

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE
NUMBER: 05-6BA-2115 -X

SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL
REVISION: 4 11/16/97

PART DATA

	PART NAME	PART NUMBER
	VENDOR NAME	VENDOR NUMBER
LRU	:PANEL FGA5 (PRE-MEDS)	V070-730257
LRU	:PANEL FBA5 (PRE-MEDS)	V070-730265
LRU	:PANEL F6A3 (MEDS)	V070-730734
LRU	:PANEL F8A3 (MEDS)	V070-730736
SRU	:SWITCH, PUSHBUTTON	ME452-0061-7145

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
SWITCH, PUSHBUTTON, LANDING GEAR DOWN, 4P2P (MOMENTARY), ILLUMINATED

REFERENCE DESIGNATORS: 34V73A6A5S2 (PRE-MEDS)
34V73A8A5S2 (PRE-MEDS)
34V73A6A3S7 (MEDS CONFIGURATION)
34V73A8A3S7 (MEDS CONFIGURATION)

QUANTITY OF LIKE ITEMS: 2
TWO

FUNCTION:
PROVIDES REDUNDANT MANUAL "ON" CONTROL OF 28VDC FROM CONTROL BUS TO LATCHING RELAYS FOR LANDING GEAR DOWN CIRCUIT. ACTUATION SWITCH LIGHT COMES ON WHEN PUSHED. TWO IDENTICAL SWITCHES PROVIDE REDUNDANT CONTROL BUS POWER TO COMMON LOAD.

FAILURE MODES EFFECTS ANALYSIS FMEA -- CIL FAILURE MODE

NUMBER: 05-6BA-2115-03

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SUBSYSTEM NAME: EPD&C - LANDING GEAR CONTROL

LRU: PANEL F6A5, F8A5 (PRE-MEDS), F6A3, F8A3 (MEDS)

CRITICALITY OF THIS

ITEM NAME: SWITCH, PUSHBUTTON

FAILURE MODE: 1/1

FAILURE MODE:

FAILS CLOSED (SET), CONTACT-TO-CONTACT SHORT (ONE POLE)

MISSION PHASE: DO DE-ORBIT

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

CAUSE:

PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN	A) N/A
	B) N/A
	C) N/A

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

FIRST FAILURE - POWERS LATCHING RELAY SET COIL(S)

(B) INTERFACING SUBSYSTEM(S):

FIRST FAILURE - LANDING GEAR DOWN CONTACTS ENERGIZED. LANDING GEARS WILL BE DEPLOYED UPON ACTIVATION OF ARM SWITCH.

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(C) MISSION:
FIRST FAILURE - NO EFFECT

(D) CREW, VEHICLE, AND ELEMENT(S):
FIRST FAILURE - LANDING GEARS WILL BE EXTENDED AS SOON AS ARM SWITCH IS ACTIVATED BECAUSE LANDING GEAR DOWN SWITCH HAS ALREADY FAILED CLOSED. THIS MAY OCCUR AT A TIME WHEN THERE IS A LIGHT WEIGHT VEHICLE, STRONG HEAD WINDS AND LOW ENERGY WHICH COULD LAND VEHICLE SHORT OF RUNWAY AND MAY CAUSE VEHICLE DAMAGE RESULTING IN POSSIBLE LOSS OF CREW/VEHICLE.

(E) FUNCTIONAL CRITICALITY EFFECTS:

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX A, ITEM 3 - PUSHBUTTON SWITCH

(B) TEST:
REFER TO APPENDIX A, ITEM 3 - PUSHBUTTON SWITCH

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

(C) INSPECTION:
REFER TO APPENDIX A, ITEM 3 - PUSHBUTTON SWITCH

(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:
GEAR IS NORMALLY ARMED AT TWO THOUSAND FOOT ALTITUDE WHICH ASSURES MAKING THE RUNWAY THRESHOLD EXCEPT FOR THE WORST CASE COMBINATION OF LIGHT WEIGHT VEHICLE, STRONG HEAD WINDS AND LOW ON ENERGY. CREW TRAINS IN SHUTTLE TRAINING AIRCRAFT AT TWO THOUSAND FOOT ALTITUDE TO MAKE FLIGHT

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ADJUSTMENTS TO COMPENSATE FOR INADVERTENT GEAR EXTENSION. IF DOWN RELAY FAILS CLOSED PRIOR TO ARM SWITCH ACTIVATION, CREW WILL DELAY "ARM" UNTIL IT IS SAFE TO DEPLOY LANDING GEAR. CREW WILL SEE "DOWN" PBI LIGHT ON AND THE GROUND WILL SEE THE ASSOCIATED TELEMETRY MEASUREMENT ON WHEN DOWN SWITCH FAILS.

- APPROVALS -

SS&PAE MANAGER	: P. STENGER-NGUYEN	: <i>P. Stenger-Nguyen 12/16/97</i>
SS&PAE	: T. AI	: <i>T. Ai 11/17/97</i>
DESIGN ENGINEERING	: T. D. NGUYEN	: <i>T. D. Nguyen 12-16-97</i>
MEDS SYSTEM	: M. B. WARNER	: <i>M. B. Warner 12/10/97</i>
MEDS HARDWARE	: R. SITAPARA	: <i>Rammit Sitapara 12/14/97</i>
JSC MOD	:	: <i>[Signature] 4/10/98</i>