Gradient Dipole Magnet Checks — 145D21

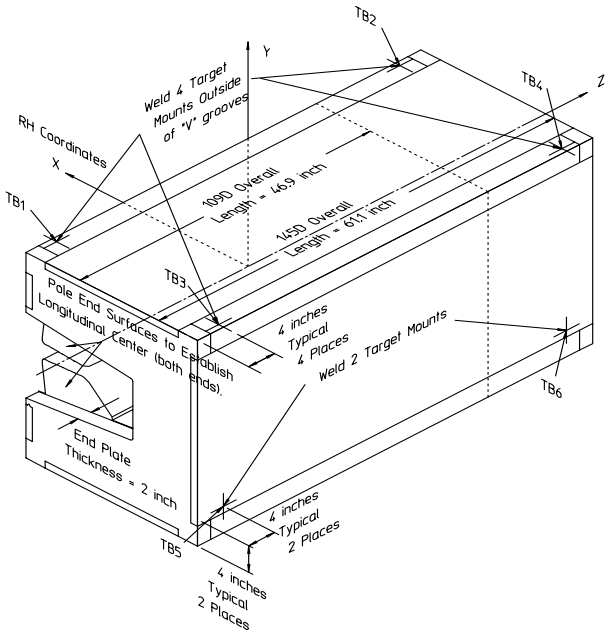
Date: 9/26/01

Magnet: 145D21

Operators: M. Rogers, J. McDougal

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-26.5563	3.4344	16.9994
TB2	26.5393	3.4480	16.9975
TB3	-26.5688	-22.4172	16.9954
TB4	26.5343	-22.4199	16.9981
TB5	-26.5389	-24.2533	-11.3557
TB6	26.4392	-24.2720	-11.6555

Offset: 0.0069 inches

Description:

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

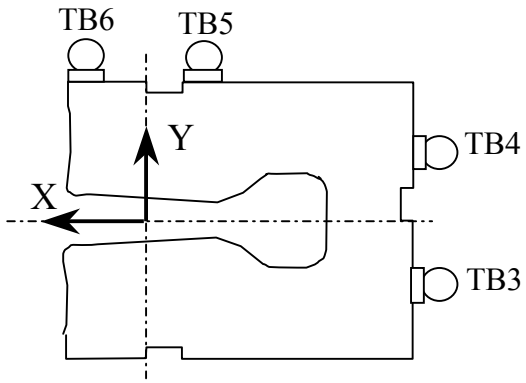
Downstream Garage Mechanical Check:

145D21 Status

Horizontal (X)	Vertical (Y)		
0.063 mm	-0.070 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:

145D21 Status

Trolley Distance

3D Distance R1	3D Distance R2	R2 - R1 (mm)	
2800.344 mm	2800.290 mm	-0.054	OK

Description:

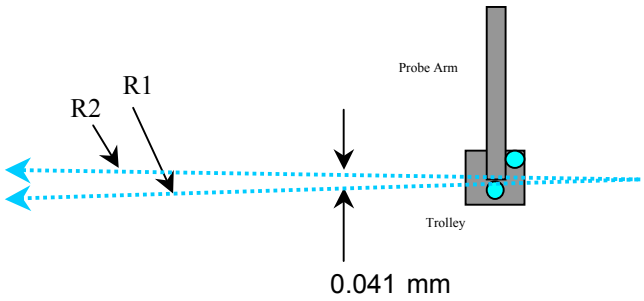
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0294	0.0127	0.0265 mrad	0.041	OK

Description:

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



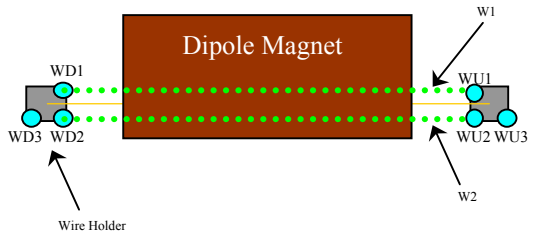
Wire Holder Position Checks:

145D21 Status

Wire Holders' Yaw Check					
3D Distance W1		3D Distance W2		W2 - W1 (mm)	
2383.748	mm	2383.287	mm	-0.461	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

145D21 Status

Wire Orientation					
3D Angle	Yaw	Pitch		Midpoint 3D Offset (mm)	
0.0275	0.0064	-0.0267	mrad	0.033	OK

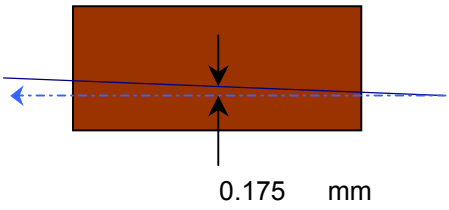
Description:

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

Wire Offsets					
US	Origin	DS			
0.167	**0.175**	0.182	mm	Origin Offset:	OK

Description:

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



End Surface Orientation Check and Magnet Length: 145D21

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	
US:	1.1449	-1.1307	0.1793	mrad	~ 0.767	Too Big?
DS:	0.7911	-0.7905	-0.0292		~ 0.530	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			
1590.671	mm	1552.571	mm		LENGTH?

