Aviation Investigation Final Report

Location:	Breckenridge, Texas	**Accident Number:**	CEN17LA285
Date & Time:	July 25, 2017, 09:10 Local	**Registration:**	N254SF
Aircraft:	HILLARD CHARLIE R HAWKER FB60	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	2 Serious
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

A witness, who was a repair facility employee, stated that, on the morning of the accident, the airplane was fueled and then flown for about 15 to 20 minutes without incident. The accident flight was the second flight of the day and was also about 15 to 20 minutes long. The witness's cell phone video revealed that the airplane was on short final for the runway as it descended and turned left; it then disappeared into a wooded area. The airplane collided with a tree and then impacted the ground and came to rest upright. First responders to the accident site stated that the fuel lines had been severed, and fuel was covering the ground under the airplane.

The propeller blades did not exhibit signs of power during impact. Postaccident testing of the engine's distributors and fuel pump did not reveal any anomalies. However, postaccident testing of the injection carburetor revealed that the right float switch pin was dislodged from its cylinder, but it could not be determined when the pin became dislodged. The pin was reinstalled into its cylinder, and subsequent testing of the injection carburetor revealed that it was out of tolerance; however, the specialists at the repair station stated that, although several of the carburetor readings were out of tolerance, none of the indications would have caused a loss of engine power.

Postaccident examination of the engine did not reveal any evidence of preimpact mechanical malfunctions or anomalies that would have precluded normal operation. The fuel selector was found positioned to the auxiliary fuel tank line, not the main fuel tank line. The valve was impact-separated from the airplane, and its preaccident position could not be confirmed. Based on the available evidence, the reason for the loss of engine power could not be determined.

Probable Cause and Findings

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

A total loss of engine power for reasons that could not be determined because postaccident engine examination and testing did not reveal any mechanical malfunctions or anomalies that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined
Environmental issues	Tree(s) - Effect on operation

Factual Information

History of Flight

Approach-VFR pattern final	Loss of engine power (total) (Defining event)
Approach-VFR pattern final	Off-field or emergency landing
Approach-VFR pattern final	Collision with terr/obj (non-CFIT)

On July 25, 2017, about 0910 central daylight time, an experimental Hawker FB60 airplane, N254SF, experienced a loss of engine power and impacted trees and terrain near Stephens County Airport (BKD), Breckenridge, Texas. The private rated pilot and one passenger were seriously injured and the airplane sustained substantial damage. The airplane was registered to a private individual and operated by the pilot under the provisions of Title 14 *Code of Federal Regulations* Part 91 as a maintenance test flight. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed. The local flight was on final approach to BKD when the accident occurred.

A review of a witness cell phone video revealed that the airplane was near the approach end of runway 17 as it descended and made a left turn, then disappeared into a wooded area.

The responding Federal Aviation Administration (FAA) inspector stated that the engine reportedly experienced a loss of power and the airplane descended into the trees and terrain. The pilot and passenger and were flown to a hospital for treatment.

The witness stated that the airplane was fueled on the morning of the accident and was flown for about 15 to 20 minutes without incident. The accident flight was the second flight of the day and also lasted about 15 to 20 minutes. During the flight she observed the landing gear extend when the airplane turned on final approach but she was unable to hear the engine.

Pilot Information

Certificate:	Private	**Age:**	74,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	5-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	February 22, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Passenger Information

Certificate:		**Age:**	Male
Airplane Rating(s):		**Seat Occupied:**	Rear
Other Aircraft Rating(s):		**Restraint Used:**	5-point
Instrument Rating(s):		**Second Pilot Present:**	No
Instructor Rating(s):		**Toxicology Performed:**	No
Medical Certification:		**Last FAA Medical Exam:**	
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:			

Aircraft and Owner/Operator Information

Aircraft Make:	HILLARD CHARLIE R	**Registration:**	N254SF
Model/Series:	HAWKER FB60 NO SERIES	**Aircraft Category:**	Airplane
Year of Manufacture:	1956	**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	37514
Landing Gear Type:	Retractable - Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	July 11, 2017 Annual	**Certified Max Gross Wt.:**	
Time Since Last Inspection:	1.8 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1294.3 Hrs at time of accident	**Engine Manufacturer:**	Curtiss Wright
ELT:		**Engine Model/Series:**	R3350-36WD
Registered Owner:	On file	**Rated Power:**	2800 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

The airplane had been damaged in a previous ground event in 2016 and repairs were being completed by a repair facility at BKD. The facility had completed the repairs on July 11, 2017, and during a test flight the pilot noticed the flight controls were not rigged correctly for level flight. The flight control rigging was fixed and the pilot was completing another test flight when the accident occurred. The airplane had been flown for several hours during the week before the accident and no engine anomalies were reported.

An employee of the repair facility confirmed that the main fuel tanks were used for these types of short test flights as stated in their procedures.

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	KBKD,1283 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	08:55 Local	**Direction from Accident Site:**	184°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	10 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	28°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Breckenridge, TX (BKD)	**Type of Flight Plan Filed:**	None
Destination:	Breckenridge, TX (BKD)	**Type of Clearance:**	None
Departure Time:	08:50 Local	**Type of Airspace:**	Class E

Airport Information

Airport:	STEPHENS COUNTY BKD	**Runway Surface Type:**	Asphalt
Airport Elevation:	1284 ft msl	**Runway Surface Condition:**	Unknown
Runway Used:	17	**IFR Approach:**	None
Runway Length/Width:	4997 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

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:**	32.727222,-98.891113(est)

The airplane collided with a 20 ft tall tree about 1,000 ft north of the approach end of the runway. The airplane impacted the ground and came to rest upright about 150 ft from the initial tree strike. Figure 1 shows the empennage mostly separated from fuselage at the aft bulkhead. The left wing was separated and distorted aft. The right wing was crushed and distorted forward. The forward fuselage, engine cowling, and propeller shaft sustained impact damaged. The four propeller blades remained attached to the hub and did not exhibit leading edge damage or rotational scoring. First responders to the accident

site stated that the fuel lines had been severed and fuel was covering the ground under the airplane.

Figure 1 – Damaged Airplane

A postaccident examination of the engine was completed on October 16-17, 2017, under the auspices of an FAA inspector. Due to impact damage the engine could not be manually rotated through to confirm internal continuity. The engine was removed from the airframe and there were no obvious anomalies observed. The propeller, mixture, and throttle controls remained connected and moved normally when manually manipulated. Examination of the carburetor did not reveal any anomalies and the fuel screen was clean and free of contaminants. A few ounces of fuel remained in the fuel lines; the fuel appeared clean. The accessory drive shaft was removed and the blower was manually rotated; the accessory gears rotated with no anomalies noted. The two front distributors were removed and the gears remained connected to the front cam drive. The outlet oil screen was removed and disassembled and there was no metal or debris observed. The front and rear oil sump plugs and screens were also free of metal and debris. The engine examination did not reveal any preimpact mechanical malfunctions or anomalies that would have precluded normal operation.

The fuel valve was impact separated from the airplane and damaged. During the postaccident

examination, air was blown through the fuel valve and determined it was positioned to an auxiliary fuel tank line.

Tests and Research

On November 9, 2017, postaccident testing of the distributors, fuel pump, and injection carburetor was completed at an FAA authorized repair station under the auspices of an FAA inspector. The two distributors and the fuel pump were run on their respective test stands and all successfully passed the testing requirements. The injection carburetor was tested on a Stromberg Aircraft Carburetor Flow Bench. The initial flow test failed and bypassed significant amounts of fuel from the vapor vent port. To troubleshoot the issue, the carburetor's cover was removed which revealed the right float switch pin was dislodged from its cylinder. The right float pin was reinstalled into its cylinder and subsequent testing of the injection carburetor was out of tolerance, including flow tests, automatic mixture control, bleed checks, and air circuit tests.

Administrative Information

Investigator In Charge (IIC):	Lindberg, Joshua
Additional Participating Persons:	Steve Miller; Federal Aviation Administration; Lubbock, TX Jeff Hamilton; FAA; San Antonio, TX
Original Publish Date:	March 18, 2019
Last Revision Date:	
Investigation Class:	Class
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=95664