

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2349 -1 REV:11/04/87

ASSEMBLY : AFT PCA-5
 P/N RI : JANTXLN1204RA
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 : 1 PER LH2/LO2 17" DISCONNECT LATCH

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO X OO	DO LS

CRIT. FUNC: 1R
 CRIT. HDW: 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>	MPS SSM <u>[Signature]</u>
QE D MASAI	QE <u>[Signature]</u>	EPDC REL <u>[Signature]</u>
		MPS REL <u>[Signature]</u>
		QE <u>[Signature]</u>

11/1/88

ITEM:
 DIODE, CROSSOVER (12 AMP), LH2/LO2 17-INCH FEEDLINE DISCONNECT VALVE LATCH UNLOCK SOLENOID POWER.

FUNCTION:
 PREVENTS INADVERTENT MDM COMMAND OR PREMATURE HDC I OUTPUT FROM ACTUATING LATCH UNLOCK SOLENOID PREMATURELY. DIODE ISOLATES REDUNDANT POWER WHICH ENERGIZES THE LATCH UNLOCK SOLENOID FOR THE FEED DISCONNECT VALVE. ISOLATES REDUNDANT POWER BETWEEN RPC OUTPUTS. 55V76A135A2CR44, CR49.

FAILURE MODE:
 OPENS, FAILS OPEN, FAILS TO CONDUCT

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) LOSS OF ONE OF TWO POWER PATHS (UNLOCK COMMAND A) TO UNLOCK COMMAND C HDC III. DEGRADATION OF REDUNDANCY TO POWER LATCH UNLOCK SOLENOID.

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

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP.

FMEA NO 05-6J -2349 -1

REV:11/04/87

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER THIRD FAILURE (SECOND FAILURE - LOSS OF POWER FROM HDC I REMOVING UNLOCK SOLENOID POWER. THIRD FAILURE - DURING ET/ORBITER UMBILICAL RETRACTION, BACKUP MECHANICAL LINKAGE FAILS, PREVENTING FLAPPER CLOSURE) RESULTING IN INABILITY TO CLOSE THE FEED DISCONNECT VALVE PRIOR TO UMBILICAL RETRACTION. FOR NOMINAL, ATO, AND AOA MISSIONS ET SEPARATION IS DELAYED FOR SIX MINUTES TO VENT RESIDUAL PROPELLANT THROUGH FAILED DISCONNECT. THIS IS TO PREVENT ORBITER/ET RECONTACT DUE TO PROPULSIVE VENTING AT SEPARATION. POSSIBLE TILE AND DOOR DAMAGE AT THE ORBITER/ET UMBILICAL AREA DUE TO CRYO IMPACT. FOR RTLS, TAL, AND MISSIONS WHERE OMS BURN CANNOT BE DELAYED ET STRUCTURAL SEPARATION IS INITIATED IMMEDIATELY AND ORBITER/ET RECONTACT IS LIKELY. ALSO RESULTS IN LOSS OF HELIUM SUPPLY DURING MANIFOLD REPRESS CAUSING POSSIBLE LOSS OF CRITICAL APT COMPARTMENT ENTRY PURGE. FAILS B SCREEN BECAUSE REDUNDANT POWER PATH MASKS FAILURE.

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) DISPOSITION AND RATIONALE:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, POWER-STUD MOUNTED.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V4LABO.1530, 1650 EVERY FLIGHT.

(E) OPERATIONAL USE

FOR NOMINAL MISSIONS, CREW WILL PERFORM MANUAL ET STRUCTURAL SEPARATION AFTER SIX MINUTE DELAY PERIOD. FOR RTLS, VEHICLE SOFTWARE PERFORMS ET STRUCTURAL SEPARATION AFTER A SIX SECOND (MAXIMUM) DELAY. FOR TAL OR MISSIONS WHERE OMS BURN CANNOT BE DELAYED CREW WILL MANUALLY INITIATE ET STRUCTURAL SEPARATION WITHOUT DELAY.