



# **Aviation Investigation Final Report**

Location:	Brady, Texas	Incident Number:	CEN23FA183
Date & Time:	May 14, 2023, 00:00 Local	Registration:	N40506
Aircraft:	Robinson R22 Beta	Aircraft Damage:	Substantial
Defining Event:	Loss of control on ground	Injuries:	1 Fatal
Flight Conducted Under:	Part 91: General aviation - Personal		

# Analysis

Although there were no witnesses to the crash, it is likely that the non-certificated pilot was conducting an engine ground run when the helicopter inadvertently became airborne. The helicopter impacted the terrain about 70 ft from the concrete pad used during ground operations. After the crash, the collective friction control was found off, which likely resulted in an unintended increase of the collective control to a point where the helicopter became airborne.

The pilot's logbook contained a student pilot certificate; however, it expired more than 50 years before the crash. A review of the pilot's logbook did not reveal any flights after he received a 90-day solo endorsement for a single-engine airplane in 1971, nor did it reveal any flights completed in a helicopter. The pilot had served in the US Army but in a non-pilot role.

The pilot purchased the helicopter in March 2016 as an investment and family members could not recall the last time he flew the helicopter. One of the pilot's daughters reported that he would occasionally bring the helicopter out of the shed to perform an engine run and, on multiple occasions, he forgot to engage the collective friction control, which resulted in unintended movement of the helicopter on the ground while the engine was running.

The 93-year-old pilot's medical history was significant for impairing physical and mental conditions. There was documentation of a previous stroke and Parkinson's disease that impacted the strength and function of his left and right upper extremities. During his last hospital admission, about 4 months before the crash, the pilot was diagnosed with moderate senile dementia. The pilot's postmortem toxicology results detected central nervous system depressant medications, including gabapentin and cyclobenzaprine, both of which can adversely interact with one another and worsen impairment, especially in older adults. The pilot's baseline ability to operate the helicopter is uncertain. Regardless, it is likely that some

combination of the pilot's various physical and mental conditions and his use of potentially impairing medications contributed to the circumstances of the crash.

Ethanol was detected in blood, but not in vitreous fluid or urine. Other volatiles, n-butanol and n-propanol were also detected. It is likely that some, or all, of the detected ethanol was from postmortem production. Thus, it is unlikely that ethanol contributed to the crash.

# **Probable Cause and Findings**

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

The non-certificated pilot's failure to ensure the collective friction control was adequately engaged during an on-ground engine run, which resulted in the helicopter inadvertently becoming airborne. Contributing to the crash were the pilot's various physical and mental conditions and his use of potentially impairing medications.

Findings	
Personnel issues	Aircraft control - Pilot
Aircraft	Main rotor control - Not used/operated
Personnel issues	Predisposing condition - Pilot
Personnel issues	Use of medication/drugs - Pilot
Personnel issues	Task monitoring/vigilance - Pilot

# **Factual Information**

#### **History of Flight**

**Standing-engine(s) operating** Loss of control on ground (Defining event)

On May 14, 2023, at an unknown time, a Robinson R22 Beta helicopter, N40506, was substantially damaged during a crash near Brady, Texas. The non-certificated pilot was fatally injured. Although the helicopter was operated under Title 14 *Code of Federal Regulations (CFR)* Part 91, evidence from the investigation suggests there was no intent for flight as defined by 49 *CFR* § 830.2 and, accordingly, the event was not classified as an accident.

There were no witnesses to the crash. According to one of the pilot's daughters, the pilot regularly attended a Sunday morning church service at 1100 in Brady, Texas, but on the morning of the crash he was not seen at the church service. After several unsuccessful attempts to reach the pilot via phone on the afternoon of May 14 and the morning of May 15, a family member asked a neighbor to check on the pilot at his residence, where the helicopter wreckage and pilot were found near the house. The pilot was reportedly wearing his church clothes and dress boots.

Certificate:	None	Age:	93,Male
Airplane Rating(s):	None	Seat Occupied:	Right
Other Aircraft Rating(s):	None	Restraint Used:	None
Instrument Rating(s):	None	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	Yes
Medical Certification:	Class 3 None	Last FAA Medical Exam:	February 3, 1970
Occupational Pilot:	No	Last Flight Review or Equivalent:	
Flight Time:			

#### **Pilot Information**

A search of FAA airman certification records found no record of a pilot certificate ever being issued to the pilot.

The pilot's family provided a pilot logbook that contained a combined FAA third-class medical and student pilot certificate dated February 3, 1970. The medical/student pilot certificate was expired. The final logbook entry was a 90-day solo endorsement for a Cessna 172 airplane dated January 17, 1971. Further review of the pilot logbook did not reveal any flights completed in a helicopter. According to the pilot's family, he had served in the US Army but in a non-pilot role. The pilot's baseline ability to fly helicopters could not be assessed with the available documentation.

Aircraft Make:	Robinson	Registration:	N40506
Model/Series:	R22 Beta	Aircraft Category:	Helicopter
Year of Manufacture:	1991	Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	1753
Landing Gear Type:	Skid	Seats:	2
Date/Type of Last Inspection:	October 10, 2003 Annual	Certified Max Gross Wt.:	1370 lbs
Time Since Last Inspection:	77.3 Hrs	Engines:	1 Reciprocating
Airframe Total Time:	3527 Hrs at time of accident	Engine Manufacturer:	Lycoming
ELT:	Not installed	Engine Model/Series:	0-320-B2C
Registered Owner:	On file	Rated Power:	135 Horsepower
Operator:	On file	Operating Certificate(s) Held:	None

#### Aircraft and Owner/Operator Information

The last annual inspection of the helicopter was completed on October 10, 2003, at 3,449.7 total airframe hours. The logbook documentation did not reveal any maintenance actions after the annual inspection. At the time of the crash, the airframe total time was 3,527.0 hours, and the engine total time since new and time since overhaul were 4,035.7 hours and 1,527.3 hours, respectively.

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Dav
Observation Facility, Elevation:	KBBD,1827 ft msl	Distance from Accident Site:	3 Nautical Miles
Observation Time:	09:55 Local	Direction from Accident Site:	148°
Lowest Cloud Condition:	Clear	Visibility	10 miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	5 knots / None	Turbulence Type Forecast/Actual:	None / None
Wind Direction:	210°	Turbulence Severity Forecast/Actual:	N/A / N/A
Altimeter Setting:	30.14 inches Hg	Temperature/Dew Point:	20°C / 17°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Brady, TX	Type of Flight Plan Filed:	None
Destination:	Brady, TX	Type of Clearance:	None
Departure Time:		Type of Airspace:	Class G

## **Airport Information**

Airport:	PVT PVT	Runway Surface Type:	
Airport Elevation:	1858 ft msl	Runway Surface Condition:	Dry
Runway Used:		IFR Approach:	None
Runway Length/Width:		VFR Approach/Landing:	None

### Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal	Latitude, Longitude:	31.225932,-99.358637

The helicopter was found on its right side, facing west, about 15 ft from the north wall of the house, as shown in figure 1. The helicopter was about 70 ft southwest from a concrete pad that the pilot used during ground operations, as shown in figure 2. The helicopter's ground handling wheels and a hand truck associated with a battery charger were found beside the concrete pad, as shown in figure 3. The battery charger and its integrated jumper cables were

found about 60 ft from the concrete pad against the rear right tire of a white sedan parked beside the helicopter wreckage, as shown in figure 4. The hood and roof of the white sedan exhibited fresh dirt deposits.

There was a small truck, full-sized recreational vehicle, and two steel drums located between the concrete pad and the helicopter wreckage, as shown in figure 5. Based on ground impact marks and the overall wreckage distribution, the helicopter ascended at least 7 ft to clear the obstacles before it impacted the ground near the house.

The pilot-side cabin door, normally installed on the right side of the helicopter, separated from the fuselage during impact and was found about 20 ft from the main wreckage. The right door hinges did not have retaining rings installed. The passenger side cabin door remained closed, latched, and undamaged on the helicopter. According to first responders, the pilot was found in the right side of the cabin with his torso still seated in the right seat, and he was not wearing the available seat restraints.



Figure 1. Main wreckage overview



**Figure 2.** Location of main wreckage in north side yard of house (red arrows) and concrete pad (yellow arrows) with inset aerial photo depicting property layout.



**Figure 3.** Concrete pad, hand truck used with battery charger (red boxes), and ground handling wheels (red arrows).



Figure 4. Main wreckage, sedan, and battery charger with jumper cables (red arrow).



Figure 5. Main wreckage with obstacles along projected flight path.

Flight control continuity was confirmed from the cyclic and collective to the swashplate assembly where both ears exhibited fracture features consistent with overstress. Both blade pitch control links remained intact. The cyclic friction was on and, as shown in figure 6, the collective friction control was off. Tail rotor flight control continuity was confirmed from the anti-torque pedals to the tail rotor blades.



Figure 6. Collective friction in off position.

Both main rotor blades were bowed upward with chordwise creases throughout their span. Both blades had rough score marks along their leading edge from mid-span out to their respective tip. The tail rotor blades exhibited normal wear along the leading edge with no impact damage.

The main transmission and tail rotor gear box rotated freely by hand. The tail rotor drive shaft remained intact. The lower and upper sheaves appeared undamaged, and the V-belts exhibited no abnormal wear. The V-belts were in place on the lower sheave and positioned one groove forward on the upper sheave. The upper and lower support bearings rotated smoothly. The upper sheave engaged the clutch shaft when rotated by hand in a counterclockwise direction (looking forward) and rotated smoothly on the shaft when rotated in a clockwise direction.

The helicopter's main fuel tank contained about 4 gallons of fuel, and the auxiliary fuel tank contained unusable fuel. The gascolator bowl was full of fuel that was blue in color with no water or debris and had the odor of 100 low-lead aviation fuel. The gascolator fuel screen was clear of debris. The airframe fuel lines were undamaged and remained attached to the carburetor inlet. The fuel shutoff valve was found open.

There was a short chain loop installed on the landing skid aft cross tube, as shown in figure 7. According to the pilot's family, to move the helicopter while on the ground, the pilot would connect an electric winch cable to a short chain loop on the helicopter's landing skid aft cross tube. The electric winch motor was located at the rear of the shed where the helicopter was normally stored. However, if he intended to fly, the pilot would remove the short chain loop before the flight. The winch cable was not connected to the chain loop at the time of the crash and was found on the floor of the shed undamaged.



Figure 7. Chain loop around the landing gear skid aft cross tube.

The engine started and operated normally during several postcrash engine runs. The wreckage examination and engine test runs did not reveal any preimpact mechanical anomalies that would have prevented normal operation of the helicopter.

# **Medical and Pathological Information**

The 93-year-old pilot had an extensive past medical history, including a stroke in 2019 with residual left upper extremity weakness, Parkinson's disease resulting in a tremor of his right hand, coronary artery disease, a recent electrocardiogram with arrhythmias, high blood pressure, high cholesterol, degenerative arthritis of the spine, chronic kidney disease, and recurrent urinary tract infections resulting in hospital admissions.

On January 19, 2023, during his most recent hospital admission, the pilot was diagnosed with moderate senile dementia. His medication list at that time included carbidopa/levodopa, a prescription medication commonly used to treat Parkinson's disease; atorvastatin, a prescription medication commonly used to control cholesterol and reduce cardiovascular risk; gabapentin, a prescription medication commonly used to treat pain and fever and to reduce cardiovascular risk; finasteride, a prescription medication commonly used to treat pain and fever and to reduce cardiovascular risk; finasteride, a prescription medication commonly used to treat nerve pain; aspirin, an over-the-counter medication medication commonly used to treat pain and fever and to reduce cardiovascular risk; finasteride, a prescription medication commonly used to treat an enlarged prostate; and levothyroxine, a prescription medication commonly used to treat low thyroid hormone.

The autopsy of the pilot was performed by Central Texas Autopsy, Lockhart, Texas, as authorized by a McCulloch County Judge. According to the autopsy report, the pilot's cause of death was blunt force head and chest trauma, and the manner of death was accident. The heart was described as enlarged with severe calcific coronary artery disease, including 50-90% stenosis of the right coronary artery, 40% stenosis of the left main coronary artery, 50-80% stenosis of the left anterior descending coronary artery and 50-100% stenosis of the circumflex coronary artery. A prior myocardial infarction (heart attack) was noted. The heart was also found to have moderate to severe left ventricular hypertrophy, and severe biventricular dilatation. The aorta was noted to have severe calcific atherosclerotic disease. The kidneys were noted to have changes from severe atherosclerosis. The remainder of the autopsy including examination of the brain, heart, and lungs did not identify other significant natural disease.

At the request of Central Texas Autopsy, NMS Labs completed toxicological testing of blood samples obtained during the pilot autopsy. No tested-for substances were detected. Caffeine was presumptively positive.

The FAA Forensic Sciences Laboratory completed postmortem toxicological testing of specimens obtained during the pilot autopsy. Ethanol was detected in blood at 0.06 gm/dL. Ethanol was not detected in vitreous fluid or urine. N-butanol was detected in heart blood and was not detected in vitreous fluid or urine. N-propanol was detected in heart blood and was not detected in vitreous fluid or urine. Gabapentin was detected in heart blood at 1986 ng/mL and detected in urine at 102,094 ng/mL. Cyclobenzaprine was detected in heart blood, and testing for cyclobenzaprine was inconclusive in urine. Norcyclobenzaprine was detected in heart blood at 3 ng/dL and was detected in urine at 17 ng/mL. Acetaminophen was detected in urine and was not detected in heart blood.

Ethanol is a type of alcohol. It is the intoxicating alcohol in beer, wine, and liquor, and if consumed, can impair judgment, psychomotor performance, cognition, and vigilance. FAA regulation imposes strict limits on flying after consuming ethanol, including prohibiting pilots from flying with a blood ethanol level of 0.04 g/dL or greater. Alcohol consumption is not the only possible source of ethanol in postmortem specimens. Ethanol can sometimes be produced by microbes in a person's body after death. Postmortem ethanol production is made more likely by extensive traumatic injury and can cause an affected toxicological specimen to test positive for ethanol while another specimen from the same person tests negative.

N-propanol and particularly n-butanol are other alcohols that can be produced by microbes in a person's body after death. Their presence in a postmortem specimen is potentially indicative of postmortem microbial activity in the specimen but does not reliably indicate that postmortem ethanol production occurred.

Gabapentin is a medication that is approved by the U.S. Food and Drug Administration for seizure disorders and nerve pain caused by herpes infections. It generally carries a warning

that use may cause somnolence, dizziness, and general central nervous system (CNS) depression. Precautions are advised for driving a vehicle or operating heavy machinery until the user can assess the impact of dosing on alertness and motor activities. Gabapentin is commonly prescribed for off-label uses such as insomnia, anxiety, depression, migraine, nerve pain, and fibromyalgia. Caution is advised when using gabapentin in older adults as these individuals have increased risk for somnolence, dizziness and falls with gabapentin use. Cautious dosing is also advised in chronic kidney disease to minimize CNS depression. The FAA considers gabapentin a "do not issue/do not fly" medication.

Cyclobenzaprine is a prescription medication commonly used to treat muscle spasms. It generally carries a warning that use in combination with other CNS depressants may impair mental and physical abilities required for the performance of hazardous tasks such as operating a motor vehicle or operating machinery. The drug generally carries a warning that older adults may be more at risk for CNS events such as hallucinations, confusion, cardiac events, and falls. Caution is advised in using cyclobenzaprine for older adults unless strongly indicated. The FAA considers cyclobenzaprine a "do not fly" medication. Norcyclobenzaprine is a metabolite of cyclobenzaprine.

Caffeine is a CNS stimulant that is commonly ingested, including in coffee, tea, soft drinks, and chocolate, and is also an ingredient in certain anti-drowsiness medications and headache medications. Caffeine is not generally considered impairing.

A search of FAA medical certification records search did not locate a medical file for the pilot.

## **Additional Information**

According to one of the pilot's daughters, the pilot purchased the helicopter in March 2016 as an investment and she could not recall the last time he flew the helicopter. She stated that the pilot would occasionally bring the helicopter out of the shed to perform an engine run and, on multiple occasions, he forgot to engage the collective friction control, which resulted in unintended movement of the helicopter on the ground while the engine was running. The pilot kept the helicopter's battery connected to a charger while the helicopter was stored in the shed and during the engine runs on the concrete pad.

#### **Administrative Information**

Investigator In Charge (IIC):	Fox, Andrew
Additional Participating Persons:	Benjamin Huffman; Federal Aviation Administration - San Antonio FSDO; San Antonio, TX Keenon Wood; Federal Aviation Administration - San Antonio FSDO; San Antonio, TX Thom Webster; Robinson Helicopter Company; Torrance, CA David Harsanyi; Lycoming Engines; Williamsport , PA
Original Publish Date:	April 24, 2025
Last Revision Date:	
Investigation Class:	Class 3
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=174530

The National Transportation Safety Board (NTSB) is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate, and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

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.