

**FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CIL HARDWARE
NUMBER: 05-6BA-2588-IM -X**

SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL

REVISION: 7

08/22/00

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 ARM CONTROL CIRCUIT (4P2P)

REFERENCE DESIGNATORS: 81V76A22K6
81V76A22K7

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:

TWO ARM RELAYS ALONG WITH THE DOWN RELAY ENABLE THE CIRCUIT FOR ENERGIZING THE LANDING GEAR EXTEND VALVE 1. THE ASSOCIATED LANDING GEAR DOWN RELAY, WHEN COMMANDED, COMPLETES THE SERIES CIRCUIT AND ALLOWS FOR PROTECTION AGAINST PREMATURE FAILURES. REDUNDANCY IS PROVIDED FOR LANDING GEAR OPERATION.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-6BA-2588-IM- 01

REVISION#: 6 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 AND K7

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: 103 DISCOVERY
104 ATLANTIS
EFFECTIVE FOR PRE LANDING GEAR MOD -
(K6 RELAY NOT CHG'D 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:

LOSS OF CAPABILITY TO DEPLOY LANDING GEAR HYDRAULICALLY.

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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 DUE TO LOSS OF CAPABILITY TO EXTEND LANDING GEARS 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 PROCESSING ACTIVITY 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. Dumetz</i>
S & R ENGINEERING ITM	:	P. A. STENGER	: <i>P. A. Stenger 9/25/00</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</i>
SR&QA	:		: <i>9/27/00</i>
NASA DCE	:		: <i>9/27/00</i>
MOD	:		: <i>9/27/00</i>
USA SAM	:		: <i>9/27/00</i>
USA ORBITER ELEMENT	:		: <i>9/27/00</i>

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PRINT DATE: 09/22/00

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- APPROVALS -

S & R ENGINEERING	:	M. D. DUMETZ / G. T. TATE	: <i>Mary Ditch</i>
S & R ENGINEERING ITM	:	P. A. STENGER	: <i>P. A. Stenger 9/20/00</i>
DESIGN ENGINEERING	:	J. L. PECK	: <i>J. L. Peck 9/20/00</i>
EPD&C SUBSYSTEM MANAGER	:	R. L. PHAN	: <i>R. L. Phan 9/20/00</i>
SR&QA	:		: <i>[Signature] 9/27/00</i>
NASA DCE	:		: <i>[Signature] 9/27/00</i>
MOD	:		: <i>[Signature] 9/27/00</i>
USA SAM	:		: <i>[Signature] 9/27/00</i>
USA ORBITER ELEMENT	:		: <i>[Signature] 9/28/00</i>

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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 9/20/00</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 9/17</i>
SR&QA	:		: <i>K. [unclear] 9/27/00</i>
NASA DCE	:		: <i>J. P. [unclear] for S. [unclear] 7/5/00</i>
MOD	:		: <i>[unclear]</i>
USA SAM	:		: <i>[unclear]</i>
USA ORBITER ELEMENT	:		: <i>[unclear] 10/2/00</i>

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