National Transportation Safety Board
Aviation Accident Data Summary

Location:	Agua Dulce, CA	**Accident Number:**	GAA16CA143
Date & Time:	03/02/2016, 0930 PST	**Registration:**	N568TB
Aircraft:	BELL 47	**Injuries:**	1 Minor
Flight Conducted Under:	Part 91: General Aviation - Personal		

Analysis

The helicopter pilot reported that while flying about 300 feet above a ridge with an elevation of 4,900 feet at 10 miles per hour (8.68 knots), he could not hear very well in his headset and needed to adjust the volume. He reported that he removed his left hand from the collective and used it to hold the cyclic so he could use his right hand to adjust the volume on his headset. During this process, he reported that he forgot to increase the friction on the collective prior to removing his left hand. He further reported that the collective "dropped which decreased main rotor pitch causing the engine to overspeed."

The pilot reported that the helicopter started to spin to the right; he grabbed the collective, reduced throttle, and then increased the collective pitch. He reported that the helicopter "experienced settling with power," and spun around 8 to 10 times. He further reported that the helicopter landed hard at the top of a ridge and rolled onto its right side. The helicopter sustained substantial damage to the fuselage, main rotor system, tailboom, and tail rotor system.

The pilot verified that there were no preimpact mechanical failures or malfunctions with the airframe or engine that would have precluded normal operation.

As a safety recommendation, the pilot stated he "should have increased the collective friction prior to removing his left hand from the collective stick." He also stated that "the problem was made worse because the helicopter was only 300 feet above ground level at 10 miles per hour [8.68 knots]."

The Federal Aviation Administration (FAA) has published FAA-H-8083-21 Helicopter Flying Handbook (2012). This handbook discusses the function of the collective and states in part: "An adjustable friction control helps prevent inadvertent collective pitch movement."

This handbook also discusses recovery from a settling with power condition and states in part: "When recovering from a settling with power condition, the pilot tends first to try to stop the descent by increasing collective pitch. However, this only results in increasing the stalled area of the rotor, thereby increasing the rate of descent. Since inboard portions of the blades are stalled, cyclic control may be limited. Recovery is accomplished by increasing airspeed, and/or partially lowering collective pitch. In many helicopters, lateral cyclic combined with lateral tail rotor thrust will produce the quickest exit from the hazard assuming that there are no barriers in that direction. In a fully developed vortex ring state, the only recovery may be to enter autorotation to break the vortex ring state."

The pilot reported that he utilized a 4-point restraint system installed in the helicopter and sustained minor injuries. He also reported that "I credit the shoulder harness restraint with keeping my injuries from being far worse."

Flight Events

Enroute-cruise - Miscellaneous/other
Enroute-cruise - Attempted remediation/recovery
Enroute-cruise - Loss of control in flight
Maneuvering-low-alt flying - Settling with power/vortex ring state

Maneuvering-low-alt flying - Collision with terr/obj (non-CFIT)
Maneuvering-low-alt flying - Off-field or emergency landing

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this accident to be:
The pilot's failure to set the appropriate collective friction prior to releasing the collective in flight, which resulted in decreased main rotor pitch, settling with power, and an impact with terrain.

Findings

Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Prop/rotor parameters-Not attained/maintained
Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Powerplant parameters-Not attained/maintained
Aircraft-Aircraft oper/perf/capability-Performance/control parameters-Descent rate-Not attained/maintained
Personnel issues-Task performance-Use of equip/info-Aircraft control-Pilot - C
Personnel issues-Task performance-Use of equip/info-Use of equip/system-Pilot - C

Pilot Information

Certificate:	Private	**Age:**	57
Airplane Rating(s):	Single-engine Land	**Instrument Rating(s):**	None
Other Aircraft Rating(s):	Helicopter	**Instructor Rating(s):**	None
Flight Time:	(Estimated) 709 hours (Total, all aircraft), 137 hours (Total, this make and model), 585 hours (Pilot In Command, all aircraft), 7 hours (Last 90 days, all aircraft), 1 hours (Last 30 days, all aircraft), 0.5 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	BELL	**Registration:**	N568TB
Model/Series:	47 G2	**Engines:**	1 Reciprocating
Operator:	Thomas J. White	**Engine Manufacturer:**	Lycoming
Air Carrier Operating Certificate:	None	**Engine Model/Series:**	VO435A1F
Flight Conducted Under:	Part 91: General Aviation - Personal		

Meteorological Information and Flight Plan

Observation Facility, Elevation:	KWJF, 2338 ft msl	**Weather Information Source:**	Weather Observation Facility
Conditions at Accident Site:	Visual Conditions	**Lowest Ceiling:**	None
Condition of Light:	Day	**Wind Speed/Gusts, Direction:**	13 knots, 290°
Temperature:	24°C / -8°C	**Visibility**	10 Miles
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	LANCASTER, CA (WJF)	**Destination:**	AGUA DULCE, CA (L70)

Wreckage and Impact Information

Crew Injuries:	1 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None

Administrative Information

Investigator In Charge (IIC):	Michael J Hodges	**Adopted Date:**	04/05/2016
Note:	This accident report documents the factual circumstances of this accident as described to the NTSB.		
Investigation Docket:	http://dms.ntsb.gov/pubdms/search/dockList.cfm?mKey=92800		