



# National Transportation Safety Board Aviation Accident Factual Report

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<b>Location:</b>	SEVIERVILLE, TN	<b>Accident Number:</b>	MIA99LA181
<b>Date &amp; Time:</b>	06/11/1999, 1700 EDT	<b>Registration:</b>	N49669
<b>Aircraft:</b>	Robinson R-44	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	3 None

**Flight Conducted Under:** Part 91: General Aviation - - Sightseeing

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On June 11, 1999, about 1700 eastern daylight time, a Robinson R-44, N49669, registered to Highway 66 Aviation, LLC, dba Scenic Helicopter Tours, operating as a Title 14 CFR Part 91 sightseeing flight, crashed into a field near Sevierville, Tennessee, after sustaining a main and tail rotor drive failure while in cruise flight. Visual meteorological conditions prevailed and no flight plan was filed. The aircraft sustained substantial damage and the airline transport-rated pilot and two passengers were uninjured. The flight originated about 10 minutes before the flight.

According to the pilot, he was in cruise flight at 400 to 500 feet agl, when he heard a loud "pop" and the helicopter vibrated and yawed without a control input. Shortly thereafter, he got a low rotor warning horn and light, both main and tail rotor tachometer indications went to zero, and he commenced an autorotation. He landed in a tobacco field, and applied the rotor brake, which had no effect.

Examination by FAA personnel revealed no damage to the external fuselage; however, removal of the rear cowling revealed (1) the forward yoke of the main drive shaft at the transmission end had failed and was in several pieces, (2) the tubular framework to the left and below the main drive shaft had been mangled and was in two pieces, (3) a 4-inch by 2-inch puncture of the left fuel tank was present, (4) the double drive belts had been displaced as was their drive pulleys, (5) the tail rotor drive shaft was sheared and its forward drive shaft yoke had failed, (6) the tail rotor control tube rod ends had failed.

The Robinson Helicopter Factory arranged for shipping the wreckage for NTSB disassembly examination at their Torrance, California, facilities. Examination of the helicopter's rotor drive systems revealed that the sequence of failure events began with engine-to-transmission drive shaft excessive end play at the transmission end. The component that supports the drive shaft in that location is the forward main rotor drive yoke, part number C908-1. The component was subsequently removed and shipped to the NTSB Materials Laboratory, Washington, D.C. for further examination.

According to the NTSB Materials Laboratory, the yoke failure was an induced fatigue

fracture originating from a defective inertia weld at fabrication. Paint found within the crack confirmed the defect existed since manufacture, and probably occurred as a result of a straightening operation. Although the component is subjected to magnetic particle inspection after straightening and before finishing, plating, and painting, this defective component had been allowed to be installed. The report from the NTSB Materials Laboratory is included under, "Materials Laboratory Factual Report".

## Pilot Information

<b>Certificate:</b>	Airline Transport; Commercial	<b>Age:</b>	46, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Right
<b>Other Aircraft Rating(s):</b>	Helicopter	<b>Restraint Used:</b>	Seatbelt, Shoulder harness
<b>Instrument Rating(s):</b>	Airplane; Helicopter	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	Helicopter	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--w/ waivers/lim.	<b>Last FAA Medical Exam:</b>	04/01/1999
<b>Occupational Pilot:</b>	<b>Last Flight Review or Equivalent:</b>		
<b>Flight Time:</b>	9000 hours (Total, all aircraft), 100 hours (Total, this make and model), 8700 hours (Pilot In Command, all aircraft), 70 hours (Last 90 days, all aircraft), 20 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

## Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Robinson	<b>Registration:</b>	N49669
<b>Model/Series:</b>	R-44 R-44	<b>Aircraft Category:</b>	Helicopter
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	No
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	562
<b>Landing Gear Type:</b>	Skid	<b>Seats:</b>	4
<b>Date/Type of Last Inspection:</b>	05/19/1999, Annual	<b>Certified Max Gross Wt.:</b>	2400 lbs
<b>Time Since Last Inspection:</b>	80 Hours	<b>Engines:</b>	1 Reciprocating
<b>Airframe Total Time:</b>	279 Hours	<b>Engine Manufacturer:</b>	Lycoming
<b>ELT:</b>	Installed, activated, did not aid in locating accident	<b>Engine Model/Series:</b>	O-540-F1B5
<b>Registered Owner:</b>	HWY 66 AVIATION LLC	<b>Rated Power:</b>	260 hp
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None
<b>Operator Does Business As:</b>	RAMBO HELICOPTER CHARTER, INC.	<b>Operator Designator Code:</b>	

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:	TYS, 981 ft msl	Distance from Accident Site:	24 Nautical Miles
Observation Time:	1653 EDT	Direction from Accident Site:	262°
Lowest Cloud Condition:	Scattered / 6500 ft agl	Visibility	9 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	6 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	60°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	33° C / 19° C
Precipitation and Obscuration:			
Departure Point:	SEVIERVILLE, TN	Type of Flight Plan Filed:	None
Destination:		Type of Clearance:	None
Departure Time:	1450 EDT	Type of Airspace:	Class G

## Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Substantial
Passenger Injuries:	2 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	ALAN C STONE
Additional Participating Persons:	ROCKY DAVIDSON; NASHVILLE, TN PAM CHARLES; NASHVILLE, TN
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .