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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 05-6J-2238B-X

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

REVISION : 1 02/05/90

	PART NAME VENDOR NAME	PART NUMBER VENDOR NUMBER
■ LRU :	MID PCA 1	V070-764400
■ LRU :	MID PCA 3	V070-764450
■ SRU :	DIODE	JANTXV1N4246

■ EXTENDED DESCRIPTION OF PART UNDER ANALYSIS:

DIODE, BLOCKING (1 AMP), LH2 RELIEF SHUTOFF VALVE (PV8), SWITCH CLOSE COMMAND.

■ REFERENCE DESIGNATORS: 40V76A25A5CR9
: 40V76A27A1CR26
: 40V76A27A1CR30

■ QUANTITY OF LIKE ITEMS: 3
THREE

■ FUNCTION:

ISOLATES MDM CLOSE COMMAND FROM MANUAL SWITCH CLOSE COMMAND. CONDUCTS MANUAL SWITCH CLOSE COMMAND TO CLOSE SOLENOID FOR LH2 RELIEF SHUTOFF VALVE.

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SHUTTLE CRITICAL ITEMS LIST - ORBITER NUMBER: 05-6J-2238B-02

REVISION# : 02/05/90

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

LRU :MID PCA 1 4 3

ITEM NAME: DIODE

CRITICALITY OF THIS
FAILURE MODE: R3

■ 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:

IR/3, 3 SUCCESS PATHS AFTER FIRST FAILURE. TIME FRAME - ASCENT.

- 1) DIODE SHORTS.
- 2) CLOSE SWITCH SCAN DIODE SHORTS.
- 3) INADVERTENT CLOSE MDM COMMAND, RESULTING IN LOSS OF CAPABILITY TO OPEN LH2 RELIEF SHUTOFF VALVE (PV8).
- 4) 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. 3 - DIODE, AXIAL LEAD.

- (B) TEST:

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

GROUND TURNAROUND TEST

COMPLETE ELECTRICAL VERIFICATION V41A80.080P, EVERY FLIGHT.

- (C) INSPECTION:

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

- (D) FAILURE HISTORY:

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

- (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>Adrian Cantone</u>
DESIGN ENGINEER	: J.L. PECK	: <u>[Signature]</u>
DESIGN SUPERVISOR	: T.J. TAUFER	: <u>T.J. Tauffer 2-9-90</u>
QUALITY ENGINEER	: D. MASAI	: <u>[Signature]</u>
QUALITY SUPERVISOR	: J.T. COURSEN	: <u>[Signature]</u>
NASA RELIABILITY	:	: <u>C.P. [Signature] 2/3/90</u>
NASA SUBSYSTEM MANAGER	:	: <u>T. [Signature] 2/2/90</u>
NASA EPD&C RELIABILITY	:	: <u>[Signature] 2/2/90</u>
NASA QUALITY ASSURANCE	:	: <u>[Signature] 2/20/90</u>
NASA EPD&C SUBSYS MGR	:	: <u>[Signature] for F. Slavin 2/5/90</u>