Aviation Investigation Final Report

Location:	UNION CITY, Tennessee	**Accident Number:**	ATL95LA171
Date & Time:	September 21, 1995, 14:15 Local	**Registration:**	N616X
Aircraft:	BELL 47G	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 None
Flight Conducted Under:	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

Occurrence #2: FORCED LANDING
Phase of Operation: DESCENT - EMERGENCY

Findings

2. AUTOROTATION - PERFORMED - PILOT IN COMMAND

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

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

Aircraft and Owner/Operator Information

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

Meteorological Information and Flight Plan

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

Airport Information

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

Wreckage and Impact Information

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

Administrative Information

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