

Fiducials for BM1 Std. Vac. Chamber

BM1011

Date:

3/28/02

Chamber:

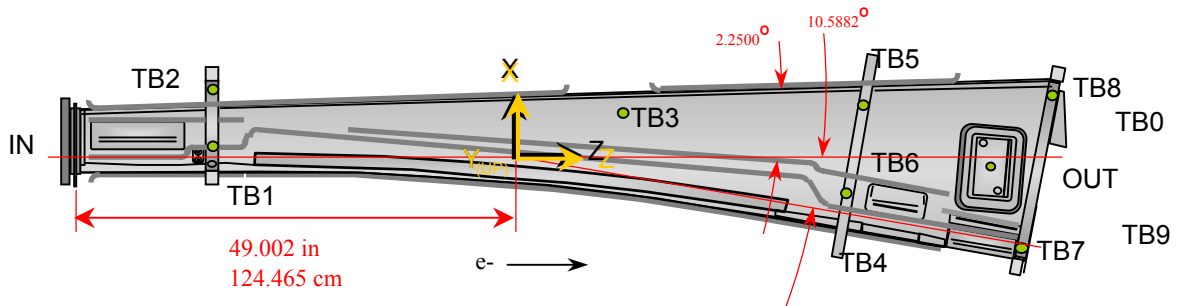
BM1011

Operator(s):

F. Gaudreault
C. Banuelos

Notes:

Z on Exit flange not measured.



Fiducial Coordinates for BM1 Standard Vacuum Chamber: (inches)

Fiducial	Z	X	Y
TB1	-34.849	1.572	4.389
TB2	-34.884	8.414	4.382
TB3	10.975	4.173	2.344
TB4	34.547	-4.906	4.379
TB5	36.835	6.183	4.371
TB6	52.481	-1.860	2.259
TB7	55.674	-11.226	3.017
TB8	59.438	8.996	2.995
TB9 (V4)	74.665	-20.335	4.387
TB0 (V4)	76.974	-8.085	4.388

inches inches inches

Nominal Deltas For H3 Absorber (TB6)		
Z	X	Y
52.486	-1.882	2.267
52.493	-1.891	2.242
-0.007	0.009	0.025

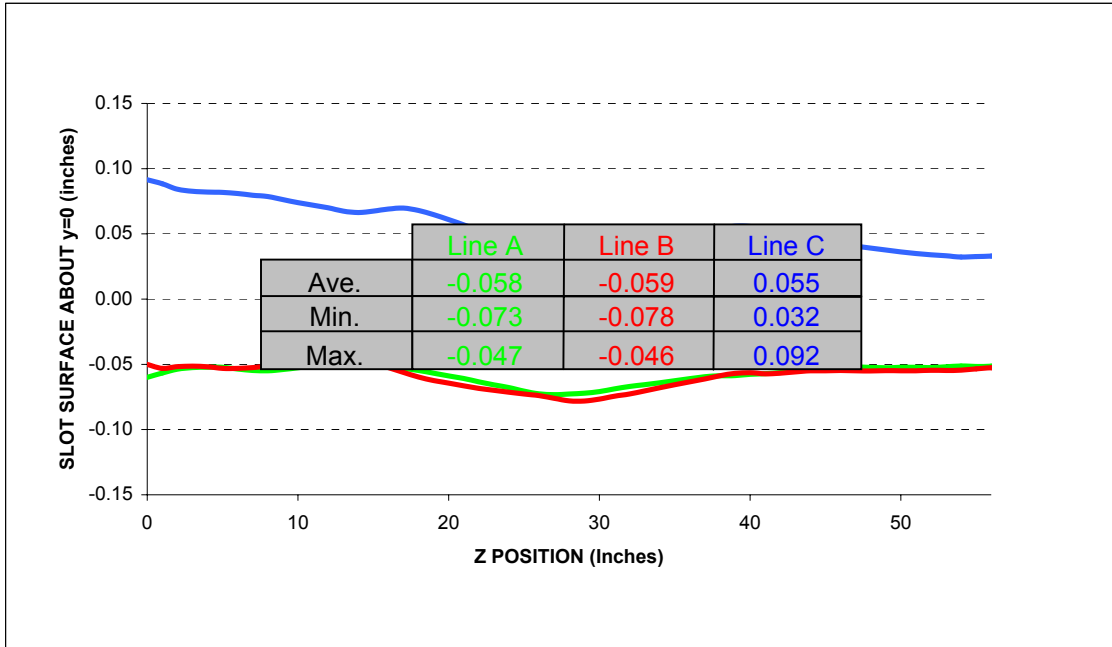
Source **V4 Step**

Description:

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

Fiducialization Step: (Traveler Step # 1380)

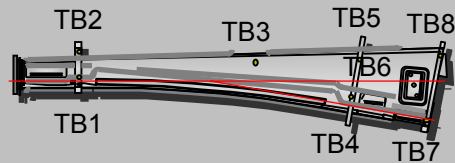
Slot Calibration	
Ideal	0.511
Meas.	0.135
Delta	-0.376



BM1011

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

Fiducial	Z	X	Y
TB1	-34.851	1.571	4.388
TB2	-34.888	8.414	4.383
TB3	10.977	4.203	2.346
TB4	34.543	-4.905	4.380
TB5	36.845	6.182	4.370
TB6	52.486	-1.882	2.267
TB7	55.664	-11.254	3.025
TB8	59.451	8.963	2.996
	inches	inches	inches

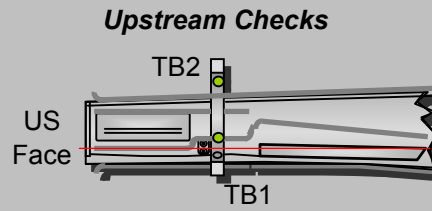


Description:

Fiducial values based on internal chamber datum.

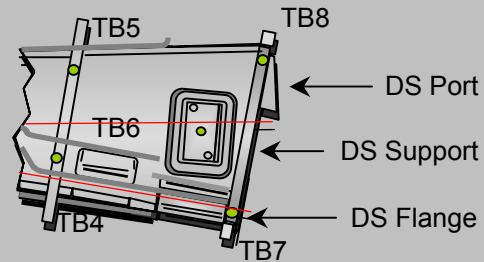
End Surface Attitudes for BM1 Std. Vac. Chamber

Upstream Face		
	yaw	pitch
Measured	2.4	3.9
Nominal	0.0	0.0
Difference	2.4	3.9
	mrad	mrad



Downstream Port		
	yaw	pitch
Measured	24.6	4.0
Nominal	25.3	0.0
Difference	-0.7	4.0

Downstream Checks



Downstream Support		
	yaw	pitch
Measured	-185.7	5.7
Nominal	-184.8	0.0
Difference	-0.9	5.7

Downstream Flange		
	yaw	pitch
Measured	-191.2	5.9
Nominal	-184.8	0.0
Difference	-6.4	5.9
	mrad	mrad

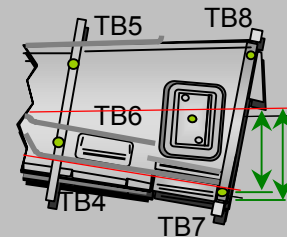
Description:

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

Datum Verification

DS Support	
	x
Measured	-11.899
Nominal	-11.912
Diff.	0.013
	inches

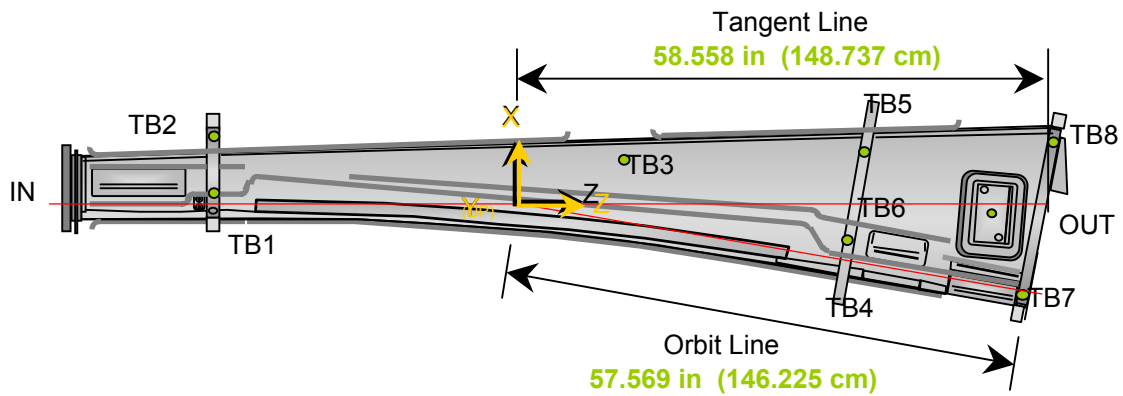
DS Flange	
	x
Measured	-11.942
Nominal	-11.958
Diff.	0.017
	inches



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 58.567 inches	without SMR	58.558 OK
Orbit Line:	Length 57.501 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	-34.850	1.571	4.389	0.000	0.000	0.001
TB2	-34.883	8.414	4.382	0.005	0.000	-0.001
TB3	10.976	4.172	2.344	0.000	-0.030	-0.002
TB4	34.547	-4.907	4.379	0.004	-0.003	0.000
TB5	36.836	6.183	4.371	-0.009	0.001	0.000
TB6						
TB7	55.674	-11.226	3.015	0.010	0.028	-0.010
TB8	59.434	8.996	2.997	-0.017	0.033	0.002

inches inches inches

Compared to Step 1 Fiducial Coords.

DS Port Level Check

Level Status: OK

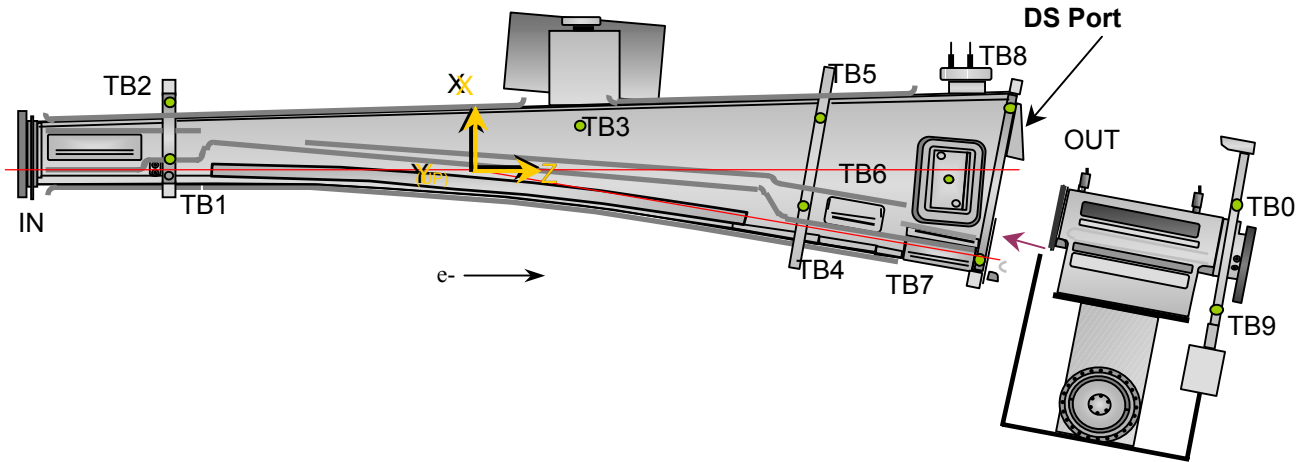
OK ? (YES or NO)

US Flange Roll Check

Roll Status: OK

OK ? (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	-50.863	1.862	2.303
Nominal	-51.000	1.836	2.282
Difference (inches)	0.137	0.026	0.021

US Inner Chamber	Z	X	Y
Measured	-50.603	-1.385	0.028
Nominal	-51.000	-1.404	0.000
Difference (inches)	0.398	0.019	0.028

US Bottom Inner Chamber Line	ROLL	(FINAL)
Measured	-1.105	
Nominal	0.000	
Difference (mrads)	-1.105	

Roll Status
UPDATE

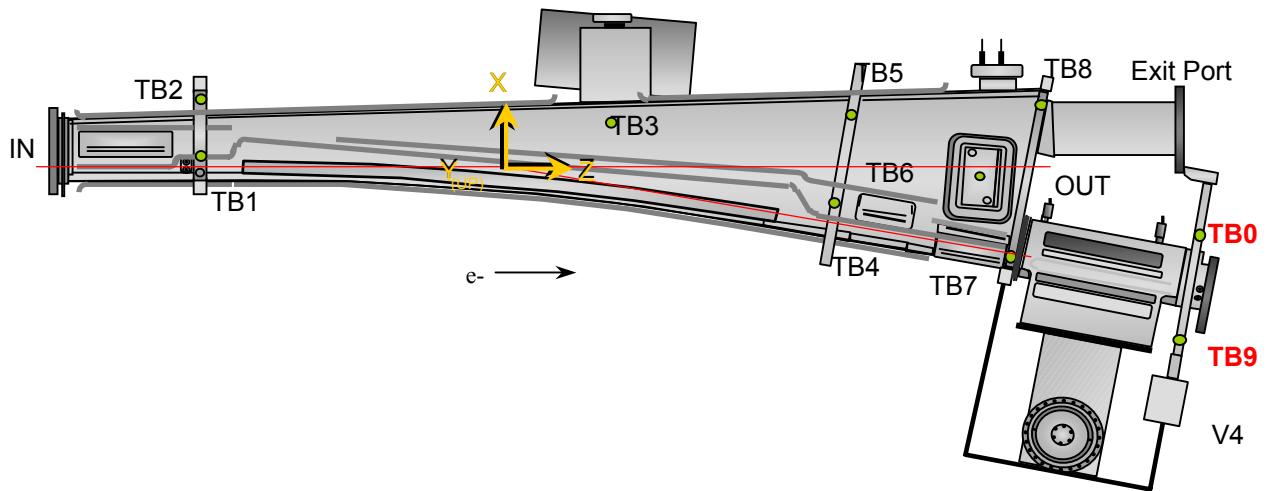
Description:
 Measured vs. nominal values for US flange expressed in the PART coordinate system.
 Fiducial values are updated (using those from Step A-1) if ROLL delta is not within 1 mrad.

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

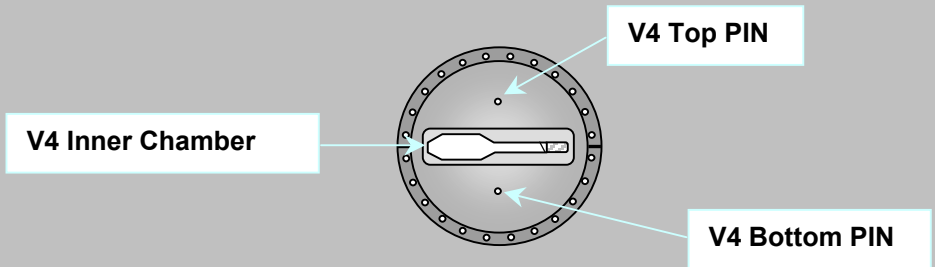
Fiducial	Z	X	Y
TB9 (V4)	74.671	-20.346	4.382
TB0 (V4)	76.992	-8.099	4.389
	inches	inches	inches

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	-0.001	2.274
Nominal	80.000	0.000	2.282
Difference (inches)	0.204	-0.001	-0.008

V4 Bottom PIN	Z	X	Y
Measured	80.177	-0.001	-2.285
Nominal	80.000	0.000	-2.282
Difference (inches)	0.177	-0.001	-0.003

V4 Inner Chamber	Z	X	Y
Measured	79.920	-1.406	-0.060
Nominal	80.000	-1.404	0.000
Difference (inches)	-0.080	-0.002	-0.060

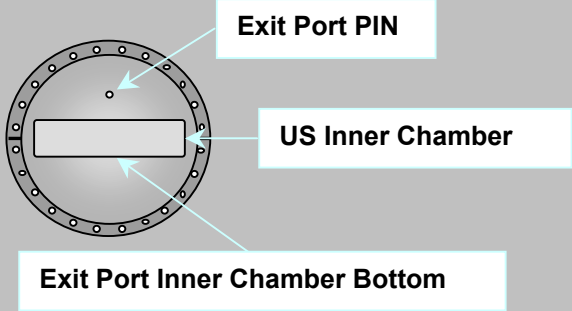
V4 Downstream Z Value	Z
Measured	80.728
Nominal	80.764
Difference (inches)	-0.036

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	75.354	4.182	2.267
Nominal	75.000	4.168	2.282
Difference (inches)	0.354	0.014	-0.015

Exit Port Inner Chamber Side	Z	X	Y
Measured	75.083	7.442	0.234
Nominal	75.000	7.418	0.000
Difference (inches)	0.083	0.024	0.234

Exit Port Inner Chamber Bottom	Z	X	Y
Measured	74.973	4.341	-0.382
Nominal	75.000	0.000	-0.366
Difference (inches)	-0.027	4.341	-0.016

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	-34.849	1.572	4.389	0.001	0.001	0.000
TB2	-34.884	8.414	4.382	0.000	-0.001	0.000
TB3	10.975	4.173	2.344	-0.001	0.000	0.000
TB4	34.547	-4.906	4.379	0.000	0.001	0.000
TB5	36.835	6.183	4.371	0.000	-0.001	0.000
TB6	52.481	-1.860	2.259			
TB7	55.674	-11.226	3.017	0.000	0.000	0.002
TB8	59.438	8.996	2.995	0.004	0.000	-0.002
TB9 (V4)	74.665	-20.335	4.387	-0.006	0.012	0.005
TB0 (V4)	76.974	-8.085	4.388	-0.018	0.014	-0.001
	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)

