SAA09FY12-006
REV. B

B/L: 389.00
SYS: 175-TON
BRIDGE
CRANE, VAB

AUG 2 0 1993

Critical Item: Synchro Transmitter and Receiver Assembly, Main Hoist

Find Number: 1SYNT/1SYNR1

Criticality Category: 2

SAA No:	09FY12-006	**System/Area:**	175-Ton Bridge Crane/VAB
NASA Part No:	NA	**PMN/ Name:**	K60-0528/ 175-Ton Bridge Crane/VAB
Mfg/ Part No:	General Electric/ 2JDA66PA10A, 5PY-5GTY23	**Drawing/ Sheet No:**	67-K-L-11348/ 16

Function: Provides main hoist position and motion indication to the operator in the cab. The operator uses this indicator to determine movement distance when required to make small incremental moves for mate/demate operations.

Critical Failure Mode/Failure Mode No: Erroneous Output (indication)/09FY12-006.103

Failure Cause: Corrosion, binding mechanism

Failure Effect: Loss of accurate position indication or load motion indication could result in improper load positioning. The worst case would be attempting to mate or demate an External Tank (ET) or the aft end of the orbiter from the transporter, the failure occurring, and the effect being the operator commanding too much movement and the ET or orbiter contacting the transporter. Possible damage to vehicle system. Time to effect: seconds.

ACCEPTANCE RATIONALE

Design:

Ratings	Actual
115 volts	120 volts

- Totally enclosed nonventilated cast housing.
- Motor-type rotor is the only moving part.
- This item 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.

- OMI Q3006, Operating Instructions, requires all crane systems to be operated briefly in all speeds to verify satisfactory operation before lifting operations.

Inspection:

- OMI Q5003, Maintenance Instructions, require monthly inspection for quietness and smoothness during operation; monthly inspection of belt drives for worn, frayed or abnormal wear; monthly inspection for broken, bent or badly worn pulleys; monthly verification by examination and manipulation that keys and couplings are securely in place; annual removal and inspection of brushes and replacement of brushes when overall length is 3/8-inch or less.

Failure History:

- The PRACA database was researched and failure data was found on this component in the critical failure mode.

  - The failures occurred on 3/9/91, 10/10/91, and 10/8/92.

  - The failure cause was binding mechanism.

  - The correcting action was to remove and replace the selsyn receiver (3/9/91), or to remove, repair and replace the selsyn receiver (10/10/91 & 10/8/92).

  NOTE: These failures did not necessarily occur on this crane drive system. The failure may have occurred on any one of the 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) When the failure indication is noticed, the operator can stop all crane operations by returning the Master Control Switch to neutral or pressing the E-Stop button (releasing the brake switch in the float mode).

  2) Operators are trained and certified to operate these cranes and know and understand what to do if a failure indication is present.

  3) 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.

- Timeframe:

  - Estimated operator reaction time is 3 to 10 seconds.