Aviation Investigation Final Report

Location:	Pueblo, Colorado	**Accident Number:**	CEN12FA151
Date & Time:	February 2, 2012, 19:12 Local	**Registration:**	N31WS
Aircraft:	GATES LEAR JET 35	**Aircraft Damage:**	Substantial
Defining Event:	Loss of control on ground	**Injuries:**	10 None
Flight Conducted Under:	Part 91: General aviation - Personal		

Analysis

The pilots were departing on a contaminated runway with a left crosswind at night in a snowstorm. According to global positioning system data, when the airplane reached a ground speed of 120 knots on the takeoff roll, it veered to the right. The captain was unable to maintain directional control, and the airplane veered off the right side of the runway. The airplane continued across several taxiways, and the main landing gear assemblies and the right wing tip fuel tank separated from the airframe, then the nose gear collapsed, and the airplane came to rest on a grassy area. All eight passengers and both pilots exited the airplane through the main cabin door. Postaccident examination revealed that damage to the right main landing gear torque link and both tires was consistent with the runway excursion. The cockpit voice recorder was not working properly, and audio from the accident flight was not recorded. Data downloaded from the digital electronic engine controls indicated that both engines were operating with no significant difference in thrust. An examination of the airplane's flight controls revealed no preimpact mechanical deficiencies that would have precluded normal operation.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The captain's failure to maintain airplane control during an attempted crosswind takeoff on a contaminated runway.

Findings

Personnel issues	Aircraft control - Pilot
Environmental issues	Crosswind - Response/compensation
Environmental issues	Snow/slush/ice covered surface - Not specified

Factual Information

History of Flight

Takeoff	Loss of control on ground (Defining event)

HISTORY OF FLIGHT

On February 2, 2012, at 1912 mountain standard time, a Gates Learjet 35, N31WS, experienced a runway excursion during takeoff from Pueblo Memorial Airport (PUB), Pueblo, Colorado. The captain, the first officer and the eight passengers were not injured. The airplane sustained substantial damage to the right wing. The airplane was registered to and operated by Extrapoint LLC, Lewes, Delaware, under the provisions of 14 Code of Federal Regulations Part 91. Night instrument meteorological conditions prevailed for the flight, which was operated on an instrument flight rules flight plan destined for McCarran International Airport (LAS), Las Vegas, Nevada.

The flight crew planned a normal takeoff, with an allowance for wet runway conditions. The captain performed a preflight inspection of the airplane and found no discrepancies. He also confirmed that the Director of Maintenance (DOM) had checked tire pressure of the landing gear.
Before takeoff, reported weather conditions included a runway visual range of 5,000 feet with light snow. The wind was from 360 degrees at 15 knots. The captain estimated the snow depth on the taxiway as 1/8-inch thick. The captain chose to depart on runway 8L with a crosswind versus runway 35 because it was longer (10,498 feet). As they approached the hold-short line for runway 8L, the captain noted there was no snow on the wings. The control tower reported they had no current runway condition reports since there were no recent landings or departures. The captain said the snow on the runway seemed to be no heavier than what he observed on the taxiway, and he could see the end-stripes on the runway. After the pre-takeoff checklist items were completed, the airplane was taxied onto the runway centerline.

The captain reported the initial portion of the takeoff was routine. As the airplane accelerated toward V1, the captain felt a “lurch” to the right. He immediately applied full left rudder, full left aileron, and reduced power, but the airplane continued off the right side of the runway. He estimated the angle was about 10 degrees from the runway centerline. As the airplane left the runway, the captain heard a noise that sounded like a “shotgun blast” and saw a bright orange flash of light out the right side window.

The airplane traveled across several taxiways before coming to rest upright south of the runway on the grass. The captain confirmed there was no fire and secured the power levers; firewall shut off handles, and started evacuation procedures. The passengers safely exited the airplane thru the main door.

