National Transportation Safety Board
Aviation Accident Final Report

Location:	EL PASO, TX	**Accident Number:**	FTW98FA376
Date & Time:	08/28/1998, 0650 MDT	**Registration:**	N126R
Aircraft:	DASSAULT FALCON DA-20	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	1 Serious, 2 Minor
Flight Conducted Under:	Part 135: Air Taxi & Commuter - Non-scheduled		

Analysis

The airplane was dispatched as a cargo flight to pick up a load of 118 boxes of automotive seatbelts. After refueling and loading the cargo on board, the flight crew taxied to runway 22 for a no-flap takeoff, which called for a V1 speed of 141 knots. The first officer was the flying pilot for this leg of the flight. The crew reported that the initial takeoff roll from the 11,009 foot runway was normal. At approximately 120 knots, the flight crew reported hearing a loud bang followed by a vibration. The captain called for the first officer to abort the takeoff. The captain later stated that he believed he saw the #2 engine "roll back." The flight crew reported that the brakes were not effective in slowing the airplane. A witness stated that the airplane was going west on the runway at a high rate of speed when it "went up to two feet, then came back down." Another witness stated that he saw the airplane "exit off the end of the runway" and after about "seventy-five to one hundred feet, the front wheels lifted off the ground about ten feet." The airplane overran the departure end of the runway, went through the airport's chain link perimeter fence, across a 4-lane highway, collided with 3 vehicles on the roadway, and went through a second chain link fence, before coming to rest. The airplane came to rest on its belly, 2,010 feet from the departure threshold of runway 22. The investigation revealed that the flight crew was provided an inaccurate weight for the cargo, and the airplane was found to be 942 pounds over the maximum takeoff weight at the time of the accident. The density altitude was calculated to be 5,614 feet at the time of the accident. Both crewmembers were current and properly certified; however, the captain had upgraded to his present position two months prior to the accident, and the first officer had accumulated a total of 123.8 hours in the Falcon 20 at the time of the accident. Both engines were operated in a test cell and performed within limits. About 90% of the right outboard main landing gear tire's retread was found on the runway approximately 7,200 feet from where the aircraft had commenced its takeoff roll. The operator stated that since the aircraft was over maximum gross weight, the long taxi to the runway could have resulted in the brakes and tires heating more than normal.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The captain's decision to abort the takeoff at an airspeed above V1, which resulted in a runway

overrun. Contributing factors were: the loading of an excessive amout of cargo by the shipper which resulted in an over gross weight airplane, the high density altitude, the separation of tire retread on takeoff roll, and the flight crew's lack of experience in the accident make and model aircraft.

Findings

Occurrence #1: OVERRUN
Phase of Operation: TAKEOFF - ABORTED

Findings
1. (F) WEATHER CONDITION - HIGH DENSITY ALTITUDE
2. (F) AIRCRAFT WEIGHT AND BALANCE - EXCEEDED - OTHER PERSON
3. (F) LANDING GEAR,TIRE - SEPARATION
4. (C) ABORT ABOVE V1 - INITIATED - PILOT IN COMMAND
5. (F) LACK OF TOTAL EXPERIENCE IN TYPE OF AIRCRAFT - FLIGHTCREW

Occurrence #2: ON GROUND/WATER COLLISION WITH OBJECT
Phase of Operation: TAKEOFF - ABORTED

Findings
6. OBJECT - FENCE
7. OBJECT - VEHICLE

Factual Information

HISTORY OF FLIGHT

On August 28, 1998, at 0650 mountain daylight time (MDT), a Dassault Falcon DA-20 twin turbo fan jet airplane, N126R, registered to and operated by Reliant Airlines of Ypsilanti, Michigan, was substantially damaged when it overran the departure end of runway 22 following an aborted takeoff from the El Paso International Airport (ELP), near El Paso, Texas. The pilot-in-command (PIC) and first officer (FO), who were both airline transport rated pilots, sustained minor injuries. One person, who was in a moving car that the aircraft struck after it departed the runway, was seriously injured. Visual meteorological conditions prevailed and an instrument flight rules (IFR) flight plan was filed for the Title 14 Code of Federal Regulations Part 135 non-scheduled domestic cargo flight. The accident occurred while the flight was initiating from runway 22. The flight's intended destination was the Memphis International Airport (MEM), near Memphis, Tennessee.

According to the operator, the aircraft arrived at ELP at 0525. The airplane was refueled and loaded with freight by a Fixed Base Operator (FBO) located at the airport. A shipping order, document #1998282, dated August 28, 1998, described the freight as 118 boxes of seatbelts that weighed 4,500 pounds. The crew consulted performance charts and determined that they would be within the maximum allowable gross weight parameters (28,200 pounds) for a "zero" flap takeoff from runway 22. The flight crew calculated that the takeoff "V1" airspeed was 141 knots.

