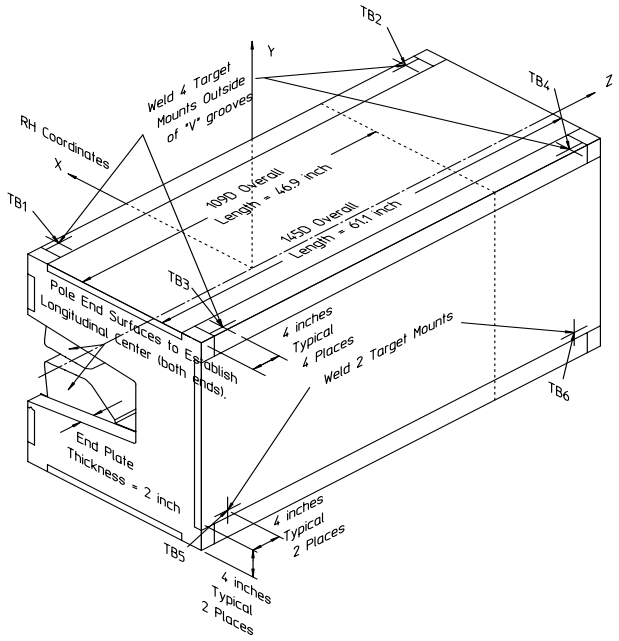
Gradient Dipole Magnet Checks — 145D18

Date: 8/31/01

Magnet: 145D18

Operators:
L. Juarez
H. Imfeld

Notes:
The arm was not indexed in a repeatable fashion. It was deemed necessary to collect RU1 and RU2 from two extra stations.
Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-26.5330	3.4409	17.0078
TB2	26.5713	3.4481	17.0126
TB3	-26.5330	-22.4188	17.0056
TB4	26.5463	-22.4130	17.0074
TB5	-26.5747	-24.2675	-11.5317
TB6	26.4731	-24.2769	-11.4615

Offset: 0.0029 inches

Description:

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

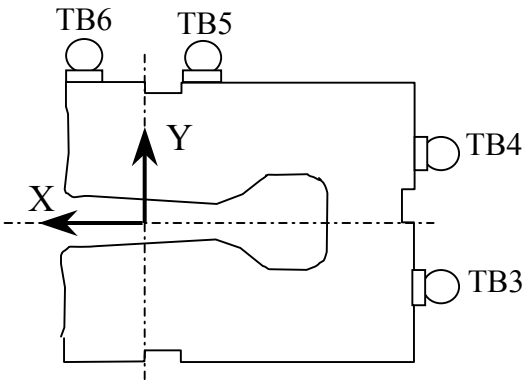
Downstream Garage Mechanical Check:

145D18 Status

Horizontal (X)	Vertical (Y)		
0.102 mm	-0.070 mm	X-value: Y-value:	X > 100μm! OK

Description:

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



Trolley Checks:

145D18 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2799.279 mm	2799.218 mm	R2 - R1 (mm) -0.061	OK

Description:

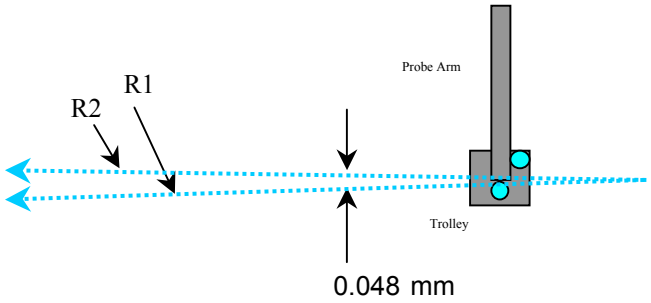
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0344	0.0230	0.0256	mrad	Midpoint 3D Offset (mm) 0.048	OK

Description:

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



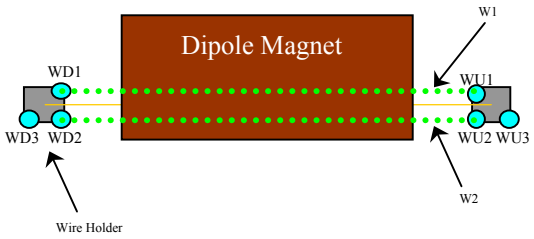
Wire Holder Position Checks:

145D18 Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2382.698 mm	2382.418 mm		-0.280	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

145D18 Status

Wire Orientation				
3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0325	0.0093	-0.0311 mrad	0.039	OK

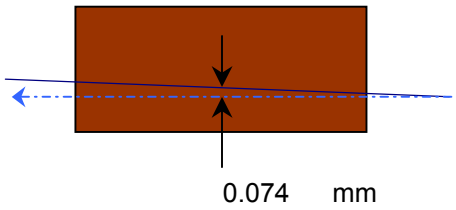
Description:

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

Wire Offsets				
US	Origin	DS	Origin Offset:	
0.063	**0.074**	0.085 mm		OK

Description:

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



End Surface Orientation Check and Magnet Length: 145D18

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	1.7614	-0.7588	1.5896	mrad	~ 1.180	Too Big?
DS:	2.0320	-1.2985	1.5629		~ 1.361	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
1590.811	mm	1552.711	mm	LENGTH?

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

Top Surface Orientation Check: 145D18

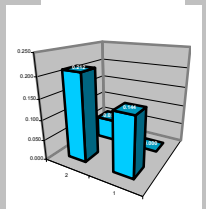
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	413.039	mm	0.144	Delta Y C1:	OK
Corner 2	413.107	mm	0.212	Delta Y C2:	OK
Corner 3	412.895	mm	0.000	Delta Y C3:	OK
Corner 4	412.951	mm	0.056	Delta Y C4:	OK

Dispersion:

Corner 1	0.034	mm
Corner 2	0.046	mm
Corner 3	0.028	mm
Corner 4	0.040	mm
Overall	0.048	mm



Roll (mm) ~ 0.126 — OK

3D Angle	Roll	Pitch		Pitch (mm)	Status
0.2370	0.2333	-0.0415	mrad	~ -0.064	OK

Twist:	Roll	Pitch		Status
	-0.0222	-0.0077	mrad	
	-0.012	-0.012	mm	Twist: OK

Description:

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

Back Surface Orientation Check:

145D18
Status

Back of Magnet

Horizontal (X-value)			Delta X
US:	115.505	mm	0.025
Origin:	115.493	mm	0.013
DS:	115.480	mm	0.000

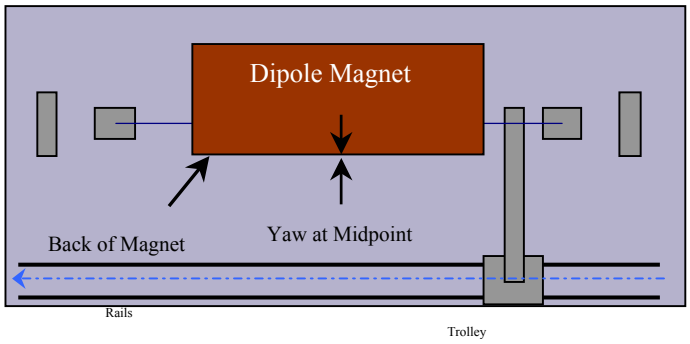
3D Angle	Roll	Yaw	
0.2171	-0.2164	-0.0177	mrad

Midpoint
Yaw in mm
-0.014

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: 145D18
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 8/31/01 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: 145D18

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset:	0.074	mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

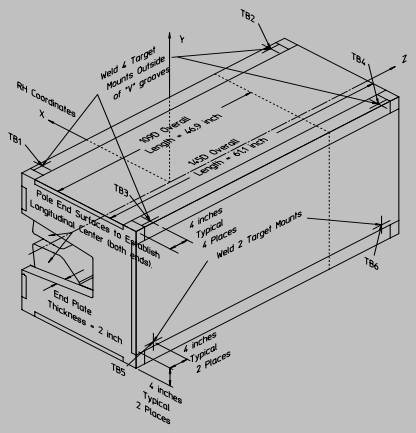
Fiducialization:

Operator(s): L. Juarez H. Imfeld

Date: 8/31/01 Temp: 24 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-673.939	87.398	431.997
TB2	674.911	87.582	432.120
TB3	-673.937	-569.438	431.943
TB4	674.275	-569.289	431.989
TB5	-674.997	-616.395	-292.906
TB6	672.416	-616.632	-291.122

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-673.939	87.398	431.997
TB2	674.911	87.582	432.120
TB3	-673.937	-569.438	431.943
TB4	674.275	-569.289	431.989
TB5	-674.997	-616.395	-292.906
TB6	672.416	-616.632	-291.122

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.455	96.520
C2	96.430	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.989	393.700
C2	394.057	393.700
C3	393.845	393.700
C4	393.901	393.700
	incl. paint	no paint

Approval: