

SAA09FTR3-004
B/L: 250.01
SYS: ET/ORB FWD
BIPOD STRUT
HOISTS

NOV 20 1995

Critical Item: Hoist Assembly (4 Items)

Find Number: None

Criticality Category: 2

SAA No: 09FTR3-004

System/Area: ET/ORB Fwd Bipod Strut
Hoists/VAB HB-1,3

NASA
Part No: None

PMN/ H78-5003/
Name: ET/ORB Fwd Bipod Strut Hoists

Mfg/ Dresser Industries Inc./
Part No: Budget #260 SR

Drawing/ 79K09530/
Sheet No: 2

Function: To position the ET/ORB Forward Bipod Strut for mate via raising, lowering, and holding motions.

Critical Failure Mode/Failure Mode No: A. Gear Disengages/09FTR3-004.001
B. Automatic Mechanical Load Brake
Fails to Engage/09FTR3-004.002

Failure Causes: A. Structural failure of planetary spur gearing component.
B. Structural failure of automatic load brake component.

Failure Effect: Suspended load (strut and sling) drops uncontrolled resulting in possible loss (damage) of a vehicle system. Failure is detectable by:
A. abnormal noises and movements up to and including dropping the load,
B. load drops when operator releases hand chain. Time to effect: seconds.

Acceptance Rationale

Design:

- o The hoist is an off-the-shelf item manufactured by Dresser Industries, Incorporated. Its design complies with American Gear Manufacturers Association (AGMA).
- o Components include bronze load hook, stainless steel alloy load chain, steel gears, automatic load brake, splined shafts, aluminum hoist frame, bronze alloy hand chain, and a bronze alloy mounting hook.
- o The gears are splined to the shafts or integrally machined and are retained in place by shoulders within the confines of the hoist assembly.

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Hoist Assembly (Continued)

- o One end of the shaft is splined to the automatic load brake while the other end has the pinion gear machined into it to drive the planetary spur gearing.
- o Load bearing members, such as the gear case and shafts, have been designed so that the calculated static stress, based upon the rated load, does not exceed 25% of the average ultimate strength of the material; i.e. 4:1 safety factor.
- o The hoists are rated at 500 pounds and a Forward Bipod Strut weighs approximately 40 pounds. This results in an operational safety factor of 50:1.

Test:

- o An acceptance test at 125% rated load was performed on initial installation.
- o A load test at 100% rated load is performed annually in accordance with manufacturer operating procedures per OMI T6047.
- o OMRS File VI requires the annual performance of a rated load test.
- o An annual operational check of the hoist under full rated load is performed per OMI T6047.
- o Pre-operational positioning of the hoist per OMI T1248 verifies proper operation of all hoist functions.
- o Tests are performed in accordance with NSS/GO-1740.9 requirements.

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Hoist Assembly (Continued)

Inspection:

- o A visual or operational check of functional alignment and/or overall condition of hoist and chain housing is performed monthly per 79K17085 to detect worn, cracked, or distorted parts, to ensure that the automatic load brake holds at any position when hand chain is released, and hooks are free to swivel a full 360 degrees and no cracks are visible on hooks.
- o An annual inspection of the hoists is performed by OMI T6048.
- o Inspections are performed in accordance with NSS/GO-1740.9 requirements.

Failure History:

- o The PRACA database was queried and no failure data was retrieved against this component.
- o The GIDEP failure data interchange system has been researched and no failures of this component were found.

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.

WORKSHEET S122-012
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