

EO 5-SAA09PP03-001
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 OCT 20 1997

~~SAA09PP03-001~~
 REV. G
 B/L 8/31
 MPS LH2, LOA SYSTEM

Critical Item: Pneumatic Ball Valve (2) - 1 per Pad

Find Number: A78147

Criticality Category: 1S

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA

PMN/ S72-0694-1/ET Intertank

Part No: 80K80649-2

Name: Purge Panel

Mfg/ Flodyne Controls

Drawing/ 79K06063/79K40023

Part No: 10A088

Sheet No: 3

Function: This valve controls the flow of GN2 to the ET for purge of the ET intertank.

Critical Failure Mode: Fail closed. FM. No. 09PP03-001.008

Failure Cause: Structural Failure.

Failure Effect: When this normally open valve fails closed, it shuts off the flow of GN2 for purge of the ET intertank. This loss of capability to purge a possible accumulation of hydrogen or oxygen gas could result in a hazardous condition for the crew and/or vehicle. Failure is detectable by pressure transducers A78160 and A78161 and the position indicator switch on the valve. Hazardous gas concentrations are detectable in the intertank area by the Hazardous Gas Detection System Mass Spectrometer. A fire or explosion is possible if loss is coupled with a LH2 leak. Possible loss of life and/or vehicle.

Acceptance Rationale

Design:

- o This valve is operated within all design specifications.
- o Valve operating parameters:

	<u>Rated</u>	<u>Actual</u>
Pressure Valve (max.) psig.	3450	3000
Pressure Actuator (max.) psig.	2000	750
Actuation Pressure psig.	>500	750
Flow (scfm)	55,000	1520
Temperature (°F)	0 to 250	Ambient at the pad

- o The burst pressure is 4 times rated pressure.

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Pneumatic Ball Valve, A78147 (Continued)

- o The pneumatic valve body and trim are constructed of 304 SST, and valve ball is 17/4 PH SST, the seat is Teflon, and the seals are Buna-N. O-rings and gaskets conform to MIL, AMS or NAS Standards.

Inspection:

- o File VI verifies the following:
 - Functional operation of the primary and redundant purges prior to each launch and at component replacement. The purges must satisfy a purge pressure specification.

Test:

- o The manufacturer's certification test includes the following tests:
 - Proof
 - Leak
 - Bubble point
 - Switch operation
- o Drawing 79K12402 Requirements:

The valve will be functionally tested by LPS with each use. This drawing requires a test annually and at component replacement. Tests consist of internal leakage and valve position indication tests.

Failure History:

- o PRACA - No PRACA failure history 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.

Operational Use: The A78147 valve is a normally open, pneumatically operated valve. Actuation pressure is controlled by solenoid valve A78152. The A78147 valve controls the flow of GN2 to the A130348 and A130349 heaters. This heated GN2 is used to purge the ET intertank area. Failure is detectable thru transducer A78160, A78161 and valve position indicator switch.

- o Corrective Action: None
- o Time to Effect: Immediately
- o Time Frame: N/A