

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Throwaway Cables X18W1 P1/P2 and X18W2 P1/P2 (Aft Lower Strut Separation Bolt PIC A and PIC B Output to Aft Lower Strut Separation Bolt NSI A and NSI B.)

PART NO.: 10400-0044
10400-0045

FM Code: A03

ITEM CODE: 50-04-X18

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1995

CRITICAL PHASES: Separation

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-695

ANALYST: R. Smith/A. Craft

SHEET 1 OF 3

APPROVED: P. Kalia

FAILURE MODE AND CAUSES: Loss of Aft Lower Strut Separation Bolt PIC A and PIC B outputs to Aft Lower Strut Separation Bolt NSI A and NSI B in both cables due to:

- o One pin or wire open caused by: open crimp or solder, open wire, broken/bent pin, unseated pin, broken pin locking mechanism, corroded pin.
- o One pin or wire short to ground caused by: bent pin, contamination in connector, insulation breakdown, frayed shielding, abraded or cut insulation.
- o Loss of connectors P1 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.
- o Loss of connectors P2 caused by: failure of locking mechanism, connector not fully mated, mechanical overstress.

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to loss of Lower Strut separation leading to recontact between SRB and the ET/Orbiter. One success path remains after the first failure. Operation is not affected until both paths are lost.

REDUNDANCY SCREENS AND MEASUREMENTS:

- 1) Pass - All cables are system tested during ground turnaround sequence.
- 2) Fail - Not verified.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

- A. DESIGN Per Appendix A Section # IV

- B. TESTING
 - 1) **VENDOR RELATED** Per Appendix B Section # III

 - 2) **KSC RELATED** Per Appendix B Section # IIA

 - 3) **SYSTEM/ UNIQUE FUNCTIONAL**

Cable X18W1 is tested after cable is installed in strut by performing NSI Bridgewire test per 10REQ-0021, para. 4.3.5.3. (Open, Short or Loss of Cable)

Cable X18W2 is tested for continuity, isolation and DWV, per ACO OMRSD para. 2.2.1.1.1, 2.2.1.1.2, and 2.2.1.1.4 after etching and connector locking before cable is installed in strut. After cable is installed in strut and a NSI Bridgewire test is performed per 10REQ-0021, para. 4.3.5.3. (Open, Short or Loss of Connector)

Again, cables are tested in series with other strut NSI cables X13W26 and X3W27 for NSI Bridge-wire continuity and isolation. (Open, Short or Loss of Connector)

After Final Ordnance Installation and Connection cables are tested per OMRSD File II, Vol. 1, requirement number S00000.410 (PIC Resistance Test). (Open, Short or Loss of Connector) The last time the cables are checked is during Final Countdown per OMRSD File II, Vol. 1, requirement number S00FA0.015 ("OO" PIC Resistance Test). (Open, Short or Loss of Connector)

- C. INSPECTION
 - 1) **VENDOR RELATED** Per Appendix C Section # I (Crimped or Soldered Connector)

 - 2) **KSC RELATED**
 - 1) Connector P2 (Bayonet type) is inspected and mated by USBI per 10REQ-0021 para. 4.3.5.6 and 4.3.5.2 (Open, Short, or Loss of connector).

- 2) Connector P1 (X18W2) (Threaded type) is inspected, mated and torqued by SPC per File V, Vol. I B75GEN.020 (Lockwired with P1, X18W2) (Open, Short, or Loss of connector)
- 3) Connector P1 (X18W2) (Threaded type) is inspected, mated, torqued, and lockwired by SPC per File V, Vol. I B75GEN.010, B75GEN.020, and B75GEN.040. (Open, Short, or Loss of connector)

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.