

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2207 -2 REV:03/14/82

ASSEMBLY : AFT LCA 1, 2, 3 CRIT. FUNC: 1R
 P/N RI : MC477-0263-0002 CRIT. HDW: 3
 P/N VENDOR: VEHICLE 102 103 104
 QUANTITY : 12 EFFECTIVITY: X X X
 : TWELVE PHASE(S): PL X LO X OO X DO X LS X
 : (TWO GROUPS OF THREE IN EACH OMS ENGINE CONTROL)

REDUNDANCY SCREEN: A-PASS B-FAIL C-PASS
 PREPARED BY: APPROVED BY: APPROVED BY (NASA):
 DES D SOVEREIGN DES *D.S. R. Bunn* SSM *John L. ... 4/1/82*
 REL F DEFENSOR REL *...*
 QE J COURSEN QE *...*
3/5/82
SPD 55M Q&A ... for use to
SPD 55M ...

ITEM:
 DRIVERS, HYBRID, TYPE III, LEFT AND RIGHT OMS ENGINE CONTROL VALVE 1 AND 2, OFF/ON.

FUNCTION:
 UPON CREW INITIATED COMMANDS, EACH GROUP OF THREE HYBRID DRIVERS (ON POWER HYBRID DRIVER FEEDING TWO GENERAL PURPOSE COMMAND HYBRID DRIVERS EACH OF WHICH ENERGIZES ONE OF THE TWO COILS IN THE SERIES CONTROL VALVES) ACT TOGETHER TO ENERGIZE ONE OF THE TWO COILS IN ENGINE OF CONTROL VALVES 1 AND 2. IDENTICAL CIRCUITS ARE USED IN BOTH LEFT AND RIGHT OMS. 54V76A121AR (J3-93), 54V76A121AR (J11-E, F). 55V76A122A (J3-93, 109), 55V76A122AR (J6-MN, NN), (J11-E', F'). 56V76A123A (J3-93), 56V76A123AR (J6-MN, PP).

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) PREMATURE OUTPUT OF THE SERIES UPSTREAM HYBRID DRIVER TO THE TWO ASSOCIATED PARALLEL HYBRID DRIVERS. FIRST FAILURE HAS NO EFFECT. NO COMMAND IS REQUIRED BEFORE ASSOCIATED DOWNSTREAM HYBRID DRIVERS CAN CONDUCT. PREMATURE OUTPUT OF ANY OF THE TWO PARALLEL HYBRID DRIVERS HAS NO EFFECT. POWER CANNOT BE CONDUCTED UNTIL THE UPSTREAM SERIES HYBRID DRIVER IS COMMANDED ON.

(B) FIRST FAILURE HAS NO EFFECT. REQUIRES SIMILAR FAILURES BEFORE INADVERTENT OMS ENGINE FIRING CAN RESULT.

(C, D) NO EFFECT.

05-6L-59

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - OMS FMEA NO 05-6L -2207 -2 REV:03/14/86

(E) POSSIBLE LOSS OF CREW/VEHICLE DUE TO INADVERTENT ENERGIZING OF ASSOCIATED SOLENOID COIL LEADING TO INADVERTENT FIRING OF OMS ENGINE REQUIRES TWO OTHER FAILURES (OTHER TWO HYBRID DRIVERS FAILED ON) BEFORE THE EFFECT IS MANIFESTED. FIRST TWO FAILURES NOT DETECTABLE IN FLIGHT DUE TO LACK OF MONITORING MEASUREMENTS.

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.

(B) GROUND TURNAROUND TEST
V43CE0.100 PNEUMATIC SYSTEM ELECTRICAL CONTROL VERIFICATION: PERFORM EACH FLIGHT. REDUNDANCY VERIFICATION OF CONTROL CIRCUIT PER FIGURE V43CA0.070-5.

(E) OPERATIONAL USE
NO ACTION FOR FIRST FAILURE - NOT DETECTABLE. FOR INADVERTENT ENGINE FIRING, ISOLATE AFFECTED SYSTEM BY CLOSING OMS TANK ISOLATION VALVES.