



# Aviation Investigation Final Report

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<b>Location:</b>	Guntersville, Alabama	<b>Accident Number:</b>	ERA13LA407
<b>Date &amp; Time:</b>	September 8, 2013, 16:56 Local	<b>Registration:</b>	N8362C
<b>Aircraft:</b>	Piper PA-32R-300	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>	Loss of engine power (total)	<b>Injuries:</b>	2 Minor
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

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## Analysis

The pilot reported that, about 3 to 4 nautical miles east-northeast of the nearest airport, the engine suddenly quit. GPS data indicate that the airplane was about 4,300 ft about that time. The pilot's attempts to restore power were unsuccessful. The pilot stated that he turned the airplane right toward the airport, and that, as he neared it, he announced his intention to land. While on approach, about 1/2 to 3/4 mile from the intended runway and with the flaps retracted, he allowed the airplane to slow to the point that the landing gear autoextend system caused the landing gear to extend, which he had not planned to do. He continued toward the runway, and the airplane touched down in water about 100 yards from the approach end of the intended runway. The pilot stated that, if the landing gear had not extended automatically, he believed that he could have reached land. Although the pilot reported that he turned toward the airport after the power loss, GPS data indicated that he actually flew west of the extended runway centerline and then maneuvered toward the airport. Based on data from the best glide chart in the Pilot's Operating Handbook, if the pilot had proceeded on a more direct course to the airport after the engine power loss or had not allowed the landing gear to automatically extend while on short final, the airplane likely would have been able to reach the intended runway.

Postrecovery examination of the engine revealed that the single-drive dual magneto was separated from the accessory case because the lower attachment hardware had lost its clamping force and that the upper flange of the magneto had fractured due to fatigue cracking. Examination also revealed that the magneto was not installed in accordance with an engine manufacturer's service instruction—an incorrect gasket, washer, and clamp were used—all of which contributed to the separation of the magneto. Although compliance with service instructions is not mandatory for Part 91 operators, if the instructions had been complied with the last time the magneto was serviced, it is likely that it would not have separated despite the fact that the airplane had not undergone an annual inspection in over 2 1/2 years and, therefore, was unairworthy at the time of the accident.

## Probable Cause and Findings

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

The improper installation of the engine magneto by unknown maintenance personnel, which resulted in the magneto separating from the engine and a subsequent total loss of engine power. Contributing to the accident was the pilot's delay in proceeding directly to the nearest airport and his failure to prevent the automatic extension of the landing gear following the total loss of engine power, which resulted in a landing undershoot.

### Findings

<b>Aircraft</b>	Magneto/distributor - Incorrect service/maintenance
<b>Personnel issues</b>	Installation - Maintenance personnel
<b>Personnel issues</b>	Delayed action - Pilot
<b>Aircraft</b>	Gear extension and retract sys - Incorrect use/operation
<b>Aircraft</b>	Descent/approach/glide path - Not attained/maintained
<b>Personnel issues</b>	Scheduled/routine inspection - Pilot

## Factual Information

### History of Flight

<b>Prior to flight</b>	Aircraft maintenance event
<b>Enroute-cruise</b>	Loss of engine power (total) (Defining event)
<b>Emergency descent</b>	Off-field or emergency landing
<b>Landing-flare/touchdown</b>	Ditching

On September 8, 2013, about 1656 central daylight time, a Piper PA-32R-300, N8362C, registered to and operated by a private individual, was substantially damaged during a forced landing in a lake short of a runway at Guntersville Municipal Airport-Joe Starnes Field (8A1), Guntersville, Alabama. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 personal, local flight from Northeast Alabama Regional Airport (GAD), Gadsden, Alabama. The airplane sustained substantial damage and the private pilot and 1 passenger sustained minor injuries. The flight originated about 1609 from GAD.

The pilot stated that before departure he performed a preflight inspection of the airplane which included checking the fuel tanks and low point of the fuel system for contaminants; none were found. The flight departed with about 20 gallons fuel in each wing fuel tank and the fuel selector positioned to the left tank. After departure he flew over the passenger's house then flew North to Guntersville, then flew over the lake. Because of haze, he decided to return to GAD. About 40 to 45 minutes into the flight, he switched the fuel selector to the right tank. The flight continued and about 15 minutes after switching tanks, the engine quit suddenly; there was no sputtering and the propeller continued to rotate. Immediately before the loss of power the airplane was flying at 3,800 feet, and the engine was set to 2,250 to 2,300 rpm, the manifold pressure was between 22 and 23 inches, and the mixture was leaned 75 degrees rich of peak, consuming approximately 15 gallons-per-hour. He glanced at the fuel pressure and it was still in the normal range. At that point he was flying in a southerly direction and was 3 to 4 miles northeast of 8A1. He turned to the right to fly to 8A1, and immediately switched tanks, and turned on the auxiliary fuel pump, but engine power was not restored. He pitched to maintain 120 miles-per-hour (mph) and continued towards 8A1. He switched tanks 3 to 4 times in an effort to restore engine power but with no effect.

