

AUG 18 1985  
SAA29CL01-026  
REV. A

B/L: 554.00, .25, .75  
SYS: ORBITER  
ARRESTING  
SYSTEM

Critical Item: Energy Absorber (12 Items Total; 4 Absorbers at each of 3 sites)  
Find Number: None  
Criticality Category: 2

SAA No: 29CL01-026

System/Area: Orbiter Arresting System/CLS  
Landing Strip

NASA  
Part No: None

PMN/  
Name: U70-1146  
System, Orbiter Arresting

Mfg/  
Part No: All American Engineering Co.  
40460-1

Drawing/  
Sheet No: AAECO 40460  
1

Function: To provide a braking force for the arresting net, which has enveloped an out-of-control Orbiter near the end of the runway.

Critical Failure Mode/Failure Mode No: Tape breaks when mechanism jams/29CL01-026.001

Failure Cause: Excessive lateral play/wear in bearings.

Failure Effect: Orbiter could veer off the side of the runway resulting in possible structural damage, in addition to TPS damage from net engagement, due to the pull on one side of the net being greater than the failed side. The failure would be detected visually, and the time to effect would be immediate.

### ACCEPTANCE RATIONALE

#### Design:

- Computer simulation work performed by AAE indicates that a maximum retarding force of 203,290 lbs. will be obtained by a 260,000 lb. Orbiter which hits the net with a 100 knot velocity, resulting in a deceleration "G" force of 0.78.
- The design is identical to the US Navy E-28 arresting system in service for over 30 years.
- The design of the energy absorber is extremely simple with only one (steel rotor) moving part. It is designed for thousands of repetitive arrestments, and is in use at military airfields in 50 countries for both operational and emergency arrestments.

Attachment  
3050234EB  
Sheet 2 of 4

X - 944.01

**Test:**

- The system has no special testing performed. The systems are set up and readied for use prior to each launch which verifies proper operation of all components.

**Inspection:**

The energy absorbers are inspected during set up prior to each launch in accordance with OMI Q5002.001 or OMI Q5002.002. The OMI's contain the following inspection sequences:

- Perform a visual inspection of energy absorbers for leakage.
- Verify that the energy absorbers are full of fluid. Rotate the rotor to remove any air pockets.
- Inspect exposed purchase tape anchor pin on each energy absorber, and verify it is secure.
- Inspect exposed ends of purchase tapes for wear or damage.
- Verify the energy absorbers have been installed on proper side of runway.

**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.