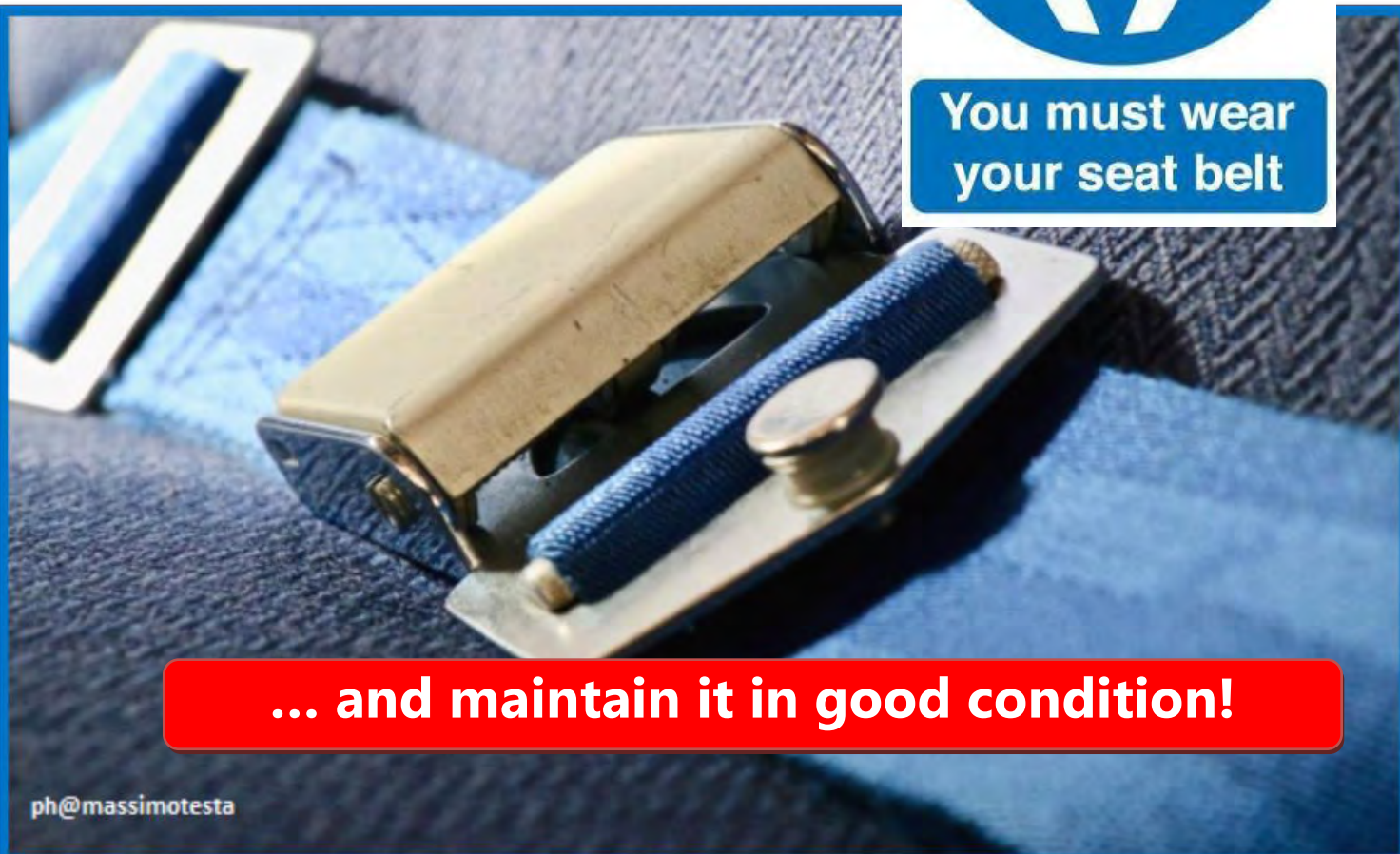


Controllo delle Cinture di Sicurezza



**You must wear
your seat belt**



... and maintain it in good condition!

ph@massimotesta

Safety Promotion Leaflet
SPL-3 - Rev. 1

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La Safety Promotion è un ambito di attività in costante e crescente sviluppo sia a livello europeo sia a livello nazionale in cui l'Europa sta investendo molto; essa trova ampia collocazione nelle azioni dello European Aviation Safety Plan - EPAS e del Safety Plan ENAC, a riprova della elevata rilevanza e del positivo contributo che essa può fornire allo sviluppo, al sostegno e al miglioramento della Safety Culture.

La Safety Promotion Leaflet [SPL] è una nuova linea di prodotto dell'ENAC, che si inserisce nel più generale contesto della Safety Promotion, con lo scopo di condividere le buone prassi, informare sulle innovazioni tecnologiche o contribuire alla diffusione di sviluppi normativi.

La Safety Promotion Leaflet non è uno strumento che si sostituisce ai tradizionali prodotti in uso, né alle previsioni regolamentari né ai metodi accettabili di rispondenza (AMC, Linee Guida ed altro) ma tende a fornire indicazioni e informazioni come contributo al miglioramento continuo del sistema *aviation safety*, di concerto con i regolamenti e le attività di sorveglianza.

