

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS FMEA NO 05-6KA-2303 -1 REV: 11/03/87

ASSEMBLY : CRIT. FUNC: 1R
P/N RI : V070-751061 CRIT. HDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 2 EFFECTIVITY: X X X
: TWO PHASE(S): PL LO X CO X DO X LS
:

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
PREPARED BY: APPROVED BY: APPROVED BY (NASA):
DES D SOVEREIGN DES P.S. R. Breen SSM
REL J BEEKMAN REL William C. Don 11-14-87 REL [Signature]
QE [Signature] QE [Signature]
EPD&C 5041 [Signature] 7-22-87

ITEM:
DEDICATED SIGNAL CONDITIONER - LEFT AND RIGHT AFT RCS THRUSTER CHAMBER PRESSURE AND PROPELLANT INJECTOR TEMPERATURE MEASUREMENTS.

FUNCTION:
PROVIDES SIGNAL CONDITIONING FOR RCS PROPELLANT INJECTOR TEMPERATURES AND THRUSTER CHAMBER PRESSURE MEASUREMENTS FOR MULTIPLEXER-DEMULTIPLEXER (MDM) AND REACTION JET DRIVER AFT INPUTS.
51V75A25, 52V75A24.

FAILURE MODE:
ALL CREDIBLE MODES, LOSS OF OUTPUT, IMPROPER OUTPUT.

CAUSE(S):
PIECE PART FAILURE, CONTAMINATION THERMAL AND MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
(A) LOSS OF NON-REDUNDANT PRESSURE AND TEMPERATURE MEASUREMENTS.
(B) LOSS OF CRITICAL DATA FROM THRUSTERS (TEMPERATURES AND PRESSURES) GOVERNING USE OR DESELECTION BY GENERAL PURPOSE COMPUTER (GPC) SOFTWARE (REDUNDANCY MANAGEMENT). NO EFFECT - REDUNDANT THRUSTERS AVAILABLE TO COMPLETE FUNCTION.
(C,D) NO EFFECT
(B) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO PERFORM EXTERNAL TANK SEPARATION AND ENTRY MANEUVERS. REQUIRES ONE OTHER FAILURE (THRUSTER) BEFORE THE EFFECT IS MANIFESTED.

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DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A) DESIGN

CONSTRUCTION IS MODULAR, ALL CIRCUITS EMPLOY TYPICAL OP-AMPS AND DISCRETE
EEE PARTS SELECTED FROM MF0004-400 (OPPL) AND DERATED ACCORDINGLY.
MODULES CONFORMALLY COATED FOR ENVIRONMENTAL PROTECTION.

(B) TEST

ALL MODULES AND CHASSIS RECEIVE ATP, AVT, AND ATT. QUAL UNIT RECEIVED
ENVIRONMENTAL TESTING, INCLUDING - SHOCK, THERMAL AND VIBRATION.

GROUND TURNAROUND TEST - COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND
TURNAROUND BY MONITORING MEASUREMENTS DURING POWERUP.

(C) INSPECTION

RECEIVING INSPECTION

RECEIVING INSPECTION PERFORMS VISUAL AND DIMENSIONAL EXAMINATION OF ALL
INCOMING PARTS. CERTIFICATION RECORDS/TEST REPORTS ARE MAINTAINED
CERTIFYING MATERIALS AND PHYSICAL PROPERTIES.

CONTAMINATION CONTROL

QC VERIFIES REQUIRED PROCEDURES. SHOP PRACTICES ARE UTILIZED FOR
CONTAMINATION CONTROL.

ASSEMBLY/INSTALLATION

A DETAILED INSPECTION IS PERFORMED ON ALL PARTS PRIOR TO NEXT ASSEMBLY.
A CRIMP LOG IS MAINTAINED, AND CRIMP TOOL CALIBRATION VERIFICATION
COMPLIES WITH MSC-SPEC-Q-1A.

CRITICAL PROCESSES

ALL CRITICAL PROCESSES AND CERTIFICATIONS ARE MONITORED AND VERIFIED BY
INSPECTION. (TESTING) ATP OBSERVED AND VERIFIED BY QC.

HANDLING/PACKAGING

PARTS PACKAGED AND PROTECTED ARE VERIFIED BY INSPECTION TO APPLICABLE
REQUIREMENTS. SPECIAL HANDLING PER DOCUMENTED INSTRUCTIONS IS VERIFIED,
TO PRECLUDE DAMAGE, SHOCK, AND CONTAMINATION DURING COMPONENT
HANDLING/TRANSPORTING/PACKAGING BETWEEN WORK STATIONS.

(D) FAILURE HISTORY

THERE ARE NO DEDICATED SIGNAL CONDITIONER (DSC) GENERIC FAILURE TRENDS
ESTABLISHED FOR THE FAILURE MODES RELATED TO THIS TEMPERATURE MONITORING
FUNCTION. PROBABILITY OF FAILING STATIC IN THE TOLERABLE RANGE AND
PRECLUDING AN ALARM IS EXTREMELY REMOTE.

(E) OPERATIONAL USE

NO ACTION POSSIBLE DURING ASCENT. DURING ENTRY IF MORE THAN ONE JET PER
DIRECTION HAS BEEN DESELECTED BY REDUNDANCY MANAGEMENT, RESELECT ALL
JETS IN THAT DIRECTION TO ENSURE ADEQUATE VEHICLE CONTROL.