

CRITICAL ITEMS LIST (CIL)
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SYSTEM: ASI
SUBSYSTEM: ET Interface Hardware
REV & DATE: J, 12-19-97
DCN & DATE:
ANALYSTS: C. Rush/E. Howell

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 fire/explosion or debris source to Orbiter from crossbeam.
TIME TO EFFECT: Immediate
FAILURE CAUSE(S): A: Improper Manufacture
B: Failure of Weld Joints
REDUNDANCY SCREENS: Not Applicable
FUNCTIONAL DESCRIPTION: Aft crossbeam structural assembly.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
4.5.3.1	80911071729-129	Beam Assembly Welded &	1	LWT-54 thru 73
	-190	Machined	1	LWT-74 thru 88
	-530		1	LWT-89 & Up

REMARKS:

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: ASI
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RATIONALE FOR RETENTION

DESIGN:

A, B: Some beam assembly details are machined from 2219-T6 aluminum alloy forgings, others are chem milled from 2219-T8511, 2024-T62 and 2024-T8511 aluminum alloy extrusions and from formed 2219-T87 aluminum alloy plate stock. Materials selected for this part number are in accordance with MMC-ET-SE16 which assures repetitive conformance of composition and properties. Surface integrity is assured by penetrant inspection per STP2501. The beam assembly and weld joints are designed to the required ultimate safety factor of 1.4 (ET Stress Report 826-2188).

B: All weld joints are butt welds per STP5501, grade 8.

TEST:

The Beam Assembly Welded & Machined is certified. Reference HCS MMC-ET-TM08-L-S102 (LWT-54 thru 88) and HCS MMC-ET-TM08-L-S516 (LWT-89 & Up).

The structural integrity of the redesigned Aft Crossbeam (LWT-74 & Up) was verified through six testing conditions simulating worst case air and feedline loading (Reference Redesigned Aft Crossbeam Verification Test Report, No. 826-2458). The crossbeam withstood limit loads without permanent deformation or buckling, withstood ultimate loads without rupture or collapse and achieved capability loads beyond the ultimate design loads.

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

A, B: Verify materials selection and verification controls (MMC-ET-SE16, STM-Q-250, STM-5163; drawings 80911071705, 80911071707, 80911071711, 80911071703, 80911071756, 80911071757, 80911071701, 80911071758 for LWT-54 thru 73; drawings 80911071701, 80911071703, 80911071705, 80911071707, 80911071711 and 80911071825 for LWT-74 & Up).

A: Ultrasonic inspect parts (2L3027).

A: Penetrant inspect parts (drawings 80911071708, 80911071712 and STP2501 Type 1 Method A; drawings 80911071756, 80911071757, 80911071758 for LWT-54 thru 73; drawing 80911071825 for LWT-74 & Up).

A: Inspect dimensional conformance (drawings 80911071708, and 80911071712; drawings 80911071756, 80911071757 and 80911071758 for LWT-54 thru 73; drawing 80911071825 for LWT-74 & Up).

MAF Quality Inspection:

A: Penetrant inspect parts (drawings 80911071702, 80911071704 and 80911071706).

A: Inspect dimensional conformance (drawings 80911071702, 80911071704 and 80911071706).

B: Inspect weld and acceptance requirements (drawings 80911071729, 80911071778 and 80911071780 for LWT-54 thru 73; drawings 80911071729 and 80911071830 for LWT-74 & Up).

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.