| pc-dmis | PART NAME : PN440004-n-Trans-Rings-000-TB9XXX000-v5-IR | | December 21, 2012 | 16:42 |
|---|---|---|---|---|
| | REV NUMBER : | SER NUMBER : | STATS COUNT : | 1 |

440004-n
FNAL 1.3GHZ TESLA
RF CAVITY
ASSEMBLY
measurement of Transition Rings
@ 000 rotational orientation

'Inspected by ' : Robert Riley
'Cavity Number' : TB9AES023
' ' : 1212121456

Datum Discs

| # | MM | LOC1 - CIRC_DATUM_DISC_MC | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Y | 25.000 | 27.789 | 2.789 | 10.000 | 10.000 | 0.000 |
| Z | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| D | 111.000 | 110.812 | -0.188 | 0.050 | 0.050 | 0.138 |
| RN | 0.000 | 0.047 | 0.047 | 0.050 | 0.000 | 0.000 |

| # | MM | LOC2 - CIRC_DATUM_DISC_FP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| Y | -1032.384 | -1031.392 | 0.993 | 10.000 | 10.000 | 0.000 |
| Z | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| D | 111.000 | 110.764 | -0.236 | 0.050 | 0.050 | 0.186 |
| RN | 0.000 | 0.061 | 0.061 | 0.050 | 0.000 | 0.011 |

Datum Disc planes

| # | MM | LOC3 - PLNC_DD_MC | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 27.000 | 29.811 | 2.811 | 10.000 | 10.000 | 0.000 |
| FL | 0.000 | 0.123 | 0.123 | 0.100 | 0.000 | 0.023 |

| # | MM | LOC4 - PLNC_DD_FP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1034.384 | -1033.467 | 0.918 | 10.000 | 10.000 | 0.000 |
| FL | 0.000 | 0.173 | 0.173 | 0.100 | 0.000 | 0.073 |

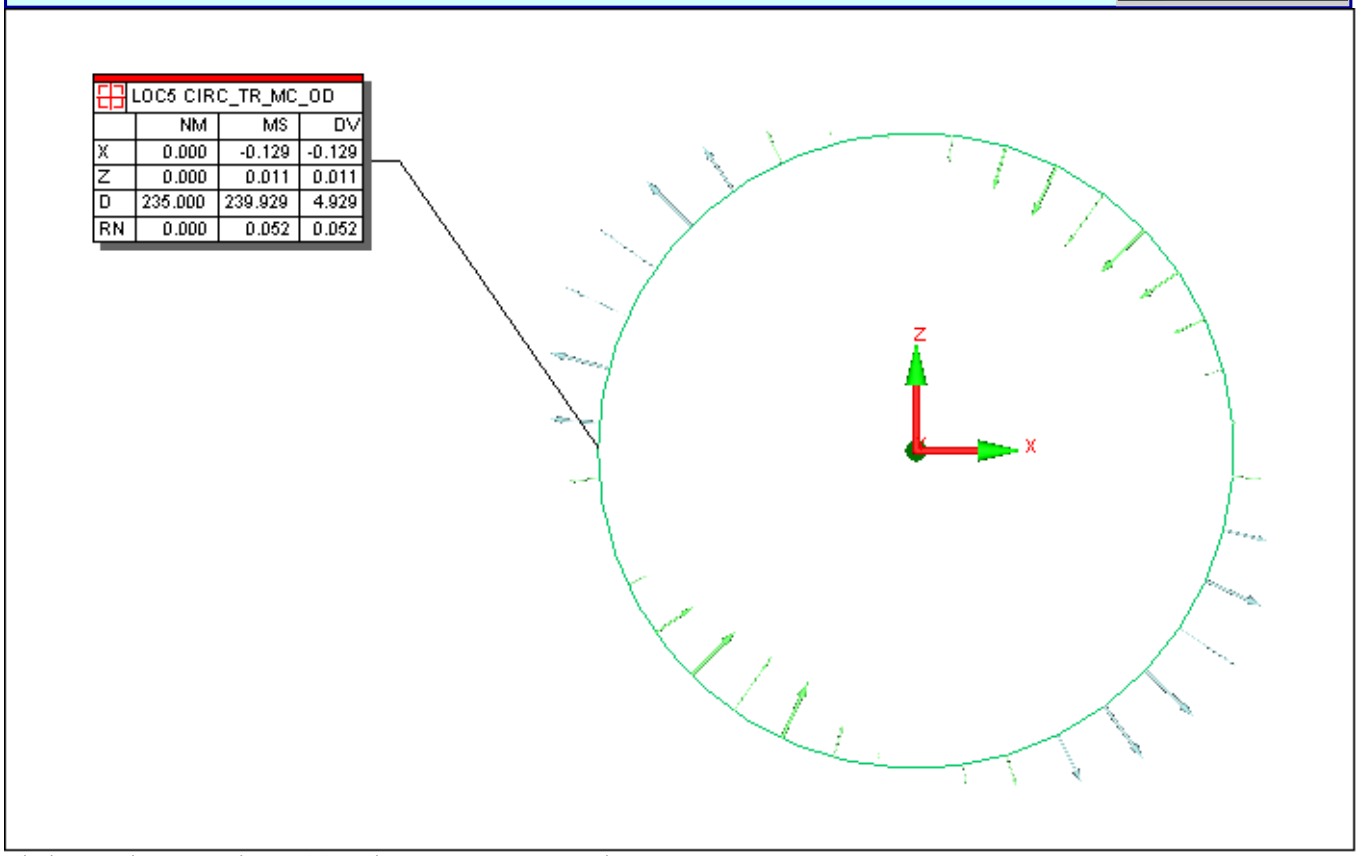
Distance between Datum Disc planes

| ↔ | MM | DIST1 - PLNC_DD_FP TO PLNC_DD_MC (YAXIS) | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1061.060 | 1063.278 | 2.218 | 0.200 | 0.200 | 2.018 |

Minimum Circumscribed 36 point constructed circle
Transition Ring Main Coupler end
235.0 O.D.

| ⌗ | MM | LOC5 - CIRC_TR_MC_OD | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.129 | -0.129 | 0.250 | 0.250 | 0.000 |
| Z | 0.000 | 0.011 | 0.011 | 0.250 | 0.250 | 0.000 |
| D | 235.000 | 239.929 | 4.929 | 0.250 | 0.250 | 4.679 |
| RN | 0.000 | 0.052 | 0.052 | 0.250 | 0.000 | 0.000 |

| ○ | MM | RND1 - CIRC_TR_MC_OD | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0.000 | 0.052 | 0.052 | 0.250 | 0.000 | 0.000 |

