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PRINT DATE: 02/06/90

SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 05-6J-2240B-X

SUBSYSTEM NAME: EPD&C - MAIN PROPULSION (03-1)

REVISION : 1 02/05/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	MID PCA 3	V070-764450
■ SRU :	DIODE	JANTX1N1204RA

- EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:
DIODE, CROSSOVER (12 AMP), LH2 RELIEF SHUTOFF VALVE CLOSE SOLENOID (LV25).
- REFERENCE DESIGNATORS: 40V76A27A4CR2
- QUANTITY OF LIKE ITEMS: 1
ONE
- FUNCTION:
PREVENTS SINGLE MDM COMMAND FROM ACTUATING CLOSE SOLENOID INADVERTENTLY.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 05-6J-22408-02

REVISION# 1 02/05/90

SUBSYSTEM: EPD&C - MAIN PROPULSION (03-1)
LRU :MID PCA 3
ITEM NAME: DIODE

CRITICALITY OF THIS
FAILURE MODE:1R3

■ FAILURE MODE:
SHORT (END TO END)

MISSION PHASE:
LO LIFT-OFF

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

■ CAUSE:
STRUCTURAL FAILURE (MECHANICAL STRESS, VIBRATION), CONTAMINATION,
ELECTRICAL STRESS, THERMAL STRESS, PROCESSING ANOMALY.

■ CRITICALITY 1/1 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 FAILURE.
- C)

- FAILURE EFFECTS -

- (A) SUBSYSTEM:
DEGRADATION OF REDUNDANCY AGAINST INADVERTENT ACTUATION OF CLOSE SOLENOID.
- (B) INTERFACING SUBSYSTEM(S):
NO EFFECT - FIRST FAILURE.
- (C) MISSION:
NO EFFECT - FIRST FAILURE.

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- (D) CREW, VEHICLE, AND ELEMENT(S):
NO EFFECT - FIRST FAILURE.

- (E) FUNCTIONAL CRITICALITY EFFECTS:

1R/3, 2 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - ASCENT.

1) DIODE SHORTS.

2) INADVERTENT CLOSE COMMAND B, RESULTING IN LOSS OF CAPABILITY TO OPEN LH2 RELIEF SHUTOFF VALVE (PV8).

3) ONE OF THE TWO RTLS DUMP VALVES (PV17, 18) FAILS TO OPEN/REMAIN OPEN FROM MECO + 10 TO MECO + 90 SECONDS.

RESULTS IN LACK OF RELIEF/^{LH2}CAPABILITY PRIOR TO DUMP. POSSIBLE RUPTURE OF THE LH2 MANIFOLD CAUSING LEAKAGE INTO AFT COMPARTMENT, OVERPRESSURIZATION, AND FIRE/EXPLOSION HAZARD. POSSIBLE LOSS OF ADJACENT CRITICAL COMPONENTS DUE TO CRYOGENIC EXPOSURE.

POSSIBLE LOSS OF CREW/VEHICLE.

- DISPOSITION RATIONALE -

- (A) DESIGN:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, STUD-MOUNT.

- (B) TEST:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, STUD-MOUNT.

GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION V41ABD.080M, EVERY FLIGHT.

- (C) INSPECTION:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, STUD-MOUNT.

- (D) FAILURE HISTORY:

REFER TO APPENDIX F, ITEM NO. 2 - DIODE, STUD-MOUNT.

- (E) OPERATIONAL USE:

LH2 MANIFOLD PRESSURE IS ON CAUTION AND WARNING.

POST MECO/PRE DUMP: START MPS PROPELLANT DUMP AS SOON AS POSSIBLE.

POST DUMP: OPEN THE LH2 FILL/DRAIN VALVES.

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- APPROVALS -

RELIABILITY ENGINEER	: S. TRUJILLO	:	<u>St</u> 2-8-90
RELIABILITY SUPERVISOR	: M.L. HOVE	:	<u>M.L. Hove</u>
DESIGN ENGINEER	: J.L. PECK	:	<u>J.L. Peck</u>
DESIGN SUPERVISOR	: T.J. TAUFER	:	<u>T.J. Tauffer</u> 2-9-90
QUALITY ENGINEER	: D. MASAI	:	<u>D. Masai</u>
QUALITY SUPERVISOR	: J.T. COURSEN	:	<u>J.T. Courson</u> 2-2-90
NASA RELIABILITY	:	:	<u>T. Masai & Courson</u> 3/2/90
NASA SUBSYSTEM MANAGER	:	:	<u>J. ...</u> 2/1/90
NASA EPD&C RELIABILITY	:	:	<u>... Woodard</u> 3/1/90
NASA QUALITY ASSURANCE	:	:	<u>... 2/24/90</u>
NASA EPD&C SUBSYS MGR	:	:	<u>... F. Stein</u> 3/5/90