Aviation Investigation Final Report

Location:	Baton Rouge, Louisiana	**Accident Number:**	CEN18LA221
Date & Time:	June 8, 2018, 16:05 Local	**Registration:**	N190RS
Aircraft:	Beech 58	**Aircraft Damage:**	Substantial
Defining Event:	Explosion (non-impact)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot reported that, during initial climb after takeoff, she heard a "loud bang" and saw flames coming from the trailing edge of the right wing. Subsequently, she was able to conduct an uneventful emergency landing.

The fire was located outboard of the right engine near the wingtip and auxiliary fuel tank. Black soot was visible near the right wingtip navigation and anticollision lights. Black soot and blue fuel stains were found near the fuel vents located on the bottom side of the wing under the right wingtip anticollision light. Blue fuel stains were also found under the right wing near the main and auxiliary fuel tanks and inside the wing cavity near the electrical wiring for the right wing navigation light. The examination of the right wing revealed that the wiring for the right wing anticollision light was crimped together with "handshake" connectors and then wrapped with electrical tape. The wiring was not properly insulated. The source of the fuel leak could not be determined due substantial damage to the right wing caused by the fire.

About 6 1/2 years before the accident, the airplane manufacturer issued a Safety Communique titled, "Outboard Wing Fire Potential Due to Fuel Leaks and Electrical Wire Chafing." The communique advised owners and operators of a potential safety issue concerning loose wiring and fuel fumes in the structural areas of the airplane. The communique reminded owners and operators to maintain the fuel and electrical systems in accordance with the maintenance manuals and to ensure there were no visible fuel leaks around the vents and sump drains. It further stated that no fuel leaks or staining should be observed around the vents and sump drains during preflight inspections.

Based on the postaccident examination, the fuel leak found on the bottom of the right wing might have been a preexisting condition; however, the pilot did not remember seeing any fuel staining during the preflight. The evidence further suggests that the initial ignition occurred behind the anticollision light in the right wingtip as a result of an improper repair, during which the anticollision light wiring was not

properly insulated, which resulted in the ignition of combustible fuel vapors in the outboard section of the right wing.

Probable Cause and Findings

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

The improper insulation of the anticollision light wiring, which resulted in the ignition of combustible fuel vapors in the outboard section of the right wing; the source of the fuel leak could not be determined due to fire damage.

Findings

Aircraft	Exterior lighting - Incorrect service/maintenance

Factual Information

History of Flight

Initial climb	Explosion (non-impact) (Defining event)
Initial climb	Fire/smoke (non-impact)
After landing	Aircraft structural failure
Landing	Off-field or emergency landing

****This report was modified on November 22, 2019. Please see the docket for this accident to view the original report.****

On June 8, 2018, about 1605 central daylight time, a Beech 58 airplane, N190RS, sustained substantial damage when the right wing caught on fire during initial climb from the Baton Rouge Metropolitan Airport (BTR), Baton Rouge, Louisiana. The pilot was not injured. The airplane was registered to Bonanza Partners LLC and operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Visual meteorological conditions prevailed at the time of the accident, and the flight had an activated instrument flight plan. The flight had departed BTR and was en route to the Jonesboro Municipal Airport (JBR), Jonesboro, Louisiana.

The pilot reported that during initial climb from runway 31, about 200 ft above ground level, she heard a loud bang from the right wing. She then saw the right wing was wrinkled between the engine nacelle and the wingtip and she thought that it might have been the result of a bird strike. She informed the tower controller that she had a bird strike and needed to land. The tower cleared her to enter the left downwind for landing. She started the turn to the left but then she saw flames coming out of the trailing edge of the right wing. She notified the tower that she had a wing fire and was turning back to make an emergency landing on runway 13. During the turn she shut off the right fuel selector, feathered the right propeller, and put the right engine fuel mixture to cutoff. After she landed on runway 13 and stopped the airplane, she "shut everything down" and exited the airplane while the wing was still on fire. The BTR fire department arrived soon after and extinguished the fire.

The location of the fire was outboard of the right engine near the wingtip and auxiliary fuel tank. The aluminum wing skin exhibited black charring, burn holes, popped rivets, and buckling on the top and bottom of the wing. Black soot was visible near the right wingtip navigation light and anti-collision light. Black soot and blue fuel stains were found near the fuel vents located on the bottom side of the wing under the right wingtip anti-collision light. Blue fuel stains were also found under the right wing near the main and auxiliary fuel tanks, and inside the wing cavity near the electrical wiring for the right wing navigation light. The examination of the right wing revealed that the wiring for the right wing anti-collision light was crimped together with "handshake" connectors and then wrapped with electrical tape. The source of the fuel leak could not be determined with any certainty due to the fire damage to the right wing.

A Hawker Beechcraft Safety Communique issued in December 2010 concerning the "Outboard Wing Fire Potential Due to Fuel Leaks and Electrical Wire Chaffing." The communique advised owners/operators of a potential safety issue concerning loose wiring and fuel fumes in the structural areas on Baron and Bonanza model airplanes. The communique reported cases of fire and/or ignition of combustible flammable fluid or vapors that occurred in the outboard wing of Baron model airplanes. Fire damage and skin buckling, skin rupture, and ballooning were noted on the outboard wings of the affected airplanes. The communique stated that it "strongly reminds all owners/operators of the importance of performing proper safety inspections and maintenance inspections on the fuel and electrical systems in accordance with the applicable maintenance manuals." It further stated that it "strongly reminds all owners/operators that no visible fuel leaks or staining should be observed around the vents and sump drains during preflight inspections."

The pilot reported that she did not think that she had flown the accident airplane before. She said that in preparation for the flight, she would have checked the airplane's maintenance records to determine that it was in an airworthy condition and that the required annual maintenance inspection had been completed. She stated that she does a thorough preflight, which would have included inspecting the bottom side of the wings. She stated that she did not remember seeing any blue staining under the right wing of the airplane during her preflight. She said that if she had seen any blue stains, then she would have considered how much staining was evident and the location of the stains. A large stain under the wing would have caused her to reject the flight until the maintenance issue was corrected. She stated that the airplane's fuel tanks were topped off and were full of fuel. She said that, during the taxi to the runway, she made a left turn from the taxiway onto the runway.

The airplane's maintenance logbook indicated that the last annual maintenance inspection was completed on October 3, 2017. The airplane had a total time of 5,941.1 hours at the time of the inspection. During the annual inspection, the right wing navigation bulb was replaced. A maintenance logbook entry made on June 6, 2018, two days before the accident, indicated that the airplane had 5,996.0 hours, 54.9 hours since the last annual maintenance inspection. The logbook entry indicated that the right wing landing light bulb had been replaced for a second time. An examination of the airplane's maintenance logbook did not reveal any logbook entries that gave a clear indication of when or what maintenance actions were required for the wiring modification behind the right wing anti-collision light.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	28,Female
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Instrument airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 Without waivers/limitations	**Last FAA Medical Exam:**	June 7, 2018
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	December 11, 2017
Flight Time:	1813 hours (Total, all aircraft), 60 hours (Total, this make and model), 1606 hours (Pilot In Command, all aircraft), 91 hours (Last 90 days, all aircraft), 44 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N190RS
Model/Series:	58	**Aircraft Category:**	Airplane
Year of Manufacture:	1977	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	TH-804
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	October 3, 2017 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	5941 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	as of last inspection	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	IO-520-C
Registered Owner:		**Rated Power:**	
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	BTR,69 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	15:53 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	280°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.04 inches Hg	**Temperature/Dew Point:**	31°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Baton Rouge, LA (BTR)	**Type of Flight Plan Filed:**	IFR
Destination:	Jonesboro, LA (JBR)	**Type of Clearance:**	VFR
Departure Time:	16:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Baton Rouge Metropolitan BTR	**Runway Surface Type:**	Asphalt
Airport Elevation:	69 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	31	**IFR Approach:**	None
Runway Length/Width:	7005 ft / 150 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	In-flight
Ground Injuries:	N/A	**Aircraft Explosion:**	In-flight
Total Injuries:	1 None	**Latitude, Longitude:**	30.533056,-91.150001

Administrative Information

Investigator In Charge (IIC):	Silliman, James
Additional Participating Persons:	Keenon Wood; FAA Baton Rouge FSDO; Baton Rouge, LA
Original Publish Date:	December 16, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=97445