

EASA: Research Project EASA.2010/5 - Seat Belt Degradation (SEBED)

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Background

EASA research on Cargo Nets in 2008 did show a high degree of fabric degradation with up to 50% loss in strength. Consequently the webbing used on seat belts / torso restraint systems may also be prone to degradation.

During the lifetime of a seat belt it is considered that mechanical performance may deteriorate due to normal daily use, exposure to environmental conditions, natural aging of fabric (as seen on cargo nets) as well as due to cleaning or maintenance.

Objectives

1. Static and dynamic testing of new and used seat belts to assess whether there was a difference in performance with age regarding strength and elongation properties.
2. Development of a small scale test rig which would duplicate the loading conditions of seat belts during dynamic seat testing and to perform a statistical analysis to compare dynamic test data with data from testing on the small scale rig.

Main Findings

Static and dynamic testing showed that there was a relationship between the age of a belt and its performance (i.e., elongation characteristics). The test results were broken down into groups and analysed accordingly.

Belts which were rated at 3000lbs showed an increase in their elongation with increasing age and belts which were rated at 2000 lbs showed a decrease in elongation characteristics with increasing age.

It is shown that it would be possible to use a small-scale rig for the testing of repaired or replacement seatbelts (ref. CS/FAR 25.562) as it is possible to replicate the loading conditions to which a seatbelt is subjected in dynamic sled testing.

It was observed during belt procurement that a large number of belts were obtained which had illegible labels. Since belts and seats are tested together in order to comply with aviation standards (ref. CS/FAR 25.562), it is important to ensure that the correct belt is used with the correct seat.

Recommendations

In order to better determine when a belt should be removed from service, that service history of the belts should be recorded. It was found that little or no information appears to be kept by the operators regarding the service history of belts.

When gathering belts from various sources, it was common to find belts, which were assembled from mismatched parts. Hence it may be useful to issue each belt with its own unique serial number to enable records keeping about individual belts.

Miscellaneous

Information will also be provided on EASA AD 2013-0020 which is based on issues involving 3rd party repair (re-webbing) of seat belts / torso restraint systems.