B/L: 505.20
SYS: ONE TON
BRIDGE
CRANE

Critical Item: Worm Drive Gear Reducer (4 Items Total)

JAN 2 3 1995

Find Number: 2

Criticality Category: 2

SAA No:	09FY36-001	**System/Area:**	Ordnance Storage Facility
NASA Part No:	None	**PMN/ Name:**	K61-2660 One Ton Bridge Crane
Mfg/ Part No:	Electrolift Inc. 423	**Drawing/ Sheet No:**	72-K-L-13040, 72-K-L-13039 4, 5

Function: Provides lifting, lowering, and holding capability for flight hardware.

Critical Failure Mode/Failure Mode No: Gears Disengage / 09FY36-001.001
Worm Wheel Key Shears / 09FY36-001.002

Failure Cause: Structural Failure

Failure Effect: Torque for holding the wire rope drum will be lost. Suspended load will drop resulting in possible loss (damage) of a vehicle system. **Detection Method:** Visual. Time to Effect: Immediate.

ACCEPTANCE RATIONALE

Design:

- Hoist design is based on ANSI B30.16, Overhead Hoists (Underhung).
- The hoist gearbox is an off the shelf item manufactured by Electrolift Inc.
- A safety factor of at least 5.0:1 (ultimate) has been maintained throughout the worm drive gear reducer assembly load carrying components.
- The gear reducer is designed to retain gears in place by shoulders within the confines of the gearcase. Thus, a gear failure would tend to lock up within the gearcase and prevent the load from lowering.
- The worm material is composed of AISI B620 Hardened and Ground Steel and the worm wheel material is Bronze UNS C92600.
- The key material is AISI 1018 cold rolled carbon steel.

Test:

- A load test at 100% of the rated load (2,000 lb.) is performed annually.

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Worm Drive Gear Reducer (continued)

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- All four hoists were proofloaded at 2,500 lbs. on 11-18-93.
- Preoperational set up verifies proper operation of the Gear Reducer.
- OMRSD File VI requires annual performance of a rated load test to verify system integrity.

Inspection:

- OMI Q6103 requires monthly inspection of the hoist for grease leakage, loose bolts, corrosion or other signs of deterioration.

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:

  There is no action which can be taken to mitigate the failure effect.

- Timeframe:

  Since no correcting action is available, timeframe does not apply.