

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - MAIN PROP. FMEA NO 05-6J -2132 -1 REV:06/15/88

ASSEMBLY : AFT LCA-3  
 P/N RI : MC477-0263-0002  
 P/N VENDOR:  
 QUANTITY : 1  
 : ONE  
 :

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

CRIT. FUNC: 1R  
 CRIT. HDW: 2

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

PREPARED BY:	APPROVED BY:	APPROVED BY (NASA):
DES <u>JWB</u> J BROWN	DES <u>J Brown</u>	EPDC SSM <u>[Signature]</u>
REL <u>GF</u> DEFENSOR	REL <u>J Kimura 6/27/88</u>	MPS SSM <u>[Signature]</u>
QE <u>Dm</u> D MASAI	QE <u>JJ Conner 6/27/88</u>	EPDC REL <u>[Signature]</u>
		MPS REL <u>[Signature]</u>
		QE <u>[Signature]</u>

ITEM:

CONTROLLER, HYBRID DRIVER (HDC), TYPE III, LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE CONTROL SOLENOID POWER.

FUNCTION:

CONDUCTS POWER TO CONTROL SOLENOID OF LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE (LV10). 56V76A123J3 (74).

FAILURE MODE:

LOSS OF OUTPUT, FAILS TO CONDUCT, FAILS TO TURN "ON".

CAUSE(S):

PIECE PART FAILURE, CONTAMINATION, VIBRATION, MECHANICAL SHOCK, PROCESSING ANOMALY, THERMAL STRESS.

EFFECT(S) ON:

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

(A) LOSS OF POWER PATH TO HELIUM CROSSOVER VALVE.

(B) INABILITY TO OPEN THE LEFT ENGINE PNEUMATIC HELIUM CROSSOVER VALVE (LV10).

(C,D) NO EFFECT - FIRST FAILURE.

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(E) 1R/2, 1 SUCCESS PATH AFTER FIRST FAILURE.  
TIME FRAME - ENGINE OPERATION.

- 1) HELIUM LEAK DOWNSTREAM OF CHECK VALVE CV9 (ASSUMES LEAK RATE IS LARGE ENOUGH TO DEplete PNEUMATIC SUPPLY BUT LESS THAN REQUIRED TO OVERPRESSURIZE THE AFT COMPARTMENT).
- 2) HDC FAILS TO TURN "ON", CAUSING HELIUM CROSSOVER VALVE TO REMAIN CLOSED WHEN CREW MANUALLY COMMANDS LV10 OPEN IN RESPONSE TO FIRST FAILURE PRIOR TO MECO.

LOSS OF PNEUMATIC ACTUATION HELIUM RESULTS IN LO2 PREVALVE FAILING TO CLOSE AND INABILITY TO MAINTAIN INJECTED HELIUM AND LO2 PRESSURE TO THE HIGH PRESSURE OXYGEN TURBOPUMP TO PREVENT PUMP OVERSPEED AND CAVITATION AT MECO. RESULTS IN UNCONTAINED ENGINE DAMAGE, AFT COMPARTMENT OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF CREW/VEHICLE.

DISPOSITION & RATIONALE:

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

(A-D) FOR DISPOSITION AND RATIONALE:

REFER TO APPENDIX B, ITEM NO. 1 - HYBRID DRIVER CONTROLLER.

(B) GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION, V41AAC.160 EVERY FLIGHT.

(E) OPERATIONAL USE

NO CREW ACTION CAN BE TAKEN.

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