Aviation Investigation Final Report

Location:	Cullman, Alabama	**Accident Number:**	MIA07LA111
Date & Time:	June 22, 2007, 14:40 Local	**Registration:**	N18491
Aircraft:	Beech A36	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

About 30 minutes into the flight the pilot reported an onboard fire to air traffic control and indicated his intent to land the airplane. The controller then provided assistance to the pilot in an attempt to aid him in reaching an airport for an emergency landing. A witness observed the airplane with its landing gear and flaps retracted as it attempted to land, going up and down at an altitude of 5 to 10 feet. The witness heard scraping metal as the airplane proceeded along the runway and further stated that the airplane's engine sounded as if it was operating normally, with no signs of smoke or fire. The airplane then gained some altitude before descending and impacting the ground beyond the departure end of the runway.

Postcrash examination indicated that the engine was operating upon impact and that the crankcase had incurred a rupture in the area above and in line with the No. 1 cylinder. The airplane exhibited an oil streak proceeding from the engine cowling along the right side of the fuselage. There was also evidence of oil starvation having affected several internal engine parts. No anomalies were noted with the airframe or other airplane systems and both the landing gear and flap systems functioned normally when tested. The manufacturer's emergency procedures for the airplane indicate that, for both an engine fire and engine failure in flight, the landing gear should be lowered during an emergency landing, depending on the landing surface.

An April 12, 2006, engine logbook entry for an annual inspection indicated that “some metal” was found after oil was drained and recommended running the engine for an additional 10 hours for further inspection. A follow-up inspection on July 20, 2006, indicated neither metal contaminants in the oil nor any oil leaks. On November 15, 2006, the engine was again

inspected for both metal contamination and leaks and none were found.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's mismanagement of an in-flight emergency, which resulted in a gear-up landing and runway overrun. Contributing to the accident was a breach to the engine crankcase above and in line with the No. 1 cylinder.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - MECH FAILURE/MALF
Phase of Operation: CRUISE - NORMAL

Findings
1. ENGINE ASSEMBLY,CRANKCASE - FRACTURED

Occurrence #2: FORCED LANDING
Phase of Operation: EMERGENCY DESCENT/LANDING

Occurrence #3: WHEELS UP LANDING
Phase of Operation: LANDING

Findings
2. (C) PROCEDURES/DIRECTIVES - NOT FOLLOWED - PILOT IN COMMAND
3. (C) GEAR EXTENSION - NOT PERFORMED - PILOT IN COMMAND
4. (C) PROPER TOUCHDOWN POINT - NOT ATTAINED - PILOT IN COMMAND

Occurrence #4: OVERRUN
Phase of Operation: LANDING

Factual Information

HISTORY OF FLIGHT

On June 22, 2007, about 1440 central daylight time, a Hawker Beechcraft Corporation A36, N18491, registered to and operated by a private individual, as a Title 14 CFR Part 91 personal flight, impacted terrain approximately 4,500 feet from the departure end of runway 2 at Folsom Field Airport, Cullman, Alabama. Visual meteorological conditions prevailed, and an instrument flight rules plan was filed. The private-rated pilot and one passenger received serious injuries, and the airplane incurred substantial damage. The flight originated in Hamilton, Alabama, the same day, at about 1400, and was destined for Moore County Airport, Pinehurst/Southern Pines, North Carolina.

One witness, a trooper pilot with the Alabama State Police, was standing on the northwest ramp of the accident airport at the time, and he reported hearing a noise “that resembled metal scraping” before observing the accident aircraft flying from the southwest along runway 02 at “five and ten feet…going up and down”. The trooper stated that both the landing gear and the flaps were in the “up position” and that “the engine sounded normal but may not have been at full throttle”. Furthermore, the trooper said that he did not see any smoke or fire coming from the aircraft. According to the trooper, the aircraft “stayed at the same altitude” until it reached the end the departure end of runway 02, where it “gained a little altitude” before impacting the ground beyond the end of the runway.

