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PRINT DATE: 08/07/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE  
NUMBER: 05-6ED-2257A-X

SUBSYSTEM NAME: EPD&C - ET UMBILICAL DOORS

REVISION : 2 08/06/90

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	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	EPD&C DIODE BOX ASSY 1, 2 & 3	V070-765380
SRU :	DIODE	JANTXVIN4246

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PART DATA

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EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:  
DIODE, GENERAL PURPOSE 1A, 400V. ISOLATION, ET DOOR UNLOCK LATCH  
ACTUATOR CIRCUIT

REFERENCE DESIGNATORS: 54V76A208A2CR15  
: 55V76A208A3CR17  
: 55V76A208A3CR19  
: 56V76A209A1CR14

QUANTITY OF LIKE ITEMS: 4  
FOUR

FUNCTION:  
PROVIDES ISOLATION FOR OR'ED LOGIC INPUT POWER (READY-TO-LATCH FROM  
TOGGLE SWITCH) FOR LATCHING OF RIGHT/LEFT ET DOORS.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE  
NUMBER: 05-6ED-2257A-02

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REVISION# 2 09/18/90 R

SUBSYSTEM: EPD&C - ET UMBILICAL DOORS  
LRU :EPD&C DIODE BOX ASSY 1, 2 & 3  
ITEM NAME: DIODE

CRITICALITY OF THIS  
FAILURE MODE:1R3

■ FAILURE MODE:  
SHORT (END TO END)

MISSION PHASE:  
DO 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 "B" SCREEN BECAUSE DIODE SHORT (END-TO-END) IS NOT DETECTABLE  
INFLIGHT.

C)

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:  
FIRST FAILURE - LOSS OF ISOLATION BETWEEN AFFECTED BUSES SUPPLYING THE  
COMMON CIRCUIT

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- (B) INTERFACING SUBSYSTEM(S):  
FIRST FAILURE - NO EFFECT
- (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 THROUGH LOSS OF ALL ET DOOR CLOSE LATCH  
 CONTROL CAPABILITY RESULTING IN STRUCTURAL DAMAGE CAUSED BY THERMAL  
 EFFECTS DURING RE-ENTRY. REQUIRES TWO OTHER FAILURES: 1) MAIN BUS  
 FAULTS TO GROUND OPENING THE FUSE AT THE CONTROL BUS AND THE FUSE AT  
 THE MAIN BUS THROUGH READY-TO-LATCH LIMIT SWITCH, 2) LOSS OF THE OTHER  
 MOTOR BEFORE EFFECT MANIFESTED.

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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  
 PROPER DIODE FUNCTION IS VERIFIED THROUGH RTL OVERRIDE CHECK. RTL LIMIT  
 SWITCH MSD'S WILL NOT CHANGE WHEN OPPOSITE DOOR MANUAL SWITCH  
 POSITIONED TO LATCH. TESTS ARE PERFORMED FOR FIRST FLIGHT FOLLOWED BY  
 TESTS AT FIVE FLIGHT INTERVALS AND LRU RETEST PER V56200.000.

- (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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- APPROVALS -

RELIABILITY ENGINEERING: T. AI  
 DESIGN ENGINEERING : J. KRAGER  
 QUALITY ENGINEERING : W. R. HIGGINS  
 NASA RELIABILITY :  
 NASA SUBSYSTEM MANAGER :  
 NASA EPO&C RELIABILITY :  
 NASA QUALITY ASSURANCE :  
 NASA EPO&C SUBSYS MGR :

: JH Nelson 8/1/90  
 : John W. Anderson 8-14-90  
 : W. R. Higgins 8-21-90  
 : Don McLaughlin 10/25/90  
 : R. W. Robinson 10/25/90  
 : L. Ward 10-24-90  
 : Robert G. ... 9/28/90  
 : J. ... 8/5/90