

APR 28 1995

B/L: 510.00  
 SYS: 30 TON  
 ROUGH  
 TERRAIN  
 MOBILE  
 CRANE

**Critical Item:** Swing Gear Case Assembly (1 ITEM)  
**Find Number:** S501389M1  
**Criticality Category:** 2

<b>SAA No:</b>	09FT01-015	<b>System/Area:</b>	30 TON ROUGH TERRAIN MOBILE CRANE/LC39
<b>NASA Part No:</b>	NONE	<b>PMN/ Name:</b>	K61-3442 30 TON ROUGH TERRAIN MOBILE CRANE
<b>Mfg/ Part No:</b>	J.I. Case/ S501389M1	<b>Drawing/ Sheet No:</b>	VEN-2103/237-239

**Function:** Transfers torque from the swing hydraulic motor to the turntable assembly.

**Critical Failure Mode/Failure Mode No.:** Gears Disengage / 09FT01-015.001.

**Failure Cause:** Structure failure of gears, couplings, and gearbox housing.

**Failure Effect:**

Torque for stopping rotation will be lost. Upper structure (boom/turret) will continue to swing at a limited speed until load frictional forces stop rotation completely. Possible damage to flight hardware. Detection Method: Visual. Time to Effect: Seconds.

#### ACCEPTANCE RATIONALE

**Design:**

- The gearbox is an off the shelf item manufactured by J. I. Case Company. The design is based on American Gear Manufacturers Association (AGMA) standards.
- Load bearing members, such as the gear case shafts, have been designed to a safety factor ratio of 5:1. The calculated static stress, based on the rated load, does not exceed 20% of the average ultimate strength of the material.
- The gears are splined to shafts or integrally machined and are retained in place by shoulders within the confines of the gearbox.

**Test:**

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- Operational Tests for the Swing Gear Case Assembly:
  - Oil sample testing is performed annually by Ferrography. The results are returned to System Engineering for review and recorded in the crane log book to document wear trends.
  - A pre operational checklist in OMI Q3205 is performed prior to lifting operations, and reported on form KSC 28-528 (Pre Operational Check List).
- PMI H105 requires semi-annual, and annual maintenance on the crane including the following:
  - Check Swing Brake for proper operation.
  - Sample, drain, inspect and refill Swing Gear Box.
- OMRSD File VI requires annual performance of an operational test under full rated load.
- The mobile crane is load tested with a load equal to the rated load at the minimum radius in accordance with the manufacturer's load chart. The swing function is operationally verified prior to use per OMI-Q3205 and annually per PMI-L20 (Rated Load Tests and Operational Test Instructions for Mobile Cranes), with a load.

#### Inspection:

- The Swing Gear Assembly is checked semi-annually in accordance with PMI-H105. Inspection includes:
  - Damage, corrosion control
  - Oil leakage
  - Loose fasteners
  - Corrosion/deterioration of metal and paint
  - Structural defects

#### 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 failure data was found on this component in the critical failure mode.
- The GIDEP failure data interchange was researched and no failure data was found on this component in the critical failure mode.

#### Operational Use:

- Correcting Action:
 

There is no action which can be taken to mitigate the failure effect.
- Time frame:
 

Since no correcting action is available, time frame does not apply.

*Attachment  
5050234 DW  
Sheet 13 of 19*