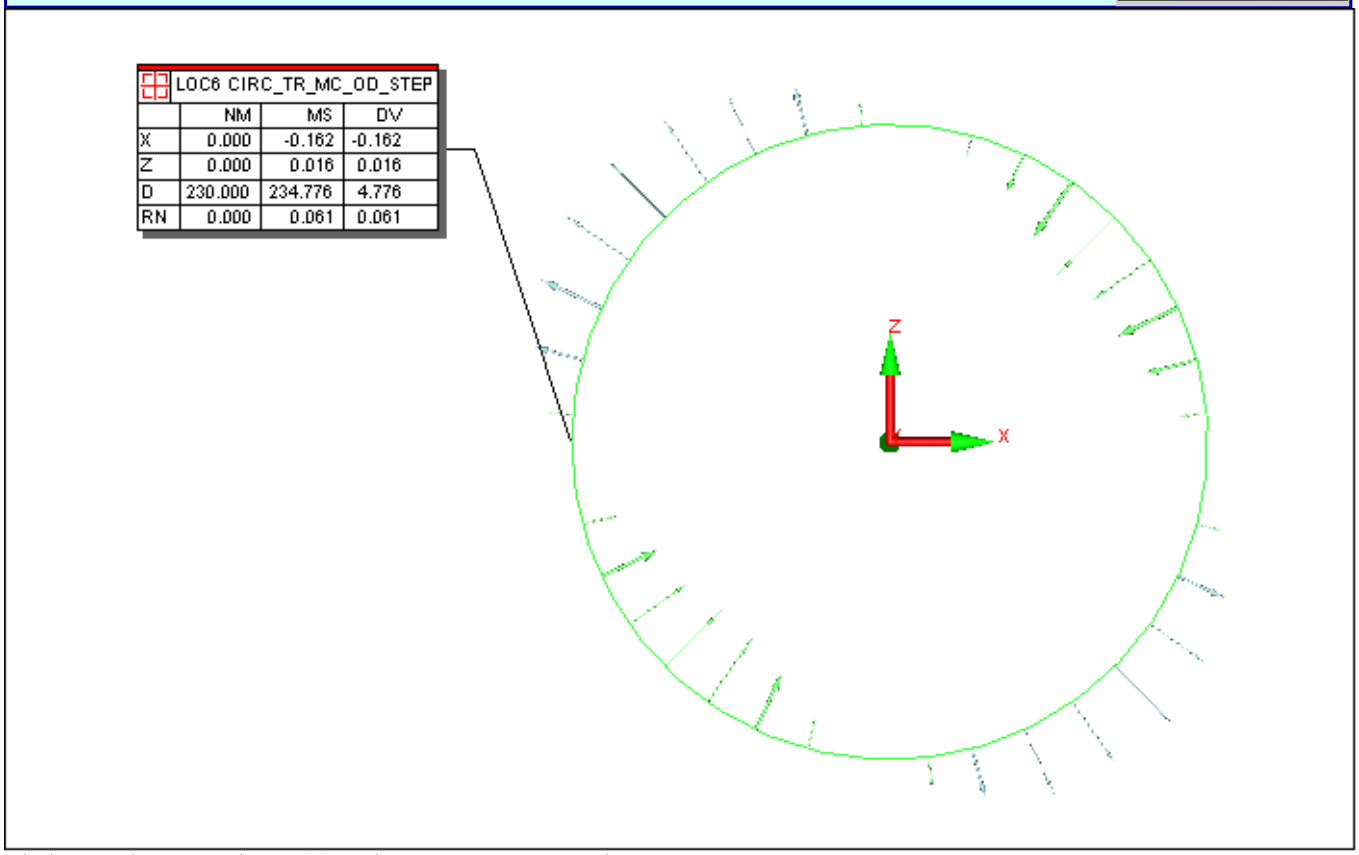



Minimum Circumscribed 36 point constructed circle
Transition Ring Main Coupler end
235.0 O.D. x1000

Minimum Circumscribed 36 point constructed circle
Transition Ring Main Coupler end
233.00 O.D. step

| | MM | LOC6 - CIRC_TR_MC_OD_STEP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.162 | -0.162 | 0.250 | 0.250 | 0.000 |
| Z | 0.000 | 0.016 | 0.016 | 0.250 | 0.250 | 0.000 |
| D | 230.000 | 234.776 | 4.776 | 0.000 | 0.250 | 4.776 |
| RN | 0.000 | 0.061 | 0.061 | 0.250 | 0.000 | 0.000 |

| | MM | RND2 - CIRC_TR_MC_OD_STEP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0.000 | 0.061 | 0.061 | 0.250 | 0.000 | 0.000 |

