

SAA09FY12-006
REV. BB/L: 389.00
SYS: 175-TON
BRIDGE
CRANE, VAB

Critical Item: Meter Relay, Auxiliary Hoist

AUG 20 1993

Find Number: M2

Criticality Category: 2

SAA No:	09FY12-006	System/Area:	175-Ton Bridge Crane/VAB
NASA		PMN/	K60-0528/
Part No:	NA	Name:	175-Ton Bridge Crane/VAB
Mfg/	Larson Instrument Co./	Drawing/	67-K-L-11348/
Part No:	CMC 3.5 K-L	Sheet No:	19

Function: Controls relay K9 to scale current reading on console ammeter by a factor of 10 when the hoist motors current reaches 20 amps. Also controls indicator light to indicate to operator when current reading is scaled.

Critical Failure Mode/Failure Mode No:
High/Low Limit No. 2 N.C. contact fails open/09FY12-006.060

Failure Cause: Corrosion, binding mechanism

Failure Effect: Relay K9 will not be energized and 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 operations resulting in inadvertent movement of load. Possible damage to vehicle system. Time to effect: seconds.

ACCEPTANCE RATIONALE

Design:

<u>Rating</u>	<u>Actual</u>
115 volts	120 volts

- 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:

- This is a self-contained unit with contacts that are not readily accessible for inspection. OMI Q6003, Maintenance Instructions, instructs that inspections shall not entail disassembly of equipment.

Failure History:

- The PRACA database was researched and failure data was found on this component in the critical failure mode.
 - The failures occurred on 7/23/91, 8/14/91, and 10/3/91.
 - The failure cause was binding mechanism.
 - The correcting action was remove and replace the relay.

NOTE: These failures did not necessarily occur on this crane drive system. The failure may have occurred on either the main or auxiliary hoist drive systems of this crane or one of the two VAB 250-Ton Bridge Cranes.

- 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 a Selsyn (inadvertent movement) that is in view of both operators.
 - 2) Operator can stop all crane operations, when the failure indication is noticed, by returning the master control switch to neutral, by releasing the brake switch or pressing the E-Stop button.
 - 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 Emergency Stop (E-Stop) operator remote from the operator's cab observing the load lift, and can stop the crane if a failure indication is noticed.
- Timeframe:
 - Estimated operator reaction time is 3 to 10 seconds.