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622-A050025-1
825-A05W0148

14 December 2005

Mr. Merlin Preuss
Director General, Civil Aviation
Transport Canada
330 Sparks Street
Place de Ville
Tower C, 5th Floor, Area A
Ottawa, Ontario
K1A 0N8

Re: AVIATION SAFETY INFORMATION LETTER A050025-1 (A05W0148)
Procedures in the Event of In-flight Engine Fire in Single Engine Aircraft

Dear Mr Preuss,

On 20 July 2005, an amateur built VariEze, registration N914VE, departed runway 12 at the Lethbridge airport on a visual flight rules (VFR) flight to Airdrie, Alberta. When the aircraft was outbound on the downwind leg for runway 12, it was observed to be trailing smoke. Immediately thereafter, the pilot advised the Lethbridge Flight Service Station (FSS) that the aircraft was on fire, and attempted to force-land the aircraft in a grain field approximately five-eighths of a mile to the northwest of the airport. After touchdown the aircraft nosed over, struck the shoulder of a gravel road, and came to rest inverted on the road. An intense post-impact fire ensued and the sole pilot occupant, was fatally injured. (TSB Class 5 occurrence A05W0148 refers.)

The aircraft had been recently modified with the installation of a turbocharged, liquid-cooled Rotax 914 UL-2 pusher engine (sn V9144874) which replaced the original Lycoming O-235 engine. This was reportedly the only VariEze currently flying with this engine configuration. Post-impact examination of the airframe and engine indicated the aircraft had sustained an intense, in-flight engine fire. This was consistent with witness observations. While the exact cause of the fire was not determined, the short duration of the flight and degree of in-flight fire damage to the engine and cowlings indicated the fire was fuel-fed from within the engine compartment.

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Fuel was supplied to the engine through two electric boost pumps (one main pump and one auxiliary pump) and a fuel selector. The electric fuel pumps were capable of pumping fuel at rates in excess of 30 US gallons per hour. Wreckage examination determined that the fuel selector handle was in the vertical position, which indicated it was selected to the auxiliary fuselage tank, and the fuel boost pump switches and magneto switches were in the ON positions at impact.

The standard emergency procedure in the event of an in-flight engine fire in a single engine aircraft includes placing the fuel selector and boost pump switches in the OFF positions, placing the magneto switches in the OFF positions, and performing an engine out landing in the most suitable available area. If the fire does not extinguish quickly, a pilot may dive the aircraft in an effort to find an airspeed that will provide an incombustible fuel / air mixture. The *VariEze Owner's Manual* states that in the event of an in-flight fire, "determine the cause: if electrical, all electrical power off; if fuel, fuel off and electrical power off. Execute a precautionary landing as soon as possible."

The accident occurred within approximately three minutes of take-off. The fire appeared to have burned with increasing intensity from the time the aircraft was first observed to be trailing smoke to the time of impact. While the pilot was able to maintain control of the aircraft up to the point of touchdown in the grain field, there was no evidence that he had taken the immediate actions necessary to stem the flow of fuel to the engine. Allowing fuel to continue to pressure feed into the engine bay significantly increased the intensity of the fire and likely precluded any possibility of self-extinguishment.

Although generally rare events, in-flight engine fires are serious and time-critical emergencies. In this occurrence, non-actioning of the emergency procedures necessary to stem the flow of pressure-fed fuel to the engine may have contributed to the severity of the accident. Vital immediate actions, including selecting the fuel boost pumps, fuel selector and magneto switches to the off positions, are necessary to reduce the intensity of or extinguish an in-flight engine fire as soon as possible. Pilots must be familiar with the procedures to handle uncommon but critical in-flight emergencies such as engine fires, and must respond accordingly in order to reduce the risk of structural failure, post-impact fire damage, or loss of control and destruction of an aircraft with related occupant injuries or fatalities.

The foregoing is provided for whatever follow-up action is deemed appropriate.

Yours sincerely,

*Original signed by Nick Stoss
December 14, 2005*

Nick Stoss
Director, Air Investigations

cc: Tom Poberezny, President, EAA Aviation Center
Steven B. Wallace, Director, Office of Accident Investigation, Federal Aviation Administration
Judy Rutherford, Director, System Safety, TC

BACKGROUND INFORMATION

Occurrence No.: A05W0148

Safety Communication No.: A050025

TSB contact: Bill Kemp
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The following TSB Engineering Branch report was completed:

LP 087/2005 - Fuel Pressure Regulator Fitting