

SAA09FT01-012
B/L: 510.00
SYS: BRODERSON
8-1/2 TON
CRANE

JAN 23 1995

Critical Item: Turret Rotation Gear Box Assembly (1 item)

Find Number: 0-280-00080

Criticality Category: 2

SAA No: 09FT01-012

System/Area: 8-1/2 Ton Broderon
Mobile Crane/LOA

NASA

Part No: None

PMN/ K61-0261/

Name: 8-1/2 Ton Broderon Mobile Crane

Mfg/ Gear Products Inc.

Part No: Series 135

Drawing/ IC-80-1B

Sheet No: 65-66

Function: Transfers torque from the Turret Rotation Motor to the Turntable Assembly.

Critical Failure Mode/Failure Mode No: Gears disengage/09FT01-012.001

Failure Causes: Structural failure of gears, couplings, keys, and gearbox housing.

Failure Effect: Torque for stopping horizontal rotation will be lost. Upper structure will continue to slew at a limited speed until the weight of the load, frictional forces, and gravity stop rotation completely. Possible damage to flight hardware.

Acceptance Rationale

Design:

- o The gearbox assembly is an off-the-shelf item manufactured by Gear Products Incorporated. The design is based on American Gear Manufacturers Association (AGMA) standards 342.02 "Design of General Industrial Double-Enveloping Wormgears" and 441.03 "Practice for Single and Double-Reduction, Double-Enveloping Worm and Helical-Worm Speed Reducers".
- o The gears are splined to shafts or integrally machined and are retained in place by shoulders within the confines of the gearcase.

*Attachment
S050234FE
sheet 2 of 8*

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Turret Rotation Gearbox Assembly (Continued)

- The gear box has a designed safety factor of 3:1 based on yield strength and approximately 5:1 based on ultimate strength.

Test:

- Oil sample testing is performed annually by ferrography. The results are returned to System Engineering for review and is documented in the crane log book.
- Heavy equipment ensures proper operation of Slewing Gear Assembly on a semi-annual basis per PMI HBJ. A pre-operational checklist is completed by OMI Q3205 prior to commencement of lifting operations.
- OMRSD File VI requires annual performance of an operational test at rated load to verify system integrity.
- The mobile crane is load tested annually per PMI L20 with a load equal to the rated load at the minimum radius in accordance with the manufacturer's load chart. The slewing function is operationally verified during this test.

Inspection: The Turret Rotation Gear Box Assembly is inspected semi-annually in accordance with PMI-HBJ for:

- a. damage, corrosion control
- b. oil leakage
- c. loose fasteners
- d. extensive corrosion/deterioration of metal and paint respectively
- e. structural defects
- f. excessive dirt

*Attachment
5050234FE
Sheet 3 of 8*

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Turret Rotation Gearbox Assembly (Continued)

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Failure History:

- o The PRACA database was queried and no failure data was found against this component.
- o The GIDEP failure data interchange system has been researched and no failures of this component were found.

Operational Use:

- o Correcting Action:

There is no action which can be taken to mitigate the failure effect.

- o Timeframe:

Since no correcting action is available, timeframe does not apply.

*Attachment
505023AFE
Sheet 4 of 8*