Gradient Dipole Magnet Checks | *109D34*

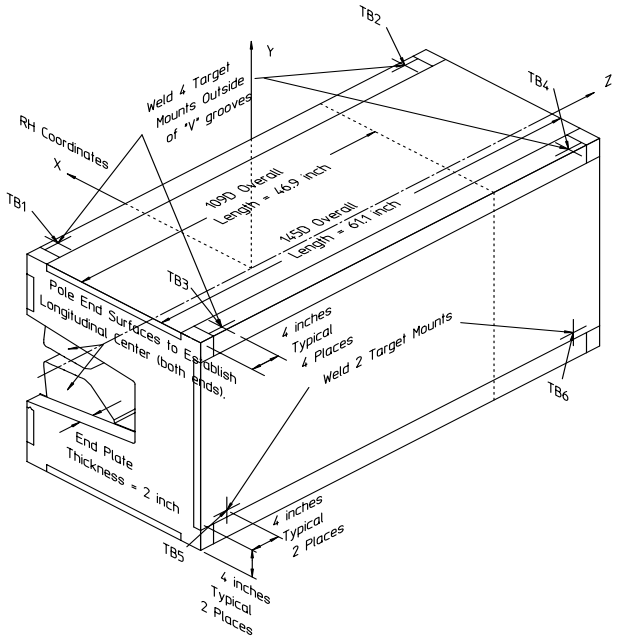
Date: 4/24/02

Magnet: 109D34

Operators: L. Griffin; M. Rogers

Notes:

Magnetic vs. Mechanical offset NOT applied (June 2002)



Magnetic Fiducial Coordinates: (inches)

Fiducial	Z	X	Y
TB1	-19.4174	3.4415	16.9978
TB2	19.4154	3.4456	16.9990
TB3	-19.4111	-22.3977	17.0056
TB4	19.3930	-22.3902	16.9945
TB5	-19.3074	-24.2439	-11.3881
TB6	19.3213	-24.2447	-11.4092

Offset: 0.2120 inches

Description:

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

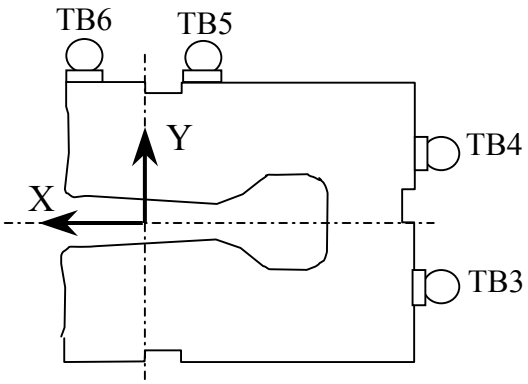
Downstream Garage Mechanical Check:

109D34 Status

Horizontal (X)	Vertical (Y)		
0.068 mm	-0.016 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:

109D34 Status

Trolley Distance

3D Distance R1	3D Distance R2		
2800.242 mm	2800.191 mm	R2 - R1 (mm) -0.051	OK

Description:

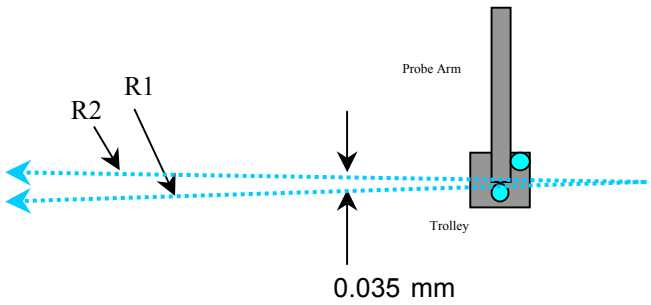
Travel distance for trolley target points should be similar. If not, trolley (rails) may be skewed.

Z-axis Vector

3D Angle	Yaw	Pitch		
0.0250	0.0149	0.0200	mrad	Midpoint 3D Offset (mm) 0.035	OK

Description:

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



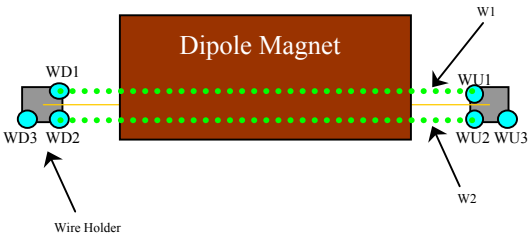
Wire Holder Position Checks:

109D34
Status

Wire Holders' Yaw Check					
3D Distance W1		3D Distance W2		W2 - W1 (mm)	
2382.959	mm	2382.574	mm	-0.385	OK

Description:

Distance between wire holders for TB1 and TB2.



Wire Position Checks:

109D34
Status

Wire Orientation					
3D Angle	Yaw	Pitch		Midpoint 3D Offset (mm)	
0.0807	0.0564	-0.0577	mrad	0.096	Too Big?

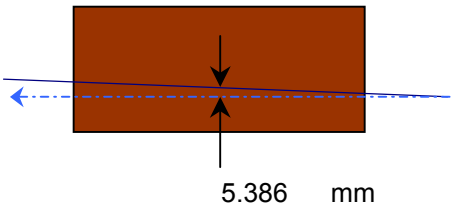
Description:

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

Wire Offsets					
US	Origin	DS			
5.319	**5.386**	5.453	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: 109D34

Status

End Surfaces

	3D Angle	Yaw	Pitch		3D Offset (mm)	Status
US:	0.9865	-0.9458	0.2805	mrad	~ 0.661	Too Big?
DS:	1.0947	-1.0667	0.2461		~ 0.733	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
1228.045	mm	1189.945	mm	LENGTH?

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

Top Surface Orientation Check: 109D34

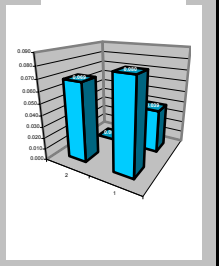
Status

Top of Magnet

Height (Y-value) **with 0.75"**			Delta Y		Status
Corner 1	412.701	mm	0.080	Delta Y C1:	OK
Corner 2	412.690	mm	0.069	Delta Y C2:	OK
Corner 3	412.660	mm	0.039	Delta Y C3:	OK
Corner 4	412.621	mm	0.000	Delta Y C4:	OK

Dispersion:

Corner 1	0.036	mm	Roll (mm)	
Corner 2	0.032	mm		
Corner 3	0.061	mm		
Corner 4	0.030	mm	~ 0.041	OK
Overall	0.049	mm		



3D Angle	Roll	Pitch		Pitch (mm)	Status
0.0818	0.0751	0.0325	mrad	~ 0.039	OK

Twist:	Roll	Pitch			Status
	-0.0519	-0.0235	mrad		
	-0.028	-0.028	mm	Twist:	OK

Description:

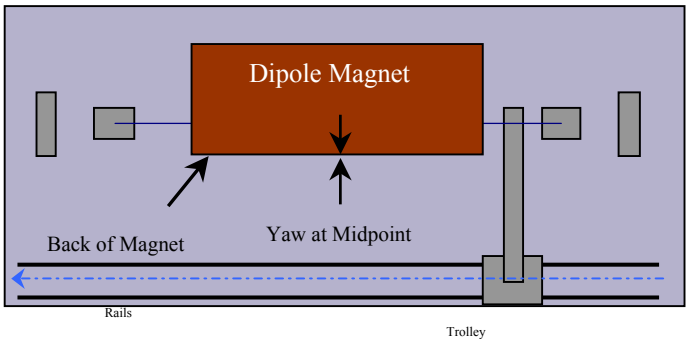
Top surface corner heights and average surface orientation values. ***(With 0.75" SMR offset.)***

Back Surface Orientation Check: 109D34

					Status
Back of Magnet					
Horizontal (X-value)			Delta X		
US:	115.621	mm	0.074		
Origin:	115.584	mm	0.037		
DS:	115.547	mm	0.000		
3D Angle	Roll	Yaw		Midpoint Yaw in mm	
0.2374	0.2294	-0.0611	mrad	-0.036	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: 109D34
Capacitive System Alignment
Date_____, Operator _____
Fiducial Measurements
See Data Sheet on Next Page. Approval:
Date: 4/24/02 Operator: L. Griffin
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: 109D34

Magnetic Measurements Operator: _____ Date:_____

Measured Magnetic Center Offset: 5.386 mm

Measured at:

Integrated Field: _____ T-m @ _____ Amps

Corrected to:

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

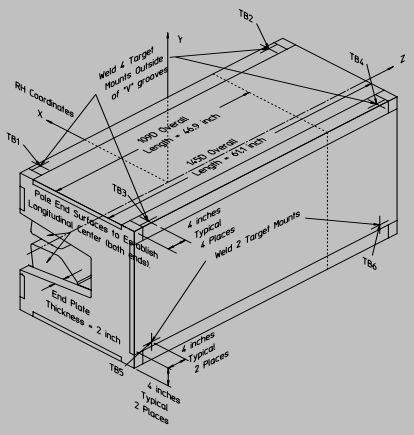
Fiducialization:

Operator(s): L. Griffin M. Rogers

Date: 4/24/02 Temp: 20 deg. C

Fiducial - Measured	z mm	x mm	y mm
TB1	-493.203	87.414	431.745
TB2	493.150	87.518	431.774
TB3	-493.041	-568.901	431.941
TB4	492.581	-568.710	431.660
TB5	-490.409	-615.794	-289.257
TB6	490.760	-615.815	-289.794

Mechanical Centerline Tooling Ball Coordinates



Fiducial - Magnetic	z mm	x mm	y mm
TB1	-493.203	87.414	431.745
TB2	493.150	87.518	431.774
TB3	-493.041	-568.901	431.941
TB4	492.581	-568.710	431.660
TB5	-490.409	-615.794	-289.257
TB6	490.760	-615.815	-289.794

Magnetic Centerline Tooling Ball Coordinates

Check Measurements:

Corner	$x_{measured}$ mm	$x_{nominal}$ mm
C1	96.571	96.520
C2	96.497	96.520
	incl. paint	no paint

	$y_{measured}$ mm	$y_{nominal}$ mm
C1	393.651	393.700
C2	393.640	393.700
C3	393.610	393.700
C4	393.571	393.700
	incl. paint	no paint

Approval: