



# Aviation Investigation Final Report

<b>Location:</b>	UNION CITY, Tennessee	<b>Accident Number:</b>	ATL95LA171
<b>Date &amp; Time:</b>	September 21, 1995, 14:15 Local	<b>Registration:</b>	N616X
<b>Aircraft:</b>	BELL                      47G	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Instructional		

## Analysis

During flight, the pilot noted a severe vibration and elected to make an emergency autorotation. He landed with forward speed in a flat, open, bean field. The pilot reported that during the landing, the skids got caught in the beans, and the helicopter rolled over. A cabin fire followed shortly thereafter. A postcrash engine teardown revealed that a #4 connecting rod bolt had failed, resulting in engine stoppage.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: Failure of a #4 connecting rod bolt, which resulted in engine stoppage and a forced landing.

### Findings

Occurrence #1: LOSS OF ENGINE POWER(TOTAL) - MECH FAILURE/MALF  
Phase of Operation: CRUISE - NORMAL

#### Findings

1. (C) ENGINE ASSEMBLY,CONNECTING ROD - FAILURE  
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Occurrence #2: FORCED LANDING  
Phase of Operation: DESCENT - EMERGENCY

#### Findings

2. AUTOROTATION - PERFORMED - PILOT IN COMMAND

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Occurrence #3: ROLL OVER

Phase of Operation: EMERGENCY LANDING

## Factual Information

On September 21, 1995, about 1415 central daylight time, a Bell 47G, N616X, force landed following an in-flight engine vibration, near Union City, Tennessee. The helicopter was operated by the pilot under the provisions of 14 CFR Part 91, and visual flight rules. Visual meteorological conditions prevailed. A flight plan was not filed for the solo, instructional flight. There were no injuries to the private pilot, and the helicopter was substantially damaged. Origination of the flight was Union City, Tennessee, about ten minutes prior to the accident.

The pilot reported that while enroute to his farm, he noticed a vibration in the flight controls and initiated an autorotation. The pilot stated that he touched down in a flat bean field with forward speed. The skids caught on the beans, the helicopter rolled over, caught fire and burned. The pilot held a private pilot certificate with airplane single engine, multi engine, and instrument ratings. He also had a helicopter solo endorsement.

During the ensuing engine teardown, it was noted that the connecting rod from the #4 cylinder was found separated from the crankshaft with the rod cap wedged between the rod and the case. Only 1 connecting rod bolt was located for the #4 cylinder, and it was located in the cap, with the threads stripped from the bolt. The separation of the rod resulted in the fracture of the camshaft, case cracking, and lifter separation.

### Pilot Information

<b>Certificate:</b>	Private	<b>Age:</b>	40, Male
<b>Airplane Rating(s):</b>	Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	March 26, 1994
<b>Occupational Pilot:</b>	UNK	<b>Last Flight Review or Equivalent:</b>	
<b>Flight Time:</b>	1475 hours (Total, all aircraft), 25 hours (Total, this make and model)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	BELL	<b>Registration:</b>	N616X
<b>Model/Series:</b>	47G 47G	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	5015
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	2
<b>Date/Type of Last Inspection:</b>	Annual	<b>Certified Max Gross Wt.:</b>	2350 lbs
<b>Time Since Last Inspection:</b>	15 Hrs	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	1700 Hrs	<b>Engine Manufacturer:</b>	FRANKLIN
<b>ELT:</b>		<b>Engine Model/Series:</b>	6VS-335-A
<b>Registered Owner:</b>	STEVEN TERRY FARMS	<b>Rated Power:</b>	210 Horsepower
<b>Operator:</b>	GORDON WADE	<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>		<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	DYR ,337 ft msl	<b>Distance from Accident Site:</b>	20 Nautical Miles
<b>Observation Time:</b>	13:48 Local	<b>Direction from Accident Site:</b>	200°
<b>Lowest Cloud Condition:</b>	Scattered / 2000 ft AGL	<b>Visibility</b>	7 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	7 knots /	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	70°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30 inches Hg	<b>Temperature/Dew Point:</b>	24°C / 16°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	, TN (UCY)	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>		<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	13:30 Local	<b>Type of Airspace:</b>	Class G

## Airport Information

<b>Airport:</b>		<b>Runway Surface Type:</b>	
<b>Airport Elevation:</b>		<b>Runway Surface Condition:</b>	
<b>Runway Used:</b>	0	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>		<b>VFR Approach/Landing:</b>	Forced landing

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	On-ground
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	36.419681,-89.050346(est)

## Administrative Information

<b>Investigator In Charge (IIC):</b>	Hicks, Preston
<b>Additional Participating Persons:</b>	MIKE ELLIOTT; MEMPHIS , TN
<b>Original Publish Date:</b>	April 29, 1996
<b>Last Revision Date:</b>	
<b>Investigation Class:</b>	<a href="#">Class</a>
<b>Note:</b>	
<b>Investigation Docket:</b>	<a href="https://data.ntsb.gov/Docket?ProjectID=3627">https://data.ntsb.gov/Docket?ProjectID=3627</a>

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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](#).