Aviation Investigation Final Report

Location:	Findlay, Ohio	**Accident Number:**	CEN14FA389
Date & Time:	July 27, 2014, 01:10 Local	**Registration:**	N40941
Aircraft:	FEDERSEN WALTER LANCAIR IVP	**Aircraft Damage:**	Destroyed
Defining Event:	Fire/smoke (non-impact)	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot was conducting a personal cross-country flight in the experimental, amateur-built airplane. Radar track data of the accident flight showed the airplane descending from cruise altitude en route to the destination airport. An approach controller provided the pilot radar vectors to the final approach course at the destination airport and then cleared the flight for an RNAV GPS approach. The pilot complied with all of the controller's instructions up to this point, and he did not inform the controller of any anomalies with the flight. Shortly after the pilot was cleared for the approach, radar contact and radio communications were lost. Two witnesses reported observing the airplane shortly before the accident. One witness reported that the airplane appeared to be intact but on fire; he was unsure of the fire's location. A second witness reported that the airplane appeared to be wings level and descending slightly when he initially saw it and that there appeared to be a fire near the rear of the airplane. The airplane subsequently descended and impacted a residential yard. The airplane was severely fragmented during the impact sequence and consumed by fire.

A postaccident examination of the airplane wreckage revealed no evidence of any preimpact mechanical failures or malfunctions. The extent of the damage caused by the impact forces and fire precluded a determination of the source of the in-flight fire.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

An in-flight fire for reasons that could not be determined due to the extent of impact and fire damage.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

Approach-IFR initial approach	Fire/smoke (non-impact) (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT
On July 27, 2014, about 0110 eastern daylight time, an experimental, amateur-built Federsen Lancair IVP airplane, N40941, was destroyed during an in-flight collision with terrain near Findlay, Ohio. The pilot and passenger were fatally injured. The airplane was registered to and operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Night visual meteorological conditions prevailed for the flight, which was operated on an instrument flight rules (IFR) flight plan. The flight originated from the West Michigan Regional Airport (BIV), Holland, Michigan, about 0036. The intended destination was the Bluffton Airport (5G7), Bluffton, Ohio.

The pilot contacted the Washington Contracted Flight Service Station (FCFSS) at 2352 (June 26th), about 40 minutes before the accident flight. He requested an abbreviated weather briefing from BIV to 5G7 and filed an IFR flight plan. At 0039, the pilot contacted the Chicago Air Route Traffic Control Center (ARTCC) after departure from BIV and requested an IFR clearance to 5G7. Radar contact was established and the pilot was cleared direct to the destination airport at 15,000 ft mean sea level (msl). At 0048, control of the flight was transferred to Cleveland ARTCC. At 0101, the pilot requested a lower altitude and the controller instructed the pilot to descend and maintain 11,000 ft msl.

At 0102, control of the flight was transferred to Toledo Terminal Radar Approach Control (TRACON). The approach controller instructed the pilot to continue the descent to 4,000 ft msl, and then to 3,000 ft msl. The controller also provided the pilot with radar vectors to the final approach course. At 0109, the pilot was cleared to proceed direct to CUDOD, the initial approach navigation fix, and cleared for the Area Navigation (RNAV) Global Positioning System (GPS) Runway 23 approach into 5G7. The pilot acknowledged. At 0110, the controller received a low altitude alert related to the accident airplane. He subsequently attempted to contact the pilot without success. No further communications were received from the pilot.

Federal Aviation Administration (FAA) air traffic control (ATC) radar track data depicted the airplane descending from 15,000 ft msl as it approached 5G7 from the northwest. About 0105, the airplane proceeded on an easterly course as it continued the assigned descent through 10,000 ft msl. About 0109, the airplane began a right turn toward the initial approach fix passing through 4,000 ft msl. The final radar data point was recorded at 0110:08 (hhmm:ss), with an associated mode-C altitude of 3,000 ft msl. That data point was located about 0.62 miles west-northwest of the accident site. The accident site was located about 18 miles northeast of runway 23 at 5G7.

A witness located on Highway 18, south of the accident site, reported observing the airplane on an east-southeasterly course. The airplane appeared to be intact; however, it also appeared to be on fire. He was

unsure of exactly where the fire was located on the airplane. The airplane subsequently descended "straight down" and impacted the ground.

