



Aviation Investigation Final Report

Location:	Cincinnati, Ohio	Accident Number:	CEN13LA366
Date & Time:	June 18, 2013, 11:25 Local	Registration:	N112EM
Aircraft:	ISRAEL AIRCRAFT INDUSTRIES 1124	Aircraft Damage:	Substantial
Defining Event:	Loss of control in flight	Injuries:	3 None
Flight Conducted Under:	Part 91: General aviation - Instructional		

Analysis

The flight instructor and pilot were conducting initial training for a type certification. As the airplane touched down on the first landing, the flight instructor directed a touch-and-go landing. During takeoff, the airplane settled back to the runway and the right wingtip struck the runway, most likely due to insufficient airspeed. The airplane subsequently yawed left, the left main gear collapsed, and the airplane skidded to a stop on the runway.

Examination and testing of the landing gear system revealed no anomalies. No damage occurred to the side or jury brace of the left main landing gear, which would be expected following a mechanical failure. Based on this lack of damage and no anomalies with the landing gear system, it is likely that the landing gear handle had been moved to the "up" position during the takeoff sequence.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Loss of control due to insufficient airspeed on takeoff and premature landing gear retraction, which resulted in the collapse of the left landing gear as the airplane impacted the runway.

Findings

Aircraft	Main landing gear - Incorrect use/operation
Personnel issues	Incorrect action performance - Pilot
Personnel issues	Incorrect action performance - Instructor/check pilot
Aircraft	Airspeed - Not attained/maintained

Factual Information

History of Flight

Takeoff	Abnormal runway contact
Takeoff	Landing gear collapse
Takeoff	Loss of control in flight (Defining event)

On June 18, 2013, about 1125 eastern daylight time, an Israel Aircraft Industries (IAI) 1124 airplane, N112EM, was substantially damaged following a landing gear collapse at Cincinnati Municipal Airport (KLUK), Cincinnati, Ohio. The flight instructor, pilot, and pilot-rated passenger did not report any injuries. The airplane was registered to and operated by E. Micah Aviation Incorporated under the provisions of 14 Code of Federal Regulations Part 91 as an instructional flight. Day visual meteorological conditions prevailed and no flight plan was filed. The local flight departed KLUK about 1045.

According to the cockpit voice recorder (CVR), the pilot and flight instructor briefed an instrument landing system (ILS) approach to runway 21L at KLUK. The flight instructor requested two ILS approaches from air traffic control (ATC) and was given missed approach instructions. After contacting the KLUK control tower, the flight instructor requested and received clearance for the "option", which permits a touch-and-go, low approach, missed approach, stop-and-go, or full stop landing.

The flight instructor verbally coached the student throughout the instrument approach, flare and landing. Although the student had flown more than 3,600 total flight hours, he was attempting his first landing in this airplane type and had not landed a high-performance or turbine powered airplane in several years.

As the pilot was flaring the airplane to land, the CVR recorded a steady tone with the frequency of the 'trim movement' buzzer, which continued 8.5 seconds. Immediately after the airplane touched down, the flight instructor stated "no, no, no, we're not stopping". As the flight instructor was making this statement, at 1125:00, a half-second rumbling sound was recorded and the trim movement buzzer tone stopped. One second later, the student stated "okay, my bad". A half second later, at 1125:01.5, the CVR recorded a steady tone with the frequency of the gear warning horn, which continued until the end of the recording. At 1125:03, a 'thunk' sound was recorded, followed by a scraping noise. At 1125:07, the scraping noise restarted and continued for about 20 seconds. The background sound and scraping noise decreased in intensity over the 20 second period, similar to the airplane decelerating.

The airplane came to a stop near the end of runway 21L with the left landing gear collapsed outward, since the IAI 1124 landing gear normally retracts outward. The airplane was hoisted up by airport personnel for recovery. While being raised, the left landing gear dropped, by gravity force alone, from a retracted position to a 'down and locked' position. No damage was observed to the left landing gear or its brace assemblies. Scrape damage consistent with runway contact was observed on the underside of the right wing, near the wingtip. Substantial damage had occurred to structural areas of the fuselage.

The flight instructor stated that the airplane never lifted off the ground during the touch-and-go sequence and thought a mechanical failure of the landing gear had occurred. The pilot was unsure of the sequence of events and stated that the flight instructor seemed to be rushing the touch-and-go sequence, as he perceived that ample runway and time existed to accelerate further prior to takeoff rotation. Neither the flight instructor nor pilot recalled moving the landing gear handle during the touch-and-go sequence.

A pilot-rated passenger, who was seated aft of the pilot and flight instructor, stated that the landing was normal. When he heard the flight instructor's command to continue with a touch-and-go, he leaned back in his seat and no longer had a view into the cockpit area. The passenger observed the airplane become airborne for one or two seconds. While airborne, the airplane banked to the right and the right wing tip contacted the runway. The airplane subsequently yawed left and the left landing gear collapsed as the airplane contacted the runway. The passenger did not notice if the landing gear selector handle was moved during the touch-and-go sequence.

