

AUG 28 8

SAA09PPAB13-003
B/L: 12.00 & 13.00
SYS: HVDS, PADS A
& B

S040254U
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Critical Item: Circuit Breakers (4 Items per Pad)

Find Number: CB-1

Criticality Category: 1S

SAA No: 09PPAB13-003

System/Area: Hypergol Vapor Detection
System/LOA

NASA
Part No: None

PMN/
Name: S70-1221-01, 02 & 03
Electrical Distribution

Mfg/
Part No: General Electric
TQC112OWL (Pad A)
TQC112OWL (Pad B)

Drawing/
Sheet No: 79K09571(Pad A)/99 thru
102
79K40039(Pad B)/101 thru
104

Function: Provides circuit overload protection for HVDS Cabinet (1 circuit
breaker for each cabinet: HVDS 6280, 6281, 6282, 6283).

Critical Failure Mode/Failure Mode No: Premature trip/
09PPAB13-003.001

Failure Causes: Internal Structural Failure

Failure Effect: Loss of 120 VAC 60 HZ power to HVDS Monitoring units.
Inability to detect presence of hypergol vapors at designated sensing points.
Possible fire and/or explosion if hypergol leaks occur. Potential loss of
life and/or vehicle during hazardous conditions.

Time to Effect: Immediate

Method of Detection: LPS monitors HVDS and would identify loss of power

Acceptance Rationale

Design:

- o Armature is counter-balanced to prevent premature tripping under conditions of shock and vibration.
- o Meets design requirements of KSC-SPEC-E.0026A, Specification for Electrical Facilities Installations (3.15 Circuit Breakers).
 - a. molded case
 - b. trip free
 - c. inverse time thermal overload protection
 - d. magnetic short circuit protection

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Circuit Breakers (4 items/Pad) (Cont)

- o Visual indication when breaker is tripped (light in breaker panel assembly)

Test:

- o Preoperational testing/setup via OMI V3542 verifies the system and this component is functional.
- o The OMRSD (File VI) requires the following operations tests after a fault:
 - a. time-current trip test
 - b. instantaneous trip test
- o OMRSD (File VI) requires an insulation meggar test after a fault.

Inspection:

- o The OMRSD (File VI) requires the following annual maintenance checks:
 - a. verify trip indicator operates
 - b. inspect for evidence of overheating

Failure History:

- o The PRACA database was queried and no failure data was retrieved against this component in the critical failure mode.
- o The GIDEP failure data interchange system has been researched and no failures of this component were found.

Operational Use:

- o The OMI requires that personnel be stationed on the RSS during loading operations; those personnel provide a visual monitoring of the operation.
- o During the break between loading operations of oxidizer (N2O4) and fuel (MMH), a survey will be taken of the units to assess the operational status and make repairs if needed.

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Circuit Breakers (4 items/Pad) (Cont)

o Correcting Action:

If circuit breakers trip during loading operations, hypergolic propellant loading will be halted, required personnel stationed on the RSS notified of the situation. A real time decision would be made by the CCMS control console operator to reset the breaker and continue or terminate loading.

o Timeframe: Minutes required to reset CB.

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