National Transportation Safety Board
Aviation Accident Final Report

Location:	Louisa, Virginia	**Accident Number:**	ERA10FA161
Date & Time:	March 4, 2010, 12:45 Local	**Registration:**	N9305T
Aircraft:	Cessna T303	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control in flight	**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

During takeoff, one witness noted that at least one engine seemed to be running rough and not making power. Several other witnesses, located about 1/2 mile northwest of the airport, observed the accident airplane pass overhead in a right turn. They reported that the engine noise did not sound normal. Two of the witnesses noted grayish black smoke emanating from the airplane. The airplane then rolled left and descended nose down into the front yard of a residence. Review of maintenance records revealed the airplane underwent an annual inspection and extensive maintenance about 3 months prior to the accident. One of the maintenance issues was to troubleshoot the right engine that was reportedly running rough at cruise. During the maintenance, the right engine fuel pump, metering valve, and fuel manifold were removed and replaced with overhauled units. Additionally, the right engine fuel flow was reset contrary to procedures contained in an engine manufacturer service information directive; however, the fuel pump could not be tested due to thermal damage and the investigation could not determine if the fuel flow setting procedure contributed to the loss of power on the right engine. On-scene examination of the wreckage and teardown examination of both engines did not reveal any preimpact mechanical malfunctions. Teardown examination of the right propeller revealed that the blades were not at or near the feather position, which was contrary to the emergency procedure published by the manufacturer, to secure the engine and feather the propeller in the event of an engine power loss. The right propeller exhibited signatures consistent with low or no power at impact, while the left propeller exhibited signatures consistent of being operated with power at impact.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's failure to maintain aircraft control and secure the right engine during a loss of engine power after takeoff. Contributing to the accident was the loss of engine power on the right engine for undetermined reasons.

Findings

Personnel issues	Aircraft control - Pilot
Personnel issues	Use of policy/procedure - Pilot
Not determined	(general) - Unknown/Not determined

Factual Information

HISTORY OF FLIGHT

On March 4, 2010, about 1245 eastern standard time, a Cessna T303, N9305T, owned and operated by a commercial pilot, was substantially damaged during impact with a residential area, following a loss of engine power during takeoff from Louisa County Airport (LKU), Louisa, Virginia. The certificated commercial pilot was killed. The personal flight was conducted under the provisions of 14 Code of Federal Regulations Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the planned flight to Danville Regional Airport (DAN), Danville, Virginia.

The airplane was based at Manassas Regional Airport (HEF), Manassas, Virginia. According to a witness at LKU, the pilot flew from HEF to LKU, and then fueled the airplane with 148.7 gallons of 100 low-lead aviation gasoline. The airplane subsequently departed on runway 27, a 4,300-foot-long, 100-foot-wide, asphalt runway. The witness, who was inside a fixed based operator building at the time of departure, became aware of the airplane as at least one engine "didn't sound right" and seemed to be "running rough and not making power." By the time the witness went to the rear door of the building, there was no sight of the airplane, and he thought the airplane had departed the area.

Several other witnesses, located about 1/2 mile northwest of the airport, observed the accident airplane pass overhead in a right turn. They reported that the engine noise did not sound normal. Two of the witnesses noted grayish black smoke emanating from the airplane. One witness stated that the smoke was coming from the right engine and the other witness stated that it seemed to be coming from the tail section. The airplane then rolled left and descended nose down into the front yard of a residence. A postcrash fire consumed a majority of the wreckage and the residence. One person was inside the residence at the time, and was able to exit without injury.

PERSONNEL INFORMATION

The pilot, age 62, held a commercial pilot certificate, with ratings for airplane single-engine land and instrument airplane. He also held a private pilot certificate, with a rating for airplane multiengine land. His most recent Federal Aviation Administration (FAA) second-class medical certificate was issued on April 14, 2008. At that time, the pilot reported a total flight experience of 2,193 hours. The pilot's logbook was located in the wreckage and had been partially consumed by fire. Review of the last legible logbook page revealed approximately 2,255 total hours of flight experience; however, no dates were legible on the page.