A maintenance worker located at the departure end of the runway observed the airplane land normally, followed by a bank to the right and strike of the right wingtip. He then noticed the airplane yaw to the left and the left landing gear collapsed.

Federal Aviation Administration (FAA) personnel examined and tested the landing gear. The landing gear hydraulically retracted 'outward' into the strut and wheel well, under the wing. The gear was locked in the 'up' position by means of a lock assembly located in each wheel well. In the 'down' position, the gear was locked and braced by side and jury brace assemblies.

The airplane was placed on jacks and the landing gear was cycled several times, with no anomalies noted. No damage was observed to the landing gear or brace assemblies. The FAA conducted a second test of the landing gear to examine adjustment criteria called out in the IAI 1124 maintenance manual. The landing gear was again cycled several times, with no anomalies noted. The clearance was checked between the piston plunger end of the landing gear unlock cylinder and unlock tang on back of the upper jury brace. This measurement was correct, which ensured that the piston travel was correct.

A review of manufacturer records and NTSB accident data did not reveal any similar landing gear incidents or accidents for IAI 1124 aircraft. The manufacturer stated that jury and/or side brace damage would be evident if the landing gear was down and locked during a collapse sequence.

Flight instructor Information

Certificate:	Airline transport; Flight instructor	Age:	69
Airplane Rating(s):	Single-engine land; Single-engine sea; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Glider; Helicopter	Restraint Used:	4-point
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 2 With waivers/limitations	Last FAA Medical Exam:	November 5, 2012
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	June 9, 2013
Flight Time:	(Estimated) 20000 hours (Total, all aircraft), 3000 hours (Total, this make and model), 20000 hours (Pilot In Command, all aircraft), 90 hours (Last 90 days, all aircraft), 30 hours (Last 30 days, all aircraft), 0 hours (Last 24 hours, all aircraft)		

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	Age:	49
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	4-point
Instrument Rating(s):	Airplane	Second Pilot Present:	Yes
Instructor Rating(s):	Airplane single-engine; Instrument airplane	Toxicology Performed:	No
Medical Certification:	Class 2 With waivers/limitations	Last FAA Medical Exam:	July 17, 2012
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	February 20, 2013
Flight Time:	(Estimated) 3621 hours (Total, all aircraft), 0 hours (Total, this make and model), 1388 hours (Pilot In Command, all aircraft), 7 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:	ISRAEL AIRCRAFT INDUSTRIES	Registration:	N112EM
Model/Series:	1124	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Transport	Serial Number:	336
Landing Gear Type:	Retractable - Tricycle	Seats:	8
Date/Type of Last Inspection:	October 11, 2011 AAIP	Certified Max Gross Wt.:	23000 lbs
Time Since Last Inspection:		Engines:	2 Turbo fan
Airframe Total Time:	7522 Hrs at time of accident	Engine Manufacturer:	GARRETT
ELT:	Installed, not activated	Engine Model/Series:	TFE 731 SER
Registered Owner:	E MICAH AVIATION INC	Rated Power:	3500 Horsepower
Operator:	E MICAH AVIATION INC	Operating Certificate(s) Held:	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	KLUK,483 ft msl	Distance from Accident Site:	0 Nautical Miles
Observation Time:	10:53 Local	Direction from Accident Site:	360°
Lowest Cloud Condition:	Few / 1200 ft AGL	Visibility	10 miles
Lowest Ceiling:	Broken / 6500 ft AGL	Visibility (RVR):	
Wind Speed/Gusts:	3 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.93 inches Hg	Temperature/Dew Point:	22°C / 19°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Cincinnati, OH (KLUK)	Type of Flight Plan Filed:	None
Destination:	Cincinnati, OH (KLUK)	Type of Clearance:	VFR flight following
Departure Time:	10:45 Local	Type of Airspace:	Class D

Airport Information

Airport:	Cincinnati Municipal Airport KLUK	Runway Surface Type:	Asphalt
Airport Elevation:	483 ft msl	Runway Surface Condition:	Dry
Runway Used:	21L	IFR Approach:	ILS
Runway Length/Width:	6101 ft / 150 ft	VFR Approach/Landing:	Touch and go

Wreckage and Impact Information

Crew Injuries:	2 None	Aircraft Damage:	Substantial
Passenger Injuries:	1 None	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 None	Latitude, Longitude:	39.103332,-84.418609(est)

Administrative Information

Investigator In Charge (IIC):	Folkerts, Michael
Additional Participating Persons:	David Melleby; Federal Aviation Administration; Cincinnati, OH
Original Publish Date:	June 2, 2014
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=87267

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