Gradient Dipole Magnet Checks — 145D12

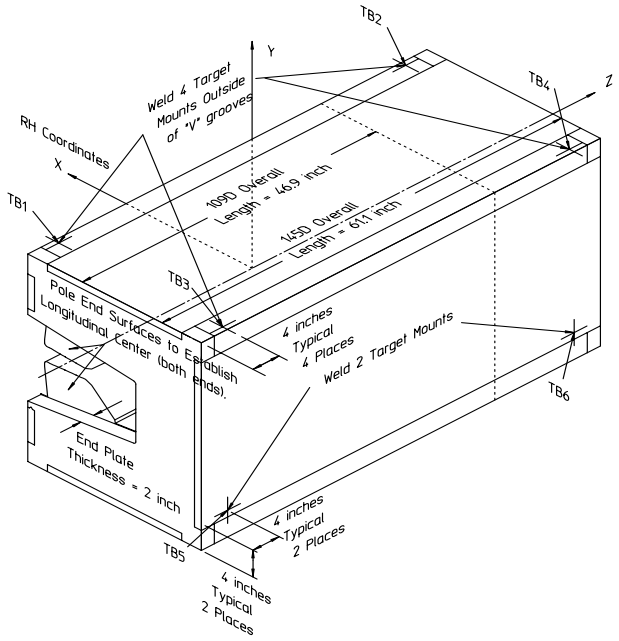
Date: 7/13/01

Magnet: 145D12

Operators: L. Juarez; H. Imfeld

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-26.5240	3.4363	16.9974
TB2	26.5509	3.4433	16.9984
TB3	-26.5507	-22.4026	17.0032
TB4	26.5252	-22.4110	16.9988
TB5	-26.4932	-24.2752	-11.7119
TB6	26.2899	-24.2760	-11.5535

Offset: 0.0002 inches

Description:

Fiducial values based on the x-offset of the mechanical center line to the magnetic.

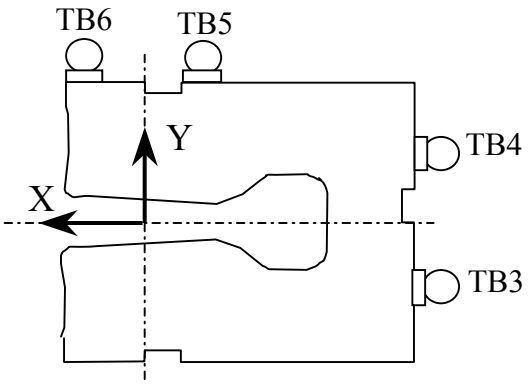
Downstream Garage Mechanical Check:

145D12 Status

Horizontal (X)	Vertical (Y)		
0.088 mm	-0.035 mm	X-value: Y-value:	OK OK

Description:

How much does the Z-axis from the US garage miss the center of the DS garage?



Trolley Checks:

145D12 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2800.156 mm	2800.103 mm	R2 - R1 (mm) -0.053	OK

Description:

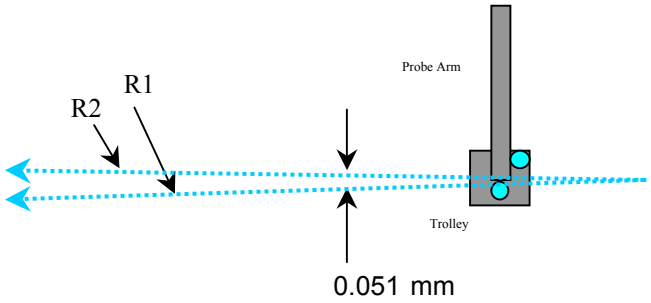
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0365	0.0203	0.0303	mrad	Midpoint 3D Offset (mm) 0.051	Too Big?

Description:

Angle between R1 and R2 vectors. The average of these two defines the Z-axis.



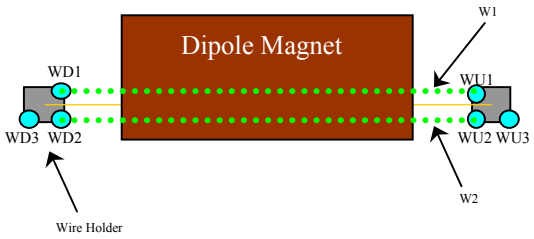
Wire Holder Position Checks:

145D12 Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2383.019 mm	2382.609 mm		-0.410	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

145D12 Status

Wire Orientation				
3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0642	0.0186	-0.0614 mrad	0.076	Too Big?

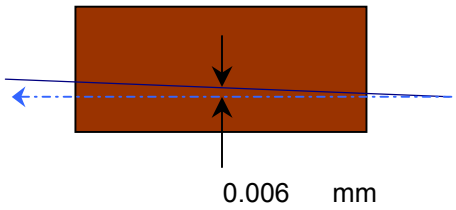
Description:

Orientation of wire with respect to Z-axis defining axis of dipole.

Wire Offsets				
US	Origin	DS	Origin Offset:	
-0.016	**0.006**	0.028 mm		OK

Description:

Offset distance from the mechanical center to the wire. (x-offsets only!)



End Surface Orientation Check and Magnet Length: 145D12

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	
US:	1.1202	-0.8702	0.7054	mrad	~ 0.751	Too Big?
DS:	0.7261	-0.4442	0.5743		~ 0.486	OK

Description:

End surface orientation relative to reference frame.

