

# INSPECTION OF THE NITROGEN CAN

## Spartan IR Camera for the SOAR Telescope

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### 1 Requirement

The bolts on the top and bottom must be aligned to  $\pm 0.15\text{mm}$  for  $\phi.1495''$  holes (normal fit) or to  $\pm 0.40\text{mm}$  for  $\phi.1695$  holes (loose fit).

### 2 Measurement & Analysis

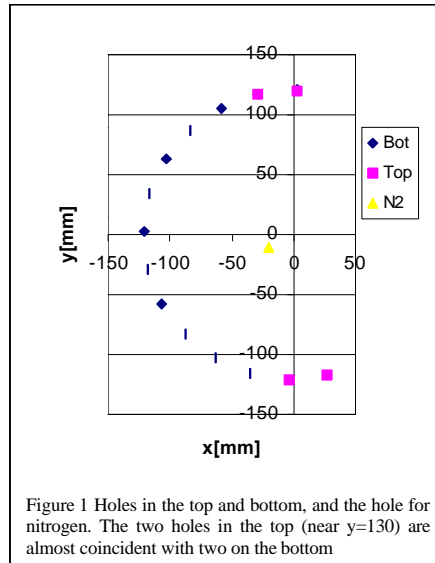
Jason Biel measured the nitrogen can at Inspection Technologies.

The top and bottom are parallel to  $0.1\text{mrad}$ , which is the precision of the report. This translates to  $0.02\text{mm}$  across the face.

Four bolt holes in the top, the nitrogen port in the top, and 12 bolt holes in the bottom were measured. (See Figure 1, which also defines the coordinate system.) The bolt holes are not easy to measure precisely since they are tapped. The data are in `\Design\N2CanMetrology.xls`.

The following results are from Table 1.

- The bolt pattern is oversized by  $0.1\text{mm}$ .



- The bolt circle in the top is misaligned from that of the bottom by (0.07, 0.05) mm and by 1.4 mrad.
- If the bolt patterns on the top and bottom are forced to agree, the maximum error is 0.14mm. This is sufficient even for bolt holes with tight clearance.

Table 1 Bolt circles on the top and bottom of the nitrogen can. The coordinate center is the center of the bolt pattern on the top.

	Top		Bottom		Top fitting bottom	
Radius	120.65 [4.75]		120.75 [4.754]		120.75 [4.754]	
Rotation [rad]	0.0014		0.0000		0.0000	
	x	y	x	y	x	y
Center	0.079	-0.052	0.000	0.000	0.000	0.000
AverageErr	0.000	0.000	0.000	0.000	0.078	-0.052
StdDevErr	0.070	0.030	0.061	0.046	0.070	0.030
MaxErr	0.060	0.037	0.093	0.065	0.139	-0.016
MinErr	-0.100	-0.035	-0.125	-0.081	-0.021	-0.087