

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2119 -2 REV:06/15/88

ASSEMBLY : AFT LCA-1,2,3 CRIT. FUNC: 1R  
P/N RI : JANTXVIN5551 CRIT. HDW: 3

P/N VENDOR: VEHICLE 102 103 104  
EFFECTIVITY: X X X  
QUANTITY : 6 PHASE(S): PL X LO X OO DO LS  
: SIX  
:

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

PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
DES J BROWN DES [Signature] EPDC SSM [Signature]  
REL DEFENSOR REL Kamura 6/27/88 EPDC RYEN [Signature]  
QE D MASAI QE J.J. Coonan 6/27/88 MPS SSM [Signature]  
MPS REL [Signature] QE [Signature]

ITEM:  
DIODE, BLOCKING (3 AMP), HELIUM ISOLATION VALVE A(LV1/3/5) SWITCH AND MDM OPEN COMMAND OUTPUT.

FUNCTION:  
CONDUCTS SWITCH MANUAL AND MDM OPEN COMMAND FOR CONTROL OF POWER TO HELIUM SUPPLY ISOLATION VALVE A.  
54V76A121J1(81), J3(76). 55V76A122J1(81), J3(76). 56V76A123J1(81), J3(76).

FAILURE MODE:  
SHORT (END TO END).

CAUSE(S):  
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION, ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

EFFECT(S) ON:  
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF ISOLATION BETWEEN MANUAL SWITCH AND MDM OPEN COMMANDS.  
(B,C,D) NO EFFECT - FIRST FAILURE.

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- (E) 1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE.  
TIME FRAME - ENGINE OPERATION.
- 1) DIODE SHORT (END TO END).
  - 2) ASSOCIATED SWITCH CONTACT SHORTS TO GROUND RESULTING IN CLOSURE OF ISOLATION VALVE A.
  - 3) HELIUM SUPPLY ISOLATION VALVE B (LV2/4/6) FAILS CLOSED.

FAILURES WILL RESULT IN LOSS OF HELIUM REQUIRED TO PERFORM CONTINUOUS PURGING OF HIGH PRESSURE OXIDIZER TURBOPUMP INTERMEDIATE SEAL CAVITY. THIS CAVITY IS BETWEEN TWO SEALS, ONE OF WHICH CONTAINS THE HOT, FUEL-RICH GAS IN OXIDIZER TURBINE AND THE OTHER CONTAINS THE LIQUID OXYGEN IN OXIDIZER TURBOPUMP. LEAKAGE THROUGH ONE OR BOTH SEALS COULD RESULT IN A CATASTROPHIC EXPLOSION IF ALLOWED TO ACCUMULATE. CONTINUOUS OVERBOARD PURGE OF THIS AREA PREVENTS THIS ACCUMULATION FROM OCCURRING. POSSIBLE LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT FAILURE.

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. 4 - DIODE, AXIAL LEAD.

(B) GROUND TURNAROUND TEST

MDM AND D&C CMD VERIF, V41AAO.010, V41AAO.030, V41AAO.050 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.