

SRB CRITICAL ITEMS LIST

SUBSYSTEM: STRUCTURES & MISCELLANEOUS ITEMS

ITEM NAME: Aft BSM Support Covers

PART NO.: 10177-0011 FM CODE: A01  
10177-0054, -0061, -0062

CN 044

ITEM CODE: 60-02-16 REVISION: Basic

CRITICALITY CATEGORY: 1 REACTION TIME: Immediate

NO. REQUIRED: 4 DATE: March 1, 2002

CRITICAL PHASES: Boost, Separation SUPERCEDES: March 31, 1998

FMEA PAGE NO.: E-25 ANALYST: Reynolds/S. Parvathaneni

SHEET 1 OF 2 APPROVED: S. Parvathaneni

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FAILURE MODE AND CAUSES: Structural failure of the covers caused by:

- O Aerodynamic loading combined with improper fabrication, improper heat treatment, improper installation or unusual environments.

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to loss of required thrust at separation causing recontact of SRB with ET/Orbiter.

RATIONALE FOR RETENTION:

A. DESIGN

- O The Aft BSM cover plates are roll formed from 2219 aluminum plate to match the configuration of the Aft BSM supports. Holes are included for securing the covers with standard aerospace fasteners. The covers provide aerodynamic protection for the BSM during ascent and mechanical protection during towback/retrieval. The covers are sealed at installation.
- O The materials used in the design were selected in accordance with 10PLN-0150 (Materials Control and Verification Program Management Plan for SS SRB Program) and MSFC-SPEC 522 (Design Criteria for Controlling Stress Corrosion Cracking).
- O The design allowables are in compliance with MIL-HDBK-5 (Metallic Materials and Elements for Aerospace Vehicle Structures) and MSFC-HDBK-505 (Structural Strength Program Requirements).
- O The fasteners are installed in accordance with MSFC-STD-486 (Threaded Fasteners, Torque Limits For).
- O The heat treat operations are in compliance with MIL-H-6088 (Heat Treatment of Aluminum Alloys).

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- O The Aft BSM Supports (including the covers) were qualified for flight by analysis and test as documented in USA SRBE Certificate of Qualification A-STR-7122.
- O Analysis shows that a factor of safety of +2.77 exists between the design of the Aft BSM support covers and the maximum predicted load during ascent (Ref. BPC-ANAL-003-87).

B. TESTING

- O No testing required during each flow applicable to this failure mode.

C. INSPECTION

VENDOR RELATED INSPECTIONS

- O USA SRBE SIP 1453 controls the USA SRBE QAR inspection criteria at the vendor's facility. (Improper Fabrication)
- O Materials are accepted on the basis of supplier certifications. Certifications are verified by USA SRBE QAR per SIP 1453. (Improper Material)
- O USA SRBE QAR verify heat treat data and charts per SIP 1453. (Improper Heat Treatment)

Critical Processes/Inspections:

- O Heat treat performed per MIL-H-6088. (Improper Heat Treatment)

ASSEMBLY/CHECKOUT RELATED INSPECTIONS

- O The Aft BSM covers are installed including verification of proper torque per OMRSD File V, Vol. 1, requirement number B08GEN.010. (Improper Installation)
- O After each flight the covers are inspected for damage, corrosion, cuts, dents, gouges, cracks, or any other unusual condition by USA SRBE Quality. Inspection and repair criteria are contained in 10SPC-0131 (Refurbishment Engineering Specifications for Space Shuttle Solid Rocket Booster Assembly Project). Any such condition is recorded, photographed, documented, and repaired as required. (Unusual Environments)

D. FAILURE HISTORY

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

E. OPERATIONAL USE

- o Not applicable to this failure mode.