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PRINT DATE: 12/19/89

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 05-6JA-2221-X

SUBSYSTEM NAME: EPD&C MAIN PROPULSION

REVISION : 2 12/19/89

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
LRU :	AFT PCA 4, 5, 6	V070-765280
SRU :	DIODE	JANTXV1N4246

EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE, BLOCKING (1 AMP), LH2 PREVALVE 1,2,3, CLOSE SWITCH SCAN BLOCKING DIODE.

REFERENCE DESIGNATORS:

- : 54V76A134A2CR11
- : 54V76A134A2CR12
- : 54V76A134A2CR15
- : 55V76A135A2CR11
- : 55V76A135A2CR12
- : 55V76A135A2CR15
- : 56V76A136A2CR11
- : 56V76A136A2CR12
- : 56V76A136A2CR15

QUANTITY OF LIKE ITEMS: 9

NINE

3 PER LH2 PREVALVE 1, 2, 3

FUNCTION:

DIODE ISOLATES CLOSE SWITCH SCAN SIGNALS FROM OTHER MANUAL SWITCH CLOSE COMMANDS.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER

NUMBER: 05-6JA-2221-02

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SUBSYSTEM: EPO&C MAIN PROPULSION

LRU :AFT PCA 4, 5, 6

ITEM NAME: DIODE

CRITICALITY OF THIS
FAILURE MODE:IR2

FAILURE MODE:

~~SHORT, INTERNAL SHORT, CURRENT LEAKAGE~~ SHORT (END TO END) PER [unclear]

MISSION PHASE:

PL PRELAUNCH

LO LIFT-OFF

VEHICLE/PAYLOAD/KIT EFFECTIVITY: 102 COLUMBIA
: 103 DISCOVERY
: 104 ATLANTIS

CAUSE:

(MECHANICAL STRESS, VIBRATION)

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

STRESS

CRITICALITY I/I DURING INTACT ABORT ONLY? NO

REDUNDANCY SCREEN A) PASS
B) FAIL
C) PASS

PASS/FAIL RATIONALE:

A)

B)

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE TO DETECT THIS
FAILURE. NOTE - BISTABLE FEATURE NOT DEMONSTRATED BY TEST (CERTIFIED
BY ANALYSIS). A FULL FLOW DETENT VERIFICATION TEST IS SCHEDULED FOR
GFY 1988.

1-3-8

C)

- FAILURE EFFECTS -

(A) SUBSYSTEM:

LOSS OF MANUAL SWITCH CLOSE COMMAND ISOLATION.

(B) INTERFACING SUBSYSTEM(S):

NO EFFECT - FIRST FAILURE.

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(C) MISSION:

NO EFFECT - FIRST FAILURE.

(D) CREW, VEHICLE, AND ELEMENT(S):

NO EFFECT - FIRST FAILURE.

(E) FUNCTIONAL CRITICALITY EFFECTS:

IR/2, 1 SUCCESS PATH AFTER FIRST FAILURE. TIME FRAME - POST MECO.

1) DIODE SHORTS

2) ROLLER/SPRING SHORTS ACROSS SINGLE SET OF CLOSE CONTACTS PROVIDING TWO INADVERTENT CLOSE COMMANDS AND TWO OPEN INHIBIT COMMANDS.

WHEN THE SWITCH FAILURE OCCURS, THE MAINSTAGE (E.G. PREVALVE CLOSE INHIBIT) COMMANDS WILL PREVENT THE PREVALVE FROM CLOSING UNTIL THEY ARE REMOVED WHEN ENGINE PC<30% OR AT MECO +1 SECOND, WHICHEVER IS SOONER. WHEN THE MAINSTAGE COMMANDS ARE REMOVED, THE PREVALVE WILL CLOSE IMMEDIATELY RESULTING IN A LOX RICH SHUTDOWN. POSSIBLE UNCONTAINED ENGINE DAMAGE. POSSIBLE LOSS OF CREW/VEHICLE.

FAILS B SCREEN BECAUSE NO INSTRUMENTATION IS AVAILABLE.

 - DISPOSITION RATIONALE -

(A) DESIGN:

REFER TO APPENDIX F, ITEM NO. 3 - DIODE.

(B) TEST:

REFER TO APPENDIX F, ITEM NO. 3 - DIODE.

GROUND TURNAROUND TEST

D & C CONTROL BUS REDUNDANCY, V41AF0.100J-L; 120J-L; 140J-L, EVERY FLIGHT.

(C) INSPECTION:

REFER TO APPENDIX F, ITEM NO. 3, DIODE.

(D) FAILURE HISTORY:

REFER TO APPENDIX F, ITEM NO. 3 - DIODE.

(E) OPERATIONAL USE:

NO CREW ACTION CAN BE TAKEN.

SHUTTLE CRITICAL ITEMS LIST - ORBITER

NUMBER: 05-6JA-2221-02

- APPROVALS -

RELIABILITY ENGINEERING: D. DEFENSOR
 DESIGN ENGINEERING : J. BROWN
 QUALITY ENGINEERING : D. MASAI
 NASA RELIABILITY :
 NASA SUBSYSTEM MANAGER :
 NASA EPD&C RELIABILITY :
 NASA QUALITY ASSURANCE :
 NASA EPD&C SUBSYS MGR :

st : Melvin C. Hon
 : J. Brown R. Brown
 : D. Masai
 : J. Brown 1/20/90
 : J. Brown 9/2/90
 : J. Brown 1/4/90 HRN 11-190
 : J. Brown 1/2/90
 : J. Brown 1/24/90