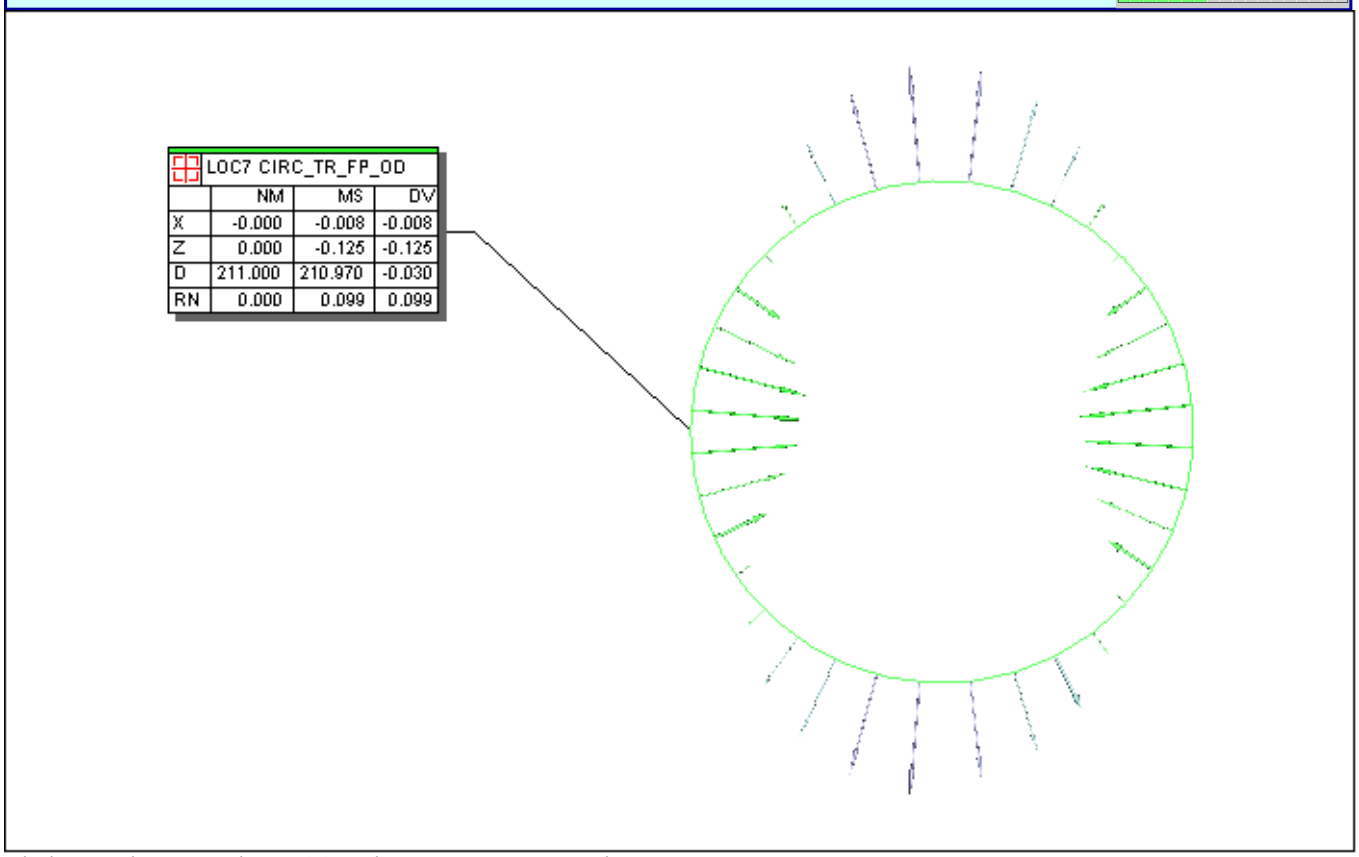



Minimum Circumscribed 36 point constructed circle
Transition Ring Main Coupler end
233.00 O.D. step x1000

Minimum Circumscribed 36 point constructed circle
Transition Ring Field Probe end
211.0 O.D.

| ⌗ | MM | LOC7 - CIRC_TR_FP_OD | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.008 | -0.008 | 0.250 | 0.250 | 0.000 |
| Z | 0.000 | -0.125 | -0.125 | 0.250 | 0.250 | 0.000 |
| D | 211.000 | 210.970 | -0.030 | 0.250 | 0.250 | 0.000 |
| RN | 0.000 | 0.099 | 0.099 | 0.250 | 0.000 | 0.000 |

| ○ | MM | RND3 - CIRC_TR_FP_OD | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0.000 | 0.099 | 0.099 | 0.250 | 0.000 | 0.000 |

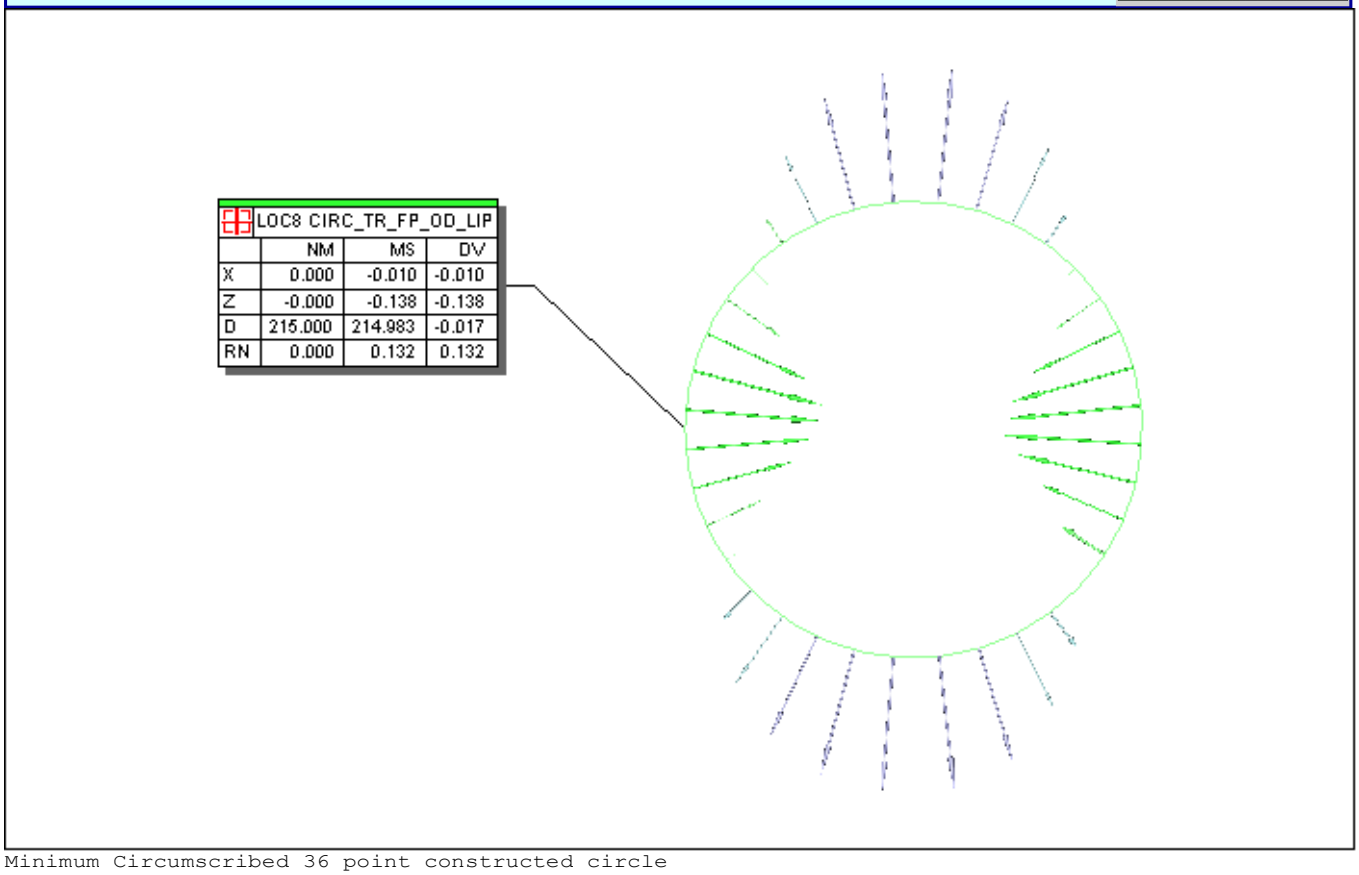



Minimum Circumscribed 36 point constructed circle
Transition Ring Field Probe end
211.0 O.D. x1000

Minimum Circumscribed 36 point constructed circle
Transition Ring Field Probe end
215.0 O.D. lip

