

B/L: 389.00
SYS: 250-TON
BRIDGE
CRANE, VAB

Critical Item: Relay, Main Hoist (2 Total, 1/Crane)
Find Number: K10
Criticality Category: 2

SAA No: 09FY12-005	System/Area: 250-Ton Bridge Crane (#1 & #2)/VAB
NASA Part No: NA	PMN/ Name: K60-0533, K60-0534/ 250-Ton Bridge Crane (#1 & #2)/VAB
Mfg/ Part No: Potter-Brumfield/ KHP 17411	Drawing/ Sheet No: 69-K-L-11388/ 15

Function: Energized when hoist motors are drawing less than 60 amps. Contacts are closed to allow the console ammeter to display actual current. De-energized when current reaches 60 amps to scale the current reading on the console ammeter by a factor of 10.

Critical Failure Mode/Failure Mode No:

- a. Fails deactivated (coil fails open)/09FY12-005.030
- b. N.O. contact fails open/09FY12-005.031

Failure Cause:

- a. Corrosion, fatigue
- b. Corrosion, binding mechanism

Failure Effect: (For both failures) The current reading on the console ammeter will be scaled without indication from console light PL34. This could lead to an operator giving an erroneous input during float operations resulting in an inadvertent movement of the load causing possible damage of a vehicle system. Time to effect: seconds.

ACCEPTANCE RATIONALE

Design:

<u>Coil Rating</u> 240 volts	<u>Actual</u> 120 volts
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- Contact material: Silver
- Expected mechanical life of 10 million operations.

Attachment
S050234CK
Sheet 33 of 147

MAR 11 1994

- This relay was off-the-shelf hardware selected by the crane manufacturer for this application.

Test:

- OMRSD file VI requires verification of proper performance of hoist operational test annually.
- OMRSD File VI requires verification of proper performance of console ammeter switch-over point (main hoist-60A, aux. hoist-20A) annually.
- OMI Q3008, Operating Instructions, requires all crane systems be operated briefly in all speeds to verify satisfactory operation before lifting operations.

Inspection:

- OMI Q6003, Maintenance instructions, requires annual inspection of relay contacts and contact members for burning, pitting, proper alignment, and discoloration caused by overheating. Visually check closing coils for deteriorated insulation and evidence of overheating or burning.

Failure History:

- The PRACA database was researched and no failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange system was researched and no failure data was found on this component in the critical failure mode.

Operational Use:

- Correcting Action:
 - 1) The failure can be recognized via the Salsyn (inadvertent movement) that is in view of both operators.
 - 2) When the failure indication is noticed, the operator can stop all crane operations by pressing the E-Stop button or releasing the brake switch.
 - 3) Operators are trained and certified to operate these cranes and know and understand what to do if a failure indication is present.
 - 4) During all critical lifts, there is at least one remote Emergency Stop (E-Stop) operator observing the load lift, and can stop the crane if a failure indication is noticed.
 - 5) Operationally, the crane must be operated in the fine or float speed mode if a critical load is within 10 feet of any structure in the direction of travel.
 - 6) During final SRB mate, all crane operations are ceased and final mate is accomplished by use of the 250-Ton Hydra-Set.
- Timeframe:
 - Estimated operator reaction time is 3 to 10 seconds.