ATTACHMENT
S40[illegible]54

SAA 09PP03-001
REV. E
B/L 8/30
MPS LH2, LOA SYSTEM

Critical Item: Regulator, Dome Loaded

Find Number: A105942

Criticality Category: 2

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA Part No: 79K80279-6

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

Mfg/ Part No: Grove/ T1741-6

Drawing/ Sheet No: 79K06063/79K40023 2

Function: Regulates GHe provided for the LH2 and LOX prepress. line anti-icing purges and for the Orbiter-to-ET disconnect cavity purge.

Critical Failure Mode: Regulates low. FM. No. 09PP03-001.022

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

## Acceptance Rationale

Design:

- This regulator is operated within all design specifications.
- 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.
- Component Specifications:

| | Rated | Actual |
|---|---|---|
| Pressure (psig) | 6000 | 6000/750 |
| Flow (scfm) | 6000 max. | 350 |
| Temperature (°F) | -20 to +250 | Ambient on the MLP |

- The burst pressure is 4 times rated pressure (24,000 psig).

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Regulator, Dome Loaded, A105942 (Continued)

- o The pressure regulator body is constructed of 18/8 Cres, the valve is 17/4 PH Cres, the seat is KEL-F-81, seals are made to MIL, AMS, or NAS standards and the diaphragm is Nitrile rubber.

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 Requirements:

  The regulator will be functionally tested by LPS with each use.
- o The component will be tested annually and after component replacement. Test is a pressure creepage test.

Failure History:

- o PRACA - There were 6 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.

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