

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - FREON RDTR DPLY FMEA NO 05-6EG-2017 -1 REV:11/03/87

ASSEMBLY : MID MCA 1,2,3,4 CRIT. FUNC: 1R
 P/N RI : MC455-0135-0001, -0002 CRIT. HDW: 2
 P/N VENDOR: VEHICLE 102 099 103 104
 QUANTITY : 16 EFFECTIVITY: X X X
 : SIXTEEN - FOUR PER MOTOR PHASE(S): PL LO OO X DC X LS
 : CIRCUIT

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES J KRAGER DES *[Signature]* SSM *[Signature]*
 REL T KIMURA REL *[Signature]* REL *[Signature]*
 QE W SMITH QE *[Signature]* QE *[Signature]*

ITEM:
 RELAY, HYBRID PORT AND STARBOARD RADIATOR DEPLOYMENT/STOW ACTUATOR MOTOR AC SWITCHING

FUNCTION:
 WHEN COMMANDED, THE HYBRID RELAY CONTACT SETS CONNECT 3-PHASE AC VOLTAGE TO ACTUATOR MOTORS FOR ARMING AND SEQUENCING TO DEPLOY OR STOW PORT AND STARBOARD RADIATORS. 40V76A117K8, 10, 12, 22; 40V76A118K52, 62, 64, 66; 40V76A119K27, 29, 39, 41; 40V76A120K32, 34, 44, 46

FAILURE MODE:
 FAILS TO TRANSFER, FAILS TO CONDUCT, SHORTS TO GROUND (DC SIDE)

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) LOSS OF VOLTAGE TO AN AFFECTED ACTUATOR MOTOR
- (B) LOSS OF INTERFACE REDUNDANCY. NO EFFECT. THE REDUNDANT CONTROL AND MOTOR STRING CAN COMPLETE THE FUNCTION BUT IN APPROXIMATELY TWICE THE TIME. FIRST FAILURE HAS NO EFFECT. SECOND RELATED FAILURE OCCURRING IN THE REDUNDANT STRING (ASSOCIATED HYBRID RELAY FAILS TO CONDUCT) PRECLUDES NORMAL RADIATOR STOWING.
- (C,D) NO EFFECT - FIRST FAILURE
- (E) POSSIBLE LOSS OF VEHICLE AFTER SECOND FAILURE IF FAILURE PRECLUDES STOWING AND PREVENTS CLOSING OF THE PAYLOAD BAY DOOR (PLBD).

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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

"DEPLOY STBD RADIATOR - MTR 1 AND 2", AND "STOW STBD RADIATOR - MTR 1 AND 2", VERIFIES FUNCTIONAL OPERATION AND MONITORING FOR THE DEPLOYMENT AND STOWAGE OF THE STARBOARD RADIATORS, MOTORS 1 AND 2. FOR STARBOARD RADIATOR OPERATION ONLY, REMOVE MID MCA 1 AC-1 AND MID MCA 4 AC-3 POWER (OPEN CIRCUIT BREAKER) TO PREVENT INADVERTENT MOVEMENT OF THE STARBOARD RADIATOR. "DEPLOY PORT RADIATOR - MTR 1 AND 2", AND "STOW PORT RADIATOR - MTR 1 AND 2", VERIFIES FUNCTIONAL OPERATION AND MONITORING FOR THE DEPLOYMENT AND STOWAGE OF THE PORT RADIATORS, MOTORS 1 AND 2. FOR PORT RADIATOR OPERATION ONLY, REMOVE MID MCA 2 AC-3 AND MID MCA 3 AC-1 POWER (OPEN CIRCUIT BREAKER) TO PREVENT INADVERTENT STARBOARD RADIATOR MOVEMENT.

ALL OF THE ABOVE TESTS ARE PERFORMED PRIOR TO EACH FLIGHT FOR WHICH A PLANNED RADIATOR DEPLOY/STOW FUNCTION IS REQUIRED OR AFTER LRV REPLACEMENT.

(E) OPERATIONAL USE

EXTRAVEHICULAR ACTIVITY (EVA) CAPABILITY EXISTS TO STOW RADIATOR FOLLOWING SECOND FAILURE.