

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - ARS:COOLING FMEA NO 05-6UB-4006 -1 REV:03/21/88

ASSEMBLY : SWITCH PANEL L1A2 CRIT. FUNC: 1R
P/N RI : ME452-0102-7301 CRIT. EDW: 2
P/N VENDOR: VEHICLE 102 103 104
QUANTITY : 1 (ONE) EFFECTIVITY: X X X
: PER SUBSYSTEM PHASE(S): PL LO X OC X DO X LS

REDUNDANCY SCREEN: A-PASS B-N/A C-PASS

PREPARED BY: J BROWN APPROVED BY: APPROVED BY (NASA):
DES REL M HOVE DES REL M HOVE SSM
QE J COURSEN QED

SPDC REL TO [Signature] 4/20/88
SPDC REL TO [Signature] 6/22/88

ITEM: SWITCH, TOGGLE (3 POLE, TWO POSITION). LOOP 1 WATER PUMPS (A OR B). 31V73A1A2S44.

FUNCTION: PROVIDES CAPABILITY TO SELECT EITHER PUMP A OR PUMP B IN LOOP #1 TO BE OPERATED IN THE MODE DETERMINED BY S3.

FAILURE MODE: FAILS OPEN, PREMATURE OPEN, SHORT-TO-CASE (GROUND)

CAUSE(S): VIBRATION, CONTAMINATION, PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, PROCESSING ANOMALY.

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

(A) LOSS OF POWER TO LOOP 1 WATER PUMPS.
(B) LOSS OF COOLING LOOP PERFORMANCE UNTIL REDUNDANT LOOP IS ACTIVATED.
(C) LOSS OF ONE WATER COOLANT LOOP REQUIRES POSSIBLE ENTRY AT THE NEXT PRIMARY LANDING SITE.
(D) FIRST FAILURE - NO EFFECT.
(E) THIS FAILURE IN COMBINATION WITH LOSS OF REDUNDANT COOLANT LOOP RESULTS IN LOSS OF AVIONICS COOLING (AIR AND WATER COOLED AVIONICS). LOSS OF AVIONICS COOLING RESULTS IN POTENTIAL LOSS OF CREW/VEHICLE.

SCREEN B IS N/A DUE TO STANDBY REDUNDANCY.

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.

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(B) GROUND TURNAROUND TEST

DURING GROUND TURNAROUND, FUNCTIONAL TESTS ARE RUN ON LOOP 1 PUMP CONTROLS FOR PUMPS A AND B, IN BOTH GPC AND MANUAL MODES. OPERATION IS VERIFIED BY MONITORING CURRENTS IN ALL THREE AC PHASES, PUMP DELTA PRESSURES, AND SWITCH SCAN MEASUREMENTS.

(E) OPERATIONAL USE

-CREW RESPONSE

-ACTIVATE REDUNDANT H2O COOLANT LOOP.

-TRAINING

-CURRENT ECLSS TRAINING COVERS THE GENERIC EFFECT OF THIS FAILURE.

-OPERATIONAL CONSIDERATION

-REAL TIME DATA SYSTEM ALLOWS FOR GROUND MONITORING.