

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SYSTEM : EPD&C - MAIN PROP.

FMEA NO 05-6J -2302 -1

REV:06/22/88

ASSEMBLY : PANEL R2  
 P/N RI : ME452-0102-7203  
 P/N VENDOR:  
 QUANTITY : 1  
 : ONE  
 :

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

CRIT. FUNC: 1R  
 CRIT. HDW: 2

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

PREPARED BY:  
 DES *JMB* J BROWN  
 REL *JF* DEFENSOR  
 QE *DMM* D MASAI

APPROVED BY:  
 DES *[Signature]*  
 REL *J Kamura 6/27/88*  
 QE *J.D. Conson 6/27/88*

APPROVED BY (NASA):  
 EPDC SSM *[Signature]*  
 MPS SSM *[Signature]*  
 EPDC REL *[Signature]*  
 MPS REL *[Signature]*  
 QE *[Signature]*

ITEM:  
 TOGGLE SWITCH (TWO POLES, THREE POSITIONS), PNEUMATIC HELIUM SUPPLY ISOLATION VALVE NO. 1 AND 2 (LV7/8) CONTROL CIRCUIT.

FUNCTION:  
 PROVIDES MANUAL CONTROL OF POWER TO CONTROL SOLENOID OF PNEUMATIC HELIUM SUPPLY ISOLATION VALVES. 32V73A2S15.

FAILURE MODE:  
 CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" CONTACTS).

CAUSE(S):  
 PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY.

EFFECT(S) ON:  
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY  
 (A) LOSS OF POWER TO BOTH PNEUMATIC HELIUM SUPPLY VALVE CONTROL SOLENOIDS.  
 (B,C,D) FIRST FAILURE - NO EFFECT.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.  
TIME FRAME - PRE LAUNCH AND ASCENT.  
1) CONTACT-TO-CONTACT SHORT (BOTH "CLOSE" CONTACTS), RESULTING IN CLOSURE OF PNEUMATIC ISOLATION VALVES.  
2) CROSSOVER VALVE (LV10) FAILS TO OPEN/REMAIN OPEN.

THE HELIUM REGULATOR AND ACCUMULATOR PRESSURES ARE MONITORED BY THE LCC PRIOR TO T MINUS 10 SECONDS. FAILURE SUBSEQUENT TO T MINUS 10 SECONDS WILL NOT PREVENT LAUNCH. THERE SHOULD BE SUFFICIENT HELIUM REMAINING IN THE ACCUMULATOR LEG TO OPERATE THE LH2 PREVALVES PRIOR TO ENGINE START AND THEIR VALVE OPEN INDICATIONS WILL PASS THEIR LCC CHECKS AT T MINUS 7 SECONDS. ACTUATION OF VALVES PRIOR TO LIFT-OFF REDUCES THE PRESSURE OF THE GAS REMAINING IN THE ACCUMULATOR. AT MECO, IF LV10 DOES NOT REPLENISH THE ACCUMULATOR PRESSURE, THE REDUCED PRESSURE WILL NOT CLOSE THE LO2 PREVALVES WITHIN THE TIME REQUIRED BY THE ENGINE (0.95 +/- 0.20 SECONDS) AND UNCONTAINED ENGINE DAMAGE MAY RESULT.

POSSIBLE LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41AAG.070A EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

EFFECTIVE FOR OI-8D SOFTWARE, CR89397B "MPS PNEUMATIC SYSTEM FDA AND DISPLAY - BFS" ADDS PNEUMATIC TANK, REGULATOR, AND ACCUMULATOR PRESSURE TO THE S/M ALERT FDA SYSTEM AND ADDS THE 3 PRESSURE MEASUREMENTS TO THE BFS SYSTEM SUMMARY DISPLAY. THIS ALLOWS THE FLIGHT CREW TO RESPOND TO A PNEUMATIC HELIUM SYSTEM LEAK INDEPENDENT OF GROUND CONTROL.

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