

B/L: 389.00
SYS: 15-TON
BRIDGE
CRANE VAB

JAN 28 1995

Critical Item: Hoist Gearbox (1 Item)

Find Number: None

Criticality Category: 2

SAA No: 09FY121-001

System/Area: 15-Ton Bridge Crane/VAB- Low Bay, Cell 7

NASA Part No: None

PMN/ Name: K60-0532/15-Ton Bridge Crane

Mfg/ Part No: Yale Engineering Co./ 6407937-08

Drawing/ Sheet No: Yale Electric Hoists, FEW Series/NA

Function: The hoist gear box transmits power from the hoist motor to the drum.

Critical Failure Mode/Failure Mode No: Gear disengages/09FY121-001.001

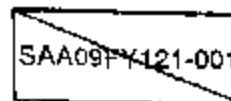
Failure Cause: Structural failure of gears, shafts, mechanical load brake components and the gearbox housing.

Failure Effect: Load (Forward Assembly) suspended from crane will drop. Failure could cause possible loss (damage) to a vehicle system. Failure is detectable by abnormal noises and movements up to and including dropping the load. Time to effect: seconds.

ACCEPTANCE RATIONALE

Design:

- The gear box is an off-the- shelf item manufactured by Yale Industries. Its design complies with Crane Manufacturers Association of America (CMAA) specification #70.
- All gearing design is based upon AGMA standards 220.02, "Rating of the Strength of Spur Gear Teeth" and 210.02, "Surface Durability (pitting) of Spur Gear Teeth."
- The gears are splined to shafts or integrally machined and are retained in place by shoulders within the confines of the gearbox.



B/L: 389.00
SYS: 15-TON
BRIDGE
CRANE VAB

JAN 23 1995

Hoist Gearbox (Continued)

- Load bearing members, such as the gear case and shafts, have been designed so that the calculated static stress, based upon the rated load, does not exceed 20% of the average ultimate strength of the material, i.e. 5:1 factor of safety.
- A forward skirt assembly weighs 21,600 lbs. yielding an operational factor of safety of 6.94:1.

Test:

- Pre-operational set up (attaching and positioning sling over the load) to support lifting operations in OMI B5303 Task 04 verifies proper operation of crane components and all functions.
- A load test at 100% of rated load is performed annually by OMI Q6166 in accordance with NSS/GO-1740.9 requirement.
- OMRSD File VI requires annual performance of a rated load test to verify system integrity.
- An annual operational check of the hoist is performed under full rated load in accordance with OMI Q6166.
- A full operational check of the hoist is performed monthly (no load) in accordance with OMI Q6166.

Inspection:

- In addition, the hoist gearbox is checked monthly per OMI No. Q6166 for the following:
 - a. damage, corrosion
 - b. loose fasteners
 - c. oil leakage
 - d. oil level

SAA09FY121-001
B/L: 389.00
SYS: 15-TON
BRIDGE CRANE
VAB

Failure History:

JAN 23 1995

- The PRACA data base was queried and there was no failure data found for this component in this failure mode.
- The GIDEP failure data interchange system has been researched and no data on this component was found.

Operational Use:

- Correcting Action:
There is no action which can be taken to mitigate the failure effect.
- Timeframe:
Since no correcting action is available, timeframe does not apply.