



# Interagency Aviation Accident Prevention Bulletin



No. IA APB 18-01

November 30, 2017

Page 1 of 2

Subject: Attention to Detail: Hidden Seatbelt Danger

Area of Concern: Flight Safety

Distribution: All Aviation Activities

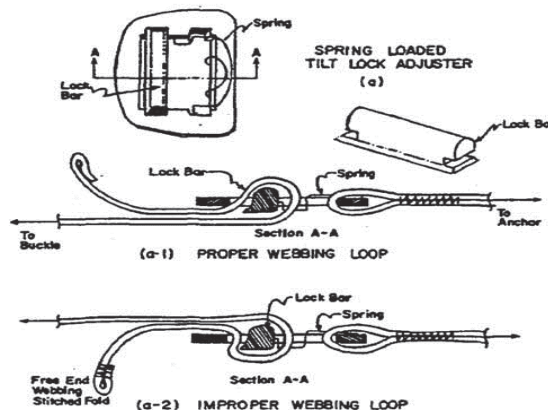
Discussion: What's wrong with this picture?



Compare the orientation of the webbing loop in the photo above..... to the PROPER WEBBING LOOP in diagram (a-1) from FAA Advisory Circular 21-34 below.

6/4/93

AC 21-34



**The webbing in the photo is INCORRECTLY routed around the lock bar!**  
The convex surface of the adjuster must face up IAW FAA AC 21-34 diagram 6(a-1).

If the anchor end of the belt was rotated 180°, the adjuster would indeed lay with its convex side up but the webbing would remain improperly threaded. At some point, the seat belt in the photo was installed incorrectly with a ½ turn at the anchor end that oriented the lock bar in the wrong direction and the loose tip of the belt was inside the belt next to the person. In this instance, the incorrect “fix” was to rethread the belt’s loose tip end around the lock bar **resulting in a safety belt that’s unable to maintain its belt tension and would fail to perform correctly when needed most!**

**FAA Advisory Circular 21-34 - Shoulder Harness-Safety Belt Installations**

**Date Issued** June 04, 1993

**Responsible Office** AIR-120, Aviation Safety - Aircraft Certification Service, Aircraft Engineering Division

**Description** Provides information and guidance pertinent to an acceptable means, but not the only means, for installation of shoulder harness-safety belt

**EXTRACT:**

**CHAPTER 2. SHOULDER HARNESS INSTALLATION CONSIDERATIONS**

**Section 3. SHOULDER HARNESS ASSEMBLY DETAILS**

.....  
e. **Adjustment hardware.** A variety of manual length adjustment hardware is available, and all rely on friction between webbing and the hardware. All length adjusters are sensitive to how the webbing is threaded through the adjuster, and some are sensitive to positioning within the belt assembly. Some adjusters are sensitive to the type of webbing material and the weave. In particular, certain precautions are warranted for adjusters known, in a general sense, as the 3-bar slide adjuster, the tilt lock adjuster, and the cam lock adjuster.

.....  
(2) **Tilt lock adjuster.** Three types of tilt lock adjusters are illustrated in figure 6. Tilt lock adjusters rely on the mechanism of clamping the webbing between a locking bar and the frame of the adjuster, and the clamping force is produced by tension from the anchored end of the webbing. The locking bar may be smooth, but is more often roughened with knurling, serrations, or a sandpaper-like finish. The type of roughness on the cross bar is generally intended for one type of webbing material or webbing weave. Some designs use a spring loaded cross bar to inhibit loosening of the shoulder harness or safety belt by vibration and normal occupant movement. Locking force and the amount of webbing wrapped around the locking bar is greatest when the frame plate is parallel to the webbing. Increasing the angle (tilt) between the frame plate and the tension end of the webbing decreases the clamping force on the webbing, which permits the webbing to be drawn through the adjuster in either direction. The primary precaution regarding the tilt lock adjuster is that proper occupant restraint is provided only if the webbing is properly looped around the lock bar.

.....  
(ii) The adjuster illustrated in Figure 6(a) [above] is sensitive to the manner in which the webbing is looped on the lock bar. As illustrated in Figure 6(a-1), the webbing should be looped around the lock bar in the manner which causes belt tension to draw on the flat side of the lock bar and applies shear loads to the thinner ears of the lock bar. The shear reaction in the thinner ears is low. An improper webbing loop appears, and provides adjustment, about the same as a proper webbing loop on this type of adjuster, but the strength of the assembly is substantially reduced. Therefore, shoulder harness and safety belt systems using this type of adjuster warrant close examination of the webbing loop on the lock bar of the adjuster.

---

**Preflight activities include restraint systems inspection to ensure they’re properly assembled & installed!**

**/s/ Keith Raley**

Keith Raley

Chief, Aviation Safety, Training, Program  
Evaluations and Quality Management  
DOI, Office of Aviation Services

**/s/ Kent Hamilton**

John Kent Hamilton

Branch Chief, Aviation  
Safety Management Systems  
USDA Forest Service