

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2078 -1 REV:11/04/87

ASSEMBLY :AFT LCA-1, 2, & 3 CRIT. FUNC: 1R  
 P/N RI :MC477-0263-0002 CRIT. HDW: 3  
 P/N VENDOR: VEHICLE 102 103 104  
 QUANTITY :12 EFFECTIVITY: X X X  
 :TWELVE PHASE(S): PL X LO X OO DO LS  
 :4 PER PREVALVE 1, 2, & 3

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
 PREPARED BY: DES J BROWN APPROVED BY: [Signature] APPROVED BY (NASA):  
 REL F DEFENSOR REL [Signature] 12-9-87 EPDC SSM [Signature]  
 QE D MASAI QE [Signature] 11/5/87 EPDC REL [Signature]  
 MPS SSM [Signature]  
 MPS REL [Signature]

ITEM:  
 CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LO2 PREVALVE 1,2,& 3, CONTROL POWER FOR OPEN SOLENOID.

FUNCTION:  
 CONDUCTS POWER TO THE OPEN SOLENOID IN EACH REDUNDANT CIRCUIT FOR THE LO2 PREVALVES 1, 2,& 3. THE HYBRID DRIVER CONTROLLER IS IN SERIES WITH A REMOTE POWER CONTROLLER AND DIODE IN EACH CIRCUIT.  
 54V76A121AR (J3-47), (J3-50), (J3-83), (J3-71),  
 55V76A122AR (J3-47), (J3-50), (J4-21), (J3-125),  
 56V76A123AR (J3-47), (J3-50), (J6-L), (J11-T).

FAILURE MODE:  
 LOSS OF OUTPUT, FAILS OPEN, FAILS TO CONDUCT.

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

EFFECT(S) ON:  
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY  
 (A) LOSS OF ONE OF TWO POWER PATHS FOR PREVALVE OPEN SOLENOID.  
 (B,C,D) FIRST FAILURE - NO EFFECT.

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(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THE THIRD FAILURE (SECOND FAILURE - LOSS OF SECOND POWER PATH TO OPEN SOLENOID, BISTABLE FEATURE MAINTAINS PREVALVE IN OPEN POSITION. THIRD FAILURE - PREMATURE ACTUATION OF CLOSE SOLENOID) RESULTING IN PREMATURE LO2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS FAILURE. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

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

MDM COMMAND REDUNDANCY, V41AEO.380B,F,H,J; 400B,F,H,J; 420B,F,H,J EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-150