Gradient Dipole Magnet Checks — 145D22

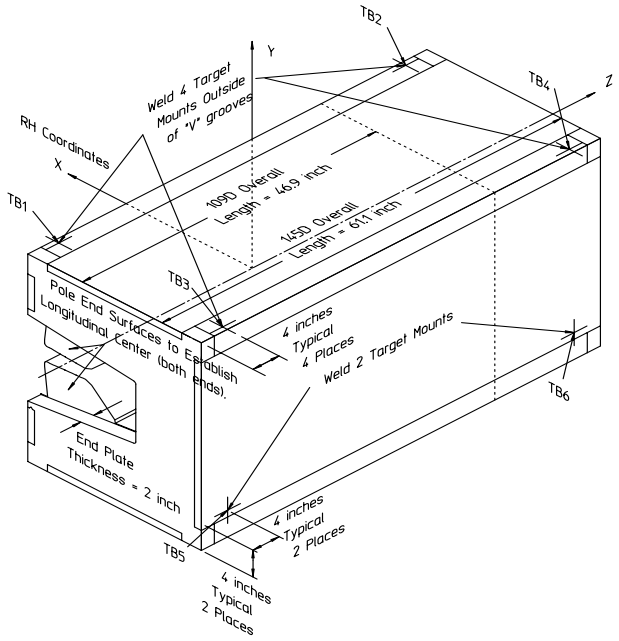
Date: 9/18/01

Magnet: 145D22

Operators: J. McDougal; F. Gaudreault

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-26.5560	3.4498	16.9961
TB2	26.5426	3.4382	17.0015
TB3	-26.5650	-22.4033	16.9953
TB4	26.5432	-22.4373	16.9938
TB5	-26.4414	-24.2492	-11.3743
TB6	26.5873	-24.2500	-11.5815

Offset: 0.0161 inches

Description:

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

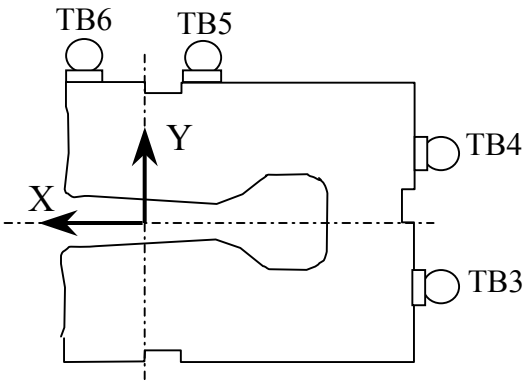
Downstream Garage Mechanical Check:

145D22 Status

Horizontal (X)	Vertical (Y)		
0.081 mm	-0.036 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:

145D22 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2800.160 mm	2800.112 mm	R2 - R1 (mm) -0.048	OK

Description:

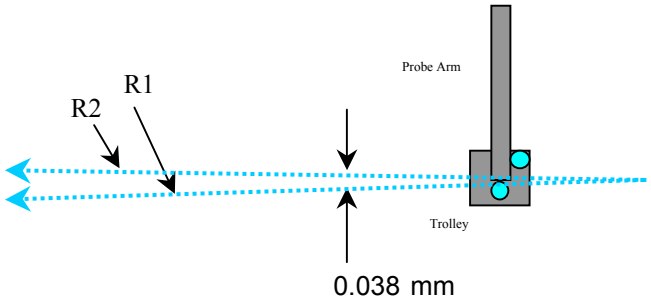
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0269	0.0124	0.0238	mrad	Midpoint 3D Offset (mm) 0.038	OK

Description:

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



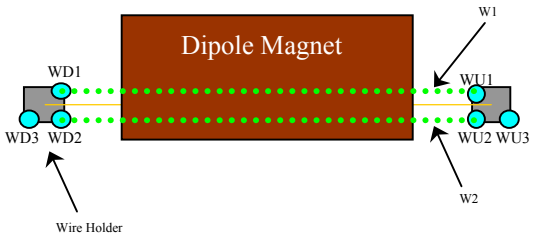
Wire Holder Position Checks:

145D22 Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2382.882 mm	2382.462 mm		-0.420	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

145D22 Status

Wire Orientation				
3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0438	0.0120	-0.0421 mrad	0.052	OK

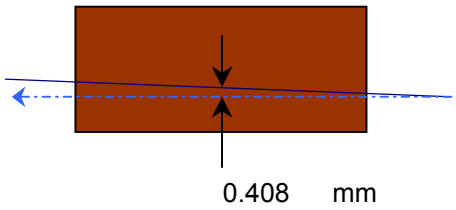
Description:

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

Wire Offsets				
US	Origin	DS	Origin Offset:	
0.394	**0.408**	0.422 mm		Too Big?