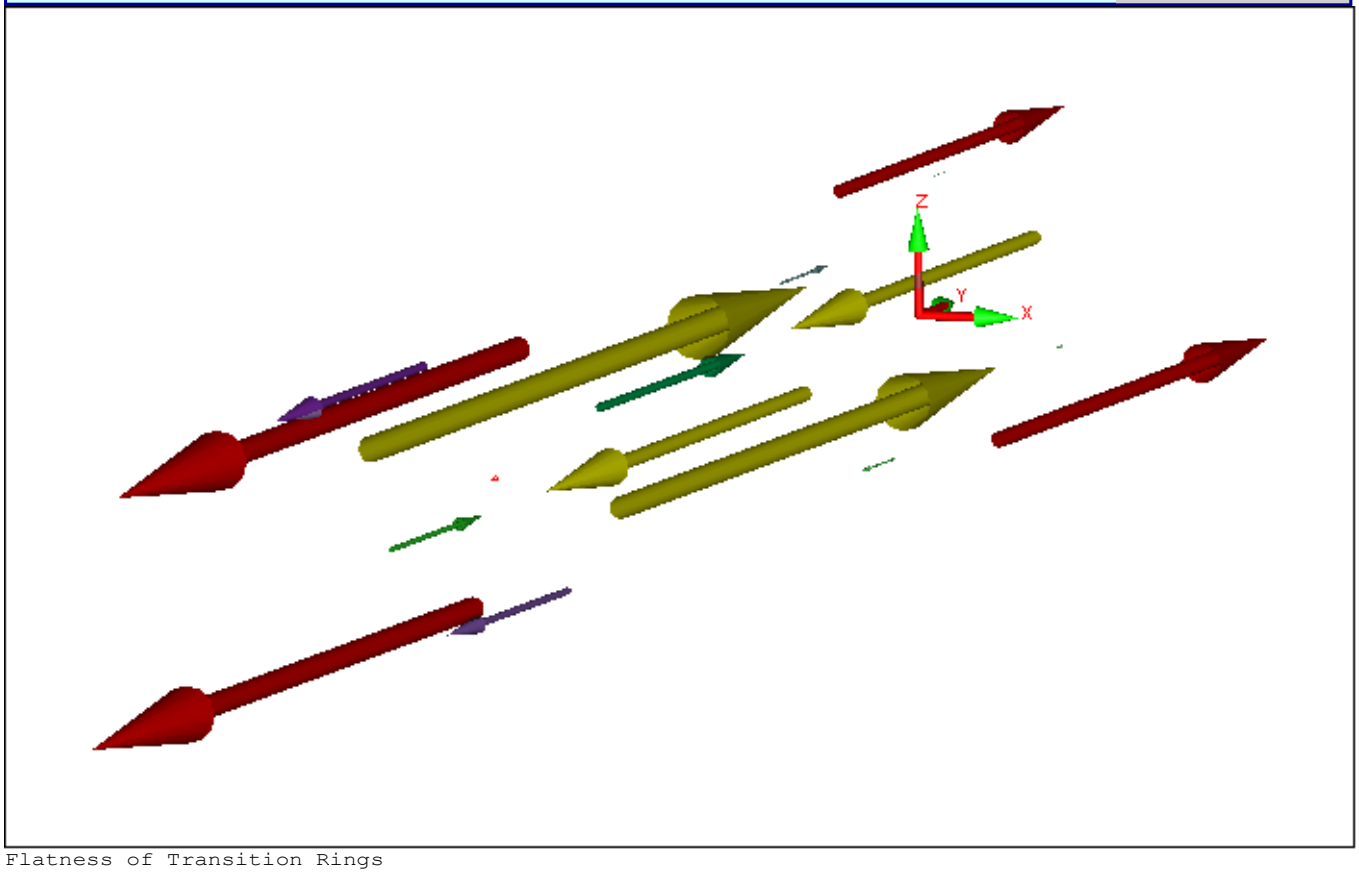
| ⌖ | MM | LOC8 - CIRC_TR_FP_OD_LIP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.010 | -0.010 | 0.250 | 0.250 | 0.000 |
| Z | 0.000 | -0.138 | -0.138 | 0.250 | 0.250 | 0.000 |
| D | 215.000 | 214.983 | -0.017 | 0.250 | 0.250 | 0.000 |
| RN | 0.000 | 0.132 | 0.132 | 0.250 | 0.000 | 0.000 |

| ○ | MM | RND4 - CIRC_TR_FP_OD_LIP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0.000 | 0.132 | 0.132 | 0.250 | 0.000 | 0.000 |




Minimum Circumscribed 36 point constructed circle
Transition Ring Field Probe end
215.0 O.D. lip x1000

