

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - ARPCS

FMEA NO 05-6UC-201

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REV: 12/05/88

ASSEMBLY : FNL L2A1
 P/N RI : ME452-0102-7101
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 : ONE PER VALVE

CRIT. FUNC: 1
 CRIT. HDW: 1
 VEHICLE 102 103 104
 EFFECTIVITY: X X X
 PHASE(S): PL X LO X OO X DO X LS X

REDUNDANCY SCREEN: A-N/A B-N/A C-N/A
 PREPARED BY: J BROWN DES APPROVED BY: [Signature] APPROVED BY (NASA): [Signature]
 DES J BROWN DES REL [Signature] SSM [Signature]
 REL M ROVE REL [Signature] REL [Signature]
 QE J COURSEN QE [Signature] QE [Signature]
 EPDC REL [Signature]
 EPDC SSM [Signature]

ITEM:

SWITCH, TOGGLE (ONE POLE, TWO POSITIONS-"OPEN" AND "CLOSE") - O2 CROSSOVER VALVE CONTROL.

FUNCTION:

PROVIDES MANUAL CONTROL OF MAIN DC BUS POWER TO O2 CROSSOVER VALVE SOLENOID CIRCUIT, SYSTEMS 1 AND 2. O2 CROSSOVER VALVE IS SPRING LOADED CLOSED AND IS POWERED OPEN DURING ALL MISSION PHASES. (THIS FMEA IS APPLICABLE FOR THE CASE WHEN THE AUXILIARY O2 TANK IS NOT INSTALLED. FAILURE EFFECTS FOR THE CASE OF AUXILIARY O2 INSTALLED WILL BE ADDRESSED IN THE MISSION KIT FMEA ON A MISSION BY MISSION BASIS).
 31V73A2A1S15, 31V73A2A1S18.

FAILURE MODE:

FAILS IN THE "CLOSE" POSITION, FAILS OPEN, SHORTS TO CASE (GROUND).

CAUSE(S):

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION, PROCESSING ANOMALY.

EFFECT(S) ON:

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

(A) LOSS OF POWER TO HOLD OPEN ONE O2 CROSSOVER VALVE.

(B) LOSS OF CROSS-TIE CAPABILITY BETWEEN TWO O2 DISTRIBUTION LOOPS AND LOSS OF ONE O2 SOURCE TO LAUNCH AND ESCAPE SUITS (L.E.S.) AND AIRLOCK.

(C) POSSIBLE EARLY MISSION TERMINATION AS ONLY ONE OXYGEN SOURCE REMAINS FOR AIRLOCK AND L.E.S. REQUIREMENTS.

(D) ONE OF TWO TOGGLE SWITCHES FAILED OPEN RESULTS IN ONE OF TWO O2 CROSSOVER VALVES FAILED CLOSED RESULTING IN INSUFFICIENT O2 SUPPLY TO L.E.S. SYSTEM. LOSS OF THIS EMERGENCY SYSTEM (L.E.S.) IN A CABIN/CREW ATMOSPHERE WHERE HARMFUL CONTAMINANTS OR DEPRESSURIZATION EXIST MAY RESULT IN LOSS OF CREW/VEHICLE.

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SUBSYSTEM : EPD&C - ARPCS

FMEA NO 05-6UC-201 -1

REV: 12/08/88

DISPOSITION & RATIONALE:

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

(A, B, C, D) DISPOSITION AND RATIONALE

REFER TO APPENDIX A ITEM NO. 1 - TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

OPERATION OF THE O2 CROSSOVER VALVE CIRCUIT IS VERIFIED FOR SYSTEMS 1 AND 2 AS PART OF THE EMERGENCY O2 TEST (L.E.S.) PRIOR TO EACH FLIGHT.

(E) OPERATIONAL USE

CREW RESPONSE

WITH MISSION CONTROL APPROVAL, ATTEMPT TO RESET CIRCUIT BREAKER AND OPERATE SWITCH TO "OPEN" POSITION.

TRAINING

NONE.

OPERATIONAL CONSIDERATION

REAL TIME DATA SYSTEM ALLOWS FOR GROUND MONITORING.

FAILURE IS VIRTUALLY UNDETECTABLE BY CREW UNTIL SECOND FAILURE OF OTHER VALVE (SWITCH, CB) AND L.E.S. USE IS REQUIRED.

VALVES ARE NORMALLY FLOWN IN OPEN (POWERED POSITION).

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