Aviation Investigation Final Report

Location:	New Canaan, Connecticut	**Accident Number:**	NYC03LA106
Date & Time:	May 15, 2003, 11:30 Local	**Registration:**	N109JS
Aircraft:	Schweizer 269C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 Minor
Flight Conducted Under:	Part 91: General aviation - Other work use		

Analysis

During cruise flight, the helicopter experienced a gradual loss of engine power. Although the engine did not lose total power, the partial power loss resulted in a forced landing. Examination of the wreckage revealed that the throttle cable lower bellcrank arm had separated from the fuel control. Further examination revealed that two brass bushings were located at the throttle cable lower bellcrank arm assembly, and were found worn. There were also two steel bushings, which fit underneath the two brass bushings at the lower bellcrank arm assembly, and they were not worn. Review of maintenance records revealed that the helicopter underwent an annual inspection about 5 months prior to the accident. During the inspection, a mechanic noted two throttle cable bushings worn at the lower bellcrank arm. However, he referred to the part number corresponding with the two steel bushings. A company inspector evaluated the discrepancy, and wrote that the bushings were found to be within limits and were re-installed. There was no mention of the brass bushings in the discrepancy list, the maintenance facility purchase order, or the customer invoice. The helicopter had accumulated approximately 75 hours of operation since the annual inspection. A 25-hour inspection and a 50-hour inspection were performed between the annual inspection and the accident. In addition, the pilot had performed multiple "First Flight of the Day" inspections subsequent to the annual inspection. That inspection required a check of the throttle linkage for excessive play and freedom. None of the inspections detected the worn brass bushings.

Probable Cause and Findings

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

The inadequate annual inspection performed by maintenance facility personnel, which resulted in a failure of a fuel system bellcrank. Factors were the subsequent inadequate inspections by other maintenance personnel and the pilot.

Findings

Occurrence #1: LOSS OF ENGINE POWER(PARTIAL) - NONMECHANICAL
Phase of Operation: CRUISE - NORMAL

Findings
1. FUEL INJECTION CONTROL,BELLCRANK - FAILURE
2. (C) MAINTENANCE,ANNUAL INSPECTION - INADEQUATE - COMPANY MAINTENANCE PERSONNEL
3. (F) MAINTENANCE,INSPECTION - INADEQUATE - OTHER MAINTENANCE PERSONNEL
4. (F) MAINTENANCE,INSPECTION - INADEQUATE - PILOT IN COMMAND

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Occurrence #3: IN FLIGHT COLLISION WITH OBJECT
Phase of Operation: EMERGENCY LANDING

Findings
5. OBJECT - TREE(S)

Factual Information

On May 15, 2003, about 1130 eastern daylight time, a Schweizer 269C, N109JS, was substantially damaged during a forced landing to a residential area, following a partial loss of engine power in cruise flight near New Canaan, Connecticut. The certificated commercial pilot and the passenger sustained minor injuries. Visual meteorological conditions prevailed for the flight that departed Danbury Municipal Airport (DXR), Danbury, Connecticut, about 1115. No flight plan was filed for the commercial aerial photography flight conducted under 14 CFR Part 91.

The pilot stated that the helicopter was in cruise flight at 1,100 feet msl, when he noticed a gradual loss of rotor rpm. The pilot lowered the collective and increased throttle, but the rotor rpm continued to decay. He repeated the procedure as the engine continued to lose power. The pilot set up for a forced landing to a field; however, the helicopter impacted the backyard of a residence prior to the field. The pilot added that the engine never experienced a total power loss. When asked if he entered an autorotation, the pilot stated, "no the needles never split."

A Federal Aviation Administration (FAA) inspector observed that the fuselage, tail boom, main rotor, and tail rotor sustained damage. He also noted a rod-end, that mated into the fuel control, was separated.

The wreckage was further examined by the FAA inspector, a Safety Board investigator, a representative from the aircraft manufacturer, and a representative from the engine manufacturer. The examination revealed that throttle cable lower bellcrank arm had separated from the fuel control. Two brass bushings (part number AN77A-3-13) were located at the throttle cable lower bellcrank arm assembly. The two brass bushings were found worn. There were also two steel bushings (part number 269A8445-3), which fit underneath the two brass bushings at the lower bellcrank arm assembly. The two steel bushings were not worn.

Review of maintenance records revealed that the helicopter underwent an annual inspection from January 13, 2003, thru January 31, 2003. Review of the shop-floor maintenance records (work order number 03-1016) revealed that a mechanic wrote the following discrepancy, "Throttle Cable Bushings (2 ea.) Worn At Lower Bellcrank Arm." However, the part number referred to the steel bushings. The action taken stated, "Removed and inspected found to be within limits, re-installed and safetied," and was initialed by a company inspector. There was no mention of the brass bushings in the shop floor records.

The customer invoice stated "Problem: During routine inspection, found throttle cable bushings worn at the lower bellcrank arm assembly...Action Taken: Remove worn bushings an install TSN 0.0 bushings 2 ea. P/N 269A8445-003. All work accomplished in accordance with

SAC HMI." The customer was charged $234.55 for the two bushings, freight, and labor; yet a review of the maintenance facility purchase order number 5111 revealed that two throttle bushings (part number 269A8445-003) were returned to the manufacturer on February 3, 2003, for a refund. There was no mention of the brass bushings on the customer invoice or the maintenance purchase order.

The helicopter had accumulated approximately 75 hours of operation since the annual inspection. A 25-hour inspection was performed on March 17, 2003, and a 50-hour inspection was performed on April 4, 2003. In addition, the pilot had performed multiple "First Flight of the Day" inspections subsequent to the annual inspection. Review of that inspection checklist revealed, "9. Throttle linkage for excessive play and freedom; contact full open and idle stops. According to the helicopter manufacturer, loose brass bushings would result in looseness in the throttle system. None of the inspections detected the worn brass bushings.

Federal Aviation Regulation Part 43, Appendix D, "Scope and Detail of Items to Be Included in Annual and 100-Hour Inspections," (d) pertained to engine components. Number (6) stated, "Engine controls--for defects, improper travel, and improper safetying;" and number (10) stated, "All systems--for improper installation, poor general condition, defects, and insecure attachment."

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	45,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Airplane; Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	June 28, 2002
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	October 2, 2002
Flight Time:	2900 hours (Total, all aircraft), 1300 hours (Total, this make and model), 2800 hours (Pilot In Command, all aircraft), 100 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Schweizer	**Registration:**	N109JS
Model/Series:	269C	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	1589
Landing Gear Type:	Skid	**Seats:**	3
Date/Type of Last Inspection:	January 31, 2003 Annual	**Certified Max Gross Wt.:**	2050 lbs
Time Since Last Inspection:	75 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	2336 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	HIO-360
Registered Owner:	Jeffrey Brunner	**Rated Power:**	190 Horsepower
Operator:	Centennial Helicopters Inc.	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	DXR,458 ft msl	**Distance from Accident Site:**	20 Nautical Miles
Observation Time:	11:53 Local	**Direction from Accident Site:**	10°
Lowest Cloud Condition:		**Visibility**	10 miles
Lowest Ceiling:	Broken / 9000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	8 knots / 15 knots	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	230°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.54 inches Hg	**Temperature/Dew Point:**	16°C / 10°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Danbury, CT (DXR)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	11:00 Local	**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Minor	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 Minor	**Latitude, Longitude:**	41.132499,-73.478057

Administrative Information

Investigator In Charge (IIC):	Gretz, Robert
Additional Participating Persons:	Bob Hennigan; FAA FSDO-03; Windsor Locks, CT Aaron Spotts; Lycoming Engines; Williamsport, PA Steve Gleason; Schweizer Aircraft Company; Elmira, NY
Original Publish Date:	April 28, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=56989