

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

JUN 27 1989

Critical Item: Filter, LOX, 8-inch (3)
Find Number: A86465
Criticality Category: 1

SAA No: 09PP02-001

System/Area: LOX MPS/LOA

NASA
Part No: 75M05869-LF-41

PMN/ S72-0814
Name: LOX System, MLP MPS Loading

Mfg/ Fluid Dynamics/
Part No: FV 3197-100

Drawing/ 79K06064/1
Sheet No: 79K40027/1

Function: Ensures cleanliness of LOX in the transfer line from the storage tank to the ET.

Critical Failure Mode: Pass contaminants. FM No. 09PP02-001.001 (MLP).

Failure Cause: Structural failure of the filter element.

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

Acceptance Rationale

Design:

- o This component was designed in accordance with NASA Specifications 75M05869-LF-41.
- o This filter is used within the design specification.

	<u>Specification</u>	<u>Operating</u>
Operating Pressure (PSIG)	350 @ -320F	100 (nominal)
Flowrate (GPM)	5000 @ -297F	1400
Operating Temperature (°F)	-320	-300
Element Collapse Pressure (PSID)	525 (min)	---
Max Differential Operating Press Across Element (PSID)	---	8.0 (Note 1)

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NOTE 1: The 8.0 PSID value is given by the manufacturer and corresponds to a liquid oxygen flowrate of 5000 GPM at -297F. The actual differential pressure corresponding to the actual max flowrate of 1400 GPM would be proportionally lower, well below the minimum element collapse pressure of 525 PSID.

- o The filter element is constructed of type 304 stainless steel pleated dutch twilled wire mesh, the filter jacket material is type 300 series Stainless steel.
- o This filter rating is 100 microns (nominal), 175 microns (absolute).
- o The maximum possible pressure on this filter is controlled by relief valve A86464 which has a cracking pressure of 140 psig.
- o This is a final filter that sees only liquid oxygen that is within an integrity control system, that meets SE-S-0073 Space Transportation System fluid procurement and use control specification.

Test:

- o Qualification and acceptance testing was in accordance with the requirements of NASA Component Specification 75M05869-LF-41.
- o This filter is qualified by usage and test. It was quality tested by TR-720 which includes the following tests:
 - o Proof
 - o Thermal Shock
 - o Functional
 - o Surge
 - o Collapse
 - o Vibration
- o Micron rating of filter element is assured by bubble point test per ARP 901.

Inspection:

- o Preventive maintenance requirements defined in OMRSD File VI requires filter element to be replaced after first functional test (cold flow) of an MLP or Pad, thereafter replace filter element annually (12 months) or when contamination is suspected. At time of element replacement, element will be cleaned and NDT tested.
- o Manufacturing/assembly (source) inspection was in accordance with the requirements of NASA Component Specification 75M05869-LF-41.

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Failure History:

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

Operational Use:

- o Correcting Action:
None
- o Timeframe:
N/A