Aviation Investigation Final Report

Location:	Hopkinsville, Kentucky	**Accident Number:**	ERA14LA253
Date & Time:	May 22, 2014, 13:30 Local	**Registration:**	N46777
Aircraft:	Piper J3C - 65	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (partial)	**Injuries:**	1 Serious, 1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that before taking off for a local flight, when he conducted the engine run up, the magneto drop for the right magneto was 150 rpm, which was 100 rpm greater than the drop for the left magneto (the pilot later stated that the "engine ran up just fine"). The pilot applied takeoff power and, based on his years of experience, he estimated that the engine was developing full power. The airplane became airborne in about the usual time, just before midfield. He began climbing out between 40 to 50 mph, which he said was normal; about 10 to 15 seconds later, when the airplane was about 100 feet above ground level and with about 1/4 of the runway remaining, the pilot noticed that the engine was not developing full power, which was usually 2400 rpm; the tachometer indicated 1,900 rpm. He verified that the throttle was full forward, the mixture control was full rich, and the carburetor heat was off. At 1,900 rpm, there was just enough power to maintain altitude but not enough to climb. The pilot initiated a shallow turn to try landing on a taxiway, but during the turn, he lost altitude and abandoned the plan. He maneuvered the airplane for a forced landing on a road. During the forced landing attempt, the right wing hit a tree, causing the airplane to be pulled to the right over a guardrail. Inspection of the engine following recovery revealed the right magneto was timed 14 degrees after the specified amount, or closer to top dead center, and discrepancies were noted with both spark plugs in the No. 4 cylinder.

Although the pilot indicated the engine run-up was satisfactory, the excessive right magneto drop was likely due to the mistimed right magneto and the spark plug discrepancies and should have been grounds to cancel the flight and investigate the reason for the excessive drop.

Probable Cause and Findings

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

The failure of the pilot to identify poor engine performance during the engine run-up before takeoff. Also causal to the accident was the mistimed right magneto and the poor condition of the spark plugs in the No. 4 cylinder.

Findings

Aircraft	Magneto/distributor - Damaged/degraded
Aircraft	Spark plugs/igniters - Damaged/degraded
Personnel issues	Decision making/judgment - Pilot
Personnel issues	(general) - Pilot
Personnel issues	Incorrect action performance - Pilot

Factual Information

History of Flight

Standing	Aircraft inspection event
Takeoff	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Landing-flare/touchdown	Collision with terr/obj (non-CFIT)

On May 22, 2014, about 1330 central daylight time, a Piper J3C-65, N46777, was substantially damaged during a forced landing shortly after takeoff from Hopkinsville-Christian county Airport (HVC), Hopkinsville, Kentucky. The private pilot sustained serious injuries while the passenger sustained minor injuries. The airplane was registered to and operated by a private individual under the provisions of 14 Code of Federal Regulations (CFR) Part 91 personal, local flight Visual meteorological conditions prevailed at the time and no flight plan was filed. The flight originated about 1 minute earlier from HVC.

The pilot stated that the purpose of the flight was to take his son for a local flight. He demonstrated to him a detailed preflight inspection, which included a check of the fuel tank and fuel strainer for contaminants; no sediment or water was detected. He was seated in the front seat and his son was in the rear seat. At that time the airplane had 10 gallons of 100LL fuel. After engine start the airplane was taxied to the approach end of runway 26 where he performed an engine run-up before takeoff. There were no issues identified during the run-up, and he reported that the left magneto drop was 50 rpm and the right magneto drop was 150 rpm. During the run-up he also checked the carburetor heat, and reported that the, "engine ran up just fine."

After the engine run-up he called on the UNICOM and announced his departure from runway 26. With a wind 30 degrees to the right of the nose at 5 to 8 knots, he applied takeoff power and based on his years of experience felt like the engine was developing full power. The airplane became airborne in about the usual time, or just before midfield, and he began climbing out between 40 to 50 miles-per-hour (normal). About 10 to 15 seconds later, when the flight was about 100 feet above ground level (agl) and about ¼ of the runway remaining, he noticed the engine was not developing full power; the tachometer indicated 1,900 rpm. He reported that the engine was not missing but it was not developing full power. He verified that the throttle was full forward, the mixture control was full rich, and the carburetor heat was off. At 1,900 rpm there was just enough power to maintain altitude, but not enough to climb. He initiated a shallow turn intended to try to land on a taxiway but during the turn he lost altitude and abandoned the idea. With a tree line ahead he flew through a gap, and then turned to land on Edward T. Breathitt Pennyrile Parkway; reporting there was no traffic on it.

