Aviation Investigation Final Report

Location:	Macon, Georgia	**Accident Number:**	ERA13FA256
Date & Time:	May 27, 2013, 18:05 Local	**Registration:**	N4489F
Aircraft:	Piper PA-32R-300	**Aircraft Damage:**	Destroyed
Defining Event:	Powerplant sys/comp malf/fail	**Injuries:**	2 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

A review of air traffic control information revealed that, during the cross-county flight, the pilot requested clearance for a precautionary landing at a nearby airport due to a low oil pressure indication. Shortly after the flight was cleared for landing, the pilot reported that the engine had lost total power. The pilot advised the air traffic controller that he could not make it to the airport and requested to land at a military base that was closer to his current position. The pilot was cleared to land at the military base; however, he never established radio contact with the military base tower. The airplane crashed about 0.8 mile northeast of the base in a heavily wooded swamp, and a postcrash fire ensued.

An examination of the engine revealed that the crankcase was fractured in the areas of the Nos. 4, 5, and 6 cylinders, that the camshaft was fractured, and that the Nos. 4, 5, and 6 connecting rods were separated from the crankshaft. The Nos. 1 and 2 connecting rod bearings and the Nos. 2 and 3 main bearings exhibited wiping, scoring, and extrusion signatures consistent with oil starvation. Although review of maintenance records revealed that Federal Aviation Administration airworthiness directives for the replacement of the oil cooler hose and the oil filter converter plate gasket were not accomplished, extensive postcrash fire and heat damage to the engine components precluded a determination of the cause of the oil starvation.

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 due to oil starvation for reasons that could not be determined due to extensive postcrash fire and heat damage to the engine components.

Findings

Aircraft	Pressure - Malfunction
Aircraft	Recip eng oil sys - Failure
Environmental issues	Rough terrain - Contributed to outcome
Aircraft	Recip eng oil sys - Not serviced/maintained
Aircraft	Oil - Fluid level

Factual Information

History of Flight

Emergency descent	Powerplant sys/comp malf/fail (Defining event)
Emergency descent	Loss of engine power (total)
Emergency descent	Collision with terr/obj (non-CFIT)

HISTORY OF FLIGHT

On May 27, 2013, about 1805 eastern daylight time, a Piper PA-32R-300, N4489F, was destroyed following a collision with terrain while on approach to the Middle Georgia Regional Airport (MCN), Macon, Georgia. The airline transport pilot and pilot-rated passenger were fatally injured. The airplane was registered to a corporation and was operated by the pilot under the provisions of 14 Code of Federal Regulations Part 91 as a personal flight. Visual meteorological conditions prevailed and an instrument flight rules flight plan was filed for the flight that departed Apalachicola Regional Airport (AAF), Apalachicola, Florida, destined for Greenville Downtown Airport (GMU), Greenville, South Carolina.

A review of the Federal Aviation Administration (FAA) air traffic control (ATC) transcription revealed that the pilot requested to make a precautionary landing at MCN due to a low oil pressure indication. The controller issued a clearance to MCN airport, assigned a 360 degree heading for a modified left base for a visual approach (VA) to runway 23 and cleared the aircraft to 3,000 feet. The controller advised the pilot to expect a VA to runway 23 and issued both the wind and altimeter settings. Personnel at Robins Air Force Base (WRB), Warner Robins, Georgia, were also advised of the airplane's position and the request to transition WRB airspace for landing at MCN, which was approved. After the pilot reported MCN in sight and as the flight was approximately 5 miles south of MCN, the controller cleared pilot for the VA to runway 23. Before switching the aircraft to MCN tower, the controller offered further assistance, to which the pilot replied, "not at this time."

On initial contact with MCN, the pilot advised that his engine had lost all power and he was not going to make it to runway 23. The MCN local controller (LC) offered runway 31 for a straight in approach; however, the pilot requested landing on runway 15 at WRB. The MCN LC coordinated with WRB and advised the pilot to contact WRB tower. The pilot never established communication with WRB and the airplane crashed approximately 0.8 mile northeast of WRB, which was 3 miles southeast of MCN. Smoke was seen from WRB tower and verified by an airborne aircraft that was in the vicinity of the accident airplane.

