

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2131 -1 REV:06/15/83

ASSEMBLY : PANEL R2 CRIT. FUNC: 1R  
P/N RI : ME452-0102-7101 CRIT. HDW: 2  
P/N VENDOR:  
QUANTITY : 1 VEHICLE 102 103 104  
EFFECTIVITY: X X X  
PHASE(S): PL LO X OO DO IS  
:  
:

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS  
PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
DES J BROWN DES [Signature] EPDC SSM [Signature]  
REL DEF DEFENSOR REL [Signature] 6/27/83 MPS SSM [Signature]  
QE DM D MASAI QE [Signature] 6/27/83 EPDC REL [Signature]  
MPS REL [Signature] QE [Signature]

ITEM:  
SWITCH, TOGGLE (1 POLE, 3 POSITIONS), LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE CONTROL.

FUNCTION:  
PROVIDES MANUAL CONTROL OF LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE. 32V73A2S54.

FAILURE MODE:  
FAILS OPEN, FAILS CLOSED IN "GPC" POSITION, SHORTS TO GROUND.

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 MANUAL SWITCH COMMAND.  
(B) LOSS OF MANUAL CAPABILITY TO OPEN LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE (LV10).  
(C,D) FIRST FAILURE - NO EFFECT.

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- (E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.  
TIME FRAME - ENGINE OPERATION.  
1) HELIUM LEAK DOWNSTREAM OF CHECK VALVE CV9 (ASSUMES LEAK RATE IS LARGE ENOUGH TO DEplete PNEUMATIC SUPPLY BUT LESS THAN REQUIRED TO OVERPRESSURIZE THE AFT COMPARTMENT).  
2) SWITCH FAILS OPEN, CAUSING HELIUM CROSSOVER VALVE TO REMAIN CLOSED WHEN CREW MANUALLY COMMANDS LV10 OPEN IN RESPONSE TO FIRST FAILURE PRIOR TO MECO.

LOSS OF PNEUMATIC ACTUATION HELIUM RESULTS IN LO2 PREVALVE FAILING TO CLOSE AND INABILITY TO MAINTAIN INJECTED HELIUM AND LO2 PRESSURE TO THE HIGH PRESSURE OXYGEN TURBOPUMP TO PREVENT PUMP OVERSPEED AND CAVITATION AT MECO. RESULTS IN UNCONTAINED ENGINE DAMAGE, AFT COMPARTMENT OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. 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 - SWITCH, TOGGLE.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41AA0.160 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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