

CRITICAL ITEMS LIST (CIL)

SYSTEM: Propulsion/Mechanical  
 SUBSYSTEM: Helium Inject  
 REV & DATE: J, 12-19-97  
 DCN & DATE:  
 ANALYSTS: J. Attar/H. Claybrook

FUNCTIONAL CRIT: 1  
 PHASE(S): a  
 HAZARD REF: P.02

FAILURE MODE: Leakage

FAILURE EFFECT: a) Loss of mission and vehicle/crew due to fire/explosion.

TIME TO EFFECT: Seconds

FAILURE CAUSE(S): A: Structural Failure  
 B: Disengagement of Orifice

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Controls GHe flowrate approximately .012 lbs per second into the aft elbow of the L02 feedline which provides propellant conditioning and prevents geysering.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
2.4.25.1	80921011938-002	Orifice	1	LWT-54 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)  
CONTINUATION SHEET

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RATIONALE FOR RETENTION

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DESIGN:

- A: The orifice is installed between the manifold and the downstream tube assembly. Helium flow is controlled to approximately .012 lb/sec. The orifice is fabricated from 304 CRES and is identical to the 57L6 adapter configuration except for the orifice flow restriction in the flow path. Selection for usage was based on design and operational experience and the capability to meet ET requirements for Class 3 threads and leakage performance. The orifice meets the required ultimate (4.0) and yield (1.25) safety factors for pressure (ET Stress Report 826-2188). Material selected in accordance with MMC-ET-SE16 and controlled per MMMA Approved Vendor Product Assurance Plan assures conformance of composition, material compatibility and properties. Procurement of the orifice is governed by material, fabrication, processing, and inspection per 80921011938. Installation loads are sufficient to provide screening for major flaws.
- B: The orifice is installed and torqued as specified on the engineering installation drawing and is lockwired to preclude disengagement.

TEST:

The Orifice is certified. Reference HCS MMC-ET-TM08-L-P015.

Acceptance:

MAF:

- A, B: Perform leakage and flow tests (MMC-ET-TM04k).

Launch Site:

- A, B: Perform flow tests (OMRSD File IV).

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

- A: Verify materials selection and verification controls (MMC-ET-SE16 and standard drawing 80921011938).
- A: Penetrant inspect after machining (STP2501, Type 1, Method A).

MAF Quality Inspection:

- A, B: Verify installation and witness torque (drawing 80921011941).
- A, B: Witness leakage and flow tests (MMC-ET-TM04k).

Launch Site:

- A, B: Witness flow tests (OMRSD File IV).

FAILURE HISTORY:

Current data on test failures, unexplained anomalies and other failures experienced during ground processing activity can be found in the PRACA data base.