USA Ground Operations CIL Sheet

Critical Item: Swing Gearbox

NASA Part No: None

Mfg/Part No: Tadano / 997-070-00873

System: 130 Ton Tadano Mobile Crane

Criticality Category: 2

Total Quantity: 1

Find No.	Qty	Area	PMN	Baseline	Drawing / Sheet
1	1	KSC	H72-1500	330.00	5905-01 / 1

Function:

   Transfer torque from the hydraulic motor to the turret assembly.

Failure Mode No. Failure Mode	Failure Cause Failure Effect	Detection Method Time to Effect	Crit Cat
00004.002 Gear disengagement	Structural failure of the gears. Torque for stopping horizontal rotation will be lost. Boom will continue to swing until the weight of the load or object stops it. Possible loss (damage) to flight hardware.	Audible, Visual Immediate	2

ACCEPTANCE RATIONALE

Design:

   • The gears in the motor, pinion and ring gear are designed to DIN 3990 standard. The DIN standard has been verified to be equivalent to AGMA-2001.
   • The design is in accordance with NSS/GO 1740.9.

Test:

   • Operational check of the turret rotation is performed before use per "Pre-Operational Maintenance Mobile Equipment Checklist" KSC form 28-528 or Startup procedures as outlined in the Vendor's Operators Manual.
   • OMRSD File VI requires annual operational test of turret rotation.

Inspection:

   • OMRSD File VI requires annual inspection of the ring and pinion gear.

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 the following data was found on a similar component in the critical failure mode.
   • One problem report, PV-6-177113, was written against aerial manlift HE-907-287 (Condor 68) for swing gearbox failure (broken teeth) The failure was caused by operator error when the turret was rotated while the boom was restrained. No problems have occurred since this incident.

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.