Premessa

Recenti studi hanno dimostrato che in alcuni incidenti aerei l'impatto al suolo non è stato fatale grazie anche alle buone condizioni delle cinture di sicurezza.

Di contro è stato rilevato che i problemi alle cinture di sicurezza contribuiscono in maniera significativa alla gravità delle conseguenze per gli occupanti dell'aeromobile durante un atterraggio forzato.

Ad esempio, nel caso di un incidente che nel 2016 ha coinvolto un aeromobile Yak 52, è stato appurato che le cinture di sicurezza (sia spallacci che ventrali) erano state in servizio molto più a lungo di quanto inizialmente previsto dal costruttore stesso. L'analisi evidenziò come le cinture mostrassero non solo un significativo indebolimento causato dai raggi ultravioletti (irraggiamento solare) e decolorazione ma anche un degradamento della loro resistenza, talvolta superiore al 50%.



La [Safety Notice 2019-003](#) "Non-EASA General Aviation Aircraft Safety Harness Integrity", pubblicata dal CAA UK, che supera la Safety Notice 2018-005, fornisce ulteriori suggerimenti e criteri per l'identificazione degli intervalli manutentivi nonché consigli e raccomandazioni per le manutenzioni di routine finalizzate alla **verifica dell'integrità** delle cinture di sicurezza installate sugli aeromobili dell'aviazione generale non soggetti alla regolamentazione EASA (ad es. aeromobili Annesso II al Reg. (CE) 216/2008, divenuti Annesso I con il NBR 2018-1139).

Questi, come riportato nella succitata Safety Notice, possono includere aeromobili storici o di costruzione amatoriale, mongolfiere, alianti, aeromobili monomotore o bimotores a pistoni con MTOM fino a 5,700 kg ed elicotteri "single pilot" con MTOM fino a 3,175 kg.

Azioni manutentive

La presente Safety Promotion Leaflet [SPL] fornisce quindi informazioni sull'importanza delle attività di manutenzione delle cinture di sicurezza per gli aeromobili dell'aviazione generale, tenendo conto non solo dell'utilizzo dell'aeromobile ma anche del luogo e delle condizioni in cui viene normalmente tenuto durante la sua vita operativa, come temperatura, umidità, ambienti salini, parcheggio in hangar o teli di copertura con protezione UV.

Le situazioni descritte sono quindi riferibili sia agli aeromobili non-EASA che ricadono sotto la responsabilità ENAC sia ai corrispettivi prodotti EASA.

Allo scopo di fornire utili informazioni ai proprietari/esercenti/manutentori di aeromobili dell'aviazione generale, l'ENAC intende aggiornare i contenuti/criteri delle [Linee Guida 2015-005-NAV](#) "Manutenzione Appareti Elettroavionici ed Equipaggiamenti vari e di Emergenza".



Si riporta di seguito il contenuto della [Safety Notice 2019-003](#), della quale si ritiene utile riportare il testo integrale in inglese del § 2 – *action to be taken*:

1. The scheduled maintenance inspection of safety harnesses in Non-EASA GA aircraft should be conducted in accordance with the procedure appropriate to the aircraft, which should preferably refer to the original manufacturer's instructions, instructions and/or specified retirement lives, or to other appropriate generic maintenance information such as that published by the CAA in LAMS ([CAP 411](#)).
2. When undertaking scheduled maintenance, the expectation is that consideration is given to the utilization of the aircraft and therefore wear to the harness, visible or not:
 - a. an aircraft that is used for training or is regularly operated by different pilots will see considerably higher 'working' of the harness through adjustment. This will have an adverse effect on the degradation rate.

(azioni manutentive)

- b. the age of the harness should be considered, regardless of the environment. Anecdotal evidence has shown that even in good storage conditions without even being installed on an aircraft, there can be a degradation in strength over time:
- (b)(1) a set of good quality Nylon harnesses that had been stored in good conditions (dry and appropriately packaged and not exposed to sunlight) showed an approximate 12% reduction in total breaking strength over 12 years, despite not ever having been installed.
 - (b)(2) a harness of the same construction and material installed on an aircraft with low annual hours, very limited UV exposure and stored in a hangar had degraded in strength by 30% over 14.5 years. The external condition appeared to be 'as new'.
- The percentage of strength deterioration that is acceptable has generally not been defined, partly because strength data is not available, and partly because the decision depends to an extent on the magnitude of the reserves of strength of the harness, particularly when compared to the strength of the attachments.
- c. Evidence suggests that while harnesses with straps made from natural fibres are likely to be worst affected, harness strap fibres constructed of any material can degrade with exposure to temperature and light (particularly UV light). With Nylon for example, continued exposure to temperatures exceeding 20 degrees Celsius will result in a degradation in strength over the long term. Above 40 degrees, this can be accelerated considerably further. Thus, a harness in a type with a bubble canopy consistently left uncovered on an apron in the summer will likely be notably affected.
3. When undertaking scheduled maintenance, it is recommended that the following advice is considered as an aid to the inspection process. Gain access to the aircraft seat harness (shoulder harness, lap belt etc.) attachments and using a suitable light source, mirrors, magnifying glasses or other visual aids, examine:
- a. each attachment bracket, its securing means and where appropriate, **whether it's free to swivel**;
 - b. each harness adjuster and buckle for evidence of cracking, corrosion, wear or deterioration of the surface finish, and for correct operation, freedom from jamming, slippage and broken springs, ability to release under tension, etc.;
 - c. the related aircraft structure in the vicinity for evidence of cracking, corrosion, distortion, wear or deterioration of the surface finish;

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- d. the webbing, ensuring it is looped through buckles and other hardware in the correct sense, has not been pulled significantly to one side of any adjustment/attachment device and is not twisted.
4. Any faults identified should be rectified in accordance with the requirements of the appropriate maintenance manual.
 5. Gain access to the full length of each safety harness (in some cases, this may involve removing the harness from the aircraft. Each individual strap of each cockpit safety harness should be examined in detail, including assessing for signs of:
 - a. broken or frayed stitches and threads;
 - b. nicks, cuts and tears;
 - c. chafing; (e.g. scratching and scuffs on webbing exterior);
 - d. warping (usually apparent by curvature in the webbing pattern)
 - e. contamination due to mould growth or from exposure to contaminants such as acid, oil, grease, water, grit/dirt etc.;. (Dirt or grit contamination could lead to chafing/fraying of stitches/webbing as the harness is in normal use, and may be partially or fully hidden from view unless care is taken);
 - f. deterioration due to exposure to sunlight (UV degradation, often evident by discoloration '**bleaching**');
 - g. lack of security of end fittings;
 - h. elongation or wear of the attachment holes.
 6. Where an unacceptable level of deterioration is found, the safety harness should be replaced.
 - a. The determination of what constitutes an acceptable, or unacceptable, level of deterioration is the responsibility of the authorised person performing the maintenance task.
 - b. Reference should be made to original equipment manufacturer's maintenance data for the harness if this identifies acceptable conditions, but this may only be applied to the safety harness specified, and generally this should not be used to determine acceptable levels of deterioration for other manufacturers' harnesses. Some manufacturers declare a maximum safe design life within the maintenance instructions for specific harnesses which should be considered when deciding whether a harness should be replaced. Justification for exceeding such a life should be recorded in the aircraft records.

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7. Care should be taken when cleaning safety harnesses to ensure that the cleaning agent used does not itself degrade the harness strength or any protective finishes.
 - a. Nylon materials respond adversely to any acidic substances, whereas for polyester, alkalis have an adverse effect. The original equipment **manufacturer's maintenance practices should be followed where possible.**
 - b. Generally, clean luke-warm or cold water with a mild (non-detergent, pH neutral) soap may be used, but even soap residue remaining present can accelerate degradation, so after rinsing, the harness should be allowed to dry naturally. Accelerated drying by heating could induce temperature-related degradation.
 - c. When cleaning, care should be taken to keep foreign matter and any cleaning media (water/soap) away from the hardware components i.e. buckles, adjusters etc.

Si riportano di seguito alcune ulteriori informazioni presenti nel § 3 della [SN 2019-003](#):

- 3.1 It is important to note that degradation is not always visible. Harnesses may appear 'as new' but have had their strength reduced considerably due simply to elapsed time or factors that are not immediately apparent. If in doubt, it is wisest to err on the side of caution, particularly when the function of the harnesses is considered. The replacement of degraded harnesses with up to date (FAI specification) automotive racing assemblies can prove cost effective, but the modification procedures of the relevant oversight body (i.e. LAA, BMAA or CAA) must be followed if such non-original equipment is substituted.
- 3.2 CS-STAN Standard Change CS-SC153b for the exchange of Safety belts/Torso-restraint systems can be utilized [...]
- 3.3 Care should be taken by those involved in re-webbing harnesses, for example with respect to thickness of the webbing. Failure to obtain the correct thickness can lead to slippage at the adjustment devices at considerably lower than specified loading conditions.
- 3.4 Inspecting engineers should also consider that the harness itself is just one part of the restraint system. Particularly in the case of lightweight structures, when inspecting the system, it is essential to check for degradation in the attaching structure/load paths.

Conclusioni

Diventa pertanto importante assicurare che le cinture di sicurezza degli aeromobili siano sempre in buone condizioni affinché esse possano continuare a garantire una protezione efficace, ad es. durante un tentativo fallito di atterraggio forzato.

Nel caso le suddette ispezioni e/o attività manutentive rivelino danni evidenti che hanno compromesso o avrebbero potuto compromettere la sicurezza del volo, diventa fondamentale che tali informazioni vengano riportate alle Autorità competenti affinché possano essere presi opportuni provvedimenti su altri velivoli interessati.



Le modalità di segnalazione all'ENAC sono reperibili nel portale dell'Ente nella sezione [Segnalazione Eventi Aeronautici - Sistema eE-MOR](#).

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