ILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE
NUMBER: MO-AA1-430-X

SUBSYSTEM NAME: STABILIZED PAYLOAD DEPLOYMENT SYSTEM
REVISION : 2 06/08/90

		PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
ASSEM	:	MID MCA-1	V070-764610
ASSEM	:	MID MCA-2	V070-764620
ASSEM	:	MID MCA-3	V070-764630
ASSEM	:	MID MCA-4	V070-764640
SRU	:	RELAY, HYBRID	MC455-0135-0001
■ SRU	:	RELAY, HYBRID	MC455-0135-0002

PART DATA

XTENDED DESCRIPTION OF PART UNDER ANALYSIS:

■ REFERENCE DESIGNATORS: 40V76A117 - K62
: 40V76A118 - K22
: 40V76A119 - K80
: 40V76A120 - K60

QUANTITY OF LIKE ITEMS: 4

■ FUNCTION:
PROVIDES ON/OFF CONTROL OF Yo DRIVE MOTOR POWER FOR THE "INBOARD" COMMAND IN RESPONSE TO COMMANDS FROM SWITCHES S45 AND S5.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AA1-430-04

REVISION# 2 06/08/90

SUBSYSTEM: STABILIZED PAYLOAD DEPLOYMENT SYSTEM

ITEM NAME: RELAY, HYBRID

CRITICALITY OF THIS FAILURE MODE:2R3

■ FAILURE MODE:
SHORTED TWO OR MORE SETS OF CONTACTS

MISSION PHASE:
OO ON-ORBIT

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

■ CAUSE:
PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS, PROCESSING ANOMALY

■ CRITICALITY 1/1 DURING INTACT ABORT ONLY? NO

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

PASS/FAIL RATIONALE:
■ A)
PRELAUNCH CHECKOUT

■ B)
TWO OR MORE PHASES WILL CAUSE MOTOR TO DRIVE. CANNOT CONFIRM RELAY FAILURE.

■ C)
PHYSICAL AND ELECTRICAL ISOLATION OF REDUNDANT ELEMENTS.

- FAILURE EFFECTS -

■ (A) SUBSYSTEM:
TWO OR MORE POWER PHASES WILL BE CONTINUOUSLY APPLIED TO A DRIVE MOTOR. WHENEVER THREE PHASE AC POWER IS PRESENT.

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL FAILURE MODE
NUMBER: MO-AAI-430-04

- (B) INTERFACING SUBSYSTEM(S):
  MOTOR WILL DRIVE AGAINST STOP, OVERHEAT AND POSSIBLY FAIL. IF UNDETECTED MOTOR WILL DRIVE AGAINST STOPS, OVERHEAT, AND FAIL MOTOR DRIVE FOR THE SELECTED FUNCTION WOULD BE AT HALF SPEED. IF THE RELAY FOR OPPOSITE MOTOR ROTATION IS ACTIVATED THE CIRCUIT BREAKER WILL TRIP.

- (C) MISSION:
  FIRST FAILURE - NO EFFECT

- (D) CREW, VEHICLE, AND ELEMENT(S):
  NO EFFECT. FIRST FAILURE.

- (E) FUNCTIONAL CRITICALITY EFFECTS:
  LOSS OF BOTH RELAYS IN THIS MODE RESULT IN LOSS OF OUTBOARD YO DRIVE CAPABILITY WHICH CAUSES LOSS OF MISSION.

- DISPOSITION RATIONALE -

- (A) DESIGN:
  REFER TO APPENDIX C, ITEM 1.

- (B) TEST:
  REFER TO APPENDIX C, ITEM 1.

  OMRSD: GROUND TURNAROUND
  FREQUENCY OF CHECKOUT IS MISSION DEPENDENT.
  DUAL MOTOR INBOARD-TO-OUTBOARD FUNCTIONAL
  S0790A-070-B
  S0790A.060-B

- (C) INSPECTION:
  REFER TO APPENDIX C, ITEM 1.

- (D) FAILURE HISTORY:
  REFER TO APPENDIX C, ITEM 1.

- (E) OPERATIONAL USE:
  NO OPERATIONAL WORKAROUND AFTER SECOND FAILURE, HOWEVER, EVA IS AVAILABLE TO DRIVE PEDESTAL OUTBOARD.

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NUMBER: MO-AA1-430-04

- APPROVALS -

RELIABILITY ENGINEERING	W. R. MARLOWE	W. P. Lyman 6/14/90
DESIGN ENGINEERING	T. TAUFER	6/14/90
QUALITY ENGINEERING	M. F. MERGEN	6/14/90
NASA RELIABILITY	G.E	9/7/90
NASA SUBSYSTEM MANAGER		9/25/90
NASA EPD&C RELIABILITY		M. S. Dinsdale for I. Woodard 9/19/90
NASA QUALITY ASSURANCE		9/14/90
NASA EPD&C SUBSYS MGR		for F. Mennis 9/20/90