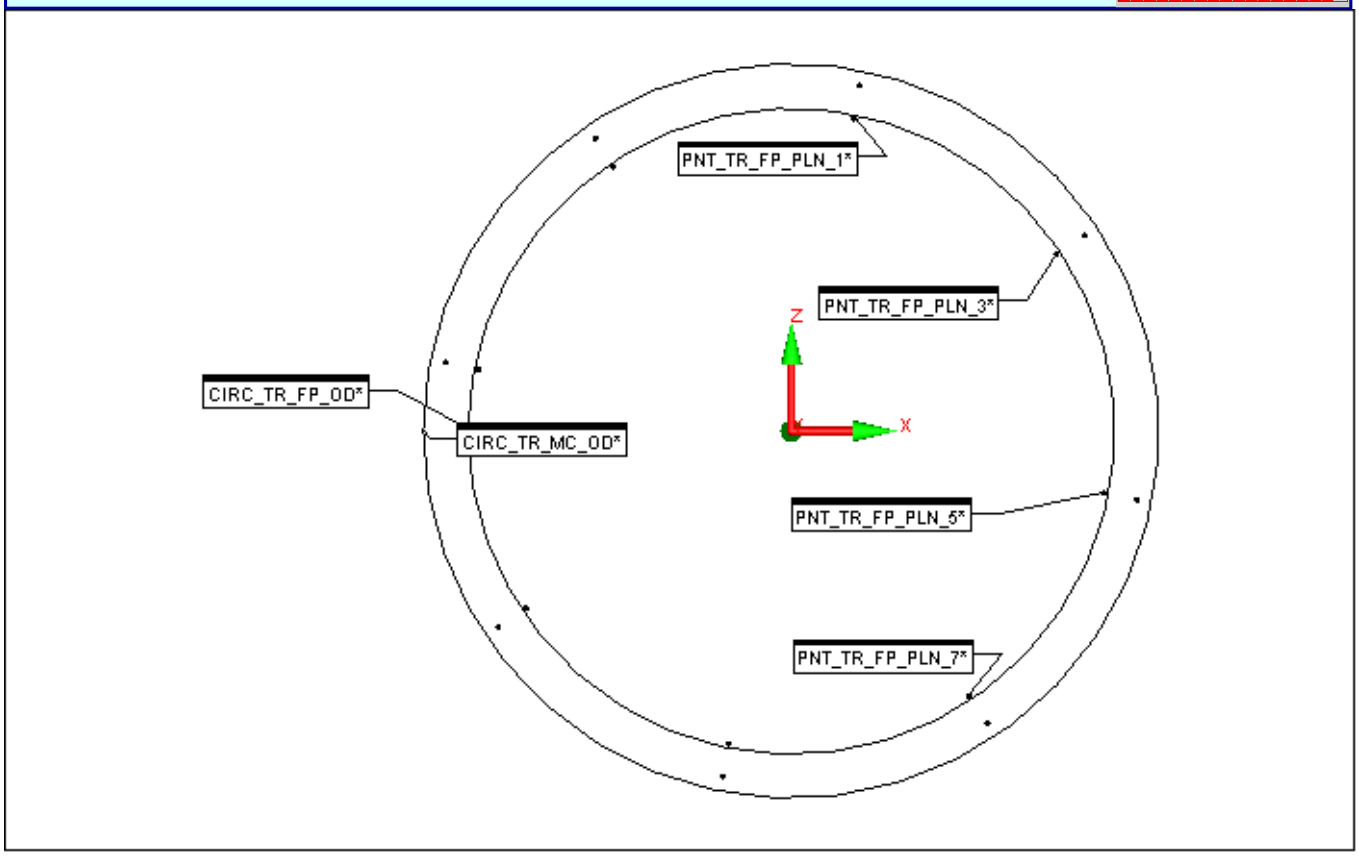
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ⌗ | MM | LOC9 - PLNC_TR_MC | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| Y | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | |
| FL | 0.000 | 0.248 | 0.248 | 0.200 | 0.000 | 0.048 | |
| AX | | I | | J | | K | |
| V | | 0.005 | | 1.000 | | 0.000 | |
| ⌗ | MM | LOC10 - PLNC_TR_FP | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| Y | -1007.500 | -1006.480 | 1.020 | 10.000 | 10.000 | 0.000 | |
| FL | 0.000 | 0.398 | 0.398 | 0.200 | 0.000 | 0.198 | |
| AX | | I | | J | | K | |
| V | | 0.000 | | -1.000 | | 0.004 | |
| ▱ | MM | FLAT3 - PLNC_TR_MC | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 0.000 | 0.248 | 0.248 | 0.200 | 0.000 | 0.048 | |
| ▱ | MM | FLAT4 - PLNC_TR_FP | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 0.000 | 0.398 | 0.398 | 0.200 | 0.000 | 0.198 | |




Flatness of Transition Rings
x5000

| ⊥ | MM | PERP1 - PLNC_TR_MC TO LINC_LEVEL_DCC | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0 | 1.116 | 1.116 | 0.200 | 0 | 0.916 |

| ⊥ | MM | PERP2 - PLNC_TR_FP TO LINC_LEVEL_DCC | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 0 | 0.980 | 0.980 | 0.200 | 0 | 0.780 |




Transition Ring points Main Coupler end

| # | MM | LOC11 - PNT_TR_MC_PLN_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | -0.067 | -0.067 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 114.984 | -0.016 | 1.000 | 1.000 | 0.000 |
| PA | 101.250 | 101.237 | -0.013 | 1.000 | 1.000 | 0.000 |

| # | MM | LOC12 - PNT_TR_MC_PLN_3 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | -0.546 | -0.546 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 114.993 | -0.007 | 1.000 | 1.000 | 0.000 |
| PA | 146.250 | 146.241 | -0.009 | 1.000 | 1.000 | 0.000 |

| # | MM | LOC13 - PNT_TR_MC_PLN_5 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | -0.545 | -0.545 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 115.007 | 0.007 | 1.000 | 1.000 | 0.000 |
| PA | -168.750 | -168.759 | -0.009 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC14 - PNT_TR_MC_PLN_7 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | -0.218 | -0.218 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 115.016 | 0.016 | 1.000 | 1.000 | 0.000 |
| PA | -123.750 | -123.764 | -0.014 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC15 - PNT_TR_MC_PLN_9 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | 0.045 | 0.046 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 115.016 | 0.016 | 1.000 | 1.000 | 0.000 |
| PA | -78.750 | -78.770 | -0.020 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC16 - PNT_TR_MC_PLN_11 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | 0.310 | 0.310 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 115.006 | 0.006 | 1.000 | 1.000 | 0.000 |
| PA | -33.750 | -33.775 | -0.025 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC17 - PNT_TR_MC_PLN_13 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | 0.570 | 0.570 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 114.993 | -0.007 | 1.000 | 1.000 | 0.000 |
| PA | 11.250 | 11.226 | -0.024 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC18 - PNT_TR_MC_PLN_15 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | 0.000 | 0.450 | 0.450 | 1.000 | 1.000 | 0.000 |
| PR | 115.000 | 114.983 | -0.017 | 1.000 | 1.000 | 0.000 |
| PA | 56.250 | 56.230 | -0.020 | 1.000 | 1.000 | 0.000 |

Transition Ring points Field Probe end

| ⌗ | MM | LOC19 - PNT_TR_FP_PLN_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.226 | 1.274 | 1.000 | 1.000 | 0.274 |
| PR | 104.000 | 103.962 | -0.038 | 1.000 | 1.000 | 0.000 |
| PA | 101.250 | 101.232 | -0.018 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC20 - PNT_TR_FP_PLN_3 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.125 | 1.375 | 1.000 | 1.000 | 0.375 |
| PR | 104.000 | 103.972 | -0.028 | 1.000 | 1.000 | 0.000 |
| PA | 146.250 | 146.247 | -0.003 | 1.000 | 1.000 | 0.000 |

| ⌗ | MM | LOC21 - PNT_TR_FP_PLN_5 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.341 | 1.159 | 1.000 | 1.000 | 0.159 |
| PR | 104.000 | 103.998 | -0.002 | 1.000 | 1.000 | 0.000 |
| PA | -168.750 | -168.746 | 0.004 | 1.000 | 1.000 | 0.000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| MM | LOC22 - PNT_TR_FP_PLN_7 | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.880 | 0.620 | 1.000 | 1.000 | 0.000 |
| PR | 104.000 | 104.025 | 0.025 | 1.000 | 1.000 | 0.000 |
| PA | -123.750 | -123.751 | -0.001 | 1.000 | 1.000 | 0.000 |
| MM | LOC23 - PNT_TR_FP_PLN_9 | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1007.105 | 0.395 | 1.000 | 1.000 | 0.000 |
| PR | 104.000 | 104.132 | 0.132 | 1.000 | 1.000 | 0.000 |
| PA | -78.750 | -78.710 | 0.040 | 1.000 | 1.000 | 0.000 |
| MM | LOC24 - PNT_TR_FP_PLN_11 | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.722 | 0.778 | 1.000 | 1.000 | 0.000 |
| PR | 104.000 | 104.167 | 0.167 | 1.000 | 1.000 | 0.000 |
| PA | -33.750 | -33.778 | -0.027 | 1.000 | 1.000 | 0.000 |
| MM | LOC25 - PNT_TR_FP_PLN_13 | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.232 | 1.268 | 1.000 | 1.000 | 0.268 |
| PR | 104.000 | 104.104 | 0.104 | 1.000 | 1.000 | 0.000 |
| PA | 11.250 | 11.160 | -0.090 | 1.000 | 1.000 | 0.000 |
| MM | LOC26 - PNT_TR_FP_PLN_15 | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| Y | -1007.500 | -1006.208 | 1.292 | 1.000 | 1.000 | 0.292 |
| PR | 104.000 | 103.980 | -0.020 | 1.000 | 1.000 | 0.000 |
| PA | 56.250 | 56.141 | -0.109 | 1.000 | 1.000 | 0.000 |

