

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C HYDRAULICS (WSB) FMEA NO 05-6WA-2054 -1 REV: 11/30/87

ASSEMBLY : PANEL R2				CRIT. FUNC: 1R
P/N RI : ME452-0102-7201				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):	
REL T KIMURA	DES # <i>R. B. ...</i>	SSM <i>[Signature]</i>	
QE J COURSEN	REL <i>[Signature]</i>	REL <i>[Signature]</i>	
	QE <i>[Signature]</i>	QE <i>[Signature]</i>	

EPDC *[Signature]*
 EPOC *[Signature]*

ITEM:

SWITCH, TOGGLE, 2 POLE 2 POSITION, "APU/HYD BOILER PWR"

FUNCTION:

ENABLES THE WATER SPRAY BOILER (WSB) CONTROLLERS. THE WSB'S MAINTAIN TEMPERATURE CONTROL OF THE ORBITER'S HYDRAULIC FLUID AND THE APU'S LUBE OIL. 32V73A2S38, S39, AND S40

FAILURE MODE:

FAILS OPEN, SHORTS TO GROUND, FAILS IN "OFF" POSITION

CAUSE(S):

PIECE-PART STRUCTURAL FAILURE, CONTAMINATION, MECHANICAL SHOCK, VIBRATION

EFFECT(S) ON:

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

(A) UNABLE TO PROVIDE SPRAY VALVE ENABLE SIGNALS TO CONTROLLERS A AND B RESULTING IN LOSS OF SPRAY VALVE FUNCTION FOR COOLING HYD FLUID AND APU LUBE OIL. LOSS OF ONE WATER SPRAY BOILER

(B) UNABLE TO PROVIDE THERMAL CONTROL FOR ONE APU/HYD LUBE OIL SYSTEM. POSSIBLE LOSS OR LIMITED RUN TIME OF ONE 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 HYD CAPABILITY TO THROTTLE ONE MAIN ENGINE, LOSS OF HYD 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 PROVIDE SAFE RETURN

(D) NO EFFECT - FIRST FAILURE

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(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 A TOGGLE SWITCH ON ANOTHER WSB) RESULTING IN 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 A, ITEM NO. 1 - TOGGLE SWITCH

(B) GROUND TURNAROUND TEST

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

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

VERIFY CONTROLLER POWER BY OPERATION OF "BOILER PWR", "BOILER CNTLR/HTR", AND "BOILER N2 SUPPLY" SWITCHES. VERIFY BOILER "READY" CONDITION WITH SWITCHES ACTIVATED.

(E) OPERATIONAL USE

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