Aviation Investigation Final Report

Location:	BERWICK, Maine	**Accident Number:**	NYC94LA088
Date & Time:	May 21, 1994, 17:38 Local	**Registration:**	N3167E
Aircraft:	AERONCA 11AC	**Aircraft Damage:**	Destroyed
Defining Event:		**Injuries:**	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

SHORTLY AFTER TAKEOFF, THE AIRPLANE DESCENDED STEEPLY TO THE GROUND. THE AIRPLANE CRASHED AT THE MIDPOINT OF THE RUNWAY. THE EXAMINATION OF THE AIRPLANE REVEALED THE ELEVATOR FLIGHT CONTROLS WERE MISRIGGED AND THE ELEVATOR OPERATED IN REVERSE TO NORMAL CONTROL INPUTS. THE INSPECTION OF THE ELEVATOR TURNBUCKLE REVEALED THE SAFETY WIRE WAS TIED IN AN UNSATISFACTORY MANNER. ALSO, AN ELEVATOR CONTROL BOLT WAS INSTALLED WITH INADEQUATE CLEARANCE FROM THE AIRFRAME. THIS WAS THE FIRST FLIGHT AFTER AN ANNUAL INSPECTION. THE INSPECTION WAS DONE BY A LICENSED MECHANIC. ON THE DAY OF THE ACCIDENT, THE PILOT WORKED ON THE AIRPLANE FOR SEVERAL HOURS. SAFETY WIRE WAS FOUND INSIDE THE AIRPLANE; SCREWS AND FASTENERS WERE FOUND IN THE PILOT'S PERSONAL EFFECTS.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The pilot's inadequate preflight which fail to detect proper operation of the elevator which resulted in the loss of control inflight. A factor is inadequate maintenance which consisted of misrigging of the elevator flight controls.

Findings

Occurrence #1: LOSS OF CONTROL - IN FLIGHT
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. (F) FLT CONTROL SYST,ELEVATOR CONTROL
2. (F) MAINTENANCE,INSTALLATION - IMPROPER - UNKNOWN
3. (C) AIRCRAFT PREFLIGHT - INADEQUATE - PILOT IN COMMAND

Occurrence #2: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: DESCENT - UNCONTROLLED

Findings
4. TERRAIN CONDITION - GRASS

Factual Information

On May 21, 1994, at 1738 eastern daylight time, an Aeronca 11AC, N3167E, owned and piloted by Gerard J. Curran, of Somersworth, New Hampshire, struck the ground after takeoff from a private airstrip in Berwick, Maine. The pilot was fatally injured and the airplane was destroyed by the impact. Visual meteorological conditions prevailed and no flight plan had been filed for the flight operating under 14 CFR Part 91.

According to a witness at the airport:

I heard...taxiing N3167E back and forth on the runway. I was opening the hangar door when I heard him apply takeoff power at the east end of the strip. I went to a window to watch takeoff which would normally be visible from window. The aircraft was not visible at first, but suddenly dropped into view in a vertical dive with no rotation or spin. Heard the engine running at full power. The aircraft immediately impacted approximately half way down the runway....

The FAA reported this was the first flight following an annual inspection. According to the mechanic who accomplished the inspection:

...I did a check of the elevator control system by moving the elevators to the full limits of their travels, at the elevators, to insure that they were going from stop to stop, they were and the control yoke responded properly.....

According to FAA Aviation Safety Inspector (Airworthiness) of the Portland Flight Standards District Office,

...the elevator control cables had been incorrectly routed to their perspective attachment point, I.E. the cables attached to the top attachment point at the elevator control was routed directly to the top attachment point at the elevator horn located at the rear most point of the fuselage. The bottom cable was attached to the bottom of the attachment point at the control yoke and routed directly to the lower attachment point of the elevator horn. This arrangement allowed the elevators to deflect downward when the control yoke was moved in the aft direction.

