Critical Item: Check Valve

Find Number: A105960

Criticality Category: 2

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA Part No: 79K80130-3

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

Mfg/ Part No: James Pond & Clark HE220T-888

Drawing/ Sheet No: 79K06063/79K40023 2

Function: Prevents reverse flow of GHe from the ET LH2 prepressurization lines into the heated helium line.

Critical Failure Mode: Fail closed. FM. No. 09PP03-001.014

Failure Effect: Loss of heated GHe resulting in a possible ice buildup on the ET LH2 prepressurization line and potential damage to the Orbiter thermal protection system from falling ice. Failure is detectable by pressure switch A106009.

Acceptance Rationale

Design:

- This check valve is operated within all design specifications.
- This failure 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	200
Flow (scfm)	6300	29
Temperature (°F)	-100 to +450	240-260

- The burst pressure is 4 times rated pressure (24,000 psig).
- The check valve body and spring are made of 302 SST and the seals are Teflon.

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Check Valve, A105960 (Continued)

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 required the following tests:
  - Proof
  - Leak
  - Functional
- o Drawing 79K12402 requires that the component be tested annually and at component replacement. Test will consist of cracking pressure and reverse seat leakage tests.

Failure History:

- o PRACA - There were 16 Problem Reports for this type component found in the PRACA Data Base.

  No failures in the critical failure mode.
- o GIDEP - The GIDEP Failure Data Interchange System has been researched, and no data on this component was found.