

PAGE: 1

PRINT DATE: 09/05/90

FAILURE MODES EFFECTS ANALYSIS (FMEA) -- CRITICAL HARDWARE

NUMBER: 05-6EE-2002-X

SUBSYSTEM NAME: EP0&C - ADP DEPLOY & HTR (02-4E)

REVISION : 3 08/31/90

1478

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	PANEL C3A5	V070-730283
SRU :	SWITCH, TOGGLE	ME452-0102-7459

PART DATA

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

SWITCH, TOGGLE - AIR DATA PROBE (ADP) LEFT AND RIGHT STOW, DEPLOY,
DEPLOY/HEATER CIRCUIT

REFERENCE DESIGNATORS: 35V73A3A558
: 35V73A3A559

QUANTITY OF LIKE ITEMS: 2
Two

FUNCTION:

PROVIDES MANUAL CONTROL OF AIR DATA PROBE STOW, DEPLOY AND HEATERS.

ASSEMBLY : PANEL C3A5
P/N RI : ME452-0102-7459
P/N VENDOR:
QUANTITY : 2
: TWO

CRIT. FUNC: 1
CRIT. HDW: 1
VEHICLE 102 103 104
EFFECTIVITY: X X X
PHASE(S): PL LO OO DO X LS X

PREPARED BY: DES J KRAGER / DES T KIMURA / QE E GUTIERREZ
APPROVED BY: APPROVED BY (NASA) SSM R. Balaraman / REL [Signature] / QE [Signature]
REDAUNDANCY SCREEN: A- N/A B- N/A C- N/A
EPOC JSC & DC and Air 51 modified
EPOC SSM [Signature]

ITEM: SWITCH, TOGGLE - AIR DATA PROBE (ADP) LEFT AND RIGHT STOW, DEPLOY, DEPLOY/HEATER CIRCUIT

FUNCTION: PROVIDES MANUAL CONTROL OF AIR DATA PROBE STOW, DEPLOY AND HEATERS. 35V73A3A558, S9

FAILURE MODE: FAILS CLOSED (ROLLER/SPRING) MULTIPLE CONTACT SETS

CAUSE(S): PIECE PART STRUCTURAL FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY

- EFFECT(S) ON:
(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
(A) FAILURE OF SWITCH CAN ENERGIZE AND CLOSE BOTH RELAYS IN SERIES DEPLOY RESULTING IN INADVERTENT DEPLOYMENT OF ADP. INHIBIT SWITCH PREVENTS INADVERTENT STOWAGE OF ADP.
(B) FAILURE COULD RESULT IN INADVERTENT DEPLOY OF THE ADP.
(C) NO EFFECT
(D) POSSIBLE LOSS OF CREW/VEHICLE IF INADVERTENT ADP DEPLOYMENT AT TOO HIGH A SPEED OCCURS UPON ENTRY CAUSING A BURN-OFF OF THE PROBE AND THERMALLY AFFECTING THE SURROUNDING STRUCTURE. PROPER LIMIT SWITCH INDICATIONS WITH ERRONEOUS DATA TO ADP CAN CAUSE A SIDE-TO-SIDE DILEMMA AND THE SOFTWARE DOWNMODES TO USING DEFAULT GAINS.

SUBSYSTEM : EPD&C - ADP DEPLOY & MTR FMEA NO 05-6EE-2002 -2 REV:05/11/90

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH

(B) TEST

GROUND TURNAROUND TEST -

"RH ADP DEPLY/STOW/DEPLY/HEAT SW CMD CK", TESTS INTEGRITY OF RIGHT HAND ADP SWITCH WITH CONTROL BUS SWITCHING.

"LH ADP DEPLOY/STOW SW CMD INTEG CHECK", TESTS INTEGRITY OF LEFT HAND ADP SWITCH WITH CONTROL BUS SWITCHING.

ABOVE TWO TESTS ARE TO BE PERFORMED ON THE NEXT FLIGHT OF EACH VEHICLE OR AFTER LRU REPLACEMENT. PROBE MUST BE AT AN INTERMEDIATE POSITION AND THE APPROPRIATE DEPLOY/STOW SWITCH MUST BE ENABLED AND AC-1, AC-2 AND AC-3 CIRCUIT BREAKERS OPEN.

DEPLOY RH AND LH ADP - DUAL MOTOR, TESTS DEPLOY OF RIGHT HAND AND LEFT HAND ADP'S AND OPERATING TIMES.

ABOVE DUAL MOTOR TESTS ARE PERFORMED BY INFLIGHT CHECKOUT OR AFTER LRU REPLACEMENT.

DEPLOY RH AND LH ADP - SINGLE MOTOR, TESTS DEPLOY OF RIGHT HAND AND LEFT HAND ADP AND OPERATING TIMES.

STOW RH AND LH ADP - SINGLE MOTOR, TESTS STOW OF RIGHT AND LEFT HAND ADP'S AND OPERATING TIMES.

ABOVE SINGLE MOTOR TESTS ARE PERFORMED PRIOR TO FLIGHT OR AFTER LRU REPLACEMENT.

(E) OPERATIONAL USE

THE PROBE FAILURE CAUSES A SIDE-TO-SIDE DILEMMA AND THE SOFTWARE DOWNMODES TO USING DEFAULT GAINS. THE CREW MUST MAINTAIN PITCH ATTITUDE WITHIN THETA LIMITS DISPLAYED ON CRT. CRT DISPLAYS ALPHA, MACH, AN ALTITUDE FROM EACH ADTA TO THE CREW. IF THE NAV DERIVED ALPHA, MACH, AN ALTITUDE DISPLAYED ON DEDICATED DISPLAYS (AMI, AVVI) ARE CORRECT, THE CREW CAN COMPARE THE ADTA DATA WITH THE NAV DERIVED DATA TO RESOLVE THE DILEMMA.