SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM :EPD&C - MAIN PROP. FMEA NO 05-6J -2206 -1 REV:11/04/87

ASSEMBLY :AFT PCA-4, 5,& 6
P/N RI :JANTX1N1204RA
P/N VENDOR:
QUANTITY :3
:THREE
:1 PER PREVALVE 1, 2,& 3

CRIT. FUNC: 1R
CRIT. HDW: 3

VEHICLE	102	103	104
EFFECTIVITY:	X	X	X

PHASE(S): PL X LO X OO DO LS

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

PREPARED BY:
DES J BROWN
REL F DEFENSOR
QE D MASAI

APPROVED BY
DES
REL 12-5-87
QE

APPROVED BY (NASA):
EPDC SSM
MPS SSM
EPDC REL
MPS REL
QE

ITEM:
DIODE, CROSSOVER (12 AMP), LH2 PREVALVE 1,2 & 3 OPEN SOLENOID POWER

FUNCTION:
PREVENTS INADVERTENT MDM COMMAND OR PREMATURE HDC I OUTPUT FROM ACTUATIN OPEN SOLENOID PREMATURELY. DIODE ISOLATES REDUNDANT POWER WHICH ENERGIZES THE OPEN SOLENOID FOR THE LH2 PREVALVES. ISOLATES REDUNDANT POWER BETWEEN REMOTE POWER CONTROLLER OUTPUTS. 54V76A134A4CR28, 55V76A135A4CR28, 56V76A136A4CR28.

FAILURE MODE:
OPENS, FAILS OPEN

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

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

(A) LOSS OF COMMAND A POWER PATH TO COMMAND C HDC III. DEGRADATION OF REDUNDANCY TO POWER OPEN SOLENOID.

(B,C,D) NO EFFECT - FIRST FAILURE.

(E) POSSIBLE LOSS OF CREW/VEHICLE AFTER FOURTH FAILURE (SECOND FAILURE - LOSS OF OPEN COMMAND B RPC OR ITS OUTPUT DIODE, REDUNDANT POWER PATH MAINTAINS PREVALVE IN OPEN POSITION. THIRD FAILURE - LOSS OF REDUNDANT POWER PATH RESULTS IN LOSS OF POWER TO OPEN SOLENOID, BISTABLE FEATURE MAINTAINS PREVALVE IN OPEN POSITION. FOURTH FAILURE - PREMATURE ACTUATION OF CLOSE SOLENOID) RESULTING IN PREMATURE LH2 PREVALVE CLOSURE WHILE ENGINE IS RUNNING. UNCONTAINED ENGINE DAMAGE DUE TO STARVATION CUTOFF. FAILS B SCREEN BECAUSE REDUNDANT POWER PATHS MASK FAILURE. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR GFY 1988.

DISPOSITION & RATIONALE:
(A)DESIGN (B)TEST (C)INSPECTION (D)FAILURE HISTORY (E)OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE
REFER TO APPENDIX F, ITEM NO. 2 - DIODE, POWER-STUD MOUNTED.

(B) GROUND TURNAROUND TEST
MDM COMMAND REDUNDANCY, V41AE0.180F; 200F; 220F EVERY FLIGHT.

(E) OPERATIONAL USE
NO CREW ACTION CAN BE TAKEN.