

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Watertight Reusable Cable X02W4R J1/P2, X02W6R J1/P2, X02W10R J1/P2 and X02W11R J1/P2 or SRB OF Throwaway Cable X02W4 J1/P2, X02W6 J1/P2, X02W10 J1/P2, and X02W11 J1/P2. (TVC A, B, C, D Rock Position Commands and Delta Fs)

PART NO.: 10400-0006, 10400-0656  
10400-0008, 10400-0658  
10400-0011, 10400-0661  
10400-0012, 10400-0662

FM CODE: A07, A08, A09, A10

ITEM CODE: 50-04-X02

REVISION: Basic

CRITICALITY CATEGORY: 1R

REACTION TIME: Immediate

NO. REQUIRED: 1 each

DATE: March 1, 1995

CRITICAL PHASES: Boost

SUPERCEDES: March 1, 1994

FMEA PAGE NO.: D-636, D-638, D-639, D-641

ANALYST: R. Smith/A. Craft

SHEET 1 OF 3

APPROVED: F. Kalia

FAILURE MODE AND CAUSES: (a) Loss of three of four Rock/Tilt position commands and/or secondary DP in three out of four cables due to: or (b) loss of two of four Rock/Tilt position commands and or Secondary DP two out of four connectors simultaneously due to:

- o For (a):
  - o One pin or wire open caused by: open solder, open wire, broken/bent pin, 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 caused by: connector not fully mated, improperly safety wired, improperly torqued, defective threads, mechanical overstress.
- o For (b):
  - o Two pins or wires open caused by: open solder, open wire, broken/bent pin, corroded pin.
  - o Two pins or wires short to ground caused by: bent pin, contamination in connector, insulation breakdown, frayed shielding, abraded or cut insulation.

**FAILURE EFFECT SUMMARY:** Loss of three of four Position commands and/or secondary DP in three out of four cables or two of four Position commands simultaneously to Rock actuator resulting in loss of TVC leading to loss of mission, vehicle and crew. Two success paths remain after the first failure. Operation is not affected until all three paths are lost except in the case of simultaneous loss.

**REDUNDANCY SCREENS AND MEASUREMENTS:**

- 1) Pass - All cables are system tested during ground turnaround sequence.
- 2) Pass - Rock A, B, C, and D secondary delta pressure measurements B58P1311A through B58P1314A.
- 3) Pass - No credible causes.

**RATIONALE FOR RETENTION:**

A. DESIGN Per Appendix A Section # I & III

B. TESTING

- 1) VENDOR RELATED Per Appendix B Section # IA & IB
- 2) KSC RELATED Per Appendix B Section # IIA
- 3) SYSTEM/ UNIQUE FUNCTIONAL

Cables are tested during Assembly Checkout Operations (ACO) (Actuator Null, Linearity, and Polarity) per IOREQ-0021, para. 2.3.14.1. (Open, Short or Loss of Connector)

Cables are again tested during hotfire operations per IOREQ-0021, para. 2.3.16.

After transfer to SPC, Cables are tested during Shuttle flight control integration test per OMRSD File II, Vol. 1, requirement numbers S00000.650, .670, .680, .720, and .750 (SRB Actuator Tests).

The last time cables are tested is during final countdown per OMRSD File II, Vol. 1, requirement number S00F50.030 (SRB Gimbal Test). (Open, Short or Loss of Connector)

C. INSPECTION

- 1) **VENDOR RELATED** Per Appendix C Section # I (Soldered Connector)
- 2) **KSC RELATED** Per Appendix C Section # IIA

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.