

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Throwaway Cables X13W14 J42/P2 (J51/P2) and X13W15 J41/P2 (J52/P2) (SRM Ignition PIC Fire Commands: Separation Arm/Fire Commands)

PART NO.: 10400-0029
10400-0030

FM CODE: A13

ITEM CODE: 50-04-X13

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1995

CRITICAL PHASES: Boost, Separation

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-677

ANALYST: R. Smith/A. Craft

SHEET 1 OF 3

APPROVED: P. Kaha

FAILURE MODE AND CAUSES: Loss of SRM Ignition PIC A and PIC B Arm/Fire commands. Separation PIC A and PIC B Arm/Fire commands and/or SRB Data Bus 1 and 2 leads A and 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 P2 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.
- o Loss of connectors J42 (J51) and J41 (J52) caused by: connector not fully mated

FAILURE EFFECT SUMMARY:

Boost: Loss of mission, vehicle and crew due to loss of SRM PIC A and PIC B Fire commands leading to ignition of one SRM without ignition of the other. Separation: Loss of mission, vehicle and crew due to loss of Separation PIC A and PIC B Arm and/or Fire commands leading to loss of SRB separation.

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 for Separation PIC A and B Fire commands.
 - Pass - For SRM Ignition PIC A and PIC B Fire commands. PIC cap volt measurements B55V1603C and B55V1604C.
 - Pass - For Separation PIC A and B Arm commands. PIC Cap Volt measurements B55V1605C through B55V1616C.
- 3) Pass - No credible cause.

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 # IIB

3) SYSTEM/ UNIQUE FUNCTIONAL

Cables are tested per OMRSD File II, Vol. 1, requirement number S00000.510 and .525. (Open, Short or Loss of Connector)

C. INSPECTION

1) VENDOR RELATED Per Appendix C Section # I (Crimped and Soldered Connector)

2) KSC RELATED Per Appendix C Section # IIB

Additional: Connectors J41(J52) and J42(J51) are pullaway connectors. SPC measures connector clearance to verify connector is fully mated (Loss of connector).

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.