The first officer's account of the accident was similar to the captain's. He said that after receiving their take off clearance, the captain taxied the airplane on to the runway and lined up on the centerline. He then increased power and the airplane began to accelerate down the runway. The takeoff was normal and there "was nothing wrong" with the engines. The first officer said he was monitoring the instruments and when the airplane reached approximately 120 knots, he felt a "lurch" to the right. The first officer then looked up and saw the airplane rapidly veering off of the right side of the runway. The first officer said he instinctively pushed down on the left rudder, but it was already full down to the stop. The first officer said thought they must have hit something during the takeoff roll. The airplane continued onto the grass and they "floated" over three "humps" before coming to a stop.

According to the airport manager, a foreign-object debris (FOD) check of the runway was conducted after the accident. No debris was found and there was no evidence that the airplane had struck something during the takeoff roll.

A handheld Garmin GPSMAP 496 was removed from the airplane and the accident flight data was successfully downloaded at the National Transportation Safety Board (NTSB) Vehicle Recorder Laboratory in Washington DC. The data was plotted on an overlay of the runway. The first data point was recorded at 1902:34 when the airplane was still at the hangar. The airplane then taxied to runway 8L and turned onto the runway at 1910:49. The airplane began the takeoff roll at 1910:58 and achieved an average ground speed of 97 knots at 1911:21, just after crossing the intersection of runway 17/35.

At 1911:26, the airplane began to veer right of the runway centerline at an average speed of 120 knots. The airplane continued off the runway at 1911:32, at an average speed of 138 knots. The airplane continued to travel over several taxiways before it came to a full stop on the grassy area east of taxiway bravo at 1911:59. The last recorded data point was at 1912:51.

A witness, who was working on the ramp, observed the airplane spinning to the left on its belly. He observed sparks, flames and an explosion. The witness estimated approximately 1-inch of slush was on the ground, along with strong wind and a mix of snow/rain falling at the time of the accident.

PERSONNEL INFORMATION

The captain held an airline transport pilot certificate with a rating for airplane multi-engine land. In addition, the pilot was a certified flight instructor for airplane single and multi-engine land, and instrument airplane. His last Federal Aviation Administration (FAA) first class medical certificate was issued on October 27, 2011. He reported a total of 15,584 hours; of which, 1,929 hours were in the same make/model as the accident airplane.

The first officer held an airline transport certificate for airplane multi-engine land. His last FAA second class medical certificate was issued on April 27, 2011. He reported a total of 2,198

hours; of which, 1,063 hours were in the same make/model as the accident airplane.

METEOROLOGICAL INFORMATION

At 1853, weather at PUB was reported as wind from 360 degrees at 15 knots, visibility 3/4-mile, snow, ceiling overcast 300 feet, and a barometric pressure setting of 29.93 inches Hg. (No temperatures were reported with this observation.)

At 1953, weather at PUB was reported as wind from 360 degrees at 24 knots gusting to 32 knots, visibility 1/2-mile, snow, fog, temperature 0 degrees Celsius, dewpoint -1 degree Celsius, and barometric pressure setting 29.95 inches Hg.

WRECKAGE AND IMPACT INFORMATION

A postaccident examination of the wreckage revealed the right wing was deformed between the wing root and the stall fence. The right wing tip-tank had separated from the wing. Both the right and left main landing gears had separated from the airframe. The nose gear was bent aft and pushed up into the airframe. The cockpit area and the fuselage sustained minor damage. Flight control continuity was established for all flight control surfaces.

The right main landing gear sustained impact damage and the torque link was fractured. The outboard tire was missing an approximately 6-inch long diamond shaped section of rubber material and the inboard tire exhibited a diagonal slash mark.

Examination of the runway environment revealed visible tire marks in the grassy area south of the runway between taxiway A5 and A7. Tire tracks made by the right main landing gear were in direct line with a 2-inch tall, square concrete structure (electrical vault for airport lighting and navigational aid utilities) located just west of taxiway A7. The flat structure extended above the ground by approximately 2-3 inches. The concrete on the west side of the drain was gouged and scraped.

TESTS AND RESEARCH

Right Main Landing Gear Torque Link

The right main landing gear torque link was sent to the NTSB Materials Laboratory in Washington DC. Examination of the link revealed the pivot was fractured on each side of the pivot pin hole. The fracture surfaces exhibited features consistent with an overstress fracture.

