

Critical Item: Pneumatic Ball Valve  
Find Number: A105999  
Criticality Category: 2

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA  
Part No: 79K80234-2

PMN/ S72-0685-5 Orbiter He  
Name: Anti-Ice Panel

Mfg/ Flodyne/  
Part No: 70A168

Drawing/ 79K06063/79K40023  
Sheet No: 2

Function: Provides remote shutoff capability for the anti-icing purge to the LH2 and LOX prepress. lines.

Critical Failure Mode: Fail closed. FM. No. 09PP03-001.016

Failure Effect: Loss of the ET prepressurization lines heated GHe anti-icing purge which can result in possible damage to the Orbiter thermal protection system from falling ice. Failure is detectable through a position switch on the valve and by pressure switch A106009.

Acceptance Rationale

Design:

- o This pneumatic ball valve is operated within all design specifications.
- o This component is only Criticality Category 2 when the ambient temperature is 36°F or below because the unheated backup helium supply is not effective at these temperatures.
- o Component Specifications:

	<u>Rated</u>	<u>Actual</u>
Pressure (psig) thru valve	3000	200
Pressure Actuator (max) psig.	2000	750
Flow (scfm)	>500	750
Temperature (°F)	55,000	250
	0-250	Ambient on the MLP

- o The burst pressure is 4 times rated pressure (12,000 psig).

Pneumatic Ball Valve, A105999 (Continued)

- o The pneumatic valve body is constructed of 304 SST, the valve ball is 17/4 PH SST, the seat is Teflon and the seals are Buna-N.

Test/Inspection:

- o File VI verifies the following:
  - Functional operation of the primary purge prior to each launch and at component replacement. The purge is verified via pressure switch indication and must satisfy a temperature specification after heater activation.
  - Functional operation of the redundant purge prior to each launch and at component replacement. The purge must satisfy a purge pressure specification.
- o The manufacturer's certification test required the following tests:
  - Proof
  - Leak
  - Functional

- o Drawing 79K12402 Requirements:

The valve will be functionally tested by LPS with each use.

This drawing requires that the component be tested annually and at component replacement. Tests shall consist of valve position indicator checks, leak tests and pull-in/drop-out low voltage tests.

Failure History:

- o PRACA - There were 10 Problem Reports for this type component found in the PRACA Data Base.  
  
No failures found in the critical failure mode.
- o GIDEP - The GIDEP Failure Data Interchange System has been researched, and no data on this component was found.