

USA Integrated Logistics CIL Sheet

SSD92FO038
Revision B

B/L: 264.12
SYS: Orbiter Windows

Critical Item: Hoist
Total Quantity: 1 item
Find Number: H
Criticality Category: 2

FMEA/CIL No: SSD92FO038

System/Area: Orbiter Windows / OPF

NASA
Part No: -

PMN/ H70-0899 / Orbiter Forward
Name: Window Handling Set

Mfg/ Columbus McKinnon Corp./
Part No: 64621SP

Drawing/ GO70-340032 / -
Sheet No:

Function: Lifts and holds Orbiter forward windows during their installation & removal.

Critical Failure Mode/Failure Mode No: 1) Fails to hold load (gearbox)/ SSD92FO038.002
2) Fails to hold load (brake)/ SSD92FO038.003

Failure Cause: Material failure of key, gear teeth, gear alignment bearings, ratchet teeth, pawl, pawl spring, pawl pivot shaft, or lubricant contamination of brake surfaces.

Failure Effect: Load falls. Possible damage to flight hardware.
Failure is detectable by uncontrolled movement. Time to effect: 1) Immediate; 2) Immediate

ACCEPTANCE RATIONALE

Design: The CM Cyclone 64621SP is a commercial off-the-shelf, hand-operated, chainfall hoist, with a manufacturer's safe working load of 500 lbs. The user rated capacity is 135 lbs. Maximum flight hardware load applied is 90 lbs. It has a single constant brake with an integral load limiter. When raising the load, the brake is intermittently disengaged by the pawl and spring. When lowering the load, the operator must pull through the engaged brake. Since a load beyond the hoist's capability (1/4 ton) would overwhelm the constantly-applied brake and drop the load by pulling through it, the load limiter prevents a too-heavy load from being lifted. Gear lubrication is provided by grease (Texaco Novatex #2) which cannot migrate from the gear case to the brake surfaces.

- Complies with ANSI Code B30.16-1987 "Overhead Hoists" and OSHA - 1970
- Stored and used in an air conditioned facility
- Safety Factor (as designed): 5 to 1
- Total Safety Factor (as used): 27.8 to 1
- Materials: - Housing - Aluminum
 - Shafts - Steel
 - Key - Steel
 - Gears - Steel
 - Pawl - Steel
 - Pawl Spring - Spring Steel
 - Pawl Pivot Shaft - Aluminum with press-fit steel sleeve (to control wear)
 - Ratchet - Steel

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- Test:**
- OMRSD File VI requires annual rated load test (135 lbs).
 - A load test of 125% of rated load (170 lbs) is performed annually per OMI V6116.
 - A load test of 600 lbs was performed during the initial Acceptance Test Procedure (ATP).
 - Tests are performed in excess of the NSS/GO-1740.9 requirements.

- Inspection:**
- An annual inspection for leakage, damage, wear or corrosion is conducted per OMI V6116.
 - Inspections are performed in accordance with NSS/GO-1740.9 requirements.

Failure History:

- Current data on test failures, unexplained anomalies, and failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and no failure data were found on this component or other similar components in the critical failure modes.
- The GIDEP failure data interchange system has been researched and no failure data were found on this component in the critical failure mode.

Operational Use:

- Correcting Action: 1) Gearbox failure: There is no action which can be taken to mitigate the failure effect.
2) Brake failure: The operator can hold the load by the hand chain should the load brake fail.
- Time Frame: 1) Gearbox failure: Since no correcting action is available, time frame does not apply.
2) Brake failure: Immediate