

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS

FMEA NO 05-6L -2208 -2

REV:10/30/87

ASSEMBLY : AFT LCA 1, 3
 P/N RI : MC477-0263-0002
 P/N VENDOR:
 QUANTITY : 2
 : TWO
 : (ONE PER ENGINE)

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

CRIT. FUNC: 1R
 CRIT. HDW: 3

PREPARED BY:
 DES D SOVEREIGN
 REL F DEFENSOR
 QE J COURSEN

REDUNDANCY SCREEN:
 APPROVED BY:
 DES *D. J. R. Burns*
 REL *Ed. Meyer, Ch. Tom 11-13-87*
 QE *DM / S. J. J. / 11/13/87*

A-PASS B-FAIL C-PASS
 APPROVED BY (NASA):
 SSM *John Norris for W. Stagg*
 REL *Ed. Meyer, Ch. Tom 11-13-87*
 QE *DM / S. J. J. / 11/13/87*
 EPD&C SSM *Ch. Tom for W. Stagg*

ITEM:

DRIVERS, HYBRID, TYPE III, LEFT AND RIGHT OMS - ENGINE GN2 FILL VALVE.

FUNCTION:

UPON PRE-LAUNCH GROUND COMMAND (THROUGH MDM-LA1), THE DRIVER CONDUCTS MAIN BUS POWER TO ENERGIZE THE ASSOCIATED LEFT OR RIGHT OMS ENGINE GN2 FILL VALVE. 54V76A121AR (J11-K'). 56V76A123AR (J11-GG).

FAILURE MODE:

INADVERTENT OUTPUT, SHORTS, CONDUCTS PREMATURELY.

CAUSE(S):

CONTAMINATION, PIECE PART STRUCTURAL FAILURE, MECHANICAL SHOCK, THERMAL STRESS, VIBRATION.

EFFECT(S) ON:

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

(A) ENERGIZES ENGINE GN2 FILL VALVE SOLENOID.

(B) FIRST FAILURE WILL OPEN ENGINE GN2 FILL VALVE BUT GN2 SUPPLY IS NOT LOST UNTIL MULTIPLE AND RELATED FAILURES OCCUR. GROUND INTERFACE (INTERNAL SEAL AND A PRESSURE CAP WITH A SEAL INSTALLED PRIOR TO FLIGHT) IS CAPPED FOLLOWING FILL OPERATIONS.

(C,D) FIRST FAILURE HAS NO EFFECT.

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO PREMATURE/UNSCHEDULED FILL VALVE OPENING AND LOSS OF PRESSURANT REQUIRED FOR BI-PROPELLANT VALVE ACTUATION, RESULTING IN LOSS OF DEORBIT CAPABILITY. REQUIRES FOUR OTHER FAILURES (GN2 COUPLING CAP LEAKING, GN2 FILL COUPLING LEAKING, GN2 ACCUMULATOR CHECK VALVE LEAKING, LOSS OF OTHER OMS ENGINE) BEFORE THE EFFECT IS MANIFESTED. INADVERTENT OUTPUT OF THE HYBRID DRIVER CANNOT BE DETECTED IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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POSITION & 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.

(B) GROUND TURNAROUND TEST

V43CAO.070 - REDUNDANT CIRCUIT VERIFICATION (PERIODIC) - ORB/POD;
PERFORMED FOR FIRST FLIGHT AND AT 5 FLIGHT INTERVALS OR FOR LRU RETEST
PER FIGURE V43200.000 OR FOR ORBITER DISRUPTED COPPER PATHS. FUNCTIONAL
CHECKOUT OF GN2 FILL VALVE CONTROL CIRCUITS PER FIGURE V43CAO.070-3.

V43CFO.030 - PNEUMATIC SYSTEM GN2 SERVICING; PERFORMED EACH FLIGHT.
LEAK CHECK OR FILL VALVE PERFORMED AFTER SERVICING.

(E) OPERATIONAL USE

NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. FOR LOSS OF GN2 DUE TO
FILL VALVE LEAK, SAVE THE REMAINING ENGINE START (IN THE ACCUMULATOR)
FOR THE DEORBIT BURN. PERFORM DEORBIT BURN IN "ARM" POSITION.