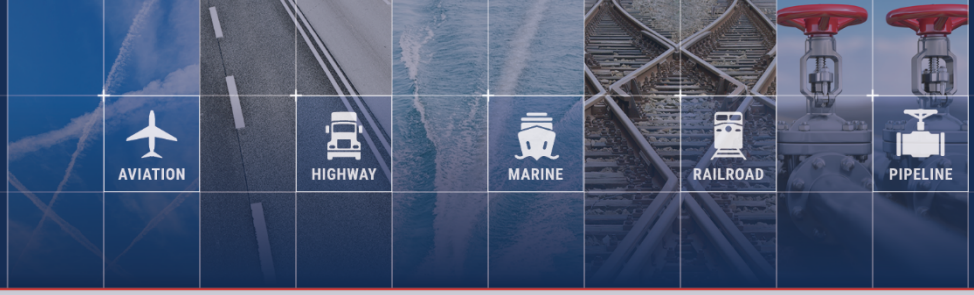

Aviation Investigation Final Report

Location:	Hochatown, Oklahoma	**Accident Number:**	CEN24LA004
Date & Time:	October 1, 2023, 12:30 Local	**Registration:**	N379SH
Aircraft:	ROBINSON HELICOPTER R44	**Aircraft Damage:**	Substantial
Defining Event:	Loss of engine power (total)	**Injuries:**	1 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilot reported that he was conducting a practice autorotation during a proficiency flight about 400 ft above ground level (agl). As he reduced the engine speed to idle, the engine lost total power. The pilot entered an autorotation and completed a forced landing to a field. The helicopter landed hard and the tailboom was severed by the main rotor blades.

Examination of the engine revealed that the idle speed was set below 50 percent, which was below the manufacturer's recommendation of 60 to 65 percent. Additionally, the carburetor heat control cable was rigged improperly, and therefore, was jammed in the full heat position. The combination of these factors would have likely made the engine more susceptible to losing power, especially with an abrupt power reduction initiated by the pilot during the simulated autorotation.

After reviewing the available maintenance records, it is possible the engine idle speed was improperly set, and the carburetor heat control was improperly rigged when the engine was overhauled and installed in the helicopter; however, investigators were unable to establish exactly when the misrigging took place or why it was not noticed during subsequent maintenance.

Probable Cause and Findings

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

A total loss of engine power during a practice autorotation due to the improper engine idle setting and rigging of the carburetor heat control which resulted in a hard landing.

Findings

Aircraft	(general) - Inadequate inspection
Aircraft	Landing flare - Not attained/maintained
Personnel issues	Installation - Maintenance personnel

Factual Information

History of Flight

Autorotation	Loss of engine power (total) (Defining event)
Autorotation	Hard landing

On October 1, 2023, about 1230 central daylight time, a Robinson Helicopter Company R44, N379SH, was substantially damaged when it was involved in an accident near Hochatown, Oklahoma. The pilot was not injured. The helicopter was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

The pilot, who was also a flight instructor, reported that he was conducting a practice autorotation during a proficiency flight about 400 ft agl. As he reduced the engine speed to idle to simulate a loss of engine power, the engine lost total power. The pilot entered an autorotation and completed a forced landing to a field. The helicopter landed hard and the tailboom was severed by the main rotor blades. The pilot exited the helicopter unassisted.

The helicopter sustained substantial damage to the tailboom and the main rotor blades. A postaccident examination revealed that the carburetor heat control knob was jammed in the full heat position. Further examination revealed that the carburetor heat control cable was rigged so that the cable was pulled beyond the end of the cable conduit sleeve (figure 1). When the carburetor heat knob was actuated, the control cable would bind with the conduit sleeve.

