

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2312 -2 REV:06/16/88

ASSEMBLY : D & C PANEL R4 CRIT. FUNC: 1R
 P/N RI : ME452-0102-7257 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 1 EFFECTIVITY: X X X
 : ONE PHASE(S): PL LO X OO DO LS
 :

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>J.B. J BROWN</u>	DES <u>[Signature]</u>	EPDC SSM <u>[Signature]</u>
REL <u>F DEFENSOR</u>	REL <u>Kamura 6/27/88</u>	MPS SSM <u>[Signature]</u>
QE <u>D.M. D MASAI</u>	QE <u>J.2. Coorsen 6/27/88</u>	EPDC REE <u>[Signature]</u>
		MPS REE <u>[Signature]</u>
		QE <u>[Signature]</u>

ITEM:

SWITCH, TOGGLE (2 POLES, 3 POSITIONS, LEVER LOCK), LO2 HELIUM MANIFOLD REPRESSURIZATION VALVES (LV40, 41).

FUNCTION:

PROVIDES MANUAL CONTROL OF POWER TO LO2 HELIUM MANIFOLD REPRESSURIZATION VALVE SOLENOID. 32V73A4S1.

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 LO2 HELIUM MANIFOLD REPRESSURIZATION VALVES.

(B) INADVERTENT OPENING OF TWO SERIES LO2 HELIUM MANIFOLD REPRESSURIZATION VALVES.

(C,D) NO EFFECT - FIRST FAILURE.

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- (E) IR/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - ENGINE OPERATION.
1) SWITCH FAILS RESULTING IN INADVERTENT OPENING OF TWO SERIES LO2
HELIUM MANIFOLD REPRESSURIZATION VALVES.
2) LO2 REPRESS REGULATOR (PR5) FAILS WIDE OPEN (MAXIMUM FLOW).

RESULTS IN HELIUM ENTERING THE FEEDLINE MANIFOLD. THIS MAY CAUSE
MULTIPLE UNCONTAINED ENGINE FAILURES DUE TO HELIUM BUBBLE INGESTION AND
TURBOPUMP CAVITATION. 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, V41AA0.090A 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.