Aviation Investigation Final Report

Location:	Vero Beach, Florida	**Accident Number:**	MIA03LA009
Date & Time:	October 25, 2002, 14:39 Local	**Registration:**	N92897
Aircraft:	Piper PA-34-220T	**Aircraft Damage:**	Substantial
Defining Event:		**Injuries:**	2 None
Flight Conducted Under:	Part 91: General aviation - Flight test		

Analysis

The pilot stated that the purpose of the flight was to gather data on the production configuration of the stall warning system and an improvement related to the landing gear warning system from throttle position microswitches to manifold pressure switches, which were later determined to be positioned on both engines. After takeoff a discrepancy with the landing gear warning system occurred evidenced by activation of the gear warning horn and gear unsafe annunciation while the landing gear was retracted. The flight continued and climbed to 8,000 feet for planned stall warning tests. Following the tests it was learned that the gear warning indication would not cease to operate with the landing gear retracted unless the throttles were reduced to approximately 14 inches manifold pressure. The flight returned to the departure airport while the landing gear warning horn sounded and the unsafe gear annunciator was illuminated. While on the base leg he lowered the landing gear selector handle and confirmed 3 green gear down and locked lights were illuminated. He turned onto 2 mile final where he confirmed two times the landing gear was down and locked as indicated by the 3 down and locked lights. He touched down first on the main landing gears followed by the nose landing gear. When he reduced back pressure, "the aircraft suddenly pitched nose down like the nose gear had collapsed." He believed the main gear had collapsed based on the fact that the airplane was sliding on the runway in a level attitude. After the airplane came to rest, he confirmed with the passenger that the landing gear selector handle was in the "down" position and only the left main down and locked light was illuminated. He secured the airplane and after he and the passenger exited it, fuel leakage was noted from the right fuel tank. The pilot-rated occupant seated in the right front seat confirmed the statement from the pilot that the landing gear was extended while on the base leg and 3 down and locked lights were illuminated following gear extension. The down and locked indication was confirmed 2 more times during the approach. The airplane was landed smooth on the main landing gear followed by the nose landing gear. The nose landing gear collapsed and the airplane began traveling to the right. He believed the right main landing gear had collapsed, and the airplane slid to the right side of the runway during which the right wing collided with a taxiway sign.

The airplane spun approximately 150 degrees to the right and came to rest upright on grass. Before the pilot secured the airplane, he also noted only the left main landing gear down and locked light was illuminated and the landing gear selector handle was in the down position. Following recovery of the airplane, an FAA inspector examined the airplane 4 days after the accident. Upon application of electrical power using an external power cart, and with the landing gear selector handle in the down position, the aural gear warning horn was sounding and no down and locked light was noted for the left main landing gear. The horn and light were attributed to the main landing gear actuator attach point being sheared. The left main landing gear down microswitch was bypassed and the left landing gear down and locked light illuminated and the aural gear warning tone stopped. An attempt was then made to raise the landing gear but no movement or sound was noted from the normal landing gear hydraulic pump. The pump was then supplied power directly and the landing gear retracted. No determination was made as to the reason why the landing gear did not retract with electrical power applied to the airplane. The nose and right main landing gears were then extended with electrical power applied directly to the hydraulic pump; attempts to forcefully unlock them were unsuccessful. The only discrepancy noted was the nose landing gear over-center locking device seemed to have "some play." Examination of a new production airplane revealed no evidence of play as compared to the accident airplane. At the time of the accident the airplane had accumulated approximately 827 hours and 372 flights. The airplane was used for flight testing and in the previous several months, was operated on at least 6 flights on grass airstrips, grooved and un-grooved asphalt runways. No excessive strains were noted to the instrumented landing gear during operation on the asphalt and grass runways during the previous flights. According to personnel from The New Piper Aircraft, Inc., post accident rigging check of the landing gear revealed no abnormalities. Documents provided by The New Piper Aircraft, Inc., personnel indicate that the nose gear and torque links were removed and inspected for wear limits on September 18, 2002, then reinstalled with a gear swing check on September 25, 2002. The airplane had accumulated 2 hours 54 minutes and 2 cycles since then at the start of the accident flight.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The collapse of the nose landing gear for undetermined reasons resulting in the loss of directional control and the subsequent collapse of the main landing gears.

