

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - HYDRAULICS FMEA NO 05-6G -2114 -2 REV:02/19/88

ASSEMBLY : AFT PCA 4, 5, AND 6
 P/N RI : MC455-0134-0004 CRIT. FUNC: 1R
 P/N VENDOR: VEHICLE 102 CRIT. HDW: 3
 QUANTITY : 12 EFFECTIVITY: X 103 104
 : TWELVE PHASE(S): PL LC X 00 DO X LS
 :

PREPARED BY: REDUNDANCY SCREEN: A-FAIL B-FAIL C-PASS
 DES J HERMAN APPROVED BY: APPROVED BY (NASA):
 REL T KIMURA DES *[Signature]* SSM *[Signature]*
 QE J COURSEN REL *[Signature]* 3/2/88
 QE *[Signature]* 3/4/88
 EPD&C REL *[Signature]* 3/2/88
 EPD&C SSM w/ *[Signature]* 3-4-88

ITEM: GENERAL PURPOSE
 CONTACTOR, POWER-(125 AMP), HYDRAULIC CIRCULATION PUMP CONTROL CIRCUIT

FUNCTION:
 PROVIDES REDUNDANT POWER TO HYDRAULIC CIRCULATION PUMP. 54V76A134K3, K4, K5, K6; 55V76A135K3, K4, K5, K6; 56V76A136K3, K4, K5, K6

FAILURE MODE:
 INTERNAL SHORT

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

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

(A) FIRST FAILURE - NO EFFECT. SECOND FAILURE (LOSS OF ASSOCIATED SERIES RELAY) - CONTINUOUS POWER TO CIRCULATION PUMP

(B) FIRST FAILURE - NO EFFECT. SECOND FAILURE - CONTINUOUS USE OF CIRCULATION PUMP WHICH WOULD INCREASE POWER CONSUMPTION (2000 WATTS)

(C,D) FIRST FAILURE - NO EFFECT

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FOUR FAILURES (FIRST FAILURE - NO EFFECT. SECOND FAILURE - INADVERTENT CLOSURE OF ASSOCIATED RELAY IN SAME CIRCUIT RESULTING IN CONTINUOUS POWER TO THE CIRCULATION PUMP WHICH WOULD "DEAD HEAD" DURING MAIN PUMP OPERATIONS ON ASCENT. THIS RESULTS IN THE LOSS OF THE CIRCULATION PUMP AND ABILITY TO REPRESS BOOTSTRAP PRESSURE. THIRD FAILURE - LOSS OF ONE HYDRAULIC SYSTEM (LOSS OF BOOTSTRAP PRESSURIZATION LEADING TO INABILITY TO START MAIN PUMP). FOURTH FAILURE - LOSS OF SECOND HYDRAULIC SYSTEM).

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SCREEN A FAILS BECAUSE INTERNAL SHORT OF CONTACT "A" OF RELAYS K3 AND K5 IS NOT GROUND DETECTABLE WITHOUT VEHICLE MODIFICATION.

SCREEN B FAILS BECAUSE FAILURE IS NOT DETECTABLE UNTIL SECOND FAILURE OCCURS (ASSOCIATED RELAY IN SAME CIRCUIT FAILS CLOSED).

DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX C, ITEM NO. 5 - GENERAL PURPOSE CONTACTOR

(B) GROUND TURNAROUND TEST

CONTACT "A" OF RELAYS K3 AND K5 ARE NOT GROUND DETECTABLE.

V58AJO.020, "CIRC PUMP ELECTRICAL VERIFICATION" (PERFORMED PRIOR TO EACH FLIGHT). VERIFY PUMP OPERATION WITH APPROPRIATE BUS DROPS, SWITCH COMMANDS, AND GPC COMMANDS.

(E) OPERATIONAL USE

NONE