Gradient Dipole Magnet Checks	109D37

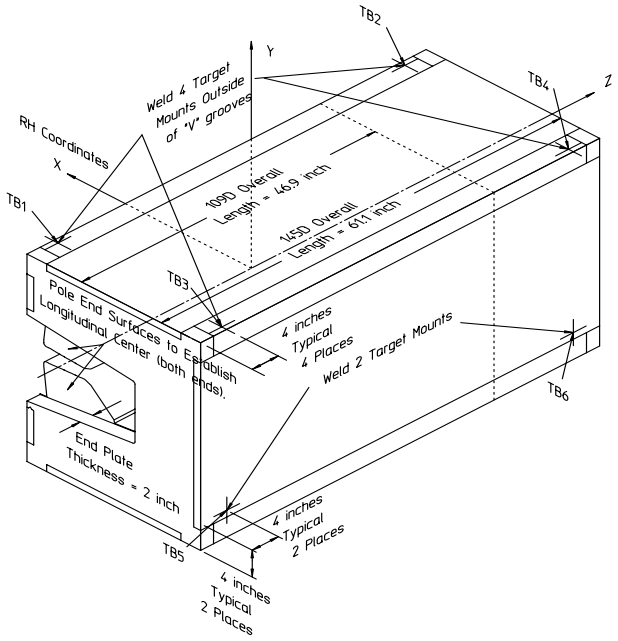
Date: 2/22/02

Magnet: 109D37

Operators: J. McDougal; H. Imfeld

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-19.4383	3.4009	16.9967
TB2	19.4231	3.4057	16.9965
TB3	-19.4379	-22.3633	16.9970
TB4	19.4077	-22.3817	16.9944
TB5	-19.2994	-24.2443	-11.2836
TB6	19.2848	-24.2506	-11.3727

Offset: 0.2116 inches

Description:

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

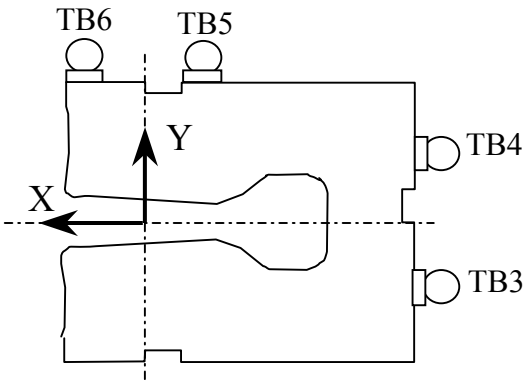
Downstream Garage Mechanical Check:

109D37 Status

Horizontal (X)	Vertical (Y)		
0.091 mm	-0.017 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:

109D37 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2800.238 mm	2800.173 mm	R2 - R1 (mm) -0.065	OK

Description:

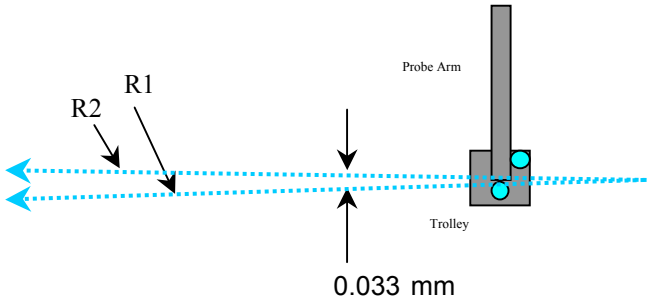
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0237	0.0111	0.0209	mrad	Midpoint 3D Offset (mm) 0.033	OK

Description:

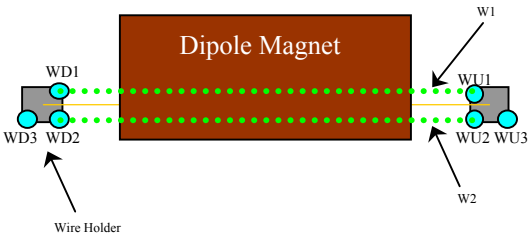
Angle between R1 and R2 vectors. The average of these two defines the Z-axis.



Wire Holder Position Checks:

109D37
Status

Wire Holders' Yaw Check				
3D Distance W1	3D Distance W2		W2 - W1 (mm)	
2382.896 mm	2382.430 mm		-0.466	OK
Description:				
Distance between wire holders for TB1 and TB2.				

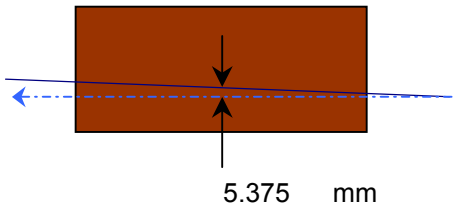


Wire Position Checks:

109D37
Status

Wire Orientation					
3D Angle	Yaw	Pitch		Midpoint 3D Offset (mm)	
0.0797	0.0419	-0.0678	mrad	0.095	Too Big?
Description:					
Orientation of wire with respect to Z-axis defining axis of dipole.					

Wire Offsets					
US	Origin	DS			
5.325	**5.375**	5.425	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: 109D37

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	0.4133	-0.3542	-0.2131	mrad	~ 0.277	OK
DS:	1.0260	-0.7179	-0.7330		~ 0.687	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
1228.335	mm	1190.235	mm	LENGTH?

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

Top Surface Orientation Check: 109D37

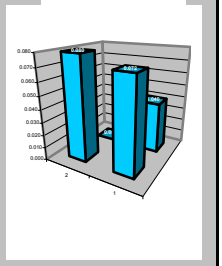
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	412.663	mm	0.072	Delta Y C1:	OK
Corner 2	412.671	mm	0.080	Delta Y C2:	OK
Corner 3	412.631	mm	0.040	Delta Y C3:	OK
Corner 4	412.591	mm	0.000	Delta Y C4:	OK

Dispersion:

Corner 1	0.036	mm
Corner 2	0.026	mm
Corner 3	0.030	mm
Corner 4	0.026	mm
Overall	0.045	mm



Roll (mm) ~ 0.046 — OK

3D Angle	Roll	Pitch		Pitch (mm)	Status
0.0865	0.0854	0.0134	mrad	~ 0.016	OK

Twist:	Roll	Pitch		Twist:	Status
	-0.0889	-0.0403	mrad		
	-0.048	-0.048	mm		OK

Description:

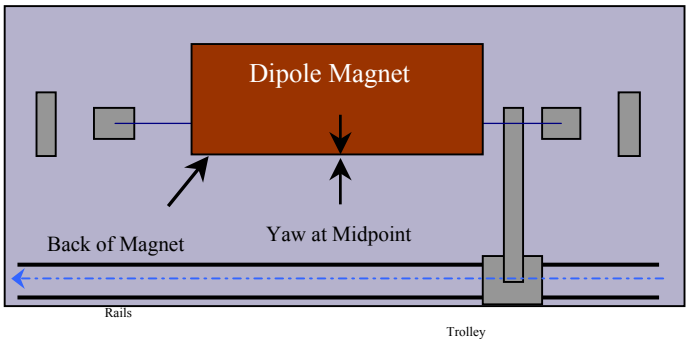
Top surface corner heights and average surface orientation values. ***(With 0.75" SMR offset.)***

Back Surface Orientation Check: 109D37

Back of Magnet					Status
Horizontal (X-value)				Delta X	
US:	115.531	mm		0.000	
Origin:	115.555	mm		0.024	
DS:	115.579	mm		0.048	
3D Angle	Roll	Yaw			
0.1667	-0.1620	0.0396	mrad	Midpoint Yaw in mm: 0.024	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: 109D37
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 2/22/02 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: 109D37

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 5.375 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

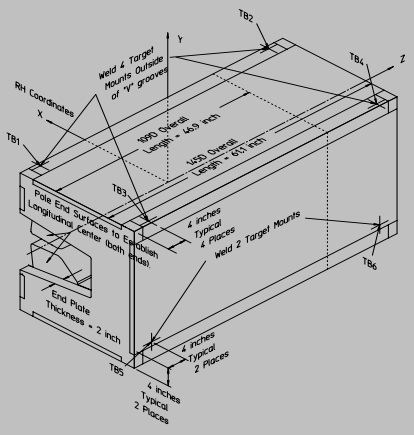
Fiducialization:

Operator(s): J. McDouga H. Imfeld

Date: 2/22/02 Temp: 20 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-493.734	86.384	431.717
TB2	493.347	86.506	431.710
TB3	-493.723	-568.027	431.724
TB4	492.956	-568.494	431.657
TB5	-490.205	-615.806	-286.604
TB6	489.833	-615.966	-288.867

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-493.734	86.384	431.717
TB2	493.347	86.506	431.710
TB3	-493.723	-568.027	431.724
TB4	492.956	-568.494	431.657
TB5	-490.205	-615.806	-286.604
TB6	489.833	-615.966	-288.867

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.481	96.520
C2	96.529	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.613	393.700
C2	393.621	393.700
C3	393.581	393.700
C4	393.541	393.700
	incl. paint	no paint

Approval: