

STS88-0244

December 19, 2002

Superseded: None

Critical Items List (CIL) Sheet

Critical Item: Actuator, Davit Crane Jack Assembly **Criticality Category:** 2
NASA Part No: G070-550681-002 **Total Quantity:** 1
Mfg/ Part No: Duff-Norton / CM1802-12B-300
System: Aft Fuselage Horizontal Equipment Installation Set

Find No.	Qty	Area	PMN	Baseline	Drawing/Sheet
G070-550681-002	1	OPF 1/2/3	H70-0588	700.19	G070-550681 / 1

Function:

Transmits manual power to the jack assembly for lifting and lowering the Davit Crane boom and suspended load.

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cal
0244.003 Worm screw threads that engage the worm gear shear at shaft hub	Wear or metal fatigue from back-loading of the worm screw threads Boom and suspended load will drop, possibly damaging flight hardware	Visual or noise from shearing worm gear or sudden movement Immediate	2

ACCEPTANCE RATIONALE

Design:

- The actuator is a commercial, off-the-shelf item with a grease-filled, modified cast iron case and 6:1 gear ratio.
- 2-ton capacity.
- The worm is 1141 cold drawn steel.
- The gear is forged steel SAE STD CA673.
- The hoist was designed with a minimum safety factor of 4:1 and is in compliance with NSS/GO-1740.9 requirements.
- Hoist design is in accordance with ASME/ANSI B30.16 and the American Gear Manufacturers Association Standards.
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Test:

- Initial proof load was performed in accordance with ML0208-0052, Proof Load, Equipment Install/Remove Aft Fuselage, Horizontal. The crane was originally load tested at 1000 lb.
- OMRSD File VI requires periodic load testing be performed in accordance with NSS/GO 1740.9. Cranes, hoists, and winches used frequently for critical lifts are load tested annually. Cranes, hoists, and winches used infrequently for critical lifts are load tested before the critical lift if it has been more than a year since the last test.
- Operational testing of the hoist per OMI/TPS verifies proper operation of all hoist functions.

Inspection:

Periodic preventive maintenance is performed in accordance with OMI V6C03 and includes inspection for:

- Any signs of deformation
- Corrosion damage or missing parts
- Cracks on load bearing bores.
- Applying grease to gears, spline shafts, and case.

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Failure History:

- The PRACA database was queried and there were no failures for this component.
- The GIDEP database was queried and there were no failures for this component.

Operational Use:

Correcting Action	Time Frame
There is no action, which can be taken to mitigate the failure effect.	Since no correcting action is available, timeframe does not apply.