

SRB CRITICAL ITEMS LIST

SUBSYSTEM: STRUCTURES & MISCELLANEOUS ITEMS

ITEM NAME: Aft Skirt Feed thru Assembly Covers

PART NO.: 10182-0408  
10182-0409

FM CODE: A01

ITEM CODE: 60-02-15

REVISION: Basic

CRITICALITY CATEGORY: 1

REACTION TIME: Immediate

NO. REQUIRED: 2

DATE: March 1, 2002

CRITICAL PHASES: Boost, Separation

SUPERCEDES: March 31, 1998

FMEA PAGE NO.: E-24

ANALYST: Reynolds/S. Parvathaneni

SHEET 1 OF 3

APPROVED: S. Parvathaneni

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FAILURE MODE AND CAUSES: Structural failure of cover 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 detonation of the LSC, loss of vehicle control, loss of separation capability or damage to the ET/Orbiter from generated debris.

RATIONALE FOR RETENTION:

A. DESIGN

- O The Aft Skirt Feed Thru Assembly Covers are fabricated from rolled and welded 2219 aluminum plate. They provide mechanical and aerodynamic protection for the electrical cables at the systems tunnel/aft skirt interface.
- O They are secured to the Aft Skirt feed thru with standard aerospace hardware.
- O The materials used in the design were selected in accordance 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).

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- O The welding is in compliance with MSFC-SPEC-504 (Welding Aluminum Alloys). The welds receive dye penetrant inspection. Weld wire controls are in compliance with MSFC-SPEC-655 (Standard Weld Filler, Control of).
- O The heat treat operations are in compliance with MIL-H-6088 (Heat Treatment of Aluminum Alloys).
- O The Aft Skirt feed thru assembly covers were qualified for flight by analysis and tests as documented in Certificate of Qualification A-STR-7117.
- O Analysis shows that a factor of safety of +1.4 exists between the design of the feed thru assembly covers and the maximum predicted load during ascent (Ref. BPC-ANAL-003-87).

#### B. TESTING

- O No other 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 All welds are penetrant inspected verified by USA SRBE QAR in compliance with SIP 1453. (10182-0408 only). (Improper Fabrication)
- O The heat treatment procedure is verified by USA SRBE QAR in compliance with SIP 1453. (Improper Heat Treatment)

##### Critical Processes/Inspections:

- o Welding operations are performed per MSFC-SPEC-504. (Improper Fabrication)
- o Heat treat operations are performed per MIL-H-6088. (Improper Heat Treatment)

##### ASSEMBLY/CHECKOUT RELATED INSPECTIONS

- 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)

PRELAUNCH CHECKOUT RELATED INSPECTIONS

- O Final installation includes verification of proper torque per OMRSD File V, Vol. 1, requirement number B08GEN.010. (Improper Installation)
  
- D. FAILURE HISTORY
  
- O Failure Histories may be obtained from the PRACA database.
  
- E. OPERATIONAL USE
  - o Not applicable to this failure mode.