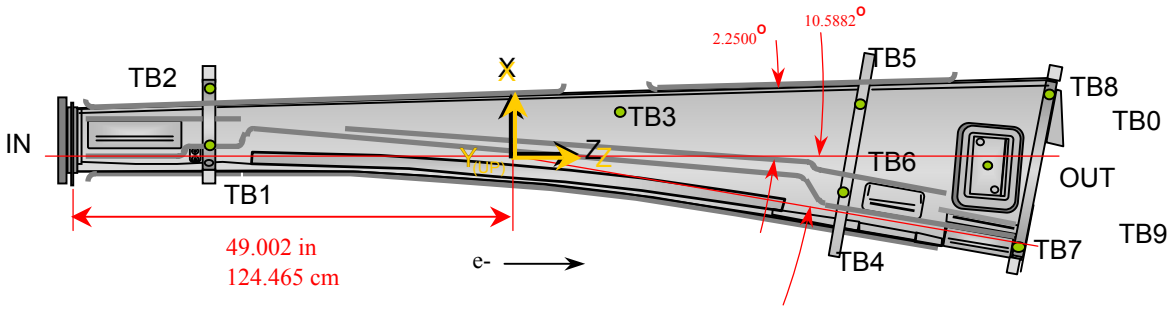
Fiducials for BM1 Std. Vac. Chamber | BM1010

Date: 5/13/02

Chamber: BM1010

Operator(s): L. Griffin, H. Imfeld

Notes:



Fiducial Coordinates for BM1 Standard Vacuum Chamber: (inches)

Fiducial	Z	X	Y
TB1	-34.837	1.491	4.350
TB2	-34.855	8.434	4.362
TB3	11.026	4.156	2.340
TB4	34.591	-4.840	4.365
TB5	36.667	6.210	4.332
TB6	52.482	-1.896	2.293
TB7	55.596	-11.183	3.062
TB8	59.425	8.991	3.006
TB9 (V4)	74.626	-20.283	4.369
TB0 (V4)	76.954	-7.972	4.382
	inches	inches	inches

Nominal Deltas For H3 Absorber (TB6)

