

SAA01FS030-013

MAY 27 1994

B/L: 245.00

SYS: APS

ROTATING

MECHANISM

Critical Item: Speed Reducer (2 Items Total)

Find Number: None

Criticality Category: 2

SAA No: 01FS030-013

System/Area: APS Rotating Mechanism/  
HMF Bldg. M7-961

NASA

Part No: None

PMN/

Name:

H70-1262/Mechanism,  
APS Rotating, HMF

Mfg/ Peerless Winamith Inc./

Part No: 15 CTD

Drawing/

Sheet No:

79K07781/M-1

Function: Transmit power and reduce rotation speed from the air motor to the aft cradle rotation pin. Provide hold/brake capability during rotation.

Critical Failure Mode/Failure Mode No: Gears disengage. /FM No. 01FS030-013.001

Failure Cause:

- Structural failure of gears.
- Structural failure of shafts.
- Structural failure of gearcase.

Failure Effect: Loss of the drive/hold capability. The APS Pod/Cradle assembly may accelerate about the rotation axis, wrapping and stretching the GSE electrical cables around the APS Pod/Cradle assembly, causing damage to the TPS and/or the flight half electrical connectors. Detection method is visual and time to effect is immediate.

### ACCEPTANCE RATIONALE

Design:

- The Speed Reducer is a worm gear double reduction unit (1500:1 ratio) rated at input HP of 3.39 at 1800 RPM. The air motor driving the speed reducer is rated at 0.6 HP at 255 RPM with a stall torque of 19 ft.-lbs.
- The torque rating of the Speed Reducer is 5525 ft.-lbs. maximum. The maximum applied load to the Speed Reducer is 4673.75 ft.-lbs.
- All gearing design complies with American Gear Manufacturers Association (AGMA) standards.

WORKSHEET 5312-013  
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Attachment

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- Load bearing members, such as the gear case and shafts, have been designed so that the calculated static stress, based upon the rated load, does not exceed 20% of the average ultimate strength of the material, i.e., 5:1 factor of safety.

**Test:**

- An operational check of the Speed Reducer is performed annually per OMI V6C49. The Speed Reducer is in a no-load condition and is rotated to assure smoothness of operation.

**Inspection:**

- OMRSD File VI requires annual verification, per OMI V6C49, of the following preventive maintenance inspections (visual):
  - Indication of fluid leaks.
  - Gearcase oil level.
  - Damage.
  - Corrosion.
- Ferrography inspection is performed every five years per OMI V6C49. The results and recommendations are provided to System Engineering and Reliability Engineering.

**Failure History:**

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