

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - HYDRAULICS FMEA NO 05-6G -2110 -2 REV:02/19/88

ASSEMBLY : AFT LCA 1, 2, AND 3

F/N RI : MC477-0263-0002

F/N VENDOR:

QUANTITY : 12

: TWELVE

:

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO X OO	DO X LS

CRIT. FUNC: 1R

CRIT. HDW: 3

PREPARED BY:

DES

REL

QE

J HERMAN

T KIMURA

J COURSEN

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

APPROVED BY:

DES

REL

QE

APPROVED BY (NASA):

SSM

REL

QE

Handwritten notes:
 EPD&C Rel *[Signature]* 3/2/88
 EPD&C SSM *[Signature]* 3/3/88
 EPD&C SSM *[Signature]* 3/4/88

ITEM:

CONTROLLER, HYBRID DRIVER, HDC TYPE 3 - HYDRAULIC CIRCULATION PUMP 1, 2, AND 3 CONTROL AND POWER CIRCUITS

FUNCTION:

ENERGIZES THE CIRCULATION PUMP RELAYS. 54V76A121AR(J9-32), (J6-DD), (J6-CC), (J9-30); 55V76A122AR(J9-32), (J6-DD), (J6-CC), (J9-30); 56V76A123AR(J9-32), (J6-DD), (J6-CC), (J9-30)

FAILURE MODE:

INADVERTENT OUTPUT

CAUSE(S):

VIBRATION, THERMAL STRESS, CONTAMINATION, MECHANICAL SHOCK, PIECE-PART FAILURE

EFFECT(S) ON:

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

(A) FIRST FAILURE - NO EFFECT. SECOND FAILURE (OTHER TYPE 3 DRIVER IN SAME CIRCUIT) - 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 - INADVERTENT OUTPUT OF HDC-3 - NO EFFECT. SECOND FAILURE - LOSS OF OTHER TYPE 3 DRIVER IN SAME CIRCUIT RESULTING IN CONTINUOUS POWER TO CIRCULATION PUMP WHICH WOULD "DEAD HEAD" DURING MAIN PUMP OPERATIONS ON ASCENT. THIS RESULTS IN LOSS OF 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 B FAILS BECAUSE FAILURE IS NOT FLIGHT DETECTABLE WITHOUT A SECOND FAILURE (HDC TYPE 3 DRIVER IN SAME CIRCUIT FAILS ON).

DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER

(B) GROUND TURNAROUND TEST

V58AJ0.020, "CIRC PUMP ELECTRICAL VERIFICATION" (PERFORMED PRIOR TO EACH FLIGHT). VERIFY CIRCULATION PUMP OPERATION WITH APPROPRIATE BUS DROPS, SWITCH COMMANDS, AND GPC COMMANDS.

(E) OPERATIONAL USE

NONE