



*Issues*

**MANDATORY BULLETIN No. EV-97 – 009 a** (ZBEV-97-009a)  
**SPORTSTAR – 004 a** (ZBSPORTSTAR-004a)

1. **CONCERNING TO :** Lock of the wide tilting canopy installed on the SPORTSTAR airplanes and on some of the EV-97 airplanes (wide canopy is recognizable by guide pins at the canopy frame sides).
2. **REASON :** Repeated unprompted opening of the wide tilting canopy in flight happened during service of Sportstar airplanes in Australia.  
The pilot had to decrease airspeed, close the canopy and land. Neither injury nor property damage was caused. The most probable cause of opening is imperfect design of the canopy lock, which does not lock the canopy sufficiently under all air loads, which may act on the canopy in flight.
3. **REQUIRED ACTION :** Replace the original lock with a new one delivered from the airplane manufacturer. The new lock has a design modification consisting of making a groove in a new handrail body with the hook, into which fits a new pin with the stop.  
The stop of the pin installed on the rear fixed canopy frame prevents canopy unprompted opening.
4. **LATEST DATE OF THE ACTION:** **Immediately after new lock obtaining**  
It is possible to operate the airplane before the new lock obtaining and installation, recommended is a thorough check of full and proper closing of the canopy before a take-off (the pin must snap fully in the hook slot). If in doubt on the canopy lock proper function, additional fixation of the canopy in closed position is recommended by means of a rubber rope (bungee) hitched with one end on the lock handrail and opposite one on the shoulder belt hinge located on an inclined bulkhead behind the baggage compartment.
5. **ACTION CARRIED OUT BY :** Airplane owner, operator or by him entrusted mechanic.
6. **COSTS COVERED BY :** Airplane manufacturer shall supply free of charge a set for new lock installation.  
Estimated time to perform bulletin is 2 ½ hours.
7. **NECESSARY MATERIAL :** Will be supplied by the airplane manufacturer.  
List of necessary tools see in Enclosure.
8. **WORK PROCEDURE :** see Enclosure.
9. **ENCLOSURES :** Procedure to replace handrail and pin of the canopy lock.
10. **ELABORATED BY :** Petr Javorský, Pavel Ulrich

  
-----  
Petr JAVORSKY  
Manufacturer's Representative

03/01/2006  
Date:

  
-----  
Jiří VYCHOPEN  
Light Aircraft Association  
Expert supervisor

03/01/2006  
Date:



## Procedure to replace handrail and upper pin of the canopy lock.

Photo	Procedure
	<p>Supplied material:</p> <ul style="list-style-type: none"><li>- handrail completed - Draw.No. E1 91-11 01</li><li>- upper pin welded - Draw.No. E1 91-14 01</li><li>- bolt M3x16 P/N 1872 (not shown) – 2 pcs.</li><li>- pin 3m6x16 P/N 46193 (not shown)</li><li>- blind rivet 3.2x7.9 P/N 6472 (not shown) – 4 pcs.</li></ul> <p>Other necessary material</p> <ul style="list-style-type: none"><li>- Loctite threadlocker (243 or 245)</li><li>- Loctite 648 to lock the pin</li><li>- Emfimastic PU 50 or 3M, Polyurethane Sealant 540 (event. suitable equivalent) to bond upper pin</li></ul>
<p>List of necessary tools:</p> <ul style="list-style-type: none"><li>- ejecting pin Ø 2.8 mm (0.1102 in) to eject handrail pin</li><li>- needle Ø 2.0 mm (0.0787 in) to align holes of the handle pivot and handrail</li><li>- drill bit Ø 2.4 mm to drill the holes for thread in handrail body and a larger diameter drill bit to countersink these holes</li><li>- drill bit Ø 2.8 mm to drill a hole for handrail fixation pin Ø 3 mm</li><li>- drill bit Ø 3.2 mm to remove the blind rivets attaching upper pin to the rear fixed canopy frame</li><li>- reamer Ø 3H7 to ream the hole for handrail pin</li><li>- M3 tap to cut a thread in the handrail body</li></ul>	<ul style="list-style-type: none"><li>- flat screwdriver to remove locking hook attachment screws</li><li>- hammer to eject and drive the pin</li><li>- flat file to trim locking hook if necessary</li><li>- blind-rivet hand riveter to rivet the upper pin</li><li>- electric hand-held drill</li><li>- bench vice to chuck handrail for working procedure</li><li>- suitable steps or chair to allow access to canopy lock</li></ul>



Photo	Procedure
	<p>Transport the airplane to a place suitable to perform the work.</p> <p>Open the canopy and turn handrail to a position suitable for ejection of the pin from handle pivot.</p>
	<p>Use ejecting pin <math>\varnothing</math> 2.8 mm to eject pin <math>\varnothing</math> 3 mm from handle pivot.</p> <p>An assistant should hold a bigger hammer on opposite side to absorb shocks during pin striking.</p>
	<p>Hold the handle and pull the handrail down the handle pivot.</p>



Photo	Procedure
	Pull the handle with pivot upwards out of the canopy frame.
	Unscrew two M3 screws attaching locking hook to the original handrail.
	Remove locking hook from the original handrail.



Photo	Procedure
	<p>Put the locking hook on the new handrail. Slip the pivot of the handle into the hole in the locking hook and handrail body to set position of the locking hook on new handrail.</p> <p>Locking hook slot must be oriented on the shorter side of the handrail (side with a groove).</p>
	<p>Chuck the handrail with handle in a vice.</p>
	<p>Make a small dimple using drill bit <math>\varnothing</math> 2.4 mm to mark position of screw hole on the handrail. Dimple position must be in the center of hole through locking hook.</p>



Photo	Procedure
	<p>Turn the locking hook slightly and drill the hole through whole handrail body.</p>
	<p>Use a drill bit or wire of suitable diameter to align locking hook hole with the drilled hole.</p> <p>Make a small dimple using drill bit <math>\varnothing</math> 2.4 mm to mark position of opposite screw hole on the handrail.</p> <p>Dimple position must be in the center of hole through locking hook.</p>
	<p>Remove a drill bit or wire used for alignment.</p> <p>Turn the locking hook slightly and drill the hole through whole handrail body.</p>



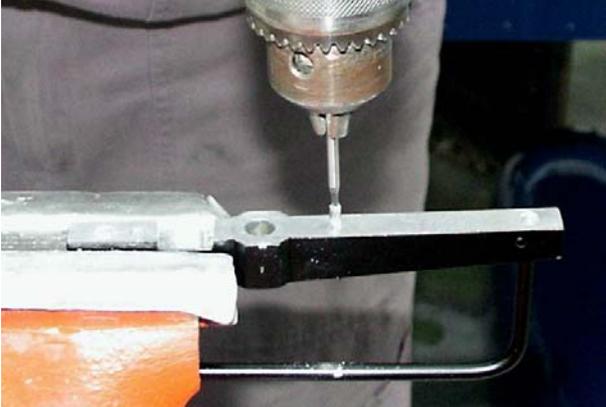
Photo	Procedure
	<p>Pull the handle and locking hook out of the handrail.</p> <p>Countersink the holes with a bigger diameter drill bit.</p> <p>Countersink enables correct tap position at the start of tapping.</p>
	<p>Cut M3 thread through both holes.</p> <p>Thread to be cut through the hole whole length.</p> <p>Use a tap wrench or machine tap held in a hand-held drill with speed regulation and left/right motion.</p> <p>Machine tap is applicable for skilled mechanics, only.</p>
	<p>Apply small amount of Loctite threadlocker (e.g. 243 or 245) on the M3 screw threads.</p>



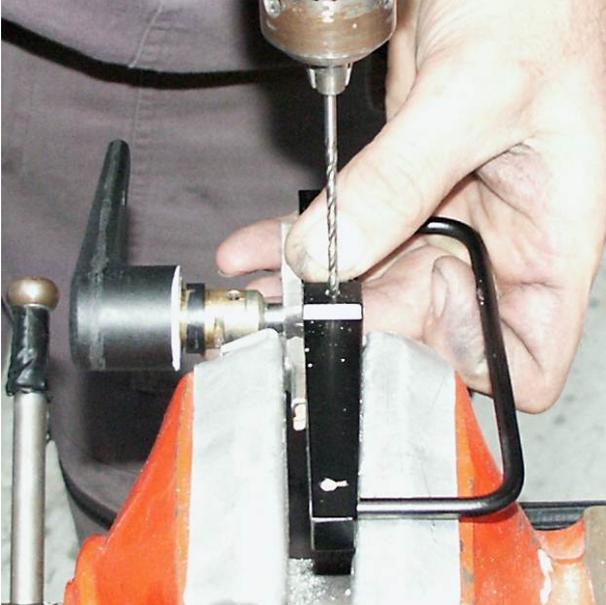
Photo	Procedure
	<p>Screw the locking hook down on the handrail with two M3 screws.</p>
	<p>Slip the handle pivot into the handrail with lock hook. The handle must be oriented to the locking hook slot.</p> <p>Align handrail hole with the handle pivot hole. Drill hole of 2.8 mm diameter through the handrail and handle pivot. Hole to be drilled through.</p>
	<p>Use Ø 3H7 reamer to ream hole drilled through the handrail and handle pivot. The hole should be reamed only to one half of its length i.e. to handle pivot axis. This is to increase tightness of the handle pivot-handrail pinning).</p>



Photo	Procedure
	<p>Set the handle pivot into the canopy frame from above and then slip handrail on the handle pivot from below. Turn the handle to be oriented towards the slot of the locking hook.</p> <p>Align position of the holes in the handrail and handle pivot with needle <math>\varnothing</math> 2 mm or a wire. Apply a small amount of Loctite 648 on pin <math>\varnothing</math> 3 mm and insert it into the hole through handrail. Pin must be inserted from the side where reaming was made. Hammer the pin fully into the handrail by means of a hammer and duralumin bar.</p> <p>An assistant should hold a bigger hammer on the opposite side of the handrail during pin hammering.</p>
	<p>Handrail is now assembled with the handle pivot and locked with the pin.</p>
	<p>Use drill bit <math>\varnothing</math> 3.2 mm to route heads of 4 rivets attaching original pin to rear canopy frame.</p> <p>Remove the original pin.</p>



Photo	Procedure
	<p>Apply Emfimastic PU 50 (or equivalent) on the inner side of the new supplied upper pin.</p>
	<p>Position the supplied upper pin on the rear canopy frame and align it with the original holes through the frame. Rivet it with blind rivets 3.2x7.9 mm (4 pcs). Use a hand riveter.</p>
	<p>New upper pin riveted on the fixed canopy frame.</p>



Photo	Procedure
	<p>Check the canopy lock mechanism function at closing the canopy. If the handle turning is very stiff, then it is necessary to dismount the handrail and use a flat file to file down the upper side of the lock hook. Then re-install the handrail.</p> <p>Picture shows closed canopy lock – view from inside the cockpit.</p>
<p>Record compliance with this bulletin into Airplane Log Book.</p>	