

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2064 -2 REV:06/16/88

ASSEMBLY : D & C PANEL R4	CRIT. FUNC:	1
P/N RI : ME452-0102-7257	CRIT. HDW:	1
P/N VENDOR:	VEHICLE	102 103 104
QUANTITY : 1	EFFECTIVITY:	X X X
: ONE	PHASE(S):	PL LO X OO DO LS

PREPARED BY:	APPROVED BY:	REDUNDANCY SCREEN: A- B- C-
DES <u>JNO</u> J BROWN	DES <u>[Signature]</u>	APPROVED BY (NASA):
REL <u>gdf</u> DEFENSOR	REL <u>J Kamura 6/27/88</u>	EPDC SSM <u>[Signature]</u>
QE <u>Dun D MASAI</u>	QE <u>[Signature] 6/10/88</u>	MPS SSM <u>[Signature]</u>
		EPDC RED <u>[Signature]</u>
		MPS REP <u>[Signature]</u>
		QE <u>[Signature]</u>

ITEM:

SWITCH, TOGGLE (2 POLES, 3 POSITIONS, LEVER LOCK), LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES (LV42, 43).

FUNCTION:

PROVIDES MANUAL CONTROL OF POWER TO LH2 HELIUM MANIFOLD REPRESSURIZATION VALVE SOLENOID. 32V73A4S2.

FAILURE MODE:

CONTACT-TO-CONTACT SHORT (BOTH "OPEN" POLES).

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) INADVERTENT MANUAL OPEN COMMAND TO SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES.

(B) INADVERTENT OPENING OF TWO SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES.

REPRESS REGULATOR (PR6) DOES NOT PROVIDE REDUNDANT HELIUM ISOLATION SINCE REGULATOR CONTROLS TO A MANIFOLD PRESSURE OF 17-30 PSIG AND THE MANIFOLD PRESSURE DURING ASCENT IS IN THIS RANGE. RESULTS IN HELIUM ENTERING THE FEEDLINE MANIFOLD. THIS MAY CAUSE MULTIPLE UNCONTAINED ENGINE FAILURES DUE TO HELIUM BUBBLE INGESTION AND TURBOPUMP CAVITATION.

(C,D) POSSIBLE LOSS OF CREW/VEHICLE.

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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, V41AAO.100A EVERY FLIGHT.

(E) OPERATIONAL USE

PNEUMATIC ACTUATION HELIUM BOTTLE PRESSURE IS ON A DEDICATED DISPLAY IN COCKPIT. CREW ACTION IS TO FOLLOW NORMAL LEAK ISOLATION PROCEDURE. PRIOR TO MECO, ISOLATION VALVES (LV7, LV8) WILL BE REOPENED AND THE LEFT ENGINE HELIUM CROSSOVER VALVE (LV10) WILL BE OPENED.

EFFECTIVE FOR OI-8D SOFTWARE, CR 89397B "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.