



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	HILLSBOROUGH, NH	<b>Accident Number:</b>	NYC99LA200
<b>Date &amp; Time:</b>	08/13/1999, 1311 EDT	<b>Registration:</b>	N193GE
<b>Aircraft:</b>	Cessna 208	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	1 Minor

**Flight Conducted Under:** Part 91: General Aviation - Ferry

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## Analysis

With an auxiliary fuel tank system installed, the pilot filled the tanks and departed. A few minutes later, he noticed fuel on the floor of the cabin, and tried to reach an airport. However, the fuel fumes were so strong he elected to land in an open field. After touchdown, the airplane passed through a ditch the pilot had not observed from the air. The nose landing gear collapsed and the airplane nosed over. An airborne witness reported the pilot exited the airplane after about 5 minutes, and about 5 minutes later, the airplane caught fire and burned. The post-crash fire consumed the cabin. In an interview, the pilot reported that he had not initiated use of the auxiliary fuel tank system when the accident occurred. He also reported he could not see where the fuel was coming from. The investigation revealed the tank installation did not match the FAA Form 337, the instructions for use of the ferry tank system were inadequate, and the pilot had reported that the auxiliary fuel pumps were secured to a board which was not secured to the airplane.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: an inadequate auxiliary fuel tank installation which resulted in a leak of undetermined origin.

## Findings

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Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION

Phase of Operation: CLIMB

Findings

1. (C) FUEL SYSTEM,TANK - LEAK
2. (C) MAINTENANCE,INSTALLATION - INADEQUATE - OTHER MAINTENANCE PERSONNEL

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Occurrence #2: FORCED LANDING

Phase of Operation: EMERGENCY DESCENT/LANDING

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Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER

Phase of Operation: LANDING - ROLL

Findings

3. TERRAIN CONDITION - HIDDEN OBSTRUCTION(S)
4. TERRAIN CONDITION - DITCH

## Factual Information

On August 13, 1999, at 1311 eastern daylight time, a Cessna 208, N193GE, was destroyed during a precautionary landing near Hillsborough, New Hampshire. The certificated airline transport pilot received minor injuries. Visual meteorological conditions prevailed for the ferry flight which departed from Manchester, New Hampshire (MHT), and was destined for Denver, Colorado (DEN). The flight was operated on an instrument flight rules flight plan under 14 CFR Part 91.

The pilot reported he flew the airplane to Bangor, Maine, on August 11, 1999, for the installation of two auxiliary fuel tanks. The installation took place on August 12 and 13, and the pilot flew the airplane to Manchester, Hampshire (MHT) where the auxiliary fuel tanks were filled. The Federal Aviation Administration (FAA), Portland Flight Standards District Office had issued a special flight permit for the overweight operation of the airplane.

At MHT, the airplane was serviced with 654 gallons of Jet-A. The wing tanks were filled, and the auxiliary fuel tanks (205 gallons each) were serviced with 190 gallons each, which brought them to within 1 inch of the top. The pilot reported that the gross weight of the airplane was about 10,000 pounds.

The takeoff and initial climb were without incident. As the airplane passed through about 800 to 900 feet, the pilot smelled turbine fuel. He stopped the climb and attempted to locate the source of the fumes. From his seat in the cockpit, he could not identify the source of the fumes. He requested radar vectors to the closest airport and initiated a descent. He then noticed about 1 inch of standing fuel on the floor of the cabin, and turned off the radios.

During the descent, the amount of fuel in the cockpit area continued to increase, so the pilot elected to land in an open field rather than continue toward the airport. He reported that due to fuel fumes and raw fuel in the cockpit, his vision was blurred, his eyes burned, and he had difficulty breathing. He positioned the airplane for landing into the wind. On final approach, the fuel was up over his ankles and his sectional charts were floating on top of the fuel.

After touchdown, he applied maximum reverse thrust and brakes. During the ground roll, at a speed of about 40 knots, he observed a ditch ahead of him. He had no further memory of events until he was being treated by paramedics.

A nearby airplane observed the landing and reported that the airplane nosed over during the landing roll. After about 5 minutes, the pilot exited the airplane and crawled away. About 5 minutes later, the airplane started to burn. Medical personnel arrived about 15 minutes after the accident.

An inspector from the FAA reported that the airplane traveled about 400 feet on the ground prior to encountering a ditch which measured about 60 feet wide and 3 feet deep. The airplane crossed the ditch, and continued for about another 120 feet and came to rest. The nose landing gear had separated from the airplane. The airplane was consumed by fire except for the outboard wing panels and empennage.

Documents from the FAA and interviews with the pilot revealed the two tanks were mounted in the cabin laterally, and secured to the floor with tie-down straps. The takeoffs for the fuel lines were on the back side of the fuel tanks and not visible to the pilot. The two tanks

fed into a common manifold, which was used to replenish the right wing fuel tank. The engine could not be fed directly from the auxiliary tanks. The pilot reported that he had not actuated the auxiliary tank system on the flight.

Examination of the supporting documents for the tank installation, furnished by the facility that performed the work, and interviews with the pilot, revealed the following; the fuel tanks were installed laterally; however, the FAA Form 337 showed the fuel tanks installed longitudinally; the instructions issued to the pilot for the use of the auxiliary tank system did not cover all contingencies, or limitations; the pilot reported that the 3 auxiliary fuel pumps used to transfer fuel from the auxiliary tanks to the right wing tank were secured to a platform. However, the platform was not secured to the airplane.

These items were discussed with the FAA Principle Maintenance Inspector (PMI) who had oversight authority for the facility that performed the auxiliary tank installation. The PMI reported that the facility has subsequently changed their procedures.

### Pilot Information

<b>Certificate:</b>	Airline Transport; Commercial	<b>Age:</b>	47, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Multi-engine Sea; Single-engine Land; Single-engine Sea	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	06/07/1999
<b>Occupational Pilot:</b>		<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	10530 hours (Total, all aircraft), 3000 hours (Total, this make and model), 10458 hours (Pilot In Command, all aircraft), 168 hours (Last 90 days, all aircraft), 22 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	Cessna	Registration:	N193GE
Model/Series:	208 208	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Special Flight	Serial Number:	20800193
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	06/08/1999, AAIP	Certified Max Gross Wt.:	8035 lbs
Time Since Last Inspection:	79 Hours	Engines:	1 Turbo Prop
Airframe Total Time:	6132 Hours	Engine Manufacturer:	P&W
ELT:	Installed, activated, aided in locating accident	Engine Model/Series:	PT6-114A
Registered Owner:	GREYSTOKE ENGINEERING INC.	Rated Power:	600 hp
Operator:	RAM AERONAUTICAL	Operating Certificate(s) Held:	None

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	MHT, 234 ft msl	Distance from Accident Site:	22 Nautical Miles
Observation Time:	1300 EDT	Direction from Accident Site:	120°
Lowest Cloud Condition:	Scattered / 3000 ft agl	Visibility	7 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	170°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29 inches Hg	Temperature/Dew Point:	28° C / 22° C
Precipitation and Obscuration:			
Departure Point:	MANCHESTER, NH (MHT)	Type of Flight Plan Filed:	IFR
Destination:	DENVER, CO (DEN)	Type of Clearance:	IFR
Departure Time:	1300 EDT	Type of Airspace:	Class E

## Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Minor	Latitude, Longitude:	

## Administrative Information

**Investigator In Charge (IIC):** ROBERT L HANCOCK **Report Date:** 06/22/2000

**Additional Participating Persons:** DONALD LEVESQUE; PORTLAND, ME

**Publish Date:**

**Investigation Docket:** NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at [pubinq@ntsb.gov](mailto:pubinq@ntsb.gov), or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).