Additionally, it was noted that the turnbuckles attached to the control yoke attachment points had been safety wired by a non experienced person, and that there was a difference in the size of the wire. The upper turnbuckle was saftied with .032 wire while the lower turnbuckle was saftied with .041 wire. At the aft section of the fuselage, two (2) discrepancies were noted. The first was the top elevator cable (attached to the top attachment point of the elevator horn) had been routed between the two elevator trim

cables. Under operating conditions, this would have caused the larger elevator cable to "saw" through the smaller diameter cable over a period of time. The second discrepancy was the incorrect installation of the bolt securing the elevator cable shackle (p/n AN 115) to the elevator horn. The nut and cotter pin barely missed striking the frame. The opposite side provided a cut out in the frame to allow for clearance of the nut/cotter pin. It was also noted that the top bolt and nut were original, but had a new cotter pin stalled. The lower bolt, nut and cotter pin were new.

According to Mr. Paul Hubbard, Aviation Safety Inspector (Airworthiness), Portland Flight Standards District Office, the airplane was involved in an incident in 1992, after which the wings and tail surfaces were removed and the airplane was taken to the pilots residence. The airplane was then transported to Furnas airport. Mr. Hubbard was unable to determined when or where the pilot installed the elevators.

In a telephone interview, Mr. Hubbard said the safety wire on the elevator cable turnbuckles had to be cut and the turnbuckles loosed to remove the cables. After installation, the turnbuckles would be tightened to tension the cables, and then safety wired to hold their positions.

An autopsy was conducted by Henry F. Ryan, M.D. Chief Medical Examiner, Augusta, Maine, on May 23, 1994. According to Dr. Ryan, a screwdriver, and various screws and fasteners were part of the pilot's personal effects. Toxicological examination conducted by the FAA Civil Aeromedical Institute in Oklahoma City, Oklahoma, was negative for drugs and alcohol.

According to the pilot's last medical application dated November 23, 1992, he had a total time of 758 hours. The last entry in the pilot's log book was dated September 24, 1993. It showed a total time of 630 hours. The pilot's recency of experience was not determined. The log book did show 60 hours of flight time in the accident airplane between August 5, 1990 and September 1993.

Pilot Information

Certificate:	Private	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Single-engine sea	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	No
Instructor Rating(s):	None	**Toxicology Performed:**	Yes
Medical Certification:	Class 3 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	November 23, 1992
Occupational Pilot:	No	**Last Flight Review or Equivalent:**	
Flight Time:	630 hours (Total, all aircraft), 60 hours (Total, this make and model)		

Aircraft and Owner/Operator Information

Aircraft Make:	AERONCA	**Registration:**	N3167E
Model/Series:	11AC 11AC	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	11AC-1507
Landing Gear Type:	Tailwheel	**Seats:**	2
Date/Type of Last Inspection:	May 19, 1994 Annual	**Certified Max Gross Wt.:**	1250 lbs
Time Since Last Inspection:	0 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	1125 Hrs	**Engine Manufacturer:**	CONTINENTAL
ELT:		**Engine Model/Series:**	A-65
Registered Owner:	GERARD J. CURRAN	**Rated Power:**	65 Horsepower
Operator:		**Operating Certificate(s) Held:**	None
Operator Does Business As:		**Operator Designator Code:**	

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	SFM ,244 ft msl	**Distance from Accident Site:**	12 Nautical Miles
Observation Time:	17:35 Local	**Direction from Accident Site:**	25°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	6 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	200°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29 inches Hg	**Temperature/Dew Point:**	21°C / 4°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	17:38 Local	**Type of Airspace:**	Class G

Airport Information

Airport:	BERWICK NONE	**Runway Surface Type:**	Grass/turf
Airport Elevation:	150 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	27	**IFR Approach:**	None
Runway Length/Width:	2000 ft / 100 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	1 Fatal	**Aircraft Damage:**	Destroyed
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Fatal	**Latitude, Longitude:**	

Administrative Information

Investigator In Charge (IIC):	Hancock, Robert
Additional Participating Persons:	PAUL HUBBARD; PORTLAND , ME RAY CLOUTIER; PORTLAND , ME
Original Publish Date:	December 7, 1994
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=38758