

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2074 -2 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:	APPROVED BY:	APPROVED BY (NASA):
DES J BROWN	DES <i>[Signature]</i>	EPDC SSM <i>[Signature]</i>
REL F DEFENSOR	REL <i>[Signature]</i>	MPS SSM <i>[Signature]</i>
QE D MASAI	QE <i>[Signature]</i>	EPDC REL <i>[Signature]</i>
		MPS REL <i>[Signature]</i>

ITEM: CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LO2 PREVALVE 1, 2, & 3, CONTR. POWER FOR CLOSE SOLENOIDS.

FUNCTION: ALLOWS GPC & MANUAL REMOTE CONTROL OF POWER TO REDUNDANT CLOSE SOLENOID FOR EACH LO2 PREVALVE 1, 2, & 3. HYBRID DRIVER CONTROLLER IS IN SERIES WITH A REMOTE POWER CONTROLLER. NOTE - HDC IDENTIFIED BY LCA INPUT PINS.
 54V76A121 (J3,49), (J6,B), (J6,D), (J13,53).
 55V76A122 (J3,49), (J3,53), (J6,B), (J6,D).
 56V76A123 (J3,49), (J3,53), (J6,B), (J6,D).

FAILURE MODE: INADVERTENT OUTPUT, FAILS ON, CONDUCTS PREMATURELY.

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

EFFECT(S) ON: (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY
 (A) DEGRADATION OF REDUNDANCY AGAINST PREMATURE CLOSE 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 CLOSE SOLENOID, ENERGIZED OPEN SOLENOID MAINTAINS PREVALVE IN OPEN POSITION. THIRD FAILURE - PREMATURE DEACTUATION OF OPEN SOLENOID) RESULTING IN PREMATURE LO2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN DUE TO SERIES/PARALLEL CIRCUIT REDUNDANCY. 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.380K; 400K; 420K EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

05-6J-140