A second witness reported observing the airplane on a northeasterly course over County Road 18. He estimated the airplane's altitude as about 600 ft above ground level. It appeared to be wings level and descending slightly when he initially saw it. There appeared to be a fire near the rear of the airplane. It subsequently descended behind a line of trees before the "sky lit up."

PERSONNEL INFORMATION

The pilot, age 47, held a private pilot certificate with airplane single-engine land and instrument airplane ratings. He was issued a third-class airman medical certificate on July 16, 2014, with a restriction for corrective lenses.

The pilot's logbook was not available to the NTSB. On his application for the medical certificate, the pilot reported a total flight time of 1,654 hours, with 80 hours flown within the preceding 6 months. The pilot's flight experience in Lancair airplanes was not able to be determined.

AIRCRAFT INFORMATION

The accident airplane was a four-place, single-engine Federsen Lancair IVP, serial number 207. It was powered by a 350-horsepower Continental TSIO-550-E2B reciprocating engine with a Hartzell PHC-H3YF propeller assembly. The airplane was issued an experimental/amateur-built category, special airworthiness certificate on January 24, 2006. According to FAA records, the pilot purchased the accident airplane from the builder on February 27, 2008. Documentation provided to the NTSB indicated that the accident airplane subsequently underwent a complete restoration.

According to the airplane maintenance records, a condition inspection was completed on January 2, 2008, about the time of the airplane sale. The recording hour (Hobbs) meter and recording tachometer times were noted as 243.0 hours and 122.0 hours, respectively. The next maintenance logbook entry was dated May 4, 2011, and referenced the completion of a condition inspection. The Hobbs and tachometer times were noted as 296.0 hours and 134.0 hours, respectively. Subsequent condition inspections were dated May 14, 2012, and May 20, 2013, with Hobbs meter times of 430.2 hours and 533.0 hours, respectively.

A maintenance entry, dated May 14, 2014, stated: "Left wing removed for fuel bay repair. Re-install left wing and check fuel calibration. Check for fuel leaks. Touched up wing paint." The airframe time was noted as 615.0 hours.

The most recent annual condition inspection was completed on June 3, 2014. The airframe and engine total times were 615.0 hours at the time of that inspection. There were no subsequent entries in the maintenance records.

METEOROLOGICAL INFORMATION

At 0053, weather conditions recorded at the Findlay Airport (FDY), located about 6 miles southwest of the accident site, were: wind from 270 degrees at 10 knots; 5 miles visibility in mist; broken clouds at 1,300 ft above ground level (agl); overcast clouds at 2,000 ft agl; temperature 24 degrees Celsius; dew point 22 degrees Celsius; altimeter 29.83 inches of mercury.

At 0131, weather conditions at FDY were: wind from 290 degrees at 7 knots; 5 miles visibility in mist; scattered clouds at 1,500 ft agl; temperature 24 degrees Celsius; dew point 22 degrees Celsius; altimeter 29.82 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The airplane impacted a residential yard about 35 ft southeast of County Road 18, between County Road 215 and 216. The airplane was fragmented and a postimpact fire ensued. The main debris field extended to about 84 ft south of the main impact, which included the fuselage, engine, and propeller assembly. An area of burned vegetation about 110 ft by 220 ft in size was located approximately 150 ft southeast of the main impact crater. The elevation of the accident site was about 797 ft.

The main impact crater was about 4 ft wide by 3 ft deep. A linear ground impression consistent with being formed by a wing emanated north-northwest from the main impact crater. The main impact crater and ground impression contained debris consistent with fuselage and wing fragments. The entire fuselage was fragmented. A concentration of debris that included the engine, forward fuselage/cockpit, and nose landing gear was located about 22 ft south of the impact crater. An additional area of debris, about 10 ft long, extended to approximately 38 ft south of the main impact. This debris area included the right main landing gear. The propeller assembly had separated from the engine and was located about 38 ft south of the main impact. The left main landing gear and aft pressure bulkhead were located about 50 ft and 53 ft south of the main impact, respectively. Sections of the left and right inboard wing spars were located about 84 ft south of the main impact.

Portions of the flight control surfaces were observed within the debris field. Examination/reconstruction of the flight control system was hindered by the level of airframe fragmentation; however, the observed control system damage was consistent with the impact forces. The recording hour meter was dislocated from the instrument panel and was damaged. The meter indicated 661.5 hours when observed at the accident site. Damage to the remaining flight instruments precluded further examination.

The engine crankcase and cylinders sustained damage consistent with a direct impact to the terrain. The no. 6 cylinder, piston, and connecting rod had separated from the engine and were located with the remainder of the engine at the accident site. The forward portion of the crankshaft was separated from the remainder of the component and remained attached to the no. 6 cylinder connecting rod. The remaining cylinders remained attached to the crankcase, but exhibited damage consistent with impact forces. Borescope examination of the cylinders, pistons, and valve faces exhibited normal operating signatures. The oil pump housing was separated from the engine. The impellers were intact and the cavity exhibited scoring. The throttle body and fuel metering unit had separated from the engine.

Both magnetos had separated from the engine and were fragmented. The spark plugs and ignition harness exhibited damage consistent with impact forces. The no. 6 cylinder top spark plug center electrode was missing. The remaining spark plugs exhibited normal operating signatures. The fuel manifold valve was separated from the engine. The valve housing appeared intact; however, the fuel lines were deformed and/or separated. The valve cavity contained some dirt and debris. The diaphragm appeared intact, and the screen was clean and free of debris. The fuel pump had separated from the engine. The component housing exhibited damage consistent with impact forces and discoloration consistent with thermal exposure. The unit was disassembled; the pump cavity, sleeve, rotor, vanes, and pressure relief valve appeared to be intact.

The propeller assembly had separated from the engine crankshaft. The hub was fractured consistent with impact forces. The propeller dome had also separated from the hub. Each of the three propeller blades remained attached to the hub. One blade exhibited S-bending, with chordwise scratching. The second blade was bent aft approximately 90 degrees over the span of the blade. The blade also exhibited chordwise scratching, leading edge and trailing edge gouges, and separation of a portion of the blade tip. The third blade was bent aft about 45 degrees at the blade root. The blade exhibited chordwise scratching and leading edges gouges. In addition, the rudder counterweight was imbedded into the trailing edge of the blade.

MEDICAL AND PATHOLOGICAL INFORMATION
An autopsy of the pilot was performed by the Lucas County Coroner's Office on July 29, 2014. The pilot's death was attributed to blunt force trauma sustained as a result of the accident. Toxicology testing revealed the presence Tamoxifen in muscle and liver samples. In addition, 34 mg/dL ethanol was detected in muscle tissue. No ethanol was detected in liver tissue. A blood sample was not available for testing.

Toxicology testing of a cavity blood sample associated with the passenger was negative for carbon monoxide.

Pilot Information

Certificate:	Private	**Age:**	47,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	July 17, 2014
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	1654 hours (Total, all aircraft), 1 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	FEDERSEN WALTER	**Registration:**	N40941
Model/Series:	LANCAIR IVP	**Aircraft Category:**	Airplane
Year of Manufacture:	2006	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	207
Landing Gear Type:	Tricycle	**Seats:**	2
Date/Type of Last Inspection:	June 3, 2014 Condition	**Certified Max Gross Wt.:**	3200 lbs
Time Since Last Inspection:	46 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	661.5 Hrs at time of accident	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TSIO-550-E2B
Registered Owner:	On file	**Rated Power:**	350 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	FDY,813 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	00:53 Local	**Direction from Accident Site:**	210°
Lowest Cloud Condition:		**Visibility**	5 miles
Lowest Ceiling:	Broken / 1300 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.82 inches Hg	**Temperature/Dew Point:**	24°C / 22°C
Precipitation and Obscuration:	N/A - None - Mist		
Departure Point:	Holland, MI (BIV)	**Type of Flight Plan Filed:**	IFR
Destination:	Bluffton, OH (5G7)	**Type of Clearance:**	IFR
Departure Time:	00:36 Local	**Type of Airspace:**	

Airport Information

Airport:	Bluffton 5G7	**Runway Surface Type:**	Asphalt
Airport Elevation:	851 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	23	**IFR Approach:**	Global positioning system
Runway Length/Width:	4126 ft / 75 ft	**VFR Approach/Landing:**	Full stop

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	Both in-flight and on-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	2 Fatal	**Latitude, Longitude:**	41.040611,-83.639495(est)

Administrative Information

Investigator In Charge (IIC):	Sorensen, Timothy
Additional Participating Persons:	John Welsh; FAA Flight Standards; Columbus, OH Kurt Gibson; Continental Motors, Inc.; Mobile, AL
Original Publish Date:	May 2, 2016
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89745