

PAGE: 1

PRINT DATE: 05/17/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6EB-2010-X

SUBSYSTEM NAME: EPD&C - PAYLOAD BAY DOORS

REVISION : 2 05/16/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	PANEL R13A2	V070-730338
SRU :	SWITCH, TOGGLE	NE452-0102-7301

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, TOGGLE (3P2P) PAYLOAD BAY DOOR (PLBD) ENABLE

REFERENCE DESIGNATORS: 32V73A13A2S13
: 32V73A13A2S14

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
PROVIDES MANUAL SWITCHING OF POWER TO THE HYBRID RELAYS TO ENABLE THE
OPENING AND CLOSING OF THE PAYLOAD BAY DOORS.

FAILURE MODES EFFECTS ANALYSIS (FMEA) — CRITICAL FAILURE MODE
NUMBER: 05-6EB-2010-01

SUBSYSTEM: EPD&C - PAYLOAD BAY DOORS
LRU : PANEL R13A2
ITEM NAME: SWITCH, TOGGLE
REVISION# 2 05/16/90 R
CRITICALITY OF THIS FAILURE MODE: LR2

- FAILURE MODE:
FAILS OPEN, PREMATURE OPEN, SHORT-TO-CASE (GROUND)

MISSION PHASE:
OO ON-ORBIT
DO DE-ORBIT

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS

- CAUSE:
PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

CRITICALITY I/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) PASS
C) PASS

PASS/FAIL RATIONALE:
A)

B)

C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:
FIRST FAILURE - INABILITY TO PROVIDE POWER TO ENABLE HYBRID RELAYS RESULTING IN LOSS OF DOOR OPERATION REDUNDANCY
- (B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - LOSS OF ASSOCIATED PLBD DRIVE/LATCH MOTORS

PAGE: 3

PRINT DATE: 05/17/90

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- (C) MISSION:
FIRST FAILURE - NO EFFECT
- (D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - NO EFFECT
- (E) FUNCTIONAL CRITICALITY EFFECTS:
SECOND FAILURE (REMAINING SWITCH) CAUSES INABILITY TO OPERATE DOORS.
POSSIBLE LOSS OF CREW/VEHICLE IF DOORS CANNOT BE CLOSED RESULTING IN
UNSAFE CONFIGURATION FOR ENTRY (1R2). POSSIBLE LOSS OF MISSION IF DOORS
CANNOT BE OPENED (2R3).

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

- (B) TEST:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

GROUND TURNAROUND TEST
SWITCH FUNCTION IS VERIFIED BY CHECKING INITIAL MCA STATUS, CYCLING
THE SWITCH FROM ENABLE TO DISABLE AND BACK, AND REVERIFYING MCA STATUS
AFTER EACH POSITION CHANGE. TESTS ARE PERFORMED FOR EVERY FLIGHT AND LRU
RETEST PER TABLE V37200.000.

(C) INSPECTION:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

- (D) FAILURE HISTORY:
REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

- (E) OPERATIONAL USE:
ABORT DECISION IS REQUIRED DUE TO THE LOSS OF REDUNDANCY ON ALL PLBD
ACTUATORS. EVA CAPABILITY EXISTS TO CLOSE PAYLOAD BAY DOORS AFTER
MULTIPLE FAILURES.

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NUMBER: 05-6EB-2010-01

- APPROVALS -

RELIABILITY ENGINEERING:	T. AI	:	<i>[Signature]</i>
DESIGN ENGINEERING	: T. BANHIDY	:	<i>[Signature]</i>
QUALITY ENGINEERING	: W. R. HIGGINS	:	<i>[Signature]</i>
NASA RELIABILITY	:	:	<i>[Signature]</i>
NASA SUBSYSTEM MANAGER	:	:	<i>[Signature]</i>
NASA QUALITY ASSURANCE	:	:	<i>[Signature]</i>
NASA EPD+C SUBSYS MGR	:	:	<i>[Signature]</i>
NASA EPDC Reliability	:	:	<i>[Signature]</i>

[Handwritten notes and dates: 8/23/90, 1 AUG 90, 20 Aug 90, 8/22/90]