

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - P/L RETENTION FMEA NO 05-6IE -2003 -1 REV:06/26/88

ASSEMBLY : M-MCA 1 AND 3 CRIT. FUNC: 1R
 P/N RI : MC455-0135-0001 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 50 EFFECTIVITY: X X X
 : SIXTY, 30/M-MCA-1 AND 30/ PHASE(S): PL LO OO DO X LS
 : M-MCA-3

PREPARED BY: C ODEGARD APPROVED BY: REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 DES C ODEGARD DES *C. Odegard* APPROVED BY (NASA): SSM *[Signature]*
 REL H YEW REL *[Signature]*
 QE J COURSEN QE *[Signature]*

ITEM: HYBRID RELAY, PAYLOAD RETENTION LATCH/RELEASE CONTROL

FUNCTION:
 RELAY CONDUCTS 3 PHASE POWER TO THE ACTUATOR DRIVE MOTOR FOR LATCHING OR
 RELEASING THE PAYLOAD. 40V76A117K13, 17, 24, 25, 27, 29, 34, 36-39, 41, 46-53, 59-
 65, 73, 74, 77, 40V76A119K5, 17, 19, 21, 31-36, 43-48, 55-58, 67-70, 73, 75, 79-82

FAILURE MODE: LOSS OF OUTPUT (FAILS OFF, SHORTS TO GROUND, SHORTS POLE-TO-POLE)

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

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
 (A) FIRST FAILURE - LOSS OF CONTROL TO ONE OF TWO ACTUATOR DRIVE MOTORS
 RESULTING IN LOSS OF REDUNDANCY. THE REMAINING ACTUATOR DRIVE MOTOR WILL
 COMPLETE MISSION, BUT AT INCREASED OPERATING TIME.
 (B) FIRST FAILURE - NONE
 (C) FIRST FAILURE - NO EFFECT. SECOND FAILURE (FAILURE AT REDUNDANT
 SYSTEM) - LOSS OF CAPABILITY TO RELEASE OR LATCH PAYLOAD RESULTS IN LOSS
 OF MISSION
 (D) FIRST FAILURE - NO EFFECT. SECOND FAILURE (FAILURE AT REDUNDANT
 SYSTEM) - IF FAILURE OCCURS DURING LATCH MID TRAVEL, THE INCOMPLETE
 LATCHING CYCLE (e.g., HALF CLOSED OR HALF OPEN) COULD CAUSE THE PAYLOAD
 TO BE LEFT UNSECURED RESULTING IN VEHICLE DAMAGE AND POSSIBLE LOSS OF
 CREW/VEHICLE UPON RE-ENTRY.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - P/L RETENTION FMEA NO 05-6IE -2003 -1 REV: 06/26/88

DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

(B) GROUND TURNAROUND TEST

VERIFY THAT HYBRID RELAYS OPERATE PROPERLY AS THEY ARE TURNED ON/OFF THROUGHOUT ALL LATCHES WITH THE FOLLOWING POWER ON : MAIN A AND B, LOGIC POWER, AB1, BC1 AND AC BUS. TEST INCLUDES VISUAL AND AUDIO CHECK THAT NO BINDING/JAMMING OF LATCH OCCURS DURING LATCH AND RELEASE PROCESS.

(E) OPERATIONAL USE

IF FAILURE OCCURS DURING LATCH/RELEASE PROCESS FOR LIGHTWEIGHT OR MIDDLEWEIGHT LONGERON LATCHES, AN EVA CAN BE PERFORMED TO MANUALLY DRIVE THE LATCHES.