

SAA09FT08-037

MAY 24 1994

B/L: 390.00, 400.16
SYS: 6 TON HOISTS
AT THE VAB,
AND RPSF

Critical Item: GEAR BOX ASSEMBLY (16 Items Total)
Find Number: NA
Criticality Category: 2

SAA No: 09FT08-037	System/Area: 6 TON HOISTS / VAB, RPSF
NASA Part No: NONE	PMN/ Name: K60-0542, K61-0039 6 TON PLATFORM HOISTS
Mfg/ Part No: ACCO/WRIGHT HOISTS 60197	Drawing/ Sheet No: 79K07022/34 (VAB), 79K21365/63 (RPSF)

Function: The hoist gear box assembly multiplies the torque provided by the hoist electrical motor to drive the drum raising and lowering the exit cone elevator platform. There are 8 hoists in two work cells located in the RPSF where SRB segments are built up or disassembled (planned processing). Contingent (unplanned) processing can be performed in Highbay 4 of the VAB where 8 hoists in two work cells are normally used for training activities. Each platform tracks along four guide rails as it is supported, raised or lowered by four 6 ton Wright hoists.

Critical Failure Mode/Failure Mode No: Gears disengage / 09FT08-037.001.

Failure Cause: Structural failure, key shears

Failure Effect: Loss of gear train between the gear box and the drum could allow one of the four hoists to yield to the load and the affected corner of the the Exit Cone Platform will drop causing an unstable and un-level condition of the platform. The Exit Cone could shift its position allowing it to contact facility or other flight hardware causing possible loss (damage) of an SRB Aft Segment / Exit Cone. Detection method is visual and the time to effect is immediate.

ACCEPTANCE RATIONALE

Design:

- The Wright hoists are rated at 12,000 lbs with a safety factor of 5:1.
- A load of 6250 lbs is applied to each hoist providing an operational safety factor of approximately 2:1 at each hoist.
- All gearing is machine cut, heat treated alloy steel and operates in an oil bath. The gears are designed to AGMA standards.
- Bearings are ball bearing type and are sealed or splash lubricated.
- The gear case housing is made from aluminum alloy.

*Attachment
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WORKSHEET 5312-013
941004rPS0177

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- Wright hoists are designed and manufactured to comply with.
 - a. Hoist Manufacturing Institute (HMI) Specifications for Electric Wire Rope Hoists (HMI 100-74)
 - b. Safety Standards for Overhead Hoists (ANSI B30.16)
 - c. Performance Standard for Overhead Electric Wire Rope Hoists (ANSI/ASME HST-4M)

Test:

- The platform hoist system was proof loaded after installation. The proof load weight (28,000 lbs.) was added to the platform weight (12,000 lbs.) for a combined weight of 40,000 lbs.
- OMRS File VI requires annual verification of an operational load test. The operational load test is performed in accordance with OMI Q6272 and utilizes a 13,000 lb. test weight for a total hoist system load of 25,000 lb. The test represents lifting a load equal to the sum of the elevator platform, the flight SRB exit cone, and the related GSE lifted during a normal operation.

Inspection:

- OMI Q6272 accomplishes the following inspections and verifications as part of the hoist maintenance:
 - a. Monthly visual inspection of the hoists for any obvious damage.
 - b. Semi-annual verification of the gear box oil level.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRAA database.

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.

*Attachment
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Sheet 11 of 12*