Aviation Investigation Final Report

Location:	Mesa, Arizona	**Accident Number:**	LAX01LA216
Date & Time:	June 21, 2001, 14:40 Local	**Registration:**	N891CP
Aircraft:	Schweizer 269C	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

About 200 feet agl the engine lost power and the CFI conducted an autorotation that resulted in a hard landing. An FAA inspector interviewed the pilot and reported that the engine failure occurred as the CFI was demonstrating a normal approach. The engine quit when the helicopter was at 200 feet agl and below 50 knots airspeed. The CFI entered an autorotation and the helicopter had a high rate of descent at touchdown. According to the height/velocity performance chart in the rotorcraft flight manual, at 200 feet agl the helicopter had to be above a speed of 50 knots in order to accomplish a successful autorotation. There were no mechanical anomalies found during a post accident engine test run.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: a loss of power for unexplained reasons. Also causal was the CFI's operation of the helicopter in a region of the height/velocity curve where a successful autorotation could not be accomplished. A factor in the accident was the high density altitude.

Findings

Occurrence #1: LOSS OF ENGINE POWER
Phase of Operation: APPROACH - VFR PATTERN - FINAL APPROACH

Findings
1. REASON FOR OCCURRENCE UNDETERMINED

Occurrence #2: HARD LANDING
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings
2. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
3. AUTOROTATION - ATTEMPTED - PILOT IN COMMAND(CFI)
4. (C) HEIGHT/VELOCITY CURVE - EXCEEDED - PILOT IN COMMAND(CFI)

Factual Information

On June 21, 2001, at 1440 mountain standard time, a Schweizer 269C, N891CP, landed hard on the helipad at Falcon Field Airport (FFZ), Mesa, Arizona, following a loss of engine power. The helicopter, operated under the provisions of 14 CFR Part 91, sustained substantial damage to the tail boom. The certified flight instructor (CFI) and student pilot were not injured. Visual meteorological conditions prevailed for the local area instructional flight, and a flight plan had not been filed. The flight departed FFZ at 1330, and was scheduled to terminate at FFZ.

According to the CFI, the purpose of the flight was to conduct pattern work and approaches to landing. About 1430, while on approach to land, at 200 feet agl and an airspeed below 50 knots, the CFI heard a "pop" from the engine. He saw the engine rpm dropping to zero and he entered an autorotation. The helicopter landed hard.

A Federal Aviation Administration (FAA) inspector interviewed the CFI. The CFI stated that he was demonstrating a normal approach for the landing. When he heard the engine "pop," he attempted to add throttle. During the autorotation, the tachometer needles split and the helicopter landed hard. The FAA inspector noted that the CFI entered the autorotation inside the height velocity envelope curve. The FAA inspector reported that the result was a high rate of descent at touchdown.

According to the height/velocity performance chart in the rotorcraft flight manual, at 200 feet agl the helicopter had to be above a speed of 50 knots in order to accomplish a successful autorotation.

The FAA inspector observed a successful post accident engine test run and noted no mechanical anomalies.

METEROLOGICAL CONDITIONS

Phoenix Sky Harbor International Airport (PHX), elevation 1,135 feet msl, is about 255 degrees at 16 nautical miles from the accident location. The aviation surface weather report at 1356, was winds from 290 degrees at 14 knots; visibility 10 miles, temperature 100 degrees Fahrenheit; dew point 55 degrees Fahrenheit; and altimeter setting 29.94 inHg. The sky condition was few clouds at 12,000, and scattered cloud layers at 18,000 and 25,000.

In the pilot's written statement to the Safety Board he indicated that the temperature at FFZ was 115 degrees Fahrenheit. According to a density altitude calculator utilized by the Safety Board, at the time of the accident the density altitude was 5,390 feet mean sea level (msl). The airport elevation is 1,394 msl.

Flight instructor Information

Certificate:	Commercial; Flight instructor; Private	**Age:**	48,Male
Airplane Rating(s):	Single-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	Yes
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	No
Medical Certification:	Class 2 Valid Medical--no waivers/lim.	**Last FAA Medical Exam:**	December 26, 2000
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	March 29, 2001
Flight Time:	1700 hours (Total, all aircraft), 450 hours (Total, this make and model), 4600 hours (Pilot In Command, all aircraft), 180 hours (Last 90 days, all aircraft), 90 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Student pilot Information

Certificate:	Student	**Age:**	39,Male
Airplane Rating(s):	None	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	None	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Unknown	**Last FAA Medical Exam:**	
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	22 hours (Total, all aircraft), 5 hours (Total, this make and model), 22 hours (Last 90 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Schweizer	**Registration:**	N891CP
Model/Series:	269C	**Aircraft Category:**	Helicopter
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	S1422
Landing Gear Type:	Skid	**Seats:**	2
Date/Type of Last Inspection:	June 20, 2001 Annual	**Certified Max Gross Wt.:**	2050 lbs
Time Since Last Inspection:	4 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	5500 Hrs as of last inspection	**Engine Manufacturer:**	Lycoming
ELT:	Not installed	**Engine Model/Series:**	HIO-360-D1A
Registered Owner:	Royal Aviation	**Rated Power:**	190 Horsepower
Operator:		**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	FFZ,1394 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	14:40 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Visibility**	30 miles
Lowest Ceiling:	Broken / 25000 ft AGL	**Visibility (RVR):**	
Wind Speed/Gusts:	12 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	270°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Mesa, AZ (FFZ)	**Type of Flight Plan Filed:**	None
Destination:	Mesa, AZ (FFZ)	**Type of Clearance:**	VFR
Departure Time:	13:30 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	FALCON FIELD FFZ	**Runway Surface Type:**	Grass/turf
Airport Elevation:	1345 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	H1	**IFR Approach:**	None
Runway Length/Width:	60 ft / 60 ft	**VFR Approach/Landing:**	Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	33.45,-111.716667

Administrative Information

Investigator In Charge (IIC):	Cornejo, Tealeye
Additional Participating Persons:	John Eller; Federal Aviation Administration; Scottsdale, AZ
Original Publish Date:	June 30, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=53348