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

Top Surface Orientation Check: 145D21

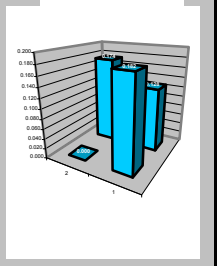
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		
Corner 1	412.854	mm	0.182	Delta Y C1:	OK
Corner 2	412.672	mm	0.000	Delta Y C2:	OK
Corner 3	412.800	mm	0.128	Delta Y C3:	OK
Corner 4	412.846	mm	0.174	Delta Y C4:	OK

Dispersion:

Corner 1	0.077	mm		
Corner 2	0.034	mm		
Corner 3	0.036	mm		
Corner 4	0.059	mm	Roll (mm)	
Overall	0.093	mm	~ 0.059	OK



3D Angle	Roll	Pitch		Pitch (mm)	
0.1238	0.1089	-0.0588	mrad	~ -0.091	OK

Twist:	Roll	Pitch			
	0.4222	0.1469	mrad		
	0.228	0.228	mm	Twist:	OK

Description:

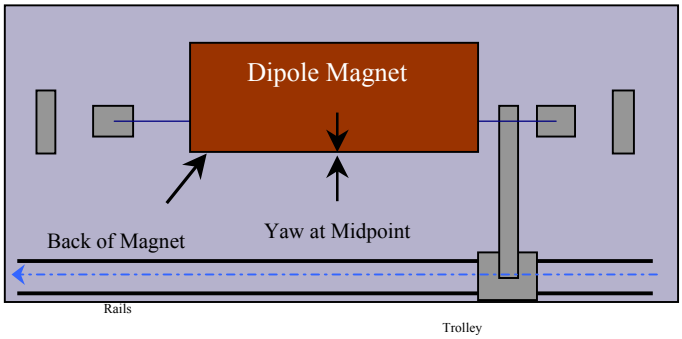
Top surface corner heights and average surface orientation values. ***(With 0.75" SMR offset.)***

Back Surface Orientation Check: 145D21

Back of Magnet					Status
Horizontal (X-value)				Delta X	
US:	115.749	mm		0.125	
Origin:	115.624	mm		0.000	
DS:	115.850	mm		0.226	
3D Angle	Roll	Yaw			
0.1376	0.1171	0.0724	mrad		
				Midpoint Yaw in mm: 0.056	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: 145D21
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 9/26/01 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: 145D21

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 0.175 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

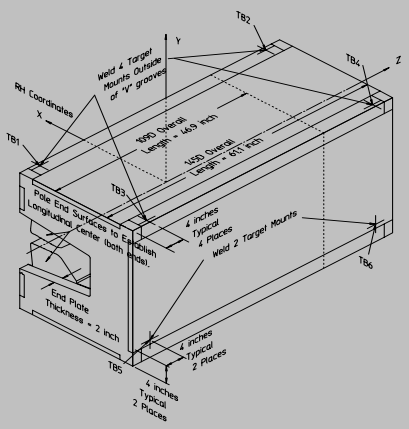
Fiducialization:

Operator(s): M. Rogers J. McDougal

Date: 9/26/01 Temp: 20 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-674.529	87.234	431.784
TB2	674.099	87.580	431.737
TB3	-674.848	-569.398	431.684
TB4	673.970	-569.465	431.751
TB5	-674.089	-616.035	-288.436
TB6	671.556	-616.508	-296.049

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-674.529	87.234	431.784
TB2	674.099	87.580	431.737
TB3	-674.848	-569.398	431.684
TB4	673.970	-569.465	431.751
TB5	-674.089	-616.035	-288.436
TB6	671.556	-616.508	-296.049

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.699	96.520
C2	96.800	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.804	393.700
C2	393.622	393.700
C3	393.750	393.700
C4	393.796	393.700
	incl. paint	no paint

Approval: