

SRB CRITICAL ITEMS LIST

SUBSYSTEM: ELECTRICAL AND INSTRUMENTATION

ITEM NAME: ET RSS/Sensor Cable, 314W32P61

PART NO.: 80900206955-009

FM CODE: A10

ITEM CODE: 50-05-01

REVISION: BASIC

CRITICALITY CATEGORY: 1R

REACTION TIME: Seconds

NO. REQUIRED: 1 each

DATE: August 31, 1998

CRITICAL PHASES: Boost

SUPERSEDES: N/A

FMEA PAGE NO.: D-768D

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SHEET 1 OF 4

APPROVED: P. Kalla

FAILURE MODE AND CAUSES: Loss of Arm and Fire commands electrical path from ar to the other SRB.

- 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 P61 caused by: connector not fully mated, mechanical overstress.

FAILURE EFFECT SUMMARY: Loss of two of four command paths for one SRB when clustered for functions 1-4 leading to loss of capability to destruct vehicle.

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:

- o Engineering Process Specifications. STP 6508 establishes the requirements to be met for fabrication and installation of airborne electrical interconnecting wire and cable assemblies. Harness assemblies produced as specified in STP 6508 will meet the applicable requirements of MIL-W-8160D and 40M39582A.

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- o The wire is procured from vendors that have qualification approval from Lockheed Martin. The vendors meet material specifications STM E659.
- o The connector is designed with alignment tolerances to ensure proper insertion. Pins have rounded tips and the insert is designed with a tapered entry to guide the male contact for a firm mating and to preclude bent pins.
- o Electrical wires, cables, and bundles are routed to avoid abrasion, cutting or piercing of the insulation by contact with rough surfaces or sharp edges along the mounting surfaces per STP 6508. Sufficient slack is provided for installed harnesses to avoid strain on the conductors within the harnesses, termination points, and associated connectors. Cables are supported by cushioned "P" clamps.
- o The backshells are designed to the same standards as the connector to ensure proper cable support and handling characteristics.
- o Ferrules are designed per MMC-58L-1-1/2 to fit tightly over wire or bundle with inner formation ring of a harder material. The outer crimp ring is a soft material. When installed on wire or bundle, the shield/ferrule termination is a snug fit. This termination is insulated and supported by shrinkable tubing.

B. TESTING:

VENDOR RELATED TESTING

- o Piece parts for the electrical system are procured and tested to approved Lockheed Martin Specifications E659, E741 and MSFC-SPEC-40M39569.

MAF Related Testing:

- o Perform Contact Retention Test (STP 6501).
- o Perform crimp tool certification test (STP 6504 for pins and sockets and STP 6503 for ferrules).
- o Perform DC Resistance Test of harness from end to end termination points (STP 6508 and TM04k).
- o Perform Dielectric Withstanding Voltage Test on Harness (STP 6508 and TM04k).
- o Perform Isolation Resistance Test (TM04k).

KSC RELATED TESTING

- o Verify RSS A&B Power Up capability and bus isolation per ORMSD File IV, requirement numbers T55DYN.011 and T55DYN.021.
- o SRSS Open Loop response with test code verifies open loop response per ORMSD File II, Vol. 1, requirement number S00000.390.
- o Verify operation of SRSS with flight code (Closed Loop) per ORMSD File II, Vol. 1, requirement number S00000.390.

The above referenced ORMSD testing is performed every flight.

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C. INSPECTION:

VENDOR RELATED INSPECTIONS

- o Surveillance by Lockheed Martin Procurement Quality is performed to ensure compliance with specifications.

MAF Related Inspections:

- o Verify certification of crimping tool (STP 6504 for pins and sockets and STP 6503 for ferrules).
- o Witness Contact Retention Test (STP 6501).
- o Inspect connector, pins or sockets for freedom of damage, are not broken, bent, misaligned or corroded, and the connector is free of foreign material (STP 6501).
- o Witness DC Resistance Test of harness from end to end termination points (STP 6508 and TM04k).
- o Inspect for proper crimp configuration and freedom of physical damage (STP 6504 for pins and sockets and STP 6503 for ferrules).
- o Inspect the installed harness per the installation requirements (STP 6508).
- o Inspect for freedom of damage of connector, backshell, attaching hardware and grommet (STP 6501).
- o Inspect wire for freedom of nicks, scrapes, cuts, breaks, abrasion or other physical damage prior to assembly (STP 6508).
- o Witness Dielectric Withstanding Voltage Test (STP 6508 and TM04k).
- o Witness Isolation Resistance Test (TM04k).

Critical Processes/Inspection/Operations

- o Crimp tool verification per STP 6503, STP 6504.
- o Crimp operation per STP 6503, STP 6504.
- o Connector assembly per STP 6501.

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KSC RELATED INSPECTIONS

- o Inspect connector, pins, or sockets for freedom of damage, are not broken, bent, misaligned or corroded, and connector is free of foreign material (STP 6501).
 - o Witness connector mating.
 - o Inspect intertank electrical cabling per ORMSD File IV, requirement number T75QAL010.
 - o Witness connector inspection prior to mating.
 - o SRSS open loop response with test code verifies open loop response per OMRSD File II, Vol. 1, requirement number S00000.380.
 - o Verify operation of SRSS with flight code (closed loop) per OMRSD File II, Vol. 1, requirement number S00000.390.
- D. FAILURE HISTORY:**
- o Failure Histories may be obtained from the PRACA database.
- E. OPERATIONAL USE:**
- o Not applicable to this failure mode.