National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: LAX00LA024	Aircraft Registration Number: N36R
Occurrence Date: 10/23/1999	Most Critical Injury: None
Occurrence Type: Accident	Investigated By: NTSB

Location/Time

Nearest City/Place	State	Zip Code	Local Time	Time Zone	
SANTA CLARITA	CA	91380	1115	PDT	

Airport Proximity: Off Airport/Airstrip

Distance From Landing Facility:

Aircraft Information Summary

Aircraft Manufacturer	Model/Series	Type of Aircraft
Bell	206-L4 /206-L4	Helicopter

Revenue Sightseeing Flight: No

Air Medical Transport Flight: No

Narrative

Brief narrative statement of facts, conditions and circumstances pertinent to the accident/incident:

*** Note: NTSB investigators may not have traveled in support of this investigation and used data provided by various sources to prepare this aircraft accident report. ***

HISTORY OF FLIGHT

On October 23, 1999, at 1115 hours Pacific daylight time, a Bell 206-L4, N36R, landed hard and rolled over in the Lake Piru riverbed near Santa Clarita, California. The helicopter, operated by MG Aviation, Teterboro, New Jersey, under the provisions of 14 CFR Part 91, was substantially damaged. Neither the private pilot/owner nor the certified flight instructor was injured. Visual meteorological conditions prevailed and no flight plan was filed. The local training flight originated from the Van Nuys airport about 1030.

The CFI stated, in the pilot operator report, that they were practicing autorotations to a power-on recovery within a dry riverbed. The pilot reported that based on their briefing, he would initiate the autorotation by rolling off the throttle and lowering the collective, and he would roll the throttle back on, to a hovering position, at the termination of the maneuver.

The private pilot stated that they had successfully completed one practice autorotation and entered a second approximately 600 feet agl. When he attempted to recover power, the engine did not respond as quickly as anticipated and the helicopter settled hard into the soft creek bed.

The CFI reported that the pilot had been late bringing in the power and he had gotten on the controls during the flare to help the pilot and level the helicopter. The pilot reported that when he realized there was a lack of power, he tried to push the nose over. Both the pilot and CFI applied full collective, and reported that there was not sufficient rotor rpm to effectively cushion the landing, causing the helicopter to land on the heels of both skids.

The surface of the dry riverbed was mostly soft sand; the aft end of the left skid contacted a 12-inch-diameter log that was embedded within the riverbed. The tip of the left skid nosed into the sand and the helicopter rolled over onto its left side. The CFI stated that just before the helicopter impacted the terrain, the power came back in and the engine torque caused the aircraft to yaw to the right. Both the CFI and the pilot reported that the engine was running after the helicopter came to rest.

The pilot reported that the engine performance seemed normal prior to the accident, including the start-up and accelerations/decelerations tests. Both the pilot and the CFI stated that they were familiar with the engine spool-up time, and that they had not noted any redline excedances, or any abnormalities with N1 or N2.

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

Narrative (Continued)

CREW INFORMATION

Review of the Federal Aviation Administration (FAA) airman certification database revealed that the CFI held a commercial certificate for rotorcraft-helicopters, an airline transport pilot certificate for single and multiengine airplanes, and, a CFI certificate for single and multiengine airplanes, instrument airplanes, and rotorcraft-helicopters. He also held advanced and instrument ground instructor certificates. He reported that he had 3,859 hours of total flight time, including 394 hours in rotorcraft, and 75 in the Bell 206-L4.

According to the FAA airman certification database, the pilot held a private pilot certificate with airplane single engine land and rotorcraft helicopter ratings. He reported that he had accumulated about 994 hours of total flight time, including 332 hours in rotorcraft and 235 hours in the Bell 206-L4.

TESTS AND RESEARCH

The tail boom and landing gear were removed from the fuselage to facilitate recovery. The basic structure of the cockpit and cabin was intact and no evidence of distortion or deformation was noted. The front seat occupant restraints were intact and neither the seat bottoms nor seat pans showed signs of deformation and the cockpit controls appeared undamaged. All switches were in found in the "OFF" position, all instrument static positions appeared normal, and all overhead circuit breakers were in.

The battery was reconnected and the engine igniter and starter circuit breakers were pulled out. When the battery switch was placed in the "ON" position the "engine out" and "rotor rpm low" audio warnings were heard, and the following caution lights were observed illuminated: "GEN FAIL," "TRANS OIL PRES," "ENG OUT," and "ROTOR LOW RPM." The fuel gauge indicated 335 pounds of fuel. When the caution panel test switch was depressed, all caution segments illuminated.

The cockpit controls were manipulated through their entire range of travel and no abnormalities were noted. The cyclic and collective controls were found to operate normally up to the hydraulic servo actuators. The tail rotor linkage was operable aft to the fractured control tube at the tail boom separation point. The throttle and collective droop linkages were intact and operable.

Both main rotor blades were fractured just outboard of the blade doublers. One of the blade tips displayed blue paint transfer, which matched damage on the upper portion of the vertical fin. The hub assembly feathering and flapping bearings operated normally. The pitch horns on both main rotor blades were intact. One of the main rotor pitch links was intact and the other pitch link was fractured.

The tail boom exhibited buckling around the entire circumference of the tail boom structure. Drive continuity was established through the 90-degree gearbox to the tail rotor. The tail rotor hub and blade assembly were intact and the blades did not exhibit damage.

The landing gear assembly had been removed from the airframe during recovery of the helicopter. The forward cross tube was fractured at the left skid attachment fitting. The front and rear cross tubes of the landing gear exhibited downward compression at the left attachment saddle area. With the fractured left skid attachment fitting placed back together, measurements were taken on the cross tubes with the landing gear assembly upright on the hangar floor. The rear cross tube measured 24 inches from the top of the tube at the left saddle down to the floor, and 24.5 inches from the top of the tube at the right saddle to the floor. The front cross tube measured 16.5 inches from the top of the tube at the left saddle down to the floor, and 21 inches from the top of the tube at the right saddle down to the floor. According to the representative from Bell Helicopters, this height measurement on an undamaged helicopter is approximately 25 inches.

Disassembly of the fuel filter revealed the element to be full of fuel, clean, and absent of debris. With both fuel boost pump circuit breakers pulled out, the battery switch was turned to the "ON" position. Both fuel boost pump warning segments illuminated on the caution panel. Each of the fuel boost pump circuit breakers were pushed in individually, and each of the respective fuel boost caution lights extinguished. The fuel line from the airframe to the inlet of the airframe filter was removed at the filter and placed in a 5-gallon container.

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

Narrative (Continued)

With both LEFT and RIGHT fuel boost pump circuit breakers pulled out, the battery switch was turned on. The LEFT fuel boost pump circuit breaker was depressed and fuel began flowing into the container at a rate estimated in excess of 65 gallons per hour. The LEFT boost pump breaker was pulled out and the RIGHT fuel boost pump breaker was depressed. Fuel flowed into the container at a rate estimated to be in excess of 65 gallons per hour.

The engine remained mounted to the airframe. The left aft engine mount tube was bent outward approximately 2 inches. External examination of the engine and accessories revealed no damage. All fuel system and airlines were tight and secure at their fittings. Control linkages were intact and secure. Hand rotation of the steel segment of tail rotor drive shafting verified proper operation of the freewheeling unit and also produced rotation of the power turbine rotor as observed through the exhaust stack.

The engine was removed for further testing. During removal, fuel was noted in the fuel lines to the engine from the airframe. The engine was taken to Air Services International, Scottsdale, Arizona, for a series of test runs on a test cell. The engine met all of the manufacturer's required specifications, and a copy of this performance data is appended to this file.

ADDITIAL INFORMATION

According to the FAA Rotorcraft Handbook concerning autorotations, with a power on recovery, the maneuver is to be started approximately 8 to 10 feet above the ground depending on the type of helicopter being used and the amount of time required for engine spool. It is noted that caution should be made to avoid excessive nose high, tail low attitudes below 10 feet.

The factory conducted recurrent training grade sheets for the pilot and the flight instructor were obtained from Bell Helicopters. For the flight instructor on flights completed from May 17-19, 1999, the evaluating pilot noted no problem areas other than "a tendency to touchdown on the heels of the skids during autorotations." This is sometimes followed with "too much forward cyclic causing the aircraft to go nose low." The same was noted on a series of flights completed on May 19-20, 1999. Recorded on May 20, 1999, sheet was the comment, "the instructor demonstrated very good skill in making required adjustments in order to reach a spot in autorotation . . . did have tendency to regularly touchdown on heel of skids in autorotation . . . knowledge of procedures also very good."

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

Landing Facility/Approach Information

Airport Name	Airport ID:	Airport Elevation	Runway Used	Runway Length	Runway Width
		Ft. MSL	0		

Runway Surface Type:

Runway Surface Condition: Dry; Soft

Approach/Arrival Flown: NONE

VFR Approach/Landing: Simulated Forced Landing

Aircraft Information

Aircraft Manufacturer	Model/Series	Serial Number
Bell	206-L4 /206-L4	52203

Airworthiness Certificate(s): Normal

Landing Gear Type: High Skid

Amateur Built Acft?	Number of Seats:	Certified Max Gross Wt.	Number of Engines:
No	7	4450 LBS	1

Engine Type:	Engine Manufacturer:	Model/Series:	Rated Power:
Turbo Shaft	Allison	250-C30	650 HP

- Aircraft Inspection Information

Type of Last Inspection	Date of Last Inspection	Time Since Last Inspection	Airframe Total Time
Annual	06/1999	65 Hours	258 Hours

- Emergency Locator Transmitter (ELT) Information

ELT Installed?/Type	ELT Operated?	ELT Aided in Locating Accident Site?
Yes /	No	

Owner/Operator Information

Registered Aircraft Owner	Street Address	City	State	Zip Code
MG AVIATION	114 CHARLES LINDBERG DRIVE	TETERBORO	NJ	07608

Operator of Aircraft	Street Address	City	State	Zip Code
MG AVIATION	114 CHARLES LINDBERG DRIVE	TETERBORO	NJ	07608

Operator Does Business As:

Operator Designator Code:

- Type of U.S. Certificate(s) Held: None

Air Carrier Operating Certificate(s):

Operating Certificate:

Operator Certificate:

Regulation Flight Conducted Under: Part 91: General Aviation

Type of Flight Operation Conducted: Instructional

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

First Pilot Information

Name	City	State	Date of Birth	Age
On File	On File	On File	On File	50

Sex: M | Seat Occupied: Left | Occupational Pilot? Unknown | Certificate Number: On File

Certificate(s): Airline Transport; Flight Instructor; Commercial

Airplane Rating(s): Multi-engine Land; Single-engine Land

Rotorcraft/Glider/LTA: Helicopter

Instrument Rating(s): Airplane

Instructor Rating(s): Airplane Multi-engine; Airplane Single-engine; Helicopter; Instrument Airplane

Current Biennial Flight Review?

Medical Cert.: Class 2 | Medical Cert. Status: Valid Medical--w/ waivers/lim. | Date of Last Medical Exam: 09/1999

- Flight Time Matrix	All A/C	This Make and Model	Airplane Single Engine	Airplane Mult-Engine	Night	Instrument Actual	Instrument Simulated	Rotorcraft	Glider	Lighter Than Air
Total Time	3859	75	2883	540	510	347	248	394		
Pilot In Command(PIC)	3413	22	2544	520	495		225	342		
Instructor	299	53	225	20	25	5	6	53		
Instruction Received										
Last 90 Days	44	11	30	3	1			11		
Last 30 Days	18	8	6	3	1			8		
Last 24 Hours	5	2	3					2		

Seatbelt Used? Yes | Shoulder Harness Used? Yes | Toxicology Performed? No | Second Pilot? Yes

Flight Plan/Itinerary

Type of Flight Plan Filed: None

Departure Point	State	Airport Identifier	Departure Time	Time Zone
VAN NUYS	CA	VNY	1030	PDT

Destination	State	Airport Identifier
Local Flight		

Type of Clearance: None

Type of Airspace: Class E

Weather Information

Pilot's Source of Wx Information:

National Transportation Safety Board

FACTUAL REPORT AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

Weather Information

WOF ID	Observation Time	Time Zone	WOF Elevation	WOF Distance From Accident Site	Direction From Accident Site
VNY	1151	PDT	799 Ft. MSL	20 NM	320 Deg. Mag.

Sky/Lowest Cloud Condition: Scattered 0 Ft. AGL

Condition of Light: Day

Lowest Ceiling: None 0 Ft. AGL

Visibility: 10 SM

Altimeter: 30.00 "Hg

Temperature: 29 °C

Dew Point: 6 °C

Weather Conditions at Accident Site: Visual Conditions

Wind Direction:

Wind Speed: Calm

Wind Gusts:

Visibility (RVR): 0 Ft.

Visibility (RVV) 0 SM

Precip and/or Obscuration:

Accident Information

Aircraft Damage: Substantial

Aircraft Fire: None

Aircraft Explosion None

- Injury Summary Matrix	Fatal	Serious	Minor	None	TOTAL
First Pilot				1	1
Second Pilot					
Student Pilot				1	1
Flight Instructor					
Check Pilot					
Flight Engineer					
Cabin Attendants					
Other Crew					
Passengers					
- TOTAL ABOARD -				2	2
Other Ground	0	0	0		0
- GRAND TOTAL -	0	0	0	2	2

National Transportation Safety Board

FACTUAL REPORT
AVIATION

NTSB ID: LAX00LA024

Occurrence Date: 10/23/1999

Occurrence Type: Accident

Administrative Information

Investigator-In-Charge (IIC)

NOELANI MARS

Additional Persons Participating in This Accident/Incident Investigation:

DON WARNER
VAN NUYS, CA

CAROL HORGAN
INDIANAPOLIS, IN

JACK SUTTLE
FORT WORTH, TX