

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FWD-RCS

FMEA NO 05-6KF-2252 -3

REV: 11/03/87

ASSEMBLY : FWD PCA 1,2
 P/N RI : JANTX1N1204RA
 P/N VENDOR:
 QUANTITY : 4
 : FOUR
 :

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO X CO	DO LS

CRIT. FUNC: 1R
 CRIT. HDW: 3

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:
 DES D SOVEREIGN
 REL J BEEKMAN
 QE

APPROVED BY:
 DES P.S. R. Burns
 REL Mehra (L. Hor) 11-14-87
 QE [Signature]

APPROVED BY (NASA):
 SSM [Signature]
 REL M. [Signature] 11-14-87
 QE [Signature]

ED&C SSM [Signature]
 FROM 1, 31464

ITEM:

ISOLATION DIODE (12 AMP) - FORWARD RCS HELIUM ISOLATION VALVE A AND B SOLENOID POWER CIRCUIT.

FUNCTION:

PROVIDES ISOLATION BETWEEN TWO POWER INPUT CIRCUITS TO THE "OPEN" SOLENOID COIL OF HELIUM ISOLATION VALVES A AND B FOR THE FORWARD RCS PRESSURIZATION SYSTEMS.
 81V76A22CRI3,37. 82V76A23CR7,8.

FAILURE MODE:

SHORT TO GROUND

CAUSE(S):

CONTAMINATION, VIBRATION (MOUNTING SURFACE)

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF REDUNDANCY - THE UPSTREAM SIDE OF ONE OF TWO DIODES FEEDING COMMON POINT IS GROUNDED AND LOST AS A VOLTAGE SOURCE. ALSO AN ASSOCIATED REMOTE POWER CONTROLLER WILL TRIP OFF WITH A DEAD SHORT TO GROUND.

(B) LOSS OF INTERFACE REDUNDANCY - ONE OF TWO MEANS OF POWERING THE OPENING SOLENOID COIL OF THE AFFECTED ISOLATION VALVE IS LOST.

(C,D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE LOSS OF CREW/VEHICLE DUE TO LACK OF PRESSURIZATION TO PERFORM NOMINAL EXTERNAL TANK SEPARATION. THREE OTHER FAILURES (SAME DIODE INTERNAL SHORT, REGULATOR B FAILED CLOSE, AND LOSS OF ULLAGE) ARE REQUIRED BEFORE TANK PRESSURIZATION FUNCTION IS LOST AND A NOMINAL EXTERNAL TANK SEPARATION CANNOT BE PERFORMED. FAILURE IS NOT DETECTABLE IN-FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX F, ITEM NO. 2 - DIODE, POWER - STUD MOUNTED.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GENERAL PURPOSE COMPUTER (GPC) COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. IF VALVE FAILS TO OPEN, USE REDUNDANT FLOW PATH.