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SAFETY ALERT / SAFETY DIRECTIVE

Release Date:
Saturday, November 07, 2009 (revision 1)

Effective Date:
Immediate

Subject/Purpose:
Mandatory Upgrade, before next flight.

Limitations:
None, once upgrade is complete.

Affected Models:
Aircraft Manufacturing & Development and Aircraft Manufacturing & Design (AMD) Zodiac CH 601 XL and CH 650 aircraft.

Owner/Operators of CH 601 XL and CH 650 aircraft in the Experimental Amateur Built category are encouraged to reference related information from Zenith Aircraft, Co. available at:
http://www.zenithair.com/news/ntsb-astm-4-09a.html

Serial numbers:
All

Notification Number:
Saturday, November 07, 2009

Does this Notice supersede another document?
Yes – Aircraft POH and all other aircraft documents that makes reference to flight limitations and Weight & Balance including pre-flight check list.

Discussion:

This Safety Alert is based on the "Chris Heintz" letter of July 7, 2009 and on the FAA's and other airworthiness authority's review of the design. Chris Heintz is the designer and owner of the Zodiac designs; AMD has a license agreement with Mr. Heintz for the manufacturing of the Zodiac 601XL and 650 in the USA under the SLSA category.

A number of accidents involving the CH 601 XL aircraft type have occurred in 2006-2009 causing diffetent authorities to conduct full reviews of the design.

Two aircraft (a CH 601 XL as well as a CH 650) were delivered to a flutter specialist in Germany for the purpose of thorough Ground Vibration Testing. It is important to note that both aircraft used in these tests were professionally built and, therefore in compliance with design specifications. The result of these real-world tests (not just a computer simulation) can be viewed on the AMD web site (at CH 650 and ZODIAC XL). The tests concluded that there are no flutter concerns for these planes. However, an on-going question that remains is: is flutter possible if a similar aircraft is not built or maintained as per the design specifications?

Chris Heintz agrees that one way to address this question is to follow the UK LAA's mandated upgrade to install aileron counter balance weights. AMD is now mandating this modification as part of the upgrades covered by this Safety Alert.

Additionally, the German laboratory in charge of the GVT also conducted non-linear test analysis of the design and concluded that the aileron bellcrank area of the CH 601 XL could be reinforced to minimize the possibility of non-linear-type vibrations in that area. This is why the reinforcement parts for this area are also part and parcel of the upgrade kit mandated by this Safety Alert.

Finally, Chris Heintz completed a series of static load tests this summer where the Zodiac design was load tested by as much as 6% beyond the SLSA requirements - without failure. This Safety Alert includes extra material which was not part of the tested airframes, further increasing the safety margins of the seat area, main spar bolt area, and rear spar area. The current upgrade kit therefore increases a number of safety margins on the aircraft even further than those on the tested airframes.

The purpose of this multi-part upgrade kit is to not only comply with the different interpretation of regulations by different authorities, but to also make sure that the aircraft is significantly tougher overall and less prone to vibrations, including everyday wear-and-tear.

Overloading of the airframes is still an important concern. In a number of cases, this overloading was probably due to exceeding Vc in turbulent conditions - which significantly increases the loads on the airframe. It is therefore imperative that all Zodiac 601XL and 650 aircraft be retrofitted with the upgrade kit covered in this Service Alert, and that pilots become and remain well aware of the aircraft limitations including Vc, and that the ASI of every aircraft be well calibrated and properly marked.

Corrective Action:

Complete the installation of the upgrade kit as per the following.

1. All work is to be performed by a certified mechanic as per maintenance manual "(a / b) Major Alterations / Major Repairs. Must be pre-approved by the Manufacturer or other identity and performed by an FAA certified A&P" or FAA certified repair station.

a) Complete the upgrade by using the following information:
   i. Drawing 6-ZU-1, 6-ZU-2, 6-ZU-3, and 6-ZU-4.
   ii. Photo guide with construction standards
   iii. Use "FAA AC-43.13.-1B and 2A if additional information is required
   iv. Use the UK LAA's modification MOD/162B/004 dated 18/08/09 for only the installation of the aileron counter balance weights. Drawings and assembly instructions are part of the modification.

b) Additionally:
   i. When removing and reassembling the wings, ailerons and flaps, follow the procedure in the service manual section VII
   ii. When removing and reinstalling the wing tanks follow the procedure in the service manual section VIII
   iii. Inspect the aircraft using the Zodiac series checklist. This is a 41-page checklist to help owners thoroughly inspect their aircraft before flying again.
   iv. Use the checklist with the Service Manual as you complete a 100 hour inspection as per table 1.
   v. Ground and flight test procedures for the return to service after upgrade Follow Appendix 1 for "major repairs and alterations"
   vi. For calibration of the ASI with a GPS, proper outside air temperature must be taken with a temperature gauge while doing the flight test as actual outside air temperature is required to allow proper correction.
   vii. Complete a new weight & balance as per procedure in POH section 4. Update the "INSTALLED EQUIPMENT LIST", "WEIGHT & BALANCE REPORT" and "WEIGHT & BALANCE UPATE" in the POH.

In addition to this and before each flight:

1. Check all control cable tensions by hand. If in doubt about the cables being properly tensioned, check them with a calibrated cable tension gauge. If necessary, adjust the cable tension to the proper values. If unsure, get a licensed mechanic to check or adjust the cables.
WARNING: Do not fly with control cables that are too loose or too tight.

2. Check for free play in the aileron control system. When holding the control stick stationary, beyond minor flexing, there should be no free play in the system when gently pushing up or down on the aileron trailing edges. Note that if the ailerons are not locked when the aircraft is parked outside, wind can damage the system.
WARNING: Do not fly with loose, sloppy or damaged controls.

3. Check the flaps for positive firm contact with the flap stops when in the "up" (retracted) position. Check for movement by gently pushing up and down on the flap trailing edges. **WARNING:** The flap system can get damaged if the flaps are stepped on. Do not fly with loose or damaged flaps.

4. When placing luggage/items in the wing lockers, baggage area behind seats, or in other places, check that it is well secured before take-off.
WARNING: Do not fly with loose luggage or other items in the aircraft.

5. Make sure the colored arcs on your ASI all properly indicate the correct speed limits (CAS). Incorrect markings could cause the pilot to unintentionally exceed aircraft limitations. Before flying your aircraft, know all the flight limitations including VA and Vc. Mark VA on your airspeed indicator (or panel). Remember that all aircraft limitations should be included in your flight manual (POH).

6. Check that your canopy closes and latches properly on both sides. If in doubt, add a secondary latching system as recommended by the Australian CAA. If your canopy does open in flight, keep your hands on the controls, lower your speed to approximately 60 knots, keep flying the aircraft and land as soon as practicable.
WARNING: Do not try to close the canopy in flight: Fly the aircraft!

7. "Self checkout" is not recommended. Before flying the aircraft, make sure that you have been properly checked out and that you are familiar with all flight limitations and the handling characteristics (feel and responsiveness) of the controls. Remember that, as with any light aircraft, if you encounter unexpected turbulence while cruising, ride it out rather than fight it – and slow down!

REMINDER TO PILOTS: Always get to know a new aircraft you plan to fly before taking the controls (this applies to any aircraft). A thorough condition inspection of the aircraft is essential; learn the operating limitations from the POH (and respect them); and get properly checked out to be familiar with the aircraft's handling qualities.

OPERATING LIMITS AFTER UPGRADE IS COMPLETE:

1. The aircraft **MUST** comply with all Safety Directives issued by AMD except for operating limitations of July 08, 2009 .
2. The aircraft **MUST** have a current Weight and Balance, and should be within limits.
3. Aircraft VNE to be as per POH of November 2009
4. Gross weight, baggage and passenger limits to be as per POH of November 2009
5. Your POH and an instrument placard **MUST** reflect POH marking of November 2009.
6. Use applicable sections of Appendix 1 in the Service Manual of November 2009 to calibrate your ASI.
7. Use November 2009 POH only after the aircraft has been signed off by a certified mechanic, clearly stating that the aircraft complies with this Safety Alert.

Reminder
AMD reminds the Owner/Operator of AMD aircraft that compliance with all Safety Directives, Aircraft Operating Instructions, Maintenance Manuals as well as the reporting of any and all Safety of Flight or Service Difficulties by the Owner/Operator is *mandatory* for the operation of an SLSA aircraft.

- AMD Safety Alerts, Service Bulletins and Notices can be viewed and downloaded at:
http://www.newplane.com/amd/CH2000_Service.html
- UK LAA aileron balance can be downloaded from:
http://www.lightaircraftassociation.co.uk/engineering/engineering_updates.html