

SUBSYSTEM :R/RADAR & COM ANT DEPLOY FMEA NO 05-6EH-56020 -2 REV:05/21/90

ASSEMBLY :MID MCA 2 AND 4
 P/N RI :MC455-0135-0002
 P/N VENDOR:
 QUANTITY :4
 :FOUR/2 PER MCA
 :

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X
PHASE(S):	PL	LO X OO X DO X LS	

CRIT. FUNC: 1R
 CRIT. HDW: 3

PREPARED BY: DES T BANHIDY
 REL *5-21-90* J RESSIA
 QE J COURSEN

REDUNDANCY SCREEN: A-PASS B-FAIL C-PAS:
 APPROVED BY: DES *J. S. ...*
 REL *5-31-90*
 QE *...*

APPROVED BY (NASA):
 SSM *...*
 REL GE *...*
 QE *...*

ITEM:
 RELAY, HYBRID - BOOM DEPLOY, MOTOR POWER

FUNCTION:
 SWITCHES POWER FROM AC BUSES TO THE KU-BAND ANTENNA DEPLOYMENT ACTUATOR
 DEPLOY MOTOR ACTIVATION IS CONTROLLED BY THE PANEL SWITCH.
 40V76A118K70, K72; 40V76A120K27, K37

FAILURE MODE:
 CLOSED, PREMATURELY CLOSES

CAUSE(S):
 PIECE-PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK,
 PROCESSING ANOMALY, THERMAL STRESS

EFFECT(S) ON:
 (A)SUBSYSTEM (B)INTERFACES (C)MISSION (D)CREW/VEHICLE (E)FUNCTIONAL
 CRITICALITY:

(A) FIRST FAILURE - LOSS OF CONTROL OF ONE OF TWO SERIES-CONNECTED HYBRID
 RELAYS USED FOR SWITCHING 3-PHASE POWER IN ONE OF TWO PATHS TO THE
 DEPLOYMENT ACTUATORS. AFTER TWO FAILURES, LOSS OF ABILITY TO SWITCH 3
 PHASE POWER IN ONE OF TWO PATHS TO THE DEPLOYMENT ACTUATORS.

(B,C,D,E) NO EFFECT - FIRST FAILURE. POSSIBLE LOSS OF CREW/VEHICLE AFTER
 FOUR FAILURES (HYBRID RELAY FAILS CLOSED; ASSOCIATED SERIES-CONNECTED
 HYBRID RELAY FAILS CLOSED; MECHANICAL POWER AC2 OR AC3 FAILS ON, DRIVING
 THE KU-BAND DEPLOYED ASSEMBLY INTO THE RADIATOR, CAUSING LOSS OF FREON
 COOLANT LOOP; AND LOSS OF REDUNDANT FREON COOLANT LOOP), DURING POWERED
 FLIGHT, CAUSING LOSS OF ALL VEHICLE COOLING CAPABILITY.

FIRST HYBRID RELAY FAILURE IS CONSIDERED AS NOT BEING READILY DETECTABLE
 IN FLIGHT ALTHOUGH OPERATIONAL STATUS MONITORING EXISTS FOR THESE HYBRID
 RELAYS. SUFFICIENT TIME MAY NOT BE AVAILABLE TO ALLOW CORRECTIVE ACTION
 TO BE PERFORMED.

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DISPOSITION & RATIONALE:

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

(A-D) DISPOSITION AND RATIONALE

REFER TO APPENDIX C, ITEM NO. 1 - HYBRID RELAY

(B) GROUND TURNAROUND TEST

"KU-BAND ANTENNA DEPLOY MOTOR 1 AND 2" VERIFIES THE INTEGRITY OF THE BOG DEPLOY HYBRID RELAYS FOR MOTORS 1 AND 2. HYBRID RELAY PERFORMANCE IS VERIFIED DURING IN-FLIGHT OPERATION. ON GROUND TESTING WOULD BE ACCOMPLISHED WHEN A VALID VERIFICATION IS UNOBTAINABLE DURING FLIGHT, C FOLLOWING LRU REPLACEMENT. ALSO, SINGLE MOTOR OPERATION IS VERIFIED EVERY FLOW: DEPLOY MOTOR 1/STOW MOTOR 2 IS VERIFIED ON ODD FLOWS: AN DEPLOY MOTOR 2/STOW MOTOR 1 IS VERIFIED ON EVEN FLOWS.

(E) OPERATIONAL USE

THE FIRST TWO FAILURES ARE NOT DETECTABLE IN FLIGHT. DURING POWERED FLIGHT, THIRD FAILURE COULD CAUSE LOSS OF ONE FREON COOLANT LOOP REQUIRING EQUIPMENT POWER-DOWN TO MINIMIZE HEAT GENERATION AND LANDING AT NEXT PRIMARY LANDING SITE (PLS). THE FOURTH FAILURE (LOSS OF REDUNDANT FREON COOLANT LOOP) COULD CAUSE LOSS OF CREW/VEHICLE.