SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - OMS   FMEA NO 05-6L -2130 -1   REV:10/30/87

ASSEMBLY :AFT MCA 1,2,3
P/N RI :MC455-0135-0001
P/N VENDOR:
QUANTITY :16
:SIXTEEN
:(TWO PER VALVE)

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

PHASE(S): PL LO OO DO X LS

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS

PREPARED BY:		APPROVED BY:		APPROVED BY (NASA):	
DES	D SOVEREIGN	DES	D.S. R Burns	SSM	[signature] for ...
REL	F DEFENSOR	REL	[signature] 11-12-87	REL	[signature] 12-9-97
QE	J COURSEN	QE	[signature] 11/12/87	QE	[signature]

EPDC SSM [signature] for ...

ITEM:
RELAY, HYBRID, 4 POLES, NONLATCHING, LEFT AND RIGHT OMS - OXIDIZER AN FUEL CROSSFEED ISOLATION VALVE A AND B, "OPEN" CIRCUIT.

FUNCTION:
UPON RECEIVING THE PROPER STIMULI FROM THE GENERAL PURPOSE COMPUTER (GPC THROUGH FLIGHT MDMS OR THE CREW THROUGH PANEL SWITCHES, THE HYBRID RELA CONTACTS CONNECT THE PROPER AC PHASE VOLTAGE TO ENERGIZE ASSOCIATED DRIV CIRCUIT TO OPEN THE OXIDIZER AND FUEL CROSSFEED ISOLATION VALVE A AND OF THE LEFT OR RIGHT OMS. 54V76A114K51, 52, 55, 56. 55V76A115K40, 43, 44 45, 48, 51, 52, 53. 56V76A116K75, 77, 78, 79.

FAILURE MODE:
FAILS TO TRANSFER, FAILS TO CONDUCT, FAILS TO CLOSE.

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) FUNCTIONA CRITICALITY

(A) LOSS OF REDUNDANCY - DEGRADATION OF ABILITY TO ENERGIZE THE AFFECTE "OPEN" AC MOTOR VALVE DRIVE CIRCUIT.

(B) FIRST FAILURE HAS NO EFFECT. REDUNDANT CIRCUIT CAN APPLY POWER T THE "OPEN" AC MOTOR VALVE CIRCUIT. A SECOND SIMILAR FAILURE WOUL RESULT IN LOSS OF ABILITY TO OPEN ONE OXIDIZER OR FUEL CROSSFEE ISOLATION VALVE.

(C,D) FIRST FAILURE HAS NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO LOSS OF CAPABILITY TO CONTROL CROSSFEED VALVES. REQUIRES THREE OTHER FAILURES (REDUNDANT RELAY FAILS TO CONDUCT, PARALLEL CROSSFEED VALVE FAILS TO OPEN, LOSS OF OTHER OMS ENGINE) BEFORE THE EFFECT IS MANIFESTED. INABILITY TO CROSSFEED PROPELLANT COULD RESULT IN INABILITY TO UTILIZE/DEPLETE PROPELLANT FROM OMS POD. FAILURE IS NOT DETECTABLE IN FLIGHT DUE TO LACK OF CREW VISIBILITY TO MCA STATUS 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. 1 - HYBRID RELAY.

(B) GROUND TURNAROUND TEST
V43CA0.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POD; PERFORMED FOR FIRST FLIGHT AND AT FIVE FLIGHT INTERVALS OR FOR LRU RETEST PER FIGURE V43Z00.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL CHECKOUT OF AC MOTOR VALVE CONTROL CIRCUITS PER FIGURE V43CA0.070-2.

V43CA0.072 - REDUNDANT CIRCUIT VERIFICATION; PERFORMED EACH FLIGHT (AFTER FIRST FLIGHT). FUNCTIONAL CHECKOUT OF AC MOTOR CONTROL CIRCUITS PER FIGURE V43CA0.070-2.

V43CF0.010 - PROPELLANT SERVICING TO FLIGHT LOAD; PERFORMED EACH FLIGHT. ALL AC MOTOR VALVES CYCLED DURING LOADING OPERATION.

(E) OPERATIONAL USE
NO ACTION FOR FIRST FAILURE. IF REDUNDANT RELAY FAILS, USE PARALLEL FLOW PATH.