He maneuvered slightly to avoid a light pole, and during the forced landing attempt, the right wing which was over a guard-rail hit a tree, causing the airplane to be pulled to the right over the guard-rail. He was thrown into the instrument panel and knocked unconscious, but his son who remained conscious turned off the fuel shutoff valve because of fuel leakage, and also pulled him from the wreckage. He confirmed the accident flight was the first flight that day, and with respect to the loss of engine power,

the engine did not react like it had ingested water; there was no spitting or sputtering. He reported flying the airplane for 20 to 25 hours since the last annual inspection was performed in September 2013, and reported no engine issues.

Following recovery of the airplane, it was inspected by a Federal Aviation Administration (FAA) airworthiness inspector. The inspection of the airframe revealed damage to the firewall and fuselage structure aft of the landing gear. The engine, a Continental A-75-8 was removed from the airframe to facilitate an inspection, which revealed no obstructions of the air induction or exhaust system components. Inspection of the carburetor revealed the bowl contained fuel and the accelerator pump worked satisfactory; the inlet screen was clean. Crankshaft, camshaft, and valve train continuity was confirmed during hand rotation of the propeller which remained attached to the crankshaft flange. Suction and compression was noted in all cylinders during hand rotation of the propeller. During removal of the top spark plugs for the compression test they were found to be snug but not torqued properly, and several gaskets were missing. Testing of the spark plugs at 80 psi using a spark plug tester was performed. The top and bottom plugs of cylinder Nos. 1, 2, and 3 tested satisfactory; however, the top and bottom plugs of the No. 4 cylinder tested weak and had no spark, respectively. Additionally, the ceramic of one of the No. 2 cylinder plugs was shipped in several places. A copy of the FAA inspector statement is contained in the NTSB public docket.

A review of the maintenance records revealed the engine was overhauled and converted in November 1967, from a Continental A-65-8 to a Continental A-75-8 engine; the logbook entry does not specify the approving authority. The airplane was also equipped with a McCauley 1A100 CM7147 fixed pitch propeller. Excerpts of the engine logbook are contained in the NTSB public docket.

Supplemental Type Certificate (STC) SA00270BO authorizes installation of a Continental A-75-8 engine with a McCauley 1A90 or 1B90 propeller. The STC is contained in the NTSB public docket.

The FAA airworthiness inspector contacted the FAA Boston Aircraft Certification Office (Boston ACO), and was informed there is no approved paperwork to allow an A-75-8 engine and a McCauley 1A100 propeller combination.

The airplane owner's manual for a J3C-65 indicates the magneto drop should not exceed 75 rpm. An excerpt from the owner's manual is contained in the NTSB public docket.

A review of FAA Special Airworthiness Information Bulletin (SAIB) titled Carburetor Icing Prevention, revealed that based on the temperature (86 degrees Fahrenheit) and dew point (72 degrees Fahrenheit) reported at facility approximately 11 miles away, the conditions were favorable for serious icing at glide power. The SAIB is contained in the NTSB public docket.

Pilot Information

Certificate:	Private	**Age:**	58
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Front
Other Aircraft Rating(s):	None	**Restraint Used:**	Lap only
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 17, 2013
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 5, 2012
Flight Time:	2985 hours (Total, all aircraft), 1645 hours (Total, this make and model), 2732 hours (Pilot In Command, all aircraft), 11 hours (Last 90 days, all aircraft), 3 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N46777
Model/Series:	J3C - 65	**Aircraft Category:**	Airplane
Year of Manufacture:	1943	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	10485
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	September 10, 2013 Annual	**Certified Max Gross Wt.:**	1220 lbs
Time Since Last Inspection:	22 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	4304.9 Hrs as of last inspection	**Engine Manufacturer:**	CONT MOTOR
ELT:	Not installed	**Engine Model/Series:**	A-75-8
Registered Owner:	CREED MICHAEL L	**Rated Power:**	75 Horsepower
Operator:	CREED MICHAEL L	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	HOP,571 ft msl	**Distance from Accident Site:**	11 Nautical Miles
Observation Time:	13:58 Local	**Direction from Accident Site:**	185°
Lowest Cloud Condition:	Few / 3600 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	11 knots / 18 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.05 inches Hg	**Temperature/Dew Point:**	30°C / 22°C
Precipitation and Obscuration:	In the vicinity - None -		
Departure Point:	Hopkinsville, KY (HVC)	**Type of Flight Plan Filed:**	None
Destination:	Hopkinsville, KY (HVC)	**Type of Clearance:**	None
Departure Time:	13:29 Local	**Type of Airspace:**	

Airport Information

Airport:	Hopkinsville-Christian County HVC	**Runway Surface Type:**	Asphalt
Airport Elevation:	564 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	26	**IFR Approach:**	None
Runway Length/Width:	5505 ft / 100 ft	**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Serious	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 1 Minor	**Latitude, Longitude:**	36.854721,-87.468887(est)

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Fred Seals; FAA FSDO; Louisville, KY
Original Publish Date:	February 11, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=89253