



Aviation Investigation Final Report

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| Location: | MINT HILL, North Carolina | Accident Number: | MIA00LA031 |
| Date & Time: | November 28, 1999, 21:00 Local | Registration: | N7145M |
| Aircraft: | Cessna 175-235 | Aircraft Damage: | Substantial |
| Defining Event: | | Injuries: | 2 None |
| Flight Conducted Under: | Part 91: General aviation - Personal | | |

Analysis

Following about 2.5 hours of banner towing in the Washington, DC/Baltimore area, the flight landed at Mitchellville, Maryland, and pumped 21 to 22 gallons of fuel aboard for the return to their home base of Goose Creek Airport, Mint Hill, North Carolina. The landing approach to Goose Creek appeared high, and the PIC decided to go around for a second attempt. As power was being added for the go around, the engine quit and the PIC gave the controls to the SIC/safety pilot, who conducted a forced landing to a vacant field. A total of 5 to 10 gallons was found in the wreckage, and the type certificate data sheets state that 9 gallons is unusable. The engine operated satisfactorily during a factory test cell run.

Probable Cause and Findings

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

The PIC's improper preflight fuel planning and preparation and the PIC's improper en route fuel consumption calculations resulting in a total loss of engine power due to fuel exhaustion and damage to the aircraft during the subsequent forced landing.

Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - NONMECHANICAL
Phase of Operation: GO-AROUND (VFR)

Findings

1. (C) PREFLIGHT PLANNING/PREPARATION - IMPROPER - PILOT IN COMMAND

2. (C) FUEL CONSUMPTION CALCULATIONS - IMPROPER - PILOT IN COMMAND
3. FLUID,FUEL - EXHAUSTION

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: EMERGENCY LANDING

Findings

4. TERRAIN CONDITION - NONE SUITABLE

Factual Information

On November 28, 1999, about 2100 eastern standard time, a Cessna 175, N7145M, registered to a private individual, dba Aerial Sign Advertising, operating as a Title 14 CFR Part 91 personal flight, crashed while attempting a go-around at Goose Creek Airport, Mint Hill, North Carolina. Visual meteorological conditions prevailed and no flight plan was filed. The airplane sustained substantial damage, and the private-rated pilot and a commercially-rated safety pilot/passenger were not injured. The flight originated from Mitchellville, Maryland, about 2 hours 45 minutes before the accident.

According to the pilot-in-command, his landing approach was too high and as he added power in preparation for a go-around maneuver the engine quit. Despite the safety pilot/passenger's taking control and performing the emergency procedures for an airborne engine failure, they were not able to regain engine power. One step that was attempted was to switch the fuel selector from "both" to "left" tank. During the subsequent forced landing, the airplane clipped two high tension wires and landed in a field, collapsing the nose landing gear. The PIC stated that the right tank was empty, and the left tank was between a third and quarter full.

According to the Director of Operations, (DO) for Aerial Sign Advertising, the flight was a return to base after 2.5 hours of aerial sign towing in the Baltimore/Washington, DC area. Prior to the return flight, 20 to 21 gallons of 100LL was pumped aboard N7145M, and was not visually confirmed by the PIC or the safety pilot/passenger. According to the DO, 5 to 10 gallons of fuel was contained in the left tank and the right tank was empty at the wreckage site. Uncontaminated fuel was found in the gascolator, fuel lines, and the carburetor at the wreckage site. Additionally, the DO stated that the airplane had undergone an engine change per STC SA122NW, (Substitution of Teledyne Continental Motors, (TCM) O-470 engine, McCauley propeller, engine mount, cowling, baffles and associated parts for the factory installed GO-300 engine series) and had developed a tendency to "suck out of the right tank" more so than the left tank when the fuel selector was on the "both" position.

According to the FAA inspector who responded to the accident call, the aircraft came to rest upright and the wings sustained impact damage but no fuel tank breaching. The wing tanks contained "trace" fuel in the right tank and "several gallons" in the left tank. The fuel selector was in the "left" position, but the SIC stated he had positioned it there from the "both" position after the engine quit. Field examination of the wreckage revealed good spark at the spark plugs, fuel in the carburetor bowl, and functional engine cockpit controls.

The TCM O-470J engine, serial no. 202206-R, was removed from the wreckage and shipped, with accompanying maintenance records, to the TCM factory for failure analysis. According to the TCM Engine Analysis Report, engine logs revealed that TCM rebuilt the engine

on May 31, 1997, and the engine was subsequently installed on N7145M. With FAA oversight and adjusting for superficial impact damage, the engine was mounted in a test cell, and engine start up was immediate and smooth. After warm up, the engine accelerated smoothly and produced rated power. TCM specifications for magneto checks and jam accelerations were met. The engine exhibited no condition that would have caused an operational problem.

