SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2065 -2 REV:06/16/88

ASSEMBLY :AFT LCA-2
P/N RI :MC477-0263-0002
F/N VENDOR:
QUANTITY :2
:TWO
:

CRIT. FUNC: 1R
CRIT. HDW: 2

VEHICLE EFFECTIVITY:	102	103	104
	X	X	X

PHASE(S): PL LO X OO DO LS

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

PREPARED BY:
DES J BROWN
REL F DEFENSOR
QE D MASAI

APPROVED BY:
DES
REL J Kamura 6/27/88
QE

APPROVED BY (NASA):
EPDC SSM
MPS SSM
EPDC REL
MPS REL
QE

ITEM:
CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LH2 HELIUM MANIFOLD REPRESSURIZATION VALVE SOLENOID (LV42, 43).

FUNCTION:
CONDUCTS MAIN BUS B POWER TO LH2 HELIUM MANIFOLD REPRESSURIZATION VALVE SOLENOID. 55V76A122J3(82), (84).

FAILURE MODE:
INADVERTENT OUTPUT, FAILS "ON", FAILS TO TURN "OFF".

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

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

(A) INADVERTENTLY CONDUCTS POWER TO LH2 HELIUM MANIFOLD REPRESSURIZATION VALVE (LV42, 43) SOLENOID.

(B) ONE OF TWO SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVES INADVERTENTLY OPENS.

(C,D) NO EFFECT - FIRST FAILURE.

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(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.
TIME FRAME - ASCENT.
1) HDC FAILS "ON" CAUSING ONE OF TWO SERIES LH2 HELIUM MANIFOLD PRESSURIZATION VALVES TO OPEN.
2) SERIES LH2 HELIUM MANIFOLD REPRESSURIZATION VALVE OPENS INADVERTENTLY.

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. 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 B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST
COMPLETE ELECTRICAL VERIFICATION, V41AA0.100A 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.