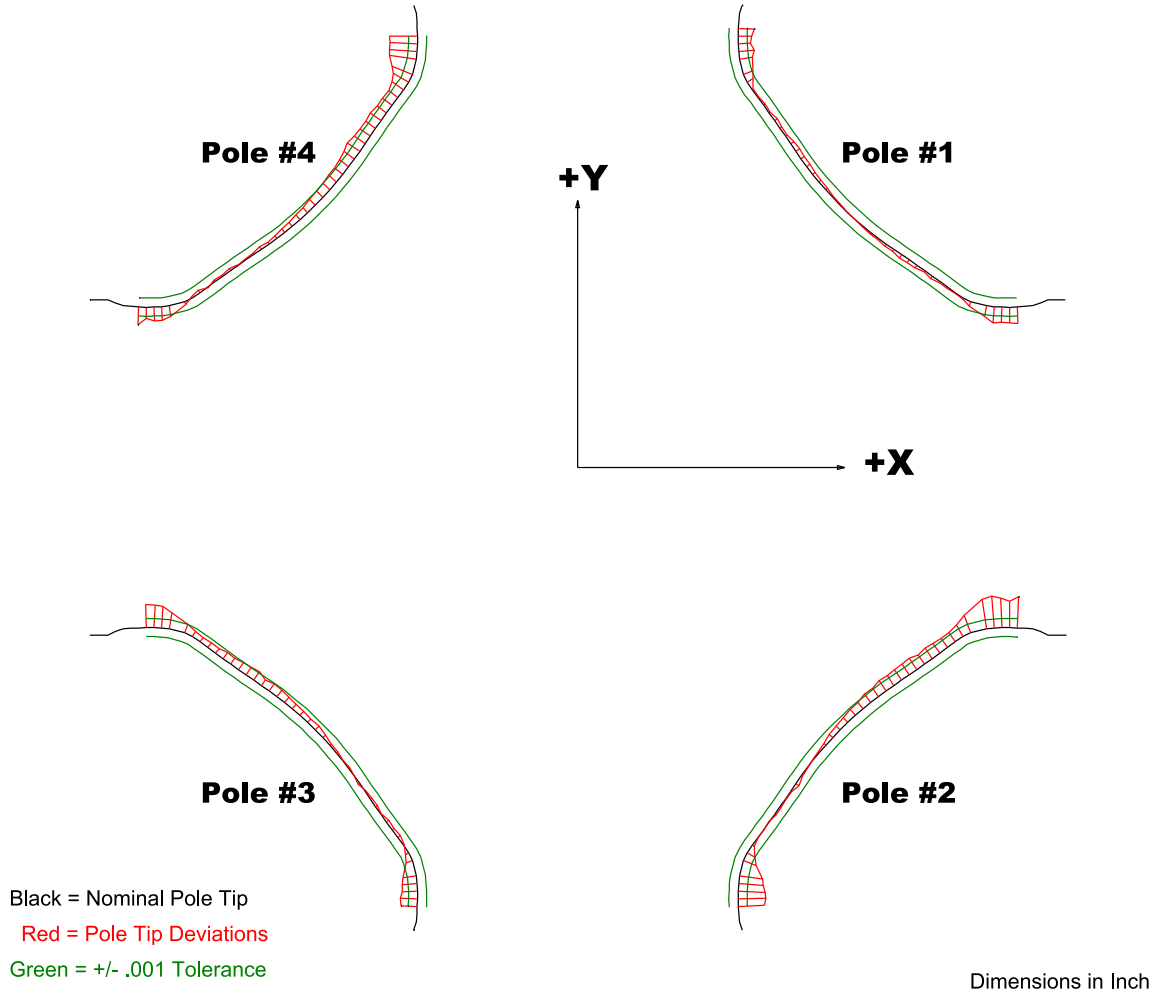
### Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00307	-0.00364	-0.00309	-0.00239
Max. Dev.	0.00053	0.00145	0.00075	0.00189

**Barcode # : 4046**

**Mfg. S/N : P17**

## Composite Best-fit of Pole Tips, Upstream



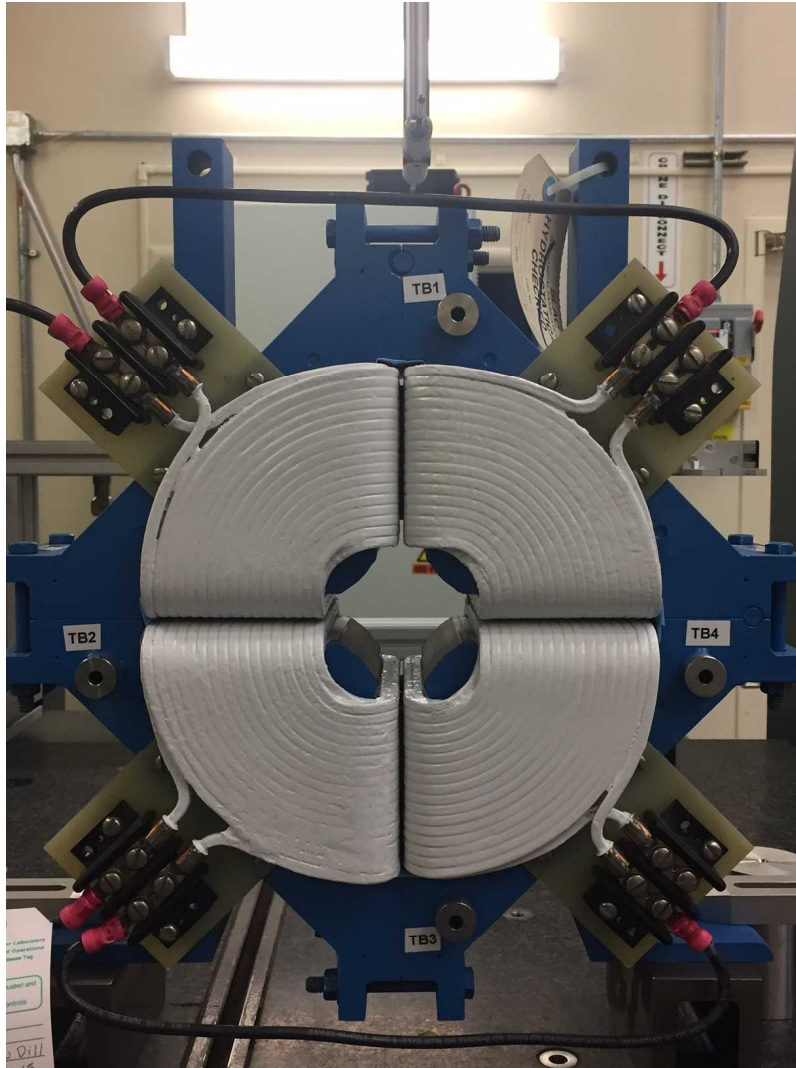
### Pole Tip Deviations

Pole Tip	#1	#2	#3	#4
Min. Dev.	-0.00185	-0.00357	-0.00254	-0.00199
Max. Dev.	0.00173	0.0031	0.00194	0.00314

**Barcode # : 4046**

**Mfg. S/N : P17**

## Angle of the Composite Pole Tip Best-Fit In Relation to Base



Angle in Decimal Degrees ° :0.04367

Angle in Milliradians :0.76224

**Barcode # : 4046**

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