



# Aviation Investigation Factual Report

<b>Location:</b>	Tampa, Florida	<b>Accident Number:</b>	MIA02LA089
<b>Date &amp; Time:</b>	April 25, 2002, 17:45 Local	<b>Registration:</b>	N237SM
<b>Aircraft:</b>	Cessna 421C	<b>Aircraft Damage:</b>	Substantial
<b>Defining Event:</b>		<b>Injuries:</b>	1 None
<b>Flight Conducted Under:</b>	Part 91: General aviation - Personal		

## Factual Information

On April 25, 2002, about 1745 eastern daylight time, a Cessna 421C, N237SM, operated and registered to MBA Graphics of Tampa, struck the ground after landing with the left main gear retracted at Vandenberg Airport, Tampa, Florida. Visual meteorological conditions prevailed at the time. No flight plan was filed for the 14 CFR Part 91 personal flight. The airplane was substantially damaged. The commercial-rated pilot reported no injuries. The flight had departed from the same airport about 1445, en route to Plant City, Florida.

According to the pilot's statement, after a landing and upon touchdown at Plant City, he said he "...observed an abnormal touchdown...and knew there was a mechanical problem." After noticing the mechanical problem, he aborted the landing, cycled the gear twice, and noted that the gear unsafe light remained illuminated. He then proceeded to his departure airport, for further assessment of the landing gear situation by the tower personnel. The tower personnel confirmed there was damage to the left main gear, he then proceeded to burn off about 1 1/2 hours of fuel before attempting a landing. The pilot landed on the grass next to the paved runway, touching down on the nose and right main landing gears. The airplane settled on the left wing, turned left onto the paved runway and came to rest 180 degrees opposite the direction of touchdown.

Examination of the landing gear after the accident revealed that the upper barrel (p/n 5141002-11) fractured during the landing attempt at Plant City. The fractured upper barrel assembly was examined at Cessna's Material and Process Engineering's Laboratory. The purpose of the examination was to determine the cause of the main landing gear (MLG) fracture. Based on the observations made during the examination of the fractured MLG barrel, and according to Cessna's factual report, the following conclusions were reached: 1.) The upper barrel broke at a location coinciding with the position of the collar, "approximately 3-9/16 inches below the trunnion." 2.) "Pre-existing cracking was present on the trunnion barrel at two separate locations approximately 180 degrees apart," along the outer diameter of the barrel. "Fatigue cracks had propagated through approximately 75 to 80 percent of the wall thickness of the barrel." 3.) The crack origins coincided with "...a transition in barrel wall thickness. Machining marks were present on the radius of the transition in wall thickness." 4.) The dimensions of the barrel "were according" to the engineering drawing with the exception of the location of "...the brazed-on collar, where the outer barrel diameter was smaller than specified." Sectioning of the barrel through the fracture surface showed the presence of a "groove machined" into the barrel immediately above the collar. 5.) Smaller than specified barrel diameter and the presence of machining marks on the machined radius "...could have contributed to the cause of cracking." The surface roughness at the radius was 140-160 µ-in (micro-inches), which "exceeded" the engineering drawing requirement of 125 µ-in. 6.) The barrel chemical composition and hardness "were according" to the engineering drawing. The thickness of the braze metal between the barrel and the collar "met the requirements" for a

Class I or Class II copper braze joint per CSMP009 as well as the requirements of CES2044 which is listed on the engineering drawing.

A review of the Cessna report by the NTSB's Materials Laboratory revealed that the Cessna factual report contained an adequate factual description of the fracture, dimensional measurements, and other features associated with the fracture of the upper barrel.

### Pilot Information

<b>Certificate:</b>	Commercial	<b>Age:</b>	26, Male
<b>Airplane Rating(s):</b>	Single-engine land; Multi-engine land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>		<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	No
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	No
<b>Medical Certification:</b>	Class 2 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	March 21, 2001
<b>Occupational Pilot:</b>	No	<b>Last Flight Review or Equivalent:</b>	April 18, 2002
<b>Flight Time:</b>	2500 hours (Total, all aircraft), 40 hours (Total, this make and model), 2390 hours (Pilot In Command, all aircraft), 200 hours (Last 90 days, all aircraft), 65 hours (Last 30 days, all aircraft), 8 hours (Last 24 hours, all aircraft)		

### Aircraft and Owner/Operator Information

<b>Aircraft Make:</b>	Cessna	<b>Registration:</b>	N237SM
<b>Model/Series:</b>	421C	<b>Aircraft Category:</b>	Airplane
<b>Year of Manufacture:</b>		<b>Amateur Built:</b>	
<b>Airworthiness Certificate:</b>	Normal	<b>Serial Number:</b>	421C-0237
<b>Landing Gear Type:</b>	Retractable - Tricycle	<b>Seats:</b>	7
<b>Date/Type of Last Inspection:</b>	October 29, 2001 Annual	<b>Certified Max Gross Wt.:</b>	7450 lbs
<b>Time Since Last Inspection:</b>	40 Hrs	<b>Engines:</b>	2 Reciprocating
<b>Airframe Total Time:</b>	3670.5 Hrs at time of accident	<b>Engine Manufacturer:</b>	Continental
<b>ELT:</b>	Installed, not activated	<b>Engine Model/Series:</b>	GTSIO-520L
<b>Registered Owner:</b>	MBA Graphics Inc	<b>Rated Power:</b>	375 Horsepower
<b>Operator:</b>		<b>Operating Certificate(s) Held:</b>	None

## Meteorological Information and Flight Plan

<b>Conditions at Accident Site:</b>	Visual (VMC)	<b>Condition of Light:</b>	Day
<b>Observation Facility, Elevation:</b>	VDF, 22 ft msl	<b>Distance from Accident Site:</b>	
<b>Observation Time:</b>	17:41 Local	<b>Direction from Accident Site:</b>	
<b>Lowest Cloud Condition:</b>	Clear	<b>Visibility</b>	10 miles
<b>Lowest Ceiling:</b>	None	<b>Visibility (RVR):</b>	
<b>Wind Speed/Gusts:</b>	0 knots / None	<b>Turbulence Type Forecast/Actual:</b>	/
<b>Wind Direction:</b>	0°	<b>Turbulence Severity Forecast/Actual:</b>	/
<b>Altimeter Setting:</b>	30.04 inches Hg	<b>Temperature/Dew Point:</b>	30°C / 21°C
<b>Precipitation and Obscuration:</b>	No Obscuration; No Precipitation		
<b>Departure Point:</b>	Tampa, FL (VDF )	<b>Type of Flight Plan Filed:</b>	None
<b>Destination:</b>	PLANT CITY, FL (PCM )	<b>Type of Clearance:</b>	None
<b>Departure Time:</b>	14:45 Local	<b>Type of Airspace:</b>	Unknown

## Airport Information

<b>Airport:</b>	VANDENBERG VDF	<b>Runway Surface Type:</b>	Asphalt
<b>Airport Elevation:</b>	20 ft msl	<b>Runway Surface Condition:</b>	Dry
<b>Runway Used:</b>	23	<b>IFR Approach:</b>	None
<b>Runway Length/Width:</b>	5000 ft / 100 ft	<b>VFR Approach/Landing:</b>	Full stop

## Wreckage and Impact Information

<b>Crew Injuries:</b>	1 None	<b>Aircraft Damage:</b>	Substantial
<b>Passenger Injuries:</b>		<b>Aircraft Fire:</b>	None
<b>Ground Injuries:</b>	N/A	<b>Aircraft Explosion:</b>	None
<b>Total Injuries:</b>	1 None	<b>Latitude, Longitude:</b>	28.008888,-82.349441

## Administrative Information

**Investigator In Charge (IIC):** Yurman, Alan J.

**Additional Participating Persons:** Linda Nevin; FAA; Tampa, FL  
Tomas Teplik; Cessna; Wichita, KS

**Report Date:** July 16, 2003

**Last Revision Date:**

**Investigation Class:** [Class](#)

**Note:**

**Investigation Docket:** <https://data.nts.gov/Docket?ProjectID=54580>

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