

Fiducials for BM1 Std. Vac. Chamber

BM1007

Date:

4/17/02

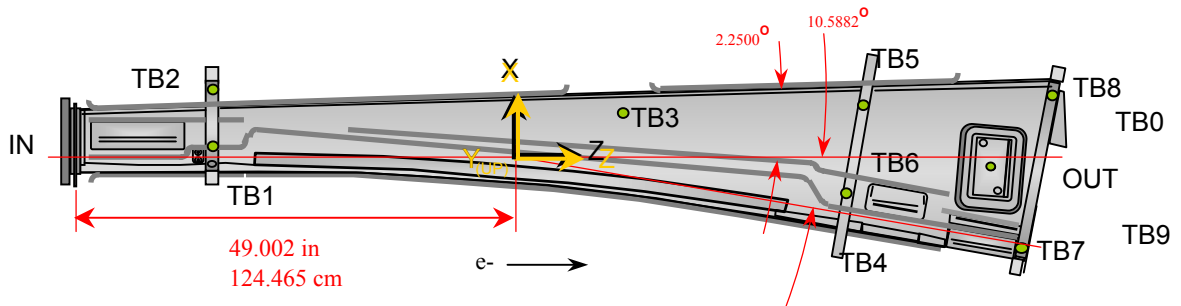
Chamber:

BM1007

Operator(s):

F. Gaudreault
L. Griffin

Notes:



Fiducial Coordinates for BM1 Standard Vacuum Chamber: (inches)

Fiducial	Z	X	Y
TB1	-34.847	1.597	4.364
TB2	-34.850	8.508	4.353
TB3	11.120	3.957	2.319
TB4	34.510	-4.859	4.378
TB5	36.580	6.236	4.354
TB6	52.475	-1.875	2.309
TB7	55.657	-11.132	3.083
TB8	59.433	8.991	3.057
TB9 (V4)	74.650	-20.294	4.379
TB0 (V4)	76.912	-8.178	4.383

inches inches inches

Nominal Deltas For H3 Absorber (TB6)		
Z	X	Y
52.478	-1.904	2.288
52.493	-1.891	2.242
-0.015	-0.013	0.046

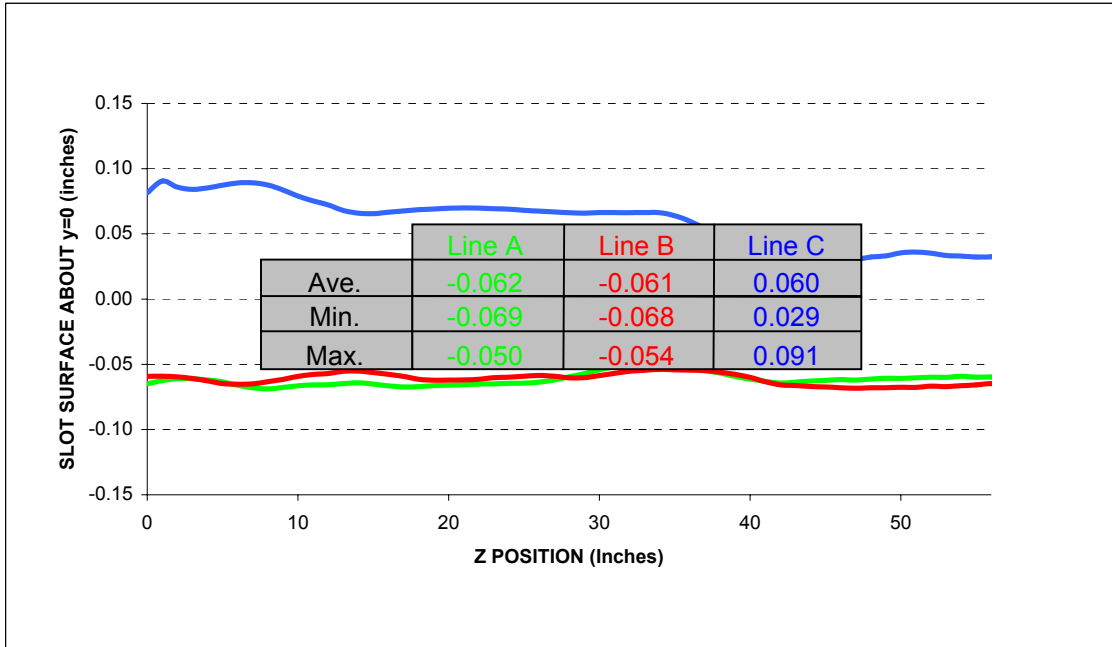
Source **V4 Step**

Description:

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

Fiducialization Step: (Traveler Step # 1380)

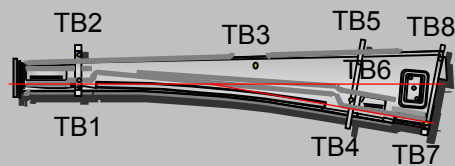
Slot Calibration	
Ideal	0.511
Meas.	0.136
Delta	-0.375



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

Fiducial	Z	X	Y
TB1	-34.851	1.595	4.381
TB2	-34.863	8.508	4.354
TB3	11.117	3.990	2.342
TB4	34.509	-4.857	4.379
TB5	36.600	6.236	4.353
TB6	52.478	-1.904	2.288
TB7	55.646	-11.167	3.060
TB8	59.453	8.950	3.018
	inches	inches	inches

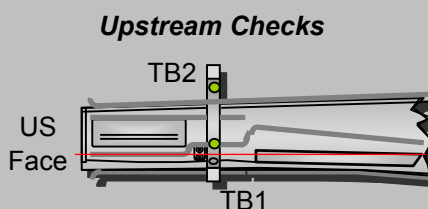


Description:

Fiducial values based on internal chamber datum.

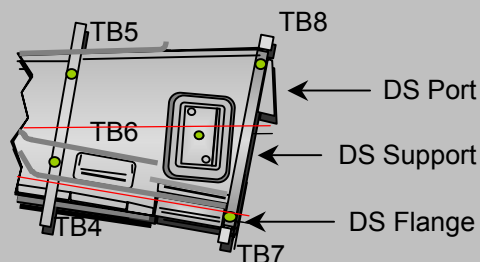
End Surface Attitudes for BM1 Std. Vac. Chamber

Upstream Face		
	yaw	pitch
Measured	2.9	-2.3
Nominal	0.0	0.0
Difference	2.9	-2.3
	mrad	mrad



Downstream Port		
	yaw	pitch
Measured	25.2	2.9
Nominal	25.3	0.0
Difference	-0.1	2.9

Downstream Checks



Downstream Support		
	yaw	pitch
Measured	-185.6	1.6
Nominal	-184.8	0.0
Difference	-0.8	1.6

Downstream Flange		
	yaw	pitch
Measured	-190.9	0.7
Nominal	-184.8	0.0
Difference	-6.1	0.7
	mrad	mrad

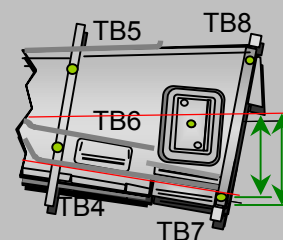
Description:

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

Datum Verification

DS Support	
	x
Measured	-11.889
Nominal	-11.912
Diff.	0.023
	inches

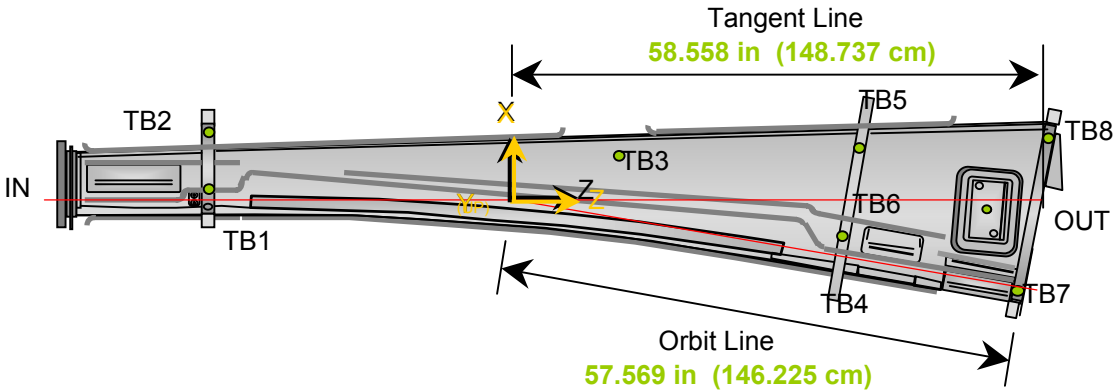
DS Flange	
	x
Measured	-11.932
Nominal	-11.958
Diff.	0.026
	inches



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 58.561 inches	without SMR	58.558 OK
Orbit Line:	Length 57.499 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	-34.849	1.595	4.382	0.002	0.000	0.001
TB2	-34.851	8.509	4.353	0.013	0.001	-0.001
TB3	11.117	3.957	2.330	0.001	-0.033	-0.012
TB4	34.514	-4.859	4.378	0.005	-0.002	0.000
TB5	36.581	6.237	4.354	-0.020	0.001	0.001
TB6						
TB7	55.660	-11.130	3.056	0.013	0.037	-0.004
TB8	59.428	8.996	3.033	-0.025	0.046	0.015

inches inches inches

Compared to Step 1 Fiducial Coords.		

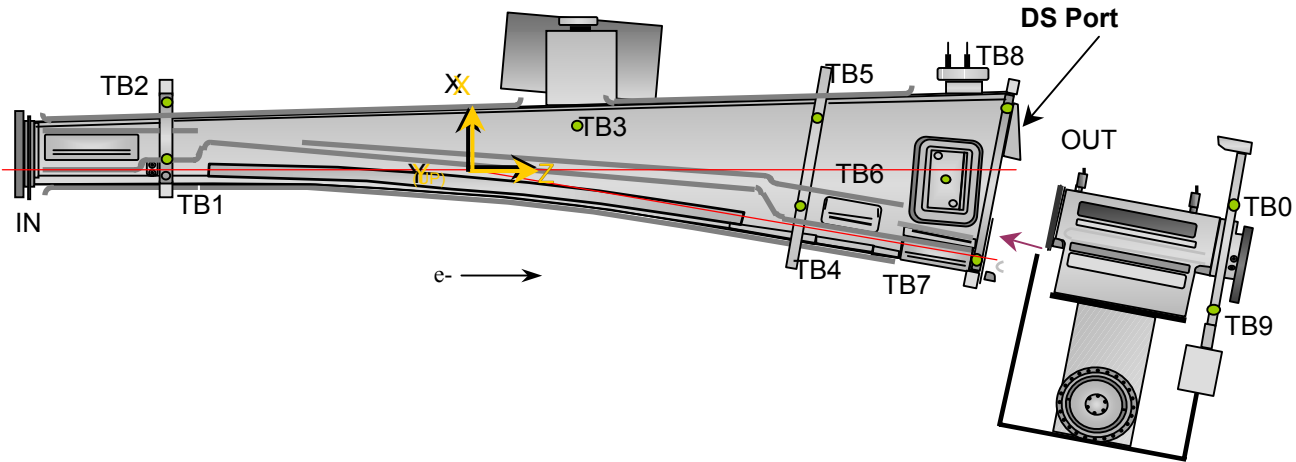
DS Port Level Check Level Status: **OK**

OK ? Yes (YES or NO)

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

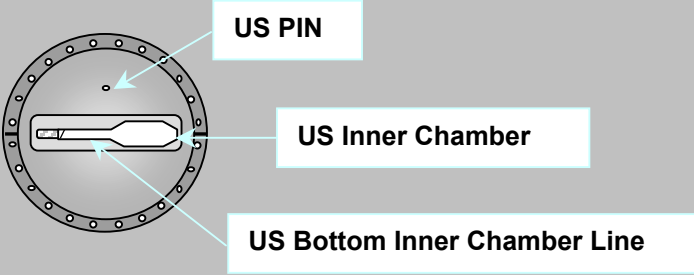
OK ? No (YES or NO)

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



US PIN	Z	X	Y
Measured	-50.870	1.841	2.284
Nominal	-51.000	1.836	2.282
Difference (inches)	0.130	0.005	0.002

US Inner Chamber	Z	X	Y
Measured	-50.536	-1.405	-0.011
Nominal	-51.000	-1.404	0.000
Difference (inches)	0.464	-0.001	-0.011

US Bottom Inner Chamber Line	ROLL	(FINAL)
Measured	-0.421	
Nominal	0.000	
Difference (mrads)	-0.421	

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 1mrad.

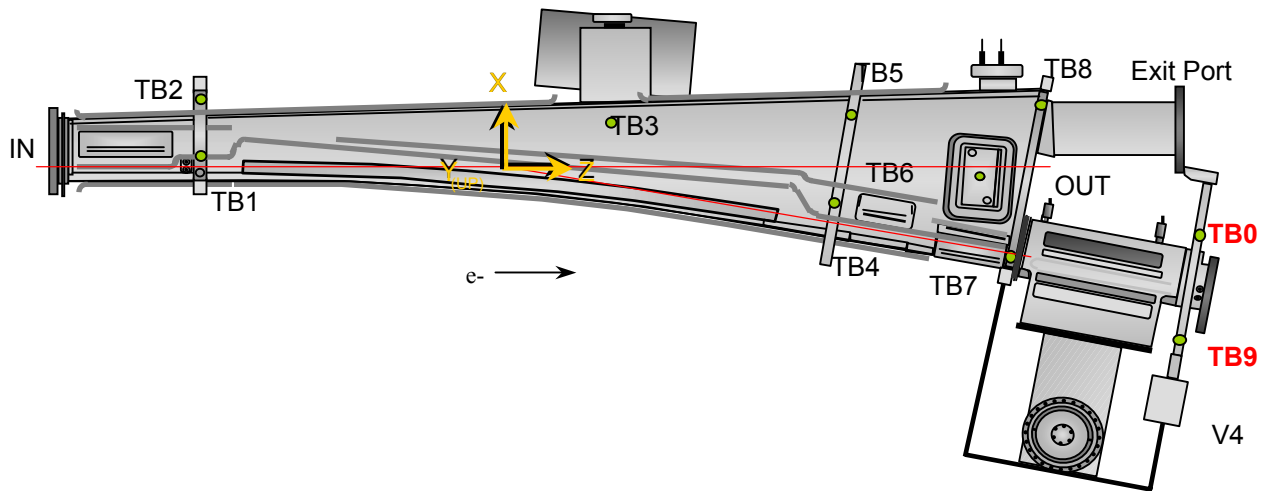
V4 Fiducialization Step: Survey of Fiducial Coordinates for BM1 Standard Vacuum Chamber with V4 and the Exit Port Attached:

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

Fiducial	Z	X	Y
TB9 (V4)	74.628	-20.321	4.380
TB0 (V4)	76.908	-8.208	4.383
	inches	inches	inches

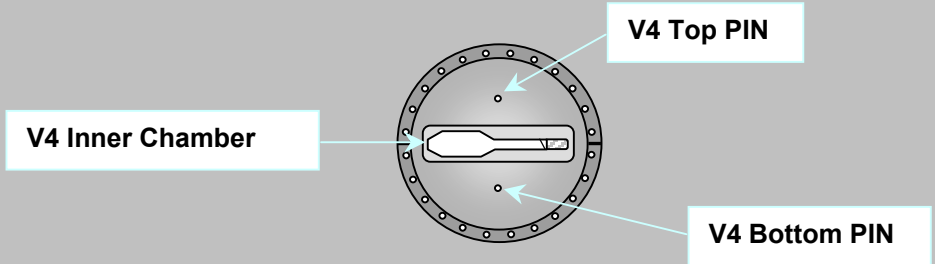
Description:

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	80.179	-0.005	2.280
Nominal	80.000	0.000	2.282
Difference (inches)	0.179	-0.005	-0.002

V4 Bottom PIN	Z	X	Y
Measured	80.170	-0.006	-2.285
Nominal	80.000	0.000	-2.282
Difference (inches)	0.170	-0.006	-0.003

V4 Inner Chamber	Z	X	Y
Measured	79.775	-1.412	-0.056
Nominal	80.000	-1.404	0.000
Difference (inches)	-0.225	-0.008	-0.056

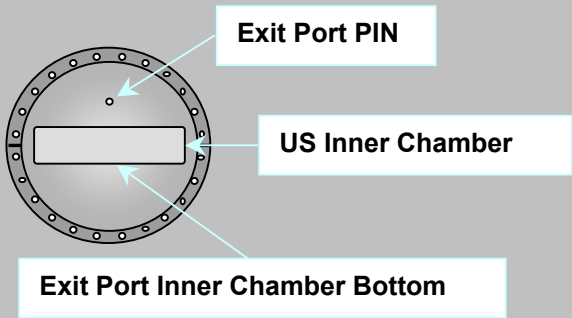
V4 Downstream Z Value	Z
Measured	80.714
Nominal	80.764
Difference (inches)	-0.050

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	75.340	4.190	2.298
Nominal	75.000	4.168	2.282
Difference (inches)	0.340	0.022	0.016

Exit Port Inner Chamber Side	Z	X	Y
Measured	75.047	7.441	0.083
Nominal	75.000	7.418	0.000
Difference (inches)	0.047	0.023	0.083

Exit Port Inner Chamber Bottom	Z	X	Y
Measured	74.941	4.047	-0.350
Nominal	75.000	0.000	-0.366
Difference (inches)	-0.059	4.047	0.016

Exit Port DS Z Value (PART Frame)	Z
Measured	75.894
Nominal	75.768
Difference (inches)	0.126

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	1.597	4.364	0.002	0.002	-0.018
TB2	-34.850	8.508	4.353	0.000	0.000	0.000
TB3	11.120	3.957	2.319	0.003	0.000	-0.012
TB4	34.510	-4.859	4.378	-0.004	0.000	0.000
TB5	36.580	6.236	4.354	0.000	-0.001	0.000
TB6	52.475	-1.875	2.309			
TB7	55.657	-11.132	3.083	-0.002	-0.002	0.027
TB8	59.433	8.991	3.057	0.005	-0.004	0.024
TB9 (V4)	74.650	-20.294	4.379	0.022	0.026	0.000
TB0 (V4)	76.912	-8.178	4.383	0.003	0.031	0.000
	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)