When near 8A1, he called in on the common traffic advisory frequency and advised he would be attempting an emergency landing. The winds favored runway 21, and while on approach to that runway with the flaps retracted, the airplane was slowed to the point that the auto extend system caused the landing gear to extend. He estimated the flight was about  $\frac{1}{2}$  to  $\frac{3}{4}$  mile from the approach end of runway 21 at that time. Unable to reach the runway, he landed the airplane in the water about 100 yards from land. The airspeed at touchdown was 70 mph, and the airplane did not go inverted at touchdown. The airplane came to rest in 3 to 4 feet of water north of the airport; the left wing spars were fractured and the wing remained connected by flight control cables. He further stated that if the landing gear had not extended automatically when it did, which he was not planning for, he felt he could have landed on land.

Following recovery of the airplane, inspection of the airplane and engine was performed by a Federal Aviation Administration (FAA) airworthiness inspector. Following removal of the engine cowling, the single drive dual magneto was found separated from the engine accessory case, but remained attached by the ignition harness. The lower magneto securing hardware was not attached to the stud and was not located; the threads of the stud were not damaged. Inspection of the upper magneto securing stud revealed a portion of the magneto flange remained secured under the clamp, which remained secured to the stud by a flat washer, internal lock washer, and nut. The upper stud securing hardware was retained, and the magneto was removed from the engine compartment, air dried, and found to operate normally during operational testing. cursory inspection of the magneto revealed a portion of flange was fractured. Further inspection of the engine revealed crankshaft, camshaft, and valve train continuity was confirmed, along with compression and suction in each cylinder during hand rotation of the crankshaft. Inspection of the fuel system components of the engine revealed the servo fuel injector and manifold valve contained fuel. No other engine abnormalities were noted. The magneto and upper securing hardware were retained and sent to the NTSB Materials Laboratory located in Washington, D.C.

Inspection of the airframe by the FAA inspector revealed fuel was present in both fuel cells. Continuity of the fuel system was demonstrated by application of compressed air through the fuel lines at each wing attach; no obstructions were noted and normal function was noted on both sides. An oil sheen was noted on the exterior bottom fuselage skin. The on-board GPS receiver was retained and sent to the NTSB Vehicle Recorder Division located in Washington, D.C.

According to the NTSB Vehicle Recorder Division GPS Factual Report, power was applied to the unit and it started normally. Data was downloaded from the unit without difficulty using Garmin supplied software; the first data point was at 1601:35, while the last data point was at 1655:47. Plotting of the data revealed that after takeoff, the flight proceeded south-southeast of GAD, then proceeded in a northerly direction and when near 8A1, flew northeast of there. The groundspeed remained about the same value from takeoff until 1652:33, where at that time the airplane was located about 3.2 nautical miles and 076 degrees from the approach end of runway 21 at 8A1. Between 1652:33 and 1652:45, the ground speed slowed from 142 to 117 knots, and the aircraft altitude decrease from 4,354 to 4,262 feet. The airplane proceeded in a northwesterly direction flying west of the extended runway centerline of runway 21 at 8A1, and after some maneuvering, proceeded onto a straight in approach for runway 21. At about 1655:14, until the end of the recorded data at 1655:47, the airplane proceeded on a southwesterly heading, and the ground speed slowed from 86 to 68 knots. At the last data point, the airplane was located approximately 754 feet and 023 degrees from the approach end of runway 21. A copy of the NTSB Vehicle Recorder Division GPS Factual Report and the tabular data are contained in the NTSB public docket.

According to the NTSB Materials Laboratory Factual Report, examination of the upper securing hardware revealed wear patterns corresponding to the teeth of the lock washer were observed on the faces of the nut and the flat washer. The clamp had more pointed corners, and had no step feature on the face that clamped to the accessory housing. The remains of a gasket was measured and found to be 0.034 inch thick, while the thickness of the correct gasket is specified to be 0.015 inch new, and when installed and clamped should have a thickness of approximately 0.010 inch. The lower flange of the magneto was inspected and found to exhibit wear at the clamping face of the attachment flange and the adjacent surface. Inspection of the fractured piece of flange revealed concentric crack arrest lines consistent with fatigue fracture emanated from an origin area near the middle of the fractured piece. A copy of the NTSB Materials Laboratory Factual Report is contained in the NTSB public docket.

Lycoming Service Instruction No. 1508C, dated February 10, 2011, describes the attachment of magnetos on all Lycoming engines with dual magnetos. The correct parts for attaching the magneto as described in SI 1508C are a nut part number (P/N) STD-1410, lock washer P/N STD-475), magneto clamp P/N 66M19385), and magneto gasket P/N LW-12681). Lycoming SI 1508C states that compliance with SI 1508C is mandatory and that failure to comply can cause loss of engine power, although compliance is not mandatory for 14 CFR Part 91 operators. The time of compliance as stated in SI 1508C is at the next oil change, not to exceed 50 hours of engine operation or at each magneto timing check or service. A copy of the service instruction is contained in the NTSB public docket.

According to the Pilot's Operating Handbook (POH), in the event of a "Power Off Landing" for this airplane equipped with a backup gear extender, the procedures call to lock the emergency gear lever in Override Engaged position before the airspeed drops to 122 miles-per-hour (mph) indicated airspeed to prevent landing gear from inadvertently free falling. The same section also indicates to trim to maintain 106 mph, indicates the flaps are retracted, and to locate a suitable field. The best glide chart indicates that based on the temperature (31 degrees Celsius), and altimeter setting of 29.98 inches of Mercury, the approximate glide distance from the approximate altitude when the engine quit (4240 feet pressure altitude) to the runway elevation (600 feet pressure altitude), would have resulted in a glide range of approximately 5 nautical miles. Excerpts of the POH are contained in the NTSB public docket.

A review of the maintenance records revealed the last annual inspection was signed off on February 18, 2011. The airplane total time at that time was recorded to be 5,156.49 hours. The airplane total time at the time of the accident was recorded to be 5,176.26 hours. An excerpt from the maintenance records is contained in the NTSB public docket.

A review of 14 CFR Part 91.409, revealed no person may operate an aircraft unless within the preceding 12 calendar months, it has had an annual inspection in accordance with 14 CFR Part 43, and has been approved for return to service.

## Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	48
<b>Airplane Rating(s):</b>	Single-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Lap only
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 3 None	<b>Last FAA Medical Exam:</b>	June 23, 2011
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	February 1, 2011
<b>Flight Time:</b>	595 hours (Total, all aircraft), 230 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Piper	<b>Registration:</b>	N8362C
<b>Model/Series:</b>	PA-32R-300	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	32R-7680099
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	6
<b>Date/Type of Last Inspection:</b>	February 18, 2011 Annual	<b>Certified Max Gross Wt.:</b>	3600 lbs
<b>Time Since Last Inspection:</b>	20 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	5156 Hrs as of last inspection	<b>Engine Manufacturer:</b>	LYCOMING
<b>ELT:</b>	C91A installed, not activated	<b>Engine Model/Series:</b>	TIO-540-K1A5D
<b>Registered Owner:</b>	BONDS THOMAS P	<b>Rated Power:</b>	300 Horsepower
<b>Operator:</b>	BONDS THOMAS P	<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	8A0,1032 ft msl	<b>Distance from Accident Site:</b>	10 Nautical Miles
<b>Observation Time:</b>	16:55 Local	<b>Direction from Accident Site:</b>	176°
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	3 knots /	<b>Turbulence Type Forecast/Actual:</b>	/ None
<b>Wind Direction:</b>	290°	<b>Turbulence Severity Forecast/Actual:</b>	/ N/A
<b>Altimeter Setting:</b>	29.97 inches Hg	<b>Temperature/Dew Point:</b>	31°C / 18°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Gadsden, AL (GAD )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	Gadsden, AL (GAD )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	16:09 Local	<b>Type of Airspace:</b>	

## Airport Information

<b>Airport:</b>	Guntersville Municipal 8A1	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	615 ft msl	<b>Runway Surface Condition:</b>	Unknown
<b>Runway Used:</b>	21	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	3368 ft / 95 ft	<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 Minor	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>	1 Minor	<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	2 Minor	<b>Latitude, Longitude:</b>	34.404445,-86.267219(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Monville, Timothy
<b>Additional Participating Persons:</b>	Clay Perkins; FAA/FSDO; Birmingham, AL
<b>Original Publish Date:</b>	June 9, 2015
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	The NTSB did not travel to the scene of this accident.
<b>Investigation Docket:</b>	<a href="https://data.nts.gov/Docket?ProjectID=88012">https://data.nts.gov/Docket?ProjectID=88012</a>

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)). A factual report that may be admissible under 49 *United States Code* section 1154(b) is available [here](#).