Distances between matching points on Transition Rings

| | | | | | | |
|---|---|---|---|---|---|---|
| MM | DIST_PA_11.25 - PNT_TR_MC_PLN_13 TO PNT_TR_FP_PLN_13 (YAXIS) | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1007.500 | 1006.802 | -0.698 | 1.000 | 1.000 | 0.000 |
| MM | DIST_PA_56.25 - PNT_TR_MC_PLN_15 TO PNT_TR_FP_PLN_15 (YAXIS) | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1007.500 | 1006.658 | -0.842 | 1.000 | 1.000 | 0.000 |
| MM | DIST_PA_101.25 - PNT_TR_MC_PLN_1 TO PNT_TR_FP_PLN_1 (YAXIS) | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1007.500 | 1006.160 | -1.340 | 1.000 | 1.000 | -0.340 |
| MM | DIST_PA_146.25 - PNT_TR_MC_PLN_3 TO PNT_TR_FP_PLN_3 (YAXIS) | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1007.500 | 1005.579 | -1.921 | 1.000 | 1.000 | -0.921 |
| MM | DIST_PA_-168.75 - PNT_TR_MC_PLN_5 TO PNT_TR_FP_PLN_5 (YAXIS) | | | | | |
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| M | 1007.500 | 1005.796 | -1.704 | 1.000 | 1.000 | -0.704 |

| ↔ | MM | DIST_PA_-123.75 - PNT_TR_MC_PLN_7 TO PNT_TR_FP_PLN_7 (YAXIS) | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 1007.500 | 1006.662 | -0.838 | 1.000 | 1.000 | 0.000 | |

| ↔ | MM | DIST_PA_-78.75 - PNT_TR_MC_PLN_9 TO PNT_TR_FP_PLN_9 (YAXIS) | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 1007.500 | 1007.150 | -0.350 | 1.000 | 1.000 | 0.000 | |

| ↔ | MM | DIST_PA_-33.75 - PNT_TR_MC_PLN_11 TO PNT_TR_FP_PLN_11 (YAXIS) | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 1007.500 | 1007.032 | -0.468 | 1.000 | 1.000 | 0.000 | |

| ↔ | MM | DIST_BETWEEN_PLANES - PLNC_TR_MC TO PLNC_TR_FP (YAXIS) | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| M | 1007.500 | 1006.480 | -1.020 | 1.000 | 1.000 | -0.020 | |

LOCATIONS OF CONSTRUCTED CIRCLES
ON 18 HALF CELLS

| ⌖ | MM | LOC_CC3 - CIRC_CAV_1_1 | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| X | 0.000 | -0.010 | -0.010 | 0.200 | 0.200 | 0.000 | |
| Y | 0.000 | -968.094 | -968.094 | 2000.000 | 2000.000 | 0.000 | |
| Z | 0.000 | -0.041 | -0.041 | 0.200 | 0.200 | 0.000 | |
| D | 210.300 | 211.174 | 0.874 | 0.200 | 0.200 | 0.674 | |
| RN | 0.000 | 0.196 | 0.196 | 0.200 | 0.000 | 0.000 | |

| ⌖ | MM | LOC_CC4 - CIRC_CAV_1_2 | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| X | 0.000 | -0.027 | -0.027 | 0.200 | 0.200 | 0.000 | |
| Y | 0.000 | -959.099 | -959.099 | 2000.000 | 2000.000 | 0.000 | |
| Z | 0.000 | -0.060 | -0.060 | 0.200 | 0.200 | 0.000 | |
| D | 210.300 | 211.120 | 0.820 | 0.200 | 0.200 | 0.620 | |
| RN | 0.000 | 0.192 | 0.192 | 0.200 | 0.000 | 0.000 | |

| ⌖ | MM | LOC_CC5 - CIRC_CAV_2_1 | | | | | |
|---|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL | |
| X | 0.000 | -0.002 | -0.002 | 0.200 | 0.200 | 0.000 | |
| Y | 0.000 | -852.558 | -852.558 | 2000.000 | 2000.000 | 0.000 | |
| Z | 0.000 | -0.263 | -0.263 | 0.200 | 0.200 | 0.063 | |
| D | 210.300 | 211.178 | 0.878 | 0.200 | 0.200 | 0.678 | |
| RN | 0.000 | 0.208 | 0.208 | 0.200 | 0.000 | 0.008 | |

| ⊞ | MM | LOC_CC6 - CIRC_CAV_2_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | 0.027 | 0.027 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -843.855 | -843.855 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.239 | -0.239 | 0.200 | 0.200 | 0.039 |
| D | 210.300 | 211.076 | 0.776 | 0.200 | 0.200 | 0.576 |
| RN | 0.000 | 0.214 | 0.214 | 0.200 | 0.000 | 0.014 |

| ⊞ | MM | LOC_CC7 - CIRC_CAV_3_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | 0.000 | 0.000 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -736.638 | -736.638 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.363 | -0.363 | 0.200 | 0.200 | 0.163 |
| D | 210.300 | 211.160 | 0.860 | 0.200 | 0.200 | 0.660 |
| RN | 0.000 | 0.171 | 0.171 | 0.200 | 0.000 | 0.000 |

| ⊞ | MM | LOC_CC8 - CIRC_CAV_3_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.002 | -0.002 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -728.080 | -728.080 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.354 | -0.354 | 0.200 | 0.200 | 0.154 |
| D | 210.300 | 211.065 | 0.765 | 0.200 | 0.200 | 0.565 |
| RN | 0.000 | 0.262 | 0.262 | 0.200 | 0.000 | 0.062 |

| ⊞ | MM | LOC_CC9 - CIRC_CAV_4_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | 0.024 | 0.024 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -621.429 | -621.429 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.460 | -0.460 | 0.200 | 0.200 | 0.260 |
| D | 210.300 | 211.085 | 0.785 | 0.200 | 0.200 | 0.585 |
| RN | 0.000 | 0.217 | 0.217 | 0.200 | 0.000 | 0.017 |

