

SAA09FT07-007 JUL 30 1991
B/L: 249.00
SYS: Lifting
Fixture, ET LH2
17" QD

Critical Item: 1-Ton Manual Chain Hoist (1 Item)

Find Number: 18

Criticality Category: 2

S0502248
ATTACHMENT -
PAGE 11 OF 14

SAA No: 09FT07-007

System/Area: Lifting Fixture, ET 17"
QD/VAB

NASA
Part No: None

PMN/ H78-5007/
Name: Lifting Fixture, ET 17" QD

Mfg/ Harrington Hoist Inc./
Part No: CF010-10

Drawing/ 80K53455
Sheet No: All

Function:

1. Support QD and/or feedline assembly during contingency installation/removal operations.
2. Rotate QD assembly from vertical to horizontal position.

Critical Failure Mode/Failure Mode No:

1. Gear disengagement/09FT07-007.001
2. Brake failure/09FT07-007.002

Failure Causes:

1. Structural failure of gears and shaft.
2. Structural failure of ratchet pawl or spring, excessive wear/glazing of friction plates.

Failure Effect: Load (ET LH2 17" QD and/or Feedline will drop/rotate.) Possible loss (damage) to a vehicle system if failure occurs in close proximity to an obstruction or flight hardware (ET). Failure may be detectable by unusual noise or "feel" on the hand chain during operation and visual observation of the load dropping. Time to effect: seconds.

Acceptance Rationale

Design:

- The hoist is an off the shelf item manufactured by Harrington Hoist Inc. Its design meets or exceeds the requirements of ASME/ANSI B30.16 "Overhead Hoists (underhung)" and complies with the Hoist Manufacturers Institute (HMI) 200-74 "Standard Specifications for Hand Operated Chain Hoists."

SAA09FT07-007 JUL 30 1991
B/L: 249.00
SYS: Lifting
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S0502248
ATTACHMENT -
PAGE 12 OF 14

1-Ton Manual Hoist (Continued)

- All gearing design is based on ANSI/AGMA 6010-E-88 Standard for Spur, Helical, Herringbone, and Bevel Enclosed Drives.
- The gears are splined to shafts or integrally machined and are retained in place by shoulders within the confines of the hoist body.
- Load bearing members, such as the hoist body and shafts, have been designed so that the calculated static stress, based upon the rated load, does not exceed 20% of the average ultimate strength of the material, i.e., safety factor of 5:1.
- The hoist is rated for loads up to 2000 lbs. The maximum applied load during operation (QD rotation only) is 600 lbs. yielding an operational safety factor of 17:1.
- The brake is a self adjusting Weston screw type common to GM commercial chain hoists.

Test:

- Pre-operational set up (attaching and positioning the hoist to the sling) to support lifting operations verifies proper operation of the hoist.
- An acceptance test of the hoist at 125% (2500 lbs.) of the rated load was performed prior to first use.
- The lifting fixture (including the hoist) was proof loaded in all configurations to 200% of the applied loads prior to first use.
- An operational test (QD rotation) of the lifting fixture at 200% of the applied load was performed prior to first use.
- The lifting fixture is load tested annually, in all configurations, at 125% of the applied loads.
- An operational test (QD rotation) of the lifting fixture at 125% of the applied load is performed annually.
- OMRSD File VI will require verification of current load test prior to use.

SAA09FT07-007 JUL 30 1991
B/L: 249.00
SYS: Lifting
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17" QD

1-Ton Manual Hoist (Continued)

S050224B
ATTACHMENT -
PAGE 13 OF 14

Inspection:

- Visual inspection of the hoist for loose or damaged parts is performed prior to use.

Failure History:

- This is a new hoist therefore no PRACA data is available.
- The GIDEP failure data interchange system has been researched and no failures of this component were found.

Operational Use:

- Correcting Action:
 - 1) There is no action which can be taken to mitigate the failure effect.
 - 2) An operator maintaining a grip on the hand chain can stop and hold the load.
- Timeframe:
 - 1) Since no correcting action is available, timeframe does not apply.
 - 2) Immediate to seconds, if the hoist operator maintains a grip on the hand chain.