

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: SRB OF Watertight Reusable Cable X13W2R P1/P2 and X13W3R P1/P2, 113W4R P1/P2 (213W4R P1/P2) and X13W12R P1/P2 (TVC A, B, C, D Rock/Tilt Position Command and Delta Ps)

PART NO.: 10400-0018
10400-0019
10400-0636 (10400-0637)
10400-0027

FM CODE: A03, A04

ITEM CODE: 50-04-X13

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-660, D-662

ANALYST: R. Smith/A. Craft

SHEET 1 OF 2

APPROVED: P. Kalia

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

- o For (a):
 - o One pin or wire open caused by: open crimp, 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 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 crimp, open wire, broken/bent pin, unseated pin, broken pin locking mechanism, 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 of four cables or two of four Position commands and/or secondary DP in two of four connectors simultaneously to Rock and/or Tilt actuators 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 failure.

REDUNDANCY SCREENS AND MEASUREMENTS:

- 1) Pass - All cables are system tested during ground turnaround sequence.
- 2) Pass - Rock and Tilt A, B, C, and D secondary delta pressure measurements B58P1311A through B58P1318A.
- 3) Pass - No credible causes.

RATIONALE FOR RETENTION:

A. DESIGN Per Appendix A Section # II

B. TESTING

- 1) **VENDOR RELATED** Per Appendix B Section # IA
- 2) **KSC RELATED** Per Appendix B Section # IIB
- 3) **SYSTEM/ UNIQUE FUNCTIONAL**

Cables are again tested during Shuttle Flight Control Integrated (SIT) per OMRSD File II, Vol. 1, requirement numbers S00000.650, .670, .680, .720, and .750 (SRB Actuator Tests). (Open, Short or Loss of Connector)

The last time cables are tested is during final countdown per OMRSD File II, Vol. 1, requirement number S00FS0.030 (SRB Gimbal Test). (Open, Short or Loss of Connector)

C. INSPECTION

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

D. FAILURE HISTORY

Failure Histories may be obtained from the PRACA database.

E. OPERATIONAL USE

Not applicable to this failure mode.