

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - BRAKE/ANTI SKID FMEA NO 05-6BB-2096 -1 REV:04/24/89

ASSEMBLY : FWD PCA-1, 2
P/N RI : MC455-0129-0001
P/N VENDOR:
QUANTITY : SIX
: THREE PER CONTROL BOX
: SIX PER VEHICLE

VEHICLE 102
EFFECTIVITY: X
PHASE(S): PL LO

CRIT. FUNC: 1R
CRIT. HDW: 3
103 104
X X
OO DO X LS

REUNDANCY SCREEN: A-PASS B-FAIL C-PASS
APPROVED BY: (NASA)
DES J HERMAN
REL H YEW
QE W HIGGINS

DES *[Signature]*
REL *[Signature]*
QE *[Signature]*

SSM *[Signature]* 5/3/89
REL *[Signature]* 5/2/89
QE *[Signature]*
EPDC SSM *[Signature]*
EPDC REL *[Signature]*

ITEM:
RELAY, GENERAL PURPOSE (4PZP) BRAKE SUB-BUS/WEIGHT-ON-WHEELS CIRCUIT
POWER. 81V76A22-K9, K12, K13. 82V76A23-K11, K16, K17.

FUNCTION:
PROVIDES THE CAPABILITY TO INHIBIT THE APPLICATION OF BRAKES PRIOR TO
WEIGHT-ON-WHEELS BEING SENSED.

FAILURE MODE:
FAILS CLOSED (INDICATES FALSE LANDING GEAR NO WEIGHT-ON-WHEELS).

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

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

(A,B) FIRST FAILURE - RELAY WOULD BE CLOSED BUT NO BRAKE INHIBIT SIGNAL
IS APPLIED UNTIL TWO ADDITIONAL RELAYS ARE CLOSED.

(C,D) FIRST, SECOND AND THIRD FAILURE - BRAKE INHIBIT IS APPLIED TO ONE
OF TWO ANTI-SKID/BRAKE BOXES AND IT CAUSES LOSS OF FIFTY PERCENT BRAKING
CAPABILITY. NO EFFECT TO NORMAL LANDING.

(E) POSSIBLE LOSS OF CREW/VEHICLE IF VEHICLE BRAKING CAPABILITY IS LOST.
REQUIRES THREE FAILURES (THREE RELAYS IN SERIES) BEFORE EFFECT IS
MANIFESTED FOR TAL (TRANSATLANTIC ABORT LANDING). REQUIRES FIVE FAILURES
(THREE RELAYS IN SERIES PLUS MAIN AND BACKUP HYDRAULIC SYSTEMS) BEFORE
EFFECT IS MANIFESTED FOR NORMAL LANDING.

FAILS "B" SCREEN BECAUSE RELAY POSITION IS NOT DETECTABLE IN FLIGHT.

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. 2 - GENERAL PURPOSE RELAY.

FAILURE
PENDING

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(B) GROUND TURNAROUND TEST

VERIFY RELAY CAPABILITY TO INHIBIT THE APPLICATION OF BRAKES PRIOR TO WEIGHT-ON-WHEELS BEING SENSED BY PERFORMING VERIFICATION OF INBOARD AND OUTBOARD BRAKES 1, 2, 3 AND 4 FOR BOXES A AND B WHEN COMMANDER OR PILOT BRAKE PEDAL IS FULLY DEPRESSED. TESTS ARE PERFORMED FOR EVERY FLIGHT AFTER LRU REPLACEMENT.

(E) OPERATIONAL USE

AFTER THIRD FAILURE (LOSS OF FIFTY PERCENT BRAKING WITH ANTI-SKID ON) COMMANDER CAN SWITCH ANTI-SKID OFF TO OBTAIN ONE HUNDRED PERCENT BRAKING WITHOUT ANTI-SKID PROTECTION.

DATE
FRI 11 1981