Gradient Dipole Magnet Checks — 109D38

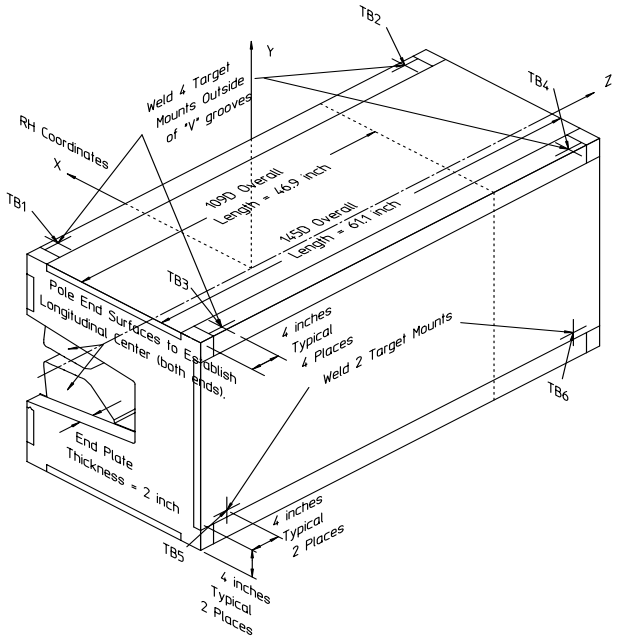
Date: 4/10/02

Magnet: 109D38

Operators: M. Rogers, H. Imfeld

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-19.4158	3.4503	16.9999
TB2	19.4191	3.4511	17.0026
TB3	-19.4098	-22.3719	16.9994
TB4	19.3873	-22.3678	17.0004
TB5	-19.2329	-24.2608	-11.2870
TB6	19.2132	-24.2521	-11.5286

Offset: 0.2099 inches

Description:

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

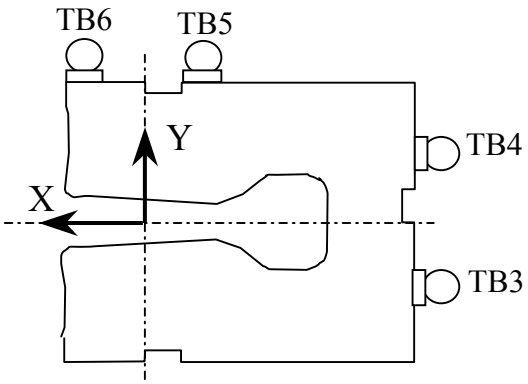
Downstream Garage Mechanical Check:

109D38 Status

Horizontal (X)	Vertical (Y)		
0.103 mm	-0.024 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:

109D38 Status

Trolley Distance

3D Distance R1	3D Distance R2	R2 - R1 (mm)	
2800.235 mm	2800.167 mm	-0.068	OK

Description:

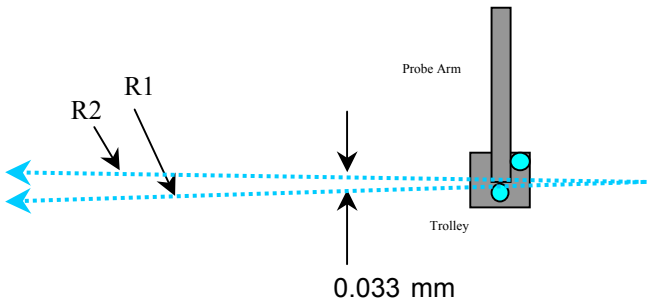
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch	Midpoint 3D Offset (mm)	
0.0236	0.0091	0.0218 mrad	0.033	OK

Description:

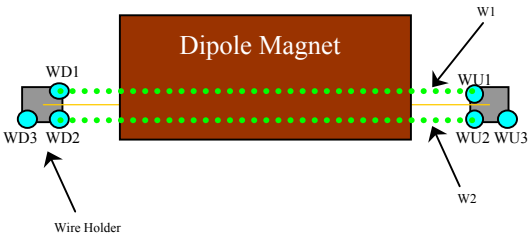
Angle between R1 and R2 vectors. The average of these two defines the Z-axis.



Wire Holder Position Checks:

109D38 Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2383.343 mm	2382.866 mm		-0.477	OK
Description:				
Distance between wire holders for TB1 and TB2.				

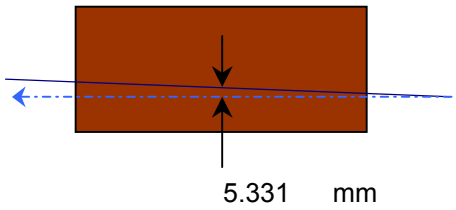


Wire Position Checks:

109D38 Status

Wire Orientation					
3D Angle	Yaw	Pitch		Midpoint 3D Offset (mm)	
0.0721	0.0488	-0.0531	mrad	0.086	Too Big?
Description:					
Orientation of wire with respect to Z-axis defining axis of dipole.					

