

CRITICAL ITEMS LIST (CIL)

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

FAILURE MODE: Area Not Sealed

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

TIME TO EFFECT: Seconds

FAILURE CAUSE(S):
(See REMARKS)

A: Improper Application or Omission of RTV
 B: Improper Adhesion/Cure of RTV
 C: Improper Installation
 D: Aluminum Carrier out of Tolerance
 E: Defective O-Ring

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

FUNCTIONAL DESCRIPTION: Prevents airflow through the bolt catcher to protect NSI wire.

<u>FMEA ITEM CODE(S)</u>	<u>PART NO.</u>	<u>PART NAME</u>	<u>QTY</u>	<u>EFFECTIVITY</u>
7.5.8.1	80911019119-019	Bolt Catcher (Sealed Area	1	LWT-54 thru 63
	-039	Between Bolt Catcher and	1	LWT-64 thru 69
	-040	Forward ET/SRB Attachment Fitting)	1	LWT-70 & Up
7.5.9.1	80911019119-020	Bolt Catcher (Sealed Area	1	LWT-54 thru 63
	-039	Between Bolt Catcher and	1	LWT-64 thru 69
	-040	Forward ET/SRB Attachment Fitting)	1	LWT-70 & Up

REMARKS: Failure Causes A and B are applicable for LWT-54 thru 63.
 Failure Causes C, D and E 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
SUBSYSTEM: Miscellaneous
FMEA ITEM CODE(S): 7.5.8.1, 7.5.9.1

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

DESIGN:

- A-E: A portion of the NSI (pyro) wire which controls SRB separation is contained in the bolt catcher. The interface area of the bolt catcher and forward ET/SRB fitting is sealed to protect the NSI wire from aerodynamic heating during ascent. For LWT-54 thru 63, RTV sealant is applied to the interface area, cable groove and two gaps in the bolt catcher. For LWT-64 & Up, an aluminum carrier and two O-Rings seal the interface.
- A-E: 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 80911019119) assure that RTV sealant will be applied to the interface surfaces of the bolt catcher and the forward ET/SRB attachment fitting.
- A, B: Engineering drawing 80911019119 specifies application of RTV sealant (M650C) into cable groove and application of RTV sealant per STP7002 Type III to bolt catcher and SRB fitting interface surfaces (which includes the gaps).
- Vent system performance verification is by analysis (MNC-ET-SE05-95 for LWT-54 thru 88 and MNC-ET-SE05-579 for LWT-89 & Up).

TEST:

The Bolt Catcher (Sealed Area Between Bolt Catcher and Forward ET/SRB Attachment Fitting) is certified. Reference NCS MNC-ET-TM08-L-8162 (LWT-54 thru 88) and NCS MNC-ET-TM08-L-9521 (LWT-89 & Up).

Testing was performed on the seal between the forward ET/SRB fitting and bolt catcher interface (MNC-Memo-3521-85-90, "SRB Bolt Catcher Test Data Report", July 19, 1985 for LWT-54 thru 63 and "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. The RTV was verified to be an acceptable sealant in this application up to 20 psid. Maximum allowable mass flow rate is based on the max leak area of 0.025 in². The leak area measured by pressure decay was computed to be .000275 in² for the RTV and .00474 in² for the aluminum/O-ring seal and the NSI wire grommet combined.

Vendor:

- B: Perform material and process test (GE-RTV162).

Launch Site:

- B: Perform RTV sealant adhesion "tack free" test (STP7002).

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RATIONALE FOR RETENTION

INSPECTION:

MAF Quality Inspection:

- A, B: Verify materials selection (GE-RTV162).
- E: Verify material selection (standard drawing 55L12).
- D, E: Verify dimensional conformance (standard drawing 55L12).
- D, E: Inspect dimensional conformance (drawing 80911009140).

Launch Site:

- A: Verify surface preparation and RTV Application (drawing 80911019119).
- A, B: Inspect/Verify gap around bolt catcher is sealed (drawing 80901019008).
- B: Verify sealant cure (STP7002).
- B: Witness RTV sealant adhesion "tack free" test (STP7002).
- C: Verify installation (drawing 80911019119).

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.