PERSONNEL INFORMATION

The pilot, age 58, held an airline transport pilot certificate for airplane single-engine land, airplane multiengine land, and instrument airplane ratings; flight instructor, airplane single engine with a rating for instrument airplane. The pilot reported his total flight experience as 10,050 hours, including 120 hours in last six months on his FAA medical certificate application, dated August 17, 2004. At that time,

the pilot was issued a second class limited medical certificate with waivers for corrective lenses. The pilot's flight logbook was not available for review.

AIRCRAFT INFORMATION

The four-seat, low-wing airplane, serial number 32R-7680452, was manufactured in 1976. It was powered by a Lycoming model IO-540-K1G5D, 300-hp engine equipped with Hartzell HC-C3AYR-1RF three bladed propeller. A review of copies of maintenance logbook records showed an annual inspection was completed on August 16, 2012, at a recorded engine tachometer time of 1750.7 hours and a total airframe time of 5917.8 hours. A review of FAA Airworthiness Directive (AD) compliance records revealed that AD 95-26-13, oil cooler hose replacement, was complied with on May 11, 2006, and on the last annual inspection that was complied with, this AD was 354.3 hours overdue and not accomplished. Upon further review of the engine overhaul AD compliance log, it revealed that AD 02-12-07, oil filter converter plate gasket, was complied with on April 22, 2002. The AD was not effective until July 03, 2002, and the engine overhaul log did not show that this AD was accomplished at that time and there was no record in any log book showing that it was accomplished.

METEOROLOGICAL INFORMATION

The recorded weather at the WRB, at an elevation of 294 feet, revealed that at 1758, conditions included wind from 150 degrees at 4 knots, clear sky, temperature 30 degrees Celsius (C), dew point 17 degrees C, and altimeter setting 30.12 inches of mercury.

WRECKAGE AND IMPACT INFORMATION

The wreckage was located about .8 miles north of the runway 15 threshold, in a heavily wooded swamp. The airplane came to rest upright at the base of a stump, in a flat attitude, on a course of about 275 degrees. The cockpit, forward cabin, and left wing were damaged by a post-crash fire. No tree strikes were observed south of the main wreckage and all flight control surfaces were located within the wreckage area.

An examination of the cockpit section revealed that the rudder pedal assembly separated from the structure and sustained fire damage. Both rudder cable attachment levers were broken from the tube at the weld point. One rudder cable with the attached lever was recovered with the wreckage and the second cable and lever was not located.

The control column assembly separated from the aircraft and was fire damaged. Both control wheel assemblies remained attached to the upper tee bar section. The tee bar assembly sustained impact damage. The aileron chains were not attached to the sprockets. The forward aileron cables and chain assemblies were imbedded within the molten metal of the fire-damaged cockpit. The lower tee bar section separated from the upper bar assembly. Both stabilator cables remained attached to the lower tee bar assembly. Both cables were cut about 2 feet from their attachment points on the bar assembly for recovery.

The fuel selector valve assembly separated from the fuselage structure and sustained fire damage. The fuel bowl was fire damaged and no fuel was present. The valve was observed to be in the right fuel tank position, but was not in its detent.

The nose landing gear assembly remained partially attached to the engine mount assembly. The lower gear assembly separated from the upper strut housing. The position of the nose landing gear could not be determined due to impact and fire damage.

An examination of the left wing revealed that it was separated from the fuselage at the wing root. The wing broke into two sections between the flap and aileron surfaces. The wing sustained post-crash fire damage mainly to the outboard side of the outboard fuel tank out to the tip. The fuel cap remained attached to the outboard fuel tank. The inboard fuel tank separated from the wing and was destroyed by fire. The aileron surface remained attached to the wing by its inboard hinge. No fire damage was noted on the aileron surface. The aileron cables remained attached to the aileron bellcrank assembly. The bellcrank remained attached to the wing and was undamaged. The aileron cables exhibited overload type separation in the wing root area. The flap surface remained attached to the wing. The surface revealed impact damage and the position of the flap could not be determined due to separation of the flap torque tube assembly. The left main landing gear assembly remained attached to the wing and was in the retracted position.

An examination of the right wing revealed that is was separated from the fuselage at the wing root. The wing was partially consumed by the post-crash fire. Both fuel tanks were fire damaged and destroyed. The outboard fuel tank cap remained attached to the tank. The flap surface remained attached to the wing but it sustained impact and fire damage. The position of the flap could not be determined due to separation of the flap torque tube assembly. The aileron surface separated from the wing and was impact damaged. The aileron did not exhibit fire damage. The aileron cables remained attached to the aileron bellcrank assembly. The bellcrank separated from the wing and both arms of the bellcrank were bent. The aileron cables exhibited overload type separation signatures in the wing root area. The right main landing gear remained attached to the wing and was in the retracted position. The gear assembly was fire damaged.

An examination of the empennage section revealed it was separated from the cabin area due to the post-crash fire. The rear empennage was intact and all movable control surfaces remained attached. The left horizontal stabilizer sustained leading edge impact damage on its inboard section. The right horizontal stabilizer tip was bent upwards, outboard of the trim tab. The rudder remained attached to the vertical fin and was impact damaged. The forward vertical fin and fairing sustained impact and fire damage. Both left and right rudder control cables remained attached to the rudder horn. Both stabilator control cables remained attached to the balance weight arm assembly.

An examination of the engine revealed the crankcase was fractured in the areas of the numbers 4, 5, and 6 cylinders. A visual inspection through the case openings showed impact damage to the interior surfaces. The camshaft was fractured in the area above the numbers 5 and 6 cylinders. The numbers 4, 5, and 6 connecting rods were separated from the crankshaft. The numbers 1, 2, and 3 connecting rods remained attached to the crankshaft. The number 3 connecting rod was free to rotate on the crankshaft rod journal. The numbers 1 and 2 rods rotated on the journals and the number 3 rod bearing was unremarkable. The numbers 1 and 2 rod bearings exhibited wiping, scoring and extrusion of the bearing material. The front main crankshaft bearing was unremarkable. The numbers 2 and 3 main bearings exhibited wiping, scoring and extrusion of bearing material. The rear main bearing exhibited wiping, scoring and thermal discoloration. The accessory case was melted on the right side of the oil filter mounting boss. The accessory case and the oil filter mounting plate were sent to the NTSB Materials Laboratory for further evaluation. The hydraulic hose fitting which attached the hose from the right oil

cooler to the accessory case near the oil filter was fractured. The separated portion of the fitting and the hose were sent to the NTSB Materials Laboratory for further evaluation. Material consistent in appearance with portions of connecting rods, rod caps, rod bolts, rod bolt nuts, tappet bodies, bearing material and a camshaft lobe were observed in the oil sump.

Oil was observed inside the engine. About 1 pint was drained from the engine when it was mounted vertically for disassembly. The oil sump was removed and contained a small amount of oil and debris, consistent with bearing material, tappet body material, connecting rod material and a portion of the camshaft. The oil suction screen was almost completely obstructed by metallic debris, both ferrous and non-ferrous. The oil filter paper element was charred and exhibited a smaller amount of metallic debris. The oil coolers remained attached to the rear engine baffling and no breach in the cooler surfaces was identified. The oil cooler hoses exhibited fire damage. Examination of the oil pump revealed the gears were intact and no anomalies were noted.

An examination of the fuel injector servo revealed that it remained attached to the engine and was discolored and fire damaged. The throttle and mixture cables remained attached to the throttle and mixture control arms. The fuel servo inlet screen was removed and no debris was noted.
The fuel manifold flow divider remained attached to the engine and was fire damaged. The rubber diaphragm was deteriorated and partially melted. The one-piece fuel injector nozzles were removed. The nozzle from the number 5 cylinder was obstructed with molten metal debris. The remaining nozzles were unobstructed. The engine driven fuel pump remained attached to the engine and was partially fire damaged. All fuel hoses forward of the fire were fire damaged.

The propeller remained attached to the crankshaft flange and the propeller spinner was crushed. The blades were marked A, B and C to differentiate between the three blades. Blade "A" was bent aft about 5 degrees, about 6 inches outboard of the hub. Blade "B" was curved aft about 10 degrees, about 18 inches outboard of the hub. Blade "C" was curved aft about 90 degrees, about 18 inches outboard of the hub. Blade "C" was fire damaged and partially melted. The propeller governor remained attached to the engine and the control cable remained attached to the governor control arm. The governor was removed and no debris was noted in the governor oil screen.

MEDICAL AND PATHOLOGICAL INFORMATION

An autopsy was performed on the pilot by the Georgia Bureau of Investigation, Decatur, Georgia. The autopsy report noted the manner of death as "multiple blunt trauma."

Toxicological testing was performed on the pilot by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. Review of the toxicology report revealed that no drugs were detected in body cavity blood.

An autopsy was performed on the pilot rated passenger by the Georgia Bureau of Investigation, Decatur, Georgia. The autopsy report noted the manner of death as "multiple blunt trauma."

Toxicological testing was performed on the pilot rated passenger by the FAA Bioaeronautical Science Research Laboratory, Oklahoma City, Oklahoma. Review of the toxicology report revealed that no drugs were detected in body cavity blood.

TEST AND RESEARCH

On June 7, 2013, the accessory case cover with oil filter mounting plate, hose fitting and oil hose were examined at the NTSB Materials Laboratory.

The fitting on the crankcase side of the hose was fractured. A bench binocular microscope examination of the hose revealed the fractured fitting contained a slant fracture that extended completely around the fitting. The fracture face exhibited a rough texture consistent with overstress separation with no evidence of fatigue cracking. An adapter was attached to the fractured fitting. The exposed end of the adapter contained an external thread. The external thread portion was covered with solidified metal. The mating internal threads located on the accessory case and accessory case in the general area of the internal threads was severely deformed from exposure to the post-crash fire. Close examination of the adapter revealed the corner adjacent to the external threads and in the area below the solidified metal contained material exhibiting size and contour consistent with a gasket.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	58
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	3-point
Instrument Rating(s):	Airplane	**Second Pilot Present:**	No
Instructor Rating(s):	Airplane single-engine; Instrument airplane	**Toxicology Performed:**	Yes
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	August 17, 2004
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	
Flight Time:	10050 hours (Total, all aircraft), 10050 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N4489F
Model/Series:	PA-32R-300 32R-768045	**Aircraft Category:**	Airplane
Year of Manufacture:	1976	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	32R-7680452
Landing Gear Type:	Retractable - Tricycle	**Seats:**	7
Date/Type of Last Inspection:	August 16, 2012 Annual	**Certified Max Gross Wt.:**	3600 lbs
Time Since Last Inspection:	354 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5917.8 Hrs as of last inspection	**Engine Manufacturer:**	LYCOMING
ELT:	Installed, not activated	**Engine Model/Series:**	TI0-540 SER
Registered Owner:	FLEBO AIR LLC	**Rated Power:**	310 Horsepower
Operator:	FLEBO AIR LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	WRB,294 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	17:58 Local	**Direction from Accident Site:**	40°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	3 knots /	**Turbulence Type Forecast/Actual:**	/ None
Wind Direction:	180°	**Turbulence Severity Forecast/Actual:**	/ N/A
Altimeter Setting:	30.12 inches Hg	**Temperature/Dew Point:**	30°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Apalachicola, FL (AAF)	**Type of Flight Plan Filed:**	IFR
Destination:	Greenville, SC (GMU)	**Type of Clearance:**	IFR
Departure Time:	16:41 Local	**Type of Airspace:**	

Airport Information

Airport:	Middle Georgia Regional MCN	**Runway Surface Type:**	
Airport Elevation:	354 ft msl	**Runway Surface Condition:**	Rough
Runway Used:		**IFR Approach:**	None
Runway Length/Width:		**VFR Approach/Landing:**	Forced landing

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:	1 Fatal	**Aircraft Fire:**	On-ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Fatal	**Latitude, Longitude:**	32.663887,-83.603057

Administrative Information

Investigator In Charge (IIC):	Alleyne, Eric
Additional Participating Persons:	Micheal A Pupek; FAA/FSDO; Atlanta, GA Micheal Childers; Lycoming Engine; Williamsport, PA Charles R Little; Piper; Chino Hills, CA
Original Publish Date:	April 7, 2015
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87001