Gradient Dipole Magnet Checks — 145D14

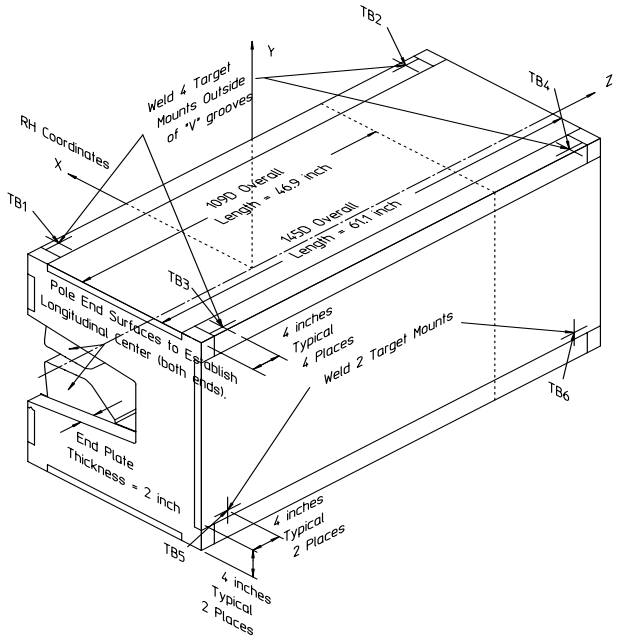
Date: 7/18/01

Magnet: 145D14

Operators: M. Rogers; F. Gaudreault

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-26.5457	3.4452	17.0032
TB2	26.5503	3.4464	16.9995
TB3	-26.5207	-22.4160	17.0001
TB4	26.5430	-22.4113	16.9959
TB5	-26.4051	-24.2682	-11.5563
TB6	26.4445	-24.2632	-11.4677

Offset: 0.0067 inches

Description:

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

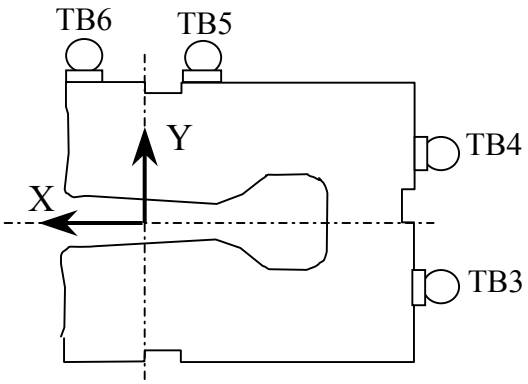
Downstream Garage Mechanical Check:

145D14 Status

Horizontal (X)	Vertical (Y)		
0.088 mm	-0.082 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:

145D14 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2800.140 mm	2800.079 mm	R2 - R1 (mm) -0.061	OK

Description:

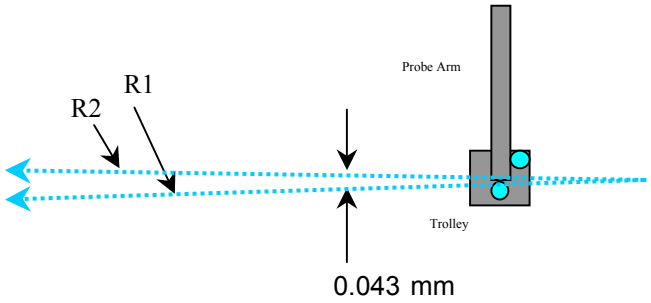
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0308	0.0170	0.0257	mrad	Midpoint 3D Offset (mm) 0.043	OK

Description:

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



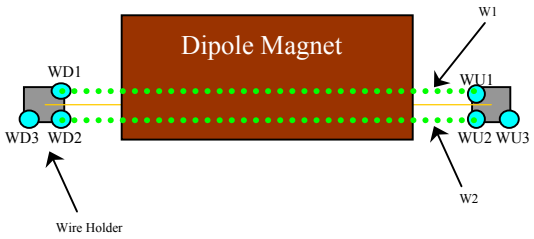
Wire Holder Position Checks:

145D14 Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2383.102 mm	2382.704 mm		-0.398	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

145D14 Status

Wire Orientation				
3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0370	0.0067	-0.0363 mrad	0.044	OK

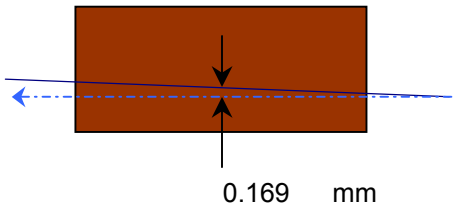
Description:

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

Wire Offsets				
US	Origin	DS	Origin Offset:	
0.161	**0.169**	0.177 mm		OK

Description:

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



End Surface Orientation Check and Magnet Length: 145D14

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	0.5824	-0.2019	0.5463	mrad	~ 0.390	OK
DS:	0.4647	0.1019	0.4534		~ 0.311	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		Status
1590.347	mm	1552.247	mm	LENGTH?