| ⊞ | MM | LOC_CC10 - CIRC_CAV_4_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.007 | -0.007 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -612.651 | -612.651 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.469 | -0.469 | 0.200 | 0.200 | 0.269 |
| D | 210.300 | 211.065 | 0.765 | 0.200 | 0.200 | 0.565 |
| RN | 0.000 | 0.223 | 0.223 | 0.200 | 0.000 | 0.023 |

| ⊞ | MM | LOC_CC11 - CIRC_CAV_5_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.047 | -0.047 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -505.611 | -505.611 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.513 | -0.513 | 0.200 | 0.200 | 0.313 |
| D | 210.300 | 211.137 | 0.837 | 0.200 | 0.200 | 0.637 |
| RN | 0.000 | 0.210 | 0.210 | 0.200 | 0.000 | 0.010 |

| ⊞ | MM | LOC_CC12 - CIRC_CAV_5_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.048 | -0.048 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -497.237 | -497.237 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.539 | -0.539 | 0.200 | 0.200 | 0.339 |
| D | 210.300 | 211.106 | 0.806 | 0.200 | 0.200 | 0.606 |
| RN | 0.000 | 0.179 | 0.179 | 0.200 | 0.000 | 0.000 |

| ⊞ | MM | LOC_CC13 - CIRC_CAV_6_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.097 | -0.097 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -390.694 | -390.694 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.550 | -0.550 | 0.200 | 0.200 | 0.350 |
| D | 210.300 | 211.169 | 0.869 | 0.200 | 0.200 | 0.669 |
| RN | 0.000 | 0.198 | 0.198 | 0.200 | 0.000 | 0.000 |

| ⊞ | MM | LOC_CC14 - CIRC_CAV_6_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.058 | -0.058 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -381.826 | -381.826 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.498 | -0.498 | 0.200 | 0.200 | 0.298 |
| D | 210.300 | 211.087 | 0.787 | 0.200 | 0.200 | 0.587 |
| RN | 0.000 | 0.240 | 0.240 | 0.200 | 0.000 | 0.040 |

| ⊞ | MM | LOC_CC15 - CIRC_CAV_7_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.035 | -0.035 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -274.589 | -274.589 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.412 | -0.412 | 0.200 | 0.200 | 0.212 |
| D | 210.300 | 211.139 | 0.839 | 0.200 | 0.200 | 0.639 |
| RN | 0.000 | 0.223 | 0.223 | 0.200 | 0.000 | 0.023 |

| ⊞ | MM | LOC_CC16 - CIRC_CAV_7_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.073 | -0.073 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -265.434 | -265.434 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.413 | -0.413 | 0.200 | 0.200 | 0.213 |
| D | 210.300 | 211.077 | 0.777 | 0.200 | 0.200 | 0.577 |
| RN | 0.000 | 0.165 | 0.165 | 0.200 | 0.000 | 0.000 |

| ⊞ | MM | LOC_CC17 - CIRC_CAV_8_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.039 | -0.039 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -159.147 | -159.147 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.255 | -0.255 | 0.200 | 0.200 | 0.055 |
| D | 210.300 | 211.181 | 0.881 | 0.200 | 0.200 | 0.681 |
| RN | 0.000 | 0.171 | 0.171 | 0.200 | 0.000 | 0.000 |

| ⌗ | MM | LOC_CC18 - CIRC_CAV_8_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.064 | -0.064 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -150.395 | -150.395 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.311 | -0.311 | 0.200 | 0.200 | 0.111 |
| D | 210.300 | 211.094 | 0.794 | 0.200 | 0.200 | 0.594 |
| RN | 0.000 | 0.150 | 0.150 | 0.200 | 0.000 | 0.000 |

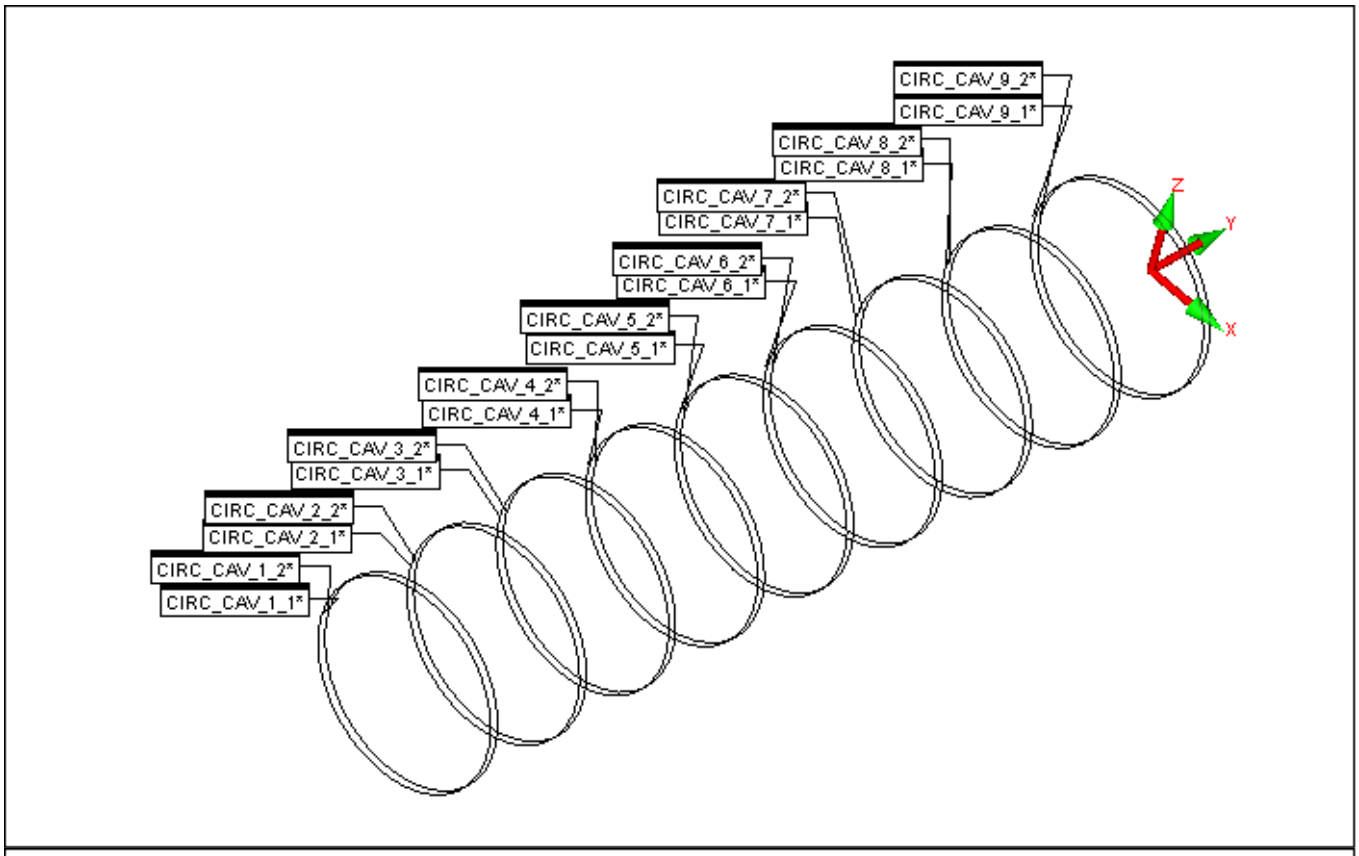
| ⌗ | MM | LOC_CC19 - CIRC_CAV_9_1 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.152 | -0.152 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -43.312 | -43.312 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.110 | -0.110 | 0.200 | 0.200 | 0.000 |
| D | 210.300 | 211.128 | 0.828 | 0.200 | 0.200 | 0.628 |
| RN | 0.000 | 0.211 | 0.211 | 0.200 | 0.000 | 0.011 |

