

B/L: 252.00
 SYS: PAYLOAD
 GROUND HAN-
 DLING MECH-
 ANISM

JAN 24 1995

Critical Item: BALL SCREW ACTUATOR - 10 Ton (8 Items Total)
Find Number: 155, 77
Criticality Category: 2

SAA No: 09FTAB31-001

System/Area: UPPER/LOWER FLOATING
 BEAM ASSEMBLY / PADS A &
 B

NASA

Part No: NONE

PMN/

Name: H70-0534
 PAYLOAD GROUND HANDLING
 MECHANISM

Mfg/ DUFF-NORTON

Part No: M-2810-13

Drawing/

Sheet No: 79K22693, 79K22694

1 TO 5

Function:

Provides the manual Zo adjustment capability (Extend/Retract/Hold) for the upper or lower end of one Payload Support Beam.

Critical Failure Mode/Failure Mode No:

Gears Disengage/09FTAB31-001.002

Failure Cause:

Structural Failure of the Ball Nut Assembly or Screw Column.

Failure Effect:

The actuator could backdrive resulting in a shift of the payload. This could cause loss (damage) to a vehicle system. Detection Method : Visual. Time to Effect : Seconds

ACCEPTANCE RATIONALE

Design:

- The actuator is an off-the-shelf item manufactured by Duff-Norton Co. Inc.
- The actuator is a translating screw type designed for daily usage.



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- Worm Gear (Helical Gear) is centrifugally cast Manganese Bronze per SAE J463 specification.
- Actuator is designed to retain gears in place by shoulders within the confines of the gearcase. Thus, a worm gear failure would tend to lock up within the gearcase and prevent backdriving.
- Worm material is AISI 1141 Alloy Steel used for high strength applications.
- With a 71,000 lb. load on the front end consisting of a 65,000 lb payload and 6,000 lbs of support equipment, the resulting induced loading in one actuator is 6,790 lbs. The safety factor for the actuator is greater than 5.89:1 (ultimate).
- Design is based on the American Institute of Steel Construction (AISC) specification sections A2.2, B7, and E2.

Test:

The Upper/Lower manual Zo actuators are operationally checked (without a load) monthly per OMI V6F09 except during a payload flow.

Inspection:

The actuator screw is inspected and lubricated annually per OMI V6F09.

OMRSD File VI requires annual oil sample testing. The results and recommendation are returned to System Engineering for review.

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