

SAA29FR01-001
REV. B
B/L: 365.00
SYS: 25-TON DFRC
BRIDGE CRANE

Critical Item: Gearbox Speed Reducer (Two)

NOV 20 1995

Find Number: N/A (P/N HTS 2000-7)

Criticality Category: 1

SAA No: 29FR01-001, Rev. B

System/Area: DFRC Hangar Cranes/
Edwards AFB

NASA
Part No: None

PMN/ X60-0476
Name: 25-Ton DFRC Bridge Crane

Mfg/ Link Belt
Part No: P/N HTS 2000-7

Drawing/ Vendor Doc.
Sheet No: Munct AD10180-1

Function: Provides gear reduction from output of hoist motor to wire rope drum.

Critical Failure Mode: FM No. 29FR01-001.001 Gear disengagement.

Failure Cause: Structural failure of gears or gearbox housing.

Failure Effect: Loss of torque to hold load. Could cause loss or damage to the Orbiter or the payload which is being lifted or lowered, since the load would drop, possibly resulting in loss of life or the Orbiter.

Design:

Acceptance Rationale

- o The steel gear design is in accordance with the American Gear Manufacturers Association with a minimum safety factor of 5:1.
- o Gears are press-fitted on the shafts with tight interference fits to overcome lateral loads and prevent movement. They are also keyed in place.
- o The shaft ends have bearings which are press-fitted and locked in place with snap rings. The shafts are prevented from lateral movement by collars which are bolted to the gear case at each of the shaft ends. The collars directly engage the outer bearing race and the shaft shoulder engage the inner bearing race.
- o Pinion gears are machined integrally with the shafts.
- o Hoist capacity is rated at 25 tons. Maximum LRU operational load is 8 tons.

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Gearbox Speed Reducer, Hoist (Continued)

Test:

- An annual operational check of the hoist is performed in accordance with OMI No. DFRC 537.
- An operational check of the hoist will be performed prior to each use in accordance with OMI No. DFRC 537.
- OMRS File VI requires annual performance of a rated load test.
- Acceptance test at 125% of rated load was performed on initial installation.

Inspection:

- A visual inspection is performed semi-annually for loose mounting bolts and gearcase oil level in accordance with OMI No. DFRC 537.

Failure History:

- The PRACA data base was queried, and no failure data was retrieved against this component.
- The GICEP failure data interchange system has been researched, and no failures of this component was found.
- There have been no reported failures of this gearbox since its installation in 1979.

Operational Use:

o Correcting Action:

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

o Timeframe:

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