The trooper further stated that he immediately entered a vehicle and drove to the accident scene, and upon arriving at the aircraft moments after the crash, he observed that both the pilot and passenger “were conscious and able to talk”. He stated that when asked, the pilot did not know what happened, or where he was located, and added that the passenger was talking to a 911 dispatcher on her cell phone. The trooper said that when he asked the passenger what happened all she could remember was that there had been a fire. The trooper further stated that the passenger did not know where she was, nor did she remember if they were taking off or landing.

The NTSB did not receive an accident/incident report form related to this accident.

An FAA transcript of communications showed that the pilot had contacted FAA Memphis Air Route Traffic Control Center (ARTCC) after departing Marion County-Rankin Fite Airport, Hamilton, Alabama. At 1516:08, the FAA Memphis ARTCC low Altitude Radar Controller cleared the pilot of N18491 to climb and maintain one one thousand. At 1516:13, the pilot acknowledged, saying, “ four niner one out of seven for eleven thank you.”

At 15:32:50 contacted the controller, and after the controller responded, at 1532:57 the pilot

stated, “I need to go down my airplane’s on fire I’m gonna have to go down”. The controller continued to provide assistance, and at 1533:52 the controller stated “one eight four ninety one uh Memphis if you can sir if you’ll turn to the south there is an airport at your uh seven o’clock position has a fifty five hundred foot runway cullman airfield if not try to head north towards Huntsville that’s about twenty miles away sir.” The controller continued trying to contact and assist the pilot of N18491, however no further radio transmissions were received.

PERSONNEL INFORMATION

FAA records showed that the pilot held a private pilot certificate with airplane single-engine and instrument ratings. In addition, on May 31, 2007, he was issued an FAA third class medical certificate, with the stated restriction “Must wear corrective lenses”.

The pilot’s logbook indicated that he had accumulated about 2887.1 hours flight experience as pilot-in-command, prior to the accident flight, with 11.4 hours having been accumulated in the last 30 days and 15.0 hours in the last 90 days. The pilot’s last flight review was conducted on April 22, 2006.

AIRCRAFT INFORMATION

The accident airplane was a Hawker Beechcraft Corporation model Bonanza A36, serial number E-1152, manufactured in 1977. It was powered by a Teledyne Continental IO-520-BA (serial number 814405), fuel-injected, six-cylinder piston engine. According to the FAA database, on January 17, 1990, it was registered to John M. Kerr II.

The airplane’s engine logbook revealed that the engine had been rebuilt by the manufacturer on June 29, 1999, and had accumulated about 692 hours since it was rebuilt. The airframe had accumulated about 4,360 hours. Engine and airframe maintenance logbooks showed that the plane was given a 100-hour inspection on May 31, 2007. In the logbook, the mechanic noted, “this aircraft has been inspected in accordance with an annual inspection and determined to be in an airworthy condition”, however, on the same day, the airframe logbook was annotated to read, “aircraft restricted to VFR flight until the VSI is check by an avionics shop”. Records available to the NTSB did not reveal that the VSI had been checked.

On April 12, 2006, an engine logbook entry for an annual inspection indicated that “some metal” was found after oil was drained and recommended “running engine an additional 10hrs” for further inspection. On July 20, 2006, the engine was inspected for metal contamination and the engine logbook entry showed that “no metal or contamination” nor were any oil leaks were found. On November 15, 2006, the engine was inspected again for metal contamination and leaks, and none were found.

METEOROLOGICAL INFORMATION

FAA records showed that the pilot had obtained a weather briefing, and had filed an instrument

flight rules flight plan with the Washington Hub Automated Flight Service Station, about one hour prior to departure. No significant weather was reported, or forecasted to be along the pilot's intended route of flight, and weather was not considered to be a factor in this accident.

