

CRITICAL ITEMS LIST (CIL)

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

FUNCTIONAL CRIT: 1
 PHASE(S): a
 HAZARD REF: P.04

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 Union
 REDUNDANCY SCREENS: Not Applicable
 FUNCTIONAL DESCRIPTION: Provides connections for tube assemblies that transport heated nose cone purge GN2 through the LO2 cable tray.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
2.12.12.1	MS24392-J4	Union (LO2 Tank Cable Tray)	3	LWT-54 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

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RATIONALE FOR RETENTION

DESIGN:

The unions connect the tube assemblies within the LO2 cable tray that transport heated GN2 purge gas from the Intertank umbilical carrier plate to the nose cone.

A: The unions are fabricated from 304 CRES and were selected for usage based on operational experience and their capability to meet ET requirements for class 3 threads and leakage performance. The union is designed to meet the required ultimate (1.5) 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 product assurance plan assures conformance of composition, material compatibility and properties. Procurement of unions is governed by material, fabrication, processing, and inspection specification per standard MS24392. Installation loads are sufficient to provide screening for major flaws.

B: The unions are selected from the Approved Standard Parts Lists (ASPL 826-3500) and installed and torqued as specified on the engineering installation drawing.

TEST:

The Union (LO2 Tank Cable Tray) is certified. Reference HCS MMC-ET-TM08-L-P015.

MPTA Firings/Tankings: The nose cone purge system was installed on MPTA and supported all cryogenic loadings/detankings and accumulated 62.5 minutes of firing time. There was no evidence of leakage or structural damage.

Acceptance:

Vendor:

A, B: Perform material properties strength and finish (Standard drawing MS24392).

MAF - (Vehicle Assembly):

A, B: Perform flow test (MMC-ET-TM04k).

Launch Site:

A, B: Perform audible flow test (OMRSD File IV).

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INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

A: Verify materials selection and verification controls (MMC-ET-SE16 and Standard drawing MS24392).

MAF Quality Inspection:

A, B: Inspect fittings and flare mating surfaces for freedom of nicks, scratches and other physical damage (MPP 80921021009).

B: Verify installation and witness torque (drawing 80921021009).

A, B: Inspect for freedom of damage (MPP 80911041204).

A, B: Witness flow test (MMC-ET-TM04k).

Launch Site:

A, B: Witness flow test (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.