Aviation Investigation Final Report

Location:	Smoketown, Pennsylvania	**Accident Number:**	ERA13FA412
Date & Time:	September 11, 2013, 09:23 Local	**Registration:**	N691LB
Aircraft:	JOSEPH BENDER MUSTANG II	**Aircraft Damage:**	Destroyed
Defining Event:	Loss of control in flight	**Injuries:**	1 Serious
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot/owner/builder had received an airworthiness certificate for the airplane nearly 2 years before the accident, but he had not flown the airplane. He and witnesses reported that he had been conducting taxi-testing of the airplane on the day of, and for months before, the accident. Witnesses indicated that, on the day of the accident, the airplane had just lifted off from runway 28 at "full power" when the wings rocked steeply first to the left, and then to the right. One witness described the attitude of the airplane as a "knife edge." The airplane descended, impacted the parallel taxiway, and continued into a hangar, where it was mostly consumed by post-crash fire. The witnesses described the sound of the engine as smooth, continuous, and at "full power" until ground contact, suggesting that the pilot had not attempted to abort the high-speed taxi test/takeoff. Immediately after the accident, the pilot reported to witnesses that he had intended to fly and that the airplane was responding to his control inputs. Before being transported to the hospital, the pilot reported to police that he had been conducting several high-speed taxi tests to identify ground-handling issues with the airplane. He stated that he had never flown the airplane, had not intended to fly, and that the airplane "suddenly" lifted from the runway. Once airborne, he was unable to control the airplane, and it subsequently descended into the ground and caught fire. Due to the pilot's contradictory statements, it could not be determined whether the accident flight was the result of an accidental takeoff during a high-speed taxi test or a premeditated intent to conduct a first test flight of the airplane.

Postaccident examination of the airframe and engine revealed no obvious evidence of any pre-impact mechanical malfunctions or failures; however, due to the damage sustained during the impact and the post-impact fire, the airplane's specific pre-accident on-ground and in-flight handling characteristics could not be qualified or evaluated. In an interview following the accident, a local flight instructor stated that the pilot had no flight experience in the accident airplane make and model and had only flown once in the 3 1/2 years before the accident, which was a flight review with the instructor. The instructor stated that he had accompanied the pilot during ground tests of the airplane and that during those tests, he found the airplane was "uncontrollable." When asked by the pilot if he would perform the initial flight testing of the airplane, the flight instructor refused because he thought the airplane was "unsafe." He

counseled the pilot to obtain instruction in the accident airplane make and model, and when the pilot dismissed that notion, he advised the pilot to obtain instruction in a "high performance tail-dragger." The pilot also dismissed that advice and said he had learned to fly in a relatively low performance tailwheel-equipped airplane and that was adequate training for the accident airplane.

Probable Cause and Findings

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

The pilot/owner/builder's failure to abort the takeoff and his subsequent failure to maintain airplane control. Contributing to the accident were the pilot's total lack of experience in the accident airplane and his lack of flying experience in the 3 1/2 years before the accident.

Findings

Aircraft	Directional control - Not attained/maintained
Personnel issues	Incorrect action performance - Pilot
Aircraft	Airspeed - Not attained/maintained
Personnel issues	Total experience w/ equipment - Pilot

Factual Information

History of Flight

Takeoff	Loss of control in flight (Defining event)

HISTORY OF FLIGHT

On September 11, 2013, at 0923 eastern daylight time, a Bender Mustang II, N691LB, was destroyed when it impacted a taxiway and hangar during takeoff from Smoketown Airport (S37), Smoketown, Pennsylvania. The private pilot/owner/builder was seriously injured, and the airplane was consumed by post-crash fire. Visual meteorological conditions prevailed, and no flight plan was filed for the personal flight, which was originating at the time of the accident. The flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

Witnesses indicated the airplane had just lifted from runway 28 at "full power" when the wings rocked steeply to the left, and then to the right. One witness described the attitude of the airplane as a "knife edge." The airplane descended and subsequently impacted the parallel taxiway on the north side of the airport, and continued into a hangar. The witnesses described the sound of the engine as smooth, continuous, and at "full power" until ground contact. The engine separated from the airframe, and the cockpit area caught fire. The pilot egressed under his own power, and received help from the witnesses to extinguish the flames on his clothing.

The witnesses asked the pilot if he intended to fly, as he had been performing ground testing of the airplane, and he replied, "Yes." When asked if the airplane was responding to his control inputs, he also replied, "Yes."

