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SAA09PP03-001  
REV. E  
B/L 8/30  
MPS LH2, LOA SYSTEM

Critical Item: Solenoid valve

Find Number: A78400

Criticality Category: 15

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA  
Part No: 79K80222-3

PMN/ S72-0697-8/ET Vent Valve  
Name: Actuation & Purge Panel

Mfg/ Marotta  
Part No: 2096237-001

Drawing/ 79K06063/79K40023  
Sheet No: 3

Function: Controls flow of the inert (GHe) purge for the ET Vent disconnect cavity.

Critical Failure Mode: Fail closed. FM. No. 09PP03-001.005

Failure Effect: Loss of purge for the ET vent disconnect cavity with possible buildup of GH2 in the ET Vent disconnect cavity. Failure is detectable by pressure transducer A78409 and the valve position indicator. Hazardous gas concentration is also detectable in the cavity by the Hydrogen detection system. A fire or explosion is possible if loss of GHe flow is coupled with a LH2 leak. Possible loss of life and/or vehicle.

Acceptance Rationale

Design:

- o This solenoid valve is operated within all design specifications.
- o Component specifications:

	<u>Rated</u>	<u>Actual</u>
Pressure (psig)	6000	750
Flow (scfm)	525	60
Temperature (°F)	0° to 160°	Ambient on the pad

- o The burst pressure is 4 times rated pressure (24,000 psig).
- o The solenoid valve body and poppet are constructed of 300 series SST, the O-rings are made of Buna-N, the backup rings are Teflon, and seats are nylon.

Solenoid valve, A78400 (Continued)

Test/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 purge pressure and pressure decay rate specifications.
- o The manufacturer's certification test requirements included the following tests:
  - Proof
  - Leak
  - Functional
  - Continuity
  - Insulation resistance
  - Voltage drop
- 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 a valve position test, pull-in/drop-out voltage tests and an internal leakage test.

Failure History:

- o PRACA - There were 7 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.