Findings

Occurrence #1: NOSE GEAR COLLAPSED
Phase of Operation: LANDING - FLARE/TOUCHDOWN

Findings

1. (C) REASON FOR OCCURRENCE UNDETERMINED

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

Findings
2. DIRECTIONAL CONTROL - NOT POSSIBLE - PILOT IN COMMAND

Occurrence #3: GEAR COLLAPSED
Phase of Operation: LANDING - ROLL

Findings
3. LANDING GEAR,MAIN GEAR - COLLAPSED

Factual Information

On October 25, 2002, about 1439 eastern daylight time, a Piper PA-34-220T, N92897, registered to New Piper Aircraft, Inc., as an experimental/test prototype, operating as a Title 14 CFR Part 91 factory test flight, sustained collapse of all landing gears upon landing at the Vero Beach Municipal Airport, Vero Beach, Florida. Visual meteorological conditions prevailed and no flight plan was filed. The airplane was substantially damaged and the commercially-rated pilot and passenger (flight test engineer) were not injured. The flight originated from the same airport about 39 minutes before the accident.

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locked light was illuminated and the landing gear selector handle was in the down position.

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Pilot Information

Certificate:	Commercial	**Age:**	58,Male
Airplane Rating(s):	Single-engine land; Multi-engine land	**Seat Occupied:**	Left
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 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	May 13, 2002
Occupational Pilot:	Yes	**Last Flight Review or Equivalent:**	October 11, 2002
Flight Time:	6788 hours (Total, all aircraft), 714 hours (Total, this make and model), 100 hours (Last 90 days, all aircraft), 38 hours (Last 30 days, all aircraft), 1 hours (Last 24 hours, all aircraft)		

Other flight crew Information

Certificate:	Commercial	**Age:**	33,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 Valid Medical--w/ waivers/lim	**Last FAA Medical Exam:**	October 28, 2002
Occupational Pilot:	UNK	**Last Flight Review or Equivalent:**	
Flight Time:	1130 hours (Total, all aircraft), 510 hours (Pilot In Command, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	**Registration:**	N92897
Model/Series:	PA-34-220T	**Aircraft Category:**	Airplane
Year of Manufacture:		**Amateur Built:**	
Airworthiness Certificate:	Experimental (Special)	**Serial Number:**	3449001
Landing Gear Type:	Retractable - Tricycle	**Seats:**	2
Date/Type of Last Inspection:	July 22, 2002 Condition	**Certified Max Gross Wt.:**	4750 lbs
Time Since Last Inspection:	19 Hrs	**Engines:**	2 Reciprocating
Airframe Total Time:	826.6 Hrs at time of accident	**Engine Manufacturer:**	Continental
ELT:	Installed, not activated	**Engine Model/Series:**	TSIO-360-KB
Registered Owner:	On file	**Rated Power:**	220 Horsepower
Operator:	On file	**Operating Certificate(s) Held:**	None

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	**Condition of Light:**	Day
Observation Facility, Elevation:	VRB,24 ft msl	**Distance from Accident Site:**	
Observation Time:	14:40 Local	**Direction from Accident Site:**	
Lowest Cloud Condition:	Few / 4900 ft AGL	**Visibility**	10 miles
Lowest Ceiling:	None	**Visibility (RVR):**	
Wind Speed/Gusts:	7 knots /	**Turbulence Type Forecast/Actual:**	/
Wind Direction:	110°	**Turbulence Severity Forecast/Actual:**	/
Altimeter Setting:	29.95 inches Hg	**Temperature/Dew Point:**	29°C / 23°C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Vero Beach, FL (VRB)	**Type of Flight Plan Filed:**	None
Destination:		**Type of Clearance:**	None
Departure Time:	14:00 Local	**Type of Airspace:**	Class D

Airport Information

Airport:	Vero Beach Municipal VRB	**Runway Surface Type:**	Asphalt
Airport Elevation:	24 ft msl	**Runway Surface Condition:**	Dry
Runway Used:	11R	**IFR Approach:**	None
Runway Length/Width:	7314 ft / 100 ft	**VFR Approach/Landing:**	Full stop;Traffic pattern

Wreckage and Impact Information

Crew Injuries:	2 None	**Aircraft Damage:**	Substantial
Passenger Injuries:		**Aircraft Fire:**	None
Ground Injuries:	N/A	**Aircraft Explosion:**	None
Total Injuries:	2 None	**Latitude, Longitude:**	27.655555,-80.418052

Administrative Information

Investigator In Charge (IIC):	Monville, Timothy
Additional Participating Persons:	Tony Alfaya; FAA Flight Standards District Office; Orlando, FL
Original Publish Date:	April 28, 2004
Last Revision Date:	
Investigation Class:	Class
Note:	
Investigation Docket:	https://data.ntsb.gov/Docket?ProjectID=55967