Prior to being transported to the hospital, the pilot reported to police that he had been conducting several high-speed taxi tests to identify ground-handling issues with the airplane. He stated that he had never flown the airplane, had not intended to fly, and that the airplane "suddenly" lifted from the runway. Once airborne, he was unable to control the airplane and it almost immediately impacted the ground and caught fire. He reported that he egressed the airplane under his own power.

PERSONNEL INFORMATION

The pilot/owner held a private pilot certificate with ratings for airplane single engine land and instrument airplane. He did not possess a helicopter rating. The pilot also held a repairman experimental aircraft builder certificate for a Rotorway Exec 162F helicopter, but not for the Mustang II. His pilot logbooks were not recovered, and therefore his total flight experience could not be determined. His most recent Federal Aviation Administration (FAA) third class medical certificate was issued on April 11, 2011. The pilot reported 977 total hours of flight experience on that date.

The pilot died in the hospital on November 23, 2013.

AIRCRAFT INFORMATION

The experimental amateur-built airplane was constructed from a kit. According to the kit manufacturer's records, the pilot/owner/builder first purchased fuselage and empennage kits in 1999. In 2001, a wing kit was purchased and in 2008 an engine cowling and propeller spinner were shipped to the pilot/owner. An invoice that referenced a main landing gear leg, or potentially a landing gear leg repair was dated February 2012.

According to FAA records, the airplane was manufactured in 2005, and the airworthiness certificate was issued October 27, 2011. During a post-accident telephone interview, the FAA inspector who completed the inspection and issued the airworthiness certificate specifically recalled that during the inspection he had checked the flight controls for proper and corresponding movement, and noted no anomalies.

Photographs of the maintenance records for the airplane were taken at the time of the inspection, but records documenting the period of time following the airplane's certification were not recovered.

Searches conducted by the FAA, police, friends and family members for the records were unsuccessful. As such, it could not be determined if any subsequent condition inspections or modifications had been made to the airplane since its certification.

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.METEOROLOGICAL INFORMATION

At 0914, the weather conditions reported at Lancaster Airport (LNS), 6 miles northwest of the accident site, included clear skies, calm winds, and 3 miles visibility in haze. The temperature was 26 degrees C, dew point 22 degrees C, and the altimeter setting was 30.15 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The wreckage was examined at the accident site on September 11, 2013, and all major components were accounted for at the scene. The wreckage path was oriented 297 degrees magnetic, and was about 110 feet in length. The initial impact point was on the asphalt taxiway, which displayed smearing and parallel, arcing striations consistent with the dimensions of the propeller blades. Beyond the taxiway edge, angularly-cut trenches in the grass and dirt displayed paint and asphalt transfers consistent with the propeller blades and the taxiway. From the taxiway edge to the main wreckage was about 85 feet. The main wreckage came to rest upright, facing northeast. The engine was separated from the airframe and was inverted against the hangar wall. The propeller blades exhibited similar twisting, bending, leading edge gouging, chordwise scratching, and tip curling.

The cockpit, instrument panel, and the left side of the cabin were consumed by fire. The wings, and the empennage were damaged by impact, and the fuselage was twisted. The left main landing gear was separated from the airplane, the right main landing gear was bent forward, with the tire was cambered inward. The tailwheel was collapsed, but still attached to the airframe.

Control continuity was traced from the cockpit to all flight control surfaces. Movement of the rudder pedals and control stick in the cockpit resulted in corresponding movement of the ailerons, elevator, and rudder. Due to impact-related damage to the airplane, it's pre-impact on-ground and in-flight handling characteristics could not be evaluated.

ADDITIONAL INFORMATION

In a telephone interview, a flight instructor who was acquainted with the pilot/owner stated he had provided flight instruction to him in airplanes and helicopters, and had conducted the pilot/owner's most recent flight review. The instructor also participated in some ground testing of the accident airplane with the pilot/owner, and discussed his evaluation of the airplane. He gave the pilot/owner advice and counsel with regards to his flying the Mustang II airplane after the ground testing was completed.

When asked about his overall piloting skills, he said the pilot/owner performed "okay" in airplanes, but needed to fly more. The flight instructor also relayed an anecdote regarding a previous training experience in the pilot's amateur built helicopter. During the flight, the pilot/owner struggled to maintain control of the helicopter, and often made inputs into the flight controls that were opposite of what was required, for example, adding right pedal to arrest a yaw to the right.

The flight instructor additionally stated that the pilot had, "wrecked that helicopter a couple of times too."The flight instructor completed a flight review with the pilot in a Piper PA-28-180 about a year and a half prior to the accident. He said that at the time, the pilot had not flown in the two years preceding the review, and that the accident flight was his first flight since. When asked about the pilot/owner's recent flight experience, prior to the accident, he replied, "He flew nothing. If you ever find his logbook, there will be only one entry in the last three years, and that's the flight review I gave him."

In the months following the flight review, the flight instructor accompanied the pilot on some ground tests of the accident airplane, and was asked if he would test fly the airplane after ground testing was completed. According to the instructor, "I told him it wasn't safe to fly. It would get to 40 to 50 knots and it was uncontrollable. You couldn't control it on the ground. I refused to fly it. It was unsafe." The flight instructor further described that one factor contributing to the airplane's lack of controllability was the geometry and alignment of its landing gear, and that the pilot was still struggling to perfect it. He stated that the pilot/owner spent "quite a bit of time" trying to sort out the landing gear but that ultimately, "he couldn't control it on the ground." He said, "He was meticulous about that thing. He must have had it in and out of the hangar 150 times." When asked when his participation in the ground testing of the airplane took place, the instructor couldn't be certain, but estimated it was in the spring of 2012. He recounted that during one high speed pass down the runway, the pilot could not maintain directional control, the airplane departed the runway, and got stuck in the "soft" grass. The airplane was then towed out and back to the pilot's hangar.

The flight instructor finally advised the pilot to obtain type-specific training in the Mustang II before he attempted to test fly it. He recommended a Mustang II owner who lived locally, but the pilot/owner refused to contact him for reasons he wouldn't specify. Then, the flight instructor located someone in California who could help, but the pilot decided the cost was prohibitive. After the pilot refused those options, the flight instructor recommended that he fly a "high performance tail-dragger" before he attempted to fly the Mustang II. The pilot dismissed the advice, saying that he had learned to fly in a Piper J3, and that the Mustang II "wouldn't be a problem."

FAA Advisory Circular 90-89A, AMATEUR-BUILT AIRCRAFT AND ULTRALIGHT FLIGHT TESTING HANDBOOK

This AC's purpose was the following:

"(1) To make amateur-built/ultralight aircraft pilots aware that test flying an aircraft is a critical undertaking, which should be approached with thorough planning, skill, and common sense."

"(2) To provide recommendations and suggestions that can be combined with other sources on test flying (e.g., the aircraft plan/kit manufacturer's flight testing instructions, other flight testing data). This will assist the amateur/ultralight owner to develop a detailed flight test plan, tailored for their aircraft and resources."

The advisory circular provided guidance on preparing a plan for each phase of the amateur-built airplane's production. The areas for which guidance was provided included preparing for the airworthiness inspection, weight and balance, taxi test, flight testing, and emergency procedures. The suggested flight testing regimen was separated into 10-hour segments for the 40-plus hour flight testing requirement.

Suggested guidelines for the experience level of the test pilot for the recently-completed amateur-built airplane were also provided. Among the guidelines, was the following:"A minimum of 50 recent takeoffs and landings in a conventional (tail wheel aircraft) if the aircraft to be tested is a tail dragger."

"If appropriate, have logged a minimum of 10 tail wheel take-off and landings within the past 30 days."

Pilot Information

Certificate:	Private	**Age:**	74
Airplane Rating(s):	Single-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):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	April 11, 2011
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	977 hours (Total, all aircraft), 1 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	JOSEPH BENDER	**Registration:**	N691LB
Model/Series:	MUSTANG II	**Aircraft Category:**	Airplane
Year of Manufacture:	2005	**Amateur Built:**	Yes
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	M-II-1977
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	October 27, 2011 Condition	**Certified Max Gross Wt.:**	1800 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Installed, not activated	**Engine Model/Series:**	IO-360A1B6
Registered Owner:	Joseph Bender	**Rated Power:**	
Operator:	Joseph Bender	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	LNS,270 ft msl	**Distance from Accident Site:**	6 Nautical Miles
Observation Time:	09:14 Local	**Direction from Accident Site:**	330°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.14 inches Hg	**Temperature/Dew Point:**	26°C / 22°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Smoketown, PA (S37)	**Type of Flight Plan Filed:**	None
Destination:	Smoketown, PA (S37)	**Type of Clearance:**	None
Departure Time:	09:23 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	Smoketown S37	**Runway Surface Type:**	Asphalt
Airport Elevation:	370 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	28	**IFR Approach:**	None
Runway Length/Width:	2400 ft / 50 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious	**Latitude, Longitude:**	40.041389,-76.201942(est)

Administrative Information

Investigator In Charge (IIC):	Rayner, Brian
Additional Participating Persons:	
Original Publish Date:	December 10, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=88026