

Non EASA fleet aircraft: Industry consultation on seat harness/belt lives

Introduction

The CAA wishes to consult with key elements of the non-EASA GA Continued Airworthiness community on the most appropriate means to assure the integrity of seat harnesses and belts. CAA considers that whilst introducing mandatory replacement lives for harnesses could be considered a means to ensure that an acceptable residual strength is retained, there is a diversity of components, installations and factors affecting degradation which are likely to make it a considerable challenge.

Background

AAIB Safety Recommendation 2017-021 required CAA to review the maintenance requirements for seat belts and harnesses, and, if necessary, revise these to ensure that seat belts and harnesses remain in a condition with an acceptable residual strength. In response, CAA published [Safety Notice 2018/005](#), providing clarification of items to consider during routine aircraft inspection.

Complementing this, the Light Aircraft Association published [Airworthiness Alert LAA/AWA/18/07](#) drawing attention to the CAA SN and highlighting the importance of maintaining safety harnesses in a good condition.

CAA also considered whether introducing mandatory replacement life or lives could be a means to ensure that an acceptable residual strength is retained, but the challenge of arriving at required replacement periods that would prove effective without being unduly penalising may be significant for what is a diverse fleet.

Discussion

Some aircraft seat harnesses are already bound by replacement lives, including those covered by CAA AD/1819/00 for the DH Moth aircraft, and consideration of the harness materials and the installed/exposed environment are key factors in the associated considerations.

This consultation does not seek to affect these already imposed lives.

The operational and environmental conditions seen by individual harnesses will have a large bearing on the rate of degradation. Ultraviolet light and cockpit temperature, the number of fitting and adjustment cycles and any cleaning materials used can all play their part. A training aircraft with a bubble canopy spending its life on the apron without a cockpit cover will be more prone to harness degradation than a high wing, cosseted aircraft that spends a large portion of its time within a hangar.

As well as operational variations, there can be a number of different harnesses for even a single type within the fleet. A single life is unlikely to be effective (or reasonable) for the wide variety of harness components and installations found. Also, there may well be a lack of reliable age information for the current components, providing a less than solid foundation for the application of a hard replacement life, at least initially.

For these reasons, the application of an effective but simplistic single 'life' could be penalising in a number of cases. The application of 'adjustment factors', depending on operational usage of an aircraft and its configuration is likely to be the only practical way of imposing a mandatory life, given the variables involved.

Whether or not changes to the CAAIPS material (Notice 25-40) and/or the LAMS are required, or not also needs to be considered.

Another factor is whether a special (safety benefit) provision should be offered in terms of Major/Minor mod status for non-original harnesses being fitted as a result of this exercise. It could, for instance be said that if the harness geometry and pick-up point philosophy/bolt diameters etc are identical, it could be a minor change.

Also, in the cases where an airframe OEM-specified harness/belt is regarded as unjustifiably costly, it could be proposed that a commercially-sourced automotive model may be equivalent, or even improve the situation. A replacement UK-manufactured (Willans) 4-point racing harness setup costs around £100.

Example

If it is felt that the imposition of a hard life is likely to be the only reliable way of reasonably assuring adequate belt/harness performance into the future, an example could be:

Inspect [to specified criteria taken from TNS CT(MOTH) #33 for the Sutton Harnesses] within 10 flight hours or 3 months (whichever is sooner)

- If condition unsatisfactory, replace within a further 10 hours/3 months.
- If condition satisfactory, is there evidence that the harness has been fitted for more or less than 10 years*?
 - If less, inspect on Annual basis until 10 years has elapsed.
 - If more, replace within 20 hours/6 months.

*[This 10 year life could be extendable if there is clear evidence that one or more of the key life affecting parameters is applicable. What weighting was applicable to each 'adjustment factor' clearly needs to be considered.]

Request for comments

CAA would therefore welcome comments:

- On whether mandating replacement lives for the Non-EASA UK regulated GA fleet's seat belts and harnesses would be appropriate, either assuming a single non-variable figure or the application of 'adjustment factors'
- As an alternative, the CAA would welcome proposals to ensure retention of an acceptable residual seat harness/belt strength that did not result in the mandating of replacement lives, such as the provision of thorough seat harness/belt condition criteria that identifies how acceptable residual strength could be inspected for.
- Any other related suggestions would be appreciated.

Request for comments/feedback to GA@caa.co.uk by 1 January 2019, please.

GA Unit (Airworthiness)

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