

SRB CRITICAL ITEMS LIST

SUBSYSTEM: SEPARATION

ITEM NAME: Aft Strut Attachment Fitting,  
Energy Absorber (ET End)

PART NO.: 10176-0010 FM CODE: A02  
10176-0134  
10170-0010  
10170-0011  
10176-0033

ITEM CODE: 30-04-01D REVISION: Basic

CRITICALITY CATEGORY: 1 REACTION TIME: Immediate

NO. REQUIRED: 3 DATE: March 1, 2002

CRITICAL PHASES: Separation SUPERCEDES: March 1, 1993

FMEA PAGE NO.: B-63 ANALYST: Reynolds/S. Parvathaneni

SHEET 1 OF 2 APPROVED: S. Parvathaneni

CN 044

FAILURE MODE AND CAUSES: Energy absorber fails to absorb the kinetic energy of the separation bolt caused by:

- o Improper Honeycomb

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to damage to Orbiter/ET skin when bolt catcher fails to limit shock to structure leading to fire and explosion.

RATIONALE FOR RETENTION:

- A. DESIGN: The aft ET attach strut fittings (ET end) consist of a strut fitting assembly with an integral spherical seat, a spherical bearing, and an energy absorber.

The energy absorber consists of a 5052 aluminum alloy honeycomb core with a protective layer of PDL 4034-2.5 foam. The foam prevents the aluminum honeycomb from cutting, abrading, or otherwise degrading the NSI detonator cable. The energy absorber is designed to absorb 2925 ft./lb. of kinetic energy within a 1 1/2 inch distance. Approximately 50 percent of the overall height. Without the shock absorber, excessive loads will occur that may cause excessive shock loads to be transmitted into the ET. This could result in possible failure of the ET LH<sub>2</sub> tank and severely damage the orbiter TPS and structure.

- B. TESTING: The energy absorber was qualified in accordance with MSFC document SE-019-106-2H during the component separation tests. The Qual Test Report is SST-SC-TR-FRO3, SRB/ET Aft Attach Structural Test Final Report. The COQ is K-STR-7003-3. (Improper Honeycomb)

C. INSPECTION:

VENDOR RELATED INSPECTIONS

- o USA SRBE Source Inspection Plan (SIP) 1453 controls the USA SRBE QAR inspection criteria at the vendor's facility. (Improper Honeycomb)
- o Vendor QA and USA SRBE QA verify chemical and physical materials certification in accordance with SIP 1453. (Improper Honeycomb)
- o Vendor QA and USA SRBE QA verify the dimensional data in accordance with SIP 1453. (Improper Honeycomb)

PRELAUNCH CHECKOUT RELATED INSPECTIONS

The energy absorber installation includes verification for proper installation by USA SRBE Quality per drawing 10130-0001. (Improper Honeycomb)

D. FAILURE HISTORY

- o Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

- o Not applicable to this failure mode.