Tires

The right main landing gear tires were sent to the Goodyear Innovation Center in Akron, Ohio, and visually examined under the supervision of the NTSB IIC and Division Chief of the NTSB Materials Laboratory. Examination of the tires revealed there was no evidence of tire material

failure or hydroplaning (tread rubber reversion). The observed damage was consistent with the tire sustaining a hard impact with an object.

Digital Electronic Engine Controls

Both digital electronic engine controls (DEECs) were successfully downloaded at Honeywell, in Phoenix, Arizona, under the supervision of the FAA. The data indicated that both engines were operating at the requested power setting and there was no indication of asymmetric thrust.

Cockpit Voice Recorder

The cockpit voice recorder (CVR) was removed from the airplane and sent to the NTSB Recorder Laboratory in Washington DC for download. When the unit was opened to access the tape, the tape was found tangled around the final spool and was damaged. Some audio was recorded but did not include the accident flight. The audio was consistent with the CVR being inoperative at the time of the accident.

Pilot Information

Certificate:	Airline transport; Flight instructor	**Age:**	52,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
Other Aircraft Rating(s):		**Restraint Used:**	
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:**	October 27, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	January 20, 2012
Flight Time:	15584 hours (Total, all aircraft), 1929 hours (Total, this make and model), 14377 hours (Pilot In Command, all aircraft), 79 hours (Last 90 days, all aircraft), 40 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Co-pilot Information

Certificate:	Airline transport	**Age:**	53,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Right
Other Aircraft Rating(s):	None	**Restraint Used:**	
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 2 With waivers/limitations	**Last FAA Medical Exam:**	April 27, 2011
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	July 10, 2011
Flight Time:	2198 hours (Total, all aircraft), 1063 hours (Total, this make and model), 794 hours (Pilot In Command, all aircraft), 27 hours (Last 90 days, all aircraft), 7 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	GATES LEAR JET	**Registration:**	N31WS
Model/Series:	35	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Normal	**Serial Number:**	027
Landing Gear Type:	Retractable - Tricycle	**Seats:**	10
Date/Type of Last Inspection:	May 23, 2011 Continuous airworthiness	**Certified Max Gross Wt.:**	18300 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo fan
Airframe Total Time:	11748 Hrs at time of accident	**Engine Manufacturer:**	GARRETT
ELT:	Installed, not activated	**Engine Model/Series:**	TFE 731 SER
Registered Owner:	EXTRAPOINT LLC	**Rated Power:**	3500 Horsepower
Operator:	EXTRAPOINT LLC	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Instrument (IMC)	**Condition of Light:**	Night
Observation Facility, Elevation:	PUB,4729 ft msl	**Distance from Accident Site:**	0 Nautical Miles
Observation Time:	18:53 Local	**Direction from Accident Site:**	0°
Lowest Cloud Condition:		**Visibility**	
Lowest Ceiling:	Overcast / 300 ft AGL	**Visibility (RVR):**	5000 ft
Wind Speed/Gusts:	15 knots / None	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	360°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.93 inches Hg	**Temperature/Dew Point:**	1°C / -1°C
Precipitation and Obscuration:			
Departure Point:	Pueblo, CO (PUB)	**Type of Flight Plan Filed:**	IFR
Destination:	Las Vegas, NV (LAS)	**Type of Clearance:**	IFR
Departure Time:	19:12 Local	**Type of Airspace:**	

Airport Information

Airport:	Pueblo PUB	**Runway Surface Type:**	Asphalt
Airport Elevation:	4729 ft msl	**Runway Surface Condition:**	Snow;Wet
Runway Used:	08L	**IFR Approach:**	None
Runway Length/Width:	10498 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:	8 None	**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	On-ground
Total Injuries:	10 None	**Latitude, Longitude:**	38.286666,-104.491111(est)

Administrative Information

Investigator In Charge (IIC):	Yeager, Leah
Additional Participating Persons:	William Watts; FAA/FSDO; Denver, CO Dana Metz; Honeywell; Phoenix, AZ Terry Rubek; Bombardier Learjet; Engleton, CO
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Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=82842