After completion of pre-fight checks by the flight crew, they taxied the aircraft for about 2 miles from the FBO ramp to runway 22 for departure. The FO, who occupied the right seat, was the flying pilot for this leg of the flight. In an interview with the NTSB investigator-in-charge (IIC) the PIC stated that when they were cleared for takeoff, they taxied to the end of the 11,009 foot runway, held the brakes, ran the engines to full power (1.51 engine pressure ratio [EPR]), and released the brakes.

The flight crew reported that at approximately 120 knots, they heard a loud "bang" noise followed by a vibration, and the PIC called for the FO to abort. The PIC further stated that he believed that he saw the #2 engine "roll back." He noted that both the EPR and N1 gauges moved, but did not quantify the readings. The crew stated that they thought they had enough runway to stop, but reported that application of both pilot and co-pilot brake pedals were not effectively slowing the aircraft. The PIC stated that he moved both engine throttle levers to the "flight idle" position during the abort. He said that he moved the levers to the "idle cut off" position when he realized that the aircraft was going to overrun the departure end of the runway.

The aircraft overran the departure end of the runway, traveled over the 800 foot paved stop-way, across approximately 1,000 feet of sandy terrain, through a steel fence (airport perimeter), over embedded railroad tracks, through a concrete curb, across a four lane highway impacting three moving vehicles, through a second concrete curb, and through another steel fence, before coming to a stop. The distance from the departure end of the runway to where the aircraft stopped measured about 2,010 feet.

The flight crew reported that they evacuated the airplane unassisted through the two emergency escape windows in the cockpit.

Witnesses at the airport reported observing the airplane during it's takeoff roll. One witness stated that the airplane "was going west on the runway at a high rate of speed when [he] saw [the airplane] trying to go up once , but it only went up to two feet, then came down." He then noticed smoke that "started to come from the tires." Another witness stated that he saw the airplane "exit off the end of the runway" and after about "seventy-five to one hundred feet, the front wheels lifted off the ground about ten feet." He further stated that "the engines seemed to be at full throttle and some popping sounds [were] coming from them" and then "the front came back down and bounced upward again." By this time, he observed the airplane at the perimeter fence and then heard "a crash" and saw "debris flying and a big flash of fire."

PERSONNEL INFORMATION

The PIC had accumulated a total of 3,700 flight hours, of which 1,850 were in the Falcon 20 aircraft. Review of the company training records revealed that the PIC had upgraded to captain two months earlier. The review also revealed that the FO had been recently hired by the company, and he had accumulated a total of 123.8 flight hours in the Falcon 20 aircraft.

AIRCRAFT INFORMATION

A review of the maintenance records for the airplane and the engines by the IIC did not reveal any evidence of overdue inspections or uncorrected maintenance discrepancies that could have contributed to the accident. The aircraft was maintained in accordance with the company FAA approved continuous maintenance inspection program. The airplane had accumulated a total of 16,602 hours. The airplane was last inspected on July 12, 1998, about 127 hours prior to the accident.

The airplane was serviced with fuel during the intermediate stop at El Paso. According to the FBO's re-fueling records, 595 gallons of Jet- A fuel were added for the flight.

The cargo onboard the aircraft was surveyed and weighed at the accident site. One hundred and twenty -one boxes of automotive seatbelts were found to be onboard the aircraft. The total weight of all the boxes was found to be 5,610 pounds, 1,110 pounds more than indicated on the shipping order. This placed the aircraft about 942 pounds over the maximum take-off weight at the time of the accident. The flight crew did not have any devices or scales onboard the aircraft to verify the individual weight of a box of seat belts.

METEOROLOGICAL INFORMATION

Based on a temperature of 23 degrees Celsius, an altimeter of 30.16 inches, and a field elevation of 3,956 feet, the investigator-in-charge calculated the density altitude as 5,614 feet.

AIRDROME INFORMATION

A level III alert was initiated by the tower personnel at the ELP airport. Airport Rescue and Fire Fighting (ARFF) response was immediate.

FLIGHT RECORDERS

The airplane was not equipped with either a cockpit voice recorder (CVR) or a flight data recorder (FDR).

WRECKAGE AND IMPACT INFORMATION

A total of three automobiles (a passenger car, sports car, and mini-van), two airport perimeter fences, a railroad track, and two concrete curbs were damaged during the runway overrun. The

airplane came to rest on federal property operated by the U.S. Army as Fort Bliss.

Remnants of a blown tire were found on the runway approximately 7,200 feet from where the aircraft had commenced its takeoff roll. The rubber debris constituted about 90% of a tire's "recap" material.

Examination of the wreckage revealed that about 30% of the right wing of the airplane was sheared-off. Additionally, the fuselage was found to be buckled and twisted between frame zero and the wing leading edge, the right main landing was sheared off at the trunnion, the left main landing gear collapsed into the wheel well, and the nose landing gear folded aft into the fuselage. The nose section of the airplane, forward of the windshield, sustained major structural damage. The underside of the fuselage also sustained major structural damage. The right main landing gear outboard tire was found to be severely shredded with its "recap" material missing.

The flaps were found in the retracted position, and the speed brakes at the wings were found partly extended. The drag chute was found stowed. All flight control surfaces remained attached to the airplane and flight control continuity was confirmed.

