



# National Transportation Safety Board Aviation Accident Data Summary

<b>Location:</b>	Boise, ID	<b>Accident Number:</b>	WPR12FA089
<b>Date &amp; Time:</b>	02/03/2012, 0856 MST	<b>Registration:</b>	N321LC
<b>Aircraft:</b>	GARZA LANCAIR IV-TP	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

## Analysis

The amateur-built, experimental, high-performance airplane was fueled to capacity and the pilot had planned a cross-country flight. During an initial takeoff, the airplane climbed to about 60 feet above ground level (agl) before touching back down; the pilot transmitted to the air traffic controller that he had a problem. The controller asked if the pilot needed any assistance, and the pilot responded that he was going to taxi back and "see if I can figure it out," indicating that there was not a catastrophic failure and the pilot was intending to troubleshoot the problem. The pilot then taxied to a ramp area where the airplane was stationary for almost a minute and a half. Although the pilot's actions during this period are not known, it is likely that he was attempting to troubleshoot a problem with the airplane because the recorded engine parameters are consistent with the pilot cycling the propeller. Thereafter, the pilot stated his intention to stay in the traffic pattern, and he taxied the airplane back to the runway. The airplane became airborne about 18 seconds into the takeoff; the pilot then made a request to turn back to land. The airplane turned to the left and continued to climb until it reached its peak altitude of about 320 feet agl. Witnesses indicated that the airplane then entered a spin, completed about one revolution, and impacted terrain in a nose-low attitude before coming to rest in a dirt area between the parallel runways. A fire started upon impact.

At the peak of the airborne portion of the first rejected takeoff, about 5,860 feet of runway remained. When the pilot made the request to turn back to land during the second takeoff, over 5,160 feet of runway remained, but because the airplane was 260 feet higher and had a higher airspeed than previously, the pilot likely thought he would not be able to land on the runway surface straight ahead. A performance study indicated that the airplane experienced a loss of thrust during the accident takeoff about 1 second before the pilot's request to return.

Postaccident examination revealed no evidence of a preimpact uncontained engine failure, inflight fire, or flight control system malfunction. Fuel system continuity could not be confirmed due to thermal damage incurred during the postcrash fire. Review of the engine parameters revealed that, during the accident takeoff, the greatest anomaly in the airplane's parameters was that the fuel pressure dropped to a minimum psi while the fuel flow increased and the torque delivered to the engine shaft (Q) increased excessively. Shortly thereafter, fuel pressure recovered when the fuel flow reduced and Q retarded to an idle setting. Q also dropped to an idle setting during the previous takeoff. The reason for these variations could not be explained. In comparing prior flights to the accident flight, the maximum Q attained during takeoff climb was lower than the Q for the accident takeoff, and the fuel pressure did not drop to the same level as during the accident flight, which are indicative of a problem with the airplane.

The airplane was equipped with a Turbine Starter Limiting/Monitoring System, capable of limiting power by restricting fuel flow, which was designed to act as a start sequence controller, an engine protection limiter, and an engine monitor/recorder. It is possible that this system/installation malfunctioned and engaged during the accident takeoff; however, the system was destroyed in the postcrash fire and could not be examined. Consequently, no determination regarding its performance during the accident flight is possible.

The data showed that the pilot's most recent flight in the airplane was 6 days before the accident, at the same airport. During that flight, he also performed an initial rejected takeoff, suggesting that he was possibly having problems at that time; he made a successful flight thereafter, but remained in the traffic pattern.

A simulation of the accident flight indicated that, during the airplane's left turn, the angle of attack at which the wing stalls was exceeded. A former engineer and general manager of the kit manufacturer stated that if the engine failed during takeoff, the airspeed would rapidly decay, and the pilot would have to push the nose down to maintain flying speed. He noted that following a loss of power, the nose would remain in a nose-up attitude, and unless the pilot made corrective pitch inputs (reducing the angle of attack) within about 4 to 5 seconds, the airplane would rapidly reach a critical angle of attack and stall, which would result in the wing simultaneously dropping. It would not be possible to recover from the stall at altitudes below 1,500 ft agl.

Based on the results of the simulation for the accident flight, witness statements, statements from a former employee of the kit manufacturer, it is likely that pilot was attempting to return to a runway (either the takeoff runway or the parallel runway). The pilot did not push the nose down to maintain flying speed and stalled the airplane well below 1,500 ft agl, and the airplane was spinning when it impacted the ground. Although beyond the end of the takeoff runway was flat, unpopulated hard-dirt surface, suitable for a straight-ahead emergency landing, it is unknown why they pilot chose to return to the airport rather than lower the nose and land there.

Twenty-six percent of Lancair airplanes have been involved in accidents, and 19 percent have been involved in fatal accidents. In 2008 and 2012, the FAA convened two safety groups specifically to address the airplane's "unusually high accident and fatality rate compared to other amateur-built aircraft." The study noted that based on the statistics, the kit was involved in fatal accidents at "a rate that is disproportionate to their fleet size." As a result of studies developed by these safety groups, the FAA acknowledged that accidents would continue to occur if no action was taken. Thus, the FAA issued a notice that Lancair pilots should "review and thoroughly understand all information regarding stall characteristics and obtain specialized training regarding slow flight handling characteristics, stall recognition, and stall recovery techniques;" install an angle-of-attack indicator to better predict a stall; and have their airplane evaluated by an experienced type-specific mechanic to ensure proper rigging, wing alignment, and weight and balance. The notice was recalled shortly after its release and another notice was released later to include other high-performance experimental amateur-built aircraft.

When asked about what he disliked about the flight characteristics of the airplane, the pilot had told a technician who refueled the airplane that it was "squirrely." According to the FAA, depending on the complexity of the systems installed, pilots likely will require orientation and specially-tailored training to operate this airplane safely. Although the pilot was properly certificated in accordance with existing Federal Aviation Regulations and his estimated flight experience in the airplane was 13 hours 40 minutes, no evidence was found indicating that the pilot had received flight instruction in the accident airplane model, even though he was aware that insurance companies required him to do so in order to receive coverage.

## **Flight Events**

Initial climb - Aerodynamic stall/spin

## **Probable Cause**

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss or commanded reduction of engine power during the initial climb for reasons that could not be determined because of postaccident impact damage and fire destruction to engine systems and

components. Also causal were the pilot's failure to maintain adequate airspeed and airplane control while attempting to return to the runway despite unpopulated, flat terrain immediately ahead that was suitable for an emergency landing; his decision to take off again with a known problem; and his lack of training in the make and model airplane.

## Findings

Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Airspeed-Not attained/maintained - C

Personnel issues-Action/decision-Info processing/decision-Decision making/judgment-Pilot - C

Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C

Personnel issues-Experience/knowledge-Training-Training with equipment-Pilot - C

Organizational issues-Support/oversight/monitoring-Safety programs-Adequacy of safety program-FAA/Regulator

Not determined-Not determined-(general)-(general)-Unknown/Not determined - C

## Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	51
<b>Airplane Rating(s):</b>	Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea	<b>Instrument Rating(s):</b>	Airplane
<b>Other Aircraft Rating(s):</b>	None	<b>Instructor Rating(s):</b>	None
<b>Flight Time:</b>	3600 hours (Total, all aircraft), 13 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Manufacturer:</b>	GARZA	<b>Registration:</b>	N321LC
<b>Model/Series:</b>	LANCAIR IV-TP	<b>Engines:</b>	1 Turbo Prop
<b>Operator:</b>	On file	<b>Engine Manufacturer:</b>	Diemech Turbine
<b>Air Carrier Operating Certificate:</b>	None	<b>Engine Model/Series:</b>	M601D
<b>Flight Conducted Under:</b>	Part 91: General Aviation - Personal		

## Meteorological Information and Flight Plan

<b>Observation Facility, Elevation:</b>	BOI, 2871 ft msl	<b>Weather Information Source:</b>	Weather Observation Facility
<b>Conditions at Accident Site:</b>	Visual Conditions	<b>Lowest Ceiling:</b>	None
<b>Condition of Light:</b>	Day	<b>Wind Speed/Gusts, Direction:</b>	7 knots, 130°
<b>Temperature:</b>	-2° C / -7° C	<b>Visibility</b>	10 Miles
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Boise, ID (BOI)	<b>Destination:</b>	Boise, ID (BOI)

## Airport Information

<b>Airport:</b>	Gowen Field (BOI)	<b>Runway Surface Type:</b>	Asphalt
<b>Runway Used:</b>	10R	<b>Runway Surface Condition:</b>	Dry
<b>Runway Length/Width:</b>	9763 ft / 150 ft		

## Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None

## Administrative Information

Investigator In Charge (IIC):	Zoe Keliher	Adopted Date:	09/08/2014
Investigation Docket:	<a href="http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=82809">http://dms.nts.gov/pubdms/search/dockList.cfm?mKey=82809</a>		

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