Z	X	Y
52.485	-1.913	2.290
52.493	-1.891	2.242
-0.009	**-0.022**	**0.048**

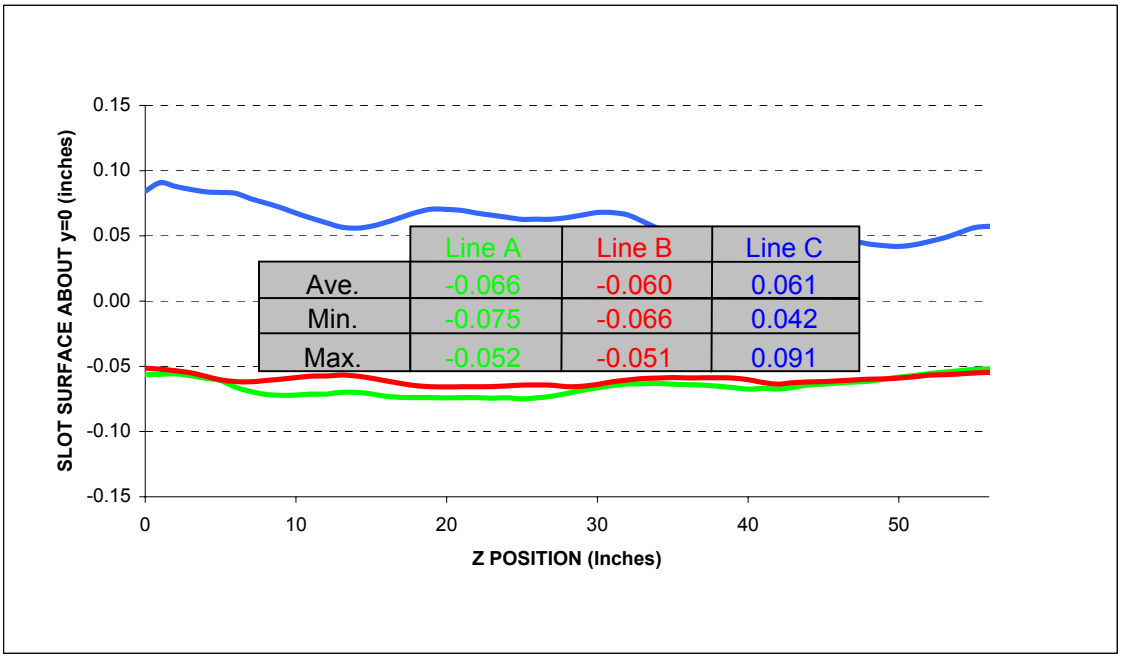
Source: **V4 Step**

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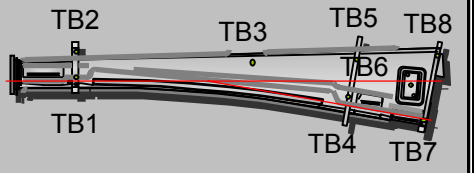
Step 1: *Fiducial Coordinates for BM1 Std. Vac. Chamber*

Fiducial	Z	X	Y
TB1	-34.836	1.488	4.376
TB2	-34.859	8.434	4.362
TB3	11.026	4.176	2.351
TB4	34.589	-4.838	4.365
TB5	36.678	6.208	4.332
TB6	52.485	-1.913	2.290
TB7	55.587	-11.202	3.064
TB8	59.428	8.969	2.990
	inches	inches	inches



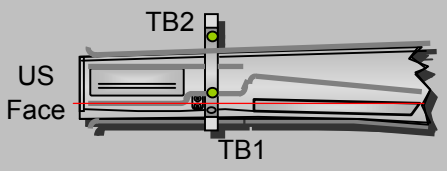
Description:

Fiducial values based on internal chamber datum.

End Surface Attitudes for BM1 Std. Vac. Chamber

Upstream Face	yaw	pitch
Measured	2.0	-3.7
Nominal	**0.0**	**0.0**
Difference	**2.0**	**-3.7**
	mrad	mrad

Upstream Checks

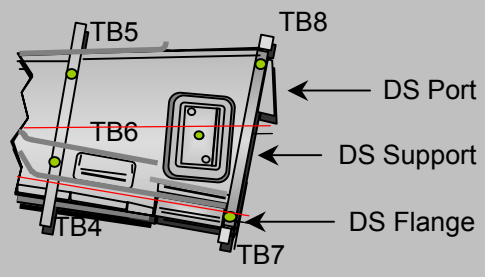


Downstream Port	yaw	pitch
Measured	24.0	0.1
Nominal	**25.3**	**0.0**
Difference	**-1.3**	**0.1**

Downstream Support	yaw	pitch
Measured	-185.4	-1.2
Nominal	**-184.8**	**0.0**
Difference	**-0.6**	**-1.2**

Downstream Flange	yaw	pitch
Measured	-192.0	-1.1
Nominal	**-184.8**	**0.0**
Difference	**-7.2**	**-1.1**
	mrad	mrad

Downstream Checks



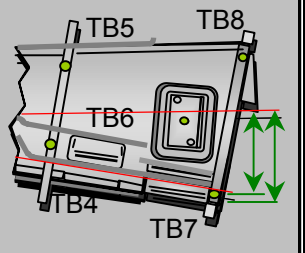
Description:

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

Datum Verification

DS Support	x
Measured	-11.898
Nominal	**-11.912**
Diff.	**0.014**
	inches

DS Flange	x
Measured	-11.940
Nominal	**-11.958**
Diff.	**0.018**
	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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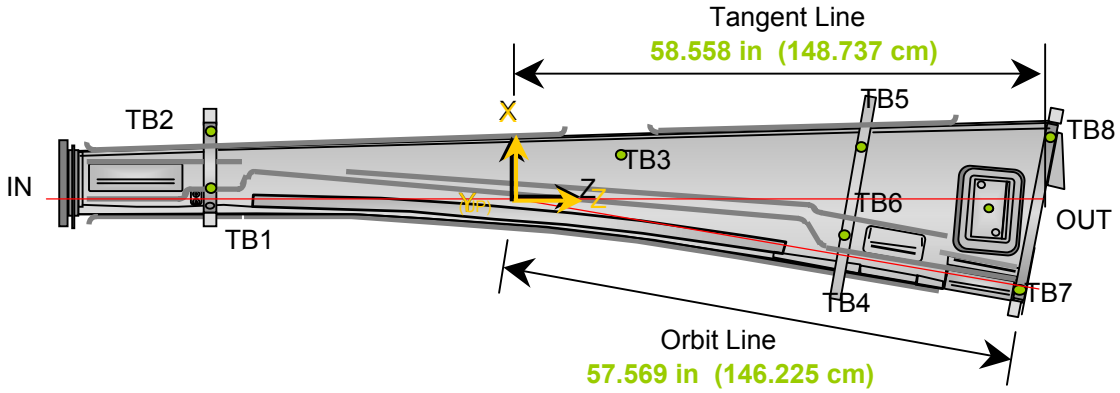
Status

BM1 Chamber Lengths				
	Length			Nominal Length
Tangent Line:	58.569	inches	with**out** SMR	58.558 OK
	Length			Nominal Length
Orbit Line:	57.494	inches	with**out** 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
TB1	-34.837	1.490	4.374
TB2	-34.856	8.433	4.364
TB3	11.024	4.153	2.353
TB4	34.595	-4.840	4.366
TB5	36.670	6.209	4.331
TB6			
TB7	55.599	-11.179	3.038
TB8	59.417	8.999	2.978
	inches	inches	inches

del Z	del X	del Y
-0.001	0.002	-0.002
0.002	-0.001	0.002
-0.001	-0.023	0.001
0.007	-0.002	0.001
-0.007	0.001	-0.002
0.012	0.022	-0.027
-0.011	0.030	-0.011

Compared to Step 1 Fiducial Coords.

DS Port Level Check

OK ? Yes (YES or NO)

Level Status: OK

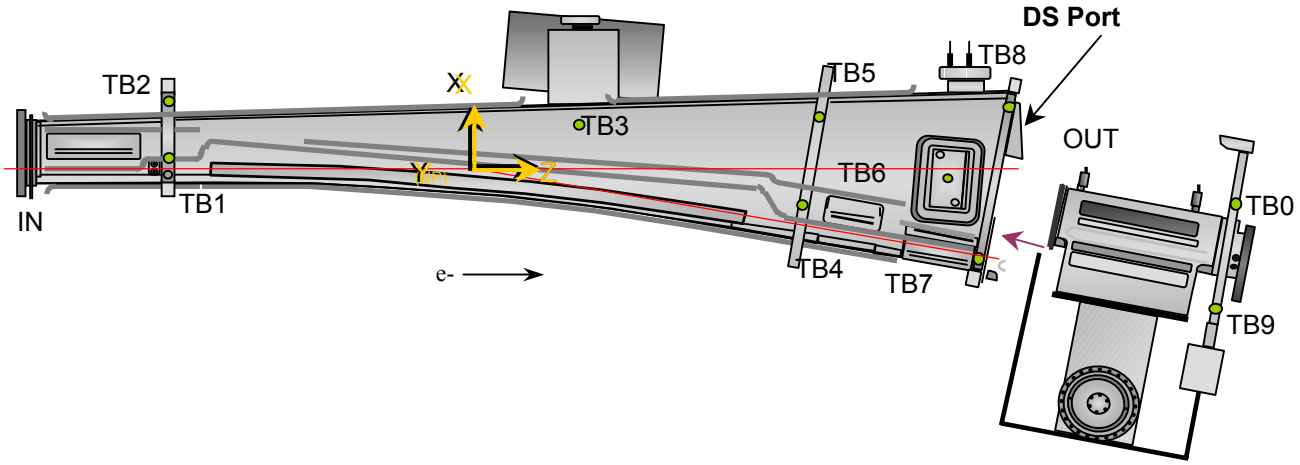
US Flange Roll Check

OK ? No (YES or NO)

Roll Status: UPDATE

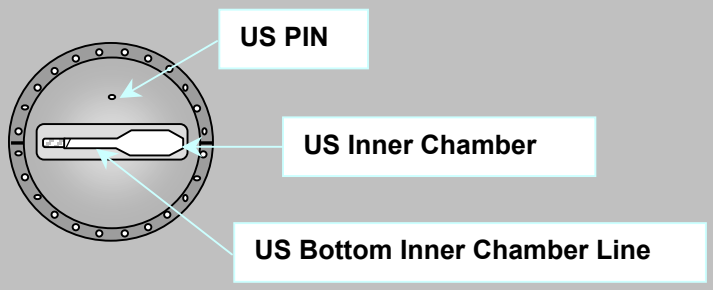
Description:

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 Postion*



US PIN	Z	X	Y
Measured	-50.878	1.854	2.282
Nominal	-51.000	1.836	2.282
Difference (inches)	**0.122**	**0.018**	**0.000**

US Inner Chamber	Z	X	Y
Measured	-50.612	-1.393	0.014
Nominal	-51.000	-1.404	0.000
Difference (inches)	**0.388**	**0.011**	**0.014**

US Bottom Inner Chamber Line	ROLL	(FINAL)
Measured	-0.214	
Nominal	0.000	Roll Status
Difference (mrads)	**-0.214**	**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 within1mrad.

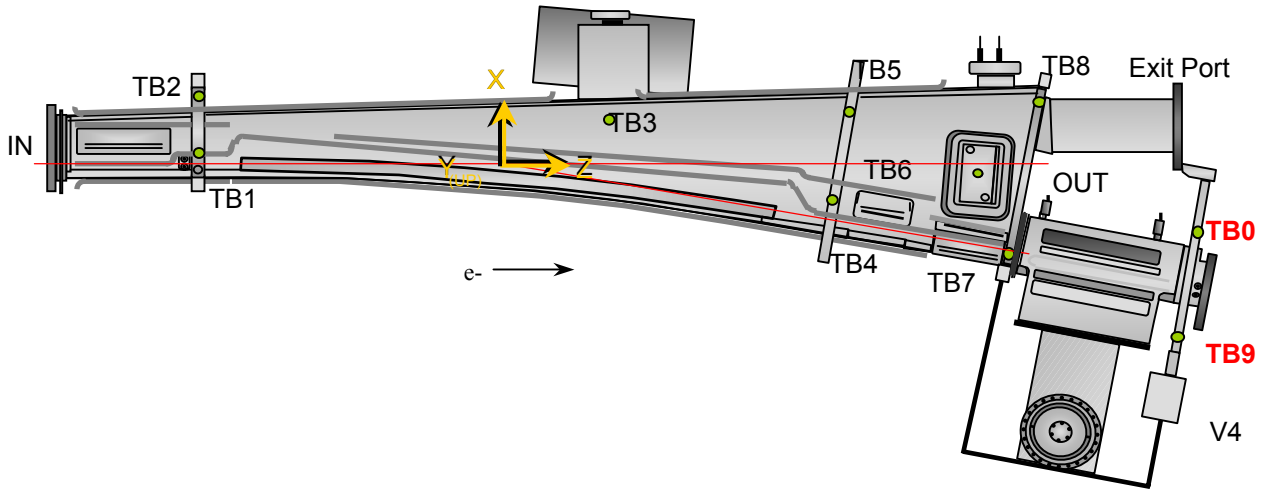
V4 Fiducialization Step: **Survey of Fiducial Coordinates for BM1 Standard Vacuum Chamber with V4 and the Exit Port Attached:**

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

Fiducial	Z	X	Y
TB9 (V4)	74.617	-20.286	4.363
TB0 (V4)	76.962	-7.976	4.388
	inches	inches	inches

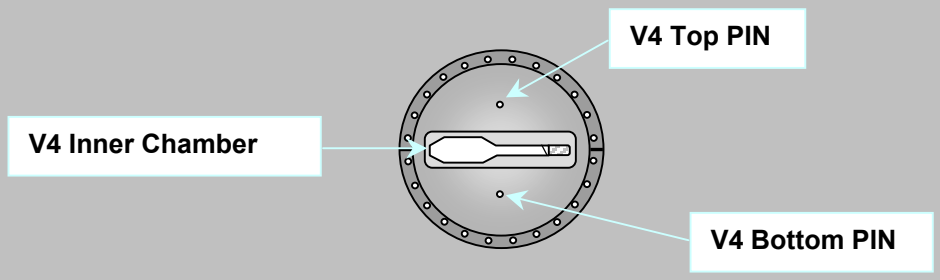
Description:

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	80.182	0.002	2.276
Nominal	80.000	0.000	2.282
Difference (inches)	0.182	**0.002**	**-0.006**

V4 Bottom PIN	**Z**	**X**	**Y**
Measured	80.173	0.001	-2.286
Nominal	80.000	0.000	-2.282
Difference (inches)	0.173	**0.001**	**-0.004**

V4 Inner Chamber	**Z**	**X**	**Y**
Measured	79.889	-1.405	-0.001
Nominal	80.000	-1.404	0.000
Difference (inches)	-0.111	**-0.001**	-0.001

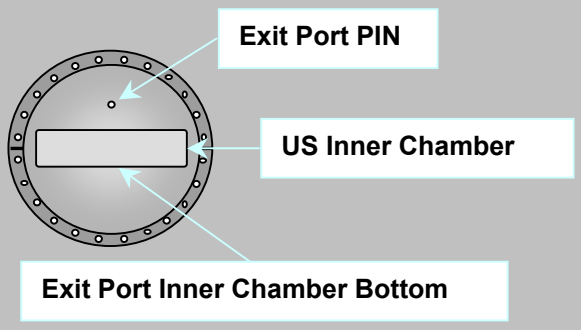
V4 Downstream Z Value	**Z**
Measured	80.710
Nominal	80.764
Difference (inches)	**-0.054**

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	75.312	4.184	2.278
Nominal	75.000	4.168	2.282
Difference (inches)	0.312	**0.016**	**-0.004**

Exit Port Inner Chamber Side	**Z**	**X**	**Y**
Measured	75.033	7.440	0.229
Nominal	75.000	7.418	0.000
Difference (inches)	0.033	**0.022**	0.229

Exit Port Inner Chamber Bottom	**Z**	**X**	**Y**
Measured	74.978	3.897	-0.377
Nominal	75.000	0.000	-0.366
Difference (inches)	-0.022	3.897	**-0.011**

Exit Port DS Z Value (PART Frame)	**Z**
Measured	75.843
Nominal	75.768
Difference (inches)	**0.075**

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	-34.837	1.491	4.350	0.001	0.001	-0.024
TB2	-34.855	8.434	4.362	0.001	0.001	-0.002
TB3	11.026	4.156	2.340	0.002	0.003	-0.013
TB4	34.591	-4.840	4.365	-0.005	0.000	-0.002
TB5	36.667	6.210	4.332	-0.003	0.001	0.001
TB6	52.482	-1.896	2.293			
TB7	55.596	-11.183	3.062	-0.003	-0.004	0.024
TB8	59.425	8.991	3.006	0.008	-0.008	0.028
TB9 (V4)	74.626	-20.283	4.369	0.008	0.002	0.005
TB0 (V4)	76.954	-7.972	4.382	-0.008	0.004	-0.006
	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)