

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2202 -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 : 6 EFFECTIVITY: X X X
 : SIX PHASE(S): PL X LO X CO DO LS
 : 2 PER PREVALVE 1, 2, & 3

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

PREPARED BY:	J BROWN	APPROVED BY:	<i>[Signature]</i>	APPROVED BY (NASA):	
DES		DES	<i>[Signature]</i>	EPDC SSM	<i>[Signature]</i>
REL	F DEFENSOR	REL	<i>[Signature]</i> 12-5-87	MPS SSM	<i>[Signature]</i>
QE	D MASAI	QE	<i>[Signature]</i> "15/1"	EPDC REL	<i>[Signature]</i>
				MPS REL	<i>[Signature]</i>
				QE	<i>[Signature]</i>

ITEM:
 CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LH2 PREVALVE 1, 2, & 3,
 CONTROL POWER FOR OPEN SOLENOID.

FUNCTION:
 PROVIDES GPC AND MANUAL CONTROL OF POWER TO OPEN SOLENOID FOR EACH LH2
 PREVALVE 1, 2, & 3. HDC IS IN SERIES WITH A RPC. NOTE - HDC IDENTIFIED
 BY LCA INPUT PINS. 54V76A121AR-J3(38), (42); 55V76A122AR-J3(38), (42);
 56V76A123AR-J3(38), (42).

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 TO OPEN SOLENOID.
- (B,C,D) NO EFFECT - FIRST FAILURE.
- (E) POSSIBLE LOSS OF CREW/VEHICLE AFTER 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 LH2 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.

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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.180B, F; 200B, F; 220B, F EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-312