The type certification data sheets for the Cessna 175 aircraft state the fuel capacity is 52 gallons in two 26-gallon wing tanks. The data sheets also state that of the 52 gallon total, 43 gallons is usable and 9 gallons is unusable. The PIC's statement as to fuel remaining at the time of the engine stoppage being 1/3 to 1/4 full in the left tank computes to about 8.6 gallons to 6.5 gallons.

Pilot Information

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|----------------------------------|--|--|---------------|
| Certificate: | Private | Age: | 23, Male |
| Airplane Rating(s): | Single-engine land | Seat Occupied: | Left |
| Other Aircraft Rating(s): | None | Restraint Used: | |
| Instrument Rating(s): | Airplane | Second Pilot Present: | Yes |
| Instructor Rating(s): | None | Toxicology Performed: | No |
| Medical Certification: | Class 2 Valid Medical--w/ waivers/lim | Last FAA Medical Exam: | June 21, 1999 |
| Occupational Pilot: | Yes | Last Flight Review or Equivalent: | |
| Flight Time: | 203 hours (Total, all aircraft), 11 hours (Total, this make and model), 155 hours (Pilot In Command, all aircraft), 11 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft) | | |

Aircraft and Owner/Operator Information

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|--------------------------------------|--------------------------|---------------------------------------|-----------------|
| Aircraft Make: | Cessna | Registration: | N7145M |
| Model/Series: | 175-235 175-235 | Aircraft Category: | Airplane |
| Year of Manufacture: | | Amateur Built: | |
| Airworthiness Certificate: | Normal | Serial Number: | 55445 |
| Landing Gear Type: | Tricycle | Seats: | 4 |
| Date/Type of Last Inspection: | November 26, 1999 Annual | Certified Max Gross Wt.: | 2350 lbs |
| Time Since Last Inspection: | 20 Hrs | Engines: | 1 Reciprocating |
| Airframe Total Time: | 3800 Hrs | Engine Manufacturer: | Continental |
| ELT: | Installed, not activated | Engine Model/Series: | O-470-J |
| Registered Owner: | RICK B. MACALUSO | Rated Power: | 225 Horsepower |
| Operator: | | Operating Certificate(s) Held: | None |
| Operator Does Business As: | AERIAL SIGN ADVERTISING | Operator Designator Code: | |

Meteorological Information and Flight Plan

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| Conditions at Accident Site: | Visual (VMC) | Condition of Light: | Night/dark |
| Observation Facility, Elevation: | CLT ,749 ft msl | Distance from Accident Site: | 21 Nautical Miles |
| Observation Time: | 20:54 Local | Direction from Accident Site: | 310° |
| Lowest Cloud Condition: | Scattered / 15000 ft AGL | Visibility | 10 miles |
| Lowest Ceiling: | None | Visibility (RVR): | |
| Wind Speed/Gusts: | 4 knots / | Turbulence Type Forecast/Actual: | / |
| Wind Direction: | 150° | Turbulence Severity Forecast/Actual: | / |
| Altimeter Setting: | 30 inches Hg | Temperature/Dew Point: | 12°C / 6°C |
| Precipitation and Obscuration: | No Obscuration; No Precipitation | | |
| Departure Point: | MITCHELLVILLE , MD (W00) | Type of Flight Plan Filed: | VFR |
| Destination: | GOOSE CREEK , NC (28A) | Type of Clearance: | None |
| Departure Time: | 18:15 Local | Type of Airspace: | Class G |

Airport Information

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|-----------------------------|------------------|----------------------------------|----------------|
| Airport: | GOOSE CREEK 28A | Runway Surface Type: | Asphalt |
| Airport Elevation: | 565 ft msl | Runway Surface Condition: | Dry;Rough |
| Runway Used: | 22 | IFR Approach: | None |
| Runway Length/Width: | 2300 ft / 100 ft | VFR Approach/Landing: | Forced landing |

Wreckage and Impact Information

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|----------------------------|--------|-----------------------------|---------------------------|
| Crew Injuries: | 1 None | Aircraft Damage: | Substantial |
| Passenger Injuries: | 1 None | Aircraft Fire: | None |
| Ground Injuries: | N/A | Aircraft Explosion: | None |
| Total Injuries: | 2 None | Latitude, Longitude: | 35.189231,-80.650062(est) |

Administrative Information

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| Investigator In Charge (IIC): | Stone, Alan |
| Additional Participating Persons: | RICH BURNS; CHARLOTTE , NC HOWARD BURK; MOBILE , AL |
| Original Publish Date: | August 13, 2001 |
| Last Revision Date: | |
| Investigation Class: | Class |
| Note: | |
| Investigation Docket: | https://data.ntsb.gov/Docket?ProjectID=47832 |

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](#).