Note: 3D Offset based on average of width and height of the magnet side.

Length of Magnet

Distance **with SMR**		Distance		
1590.158	mm	1552.058	mm	OK

Description: *Length of magnet along Z-axis. (Design vals: 1551.61 and 1189.10)*

Top Surface Orientation Check: 145D12

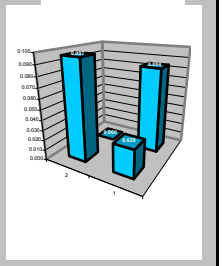
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		
Corner 1	412.700	mm	0.028	Delta Y C1:	OK
Corner 2	412.769	mm	0.097	Delta Y C2:	OK
Corner 3	412.756	mm	0.084	Delta Y C3:	OK
Corner 4	412.672	mm	0.000	Delta Y C4:	OK

Dispersion:

Corner 1	0.039	mm		
Corner 2	0.046	mm		
Corner 3	0.055	mm		
Corner 4	0.037	mm	Roll (mm)	
Overall	0.078	mm	~ 0.030	OK



3D Angle	Roll	Pitch		Pitch (mm)	
0.0591	0.0550	0.0216	mrad	~ 0.034	OK

Twist:	Roll	Pitch			
	-0.2833	-0.0986	mrad		
	-0.153	-0.153	mm	Twist:	OK

Description:

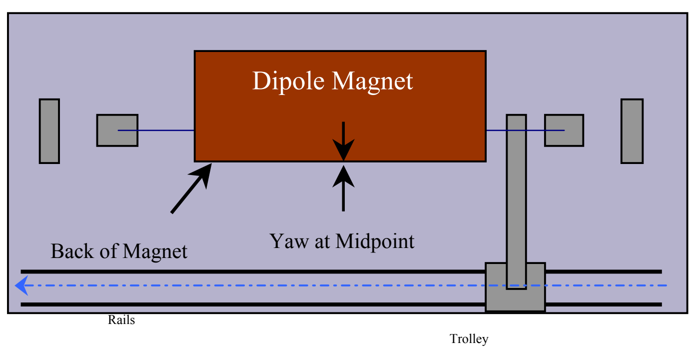
Top surface corner heights and average surface orientation values. ***(With 0.75" SMR offset.)***

Back Surface Orientation Check:

Back of Magnet							145D12 Status
Horizontal (X-value)				Delta X			
US:	115.516	mm		0.105			
Origin:	115.463	mm		0.052			
DS:	115.411	mm		0.000		Midpoint Yaw in mm	
3D Angle	Roll	Yaw					
0.6377	-0.6332	-0.0749	mrad			-0.058	OK

Description:

Position of scanned half of back surface of magnet for yaw check. ***(With 0.75" SMR offset.)***



Gradient Magnet
Magnetic Measurements/FiducializationTraveller

Approval must be obtained before going on to the next procedure
or removing the magnet from the test stand.
Magnetic Measurements Approval by – Jack Tanabe or Nanyang Li
Fiducialization Approval by – Jack Tanabe or Tony King
Magnet Serial Number: 145D12
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 7/13/01 Operator: L. Juarez
Water, Power and Interlock Connections.
Date_____, Operator _____
Measured Water Flow _____ gpm at Δp= _____ psi
Maximum Conditioning Current:_____ Amps
Wire Magnetic Measurements
Currents _____
Summary File Name(s)_____
Date_____, Operator _____ Approval _____
Coil Magnetic Measurements: Required _____ Yes _____ No.
Currents _____
Summary File Name(s)_____
Date_____, Operator _____ Approval _____

Gradient Magnet

Reduced Data Sheet

Approval must be obtained before removing magnet from test stand.

Magnetic Measurements Approval by – Jack Tanabe or Tony King.

Magnet Serial Number: 145D12

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset:	0.006	mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

Integrated Field: XX.XXX T-m @ XXX.XXX Amps

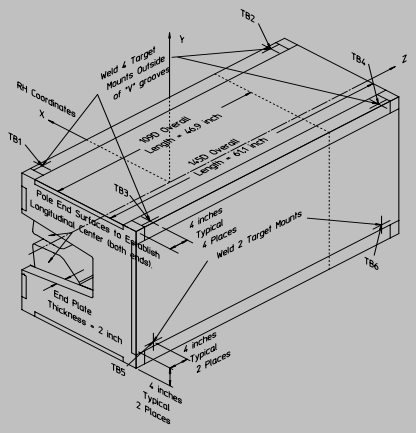
Fiducialization:

Operator(s): L. Juarez H. Imfeld

Date: 7/13/01 Temp: 22 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-673.709	87.281	431.733
TB2	674.392	87.460	431.760
TB3	-674.389	-569.027	431.881
TB4	673.740	-569.239	431.769
TB5	-672.927	-616.591	-297.483
TB6	667.764	-616.611	-293.458

Mechanical Centerline
Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-673.709	87.281	431.733
TB2	674.392	87.460	431.760
TB3	-674.389	-569.027	431.881
TB4	673.740	-569.239	431.769
TB5	-672.927	-616.591	-297.483
TB6	667.764	-616.611	-293.458

Magnetic Centerline
Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.466	96.520
C2	96.361	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.650	393.700
C2	393.719	393.700
C3	393.706	393.700
C4	393.622	393.700
	incl. paint	no paint

Approval: