10S-2 Elliptical Chamber Align	SA-444-338-14-1

See 15-2 Below

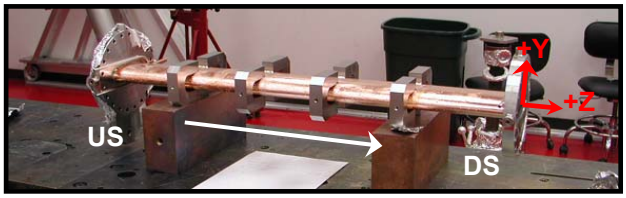
Date: 9/15/03

Ser. No.: 1 (eg. 1)

Operator(s): F. Gaudreault, H. Imfeld

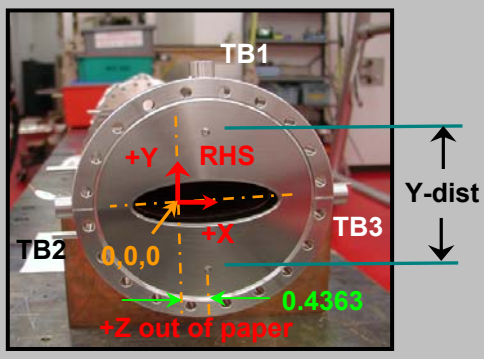
Notes:

Could not read TB3 due to water line.



Step 1: *Datum Defined Through Downstream Flange*

Flange Plane Scanned === gives ===> yaw, pitch
Measure Two Pins === gives ===> roll, origin



DS Flange Pin-to-Pin	Y-dist
Measured	4.564
Nominal	4.564
Difference	0.000

inches

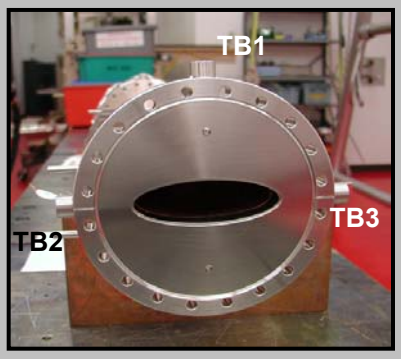
DS Flange Circle Scan Check	Dia	X	Y
Measured (Flange circle scan + SMR)		0.436	-0.002
Reduced (Minus 2 X 0.750" for SMR)			
Nominal	8.000	0.436	0.000
Difference (inches)	- - - - -	0.000	-0.002

Description:

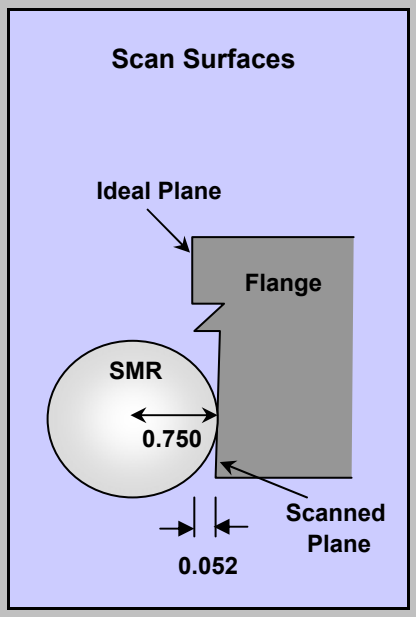
Downstream flange form chamber datum. The face scan of the flange defines yaw and pitch while the two pins hold roll fixed. The split between the two pins in the flange plane define origin. A scan of the flange edge is a check for diameter and the X & Y of the origin.

DS Flange TB Positions and Chamber Length

Step 2: *Tooling Ball Fiducial Values on Downstream Flange and Chamber Length*



Fiducial	Z	X	Y
TB1	-0.600	0.411	5.487
TB2	-0.611	-5.047	-0.024
TB3			
	inches	inches	inches



Chamber Length

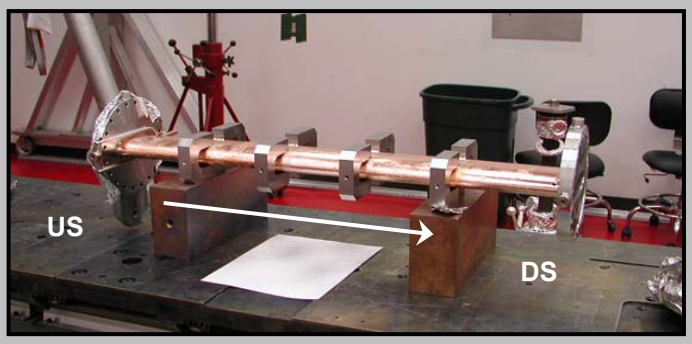
Uncorrected measured distance between DS and US flanges	34.264
Chamber Length (Ideal Plane to Ideal Plane)	**32.868**
Nominal (Ideal)	**32.899**
Difference	**-0.031**
	inches

Description:

Fiducial values based on established datum in step 1.

Upstream Flange Position (Based on DS Datum)

Step 3: *Upstream Flange Postion and Checks*



US Flange Position Information

	Z *	X	Y
Top Pin	-33.200	0.401	2.275
Bot Pin	-33.195	0.344	-2.290
	inches	inches	inches

US Flange Roll	
Measured	
Nominal	0.000
Difference	- - - - -
	mrad

	Z *	X	Y
Avg	-33.198	0.373	-0.008
Ideal		0.436	0.000
Diff	N/A	-0.064	-0.008
	inches	inches	inches

* Note: Z is arbitrary

US Plane Scan:

US Flange Attitude		
	yaw	pitch
Measured	2.0	-1.1
Nominal	0.0	0.0
Difference	2.0	-1.1
	mrad	mrad

US Flange Circle Scan Check	Dia	X	Y
Measured (Flange circle scan + SMR)		0.374	-0.008
Reduced (Minus 2 X 0.750" for SMR)			
Nominal	8.000	0.436	0.000
Difference *(inches)*	- - - - -	-0.062	-0.008

Description:

Measured vs. nominal values for US flange based on DS datum.

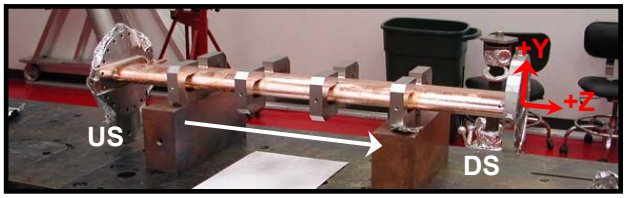
10S Elliptical Chamber Align	SA-444-338-15-2

Date: 9/15/03

Ser. No.: 2 (eg. 1)

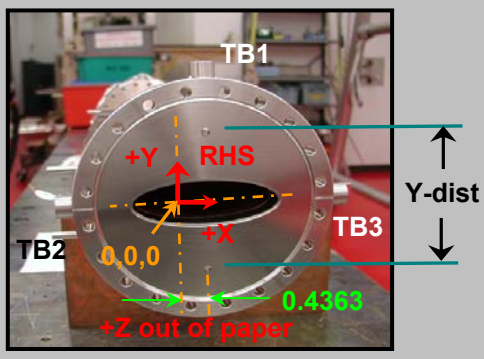
Operator(s): F. Gaudreault, H. Imfeld

Notes: Could not read TB3 due to water line.



Step 1: *Datum Defined Through Downstream Flange*

Flange Plane Scanned === gives ===> yaw, pitch
Measure Two Pins === gives ===> roll, origin



DS Flange Pin-to-Pin	Y-dist
Measured	4.567
Nominal	4.564
Difference	0.003
	inches

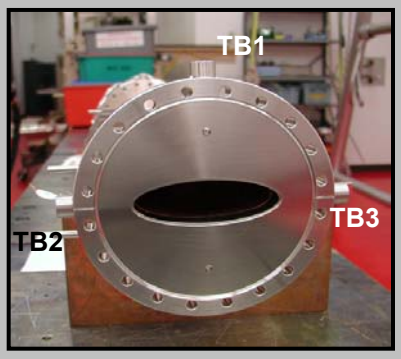
DS Flange Circle Scan Check	Dia	X	Y
Measured (Flange circle scan + SMR)		0.437	-0.001
Reduced (Minus 2 X 0.750" for SMR)			
Nominal	8.000	0.436	0.000
Difference (inches)	- - - - -	0.001	-0.001

Description:

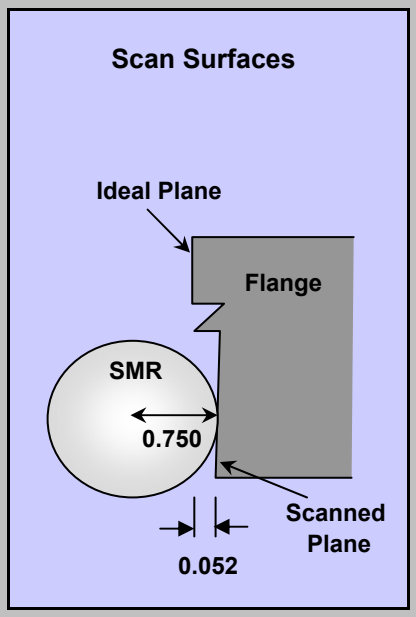
Downstream flange form chamber datum. The face scan of the flange defines yaw and pitch while the two pins hold roll fixed. The split between the two pins in the flange plane define origin. A scan of the flange edge is a check for diameter and the X & Y of the origin.

DS Flange TB Positions and Chamber Length

Step 2: *Tooling Ball Fiducial Values on Downstream Flange and Chamber Length*



Fiducial	Z	X	Y
TB1	-0.602	0.415	5.486
TB2	-0.609	-5.048	-0.021
TB3			
	inches	inches	inches



Chamber Length

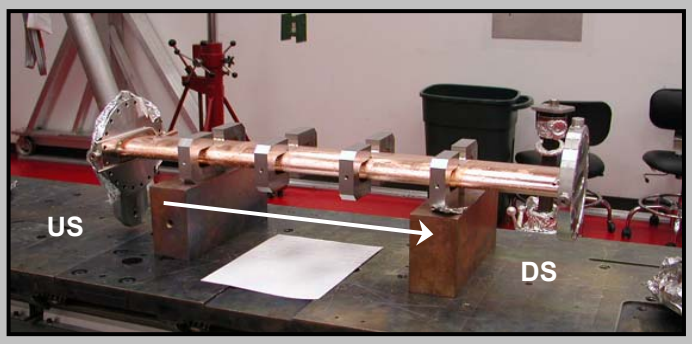
Uncorrected measured distance between DS and US flanges	35.629
Chamber Length (Ideal Plane to Ideal Plane)	**34.233**
Nominal (Ideal)	**34.250**
Difference	**-0.017**
	inches

Description:

Fiducial values based on established datum in step 1.

Upstream Flange Position (Based on DS Datum)

Step 3: *Upstream Flange Postion and Checks*



US Flange Position Information

	Z *	X	Y
Top Pin	-34.569	0.540	2.225
Bot Pin	-34.557	0.498	-2.343
	inches	inches	inches

US Flange Roll	
Measured	
Nominal	0.000
Difference	- - - - -
	mrad

	Z *	X	Y
Avg	-34.563	~~0.518~~	-0.059
Ideal		0.436	0.000
Diff	N/A	~~0.083~~	-0.059
	inches	inches	inches

* Note: Z is arbitrary

US Plane Scan:

US Flange Attitude		
	yaw	pitch
Measured	-1.9	-2.4
Nominal	0.0	0.0
Difference	-1.9	-2.4
	mrad	mrad

US Flange Circle Scan Check	Dia	X	Y
Measured (Flange circle scan + SMR)		~~0.518~~	-0.058
Reduced (Minus 2 X 0.750" for SMR)			
Nominal	8.000	0.436	0.000
Difference *(inches)*	- - - - -	0.082	-0.058

Description:

Measured vs. nominal values for US flange based on DS datum.