

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C HYDRAULICS (WSB) FMEA NO 05-6WA-2051 -1 REV: 11/30/87

ASSEMBLY : PANEL R2				CRIT. FUNC: 1R
P/N RI : ME452-0102-7303				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:	DES <i>[Signature]</i>	APPROVED BY (NASA):
REL T KIMURA	REL <i>[Signature]</i>	REL <i>[Signature]</i>	SSM <i>[Signature]</i>
QE J COURSEN	QE <i>[Signature]</i>	QE <i>[Signature]</i>	QE <i>[Signature]</i>

EPD&C REC *[Signature]* 2/24/88

ITEM: SWITCH, TOGGLE, 3 POLE 3 POSITION, "APU/HYD BOILER CNTRL/HTR"

FUNCTION: PROVIDES POWER TRANSFER CONTROL FOR THE WATER SPRAY BOILER (WSB) CONTROLLERS AND RESPECTIVE HEATERS (HEATER NO'S. 1, 2, AND 3 FOR WSB NO'S. 1, 2, AND 3). 32V73A2S41, S42, S43

FAILURE MODE: FAILS OPEN, SHORTS TO GROUND (ALL CONTACTS)

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) LOSS OF FUNCTION - NO POWER IS TRANSFERRED TO CONTROLLERS A AND B. 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 THE LOSS OF COOLING. LIMITED RUN TIME MAY NOT ALLOW APU/HYD SYSTEM TO SUPPORT THE 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
- (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) SECOND FAILURE (FOR EXAMPLE, FAILURE OF 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 AND FOR LRU RETEST)

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

VERIFY CONTROLLER POWER BY OPERATION OF THE "BOILER PWR", "BOILER CNTLR/HTR", AND "BOILER N2 SUPPLY" SWITCHES. VERIFY HYDRAULIC WATER BOILER SPRAY VALVE ACTIVATION WITH SWITCHES ACTIVATED AND HIGH HYDRAULIC FLUID TEMPERATURE SIMULATED.

(E) OPERATIONAL USE

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