AIRCRAFT INFORMATION

The six-seat, low-wing, retractable-gear airplane, serial number T30300001, was manufactured in 1981. It was powered by two Teledyne Continental Motors TSIO 520-AE, 250-horsepower engines (one counter-rotating engine), equipped with McCauley propellers. Maintenance logbooks were located in the airplane, and had been partially consumed by fire.

Review of the logbooks revealed that the airplane's most recent annual inspection was completed on December 29, 2009. Review of a work order for that annual inspection revealed:

"Right engine EGT running high...Removed turbo air cleaner filter to see if there is binding turbo bearing. No faults found. Lubricated turbo waste gate. Further T.S. required. Removed and cleaned fuel injectors. Replaced all seals, ran aircraft, ops check good."

Further maintenance was performed on the airplane, from December 31, 2009, to January 27, 2010. Review of a work order for that maintenance revealed:

"Right engine rough at cruise...Inspected control for proper range of motion mixture and throttle go stop. Ran aircraft rh fuel pump erratic. Possible bad mechanical fuel pump. Trouble shot further re inspected injector and cleaned, inspected plugs, cleaned gapped and rotated, found bad plug replaced plug. Inspected fuel distributor and found small amount of debris cleaned debris. Resecured injection system test ran and engine no longer ran rough. TIT still high removed TIT gauge for inspection. Reinstalled adjusted and gauge test. Test ran TIT ok but fuel flow has problem...Adjusted FF by Shadin due to no gauges. Ran OK. Assembled gauges for FF check found FF out of limits. Unable to adjust proper FF, MP, spoke with FF REO for assistance. Removed fuel pump, divider and control to send out for check...Installed OVH fuel pump, metering valve and fuel manifold see yellow tags attached by D & G fuel system IAW SID 97-3E. Replaced #6 lower spark plug. Rigged fire shut off valve. Bench tested and adjusted TIT gauge. Performed operational check OPS OK...EGT gauge need calibration...Function check R/H probe. Indicator recalibrated. Checked to MFG specs."

Teledyne Continental Motors (TCM) Service Information Directive SID97-3E described procedures and specification for adjustment of continuous flow fuel systems. Review of SID97-3E, page 3, revealed:

"...WARNING...USE OF INACCURATE GAUGES WILL RESULT IN INCORRECT ADJUSTMENT OF THE FUEL SYSTEM, POSSIBLE CYLINDER WEAR DUE TO LEAN OPERATION, PRE-IGNITION, DETONATION, LOSS OF POWER AND SEVERE ENGINE DAMAGE..."

Page two of SID97-3E detailed the accurate gauges to be used and there was no reference that the airplane gauges could be used for a fuel system setup or inspection.

METEOROLOGICAL INFORMATION

The reported weather at LKU, at 1240, was: wind from 330 degrees at 10 knots, gusting to 14 knots; visibility 10 miles; sky clear; temperature 9 degrees Celsius; dew point -9 degrees Celsius; altimeter 29.83 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

All major components of the airplane were accounted for at the scene. No debris path was observed and no damage was noted to the surrounding trees or utility wires. The airplane came to rest in a flat, upright attitude, on a heading of 220 degrees magnetic. The cockpit and cabin

area were consumed by fire. The empennage, engines, and inboard section of the right wing remained intact.

Rudder, rudder trim, elevator, and elevator trim control continuity were confirmed from their respective cockpit controls to the control surfaces. Aileron control continuity was confirmed from the cockpit controls to the left and right aileron bellcranks, respectively. Measurement of the rudder trim actuator revealed an approximate neutral rudder trim position. Measurement of the elevator trim jacksrcrew revealed an approximate 15-degree tab up (nose down) position.

The airplane's landing gear was observed in the retracted position. Measurement of the flap jackscrew corresponded to a 10-degree flap extended position. The left and right fuel selectors were destroyed. Several flight instruments were recovered from the cockpit; however, they were unreadable due to fire damage.

The left propeller had separated from the left engine and was buried in mud. One blade had separated from the left propeller hub, while the other two blades remained attached. One of the attached propeller blades was curled rearward at the tip. The other two left propeller blades exhibited chordwise scratches and leading edge gouging. The right propeller remained attached to the right engine. One blade was melted about 1 foot from the hub. Another blade was melted about 18 inches from the hub and curled forward at the tip. The third right propeller blade was curled rearward at the tip. Both engines had separated from the airframe and sustained fire damage. A cursory examination of both engines did not reveal any evidence of catastrophic failure.

Both propellers underwent a teardown examination at the manufacturer's facility, under the supervision of an FAA inspector. The examinations revealed that both propellers exhibited impact damage, and neither exhibited any evidence of preimpact mechanical malfunction. Both propellers exhibited signatures consistent with rotation at impact. Neither propeller was at or near the feather position at impact. The right propeller exhibited signatures consistent with "low or no power" at impact, while the left propeller exhibited signatures consistent of "being operated with power" at impact.

Both engines underwent a teardown examination at the manufacturer's facility, under the supervision of an FAA inspector. Examination of the left engine did not reveal any abnormalities that would have prevented normal operation prior to impact.

Examination of the right engine did not reveal any abnormalities that would have prevented normal operation prior to impact; however, the right engine throttle and control assembly was not recovered from the accident site and presumed destroyed in the fire. As such, the fuel setup of the right engine could not be tested or verified.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the State of Virginia, Office of the Chief Medical Examiner, Richmond, Virginia, on March 5, 2010.

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research

Laboratory, Oklahoma City, Oklahoma. Review of the toxicology report revealed, "...0.8 (ug/ml) CYANIDE detected in blood...;" however, pilot's body was extensively burned.

TESTS AND RESEARCH

Review of an information manual for the make and model airplane revealed in part:

"...CONTINUED TAKEOFF WITH ENGINE OUT (SPEED ABOVE 80 KIAS)

1. Throttles -- FULL FORWARD.
2. Propeller Controls -- FULL FORWARD.
3. Mixture Controls -- FULL FORWARD.
4. Wing Flaps -- UP.
5. Landing Gear -- UP.
6. Inoperative Engine -- IDENTIFY.
7. Windmilling Propeller -- FEATHER PROMPTLY.
8. Establish Bank – 5° TOWARD OPERATING ENGINE.
9. Airspeed -- 97 KIAS (93 KIAS with obstacles ahead)..."

History of Flight

Initial climb	Loss of engine power (partial)
Initial climb	Loss of control in flight (Defining event)
Uncontrolled descent	Collision with terr/obj (non-CFIT)

Pilot Information

Certificate:	Commercial; Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land; Multi-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 2 With waivers/limitations	**Last FAA Medical Exam:**	April 14, 2008
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	2255 hours (Total, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	**Registration:**	N9305T
Model/Series:	T303	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	T30300001
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	December 29, 2009 Annual	**Certified Max Gross Wt.:**	5175 lbs
Time Since Last Inspection:		**Engines:**	2 Reciprocating
Airframe Total Time:	1374 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-520-AE
Registered Owner:		**Rated Power:**	250 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LKU,493 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	12:40 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots / 14 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	330°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.82 inches Hg	**Temperature/Dew Point:**	9°C / -9°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Louisa, VA (LKU)	**Type of Flight Plan Filed:**	None
Destination:	Danville, VA (DAN)	**Type of Clearance:**	None
Departure Time:	12:45 Local	**Type of Airspace:**	

Airport Information

Airport:	Louisa County Airport LKU	**Runway Surface Type:**	Asphalt
Airport Elevation:	493 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	4300 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	1 Fatal	**Latitude, Longitude:**	38.014167,-77.987777

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Maury Dacey; FAA/FSDO; Richmond, VA Jason Lukasik; Teledyne Continental Motors; Mobile, AL Steve Miller; Cessna Aircraft Company; Wichita, KS Tom Knopp; McCauley Propeller Systems; Wichita, KS
Original Publish Date:	June 20, 2011
Note:	The NTSB traveled to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=75440

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available here.