The integrity of the fuel system was compromised. An unknown quantity of jet fuel either spilled or leaked from the airplane's fuel system. The fuel leak was contained by ARFF personnel at the accident site. There was no fire.

TEST AND RESEARCH

Both General Electric CF700-2D2 engines, serial number 245DGH399 (number one engine), and 299104 (number two engine) were recovered from the accident site and shipped to Bizjet International in Tulsa, Oklahoma, for examination and test cell runs. The compressor top half was removed on both engines to determine the amount and severity of any FOD sustained by the engines. Minor FOD was found on both engines; however, no signs of any bird or tire ingestion was found on either engine. Both engines were "cleared to run" and operated satisfactorily during their respective test cell runs, which were within the parameters of the CF700 Overhaul Manual.

The main landing gear tires were inspected for evidence of a blowout during the takeoff run. The retread material that was found on the runway was matched to the right main landing gear outboard tire. Since the right main landing gear tires sustained so many impacts with obstacles, it could not be determined conclusively whether the tire failed completely on the runway, or if the retread material had just delaminated from the tire's inner core. The tires on the left main landing gear wheels did not show evidence of a blowout. Additionally, there were distinct ground impressions that coincided with the approximate dimensions of all landing gear tires along the overrun path of the aircraft. Also, the operator stated that since the aircraft was about 942 pounds over maximum gross weight, the long taxi to the runway would have resulted in the brakes and tires heating more than normal.

The brake system was also inspected. No defects were found that could have contributed to the mishap.

ADDITIONAL DATA

The wreckage was released to the operator on November 13, 1998.

Pilot Information

Certificate:	Airline Transport; Flight Instructor	**Age:**	32
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Left
Other Aircraft Rating(s):		**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 Valid Medical--w/ waivers/lim.	**Last Medical Exam:**	08/03/1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	06/09/1998
Flight Time:	3700 hours (Total, all aircraft), 1850 hours (Total, this make and model), 1640 hours (Pilot In Command, all aircraft), 225 hours (Last 90 days, all aircraft), 63 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Co-Pilot Information

Certificate:	Airline Transport	**Age:**	25, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land	**Seat Occupied:**	Right
Other Aircraft Rating(s):		**Restraint Used:**	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	**Second Pilot Present:**	Yes
Instructor Rating(s):	None	**Toxicology Performed:**	No
Medical Certification:	Class 1 Valid Medical--no waivers/lim.	**Last Medical Exam:**	04/15/1998
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	07/25/1998
Flight Time:	3636 hours (Total, all aircraft), 124 hours (Total, this make and model), 3192 hours (Pilot In Command, all aircraft), 152 hours (Last 90 days, all aircraft), 63 hours (Last 30 days, all aircraft), 6 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Manufacturer:	DASSAULT	**Registration:**	N126R
Model/Series:	FALCON DA-20 FALCON DA-	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	No
Airworthiness Certificate:	Transport	**Serial Number:**	126
Landing Gear Type:	Retractable - Tricycle	**Seats:**	3
Date/Type of Last Inspection:	Unknown	**Certified Max Gross Wt.:**	28660 lbs
Time Since Last Inspection:		**Engines:**	2 Turbo Fan
Airframe Total Time:		**Engine Manufacturer:**	
ELT:		**Engine Model/Series:**	
Registered Owner:	RELIANT AIRLINES	**Rated Power:**	
Operator:	RELIANT AIRLINES	**Air Carrier Operating Certificate:**	On-demand Air Taxi (135)
Operator Does Business As:		**Operator Designator Code:**	DKAA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	**Condition of Light:**	Not Reported
Observation Facility, Elevation:	ELP, 3956 ft msl	**Observation Time:**	0656 MDT
Distance from Accident Site:	0 Nautical Miles	**Direction from Accident Site:**	0°
Lowest Cloud Condition:	Clear	**Temperature/Dew Point:**	23°C / 17°C
Lowest Ceiling:	None	**Visibility**	9 Miles
Wind Speed/Gusts, Direction:	5 knots, 360°	**Visibility (RVR):**	0 ft
Altimeter Setting:	30 inches Hg	**Visibility (RVV):**	0 Miles
Precipitation and Obscuration:	No Precipitation		
Departure Point:		**Type of Flight Plan Filed:**	IFR
Destination:	MEMPHIS, TN (MEM)	**Type of Clearance:**	IFR
Departure Time:	0650	**Type of Airspace:**	Class C

Airport Information

Airport:	El Paso International (ELP)	**Runway Surface Type:**	Asphalt
Airport Elevation:		**Runway Surface Condition:**	Dry
Runway Used:	22	**IFR Approach:**	None
Runway Length/Width:	11009 ft / 150 ft	**VFR Approach/Landing:**	None

Wreckage and Impact Information

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

Administrative Information

Investigator In Charge (IIC):	Alexander Lemishko	**Adopted Date:**	06/03/2002
Additional Participating Persons:	KARRY D RAY; FAA FSDO; ALBUQUERQUE, NM		
Publish Date:	01/25/2011		
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/.		