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PRINT DATE: 02/21/91

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-688-2240-X

SUBSYSTEM NAME: EPD&C - BRAKE/ANTI SKID

REVISION : 5 02/21/91

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	FWD PCA 1	V070-763320
LRU :	FWD PCA 2	V070-763340
SRU :	FUSE	ME451-0009-1003

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
FUSE, GENERAL PURPOSE, 3 AMP, BRAKE SUB BUS AND BRAKE NO WEIGHT-ON-WHEELS INHIBIT CIRCUIT.

- REFERENCE DESIGNATORS:
- : 81V76A22F15
 - : 81V76A22F16
 - : 81V76A22F17
 - : 81V76A22F21
 - : 82V76A23F9
 - : 82V76A23F10
 - : 82V76A23F11
 - : 82V76A23F12

QUANTITY OF LIKE ITEMS: 8
FOUR PER FWD PCA-1 & 2, EIGHT PER VEHICLE

FUNCTION:
PROVIDES CIRCUIT PROTECTION BETWEEN THE BRAKE SUB BUSES AND THE FOLLOWING ITEMS; (1) BRAKE/SKID CONTROL BOXES POWER SUPPLY INPUT; (2) BRAKE SKID CONTROL BOXES NO WEIGHT-ON-WHEELS INHIBIT CIRCUITS.

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SUBSYSTEM: EPD&C - BRAKE/ANTI SKID
LRU :FWD PCA 1
ITEM NAME: FUSE

REVISION# 5 02/21/91 R

CRITICALITY OF THIS
FAILURE MODE:1R3

FAILURE MODE:
FAILS OPEN, FAILS TO CONDUCT

MISSION PHASE:
DO DE-ORBIT

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

CAUSE:
STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,
PROCESSING ANOMALY, THERMAL STRESS

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:
A)

■ B)
FAILS "B" SCREEN AS FUSE FAILURE IS NOT DETECTABLE INFLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:
FIRST FAILURE - LOSS OF POWER FROM BRAKE SUB BUS TO BRAKE CONTROL
CIRCUIT WITHIN ONE OF TWO BRAKE/SKID CONTROL BOXES.

(B) INTERFACING SUBSYSTEM(S):
FIRST FAILURE - LOSS OF HALF THE BRAKING CAPABILITY ON ONE WHEEL OR
12.5 PERCENT BRAKE LOSS OUT OF FOUR WHEELS.

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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 POSSIBLE EXTENDED
ROLLOUT/UNCONTROLLABLE YAWING/LOSS OF DIRECTIONAL CONTROL AFTER LOSS OF
ELECTRICAL POWER NECESSARY FOR BRAKING. REQUIRES TWO ADDITIONAL FAILURES
(TWO POWER DIODES ON REDUNDANT BOX) CAUSING 62.5% LOSS OF BRAKING
CAPABILITY BEFORE EFFECT IS MANIFESTED.

- DISPOSITION RATIONALE -

(A) DESIGN:
REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD/CARTRIDGE

■ (B) TEST:
REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD/CARTRIDGE

GROUND TURNAROUND TEST
VERIFY FUSE CONDITION BY MONITORING APPLICABLE BRAKE PRESSURE
MEASUREMENTS. TESTS ARE PERFORMED PER PARAGRAPH V51AFO.011 "BRAKE/SKID
POWER REDUNDANCY TEST" EVERY FLIGHT, AND LRU RETEST PER TABLE
V51Z00.000.

■ (C) INSPECTION:
REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD/CARTRIDGE

■ (D) FAILURE HISTORY:
REFER TO APPENDIX D, ITEM NO. 2 - FUSE, AXIAL LEAD/CARTRIDGE

(E) OPERATIONAL USE:
NONE

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- APPROVALS -

RELIABILITY ENGINEERING: T. AI
DESIGN ENGINEERING : Q. N. DANG
QUALITY ENGINEERING : W. HIGGINS
NASA RELIABILITY :
NASA SUBSYSTEM MANAGER :
NASA EPD&C RELIABILITY :
NASA QUALITY ASSURANCE :
NASA EPD&C SUBSYS MGR :

: TA Hsu 4/22/91
: Q. N. Dang 4/22/91
: W. Higgins 3/23/91
: Charles Campbell 4/9/91
: M. Solomon 4/22/91
: Bo G. Antenat 4/9/91
: B. Schaefer for F. Arnis 4-22-91