

CRITICAL ITEMS LIST (CIL)

SYSTEM: Venting
 SUBSYSTEM: Aft Cable Trays
 REV & DATE: J, 12-19-97
 DCN & DATE:
 ANALYSTS: P. Ghanchi/E. Howell

FUNCTIONAL CRIT: 1
 PHASE(S): b
 HAZARD REF: E.01

FAILURE MODE: Excessive Leak Area
 FAILURE EFFECT: b) Loss of mission and vehicle/crew due to loss of SRB command signals.
 TIME TO EFFECT: Seconds
 FAILURE CAUSE(S): A: Improper Installation or Omission of Flow Restrictor
 B: Undersized Flow Restrictor
 REDUNDANCY SCREENS: Not Applicable
 FUNCTIONAL DESCRIPTION: Provides venting and flow restriction for the aft SRB cable tray fairing compartment during ascent phase.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
7.4.27.2	80911019139-039	Fairing Instl, Upper, Aft ET/SRB - KSC (RH Aft SRB Fairing T-Shaped Flow Restrictor Vent/Leak Area)	1	LWT-54 & Up
7.4.28.2	80911019139-040	Fairing Instl, Upper, Aft ET/SRB - KSC (LH Aft SRB Fairing T-Shaped Flow Restrictor Vent/Leak Area)	1	LWT-54 & Up

REMARKS: These items are grouped as the failure mode, causes and effects are the same.

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM: Venting
SUBSYSTEM: Aft Cable Trays
FMEA ITEM CODE(S): 7.4.27.2, 7.4.28.2

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RATIONALE FOR RETENTION

DESIGN:

The system of cable trays on the ET/ORB/SRB aft attachment is a network of interlocking individual cable tray compartments. In order to model the pressure conditions at a vent/leak location, the space between the overlapping trays were divided into three distinct areas. These areas were defined according to whether they experience windward, leeward, or tangential flow. External pressure coefficients and discharge coefficients are documented in MMC-ET-SE05-95 and MMC-ET-SE05-579. The aft SRB fairing T-shaped flow restrictor vent/leak area is defined by the gap formed between the flow restrictor and the upper ET/SRB strut. The flow restrictor is manufactured in two pieces. The T-shaped flow restrictor is formed out of two layers of nomex cloth .028 inch thick, two layers of fiberglass 0.011 inch thick, one rubber layer .01 inch thick, two rubber layers .001 inch thick and one rubber ablative layer 0.04 inch thick. The total thickness of the flow restrictor is 0.136 inch. The two halves of the flow restrictor are riveted to the fairing to prevent over-heating of electrical wires due to excessive air mass flow during ascent.

Vent system performance verification is by analysis (MMC-ET-SE05-95 for LWT-54 thru 88 and MMC-ET-SE05-579 for LWT-89 & Up).

- A: Engineering requirements (drawing 80911009125) assure that the T-shaped flow restrictor will be installed in both RH and LH Aft upper SRB fairings.
- B: Engineering requirements (drawing 80911009134) assure that the T-shaped flow restrictors will be manufactured to the correct dimensions within drawing tolerances.

TEST:

The Fairing Instl, Upper, Aft ET/SRB KSC (RH & LH Aft SRB Fairing T-Shaped Flow Restrictor Vent/Leak Area) is certified. Reference HCS MMC-ET-TMOB-L-5174 (LWT-54 thru 88) and HCS MMC-ET-TMOB-L-5522 (LWT-89 & Up).

INSPECTION:

Vendor Inspection - Lockheed Martin Surveillance:

- B: Verify materials selection and verification controls (MMC-ET-SE16 and drawing 80911009134).
- B: Inspect dimensions (drawing 80911009134).

Launch Site:

- A, B: Inspect for existence of flow restrictors (drawing 80901019008).
- A, B: Verify assembly and installation (drawings 80911019139 and 80971009442).

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.