

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS

FMEA NO 05-6L -2134 -2

REV: 10/30/87

ASSEMBLY : APT PCA 1,2  
 P/N RI : MC455-0129-0001  
 P/N VENDOR:  
 QUANTITY : 8  
 : EIGHT  
 : (TWO PER HEATER GROUP)

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

CRIT. FUNC: 2R  
 CRIT. HDW: 3

PREPARED BY:  
 DES D SOVEREIGN  
 REL F DEFENSOR  
 QE J COURSEN

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
 APPROVED BY:  
 DES *D. E. R. B...*  
 REL *P. J. ... 11-16-87*  
 QE *[Signature]*

APPROVED BY (NASA):  
 SSM *John ...*  
 REL *[Signature]*  
 QE *[Signature]*  
*EPDC SSM Approval for KC Stage*

ITEM:

RELAY, GENERAL PURPOSE, 4 POLES, NONLATCHING, LEFT AND RIGHT OMS-GROUP 1 AND 2 HEATER, DRIVER LOGIC AND POWER INPUT.

FUNCTION:

UPON CREW ACTUATION OF PANEL SWITCHES THE RELATED RELAY (GROUP 1 OR 2) OPERATES TO APPLY MAIN BUS VOLTAGE TO HYBRID DRIVER LOGIC AND POWER INPUTS FOR THE SELECTED GROUP 1 AND GROUP 2 HEATERS IN THE LEFT AND RIGHT OMS. 54V76A131K3, 4, 5. 55V76A132K4, 5, 6. 56V76133K3, 5.

FAILURE MODE

INADVERTENT OPERATION, INADVERTENTLY CLOSES, SHORTS.

CAUSE(S):

CONTAMINATION, PIECE PART STRUCTURAL FAILURE, VIBRATION, THERMAL STRESS, MECHANICAL SHOCK

EFFECT(S) ON:

(A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE (E) FUNCTIONAL CRITICALITY

(A) ENERGIZES HYBRID DRIVER POWER INPUTS AND ENABLES PART OF THE HEATERS AND THERMAL SWITCHES.

(B) FIRST FAILURE HAS NO EFFECT. FUNCTION WILL NOT BE COMPLETED ON HEATERS CONTROLLED BY THE HYBRID DRIVERS SINCE A SECOND COMMAND INPUT FROM A SEPARATE CIRCUIT IS REQUIRED BEFORE THESE HEATERS CAN TURN ON. A SECOND RELATED FAILURE COULD RESULT IN ENABLING REDUNDANT SYSTEM HEATERS. POWER WILL BE SUPPLIED TO REMAINING HEATERS; THERMAL SWITCHES WILL PREVENT BOTH GROUP 1 AND 2 HEATERS FROM CREATING AN OVER TEMPERATURE CONDITION.

(C, D) FIRST FAILURE HAS NO EFFECT. HEATERS ARE CONTROLLED AUTOMATICALLY BY THERMAL SWITCHES.

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(E) POSSIBLE LOSS OF MISSION DUE TO THE PREMATURE ENABLING OF GROUP 1 OR 2 HEATERS WHILE OTHER SET OF HEATERS ARE ENABLED LEADING TO OVERHEATING. NEXT PLS DEORBIT REQUIRED IF POD THERMAL LIMITS ARE VIOLATED. REQUIRES TWO OTHER FAILURES (THERMAL SWITCH FAILED ON, THERMAL SWITCH ON REDUNDANT HEATERS FAILED ON) BEFORE THE EFFECT IS MANIFESTED. FAILURE IS NOT READILY DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE

REFER TO APPENDIX C, ITEM NO. 2 - RELAY, GENERAL PURPOSE.

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POD; PERFORMED FOR FIRST FLIGHT AND AT 5 FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43Z00.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL CHECKOUT OF HEATER CONTROL CIRCUITS PER FIGURE V43CAO.070-6.

V43CAO.075 - ELECTRICAL INTERFACE VERIFICATION ORB/POD; PERFORMED ON A CONTINGENCY BASIS (POD REMOVAL AND REPLACEMENT). COPPER PATH VERIFICATION OF HEATER CONTROL CIRCUIT INTERFACES.

(E) OPERATIONAL USE

IF FAILURE IS DETECTED, DO NOT USE REDUNDANT HEATER CIRCUIT.