



# Aviation Investigation Final Report

<b>Location:</b>	Loveland, Colorado	<b>Accident Number:</b>	CEN19FA143
<b>Date &amp; Time:</b>	May 15, 2019, 12:48 Local	<b>Registration:</b>	N60RK
<b>Aircraft:</b>	Beech 60	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	1 Fatal
<b>Flight Conducted Under:</b>	Part 91: General aviation - Ferry		

## Analysis

The commercial pilot was relocating the multiengine airplane following the completion of an extensive avionics upgrade, which also included the installation of new fuel flow transducers. As the pilot neared the destination airport, he reported over the common traffic advisory frequency that he had "an engine out [and] smoke in the cockpit." Witnesses observed and airport surveillance video showed fire emanating from the airplane's right wing. As the airplane turned towards the runway, it entered a right-rolling descent and impacted the ground near the airport's perimeter fence.

The right propeller was found feathered. Examination of the right engine revealed evidence of a fire aft of the engine-driven fuel pump. The fuel pump was discolored by the fire. The fire sleeves on both the fuel pump inlet and outlet hoses were burned away. The fuel outlet hose from the fuel pump to the flow transducer was found loose. The reason the hose was loose was not determined. It is likely that pressurized fuel sprayed from the fuel pump outlet hose and was ignited by the hot turbocharger, which resulted in the inflight fire.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: A loss of control due to an inflight right engine&nbsp;fire due to the loose&nbsp;fuel&nbsp;hose between the engine-driven fuel pump&nbsp;and the flow transducer.

## Findings

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<b>Aircraft</b>	(general) - Not attained/maintained
<b>Aircraft</b>	Fuel distribution - Failure
<b>Aircraft</b>	Fuel distribution - Not inspected
<b>Personnel issues</b>	Aircraft control - Pilot

## Factual Information

### History of Flight

<b>Approach-VFR pattern downwind</b>	Loss of engine power (total) (Defining event)
<b>Approach-VFR pattern downwind</b>	Fire/smoke (non-impact)
<b>Uncontrolled descent</b>	Collision with terr/obj (non-CFIT)

On May 15, 2019, at 1248 mountain daylight time, a Beech 60, N60RK, was destroyed when it collided with terrain during an emergency landing at Northern Colorado Regional Airport (FNL), Loveland, Colorado. The pilot was fatally injured. The airplane was registered to Majeste Air LLC, and was being operated as a Title 14 *Code of Federal Regulations* (CFR) Part 91 personal flight. Visual meteorological conditions existed at the accident site at the time of the accident, and no flight plan was filed for the flight which originated from Rocky Mountain Metropolitan Airport (BJC), Broomfield, Colorado, about 1230, was destined for FNL.

The airplane had been at BJC since July 2017 for the installation of new avionics which included a primary flight display (PFD); multi-function display (MFD); a backup to the electronic flight instrument system (EFIS); two navigation, communication, and GPS units, a transponder, audio panel, and associated wiring.

According to individuals who performed work on the airplane, a Hobbs meter oil hose was installed, as well as a longer fuel line in order to use the same mounting locations for the fuel flow transducers. This was only required on the right engine because of the location of air conditioning compressor.

Three engine runs were conducted after the work was completed. The first test run revealed an oil leak in the left engine oil pressure transducer. The line was retorqued and the two subsequent engine runs revealed no anomalies. The pilot arrived at the airport about 1130. He had been issued a ferry permit, but the airplane was not inspected by a mechanic per special flight permit requirements before departure.

At 1217, the pilot contacted BJC ground control and requested a "high-speed taxi" before takeoff. The request was granted, and the pilot made the high-speed taxi on runway 12L. He was subsequently cleared for takeoff at 1226.

At 1247, the pilot reported on the FNL common traffic advisory frequency that he was on the left downwind leg for runway 15 and that he had "an engine out [and] smoke in the cockpit." The pilot of another airplane advised that he could see the fire and that the runway was clear. The accident pilot replied, "I've got a fire. I'm gonna land it pretty darn quick. Please have the trucks come on out." There were several ground witnesses, one of which said that the airplane's right wing was on fire before the accident.

A video taken by an airport security camera showed the airplane on a base leg for runway 15. Fire could

be seen on the right side of the airplane. The airplane completed two full rolls as it descended before impacting a dry retention pond about ¼-mile from the approach end of the runway.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	69, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Unknown
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 3 With waivers/limitations	<b>Last FAA Medical Exam:</b>	March 14, 2018
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	7000 hours (Total, all aircraft), 100 hours (Total, this make and model), 25 hours (Last 90 days, all aircraft)		

The 69-year-old pilot held a commercial pilot certificate with airplane single- and multiengine land and instrument ratings. He also held a third-class airman medical certificate, dated March 14, 2018, that contained the restriction, "Must wear corrective lenses for distant vision and have available glasses for near vision." At the time of his medical certification, he reported civil flight experience of 7,000 total hours with 50 hours in the previous 6 months.

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Beech	<b>Registration:</b>	N60RK
<b>Model/Series:</b>	60 Undesignat	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>	1969	<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	P-79
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	September 1, 2017 Annual	<b>Certified Max Gross Wt.:</b>	6775 lbs
<b>Time Since Last Inspection:</b>		<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	3119.8 Hrs as of last inspection	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	TIO-541-E1C4
<b>Registered Owner:</b>	On file	<b>Rated Power:</b>	310 Horsepower
<b>Operator:</b>	On file	<b>Operating Certificate(s) Held:</b>	None

The accident airplane (serial number P-79), was manufactured by the Beech Aircraft Corporation in 1969. It was powered by two Lycoming TIO-541-E1C4 fuel-injected reciprocating engines (serial numbers RL-1143-59, left; L-1676-59, right), each rated at 310 horsepower, and each with Hartzell 3-blade, all-metal, constant speed propellers (model number HC-F73YR-2UF).

According to the maintenance records, the last annual inspection occurred on September 1, 2017, when the airframe had accrued 3,119.9 hours on the tachometer (the Hobbs meter read 1,754.0 hours). At that time, the left engine had accrued 3,337.5 total hours and 902.9 hours since major overhaul, and the right engine had accrued 3,467.3 total hours and 827.7 hours since major overhaul. Review of FAA records confirmed that the pilot had not obtained a ferry permit for the accident flight.

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	FNL,5016 ft msl	<b>Distance from Accident Site:</b>	25 Nautical Miles
<b>Observation Time:</b>	12:56 Local	<b>Direction from Accident Site:</b>	360°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	7 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	210°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	29.95 inches Hg	<b>Temperature/Dew Point:</b>	26°C / 1°C
<b>Precipitation and Obscuration:</b>			
<b>Departure Point:</b>	Broomfield, CO (BJC )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Loveland, CO (FNL )	<b>Type of Clearance:</b>	VFR
<b>Departure Time:</b>	12:30 Local	<b>Type of Airspace:</b>	Class E

The recorded weather conditions at FNL about the time of the accident included wind from 210°; at 7 knots, variable between 180°; and 240°; 10 miles visibility; clear sky; temperature 28°C; dew point 01°C; altimeter setting, 29.96 inches of mercury.

## Airport Information

<b>Airport:</b>	Northern Colorado Regional FNL	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	5016 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	15	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	8500 ft / 100 ft	<b>VFR Approach/Landing:</b>	Traffic pattern

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Fatal	<b>Aircraft Damage:</b>	Destroyed
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	Both in-flight and on-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	On-ground
<b>Total Injuries:</b>	1 Fatal	<b>Latitude, Longitude:</b>	40.464721,-105.085556

The airplane came to rest upright on a magnetic heading of 072° at an elevation of 4,869 ft mean sea level (msl).

The right engine was located about 40 ft northeast of the main wreckage. The right wing was separated just outboard of the right nacelle and came to rest on a heading of 192°. Fire had consumed the inboard right wing, which was oriented on a heading of 020°. The left wing was also destroyed by fire; it was oriented on a magnetic heading of 204°.

The rudder and right elevator were destroyed by fire, but the left elevator was intact and oriented on a magnetic heading of 090°. The fuselage and instrument panel were destroyed by fire. Control cable continuity was established to all flight controls from their attach points through tensile overload failures. The flap actuators were consumed by fire. The left main landing gear was found in the retracted position. The nose landing gear and right main landing gear were separated during the impact sequence. The actuating arm indicated that the landing gear was extended.

Continuity and compression were established on the right engine except for cylinder Nos. 1, 3 and 5 due to impact damage. A significant area of thermal damage was observed in the vicinity of the engine-driven fuel pump. The fuel line from the pump to the fuel flow transducer was loose and could be moved by hand. The fuel strainer screens clean, but each bowl contained burnt material. Both fuel selector valves were positioned on the main tanks. Continuity and compression were established on the left engine. The magnetos were thermally damaged and did not spark.

The right propeller remained attached to the engine and was in the feathered position. Two blades were straight and unremarkable; the third blade exhibited S-bending. The left propeller remained attached to the left engine. One blade remained attached to the hub and was bent slightly forward at midspan. The other two blades separated from the hub; one blade was straight, the other was fractured at midspan.

The left side of the right engine sustained heavy impact damage. The turbocharger pipes were displaced to the right, and the flange bolts were sheared off to the right. The air conditioning hoses were completely consumed by fire. There was evidence of fire aft of the engine-driven fuel pump. The fuel pump was discolored by fire. The fire sleeves on both the fuel pump inlet and outlet hoses were burned away. The fuel outlet hose to the flow transducer was loose.

## **Medical and Pathological Information**

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An autopsy was performed on the pilot by the Larimer County Chief Medical Examiner in Loveland, Colorado. The cause of death was attributed to blunt force and thermal injuries.

Toxicological screening performed by FAA's Forensic Sciences laboratory found no evidence of carboxyhemoglobin or ethanol in blood, or drugs in urine. A cyanide test was not performed.

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Scott, Arnold
<b>Additional Participating Persons:</b>	Keith Claus; FAA Flight Standards District Office; Denver, CO Michael Burton; FAA Flight Standards District Office; Denver, CO Troy Helgeson; Lycoming Engines; Milliken, CO Jennifer D Barclay; Textron Aviation; Wichita, KS
<b>Original Publish Date:</b>	May 19, 2020
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB traveled to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=99441">https://data.ntsb.gov/Docket?ProjectID=99441</a>

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