SAA09FY093-012

NOV 2 0 1995

B/L: 287.00
SYS: Orbiter Main Access Platforms, OPF-3

Critical Item: Electric Winch Assembly (2 Items Total)

Find Number: HST0080MCHT, HST0090MCHT

Criticality Category: 2

SAA No: 09FY093-012

System/Area: Orbiter Main Access Platforms / OPF-3

NASA Part No: None

PMN/ A70-0668-03
Name: Orbiter Main Access Platforms

Mfg/ Ingersoll-Rand (Beebe Bro.)
Part No: 4000B20

Drawing/ 221-25-905
Sheet No: EQ18

Function: Provide the means to Raise and Lower platforms [12-1,-2] and [12-4,-5].

Critical Failure Mode/Failure Mode No: A. Chain Failure / 09FY093-012.003
B. Gears Disengage / 09FY093-012.004

Failure Cause: A. Chain Breaks or Disengages from the Sprocket
B. Structural Failure

Failure Effect: The platform would unfold under its own weight down to the extended position. The support cables associated with the platform could fail, allowing it to fall onto the Orbiter. The failure would be visually detected and the time to effect would be immediate.

ACCEPTANCE RATIONALE

Design:

- The winch is an off-the-shelf design manufactured by Beebe Bro. Inc., now Ingersoll-Rand. The electric motor gear assembly used in the winch (part no. H5-500A), was manufactured by Electra Motors division of Dresser Inc., and its design complies with the American Gear Manufacturers Association (AGMA) standards.
- The winch is made with a steel frame, and a fully enclosed housing.
- The manufactured safety factor 5 : 1 minimum for the winch assembly.
- The Roller Chain safety factor is 6 : 1 at the rated load for the winch assembly.
- The winch will only be used approximately 30 times per year, given 5 shuttles flows per through OPF-3, and 6 lifts per flow including maintenance. This is an extremely low duty cycle when compared to a commercial duty cycle of 5 - 10 lifts per day at 50% rated load.
- These winches will not be required to support/hold the platform in position. Their only operational use is to raise and lower the platforms.

Test:

- OMRS File VI requires the annual performance of an operational test.

- An acceptance test at 125% rated load is required at initial installation.
- Preventive maintenance of the platforms, including hinges and associated winch mechanisms will be performed per OMI V6H59.

Inspection:

- A visual check of functional alignment and/or overall condition of winch, chain, gear housing, and platforms are performed annually to detect worn, cracked, or distorted parts.
- Inspections are performed in accordance with NSS/GO-1740.9 requirements.
- Inspections are performed per the preventive maintenance OMI V6H59.

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.