

840324X 52
SAA09PP03-001
REV. E
B/L 8/30
MPS LH2, LOA SYSTEM

Critical Item: Relief Valve
Find Number: A105947
Criticality Category: 2

SAA No: 09PP03-001 System/Area: LH2 MPS/LOA
NASA Part No: 79K80162-10 PMN/ Name: S72-0685-5 Orbiter Helium Anti-Ice Panel
Mfg/ Part No: Anderson-Greenwood 81JS68-8A Drawing/ Sheet No: 79K06063/79K40023 2

Function: Provides overpressure protection for the GHe system between regulators A105942 and A105951.

Critical Failure Mode: Fail open (continuous vent). FM. No. 09PP03-001.021

Failure Effect: Loss of heated GHe to the LH2 and LOX prepress lines for anti-ice purposes and helium to the Orbiter-to-ET disconnect cavity for purging. Possible damage to the Orbiter TPS from falling ice. Failure is detectable by pressure transducer A105946.

Acceptance Rationale

Design:

- o This relief 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)	601-900	750 (880 set press.)
Flow (scfm)	6776	5500 max.
Temperature (°F)	-20 to +250	Ambient on the MLP

- o The burst pressure is 4 times rated pressure (3,600 psig).

Relief Valve, A105947 (Continued)

- o The relief valve body and spring are constructed of 316 SST, internal metal parts are made of 300 series SST, the seat is made of Vespel SP-21, and the seals are Teflon.

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 requirements included the following tests:
 - Proof
 - Leak
 - Functional
- o Drawing 79K12402 requires that the component be tested annually and at component replacement. Tests consists of leakage test, crack and re-seat pressure tests.

Failure History:

- o PRACA - The PRACA data base was queried and there were no Problem Reports found for this component.
- o GIDEP - The GIDEP Failure Data Interchange System has been researched, and no data on this component was found.