National Transportation Safety Board
Aviation Accident Final Report

Location:	Eagle, CO	**Accident Number:**	DEN05LA111
Date & Time:	07/15/2005, 0930 MDT	**Registration:**	N620JM
Aircraft:	Gates Learjet 35A	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 3 Minor
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

A witness saw the airplane approach from the east. She said that the airplane came in "pretty fast" and touched down "approximately half way down the runway." The witness said, "The nose was down. He hit the ground and within 3 seconds he was off the runway and gone. Then all you saw was smoke." The witness said when the airplane hit "the front end shook. It wobbled like a kid on a tricycle. When it shook, it kind of looked like it [the airplane] bounced. Then it was gone." The control tower operator said he heard the captain say something over the radio, which caused him to look in the direction of the airplane. The tower operator saw the airplane off the runway, the main landing gear came off behind the airplane, and the airplane caught fire. The tower operator said he saw four people get out of the airplane. The airplane came to rest in a shallow ravine approximately 331 feet north of the runway. An examination of the airplane showed impact damage to the nose gear and nose gear wheel well. An examination of the airplane's systems revealed no anomalies.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: the pilot's improper flare resulting in the hard landing and the fractured nose gear attachment, and the subsequent loss of control. Factors contributing to the accident were the high airspeed on approach, the pilot's improper in-flight planning/decision, and the pilot's inability to maintain directional control after the gear failure.

Findings

Occurrence #1: HARD LANDING
Phase of Operation: LANDING

Findings
1. (C) FLARE - IMPROPER - PILOT IN COMMAND(CFI)
2. (F) AIRSPEED - HIGH
3. (F) IN-FLIGHT PLANNING/DECISION - IMPROPER - PILOT IN COMMAND

Occurrence #2: LOSS OF CONTROL - ON GROUND/WATER
Phase of Operation: LANDING

Findings
4. (C) LANDING GEAR,NOSE GEAR ATTACH POINT - FRACTURED
5. LANDING GEAR,NOSE GEAR - FAILURE,TOTAL
6. (F) DIRECTIONAL CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #3: ON GROUND/WATER ENCOUNTER WITH TERRAIN/WATER
Phase of Operation: LANDING

Findings
7. TERRAIN CONDITION - RUNWAY
8. TERRAIN CONDITION - GROUND

Factual Information

HISTORY OF FLIGHT

On July 15, 2005, approximately 0930 mountain daylight time, a Gates Learjet Corporation 35A, N620JM, was substantially damaged, when during landing the airplane landed hard on the nose wheel and then departed the runway at the Eagle County Regional Airport (EGE), Eagle, Colorado. Following its departure from the runway, the airplane's landing gear collapsed and separated, and the airplane subsequently caught on fire. Visual meteorological conditions prevailed at the time of the accident. The unscheduled, domestic, on-demand charter flight from Aspen, Colorado (ASE), to EGE was operating on a visual flight rules flight plan under the provisions of Title 14 CFR Part 135. The captain and first officer sustained minor injuries. The two passengers on board the airplane sustained serious injuries. The flight departed ASE approximately 0915.

The pilot said the flight to EGE was normal. They entered a left downwind for runway 25 (8,000 feet by 150 feet, dry, asphalt). They were number two following a Boeing 737 airplane on a right downwind. The pilot said they made a normal approach and that the airplane was fully configured on an extended base leg. The pilot recalled that when they were 2 miles from the threshold, based on global positioning satellite coordinates, he could see the Precision Approach Path Indicator (PAPI) lights as 3 reds and 1 white, and that the Boeing 737 was on climb out. The pilot said the landing and touchdown were smooth, but when the nose wheel touched down, the airplane began an uncommanded right turn. The pilot said he used full left rudder and brakes in an attempt to regain control of the airplane. The airplane departed the runway surface and stopped well right of the runway.

The attending nurse on board the airplane said they approached the airport from the west. She said they made "a big banking turn to the south side of the airport and immediately set up for landing." She said she was looking out the window. "We were landing farther down the runway and tilting. We hit the ground hard and fast. I thought we'd abort the landing because we were far down the runway and going so fast ... Then the plane started to shake." The nurse said she shielded the patient's body from "stuff that was flying around in the back of the airplane." She said that the airplane's right wing struck the runway as they were going fast. She said they hit the ground, then they were back in the air again for a moment, then they hit the ground again. When the airplane came to a stop, the nurse said she started to get the patient out of the airplane. The patient told her that his back was broken. That's when she looked out the right side of the airplane and saw flames coming out.

A limousine driver that was waiting for the passenger and nurse to arrive at the fixed base operator (FBO) said she saw the airplane approach from the east. She said that the airplane touched down abeam the FBO, approximately half way down the runway. She said it was coming in "pretty fast." The witness said, "The nose was down. He hit the ground and within 3 seconds he was off the runway and gone. Then all you saw was smoke." The witness said when the airplane hit "the front end shook. It wobbled like a kid on a tricycle. When it shook, it kind of looked like it [the airplane] bounced. Then it was gone." The witness said, "I don't think those flappy things [thrust reversers] you see on the airplanes went out."

The control tower operator said he heard the captain say something over the radio, which caused him to look in the direction of the airplane. The tower operator saw the airplane off the runway, the main landing gear come off behind the airplane, and the airplane catch on fire.

The tower operator said he saw four people get out of the airplane.

METEOROLOGICAL INFORMATION

At 0924, the wind conditions at EGE were 290 degrees at 4 knots.

FLIGHT RECORDERS

A thirty -minute digital cockpit voice recorder was located in the rear avionics section of the airplane. The recorder was sent to the National Transportation Safety Board Audio Laboratory on July 26, 2005, where the audio information was extracted. The times depicted are based on the 30 minute duration of the recording. The recording begins with the airplane arriving at Aspen on the previous flight. At 18:39 (18 minutes, 39 seconds tape duration), the crew departs ASE. At 24:03, the crew contacted EGE tower and reported they were 10 miles south of the airport. At 25:40, the crew extends the landing gear on left downwind.

At 26:44, EGE tower cleared the airplane to land on runway 25.

At 26:52, the captain read the final checklist. At 27:48, the first officer called for landing flaps. At 30:02, the first officer called for spoilers.

At 30:09, a "pilot expletive" was heard. At 30:11, the captain radioed "off the runway." At 30:14, a second "pilot expletive" was heard. The recording ended at 30:15 when power was removed from the device.

A summary of selected events which occurred during the recording is provided in the Cockpit Voice Recorder Group Chairman's Summary Report, as an addendum to this report.

WRECKAGE AND IMPACT INFORMATION

The airplane came to rest in a shallow ravine approximately 331 feet north of the runway. An examination of the airplane showed the airplane's right side fuselage, beginning at the right wing root and running aft to the tail cone was charred and melted. The airplane's right engine nacelle pylon was bent downward. The engine nacelle, engine, and the pylon were charred and melted by fire. The airplane's left engine pylon was also bent slightly downward. The airplane's right wing, and aft portion of the right tip fuel tank were charred, melted, and consumed by fire. The left and right main landing gear and the main gear doors were fractured and separated aft. The nose gear was broken aft and crushed upward into the right bottom fuselage, aft of the nose gear wheel well.

An examination of tire tracks on the runway showed a set of two tire tracks to the left of a single tire track. The tire tracks began at the runway centerline and immediately veered from the centerline to the north side of the runway, continuing off the runway into the dirt. Of the tire tracks, the left set of tracks were heavy and distinct. Of that set, the farther left of the two was wider and darker than the other tire track. Of the single tire track, it was lighter than the left set of tire tracks. The track also showed a serpentine pattern that moved in and away from the left set of tire tracks.

FIRE

The airplane sustained fire damage to the right upper aft portion of the fuselage, the tail cone, the right engine, the aft portion of the right wing, and right tip fuel tank. The fire origination was in the area encompassing the fuel pump and fuel lines to the right engine. Witnesses on the airplane stated they saw fire come from the front of the right engine nacelle. Airport fire

personnel responded immediately and put out the fire.

SURVIVAL ASPECTS

According to the nurse-passenger on board the airplane, after the airplane came to a stop, the patient-passenger told her that his back was broken. The nurse said she looked to the front of the airplane. The pilots got out and were running from the airplane. She said she did not see the pilots get out of their seats, open the door and leave the airplane because she was not conscious. When she woke up, the pilots were already outside. The nurse said she ran up to the door and yelled to the pilots to return to the airplane and help get the patient out. She said one of the pilots did return to assist her in getting the patient out of the airplane. The nurse said that a medical bag had to go with the patient and that the patient could not survive without it.

According to the patient-passenger, he had to hold on to the seat backs and be supported by the nurse in order to get from the rear couch seat where the nurse and him had been seated, to the front of the airplane. The patient said that when he reached the door, he told the pilot who was there to use a "fireman's carry" to get him from the airplane. The patient said the pilot expressed he did not know what that was. The nurse said that the pilot and her were able to get the patient away from the airplane.

TESTS AND RESEARCH

Detailed examinations of the airplane were conducted at Greeley, Colorado, on October 3, and November 9, 2005. The examinations showed the nose gear strut broken upward, aft and to the right at the gear strut pivot. Corresponding damage was observed to the right side of the nose wheel well. The nose landing gear strut cylinder was fully compressed. The strut fork, axle, and nose wheel were turned right approximately 160 degrees. The strut fork and axle were bent inward approximately 20 degrees, such that the top of the fork pressed inward into the nose gear tire. Diagonal scrapes and gouges were observed in the outward-facing side of the fork. Asphalt was observed embedded in some of the scrapes. The nose wheel tire showed scuffs, cuts, and heavy tread wear. The nose wheel steering unit was intact. An internal examination of the unit showed the gears were undamaged and turned freely. An examination of the nose steering computer showed no anomalies.

The main landing gear struts were broken upward and aft at the pivots. The wing skin over the top of the struts was pushed upward and broken upward and forward. The left main tires showed minor damage and light tread wear. The right main tires showed heavier tread wear. The left and right brakes showed no damage. The discs moved freely within their housings. The antiskid valves and antiskid controls were examined and showed no anomalies.

An examination of the engines showed both thrust reversers fully deployed. The right thrust reverser was charred by fire. An examination of the airplane's cockpit showed the throttles in the flight idle position with the thrust reverser levers in the deployed position.

An examination of the bottom front portion of the left wing tip tank showed inward crushing, paint chipping, and parallel-running scrapes and scratches. Asphalt was observed embedded in some of the scratches and in the bare metal where the paint chipped away from the tank.

Flight control continuity was confirmed. All other airplane systems showed no pre-impact anomalies.

Federal Aviation Administration (FAA) Handbook FAA-H-8083-3, "Airplane Flying

Handbook" describes "wheelbarrowing" as "When a pilot permits the aircraft weight to become concentrated about the nose wheel during landing roll. Wheelbarrowing may cause loss of directional control during landing roll because braking action is ineffective, and the airplane tends to swerve or pivot on the nose wheel. One of the most common causes of wheelbarrowing during landing roll is a simultaneous touchdown of the main and nose wheel with excessive speed followed by application of forward pressure on the elevator control. Wheel barrowing will not occur if the pilot achieves and maintains the correct landing attitude, touches down at the proper speed, and gently lowers the nose wheel while losing speed on rollout."

ADDITIONAL INFORMATION

Bombardier Learjet was a party to the investigation. The airplane and all examined components were released and returned to the operator's insurance company.

Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	71, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	Airplane Multi-engine; Airplane Single-engine; Instrument Airplane	**Toxicology Performed:**	No
Medical Certification:	Class 1 With Waivers/Limitations	**Last FAA Medical Exam:**	04/01/2005
Occupational Pilot:		**Last Flight Review or Equivalent:**	07/01/2005
Flight Time:	29612 hours (Total, all aircraft), 8967 hours (Total, this make and model), 19612 hours (Pilot In Command, all aircraft), 189 hours (Last 90 days, all aircraft), 54 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport; Flight Engineer	**Age:**	58, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 None	**Last FAA Medical Exam:**	06/01/2005
Occupational Pilot:		**Last Flight Review or Equivalent:**	02/01/2005
Flight Time:	9433 hours (Total, all aircraft), 75 hours (Total, this make and model), 7305 hours (Pilot In Command, all aircraft), 50 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Gates Learjet	**Registration:**	N620JM
Model/Series:	35A	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Normal	**Serial Number:**	207
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	04/01/2005, Continuous Airworthiness	**Certified Max Gross Wt.:**	18300 lbs
Time Since Last Inspection:	93 Hours	**Engines:**	2 Turbo Fan
Airframe Total Time:	8234 Hours at time of accident	**Engine Manufacturer:**	Garrett
ELT:	Installed, activated, did not aid in locating accident	**Engine Model/Series:**	TFE731-2-2B
Registered Owner:	Aspen Base Operation, Inc.	**Rated Power:**	3500 lbs
Operator:	Aspen Base Operation, Inc.	**Operating Certificate(s) Held:**	On-demand Air Taxi (135)
Operator Does Business As:	Aspen Aviation	**Operator Designator Code:**	CKBA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Day
Observation Facility, Elevation:	EGE, 6535 ft msl	**Distance from Accident Site:**	1 Nautical Miles
Observation Time:	0924 MDT	**Direction from Accident Site:**	360°
Lowest Cloud Condition:	Clear	**Visibility**	10 Miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	4 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	290°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	30.35 inches Hg	**Temperature/Dew Point:**	21°C / 6°C
Precipitation and Obscuration:	No Obscuration		
Departure Point:	Aspen, CO (ASE)	**Type of Flight Plan Filed:**	VFR
Destination:	Eagle, CO (EGE)	**Type of Clearance:**	VFR
Departure Time:	0915 MDT	**Type of Airspace:**	

Airport Information

Airport:	Eagle County Regional Airport (EGE)	**Runway Surface Type:**	Asphalt
Airport Elevation:	6535 ft	**Runway Surface Condition:**	Dry
Runway Used:	25	**IFR Approach:**	None
Runway Length/Width:	8000 ft / 150 ft	**VFR Approach/Landing:**	Full Stop; Traffic Pattern

Wreckage and Impact Information

Crew Injuries:	2 Minor	**Aircraft Damage:**	Substantial
Passenger Injuries:	1 Serious, 1 Minor	**Aircraft Fire:**	On-Ground
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	1 Serious, 3 Minor	**Latitude, Longitude:**	39.642500, -106.934444

Administrative Information

Investigator In Charge (IIC):	David C Bowling	**Report Date:**	03/28/2006
Additional Participating Persons:	Mike Zadar; Federal Aviation Administration; Denver, CO Ralph Witzke; Bombardier Aerospace; Wichita, KS		
Publish Date:			
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 pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at http://dms.ntsb.gov/pubdms/.		