The nearest weather reporting facility at the time of the accident was Huntsville International Airport-Carl T Jones Field, Huntsville, Alabama, (KHSV), about 25 miles north of the accident airport. The Huntsville, Alabama 1453, surface weather observation was: winds from 080 degrees at 8 knots, visibility 10 statute miles, ceiling 11,000 overcast, temperature 34 degrees Celsius, dew point temperature 11 degrees Celsius, altimeter 30.02 inHg.

WRECKAGE AND IMPACT

N18491 impacted the ground about three quarters of a mile northeast of the airport, and came to rest about 2,600 feet from the departure end of the runway, to the left of the centerline, on a heading of about 248 degrees. The debris field/disturbed area was about 110 feet long, oriented along the direction of travel, and the grass that began at the end of the runway was about 2 feet tall and as a result of its contact with the airplane it lay in the direction of travel.

An FAA inspector initially responded to the accident scene, and on the following day, June 23, 2007, representatives from Hawker Beechcraft Corporation, and Teledyne Continental Motors, met with the inspector, and they conducted follow-on examinations of both the scene and the accident airplane.

The on-scene examination revealed several white paint transfer markings on the runway, consistent with the airplane's white underbelly, and there were about 13 gouge marks imprinted into the runway surface extending along the direction of travel on the runway for a distance of about 59 feet, consistent with propeller slash marks made by the accident airplane during its landing attempt.

Examination of the airplane revealed no evidence of fire. There was impact damage in the forward part of the airplane, to include the propeller, engine, engine cowl, windshield and pilots window. Aft of the firewall the airplane was mostly intact. The upper engine cowl had separated from the airframe at the aft end of the center hinge, and lay to the side of the engine. The lower engine cowl and left and right fuselage structure was deformed downward, and crushed aft. Both the windshield and the pilot's side window had separated from the airframe.

All three propeller blades were bent and twisted at the tips, and the blades exhibited signatures consistent with the propeller rotating and generating power during the approach and landing.

The left wing remained attached to the fuselage at the attach fittings, and the leading edge in the area of the center of the wing was dented. Damage to the fuselage extended from frame 39 to 140, in the area about 12 inches above the top of the wing. The lower fuselage exhibited crushing damage upward and aft. The pitot tube was separated from the left wing, and there was damage above the top of the wing. The upper side of the right wing was relatively

undamaged. The lower skin of the right wing exhibited lateral winkles. The empennage also exhibited no damage.

The flap indicator in the cockpit indicated that the flaps were in the full up position, and the cockpit instruments did not reveal any anomalies.The landing gear handle in the cockpit, and landing gear actuator, were both examined and each was found to be in positions that corresponded to the landing gear being up and locked. The main landing gear doors had remained closed, and the left door had minimal damage. During the examination power was applied to the landing gear motor and the landing gear was extended and retracted, with no anomalies being noted.

The airplane's flight controls were examined, and there was flight control continuity from the control yoke to the ailerons and elevator. The floorboard in the area of the pilot's side rudder pedals was deformed, and rudder movement from the pedal to the rudder was not possible due to impact-related structural deformation, however control continuity from the rudder pedals to the rudder was confirmed by tracing the control cables.

Both the left and right flaps were in the up position, and when power was applied to the flap motor the flap was extended and retracted throughout the full range of operation. The left and right trim tab actuator measurements were taken and each measured one and a quarter inches, which equated to a range of 0 to 5 degrees tab up.

Continuity was established to the fuel system, and no anomalies were noted. Both fuel tanks were found to be intact, fuel was present, and the fuel caps were secure. The right fuel tank had been selected, and the fuel selector could not be moved from the "right" position, due to impact related deformation in the area. Fuel was found to be present in the fuel line that ran from the right fuel tank, and when tested with compressed air, the system was confirmed to be intact.

The fuel pump was removed for examination, and fuel was found in the fuel metering inlet line. In addition the fuel drive coupling was intact, and the fuel pump drive shaft rotated freely.

A long oil streak was noted, which led from the engine cowling along the right side of the fuselage, and it tapered off just aft of the trailing edge of the right wing, consistent with that of an oil leak while the airplane was in motion.

Upon removal of the aircraft from the scene of the accident, the underbelly showed significant damage from the firewall extending through the midsection of the underbelly. The fuselage beneath the firewall was severely shredded and buckled.

The rear engine mount brackets had fractured. There was a hole in the right engine cover that was over the number 1 cylinder. During the removal of the engine from the firewall it was noted that approximately 2 quarts of oil dripped out of the engine, and was captured in a bucket. The crankcase was breached above and in line with the number one cylinder. The right-hand

magneto was fractured from its mounting position. The number 3, 4, 5, and 6 cylinder exhaust valves exhibited leakage signatures. The crankshaft and counterweight assembly exhibited lubrication distress, thermal damage, and metal transfer.

The engine was secured and shipped to Teledyne Continental Motors for examination, and on July 2, 2007, the detailed examination was conducted under the supervision of an FAA inspector. The examination showed that the crankcase was breached above and in line with the No. 1 cylinder. The right magneto, positioned above the opened area had separated at its mounting flange. The Nos. 1 and 4 main bearings exhibited rotational scoring and scratching, exposing the copper layer, consistent with a loss of lubrication. The Nos. 2 and 3 main bearings had the bearings' copper layer exposed, and exhibited signatures consistent with oil starvation. The No. 5 main bearings also had smearing on the babbit layer, also consistent with oil starvation.

The Nos. 1 and 3 crankcase main bearing support diameters showed evidence of having been displaced, and there was thermal damage and rotation signatures on the bearing itself. A hole was found at the bottom of the oil sump, and only residual oil remained. In addition the sump contained numerous particles of metal.

TESTS AND RESEARCH

Examination of Hawker Beechcraft Corporation's emergency procedures for the Beech A-36, both for an engine fire during flight, and an engine failure during flight, both provide guidance that the landing gear be lowered prior to landing, depending on the landing surface upon which emergency landing is being attempted.

Pilot Information

Certificate:	Private	**Age:**	62,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	May 31, 2007
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	April 22, 2006
Flight Time:	2887 hours (Pilot In Command, all aircraft), 15 hours (Last 90 days, all aircraft), 11 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Beech	**Registration:**	N18491
Model/Series:	A36	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	E-1152
Landing Gear Type:	Retractable - Tricycle	**Seats:**	6
Date/Type of Last Inspection:	May 31, 2007 100 hour	**Certified Max Gross Wt.:**	3650 lbs
Time Since Last Inspection:	12 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4360 Hrs as of last inspection	**Engine Manufacturer:**	Continental
ELT:	C91A installed	**Engine Model/Series:**	IO-520-BA
Registered Owner:	John M. Kerr II	**Rated Power:**	
Operator:	John M. Kerr II	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HSV	**Distance from Accident Site:**	
Observation Time:	14:53 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	Overcast / 1100 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	80°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.02 inches Hg	**Temperature/Dew Point:**	34°C / 11°C
Precipitation and Obscuration:			
Departure Point:	Hamilton, AL (HAB)	**Type of Flight Plan Filed:**	IFR
Destination:	Pinehurst, NC (SOP)	**Type of Clearance:**	IFR
Departure Time:	14:00 Local	**Type of Airspace:**	

Airport Information

Airport:	Fulsom Field Airport 3A1	**Runway Surface Type:**	Asphalt
Airport Elevation:	963 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	02	**IFR Approach:**	None
Runway Length/Width:	5500 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Serious	**Latitude, Longitude:**	34.281665,-86.853614

Administrative Information

Investigator In Charge (IIC):	Lovell, John
Additional Participating Persons:	Chuck Thompson; FAA FSDO; Birmingham, AL Jason Lukasik; Teledyne Continental Motors; Mobile, AL Brian Weber; Hawker Beechcraft Company; Wichita, KS
Original Publish Date:	March 16, 2011
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=66076