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

Top Surface Orientation Check: 145D14

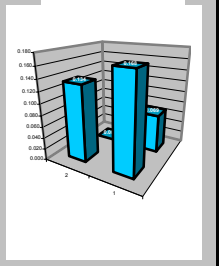
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	412.770	mm	0.168	Delta Y C1:	OK
Corner 2	412.736	mm	0.134	Delta Y C2:	OK
Corner 3	412.671	mm	0.069	Delta Y C3:	OK
Corner 4	412.602	mm	0.000	Delta Y C4:	OK

Dispersion:

Corner 1	0.046	mm		
Corner 2	0.021	mm		
Corner 3	0.038	mm		
Corner 4	0.035	mm		
Overall	0.041	mm		



Roll (mm) ~ 0.110 — OK

3D Angle	Roll	Pitch		Pitch (mm)	Status
0.2073	0.2032	0.0407	mrad	~ 0.063	OK

Twist:	Roll	Pitch		Twist:	Status
	-0.0648	-0.0225	mrad		
	-0.035	-0.035	mm		OK

Description:

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

Back Surface Orientation Check:

145D14
Status

Back of Magnet

Horizontal (X-value)			Delta X
US:	115.585	mm	0.028
Origin:	115.571	mm	0.014
DS:	115.557	mm	0.000

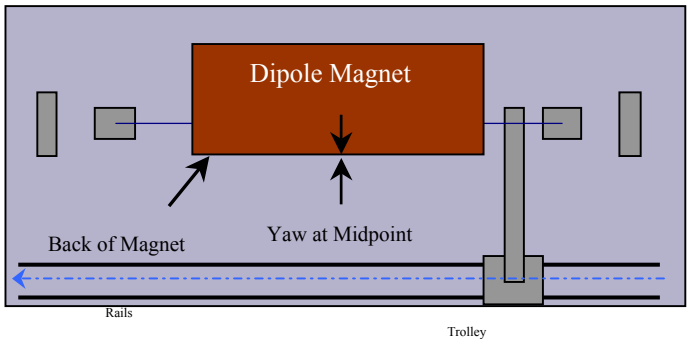
3D Angle	Roll	Yaw	
0.0506	-0.0464	-0.0202	mrad

Midpoint
Yaw in mm
-0.016

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: 145D14
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 7/18/01 Operator: M. Rogers
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: 145D14

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 0.169 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

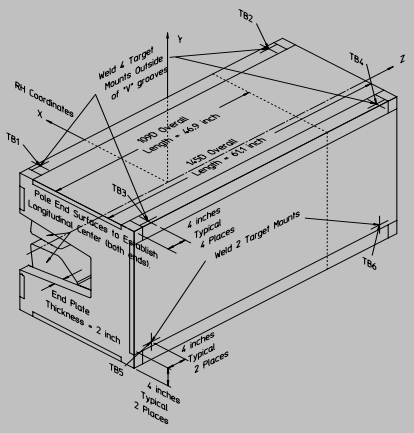
Fiducialization:

Operator(s): M. Rogers F. Gaudreault

Date: 7/18/01 Temp: 20 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-674.262	87.507	431.882
TB2	674.377	87.538	431.788
TB3	-673.626	-569.367	431.803
TB4	674.191	-569.246	431.697
TB5	-670.689	-616.413	-293.529
TB6	671.690	-616.285	-291.279

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-674.262	87.507	431.882
TB2	674.377	87.538	431.788
TB3	-673.626	-569.367	431.803
TB4	674.191	-569.246	431.697
TB5	-670.689	-616.413	-293.529
TB6	671.690	-616.285	-291.279

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.535	96.520
C2	96.507	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.720	393.700
C2	393.686	393.700
C3	393.621	393.700
C4	393.552	393.700
	incl. paint	no paint

Approval: