

Fiducials for BM1 Std. Vac. Chamber

BM1008

Date:

5/22/02

Chamber:

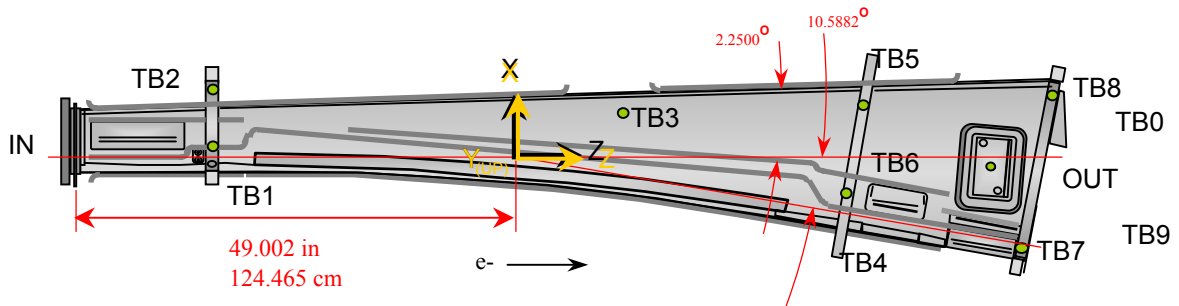
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Operator(s):

M. Rogers
H. Imfeld

Notes:

Z on Exit port not measured. V4 data missing.



Fiducial Coordinates for BM1 Standard Vacuum Chamber: (inches)

Fiducial	Z	X	Y
TB1	-34.847	1.547	4.379
TB2	-34.820	8.498	4.397
TB3	10.980	4.211	2.318
TB4	34.574	-5.014	4.375
TB5	36.641	6.197	4.356
TB6	52.460	-1.888	2.291
TB7	55.625	-11.189	3.088
TB8	59.431	8.943	3.031
TB9 (V4)	74.717	-20.296	4.417
TB0 (V4)	76.941	-8.226	4.425

inches inches inches

Nominal Deltas For H3 Absorber (TB6)		
Z	X	Y
52.466	-1.895	2.276
52.493	-1.891	2.242
-0.027	-0.004	0.034

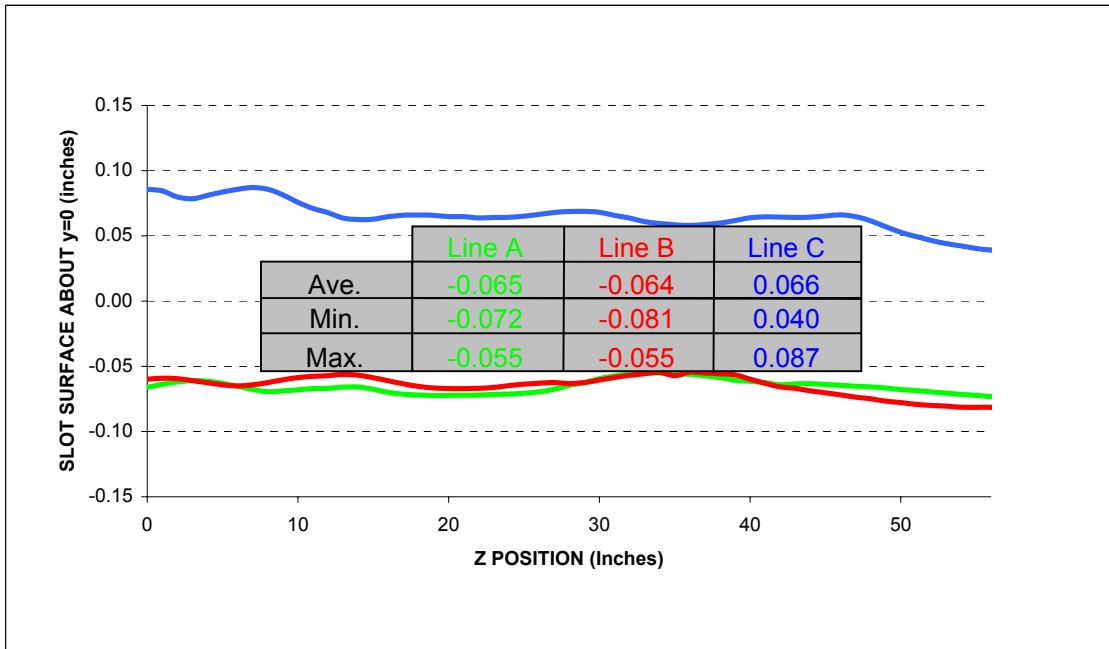
Source **V4 Step**

Description:

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

Fiducialization Step: (Traveler Step # 1380)

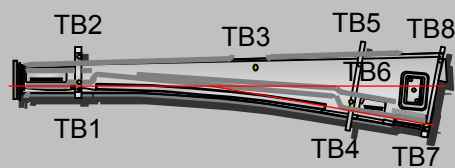
Slot Calibration	
Ideal	0.511
Meas.	0.137
Delta	-0.374



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

Fiducial	Z	X	Y
TB1	-34.851	1.538	4.379
TB2	-34.842	8.495	4.347
TB3	10.978	4.232	2.334
TB4	34.577	-5.009	4.377
TB5	36.655	6.201	4.354
TB6	52.466	-1.895	2.276
TB7	55.626	-11.197	3.072
TB8	59.439	8.934	3.009
	inches	inches	inches

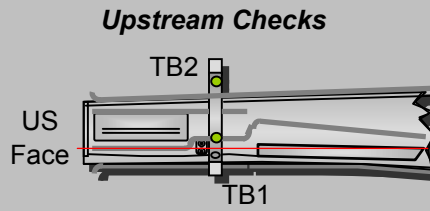


Description:

Fiducial values based on internal chamber datum.

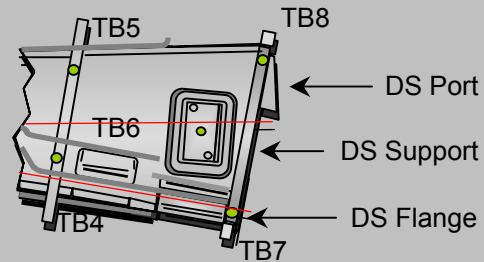
End Surface Attitudes for BM1 Std. Vac. Chamber

Upstream Face		
	yaw	pitch
Measured	3.1	-2.3
Nominal	0.0	0.0
Difference	3.1	-2.3
	mrad	mrad



Downstream Port		
	yaw	pitch
Measured	24.7	3.6
Nominal	25.3	0.0
Difference	-0.6	3.6

Downstream Checks



Downstream Support		
	yaw	pitch
Measured	-185.8	3.7
Nominal	-184.8	0.0
Difference	-1.0	3.7

Downstream Flange		
	yaw	pitch
Measured	-190.0	3.5
Nominal	-184.8	0.0
Difference	-5.2	3.5
	mrad	mrad

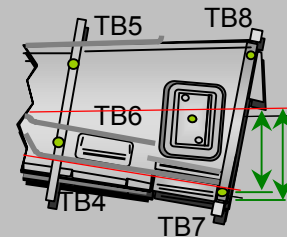
Description:

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

Datum Verification

DS Support	
	x
Measured	-11.924
Nominal	-11.912
Diff.	-0.012
	inches

DS Flange	
	x
Measured	-11.967
Nominal	-11.958
Diff.	-0.009
	inches

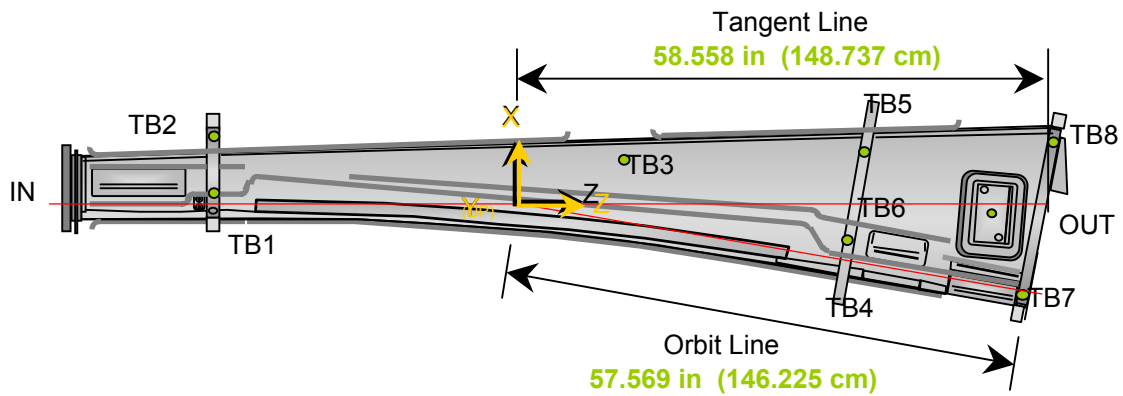


Description:

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.

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Status

<u>BM1 Chamber Lengths</u>			Nominal Length
Tangent Line:	Length 58.550 inches	without SMR	58.558 OK
Orbit Line:	Length 57.496 inches	without SMR	57.569 OK
Description: Both lengths are to the faces of the weld flanges. Length tolerance +/- 0.125 in.			



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	-34.845	1.548	4.379	0.006	0.010	0.000
TB2	-34.818	8.499	4.397	0.024	0.004	0.050
TB3	10.981	4.210	2.312	0.003	-0.021	-0.022
TB4	34.572	-5.016	4.375	-0.005	-0.007	-0.002
TB5	36.640	6.196	4.356	-0.014	-0.005	0.001
TB6	52.461	-1.889	2.301	-0.005	0.006	0.025
TB7	55.626	-11.189	3.099	0.000	0.008	0.026
TB8	59.425	8.946	3.041	-0.014	0.012	0.032

inches inches inches

Compared to Step 1 Fiducial Coords.

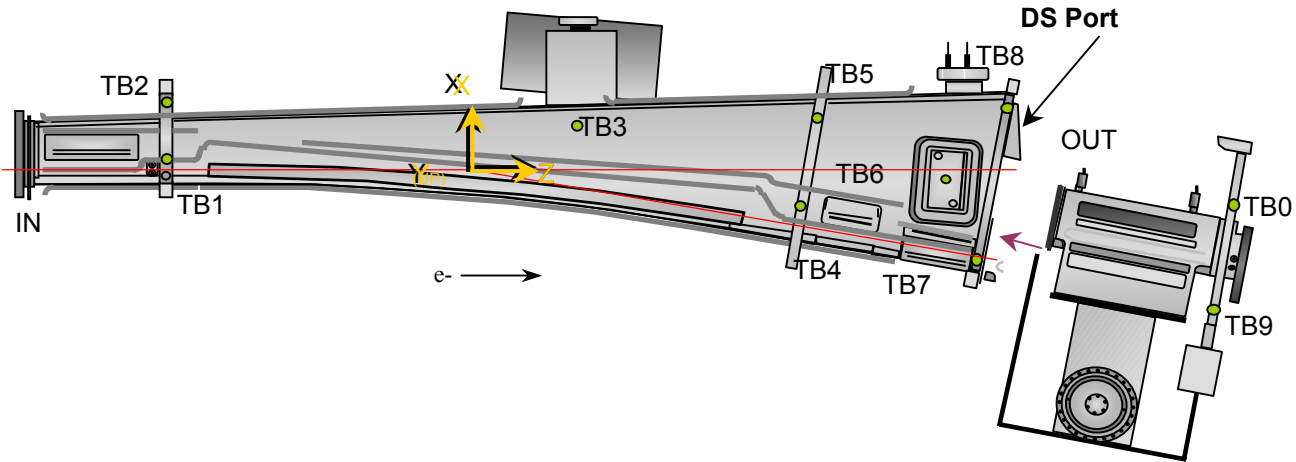
DS Port Level Check Level Status: **OK**

OK ? Yes (YES or NO)

US Flange Roll Check Roll Status: **UPDATE**

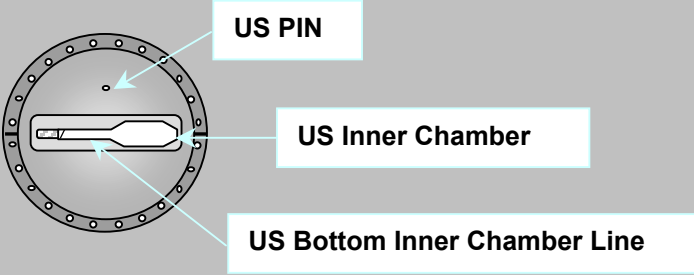
OK ? No (YES or NO)

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 line along the bottom edge of the inner chamber is labeled 'US Bottom Inner Chamber Line'.

US PIN	Z	X	Y
Measured	-50.859	1.899	2.306
Nominal	-51.000	1.836	2.282
Difference (inches)	0.141	0.063	0.024

US Inner Chamber	Z	X	Y
Measured	-50.603	-1.348	0.066
Nominal	-51.000	-1.404	0.000
Difference (inches)	0.397	0.057	0.066

US Bottom Inner Chamber Line	ROLL	(FINAL)
Measured	1.183	
Nominal	0.000	
Difference (mrads)	1.183	

Roll Status
UPDATE

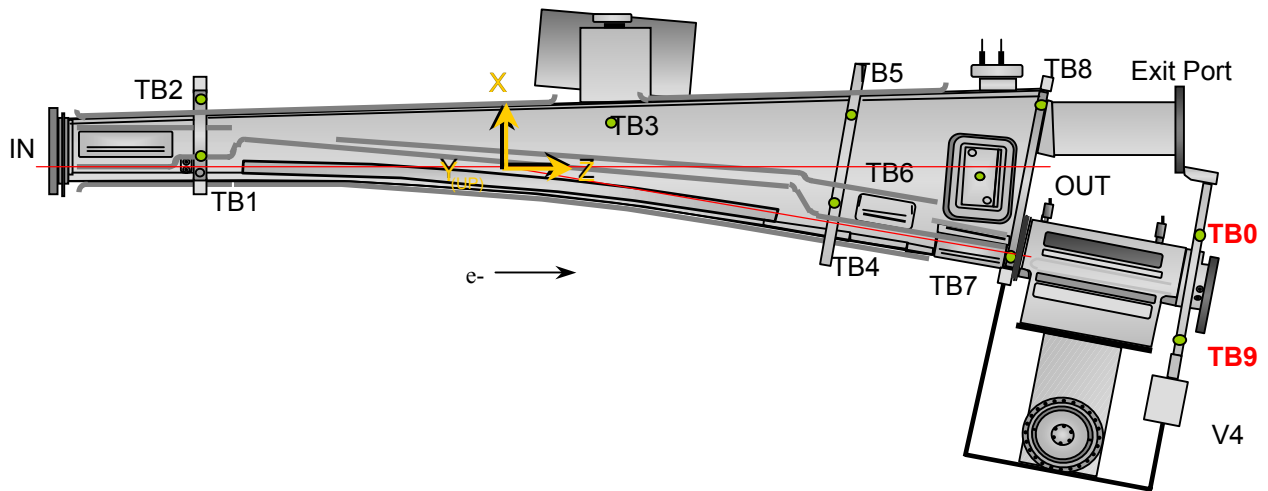
Description:
 Measured vs. nominal values for US flange expressed in the PART coordinate system.
 Fiducial values are updated (using those from Step A-1) if ROLL delta is not within 1 mrad.

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

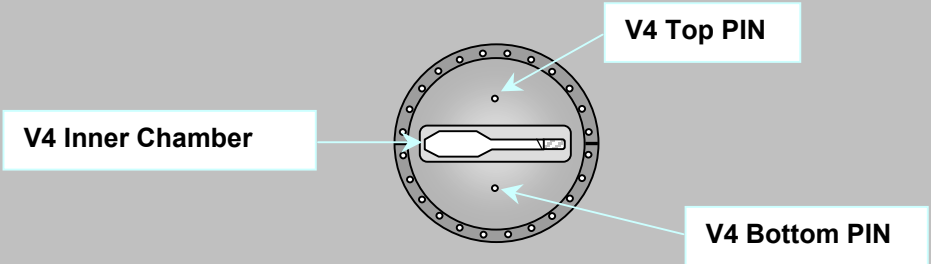
Fiducial	Z	X	Y
TB9 (V4)	74.736	-20.320	4.420
TB0 (V4)	76.972	-8.252	4.423
	inches	inches	inches

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			
Nominal	80.000	0.000	2.282
Difference (inches)	-----	-----	-----

V4 Bottom PIN	Z	X	Y
Measured			
Nominal	80.000	0.000	-2.282
Difference (inches)	-----	-----	-----

V4 Inner Chamber	Z	X	Y
Measured			
Nominal	80.000	-1.404	0.000
Difference (inches)	-----	-----	-----

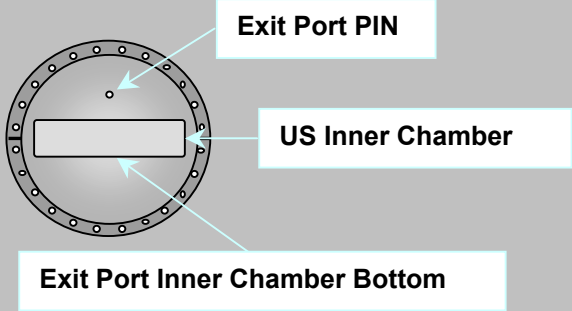
V4 Downstream Z Value	Z
Measured	
Nominal	80.764
Difference (inches)	-----

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.

Metrology Dept:
 V4 was measured, but data was mistakenly deleted during the course of subsequent observations.

V4 Fiducialization Step: Exit Port

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



Exit Port PIN	Z	X	Y
Measured	75.292	4.165	2.309
Nominal	75.000	4.168	2.282
Difference (inches)	0.292	-0.003	0.027

Exit Port Inner Chamber Side	Z	X	Y
Measured	74.995	7.405	0.129
Nominal	75.000	7.418	0.000
Difference (inches)	-0.005	-0.013	0.129

Exit Port Inner Chamber Bottom	Z	X	Y
Measured	74.913	4.322	-0.346
Nominal	75.000	0.000	-0.366
Difference (inches)	-0.087	4.322	0.020

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

Metrology Dept:
Did not measure flange face.

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	-34.847	1.547	4.379	-0.002	-0.001	0.000
TB2	-34.820	8.498	4.397	-0.002	-0.001	0.000
TB3	10.980	4.211	2.318	-0.001	0.001	0.006
TB4	34.574	-5.014	4.375	0.002	0.002	0.000
TB5	36.641	6.197	4.356	0.001	0.001	0.000
TB6	52.460	-1.888	2.291	-0.001	0.001	-0.010
TB7	55.625	-11.189	3.088	-0.002	0.000	-0.011
TB8	59.431	8.943	3.031	0.005	-0.003	-0.010
TB9 (V4)	74.717	-20.296	4.417	-0.020	0.024	-0.003
TB0 (V4)	76.941	-8.226	4.425	-0.031	0.026	0.002
	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)

