

USA Ground Operations CIL Sheet

Critical Item: Jackscrew
NASA Part No: None
Mfg/Part No: Limitorque / SMB-0
System: Orbiter Lifting Frame

Criticality Category: 2
Total Quantity: 1

Find No.	Qty	Area	PMN	Baseline	Drawing / Sheet
None	1	Palmdale	H70-8392	237.00	SMBI-82C / All

Function:

The jackscrew positions the Orbiter lifting sling in the X-Axis (Forward) when mating/demating the Orbiter to/from the SCA..

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cat
29CL01-025.003 Lift screw disengagemant from drive sleeve	Mechanical wear of drive sleeve beyond operational limits, structural failure, improper maintenance. The jackscrew becomes inoperable. Total travel of the jackscrew movement is 6 inches. If the sling is positioned at total travel and the screw became disengaged, the sling could swing into the side of the Orbiter. Possible loss (damage) of a vehicle system.	Audible, Visual Immediate	2

ACCEPTANCE RATIONALE

Design:

- Jackscrew is rated at 12 Tons.
- The manufacturer states that:
 1. The rated design safety factor is equal to or greater than 4:1.
 2. The jackscrew is seviceable until the backlash reaches 50% of the screw thread thickness. 50% thread thickness is 0.25".

Test:

- An operational test of the jackscrew is performed semiannually to detect any binding in the screw per OMI Q6334.

Inspection:

- OMI Q6334 requires the following inspections to be performed semiannually.
 1. Inspect the limitorque for corrosion, sand and grease deposits.
 2. Remove any grease deposits.
- OMRSD File VI requires performance of a backlash test of the jackscrew every four years to determine wear on the mechanism in accordance with KSC-5600-5610, Jackscrew Wear Inspections.

Failure History:

- Current data on test failures, unexplained anomalies, and other failures experienced during ground processing activities can be found in the PRACA database. The PRACA database was researched and no data was found on this component in the critical failure mode.
- A failure of another jackscrew did occur in the ET Gox Vent Arm Hood on 4/6/98 (PR PV-6-336823). The NASA KSC Malfunction Lab inspected the failed unit (Report #MSL-0422-1998) and attributed its failure to worn threads on the drive sleeve unit.

Operational Use:

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