

SRB CRITICAL ITEMS LIST

SUBSYSTEM ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Throwaway Cables X16W1 P1/P2, X16W2 P1/P2 (Aft Upper Strut Separation Bolt PIC A and PIC B Outputs to Aft Upper Strut Separation Bolt NSI A and NSI B)

PART NO.: 10400-0040,
10400-0041

FM CODE: A01

ITEM CODE: 50-04-X16

REVISION: Basic

CRITICALITY CATEGORY: IR

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1995

CRITICAL PHASES: Separation

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-691

ANALYST: R. Smith/A. Craft

SHEET 1 OF 3

APPROVED: P. Kalia

FAILURE MODE AND CAUSES: Loss of Aft Upper Strut Separation Bolt PIC A and PIC B outputs to Aft Upper 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 connector P1 (X16W1) caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.
- o Loss of connector P2 caused by: failure of locking mechanism, connector not fully mated, mechanical overstress.
- o Loss of connector P1 (X16W2) caused by: connector not fully mated. (Pullaway Type)

FAILURE EFFECT SUMMARY: Loss of mission, vehicle and crew due to loss of Aft Upper 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.

- 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 # IB
- 2) KSC RELATED Per Appendix B Section # III
- 3) SYSTEM/ UNIQUE FUNCTIONAL

Cable X16W1 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 Connector)

Cable X16W2 is tested for continuity, isolation and DWV after etching and connector clocking, before cable installed in strut per 10REQ-0021, para. 2.2.1.1.1, 2.2.1.1.2, and 2.2.1.1.4. After cable is installed in strut 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 X13W30 and X13W23 for NSI bridgewire continuity and isolation. (Open, Short or Loss of Connector)

After Final Ordnance Installation and Connection cables are tested per OMRSD File II, Vol. I, requirement numbers 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. I, requirement number S00FAO.015 (*GO PIC Resistance Test).

C. INSPECTION

- 1) VENDOR RELATED Per Appendix C Section # I (Crimped and Soldered Connector)
- 2) KSC RELATED
 - 1) Connector P2 (bayonet type) is inspected and mated by USB1 per 10REQ-0021 para. 4.3.5.1 and 4.3.5.2 (open, short, or loss of connector)
 - 2) Connector P1 of X16W2 (Threaded type) is inspected, mated, torqued and lockwired per File V, Vol. I B75GEN.010, B75GEN.020, and B75GEN.040. (open, short, or loss of connector) -

- 3) Connector P1 of cable X16W1 is a pullaway type. Connectors are measured to ensure full mating.

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.