Aviation Investigation Final Report

Location:	Mount Pleasant, Tennessee	**Accident Number:**	ERA18LA241
Date & Time:	September 1, 2018, 17:15 Local	**Registration:**	N388MA
Aircraft:	Diamond DA40	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The private pilot reported that, while on a downwind leg of the airport traffic pattern, he reduced the engine power to prepare for landing; however, the engine lost total power. The pilot then advanced the throttle in an unsuccessful attempt to regain power. He subsequently attempted an engine restart to no avail and, at that time, realized that the airplane would not be able to glide to the runway. The pilot performed a forced landing to a field about 1 mile short of the runway threshold, which resulted in substantial damage to the landing gear and empennage. Postaccident examination of the airplane revealed that sufficient fuel remained in the left fuel tank and that the fuel selector was found positioned to the left fuel tank; sufficient fuel also remained in the right fuel tank. Further examination of the engine, fuel system, and ignition system did not reveal any evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation. Although fuel unporting is possible with the amount of fuel that was available in the left tank, it was unlikely based on the airplane's attitude around the time of the loss of engine power. Thus, 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 examination of the airplane did not reveal any evidence of preimpact mechanical malfunctions or failures that would have precluded normal operation.

Findings

Not determined	(general) - Unknown/Not determined

Factual Information

History of Flight

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

On September 1, 2018, about 1715 central daylight time, a Diamond Aircraft DA 40, N388MA, operated by the private pilot, was substantially damaged during a forced landing to a field, following a total loss of engine power during approach to Maury County Airport (MRC), Mount Pleasant, Tennessee. The private pilot incurred minor injuries. The personal flight was conducted under the provisions of Title 14 *Code of Federal Regulations* Part 91. Visual meteorological conditions prevailed and no flight plan was filed for the local flight that departed MRC about 1615.

The pilot reported that after flying over the local area for approximately 40 minutes, he returned to MRC and entered the airport traffic pattern for landing on runway 6. While on a downwind leg of the airport traffic pattern, he reduced the engine power in preparation for landing; however, the engine lost all power. The pilot then advanced the throttle in unsuccessful attempt to regain power. He subsequently attempted an engine restart with no success and at that time realized that the airplane would not be able to glide to the runway. The pilot then performed a forced landing to a field about 1 mile prior to the runway 6 threshold.

Examination of the wreckage by a Federal Aviation Administration inspector revealed that during the landing, the nose landing gear and left main landing gear collapsed, and the empennage separated from the airframe. The inspector added that although there was some damage to the wings, though their respective fuel tank remained intact. He drained approximately 4 gallons of fuel from the left fuel tank and 10 to 11 gallons of fuel from the right fuel tank. The fuel was 100-low-lead aviation fuel and appeared bright, clear, and absent of any visible contamination. Additionally, the fuel selector was found positioned to the left fuel tank prior to being moved to the off position by rescue personnel.

The inspector further examined the wreckage following its recovery to a storage facility. He was able to rotate the engine's crankshaft by hand and confirm crankshaft, camshaft, and valve train continuity to the rear accessory section of the engine. The engine had sat for almost 10 months and thumb compression was not attained on three of the four cylinders; however, a borescope examination of the cylinders did not reveal any anomalies. The mechanical fuel pump and magnetos tested satisfactorily. Air was blown through the fuel lines and no blockages were observed. No anomalies were noted with the fuel servo and it contained residual fuel. Its filter was absent of debris and the oil filter was absent of metallic contamination.

The four-seat, low-wing, fixed tricycle-gear airplane, was manufactured in 2005. It was powered by a Lycoming IO-360-M1A, 180-horsepower engine, equipped with a constant-speed, two-blade Hartzell propeller. The airplane's most recent annual inspection was completed on January 9, 2018. At that time,

the airframe and engine had accrued 1,346 hours since new. The airplane flew an additional 40 hours from the time of the most recent inspection, until the accident. Review of a make and model airplane flight manual revealed that the left and right fuel tank each held 20.6 gallons of fuel, with .5 gallon unusable in each tank. According to a representative from the aircraft manufacturer, fuel unporting is possible with 4 to 6 gallons remaining in a fuel tank; however, it's more probable if the airplane is in a bank greater than a 45° angle.

Pilot Information

Certificate:	Private	**Age:**	60,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 3 With waivers/limitations	**Last FAA Medical Exam:**	November 29, 2016
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	August 3, 2018
Flight Time:	121 hours (Total, all aircraft), 100 hours (Total, this make and model), 61 hours (Pilot In Command, all aircraft), 24 hours (Last 90 days, all aircraft), 10 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Diamond	**Registration:**	N388MA
Model/Series:	DA40 UNDESIGNAT	**Aircraft Category:**	Airplane
Year of Manufacture:	2005	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	40.522
Landing Gear Type:	Tricycle	**Seats:**	4
Date/Type of Last Inspection:	January 9, 2018 Annual	**Certified Max Gross Wt.:**	2535 lbs
Time Since Last Inspection:	40 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1386 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, activated, did not aid in locating accident	**Engine Model/Series:**	IO-360-M1A
Registered Owner:		**Rated Power:**	180 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:	MRC,681 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	17:15 Local	**Direction from Accident Site:**	60°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.07 inches Hg	**Temperature/Dew Point:**	31°C / 20°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Mount Pleasant, TN (MRC)	**Type of Flight Plan Filed:**	None
Destination:	Mount Pleasant, TN (MRC)	**Type of Clearance:**	None
Departure Time:	16:15 Local	**Type of Airspace:**	

Airport Information

Airport:	Maury County Airport MRC	**Runway Surface Type:**	Asphalt
Airport Elevation:	681 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	06	**IFR Approach:**	None
Runway Length/Width:	6000 ft / 100 ft	**VFR Approach/Landing:**	Forced landing;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Minor	**Latitude, Longitude:**	35.550277,-87.206665(est)

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	James Ruckman; FAA/FSDO; Nashville, TN
Original Publish Date:	November 19, 2019
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=98219