

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - ATCS/ABS FMEA NO 05-6WB-1005 -2 REV: 06/10/88  
ASSEMBLY : APT LD CNTRL ASSY 1,2,3 CRIT. FUNC: 1R  
P/N RI : MC477-0263-0002 CRIT. HDW: 2  
P/N VENDOR: VEHICLE 102 103 104  
QUANTITY : 8 (EIGHT), EFFECTIVITY: X X X  
: TWO PER AMMONIA PHASE(S): PL LO OO X DO X LS  
: SYSTEM CONTROLLER

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS  
PREPARED BY: APPROVED BY: APPROVED BY (NASA):  
DES J BROWN DES *[Signature]* BSM *[Signature]*  
REL H HOVE REL *[Signature]* REL *[Signature]*  
QE J COURSEN QE *[Signature]* QE *[Signature]*  
*[Handwritten notes and signatures]*

ITEM: HYBRID DRIVER CONTROLLER, TYPE III. NH3 CONTROLLERS.

FUNCTION:  
TWO SERIES HYBRID DRIVERS PROVIDE POWER TO THE ABS ISOLATION VALVES, UPON GPC COMMANDING OR MANUAL SWITCHING. 55V76A121AR (J6-N'). 55V76A122AR (J6-K/M'). 56V76A121AR (J6-N', M/R') NOTE - LETTERS WITH A PRIME SYMBOL INDICATE LOWER CASE LETTERS.

FAILURE MODE:  
INADVERTENT OUTPUT, FAILS "ON"

CAUSE(S):  
CONTAMINATION, STRUCTURE FAILURE, VIBRATION, MECHANICAL SHOCK, THERMAL STRESS, PROCESSING ANOMALY

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

(A) ONE DRIVER FAILED "ON", BUT OTHER DRIVER WILL MAINTAIN CONTROL OF ABS ACTIVATION.

(B, C, D) NO EFFECT.

(E) FUNCTIONAL CRITICALITY EFFECT - INADVERTENT ACTIVATION OF ABS CAN CAUSE EXCESSIVE COOLING OF FREON IN BOTH LOOPS AND FREEZING OF INTERCHANGER, RESULTING IN LOSS OF ORBITER COOLING AND POSSIBLE LOSS OF CREW/VEHICLE. WITH FAILURE OF ONE OF TWO DRIVERS IN SERIES, SECOND ASSOCIATED FAILURE (OTHER DRIVER FAILS ON) COULD CAUSE ACTIVATION OF THE ABS.

FAILS SCREEN B BECAUSE ONE DRIVER SERIES ELEMENT CAN BE "ON" WITHOUT BEING DETECTED IN FLIGHT.

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

(A-D) DISPOSITION AND RATIONALE  
REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER.

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(B) GROUND TURNAROUND TEST

AMMONIA BOILER HYBRID DRIVER CONTROLLERS ARE VERIFIED EVERY FIVE FLIGHTS.

(E) OPERATIONAL USE

NONE FOR FIRST FAILURE. SECOND FAILURE TO REDUNDANT DRIVER WILL ACTIVATE NH3 BOILER AND MAY CAUSE UNDER TEMP CONDITION WHICH WILL BE INDICATED BY ONBOARD ALARM 'EVAP OUT TEMPERATURE'. BOTH APS H2O LOOPS WILL BE ACTIVATED AND RADIATOR CONTROLLER WILL BE SWITCHED TO HIGH SET POINT UNTIL NH3 DEPLETION.