

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

SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL

REVISION: 0

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: 81V76A22K7

QUANTITY OF LIKE ITEMS: 1
 ONE

FUNCTION:

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

FAILURE MODES EFFECTS ANALYSIS FMEA – CIL FAILURE MODE

NUMBER: 05-6BA-2588A-IM- 02

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, K7

FAILURE MODE:

CLOSED, PREMATURELY CLOSSES (TO SET POSITION), SHORTS CONTACT-TO-CONTACT (TO SET POSITION)

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 RELAY)

CAUSE:

PIECE PART 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 BECAUSE RELAY SINGLE CONTACT STATUS CANNOT BE MONITORED IN FLIGHT.

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

FIRST FAILURE – PREMATURE ARMING OF THE LANDING GEAR DOWN CIRCUIT.

(B) INTERFACING SUBSYSTEM(S):

PREMATURE ARMING OF THE LANDING GEAR DOWN CIRCUIT.

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(C) MISSION:

FIRST FAILURE - NO EFFECT

(D) CREW, VEHICLE, AND ELEMENT(S):

FIRST FAILURE - NO EFFECT

(E) FUNCTIONAL CRITICALITY EFFECTS:

SHORTS CONTACT-TO-CONTACT (TO SET POSITION); CRITICALITY 1R2, PFP

POSSIBLE LOSS OF CREW/VEHICLE DUE TO THE FOLLOWING SCENARIO:

1. K7 (ARM) RELAY SHORTS CONTACT-TO-CONTACT (TO SET POSITION).
2. LANDING GEAR DOWN PUSH BUTTON SWITCH FAILS (CONTACT-TO-CONTACT SHORT). PREMATURE EXTENSION OF LANDING GEARS OCCURS.
POSSIBLE LOSS OF CREW/VEHICLE WITH PREMATURE EXTENSION OF LANDING GEARS CAUSING VEHICLE TO LAND SHORT OF RUNWAY.

-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. D. Dumetz</i>
S & R ENGINEERING ITM	:	P. A. STENGER	:	<i>P. A. Stenger 9/27/00</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 9/28/00</i>
SR&QA	:		:	<i>K. S. Senger 9/27/00</i>
NASA DCE	:		:	<i>J. P. ... for J. Norris 28 Sep 00</i>
MOD	:		:	<i>J. Cyell</i>
USA SAM	:		:	
USA ORBITER ELEMENT	:		:	

PAGE: 4

PRINT DATE: 09/22/00

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

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- GIL FAILURE MODE

NUMBER: 05-6BA-2588A-IM-02

- APPROVALS -

S & R ENGINEERING	: M. D. DUMETZ / G. T. TATE	: <i>M. Dumetz</i>
S & R ENGINEERING ITM	: P. A. STENGER	: <i>P. Stenger 7/27/00</i>
DESIGN ENGINEERING	: J. L. PECK	: <i>J. L. Peck 7/27/00</i>
EPD&C SUBSYSTEM MANAGER	: R. L. PHAN	: <i>R. Phan 9/28/00</i>
SR&QA	:	: <i>W. Stenger 9/11/00</i>
NASA DCE	:	: <i>Z. P. ... for J. Morris 18 Sept 00</i>
MOD	:	: <i>J. ...</i>
USA SAM	:	: <i>... 10/2/00</i>
USA ORBITER ELEMENT	:	: