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**Federal Aviation
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InFO

Information for Operators

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http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info

An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements with relatively low urgency or impact on safety.

Subject: Safety concerns of amateur-built experimental Lancair and other amateur built airplanes possessing high wing loading and stall speeds in excess of 61 knots

Purpose: To alert owners/operators and pilots about a Federal Aviation Administration (FAA) operational safety concern regarding amateur-built airplanes operating under an experimental airworthiness certificate and possessing high wing loading with stall speeds in excess of 61 knots.

Background: FAA analysis of fatal accidents for airplanes operating under an experimental airworthiness certificates, such as the Lancair, has revealed a large and disproportionate number of fatal accidents for their fleet size. Though the FAA has seen a recent downward trend, these aircraft types have experienced fatal accident rates substantially higher than for-personal-use general aviation and the overall fatal accident rate for all amateur-built experimental aircraft. The FAA believes that this is mainly due to the pilot's lack of awareness of the slow-flight and stall characteristics of these type of high performance aircraft. Also, the nature of amateur-built aircraft means that each amateur-built aircraft may have unique flight handling characteristics.

Discussion: Over the past few years a number of fatal accidents occurred in these types of aircraft. A majority of the fatal accidents occurred due to inadvertent stall/spins while at slower airspeeds in home airport traffic patterns.

Amateur built experimental aircraft are not required to be type certificated in accordance with Title 14 of the Code of Federal Regulations (14 CFR) part 23 – Airworthiness Standards: Normal, Utility, Acrobatic, and Commuter Category Airplanes. Stability, handling, and stall characteristics for the amateur-built experimental airplanes are different from general aviation airplanes that are type certificated under part 23. In addition to not meeting the part 23 certifications standards, aircraft such as the Lancair are high-performance, hand-made (non-production) aircraft. Each individual amateur built experimental aircraft possessing high wing loading and stall speeds in excess of 61 knots can have unique handling, stability, and stall characteristics. These design characteristics, while allowing for higher operational speeds, can expose pilots to additional risk during slow-speed operations while close to the ground and with little time to recover from an unintentional stall. Understanding these differences is critical for safe operation of such aircraft.

Recommended Action: The FAA recommends that pilots operating the amateur built experimental aircraft, such as the Lancair amateur-built experimental airplanes do the following-

1. Review and thoroughly understand all available information regarding the slow-flight and stall characteristics of their own Lancair prior to attempting to duplicate these maneuvers. In addition, obtain specialized training from a Lancair recommended flight instructor who has had adequate training in the

Lancair model or other similar high-performance airplanes to experience slow flight handling characteristics, stall recognition, and stall recovery techniques.

2 Install an angle-of-attack (AOA) indicator and/or a stall warning indicator to provide warning of an impending stall. Owners that already have an AOA and/or a stall warning indicator installed should have the calibration validated to assure proper operation. Amateur built experimental aircraft can possess flight characteristics, including stall speeds, which can vary from airplane to airplane. (Note: indicated airspeeds can be as much as 10-20% off if the pitot tube is not in the proper location, or if not properly calibrated and verified).

3 Amateur built experimental aircraft possessing high wing loading and stall speeds in excess of 61 knots, such as the Lancair, should have their aircraft evaluated by a mechanic with sufficient builders and maintenance experience to verify proper rigging, wing alignment, and weight and balance. Lancair airplane builders should use the services of experienced and qualified construction evaluators who are familiar with the Lancair and/or other similar aircraft construction, rigging, flight, and handling characteristics.

4 Owners of amateur built experimental aircraft possessing high wing loading and stall speeds might wish to have their aircraft evaluated by a qualified test pilot to determine the aircrafts handling characteristics prior to adding any suggested aerodynamic improvement and where appropriate, have items such as leading edge wing cuffs and/or strakes installed and then tested, by a qualified test pilot to verify improvements to the aircraft's handling characteristics and or reduction in stall speed before permanent attachment.

Contact: Any question regarding this InFO should be directed to the Flight Standards Service, General Aviation and Commercial Division, Certification and General Aviation Operations Branch, AFS-810, telephone 202-267-8212.