

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2073 -1 REV: 11/04/87

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 IS
 : 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 [Signature] EPDC SSM [Signature]
 REL F DEFENSOR REL [Signature] MPS SSM [Signature]
 QE D MASAI QE DM [Signature] EPDC REL [Signature]
 MPS REL [Signature]

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, 33.
 LO2 PREVALVE 2 - 55V76A135A4CR19, 29 AND 56V76A136A4CR20, 33.
 LO2 PREVALVE 3 - 54V76A134A4CR20, 33 AND 56V76A136A4CR19, 29.

FAILURE MODE:
 OPENS, FAILS OPEN, FAILS TO CONDUCT POWER.

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

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

(A) LOSS OF ONE OF TWO POWER PATHS TO CLOSE SOLENOID.

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

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF SECOND POWER PATH TO CLOSE SOLENOID, REDUNDANT SOLENOID PERFORMS FUNCTION. THIRD FAILURE- FAILURE OF REDUNDANT CLOSE SOLENOID) RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECC + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS 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.380L,P; 400L,P; 420L,P EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO2
17-INCH DISCONNECT (PD1); DRAIN MANIFOLD.