



Aviation Investigation Final Report

Location:	Englewood, Colorado	Accident Number:	CEN13LA291
Date & Time:	May 22, 2013, 17:30 Local	Registration:	N571MA
Aircraft:	DIAMOND AIRCRAFT IND INC DA 20-C1	Aircraft Damage:	Substantial
Defining Event:	Loss of engine power (total)	Injuries:	2 Minor
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

While on final approach during an instructional flight, the engine became unresponsive to throttle movements. The flight instructor took control of the airplane from the student pilot and made a forced landing, during which the airplane rolled onto soft ground and nosed over to an inverted position. Engine examination revealed that the engine throttle lever and throttle cable had become disconnected and that the bolt connecting these two components was located at the bottom of the engine cowling. A self-locking nut, which normally secures this bolt, was missing and not located. Therefore, it is likely that maintenance personnel did not apply sufficient torque to the nut or improperly reused a degraded self-locking nut, which resulted in the eventual loosening of the nut and the in-flight separation of the engine throttle lever and throttle cable.

Probable Cause and Findings

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

The in-flight separation of the engine throttle lever and throttle cable due to maintenance personnel not applying sufficient torque to the self-locking nut or improperly reusing a degraded self-locking nut.

Findings

Aircraft	Power lever - Incorrect service/maintenance
Personnel issues	Understanding/comprehension - Maintenance personnel
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Approach-VFR pattern final	Loss of engine power (total) (Defining event)
Landing	Roll over

On May 22, 2013, about 1730 mountain daylight time, a Diamond DA-20-C1 airplane, N571MA, was substantially damaged during a forced landing at Centennial Airport (KAPA), Englewood, Colorado. The flight instructor and student pilot received minor injuries. The airplane was registered to 5280 Flying Club LLC and operated under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Day visual meteorological conditions prevailed for the local flight, and no flight plan had been filed.

The flight instructor stated that the student pilot was flying a visual approach to a full stop landing at KAPA. While on final approach, the engine became unresponsive to throttle movement. The flight instructor took control of the airplane and attempted to restart the engine. With no increase in engine power, a forced landing was made and the airplane touched down just short of the runway threshold. After touchdown, the airplane rolled onto soft terrain and nosed over to an inverted position.

During the engine examination, Federal Aviation Administration (FAA) personnel discovered that the engine throttle lever and throttle cable were disconnected. The bolt normally connecting these two components was located at the bottom of the engine cowling. A self-locking nut (Diamond part number MS21042-3), which normally secures this bolt, was missing and not located. No other anomalies were noticed with the engine.

FAA review of airplane records indicated that the engine was removed and re-installed on March 15, 2013 to facilitate the repair of a loose crankcase stud. The airplane flew 100.1 hours after engine re-installation until the accident.

Flight instructor Information

Certificate:	Commercial; Flight instructor	Age:	30
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine	Toxicology Performed:	No
Medical Certification:	Class 1 Without waivers/limitations	Last FAA Medical Exam:	August 20, 2012
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	October 9, 2012
Flight Time:	475 hours (Total, all aircraft), 26 hours (Total, this make and model), 395 hours (Pilot In Command, all aircraft), 146 hours (Last 90 days, all aircraft), 90 hours (Last 30 days, all aircraft), 4 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Student	Age:	21
Airplane Rating(s):	None	Seat Occupied:	Unknown
Other Aircraft Rating(s):	None	Restraint Used:	3-point
Instrument Rating(s):	None	Second Pilot Present:	Yes
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	None	Last FAA Medical Exam:	
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:	14 hours (Total, all aircraft), 12 hours (Total, this make and model), 0 hours (Pilot In Command, all aircraft), 14 hours (Last 90 days, all aircraft), 14 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	DIAMOND AIRCRAFT IND INC	Registration:	N571MA
Model/Series:	DA 20-C1	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	C0271
Landing Gear Type:	Tricycle	Seats:	2
Date/Type of Last Inspection:	May 10, 2013 100 hour	Certified Max Gross Wt.:	
Time Since Last Inspection:		Engines:	1 Reciprocating
Airframe Total Time:	3360 Hrs at time of accident	Engine Manufacturer:	CONT MOTOR
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	IO-240-B
Registered Owner:	5280 Flying Club LLC	Rated Power:	125 Horsepower
Operator:	5280 Flying Club LLC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KAPA, 5885 ft msl	Distance from Accident Site:	1 Nautical Miles
Observation Time:	17:53 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:	Scattered / 10000 ft AGL	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots /	Turbulence Type Forecast/Actual:	/ None
Wind Direction:	130°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.92 inches Hg	Temperature/Dew Point:	22°C / 1°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Englewood, CO (KAPA)	Type of Flight Plan Filed:	None
Destination:	Englewood, CO (KAPA)	Type of Clearance:	None
Departure Time:	17:00 UTC	Type of Airspace:	

Airport Information

Airport:	Centennial Airport KAPA	Runway Surface Type:	Asphalt
Airport Elevation:	5885 ft msl	Runway Surface Condition:	Dry
Runway Used:	17R	IFR Approach:	None
Runway Length/Width:	7000 ft / 77 ft	VFR Approach/Landing:	Forced landing;Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	Aircraft Damage:	Substantial
Passenger Injuries:		Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Minor	Latitude, Longitude:	39.570278,-104.849441(est)

Administrative Information

Investigator In Charge (IIC):	Folkerts, Michael
Additional Participating Persons:	Jimmie Hopkins; Federal Aviation Administration; Denver, CO Joseph T Walsh; Federal Aviation Administration; Denver, CO
Original Publish Date:	February 10, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=86971

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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](#).