



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

Aviation Investigation Final Report

Location:	Zanesville, Ohio	Accident Number:	CEN18LA284
Date & Time:	July 19, 2018, 16:00 Local	Registration:	N23JH
Aircraft:	Toomey Quickie	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (partial)	Injuries:	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The commercial pilot departed in the experimental, amateur-built airplane for a local photography flight. During the return flight, the engine power dropped more than 1,000 rpm, and the engine monitor indicated about twice the normal fuel flow. The pilot was initially able to maintain airspeed and altitude; however, the rpm subsequently began to decrease further, and the pilot determined that the airplane would not be able to reach the airport. During the subsequent forced landing in a cornfield, the airplane's nose struck the ground, and the airplane then nosed over.

Examination of the wreckage revealed a separation of the right exhaust manifold, which was directly beneath the intake breather for the engine. Additionally, a mixture set screw on the carburetor was found loose and extended out, both of which would have resulted in a loss of rpm. Although the weather conditions were conducive to carburetor icing at descent power, the failed exhaust manifold and loose mixture screw likely led to the loss of engine power.

Probable Cause and Findings

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

The failure of the exhaust manifold and a loose mixture screw, which resulted in a partial loss of engine power.

Findings

Aircraft	(general) - Failure
Aircraft	Fuel control/carburetor - Malfunction
Environmental issues	Rough terrain - Contributed to outcome

Factual Information

History of Flight

Enroute	Loss of engine power (partial) (Defining event)
Emergency descent	Off-field or emergency landing
Landing	Nose over/nose down

On July 19, 2018, about 1600 eastern daylight time, a Toomie Quickie airplane, N23JH, impacted high vegetation, nosed over, and impacted terrain near Zanesville, Ohio, during a forced landing following an inflight loss of engine power. The commercial pilot was uninjured. The airplane sustained substantial canard and fuselage damage during the nose over. The airplane was registered to and operated by the pilot as a Title 14 *Code of Federal Regulations* Part 91 personal flight. Day visual meteorological conditions prevailed in the area about the time of the accident, and the flight was not operated on a flight plan. The flight originated from the Zanesville Municipal Airport (ZZV), near Zanesville, Ohio, about 1530.

According to the pilot, the airplane was not equipped with an electric starter and required the pilot to start the engine by rotating the propeller by hand. Additionally, the airplane required an electrical charge to operate the spark plugs' igniter as opposed to a spark from an engine driven magneto. The day before the accident flight, the airplane was grounded due to a dead battery. The pilot charged the battery with jumper cables and was able to start the airplane. However, the pilot subsequently installed a new battery and found it produced 13-14 volts versus the previous battery's 8.5-9.5 volts. The pilot cycled the engine through an engine run and departed from the Butler County Regional Airport-Hogan Field, near Hamilton, Ohio, and landed at ZZV about 1300.

The pilot discussed the intended photo mission with the flightcrew of the chase airplane. They decided that the pilot would position the airplane off the chase airplane's right wing north of the airport over an area where the terrain of rolling hills and wooded areas would provide the best backdrop for a northbound photo run. The photo mission was anticipated to take about 30 minutes to complete.

The pilot performed a quick preflight inspection, started the airplane, departed ZZV on runway 16, and performed a climbing left turnout to head north. Upon reaching 2,500 ft, about 1,500 ft above ground level (agl), he joined up with the chase airplane. Up to this point in the flight, there were no malfunctions and the pilot was able to keep the airplane in formation with the chase airplane.

The pilot signaled the end of the flight with a "rudder wag" and both airplanes headed back to ZZV. During the return flight, approximately 4 miles north of the airport, the airplane engine power dropped in excess of 1,000 rpm and its engine monitor indicated about twice the normal fuel flow. The pilot was able to maintain airspeed and altitude. He announced that the airplane was having engine trouble and was planning a straight-in landing.

The rpm subsequently began to decrease even further, about 20 rpm per second. The pilot determined that the airplane would not be able to make the airport. The pilot saw unsuitable terrain to the airplane's

right, and to the left, a dogleg road pointed into the wind with fields beyond it. He announced his intentions over the ZZV unicom frequency, and began a descending right turn down toward the road. The pilot stated that when he lined the airplane up with the road, it had excess airspeed and that he knew he could not stop the airplane in time. He observed signs at the turn of this road and elected to fly over them. But, there were cornfields on the other side of the signs. The pilot reduced the power to idle and flew above the top of the corn, bleeding off as much airspeed as possible before "dropping in" the cornfield. The airplane's nose struck the ground and the "momentum and angle of the crash caused the tail of the aircraft to gently continue over before coming to rest upside down."

The pilot reported that even though the canopy had shattered during the impact, he, after unhooking from the harness, was unable to get out of the inverted wreckage. Fuel began to leak from the vent on the fuel tank filler cap and he "secured" the airplane. The pilot subsequently used his mobile phone's voice calling feature to call the chase airplane pilot and 9-1-1. The 9-1-1 call lasted about 30 minutes and the operator stayed on the line until the first responders were able to locate the pilot.

The accident airplane had a condition inspection completed on July 4, 2018. During the inspection, a cracked exhaust manifold was welded back together and reinstalled.

At 1553, the recorded weather at ZZV was wind 110° at 7 knots; visibility 10 statute miles; sky condition clear; temperature 28° C; dew point 13° C; altimeter 30.03 inches of mercury. The temperature and dew point present were favorable for the formation of serious carburetor icing at a descent power setting.

A Federal Aviation Administration Inspector examined the wreckage. The inspector observed a separation of the right-hand exhaust manifold which was directly beneath the intake breather for the engine. He also found the mixture set screw on the carburetor was very loose against the spring and was extended out. The cowling exhibited an impact mark in the location of the mixture screw.

The pilot's safety recommendation stated, "I was planning on installing stronger exhaust manifolds after the summer season because I wanted to take the aircraft to Oshkosh. I should have grounded the airplane when this same exhaust manifold broke previously."

Pilot Information

Certificate:	Commercial	Age:	24, Male
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Single
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 Without waivers/limitations	Last FAA Medical Exam:	March 16, 2018
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	March 30, 2018
Flight Time:	586 hours (Total, all aircraft), 45 hours (Total, this make and model), 430 hours (Pilot In Command, all aircraft), 46 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Toomey	Registration:	N23JH
Model/Series:	Quickie	Aircraft Category:	Airplane
Year of Manufacture:	2013	Amateur Built:	Yes
Airworthiness Certificate:	Experimental (Special)	Serial Number:	003
Landing Gear Type:	Tailwheel	Seats:	1
Date/Type of Last Inspection:	July 4, 2018 Condition	Certified Max Gross Wt.:	640 lbs
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	99.4 Hrs at time of accident	Engine Manufacturer:	Onan
ELT:	Not installed	Engine Model/Series:	
Registered Owner:		Rated Power:	18 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KZZV, 880 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	15:53 Local	Direction from Accident Site:	187°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	7 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.03 inches Hg	Temperature/Dew Point:	28°C / 13°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Zanesville, OH (ZZV)	Type of Flight Plan Filed:	None
Destination:	Zanesville, OH (ZZV)	Type of Clearance:	None
Departure Time:	15:30 Local	Type of Airspace:	Class E

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 None	Latitude, Longitude:	39.988609,-81.884719(est)

Administrative Information

Investigator In Charge (IIC):	Malinowski, Edward
Additional Participating Persons:	Paul Gillenwater; Federal Aviation Administration; Columbus, OH
Original Publish Date:	November 6, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=97846

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