| ⌗ | MM | LOC_CC20 - CIRC_CAV_9_2 | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.053 | -0.053 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | -34.727 | -34.727 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | -0.126 | -0.126 | 0.200 | 0.200 | 0.000 |
| D | 210.300 | 211.105 | 0.805 | 0.200 | 0.200 | 0.605 |
| RN | 0.000 | 0.231 | 0.231 | 0.200 | 0.000 | 0.031 |

Location of End Flanges

| ⌗ | MM | LOC_23 - CIR_END_FLANGE_MC | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.069 | -0.069 | 0.200 | 0.200 | 0.000 |
| Y | 0.000 | 117.588 | 117.588 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | 0.182 | 0.182 | 0.200 | 0.200 | 0.000 |
| D | 140.000 | 140.007 | 0.007 | 0.300 | 0.300 | 0.000 |
| RN | 0.000 | 0.083 | 0.083 | 0.200 | 0.000 | 0.000 |

| ⌗ | MM | LOC_24 - CIR_END_FLANGE_FP | | | | |
|---|---|---|---|---|---|---|
| AX | NOMINAL | MEAS | DEV | +TOL | -TOL | OUTTOL |
| X | 0.000 | -0.044 | -0.044 | 0.200 | 0.200 | 0.000 |
| Y | -1153.884 | -1119.894 | 33.990 | 2000.000 | 2000.000 | 0.000 |
| Z | 0.000 | 0.222 | 0.222 | 0.200 | 0.200 | 0.022 |
| D | 140.000 | 139.976 | -0.024 | 0.300 | 0.300 | 0.000 |
| RN | 0.000 | 0.042 | 0.042 | 0.200 | 0.000 | 0.000 |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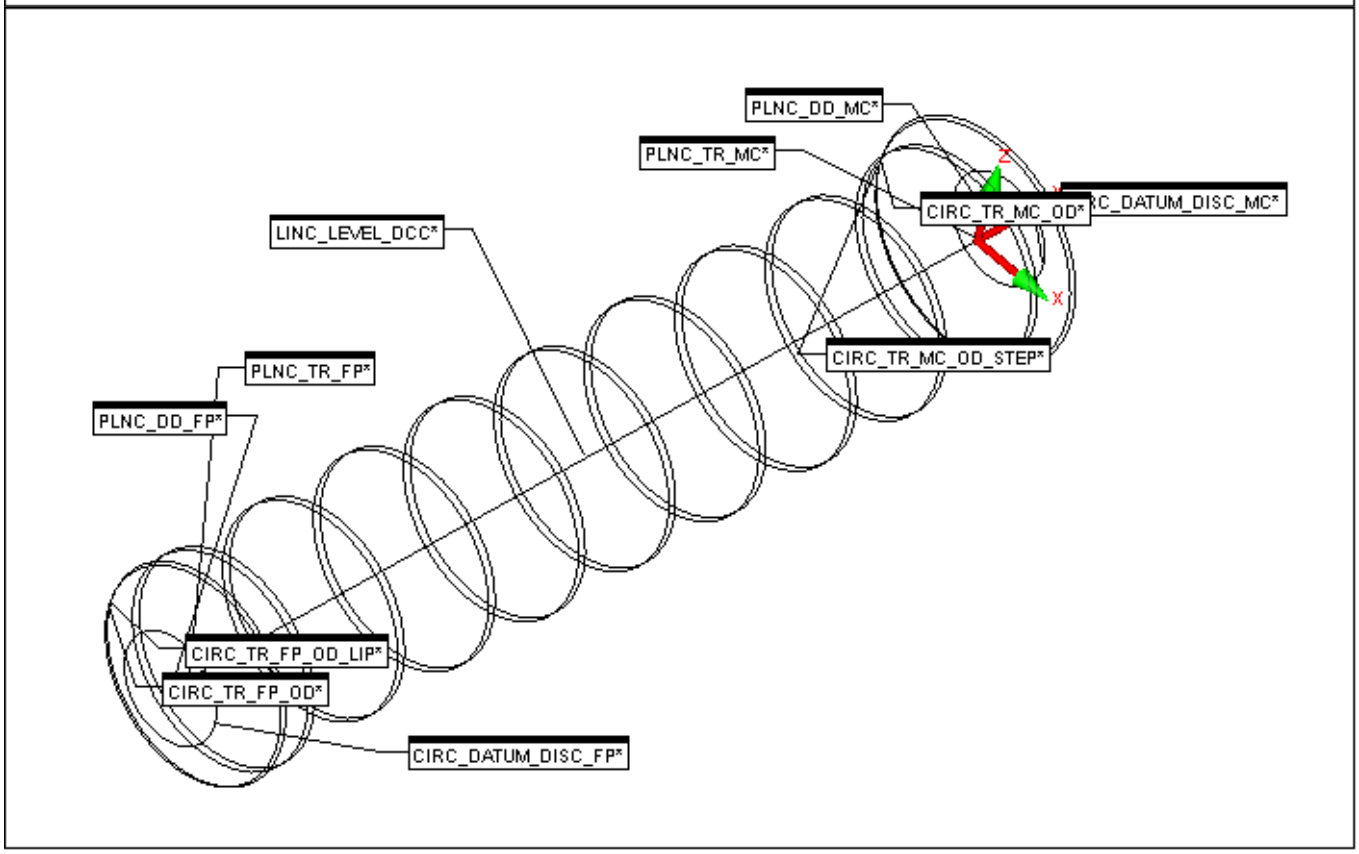
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