

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE -

NUMBER: 05-6DS-2016-X

SUBSYSTEM NAME: EPD&C-DRAG CHUTE

REVISION : 1 04/23/92

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	DRAG CHUTE CONTROLLER ASSY	V070-765440
■ SRU :	CONTROLLER, HYBRID DRIVER	MC477-0261-0002

PART DATA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
HYBRID DRIVER CONTROLLER (HDC), TYPE I - SECOND STAGE JETTISON FIRE 1
COMMAND DRIVER
- REFERENCE DESIGNATORS: 50V76A214AR11
: 50V76A215AR11
- QUANTITY OF LIKE ITEMS: 2
TWO, ONE PER ASSEMBLY NO. 1 & NO. 2
- FUNCTION:
UPON RECEIPT OF 28VDC SIGNAL FROM FIRE 1 COMMAND DRIVER, THE HDC
PERFORMS AS A DRIVER TO THE ASSOCIATED PIC. ARM COMMAND SIGNAL IS
REQUIRED TO POWER UP THE SECOND STAGE HDC.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: 05-6DS-2016-02

REVISION# 1 04/23/92 R

SUBSYSTEM: EPD&C-DRAG CHUTE
LRU :DRAG CHUTE CONTROLLER ASSY
ITEM NAME: CONTROLLER, HYBRID DRIVER

CRITICALITY OF THIS
FAILURE MODE:1R3

- FAILURE MODE:
LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON"

MISSION PHASE:
00 DE-ORBIT

- 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 1/1 DURING INTACT ABORT ONLY? NO

- REDUNDANCY SCREEN A) PASS
■ B) FAIL
■ C) PASS

PASS/FAIL RATIONALE:

- A)
- B)
FAILS SCREEN "B" BECAUSE HDC FAILURE IS NOT READILY DETECTABLE UNLESS
THE MSID MEASUREMENT (PIC VOLTAGE) IS BEING RETRIEVED.
- C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:
LOSS OF JETTISON COMMAND CAPABILITY
- (B) INTERFACING SUBSYSTEM(S):
UNABLE TO JETTISON DRAG CHUTE VIA ASSOCIATED PIC

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- (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 IF UNABLE TO JETTISON A PREMATURE
DEPLOYED DRAG CHUTE. REQUIRES TWO ADDITIONAL FAILURES (LOSS OF
REDUNDANT HOC AND PILOT MORTAR CARTRIDGE PREMATURELY OPERATED CAUSING
PREMATURE DEPLOYMENT OF DRAG CHUTE) BEFORE EFFECT IS MANIFESTED.

| NOTE: FAILURE SCENARIO IS CREDIBLE ONLY AT ALTITUDES OF 40 TO 135 FEET.

- DISPOSITION RATIONALE -

- (A) DESIGN:
REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER
- (B) TEST:
REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER

GROUND TURNAROUND TEST
VERIFY THAT SECOND STAGE F1 HOC DOES NOT HAVE LOSS OF OUTPUT CONDITION
BY VERIFYING PIC VOLTAGES DURING JETTISON FUNCTIONAL TEST AND
JETTISON OUT OF SEQUENCE VERIFICATION. TESTS ARE PERFORMED EVERY FLOW
IF DRAG CHUTE IS INSTALLED AND FOR LRU RETEST PER TABLE V55200.000.
- (C) INSPECTION:
REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER
- (D) FAILURE HISTORY:
REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER
- (E) OPERATIONAL USE:
NONE

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- APPROVALS -

RELIABILITY ENGINEERING: T. AI
 DESIGN ENGINEERING : T. POCKLINGTON
 QUALITY ENGINEERING : W. R. HIGGINS
 NASA RELIABILITY :
 NASA SUBSYSTEM MANAGER :
 NASA EPD&C RELIABILITY :
 NASA QUALITY ASSURANCE :
 NASA EPD&C SUBSYS MGR :

T. J. E. ... 4/27/92
... 4-24-92
... 5/19/92
... 5/10/92
H. Salameh ... 5/11/92
KO ... 5/6/92
... 5-18-92