

FAILURE MODES EFFECTS ANALYSIS (FMEA) - CIL HARDWARE

NUMBER:05-60-200715 -X

SUBSYSTEM NAME: EPD&C-GUIDANCE, NAVIGATION, & CONTROL (05-1)

REVISION: 0 09/12/88

PART DATA

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU	:AFT MCA-1	V070-765410
LRU	:AFT MCA-2	V070-765420
LRU	:AFT MCA-2	V070-765820
LRU	:AFT MCA-1	V070-765630
SRU	:RELAY, LATCHING	MC455-0128-0001

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
RELAY, LATCHING (12 AMPS) ATVC DEADFACE

REFERENCE DESIGNATORS: 55V76A115K62
55V76A115K84
54V76A114K73
54V76A114K75

QUANTITY OF LIKE ITEMS: 4
FOUR - ONE PER ATVC

FUNCTION:

PROVIDES A DEADFACING FUNCTION TO THE 28 VOLTS AC EXCITATION POWER FROM THE ATVC'S TO THE SRB DIFFERENTIAL PRESSURE TRANSDUCERS FOLLOWING SRB SEPARATION.

FAILURE MODES EFFECTS ANALYSIS FMEA - CIL FAILURE MODE

NUMBER: 05-60-200715-02

REVISION#: 1 01/22/96

SUBSYSTEM NAME: EPD&C-GUIDANCE, NAVIGATION, & CONTROL (05-1)

LRU: AFT MCA-1, 2

CRITICALITY OF THIS

ITEM NAME: RELAY, LATCHING

FAILURE MODE: 1R2

FAILURE MODE:

SHORTS CONTACT TO CONTACT, SHORTS TO GROUND, FAILS TO TRANSFER (DEADFACE)

MISSION PHASE: LO LIFT-OFF

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

CAUSE:

PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS

CRITICALITY 1/4 DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN	A) PASS
	B) PASS
	C) PASS

PASS/FAIL RATIONALE:

A)

B)

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF ONE OF FOUR ATVC POWER SUPPLIES.

(B) INTERFACING SUBSYSTEM(S):

LOSS OF ONE OF FOUR ATVC'S DUE TO THE 28 VOLT AC POWER SUPPLY SHORT. THE REMAINING ATVC CHANNELS STILL OPERATE TO MAINTAIN STABILITY.

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(C) MISSION:
NO EFFECT.

(D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT FOR FIRST FAILURE. SECOND FAILURE (LOSS OF ANOTHER ATVC AND ITS ASSOCIATED ISOLATION VALVE DRIVER, DUE TO AN ATVC POWER SWITCH FAILURE WHERE ALL THREE CONTACTS ARE SHORTED TO GROUND) COULD RESULT IN SEQUENTIAL BYPASSING OF GOOD CHANNELS AND SUBSEQUENT LOSS OF CONTROL. THE REMAINING GOOD CHANNELS (TWO) AS A RESULT OF THE SECOND FAILURE MOST LIKELY COULD SEQUENTIALLY EXCEED THE ATVC-FDI TRIP LEVEL (2200PSI), RESULTING IN AN ADDITIONAL CHANNEL BYPASS DUE TO A TWO AGAINST ONE FORCE FIGHT CONDITION. THIS SECOND FAILURE EFFECT ASSUMES A WORST CASE ANALYSIS WHERE ONE OF THE REMAINING GOOD CHANNELS EXCEEDS ITS TRIP LEVEL AS A RESULT OF TOLERANCE CONDITIONS BETWEEN CHANNELS AND IS SUBSEQUENTLY BYPASSED BY THE DELTA PRESSURE MONITOR.

(E) FUNCTIONAL CRITICALITY EFFECTS:
CRITICALITY 1R BECAUSE LOSS OF MPS OR SRB THRUST VECTOR CONTROL MAY CAUSE LOSS OF CREW/VEHICLE.

-DISPOSITION RATIONALE-

(A) DESIGN:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY (MC455-0128).

(B) TEST:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY (MC455-0128).

GROUND TURNAROUND TEST
PROPER OPERATION OF THE RELAY IS VERIFIED DURING GROUND TURNAROUND TESTING.

(C) INSPECTION:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY (MC455-0128).

(D) FAILURE HISTORY:
REFER TO APPENDIX C, ITEM NO. 3 - LATCHING RELAY (MC455-0128).

(E) OPERATIONAL USE:
REMAINING FCS CHANNEL SWITCHES TO BE PLACED IN "OVERRIDE". SEE FLIGHT RULE 8-52 (D) & (E).

- APPROVALS -

EDITORIALLY APPROVED : RI
EDITORIALLY APPROVED : JSC
TECHNICAL APPROVAL : APPROVAL FORM

: Jim D. 1/31/96
: Don Leacy 2-12-96
: 85-CIL-004-RI