U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

JUL 13 2009

The Honorable Mark V. Rosenker
Acting Chairman, National Transportation
Safety Board
490 L'Enfant Plaza East, SW.
Washington, DC 20594

Dear Acting Chairman Rosenker:

This is in response to Safety Recommendations A-09-30 through -37 issued by the Board on April 14, 2009. These safety recommendations were issued as a result of the Safety Board's investigation of a series of in-flight structural breakups of Zodiac CH-601XL airplanes designed by Zenair, Inc., that occurred in the United States in the last 3 years. The Safety Board is also aware of several in-flight structural breakups of CH-601XLs that have occurred abroad. It appears that aerodynamic flutter is the likely source of four of the U.S. accidents and of at least two foreign accidents.

The Federal Aviation Administration chartered a special review team to investigate the details of each recommendation. The team consists of FAA specialists from flight test, engineering, manufacturing, and accident investigation. The special review team will analyze the Zodiac CH-601XL and its derivatives. A design review for each version may suggest further FAA action. These responses should be considered interim until the final report from the special review team is issued and follow on actions are completed.

A-09-30. Prohibit further flight of the Zodiac CH-601XL, both special light sport aircraft and experimental, until such time that the Federal Aviation Administration determines that the CH-601XL has adequate protection from flutter.

FAA Comment. There are four variants of the Zodiac CH-601XL: 1) a special category light sport aircraft (S-LSA) version; 2) an experimental LSA (E-LSA) version; 3) a European micro-light version; and 4) an experimental amateur-built version. The Safety Board's recommendation seems to treat the derivatives of the Zodiac CH-601XL the same. The Board mentions two specific versions: 1) S-LSA and 2) the experimental amateur-built. Data indicates the CH-601XL has a safety record similar to other S-LSA and appears capable of safe flight and operation if maintained according to the manufacturer's recommendations. At this time, the FAA lacks adequate justification to take immediate certificate action to ground the entire fleet.

The FAA chartered special review team continues to aggressively investigate and study the structural design and flutter characteristics of the Zodiac CH-601XL and its existing variants. The special review team will complete an assessment of the design and determine a proper course of action. The team will review manufacturing (build records for amateur-built) and maintenance records, where available, for each of the accident aircraft and will gather pertinent information from other civil authorities as part of their investigation. In addition to the versions mentioned by the Board, the special review team will also include E-LSA in the study.

If the special review team identifies an inherent design issue, the FAA will take appropriate action based on these findings.

A-09-31. Require a comprehensive evaluation of the wing and aileron system on the Zodiac CH-601XL, including ground vibration tests, to identify design and/or operational changes that will reduce the potential for flutter; the evaluation should give significant consideration to the benefits of installing mass-balanced ailerons and should also address the adequacy of the cable tension values provided by Zenair.

FAA Comment. The FAA agrees to conduct an evaluation of the wing and aileron system on the Zodiac CH-601XL. The special review team will examine the structural design and flutter characteristics on all versions of the Zodiac CH-601XL. If the team discovers any inherent design deficiencies, the FAA will decide on an appropriate course of action.

A-09-32. Notify owners of Zodiac CH-601XLs, both special light sport aircraft and experimental, of the design and/or operational changes to the CH-601XL that are identified as necessary following the evaluation recommended in safety recommendation A-09-31 and require the owners of CH-601XL to implement those changes.

FAA Comment. The FAA agrees to communicate the findings of the special review team, including any recommended design and operational changes, to CH-601XL owners in our final report. For S-LSA, the manufacturer would communicate these recommendations through a safety directive, as required by the ASTM process. This would become a mandatory action for the owner/operator. For the experimental amateur-built airplanes, if the team discovers any inherent design deficiencies the FAA will decide on an appropriate course of action.

A-09-33. Work with ASTM International to incorporate additional requirements into the standards for light sport airplanes that provide for additional flutter mitigation strategies.

FAA Comment. In April 2009, the FAA made a recommendation to the ASTM F37 Light Sport Aircraft Committee to review the airplane standard (F2245) for flutter requirements. We encouraged the committee to consider adding information to clarify proper design and test techniques for flutter prevention. We will keep the Board informed on the progress of these recommended changes.

A-09-34. Evaluate the stick-force gradient of the Zodiac CH-601XL at the maximum aft center of gravity and notify pilots of the stick-force gradient that occurs at the aft center of gravity, especially at the higher G forces.

FAA Comment. The Zodiac pilot community is aware of the light stick forces associated with the CH-601XL design. However, we are not aware of any specific variation in stick force gradient with center of gravity location that would be cause for concern. If a design characteristic is identified as a potential safety issue during our review, we will decide on the appropriate action.

The special review team plans to flight test the S-LSA version of the CH-601XL and collect data from the manufacturer on its derivatives. We will use this data to compare stick force gradients and general controllability characteristics between the designs. The review team does not plan to test gradients at the extremes of the flight envelope as such flight tests are the responsibility of the manufacturer. The special review team will collect characteristic stick force gradients for mid center of gravity configurations, with spot checks to evaluate changes due to center of gravity location or high G forces.

The S-LSA manufacturer is evaluating a change to introduce friction into the control system to address light control forces. The special review team will validate the manufacturer's data on stick forces and consider recommendations to the ASTM F37 for additional standards.

If any safety issues are discovered regarding stick-force gradients for S-LSA, the manufacturer and owner/operator would follow the safety directive process. For the experimental amateur-built airplanes, if the team discovers any inherent design deficiencies, we will decide on an appropriate course of action.

A-09-35. Work with ASTM International to develop requirements to be included in the standards for light sport airplanes that provide stick-force characteristics that will minimize the possibility of pilot's inadvertently over-controlling the airplane.

FAA Comment. The FAA recognizes that the ASTM standards could be more prescriptive regarding stick force and controllability. The ASTM standards contain limits for maximum control forces but do not address minimum force gradients. Incidents involving over-control appear to happen more frequently for pilots trained on less responsive airplanes. This could be an indication of a training issue. Many LSA aircraft are designed with light control forces to provide better low speed controllability on landing. If the FAA special review team determines that additional standards are necessary, we will make recommendations to the ASTM F37 committee.

A-09-36. Determine the correct airspeed correlation between calibrated airspeed and indicated airspeed for the CH-601XL, require that the corrected data be included in existing and new airplane pilot operating handbooks (POHs), and ensure that the information on the airspeed indicator is accurate and consistent with the POHs.

FAA Comment. The FAA is working with the manufacturer to address concerns for the CH-601XL. We are also coordinating with the ASTM F37 committee to clarify the standards for airspeed calibration. The ASTM standards were purposefully simplistic in their airspeed calibration methodologies, since most airplanes in LSA have very simple airspeed measuring systems and speed ranges where static source error corrections are minimal. These simple systems often have little to no difference between their calibrated and indicated airspeed.

We plan to analyze this issue and make recommendations for a proper course of action in the special review final report for the CH-601XL. If specific safety issues are identified, the manufacturer and owner/operator would follow the safety directive process. For experimental amateur-built airplanes, if the team discovers any inherent design deficiencies the FAA will decide on an appropriate course of action.

A-09-37. Work with ASTM International to incorporate additional requirements into the standards for light sport airplanes that provide for the accurate determination of airspeed data and for the adequate presentation of that data in existing and new airplane pilot operating handbooks and on airspeed indicators.

FAA Comment. The FAA has been conducting a review of LSA manufacturers under an effort called the LSA Manufacturer Assessment Program. From those efforts, it is evident some manufacturers may be confused with regard to proper airspeed calibration requirements and how airspeed limitations should be documented in the POH. We will work with the ASTM F37 committee to address this issue.

I will keep the Board informed of the FAA's progress on these safety recommendations and will provide a further response by March 31, 2010.

Sincerely,

J. Randolph Babbitt
Administrator