SYSTEM:	Venting	FUNCTIONAL CRIT:	1R
SUBSYSTEM:	Miscellaneous	PHASE(S):	b
REV & DATE:	J, 12-19-97	HAZARD REF:	E.01
DCN & DATE:			
ANALYSTS:	K. Joiner/E. Simon		

FAILURE MODE: Area Not Sealed

FAILURE EFFECT: b) Loss of mission and vehicle/crew due to structural failure (SRB impacts ET/ORB).

TIME TO EFFECT: Seconds

FAILURE CAUSE(S): (See REMARKS)
- A: Improper Application or Omission of PDL
- B: Improper Adhesion/Cure of PDL
- C: Improper Installation
- D: Undersized Rubber Grommet

REDUNDANCY SCREENS:
- Screen A: PASS
- Screen B: FAIL - Sealed area not monitored during flight.
- Screen C: PASS

FUNCTIONAL DESCRIPTION: Prevents airflow through the SRB attachment to protect NSI wire during ascent.

FMEA ITEM CODE(S)	PART NO.	PART NAME	QTY	EFFECTIVITY
7.5.10.1	80911019319-019 -029	Fairing and Duct Installation ET/SRB Cross Strapping, RSS (Sealed Opening Between Bolt Catcher and Forward RSS Cable Tray Compartments)	1 1	LWT-54 thru 63 LWT-64 & Up
7.5.11.1	80911019319-020 -030	Fairing and Duct Installation ET/SRB Cross Strapping, RSS (Sealed Opening Between Bolt Catcher and Forward RSS Cable Tray Compartments)	1 1	LWT 54 thru 63 LWT-64 & Up

REMARKS: Failure Causes A and B are applicable for LWT-54 thru 63.
Failure Causes C and D are applicable for LWT-64 & Up.

These items are grouped as the failure mode and effects are the same.

CRITICAL ITEMS LIST (CIL)
CONTINUATION SHEET

SYSTEM:	Venting	REV & DATE:	J, 12-19-97
SUBSYSTEM:	Miscellaneous	DCN & DATE:	
FMEA ITEM CODE(S):	7.5.10.1, 7.5.11.1		

RATIONALE FOR RETENTION

DESIGN:

A-D: A portion of the NSI (pyro) wire which controls SRB separation is routed through a one inch diameter hole drilled in the forwared SRB fitting. The one inch diameter hole links the bolt catcher compartment to the forward RSS cable tray compartments. For LWT-54 thru 63, PDL foam is applied to seal the hole to protect the NSI wire from aerodynamic heating during ascent. For LWT-64 & Up, a rubber grommet is installed.

A, B: The PDL foam has a cure time of 2 hours and is capable of withstanding to 15 psi. For this application, the PDL foam has a safety factor of 4.05.

A-D: If failure of the seal causes failure of the NSI wire, SRB separation will be provided by the redundant pyro system on the SRB side.

A: Engineering requirements (drawing 80911019319; LWT-54 thru 63) assure that PDL foam will be applied to seal the one inch diameter cavity.

A: ICD-2-24001 requires sealing of the one inch diameter hole subsequent to NSI (pyro) wire installation.

B: Engineering requirements (drawing 80911019319; LWT-54 thru 63) requires the PDL foam to cure for a minimum of two hours at ambient conditions without movement of NSI (pyro wire). Extrusion of foam beyond cavity is acceptable. No trimming of foam is allowed. Epoxy primer repair is not required in cavity.

TEST:

The Fairing and Duct Installation ET/SRB Cross Strapping, RSS (Sealed Opening Between Bolt Catcher and Forward RSS Cable Tray Compartments) is certified. Reference HCS MMC-ET-TM08-L-S163 (LWT-54 thru 88) and HCS MMC-ET-TM08-L-S523 (LWT-89 & Up).

Testing was performed on the seal between the forward ET/SRB fitting and bolt catcher interface ("Forward SRB/ET Bolt Catcher Development Test Report, 809-3790 for LWT-64 & Up). Maximum design pressure for the seal is 9 psid. The structural and functional integrity of the seal was tested by applying the pressures of 9 and 15 psid to the sealed SRB fitting and monitoring pressure decay. Maximum allowable mass flow rate is based on the max leak area of 0.025 in^2. The leak area measured by pressure decay was computed to be .00474 in^2 for the aluminum/O-ring seal and the NSI wire grommet combined.

MAF:

B: Perform cream time, rise time, tack free time, free foam density, tensile strength and compressive strength tests (BTM-L-744).

SYSTEM:	Venting	REV & DATE:	J, 12-19-97
SUBSYSTEM:	Miscellaneous	DCN & DATE:	
FMEA ITEM CODE(S):	7.5.10.1, 7.5.11.1		

RATIONALE FOR RETENTION

INSPECTION:

MAF Quality Inspection:

B: Verify cream time, rise time, tack free time, free foam density, tensile strength and compressive strength tests (STM-L-744).

D: Verify material selection (drawing 80911009141).

D: Verify dimensional conformance (drawing 80911009141).

Launch Site:

A: Witness surface preparation and PDL application (drawing 80911019319).

A, B: Inspect/verify cavity is sealed (drawing 80901019008).

B: Verify sealant cure (STP1518).

C: Verify installation (drawing 80911019319).

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.