Description:

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



End Surface Orientation Check and Magnet Length: 145D22

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	1.0431	-1.0404	0.0751	mrad	~ 0.699	Too Big?
DS:	0.9556	-0.4396	-0.8485		~ 0.640	Too Big?

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
1591.086	mm	1552.986	mm	LENGTH?

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

Top Surface Orientation Check: 145D22

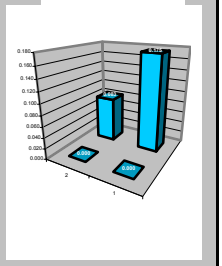
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	412.671	mm	0.000	Delta Y C1:	OK
Corner 2	412.671	mm	0.000	Delta Y C2:	OK
Corner 3	412.846	mm	0.175	Delta Y C3:	OK
Corner 4	412.754	mm	0.083	Delta Y C4:	OK

Dispersion:

Corner 1	0.063	mm
Corner 2	0.034	mm
Corner 3	0.061	mm
Corner 4	0.076	mm
Overall	0.070	mm



Roll (mm) ~ 0.099 — OK

3D Angle	Roll	Pitch		Pitch (mm)	Status
0.1881	0.1837	-0.0407	mrad	~ -0.063	OK

Twist:

Roll	Pitch		Twist:	Status
-0.1704	-0.0592	mrad		
-0.092	-0.092	mm		OK

Description:

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

Back Surface Orientation Check:

145D22
Status

Back of Magnet

Horizontal (X-value)			Delta X
US:	116.031	mm	0.285
Origin:	115.889	mm	0.143
DS:	115.746	mm	0.000

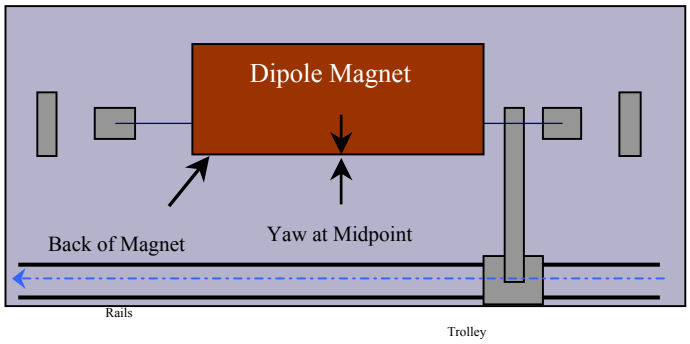
3D Angle	Roll	Yaw	
0.8777	0.8537	-0.2038	mrad

Midpoint
Yaw in mm
-0.158

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: 145D22
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 9/18/01 Operator: J. McDougal
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: 145D22

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 0.408 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

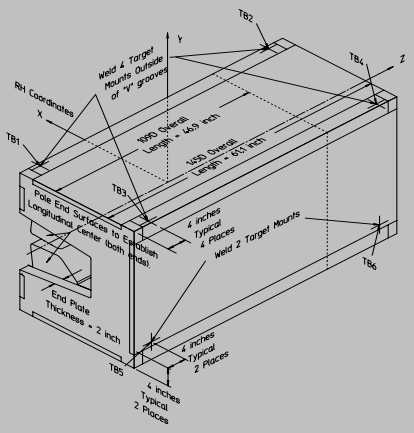
Fiducialization:

Operator(s): J. McDouga F. Gaudreault

Date: 9/18/01 Temp: 24 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-674.523	87.625	431.702
TB2	674.181	87.330	431.838
TB3	-674.751	-569.045	431.680
TB4	674.197	-569.908	431.642
TB5	-671.612	-615.930	-288.906
TB6	675.318	-615.949	-294.169

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-674.523	87.625	431.702
TB2	674.181	87.330	431.838
TB3	-674.751	-569.045	431.680
TB4	674.197	-569.908	431.642
TB5	-671.612	-615.930	-288.906
TB6	675.318	-615.949	-294.169

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.981	96.520
C2	96.696	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.621	393.700
C2	393.621	393.700
C3	393.796	393.700
C4	393.704	393.700
	incl. paint	no paint

Approval: