

Fiducials for BM1 Std. Vac. Chamber

BM1003

Date:

2/27/02

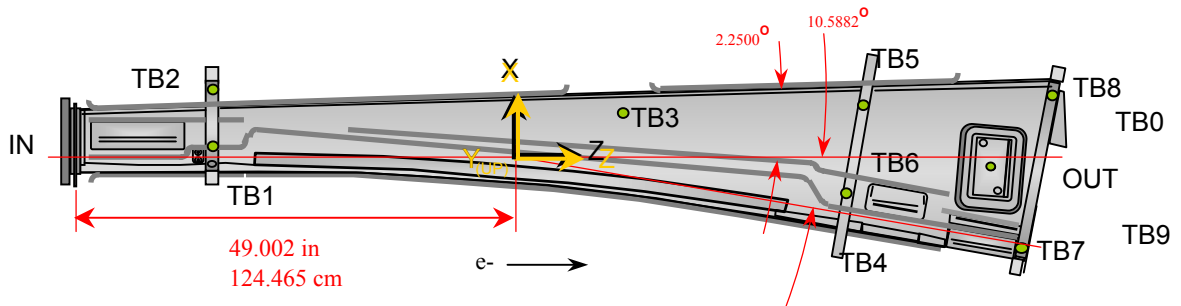
Chamber:

BM1003

Operator(s):

M. Gaydosh
C. LeCocq

Notes:



Fiducial Coordinates for BM1 Standard Vacuum Chamber: (inches)

Fiducial	Z	X	Y
TB1	-34.854	1.479	4.385
TB2	-34.790	8.503	4.439
TB3	11.103	4.391	2.349
TB4	34.524	-4.974	4.388
TB5	36.649	6.070	4.376
TB6	52.480	-1.869	2.310
TB7	55.609	-11.248	3.083
TB8	59.421	8.886	3.064
TB9 (V4)	74.694	-20.323	4.383
TB0 (V4)	76.948	-8.224	4.398

inches inches inches

Nominal Deltas For H3 Absorber (TB6)		
Z	X	Y
52.484	-1.871	2.305
52.493	-1.891	2.242
-0.009	0.020	0.063

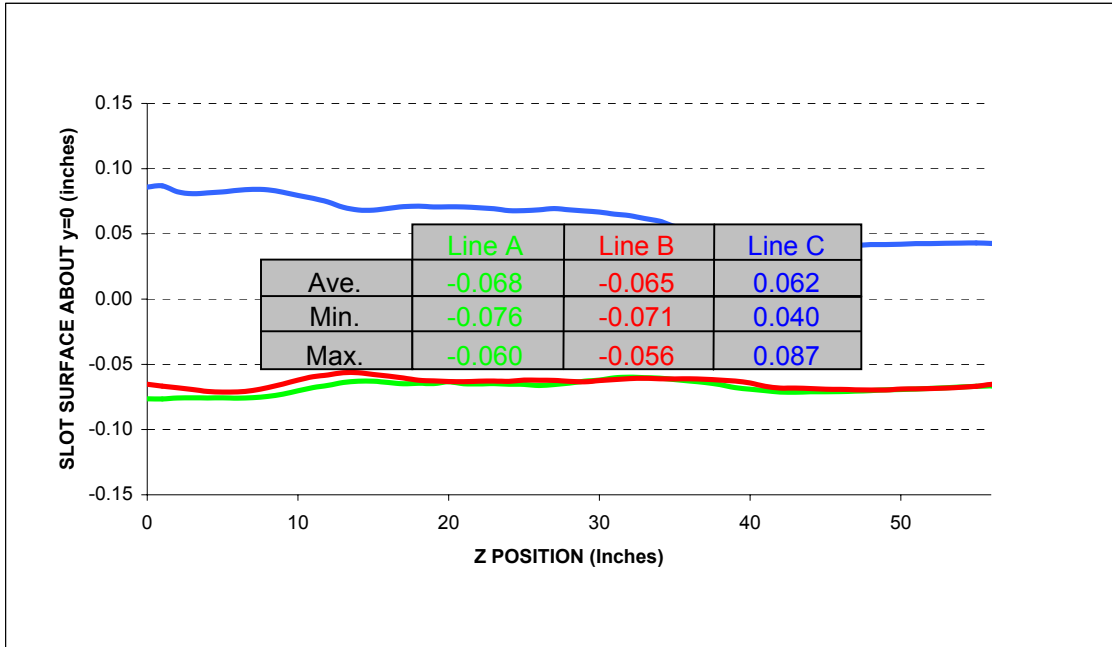
Source **V4 Step**

Description:

Fid. vals based on internal chamber datum. Source="V4 Step" indicates final data.

Fiducialization Step: (Traveler Step # 1380)

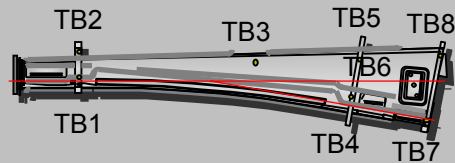
Slot Calibration	
Ideal	0.511
Meas.	0.144
Delta	-0.367



BM1003

Step 1: Fiducial Coordinates for BM1 Std. Vac. Chamber

Fiducial	Z	X	Y
TB1	-34.852	1.476	4.383
TB2	-34.800	8.503	4.383
TB3	11.100	4.411	2.354
TB4	34.528	-4.966	4.384
TB5	36.659	6.076	4.378
TB6	52.484	-1.871	2.305
TB7	55.605	-11.251	3.078
TB8	59.454	8.879	3.052
	inches	inches	inches

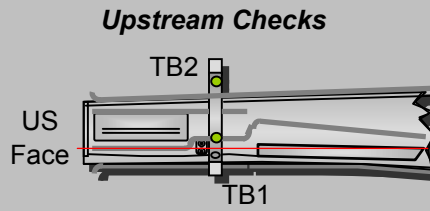


Description:

Fiducial values based on internal chamber datum.

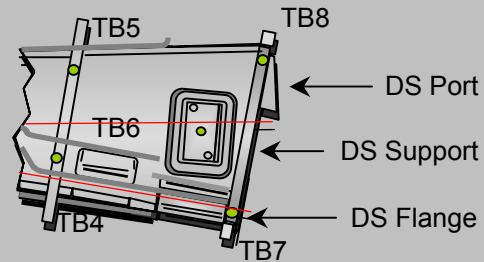
End Surface Attitudes for BM1 Std. Vac. Chamber

Upstream Face		
	yaw	pitch
Measured	0.4	4.3
Nominal	0.0	0.0
Difference	0.4	4.3
	mrad	mrad



Downstream Port		
	yaw	pitch
Measured	23.7	1.0
Nominal	25.3	0.0
Difference	-1.6	1.0

Downstream Checks



Downstream Support		
	yaw	pitch
Measured	-186.0	-0.1
Nominal	-184.8	0.0
Difference	-1.2	-0.1

Downstream Flange		
	yaw	pitch
Measured	-189.8	-0.6
Nominal	-184.8	0.0
Difference	-5.0	-0.6
	mrad	mrad

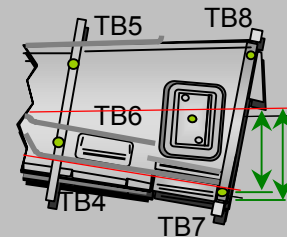
Description:

Orientation of the upstream and downstream surfaces compared to nominal values. Tol +/- 3 mrad

Datum Verification

DS Support	
	x
Measured	-11.915
Nominal	-11.912
Diff.	-0.003
	inches

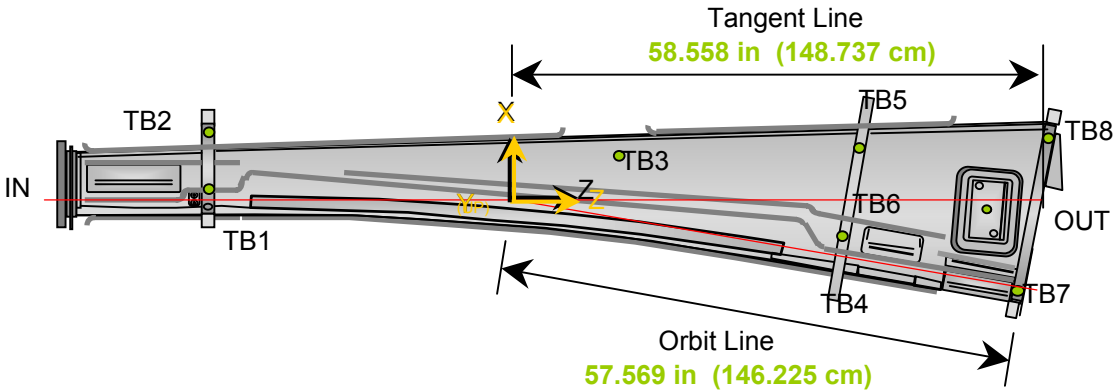
DS Flange	
	x
Measured	-11.960
Nominal	-11.958
Diff.	-0.002
	inches



Description:

The x-distance from the center-line to the projection of the measured DS inside curve point on either of the DS surfaces. Tolerance values +/- 0.020 in.

<u>BM1 Chamber Lengths</u>			Nominal Length
Tangent Line:	Length 58.564 inches	without SMR	58.558 OK
Orbit Line:	Length 57.520 inches	without SMR	57.569 OK
<p>Description: Both lengths are to the faces of the weld flanges. Length tolerance +/- 0.125 in.</p>			



V4 Step A: Survey and Check of BM1 Standard Vacuum Chamber Fiducials Before Attaching V4 and the Exit Port:

Step A-1: Remeasurement of Fiducial Coordinates for BM1 Std. Vac. Chamber

Fiducial	Z	X	Y	del Z	del X	del Y
TB1	-34.847	1.476	4.383	0.005	0.000	0.001
TB2	-34.790	8.503	4.383	0.010	0.000	0.000
TB3	11.103	4.387	2.332	0.003	-0.025	-0.022
TB4	34.528	-4.968	4.384	0.000	-0.001	0.000
TB5	36.644	6.078	4.378	-0.015	0.002	0.000
TB6						
TB7	55.611	-11.224	3.102	0.006	0.026	0.024
TB8	59.413	8.907	3.079	-0.041	0.029	0.027

inches inches inches

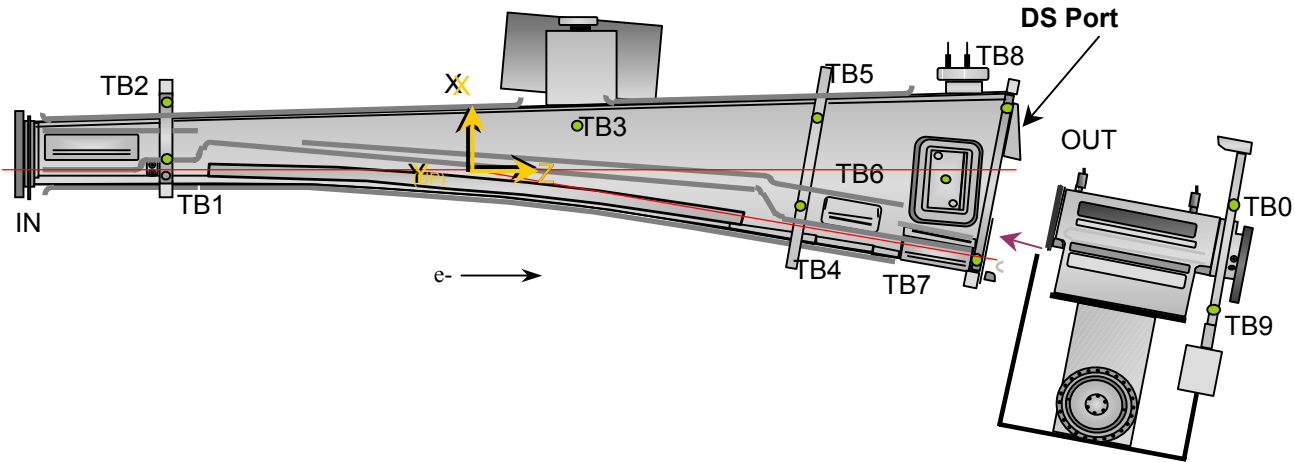
DS Port Level Check	
OK ?	<input type="text" value="Yes"/> (YES or NO)

Level Status: **OK**

US Flange Roll Check	
OK ?	<input type="text" value="No"/> (YES or NO)

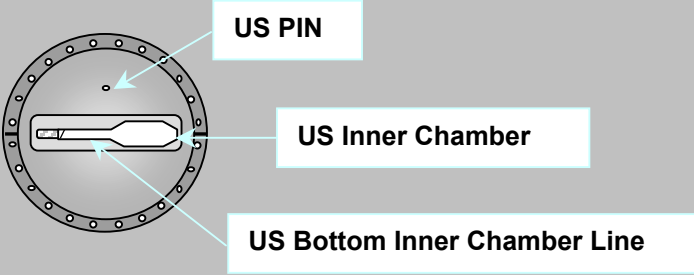
Roll Status: **UPDATE**

Description:
Fid. vals based on internal chamber datum.



V4 Step A: Check of US Flange Prior to V4 Installation

Step A-2: Pre-Installation Check of UpStream Flange Position



The diagram shows a top-down view of a circular flange with a central rectangular chamber. A small dot is labeled 'US PIN'. The central chamber is labeled 'US Inner Chamber'. A horizontal line at the bottom of the inner chamber is labeled 'US Bottom Inner Chamber Line'.

US PIN	Z	X	Y
Measured	-50.843	1.857	2.313
Nominal	-51.000	1.836	2.282
Difference (inches)	0.157	0.021	0.031

US Inner Chamber	Z	X	Y
Measured	-50.581	-1.386	0.003
Nominal	-51.000	-1.404	0.000
Difference (inches)	0.419	0.018	0.003

US Bottom Inner Chamber Line	ROLL	(FINAL)
Measured	0.744	
Nominal	0.000	
Difference (mrads)	0.744	

Roll Status **OK**

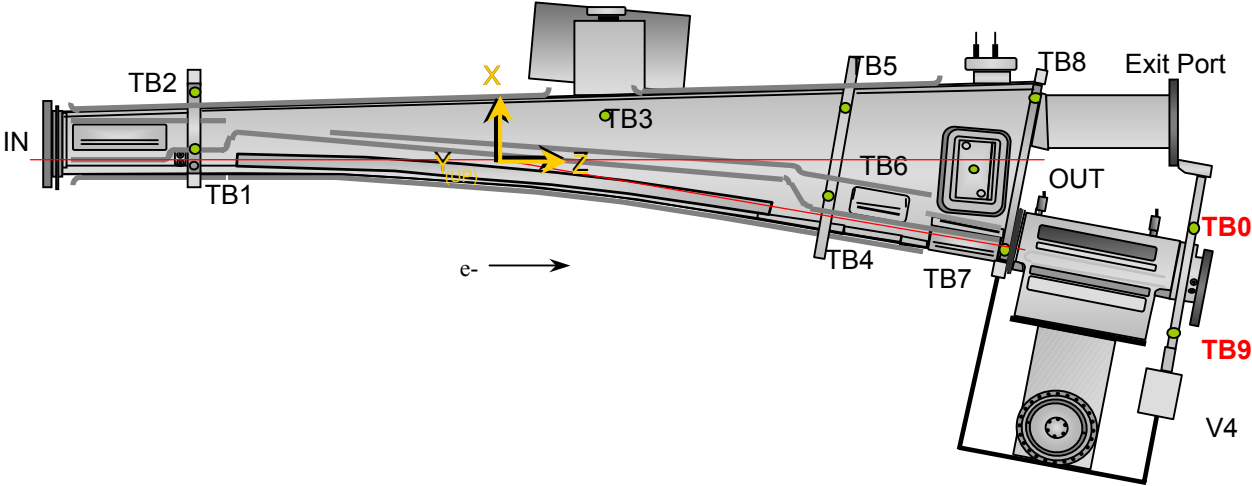
Description:
 Measured vs. nominal values for US flange expressed in the PART coordinate system.
 Fiducial values are updated (using those from Step A-1) if ROLL delta is not within 1 mrad.

V4 Fiducialization Step: Survey of Fiducial Coordinates for BM1 Standard Vacuum Chamber with V4 and the Exit Port Attached:

Step Fid-1: Position of Added Tooling Balls TB9 and TB0

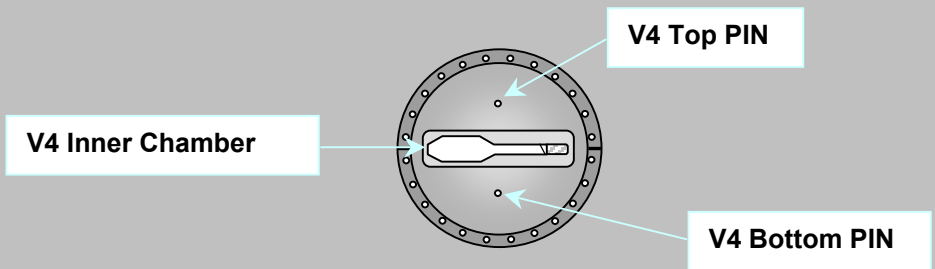
Fiducial	Z	X	Y
TB9 (V4)	74.683	-20.305	4.386
TB0 (V4)	76.948	-8.210	4.395
	inches	inches	inches

Description:
Fid. vals after V4 and exit port attached.



V4 Fiducialization Step: V4 Flange

Step Fid-2: Set Position of V4 Flange Position



V4 Top PIN	Z	X	Y
Measured	80.204	0.006	2.284
Nominal	80.000	0.000	2.282
Difference (inches)	0.204	0.006	0.002

V4 Bottom PIN	Z	X	Y
Measured	80.174	0.006	-2.279
Nominal	80.000	0.000	-2.282
Difference (inches)	0.174	0.006	0.003

V4 Inner Chamber	Z	X	Y
Measured	79.903	-1.400	0.029
Nominal	80.000	-1.404	0.000
Difference (inches)	-0.097	0.004	0.029

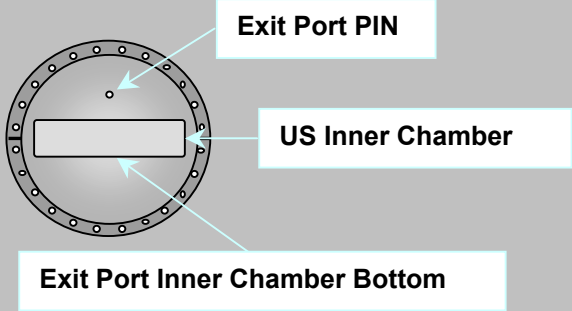
V4 Downstream Z Value	Z
Measured	80.722
Nominal	80.764
Difference (inches)	-0.042

Description:

Measured vs. nominal values for V4 flange expressed in the V4 coordinate system.
 Tol +/- 10mils except for the V4 Z-value. Values in **BOLD** or **RED** are most critical.

V4 Fiducialization Step: Exit Port

Step Fid-3: Post-Installation Check of Exit Port Flange Position



Exit Port PIN	Z	X	Y
Measured	75.323	4.123	2.288
Nominal	75.000	4.168	2.282
Difference (inches)	0.323	-0.045	0.006

Exit Port Inner Chamber Side	Z	X	Y
Measured	75.025	7.385	0.055
Nominal	75.000	7.418	0.000
Difference (inches)	0.025	-0.033	0.055

Exit Port Inner Chamber Bottom	Z	X	Y
Measured	74.941	4.036	-0.357
Nominal	75.000	0.000	-0.366
Difference (inches)	-0.059	4.036	0.009

Exit Port DS Z Value (PART Frame)	Z
Measured	75.955
Nominal	75.768
Difference (inches)	0.187

Description:
 Measured vs. nominal values for Exit Port flange expressed in the EXIT PORT coordinate system.
 Tol +/- 10mils except for the V4 Z-value. Values in **BOLD** or **RED** are most critical.

V4 Final Step: Re-Survey of all Ten Fiducials

Fiducial	Z	X	Y	del Z	del X	del Y
TB1	-34.854	1.479	4.385	-0.007	0.003	0.001
TB2	-34.790	8.503	4.439	0.000	0.000	0.056
TB3	11.103	4.391	2.349	0.000	0.004	0.017
TB4	34.524	-4.974	4.388	-0.004	-0.007	0.004
TB5	36.649	6.070	4.376	0.004	-0.008	-0.002
TB6	52.480	-1.869	2.310			
TB7	55.609	-11.248	3.083	-0.002	-0.024	-0.018
TB8	59.421	8.886	3.064	0.008	-0.021	-0.015
TB9 (V4)	74.694	-20.323	4.383	0.011	-0.018	-0.003
TB0 (V4)	76.948	-8.224	4.398	0.000	-0.014	0.004
	inches	inches	inches			

Description:
 Final survey of BM1 standard vacuum chamber. (With V4 and exit port attached.)
 Note that all comparisons are relative to the most current fiducial values.
 (I.e. deltas are computed using values from Steps A-1 and Fid-1)