Wire Offsets					
US	Origin	DS			
5.273	**5.331**	5.389	mm	Origin Offset:	Range?
Description:					
Offset distance from the mechanical center to the wire. (x-offsets only! 5.00 mm considered nom)					



End Surface Orientation Check and Magnet Length: 109D38

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	0.9766	-0.7244	0.6549	mrad	~ 0.654	Too Big?
DS:	1.0358	-0.9378	0.4397		~ 0.694	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
1228.189	mm	1190.089	mm	LENGTH?

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

Top Surface Orientation Check: 109D38

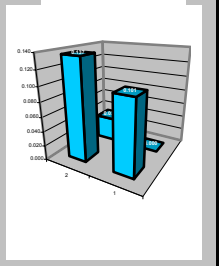
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	412.783	mm	0.101	Delta Y C1:	OK
Corner 2	412.819	mm	0.137	Delta Y C2:	OK
Corner 3	412.682	mm	0.000	Delta Y C3:	OK
Corner 4	412.716	mm	0.034	Delta Y C4:	OK

Dispersion:

Corner 1	0.030	mm
Corner 2	0.029	mm
Corner 3	0.043	mm
Corner 4	0.041	mm
Overall	0.041	mm



Roll (mm) ~ 0.084 — OK

3D Angle	Roll	Pitch		Pitch (mm)	Status
0.1591	0.1562	-0.0306	mrad	~ -0.036	OK

Twist:	Roll	Pitch		Twist:	Status
	-0.0037	-0.0017	mrad		
	-0.002	-0.002	mm		OK

Description:

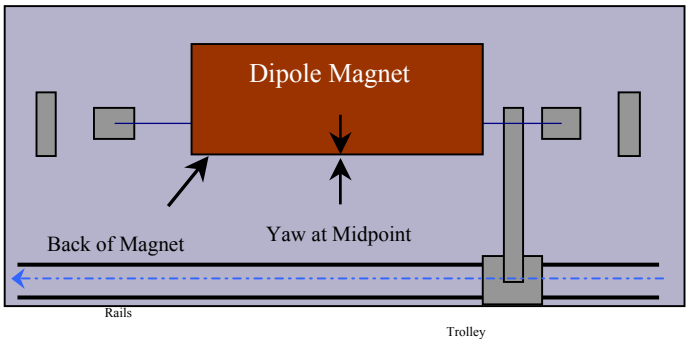
Top surface corner heights and average surface orientation values. ***(With 0.75" SMR offset.)***

Back Surface Orientation Check: 109D38

					Status
Back of Magnet					
Horizontal (X-value)			Delta X		
US:	115.719	mm	0.007		
Origin:	115.716	mm	0.004		
DS:	115.712	mm	0.000		
3D Angle	Roll	Yaw		Midpoint Yaw in mm	
0.4463	0.4462	-0.0057	mrad	-0.003	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: 109D38
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 4/10/02 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: 109D38

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 5.331 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

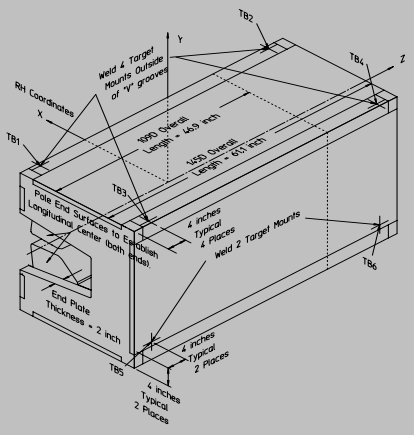
Fiducialization:

Operator(s): M. Rogers H. Imfeld

Date: 4/10/02 Temp: 20 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-493.161	87.637	431.797
TB2	493.246	87.657	431.867
TB3	-493.009	-568.245	431.784
TB4	492.438	-568.141	431.809
TB5	-488.515	-616.225	-286.691
TB6	488.015	-616.003	-292.827

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-493.161	87.637	431.797
TB2	493.246	87.657	431.867
TB3	-493.009	-568.245	431.784
TB4	492.438	-568.141	431.809
TB5	-488.515	-616.225	-286.691
TB6	488.015	-616.003	-292.827

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.669	96.520
C2	96.662	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.733	393.700
C2	393.769	393.700
C3	393.632	393.700
C4	393.666	393.700
	incl. paint	no paint

Approval: