

Critical Item: Hoist
Total Quantity: 4
Find Number: None
Criticality Category: 1

SAA No: 09FY02-006

System/Area: Extensible and Auxiliary Access Platforms/VAS HB 1&3

NASA Part No: None

PMN/Name: K50-0555/
Extensible and Auxiliary Access Platforms

Mfg/Part No: Them/
M4021PB

Drawing/Sheet No: Vendor Catalog
page FF97-2, 3

Function: Provide mechanical advantage to raise, lower, and hold the load.

Critical Failure Mode/Failure Mode No: Gear disengagement/09FY02-006.011

Failure Cause: Worn or damaged gears

Failure Effect: Load will drop without means of control resulting in possible loss of life, and/or loss (damage) of a vehicle system. The gearbox failure is detectable by abnormal noises and movements. Detection method: Visual. Time to effect: Immediate.

ACCEPTANCE RATIONALE

Design:

There are two AP-48 jib hoist platforms for HB-1 (NE and SE) and two for HB-3 (NE and SE) for a total of four.

- The model M4021PB winch is a spur gear hand winch with an automatic brake. The gear ratio is 2.85:1 requiring 55 lbs to lift a load of 1000 lbs. The gear operates in an oil bath. Bronze bearings are used throughout the winch. The gear case is constructed out of steel and zinc coated to protect against corrosion.
- The manufacturers load rating is 1000 lbs with a design safety factor of 4 to 1.
- The max peak line pull is 150 lbs. which gives an operational safety factor of 5.3 to 1.
- These hoists are subjected to a low number of cycles compared to commercial use. This diminished usage should provide for better long term reliability.
- Per NSS/GO-1740.9, manual hoists shall have at least one brake. The hoists meet this requirement.

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Attachment
sheet 9 of 13*

Test:

- OMI Q6152 requires operation of the hoist annually to verify no abnormal noise and movement.
- OMRSD File VI requires performance of an operational load test annually.
- Braking mechanisms are tested for evidence of slippage during the operational load test.

Inspection:

- Current load test validation tag is verified prior to operation.
- Per OMI Q6152 semiannually check hoist, drums and sheaves for wear, deformation, scored surfaces, cracks, fastening, and lubrication.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRAQA database. The PRAQA database was researched and no failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange 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.

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Attachment
Sheet 10 of 13