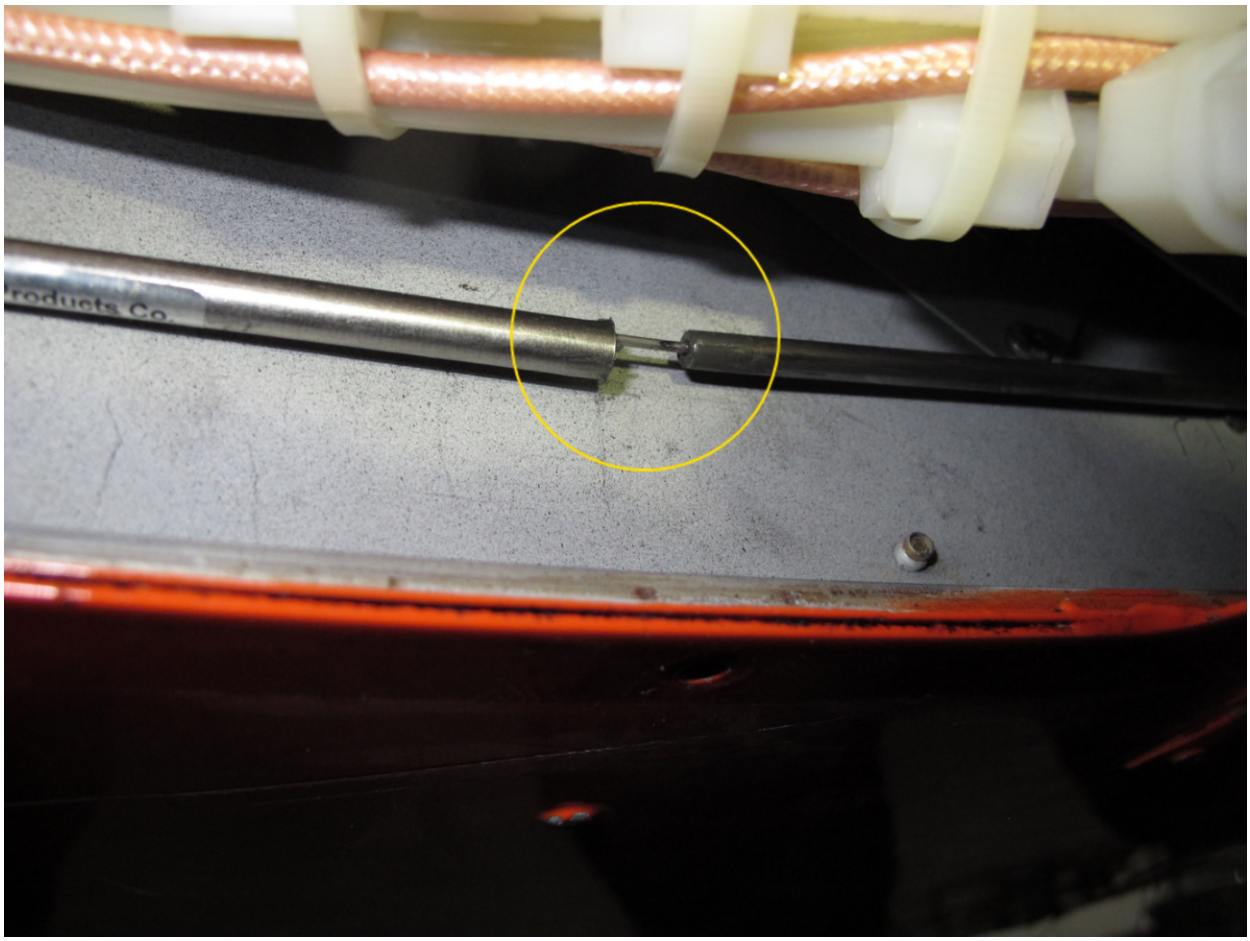

Figure 1: Carburetor heat control cable as found. The cable is free from the conduit sleeve (circled in yellow).

Figure 2 shows a normal engagement of the carburetor heat control cable in the conduit sleeve.

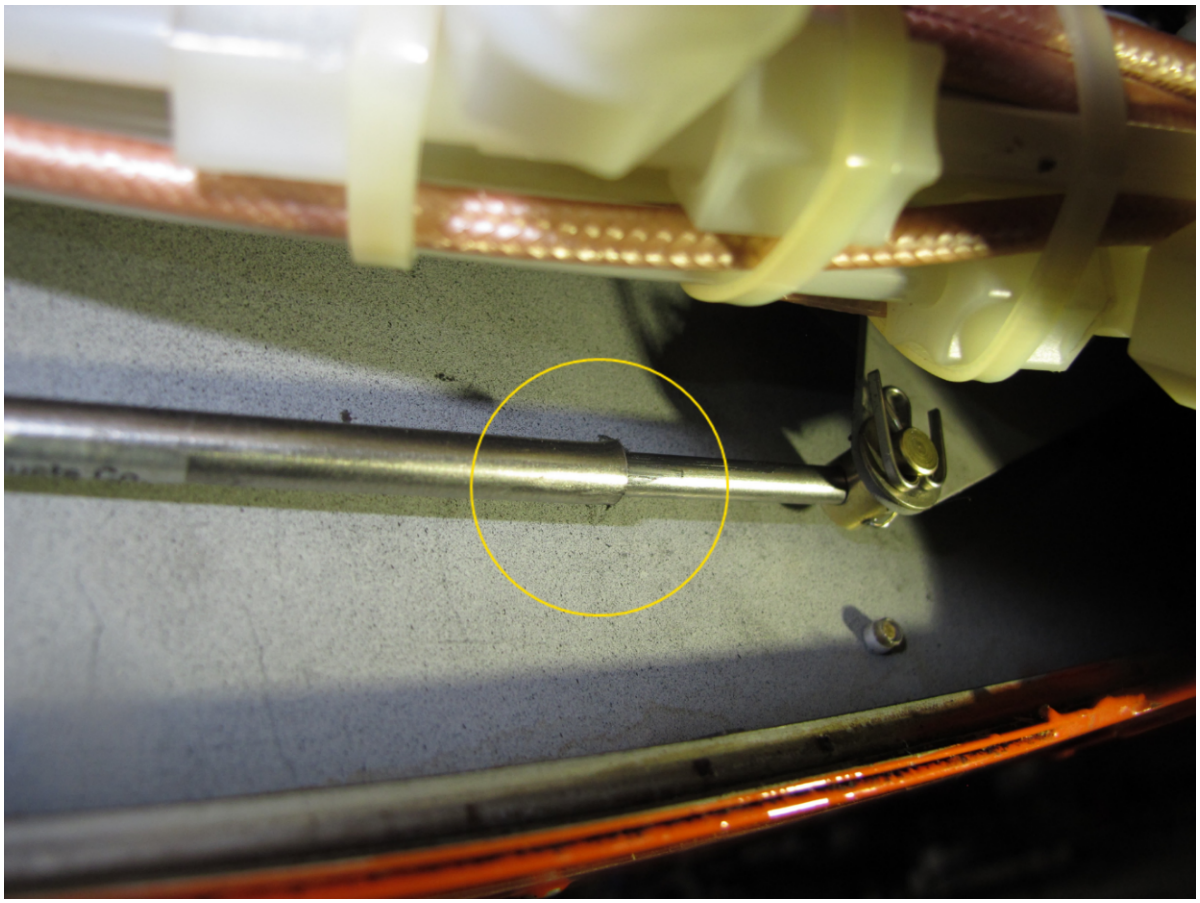

Figure 2. The normal engagement of the carburetor heat cable and conduit. Cable is inserted into the conduit sleeve (circled in yellow).

No other anomalies were found within the rigging or flight controls that would have precluded normal operation.

Single contact marks on the fore and aft faces of the upper sheave and adjacent components are consistent with the engine not running at the time of impact. The V-belts and tail boom were cut and removed to facilitate an engine run. The engine started and ran at various power settings. The idle was set to below 50 percent (the typical idle speed without V-belts is 60-65 percent). Robinson Helicopter Company Safety Notices 27 and 38 advise on how to slowly reduce throttle while practicing autorotations.RHC Safey Notice 27 states that during simulated power failures, “throttle should be rolled off smoothly, never ‘chopped.’”

A review of the helicopter maintenance records revealed that on August 25, 2022, the engine was overhauled and installed, and an annual inspection of the helicopter was completed. The last 100-hour inspection was completed on August 16, 2023. The helicopter had accumulated 44.2 hours since the 100-hour inspection. Investigators were unable to determine the last time the carburetor control cable was rigged or when the engine idle was set.

Pilot Information

Certificate:	Commercial; Flight instructor	**Age:**	25,Male
Airplane Rating(s):	None	**Seat Occupied:**	Right
Other Aircraft Rating(s):	Helicopter	**Restraint Used:**	3-point
Instrument Rating(s):	Helicopter	**Second Pilot Present:**	No
Instructor Rating(s):	Helicopter; Instrument helicopter	**Toxicology Performed:**	
Medical Certification:	Class 2 Without waivers/limitations	**Last FAA Medical Exam:**	March 2, 2023
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	September 10, 2023
Flight Time:	1353 hours (Total, all aircraft), 600 hours (Total, this make and model), 1349 hours (Pilot In Command, all aircraft), 151 hours (Last 90 days, all aircraft), 42 hours (Last 30 days, all aircraft), 3 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	ROBINSON HELICOPTER	**Registration:**	N379SH
Model/Series:	R44	**Aircraft Category:**	Helicopter
Year of Manufacture:	2012	**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	2240
Landing Gear Type:	Skid	**Seats:**	4
Date/Type of Last Inspection:	August 16, 2023 100 hour	**Certified Max Gross Wt.:**	2400 lbs
Time Since Last Inspection:	44.2 Hrs	**Engines:**	1 Reciprocating
Airframe Total Time:	241.9 Hrs at time of accident	**Engine Manufacturer:**	Lycoming
ELT:	C126 installed, not activated	**Engine Model/Series:**	O-540-F1B5
Registered Owner:	SPITZER HELICOPTER LLC	**Rated Power:**	260 Horsepower
Operator:	Jacasky LLC	**Operating Certificate(s) Held:**	None
Operator Does Business As:	Sky Tours Hochatown	**Operator Designator Code:**	N/A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	K4O4,472 ft msl	**Distance from Accident Site:**	16 Nautical Miles
Observation Time:	12:15 Local	**Direction from Accident Site:**	199°
Lowest Cloud Condition:	Clear	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	/	**Turbulence Type Forecast/Actual:**	None / None
Wind Direction:		**Turbulence Severity Forecast/Actual:**	N/A / N/A
Altimeter Setting:	30.16 inches Hg	**Temperature/Dew Point:**	31°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Hochatown, OK	**Type of Flight Plan Filed:**	None
Destination:	Hochatown, OK	**Type of Clearance:**	None
Departure Time:		**Type of Airspace:**	Class G

Wreckage and Impact Information

Crew Injuries:	1 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	N/A	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 None	**Latitude, Longitude:**	34.160278,-94.752222

Administrative Information

Investigator In Charge (IIC):	Rutt, Brian
Additional Participating Persons:	Adama Allmond; FAA - OKC FSDO Thom Webster; Robinson Helicopter Company; Torrance, CA
Original Publish Date:	November 26, 2024
Last Revision Date:	
Investigation Class:	Class 3
Note:	The NTSB did not travel to the scene of this accident.
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=193182