

CRITICAL ITEMS LIST (CIL)

SYSTEM:	Propulsion/Mechanical	FUNCTIONAL CRIT:	1
SUBSYSTEM:	Nose Cone Purge	PHASE(S):	a
REV & DATE:	J, 12-19-97	HAZARD REF:	P.04, S.05
DCN & DATE:			
ANALYSTS:	J. Attar/H. Claybrook		

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 Elbow

REDUNDANCY SCREENS: Not Applicable

FUNCTIONAL DESCRIPTION: Provides connection between tube assemblies in the intertank and LO2 cable tray that transport heated nose cone purge GW2.

<u>PNEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
2.12.7.1	MS24394-J4	Elbow (LO2 Tank Cable Tray)	1	LWT-54 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: Propulsion/Mechanical
SUBSYSTEM: Nose Cone Purge
FMEA ITEM CODE(S): 2.12.7.1

REV & DATE: J, 12-19-97
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RATIONALE FOR RETENTION

DESIGN:

The elbow is installed to the bulkhead attachment of the LO2 cable tray/Intertank penetration and connects the nose cone purge tube assemblies between the Intertank and LO2 cable tray.

The elbow is fabricated from 304 OREG and was selected for usage based on operational experience and its capability to meet ET requirements for class 3 threads and leakage performance. The elbow 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 MHA approved product assurance plan assures conformance of composition, material compatibility and properties. Procurement of elbows is governed by material, fabrication, processing, and inspection specification per MS24394 standard. Installation loads are sufficient to provide screening for major flaws.

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

TEST:

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

NPTA Firings/Tankings: The nose cone purge system was installed on NPTA 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 MS24394).

MAF - (Vehicle Assembly):

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

Launch Site:

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

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INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

A, B: Verify materials selection and verification controls (MMC-ET-8E16 and standard drawings MS24394).

SAF Quality Inspection:

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

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

A, B: Inspect for freedom of damage (MPP 80901010000).

A, B: Witness flow test (MMC-ET-TN04k).

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.