

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2078 -2 REV: 11/04/87

ASSEMBLY : AFT LCA-1, 2, & 3		CRIT. FUNC: LR
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:	APPROVED BY:	APPROVED BY (NASA):
DES J BROWN	DES <u>[Signature]</u>	EPDC SSM <u>[Signature]</u>
REL F DEFENSOR	REL <u>[Signature]</u> 12-5-87	MPS SSM <u>[Signature]</u>
QE D MASAI	QE <u>[Signature]</u> 12/5/87	EPDC REL <u>[Signature]</u>
		MPS REL <u>[Signature]</u>

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:

INADVERTENT OUTPUT, FAILS ON, CONDUCT PREMATURELY.

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) DEGRADATION OF REDUNDANCY AGAINST PREMATURE OPEN SOLENOID POWER.

(B,C,D) FIRST FAILURE - NO EFFECT.

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(E) POSSIBLE LOSS OF CREW AND VEHICLE AFTER THE THIRD FAILURE (SECOND FAILURE - SERIES RPC FAILS ON RESULTING IN PREMATURE POWER TO OPEN SOLENOID, REDUNDANT OPEN SOLENOID WILL VENT ACTUATOR. THIRD FAILURE - REDUNDANT OPEN SOLENOID FAILS TO DEACTIVATE) RESULTING IN UNCONTAINED ENGINE DAMAGE DUE TO FAILURE TO CLOSE LO2 PREVALVE AT MECO + 1.158 SECONDS. PREVALVE CLOSURE REQUIRED TO MAINTAIN NET POSITIVE SUCTION PRESSURE ON SSME HIGH PRESSURE OXIDIZER TURBOPUMP. FAILS B SCREEN BECAUSE SERIES/PARALLEL REDUNDANCY.

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.380A,G; 400A,G; 420A,G EVERY FLIGHT.

(E) OPERATIONAL USE

FLIGHT - NO CREW ACTION CAN BE TAKEN.

GROUND - IF A MAJOR LEAK IS DETECTED, CLOSE PREVALVES (PV1, 2, 3), LO2 17-INCH DISCONNECT (PDI); DRAIN MANIFOLD.