

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2073 -2 REV: 11/19/87

ASSEMBLY : AFT PCA-4, 5, & 6 CRIT. FUNC: 1R
 P/N RI : JANTX1N1204RA CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 12 EFFECTIVITY: X X X
 : TWELVE PHASE(S): PL X LO X OO DO LS
 : 4 PER PREVALVES 1, 2, 3

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES J BROWN DES R V Brown EPDC SSM Chadwick H L C Sta
 REL F DEFENSOR REL Mohamed Al Ham 12/5/87 EPDC REL Chadwick H L C Sta
 QE D M D MASAI QE Chadwick H L C Sta 12/9/87 MPS REL Chadwick H L C Sta
 QE Chadwick H L C Sta

ITEM:

DIODE, ISOLATION (12 AMP), LO2 PREVALVE 1, 2 & 3 POWER, CLOSE SOLENOID.

FUNCTION:

USED TO ISOLATE REDUNDANT MAIN BUS POWER TO A COMMON SOLENOID. LOCATED AT REMOTE POWER CONTROLLER OUTPUT AHEAD OF HYBRID DRIVER CONTROLLER IN EACH OF TWO 'CLOSE' SOLENOID CIRCUITS.

LO2 PREVALVE 1 - 54V76A134A4CR19, 29 AND 55V76A135A4CR20, 23.

LO2 PREVALVE 2 - 55V76A135A4CR19, 29 AND 56V76A136A4CR20, 33.

LO2 PREVALVE 3 - 54V76A134A4CR20, 33 AND 56V76A136A4CR19, 29.

FAILURE MODE:

SHORTS, INTERNAL SHORTS, CURRENT LEAKAGE

CAUSE(S):

CONTAMINATION, MECHANICAL SHOCK, VIBRATION, THERMAL STRESS.

EFFECT(S) ON:

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

(A) LOSS OF BUS ISOLATION.

(B, C, D) NO EFFECT - FIRST FAILURE.

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF MAIN BUS TO SERIES RPC CAUSING PARALLEL RPC TO TRIP WHICH RESULTS IN LOSS OF CLOSE SOLENOID POWER. THIRD FAILURE - FAILURE OF REDUNDANT CLOSE SOLENOID) RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECO + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS B SCREEN BECAUSE RPC WILL NOT TRIP UNTIL SECOND FAILURE.

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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

MDM COMMAND REDUNDANCY, V41AEO.380K,O,Q; 400K,O,Q; 420K,O,Q EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), L02 17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.

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