

940324K = 11 = 32
 SAA09PP03-001
 REV. E
 B/L 8/30
 MPS LH2, LOA SYSTEM

Critical Item: Filter
Find Number: A100684
Criticality Category: 1

SAA No: 09PP03-001

System/Area: LH2 MPS/LOA

NASA
Part No: 75M05752-HF-2

PMN/ S72-0109/
Name: MLP LH2 Distribution System

Mfg/ Capital Westward
Part No: 25171

Drawing/ 79K06063/79K40023
Sheet No: 1

Function: Provide 70-micron filtering of LH2 in the main line supplying LH2 to load the ET.

Critical Failure Mode: Pass contaminants. FM. No. 09PP03-001.001

Failure Effect: Possible contamination of the Shuttle main propulsion system and damage to the Orbiter SSMEs resulting in a loss of vehicle. This failure is not detectable.

Acceptance Rationale

Design:

- o This filter is operated within all design specifications.
- o Filter operating parameters:

	<u>Rated</u>	<u>Actual</u>
Pressure (psig)	150	66
Flow (gpm)	10,000	8,300 (Fast Fill)
Temperature (°F)	-423	-423
Max Differential Operating Press. Across Element (PSID)		5 (Note 1)

NOTE 1: The 5.0 PSID value is given by the manufacturer and corresponds to a liquid hydrogen flow of 10,000 GPM at -423°F. The actual differential pressure corresponding to the actual max flow rate of 8500 GPM would be proportionally lower, well below the element collapse pressure of 100 PSID.

940304K - 12 = 22

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Filter, A100684 (Continued)

- o The element is designed to withstand full operating pressure on a plugged element without collapsing the element.
- o This filter element, housing, vacuum jacket and connections are 304 or 316 stainless steel.

Test/Inspection:

- o File VI verifies the following:
 - Filter replacement annually or when contamination is suspected.
 - Filter element cleaned to KSC-C-123 Level 300 or greater.
 - Bubblepoint per ARP-901.
 - Absolute micron rating.
- o Test specification required these assemblies to be subjected to a combination pressure and cold shock test.
- o Drawing 79K12402 requires that the filter element will be replaced after the first functional test (cold flow) on an MLP or Pad, and whenever the differential pressure across the filter exceeds 25 psid or when contamination is suspected. Filter will be replaced annually. At time of filter element replacement, filter element will be cleaned and NDT tested.
- o NDT testing shall consist of bubble pointing per ARP-901, dye penetrant and/or x-ray as necessary to verify structural integrity.

Failure History:

- o PRACA - There were 5 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.

This component has been qualified through past usage, 25 launches and 51 loading operations (OMI-S1004).