

## FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE -

NUMBER: 05-6DS-2007C-X

SUBSYSTEM NAME: EPD&amp;C-DRAG CHUTE

REVISION : 1 04/23/92

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	DRAG CHUTE CONTROLLER ASSY	V070-765440
■ SRU :	DIODE	JANTXV1N4246

## PART DATA

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
DIODE, ISOLATION - REDUNDANT PATH (JETTISON)

■ REFERENCE DESIGNATORS: 50V76A214A1CR3  
: 50V76A214A1CR8  
: 50V76A214A1CR14  
: 50V76A215A1CR3  
: 50V76A215A1CR8  
: 50V76A215A1CR14

■ QUANTITY OF LIKE ITEMS: 6  
THREE PER ASSEMBLY NO. 1 & NO. 2

■ FUNCTION:  
PROVIDES ISOLATION FOR REDUNDANT ARM, FIRE 1, AND FIRE 2 COMMANDS WHICH ASSOCIATES WITH JETTISON CIRCUITRY.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
NUMBER: 05-605-2007C-02

SUBSYSTEM: EPD&C-DRAG CHUTE  
LRU :DRAG CHUTE CONTROLLER ASSY  
ITEM NAME: DIODE

REVISION# 1 04/23/92 R

CRITICALITY OF THIS  
FAILURE MODE:IR3

■ FAILURE MODE:  
SHORTS (END-TO-END)

MISSION PHASE:  
00 DE-ORBIT

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

■ CAUSE:  
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION,  
ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

■ REDUNDANCY SCREEN A) PASS  
■ B) FAIL  
■ C) PASS

PASS/FAIL RATIONALE:

- A)
- B)  
FAILS SCREEN "B" BECAUSE NO CAPABILITY TO DETECT A FAILED DIODE  
INFLIGHT.
- C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:  
LOSS OF REVERSE BIAS PROTECTION
- (B) INTERFACING SUBSYSTEM(S):  
FIRST FAILURE - NO EFFECT

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- (C) MISSION:  
FIRST FAILURE - NO EFFECT
- (D) CREW, VEHICLE, AND ELEMENT(S):  
FIRST FAILURE - NO EFFECT
- (E) FUNCTIONAL CRITICALITY EFFECTS:  
POSSIBLE LOSS OF CREW/VEHICLE DUE TO INABILITY TO JETTISON A PREMATURE DEPLOYED DRAG CHUTE. REQUIRES THREE ADDITIONAL FAILURES (REDUNDANT CROSS-STRAPPING RESISTOR IN REDUNDANT OCCA SHORTS END-TO-END, ONE POLE FROM REDUNDANT SWITCH SHORTS TO GROUND, AND PILOT MORTAR CARTRIDGE PREMATURELY OPERATED CAUSING PREMATURE DEPLOYMENT OF DRAG CHUTE) BEFORE EFFECT IS MANIFESTED.

NOTE: FAILURE SCENARIO IS CREDIBLE ONLY AT ALTITUDES OF 40 TO 135 FEET.

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- DISPOSITION RATIONALE -  
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- (A) DESIGN:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (B) TEST:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE  
  
GROUND TURNAROUND TEST  
VERIFY CROSS STRAPPING DIODES FOR SHORT END-TO-END CONDITION BY:  
(1) ACTIVATE ALL LATCHING DRIVERS WITHIN ONE OF TWO DRAG CHUTE CONTROLLER ASSEMBLIES WHILE THE POWER OF THE OTHER ASSEMBLY IS OFF,  
(2) SEQUENTIALLY, PROVIDE POWER TO THE LATCHING DRIVERS IN THE OTHER ASSEMBLY, AND 3) VERIFY THE PIC VOLTAGES OF THAT ASSEMBLY BEFORE/AFTER EACH COMMAND. TESTS ARE PERFORMED EVERY FLOW IF DRAG CHUTE IS INSTALLED AND FOR LRU RETEST PER TABLE V55Z00.000.
- (C) INSPECTION:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (D) FAILURE HISTORY:  
REFER TO APPENDIX F, ITEM NO. 3 - DIODE
- (E) OPERATIONAL USE:  
NONE

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NUMBER: 05-6DS-2007C-02

- APPROVALS -

RELIABILITY ENGINEERING : T. AI  
 DESIGN ENGINEERING : T. POCKLINGTON  
 QUALITY ENGINEERING : W. R. HIGGINS  
 NASA RELIABILITY :  
 NASA SUBSYSTEM MANAGER :  
 NASA EPD&C RELIABILITY :  
 NASA QUALITY ASSURANCE :  
 NASA EPD&C SUBSYS MGR :

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