

CRITICAL ITEMS LIST (CIL)

SYSTEM: ASI
 SUBSYSTEM: Support Hardware
 REV & DATE: J, 12-19-97
 DCN & DATE: 001, 6-15-98
 ANALYSTS: J. McAllister/A. Thadhani

FUNCTIONAL CRIT: 1
 PHASE(S): b
 HAZARD REF: S.11

FAILURE MODE: Structural Failure
 FAILURE EFFECT: b) Loss of mission and vehicle/crew due to loss of support for LH2 recirculation line resulting in fire/explosion.
 TIME TO EFFECT: Immediate
 FAILURE CAUSE(S): Improper Manufacture
 REDUNDANCY SCREENS: Not Applicable
 FUNCTIONAL DESCRIPTION: The fitting provides structural support for the recirculation line and a flow path between the recirculation line and LH2 tank through which warm LH2 flows from the main engines during prelaunch activities.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
4.4.50.1	80914940988-009	Fitting, Recirculation Line (LH2)	1	LWT-54 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: ASI
SUBSYSTEM: Support Hardware
FMEA ITEM CODE(S): 4.4.50.1

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RATIONALE FOR RETENTION

DESIGN:

The recirculation line fitting is machined from a 2219-T6 aluminum forging and has a 3.95 inch inside diameter. Materials selected for this part number are in accordance with MMC-ET-SE16 which assures repetitive conformance of composition and properties. Acceptable surface finish of machined parts is assured by penetrant inspection per STP2501. The recirculation line fitting is edge trimmed during assembly. Threaded inserts and bolts are installed in the fitting per STP2024 and STP2014 respectively.

The recirculation line fitting is welded into LH2 aft dome. Integrity of weld and weld design is covered in details in the Critical Item List (CIL) for Pressure Vessels (Volume VI).

The fitting is designed to a required yield (1.1) and ultimate (1.25) safety factor for well-defined loads and (1.4) for other loads (ET Stress Report 826-2188).

TEST:

The Recirculation Line Fitting (LH2) is certified. Reference MCS MMC-ET-TM08-L-S185 (LWT-54 thru 88) and MCS MMC-ET-TM08-L-S503 (LWT-89 & Up).

Vendor:

The fasteners are procured and tested to standard drawings 26L2 and 34L2.

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance

Verify material selection and verification controls (MMC-ET-SE16, STM5163, drawing 82614420041 and standard drawings 26L2 and 34L2).

Penetrant inspect part (drawing 80914940988 and STP2501, Type 1, Method A).

Inspect dimensional conformance (drawing 80914940988).

Inspect hole dimensions for inserts (drawing 80914940988 and STP2024).

MAF Quality Inspection:

Verify installation and witness torque (drawings 80914940945, 80921011009 and STP2014).

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.