

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE

NUMBER: 05-6BA-2584A-IM -X

SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL

REVISION: 0

08/20/00

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	: FWD PCA 1	VO70-763320
SRU	: RELAY, LATCHING	MC455-0128-0001

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

RELAY, LATCHING, LANDING GEAR DOWN CONTROL CIRCUIT (4P2P)

REFERENCE DESIGNATORS: 81V76A22K6**QUANTITY OF LIKE ITEMS:** 1
ONE, FPCA-1**FUNCTION:**

THE TWO SERIES DOWN RELAYS (K6 AND K8) WITH ONE ARM RELAY (K7) ACTUATES THE CIRCUIT FOR THE LANDING GEAR EXTEND VALVE 1. PROTECTION AGAINST PREMATURES AND REDUNDANCY PROVIDED WITHIN LANDING GEAR CIRCUITS. COMMON RESET TO ALL LANDING GEAR DOWN AND ARM RELAYS.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-6BA-2584A-IM-01

REVISION#: 0 09/22/00

SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL

LRU: FWD PCA 1

CRITICALITY OF THIS FAILURE MODE: 1R2

ITEM NAME: RELAY, LATCHING, K6

FAILURE MODE:

OPEN, FAILS TO CONDUCT (ONE CONTACT SET), FAILS TO TRANSFER (TO SET POSITION), SHORT TO STRUCTURE (GROUND)

MISSION PHASE: LS LANDING/SAFING

VEHICLE/PAYLOAD/KIT EFFECTIVITY:

- 102 COLUMBIA
 - 103 DISCOVERY
 - 104 ATLANTIS
 - 105 ENDEAVOUR
- EFFECTIVE AFTER LANDING GEAR MOD -
(K6 RELAY CHANGED TO DOWN FUNCTION)

CAUSE:

FOR OPEN: PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS
FOR SHORT TO STRUCTURE (GROUND): PIECE PART FAILURE, VIBRATION, MECHANICAL SHOCK, 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 RELAY SINGLE CONTACT STATUS CANNOT BE MONITORED IN FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

FIRST FAILURE - LOSS OF CAPABILITY TO CLOSE K6 RELAY (DOWN) WHEN COMMANDED.

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(B) INTERFACING SUBSYSTEM(S):
LOSS OF CAPABILITY TO DEPLOY LANDING GEAR HYDRAULICALLY.

(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 LOSS OF CAPABILITY TO EXTEND LANDING GEAR AFTER SECOND FAILURE (LOSS OF BACKUP PYRO RELEASE OF LANDING GEAR, I.E. FAILURE OF UPLOCK RELEASE THRUSTER OR PYRO-PRESSURE CARTRIDGE).

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX C, ITEM NO.3 - LATCHING RELAY

(B) TEST:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY

GROUND TURNAROUND TEST
ANY TURNAROUND CHECKOUT TESTING IS ACCOMPLISHED IN ACCORDANCE WITH OMRSD.

(C) INSPECTION:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY

(D) FAILURE HISTORY:
CURRENT DATA ON TEST FAILURES, FLIGHT FAILURES, UNEXPLAINED ANOMALIES, AND OTHER FAILURES EXPERIENCED DURING GROUND TURNAROUND PROCESSING CAN BE FOUND IN THE PRACA DATABASE.

(E) OPERATIONAL USE:
NONE

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- APPROVALS -

S & R ENGINEERING	:	M. D. DUMETZ / G. T. TATE	:	<i>M. D. Dumetz</i>
S & R ENGINEERING ITM	:	P. A. STENGER	:	<i>P. A. Stenger 9/22/00</i>
DESIGN ENGINEERING	:	J. L. PECK	:	<i>J. L. Peck 9/22/00</i>
EPD&C SUBSYSTEM MANAGER	:	R. L. PHAN	:	<i>R. L. Phan 9/27/00</i>
SR&QA	:		:	<i>[Signature] 9/27/00</i>
NASA DCE	:		:	<i>[Signature] 9/27/00</i>
MOD	:		:	<i>[Signature] for S. Norris 10/5/00</i>
USA SAM	:		:	<i>[Signature]</i>
USA ORBITER ELEMENT	:		:	

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- APPROVALS -

S & R ENGINEERING	:	M. D. DUMETZ / G. T. TATE:	<i>M. Dumetz</i>
S & R ENGINEERING ITM	:	P. A. STENGER	<i>P.A. Stenger 9/28/00</i>
DESIGN ENGINEERING	:	J. L. PECK	<i>J.L. Peck 9/27/00</i>
EPD&C SUBSYSTEM MANAGER:	R. L. PHAN		<i>R.L. Phan 9/27/00</i>
SR&QA	:		<i>[Signature] 9/27/00</i>
NASA OCE	:		<i>[Signature] 9/27/00</i>
MOD	:		<i>[Signature] for 5 hours 285 p.m.</i>
USA SAM	:		<i>[Signature]</i>
USA ORBITER ELEMENT	:		<i>[Signature] 9/28/00</i>

Oct-13-00 06:56A

UCL 13 '00 09:00 PK USM CHIEF ENGINEER

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PRCA 13/11/00

Sep-28-00 02:03P

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FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL FAILURE MODE

NUMBER: 05-6BA-225A-RM-01

- APPROVALS -

S & R ENGINEERING
S & R ENGINEERING ITM
DESIGN ENGINEERING
EPD&C SUBSYSTEM MANAGER:
SR&CA
NASA DCE
MOD
USA SAM
USA ORBITER ELEMENT

M. D. DUMETZ / G. Y. TATE
P. A. STENGER
J. L. PECK
R. L. PHAN

[Handwritten signatures and dates]
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