

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C HYDRAULICS (WSB) FMEA NO 05-6WA-2129 -2 REV:11/30/87

ASSEMBLY : PANEL R2				CRIT. FUNC: 1R
P/N RI : MC455-0135-0001				CRIT. HDW: 2
P/N VENDOR:		VEHICLE	102 103 104	
QUANTITY : 3		EFFECTIVITY:	X X X	
: THREE		PHASE(S):	PL LO X OO DO X LS	
:				

PREPARED BY:		REDUNDANCY SCREEN:	A-PASS B-PASS C-PASS
DES J HERMAN	APPROVED BY:	APPROVED BY (NASA)	11/15/87
REL T KIMURA	DES <i>[Signature]</i>	SSM <i>[Signature]</i>	11/15/87
QE J COURSEN	REL <i>[Signature]</i> 12-5-87	REL <i>[Signature]</i> 12/21/87	
	QE <i>[Signature]</i> 12/21/87	QE <i>[Signature]</i> 1/20/88	

EPDC *[Signature]*
EPDC Rev *[Signature]* 2/24/88

ITEM:
RELAY, HYBRID, GROUND

FUNCTION:
PROVIDES ACCESS TO THE 115 VAC FLIGHT BUS FOR POWER TO THE WATER SPRAY BOILER (WSB) BYPASS VALVE, TRANSDUCERS, CONTROLLER LOGIC, AND SIGNAL CONDITIONING FOR BOTH CONTROLLERS. 32V73A2K1, K2, K3

FAILURE MODE:
FAILS OPEN, SHORTS TO GROUND

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

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

(A) LOSS OF AC POWER TO BYPASS VALVE AND POWER SUPPLY IN WSB CONTROLLER (A AND B). LOSS OF DC POWER TO WSB TRANSDUCERS, CONTROLLER LOGIC, AND SIGNAL CONDITIONERS - LOSS OF ONE WSB.

(B) UNABLE TO PROVIDE THERMAL CONTROL FOR ONE APU/HYD LUBE OIL SYSTEM. POSSIBLE LOSS OR LIMITED RUN TIME OF ONE AUXILIARY POWER UNIT/HYDRAULICS (APU/HYD) SYSTEM DUE TO LOSS OF COOLING. LIMITED RUN TIME MAY NOT ALLOW APU/HYD SYSTEM TO SUPPORT ENTIRE POWERED FLIGHT OR ENTRY PHASE. LOSS OF HYDRAULIC CAPABILITY TO THROTTLE ONE MAIN ENGINE, LOSS OF HYDRAULIC LANDING GEAR DEPLOY AND NOSEWHEEL STEERING IF SYSTEM ONE IS LOST, AND LOSS OF ONE OF THREE ET UMBILICAL RETRACT ACTUATORS FOR EACH UMBILICAL PLATE. LOSS OF REDUNDANT HYDRAULIC POWER SYSTEM FOR FOUR TVC ACTUATORS. LOSS OF ONE OF THREE HYDRAULIC POWER SYSTEMS TO FLIGHT CONTROL SURFACES AND BRAKES.

(C) ABORT DECISION - REMAINING TWO SYSTEMS WILL PROVIDE SAFE RETURN

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(D) NO EFFECT - FIRST FAILURE

(E) POSSIBLE LOSS OF CREW/ VEHICLE WITH TWO FAILURES - (1) THIS FAILURE (RESULTING IN LOSS OF ONE WSB AND ASSOCIATED APU/HYD SYSTEM), (2) A SECOND FAILURE (FOR EXAMPLE, FAILURE OF THE CORRESPONDING HYBRID RELAY IN ANOTHER WSB SYSTEM) RESULTING IN THE LOSS OF A SECOND WSB AND ASSOCIATED APU/HYD SYSTEM.

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. 1 - HYBRID RELAY

(B) GROUND TURNAROUND TEST

V58ALO.010, "WSB CONTROLLER A ELECTRICAL VERIF" (PERFORMED PRIOR TO FIRST FLIGHT AND FOR LRU RETEST)

V58ALO.011, "WSB CONTROLLER B ELECTRICAL VERIF" (PERFORMED PRIOR TO EACH FLIGHT PLUS FOR LRU RETEST)

VERIFY THAT THE PREFLIGHT TEST BUS, IN CONJUNCTION WITH GROUND MDM COMMANDS, WILL PROVIDE AC AND DC POWER TO THE WSB CONTROLLER.

(E) OPERATIONAL USE

ASCENT - SHUT DOWN AFFECTED APU/HYD SYSTEM AT AN APPROPRIATE TIME BASED ON THE FLIGHT PHASE AND SYSTEM TEMPERATURE. ENTRY - SHUT DOWN AFFECTED APU/HYD SYSTEM OR DELAY APU START IF FAILURE IS KNOWN PRIOR TO DEORBIT.