

SAA09PP02-001
REV. H
B/L: 9 and 32
SYS: LOX MPS

JUN 27 1989

Critical Item: Solenoid Valve (2)

Find Number: A106427

Criticality Category: 2

SAA No: 09PP02-001

System/Area: LOX MPS/LOA

NASA
Part No: 79K80243-1

PMN/ S72-0694-17
Name: GN2 Anti-ice Panel

Mfg/ Morotta/
Part No: 8037147-0008

Drawing/ 79K06064/2
Sheet No: 79K40027/2

Function: Control pneumatic valve A106425.

Critical Failure Mode: Fail open, FM No. 09PP02-001.010 (PAD).

Failure Cause: Structural failure.

Failure Effect:

The inability to provide heated GN2 to the ET nose cone. This could result in a violation of the lower calibration limit of 40°F for the ET LO2 ullage pressure transducers, with a resulting loss of visibility of ET pressure. Overpressure or underpressure could result in damage to the ET. Failure is detectable by temperature transducers A106437 and A106438.

Acceptance Rationale

Design:

- o This component was designed in accordance with NASA Specification 79K80243-1.
- o Component Specifications:

	<u>Rated</u>	<u>Actual</u>
Pressure (psig)	3000	750
Flow (scfm)	495	N/A
Temperature (°F)	0-250	Ambient on the FSS

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

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Solenoid Valve, A106427 (Continued)

- o The solenoid valve body is constructed of aluminum alloy, the poppet is made of 300 series SST, O-rings are Buna-N, seats are nylon and aluminum and the seat retainer is aluminum alloy.

Test:

- o Qualification and acceptance testing was in accordance with the requirements of NASA Component Specification 79K80243-1. Acceptance testing included the following:
 - Proof
 - Leak
 - Functional
 - Continuity
 - Insulation Resistance
 - Voltage Drop

Inspection:

- o Verification of solenoid valve operation is defined by OMRSD File VI. The OMRSD requires that a functional check be performed prior to each mission and after component replacement.
- o Preventive maintenance will be in accordance with the requirements of NASA component drawing 79K90243.
- o Manufacturing/assembly (source) inspection was in accordance with the requirements of NASA Component Specification 79K80243-1.
- o Component operation is verified prior to each mission.

Failure History:

- o The GIDEP failure data interchange system was researched, and no failure of this component was found.
- o The PRACA data base was queried and no failure history on this component was found.

Operational Use:

- o The electrically-actuated solenoid valve is used to pneumatically actuate ball valve A106425. Valve A106427 is a normally closed valve and is not likely to fail open (critical mode) unless the valve is commanded open, which could increase the possibility of valve failure. This valve would not be commanded open unless valves A106424 or A106426 failed open.
- o Corrective Action: Initiate scrub procedure.
- o Time Frame: T-minus 6 hours to completion of operation.