# Aviation Investigation Final Report

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| **Location:** | Atlanta, Georgia | **Incident Number:** | ERA15IA009 |
| **Date & Time:** | October 1, 2014, 21:05 Local | **Registration:** | N301EF |
| **Aircraft:** | FUNK RALPH Velocity XLRG | **Aircraft Damage:** | Minor |
| **Defining Event:** | Hard landing | **Injuries:** | 1 None |
| **Flight Conducted Under:** | Part 91: General aviation - Personal | | |

## Analysis

The purpose of the flight was to perform three takeoffs and landings at night. The pilot stated that the first takeoff and landing was uneventful and that, at touchdown, he used aerodynamic braking to slow the airplane by keeping its nose off the runway as long as possible. He added that the second landing was faster, that more runway was used, and that the nose landing gear (NLG) touched down "harder" than during the first landing. After the NLG touched down, the airplane pulled right and developed a shimmy. The pilot subsequently lost directional control of the airplane, and the NLG collapsed. Examination of the fracture surfaces on the NLG revealed features consistent with ductile overstress fracture. The overall fracture pattern was consistent with fracture under a lateral bending load.

## Probable Cause and Findings

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

The pilot's failure to maintain directional control during a hard landing, which resulted in the fracture of the nose landing gear.

### Findings

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| **Aircraft** | Directional control - Not attained/maintained |
| **Personnel issues** | Aircraft control - Pilot |

# Factual Information

## History of Flight

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| **Landing-flare/touchdown** | Hard landing (Defining event) |
| **Landing-flare/touchdown** | Landing gear collapse |

On October 1, 2014, about 2105 eastern daylight time, a Funk Velocity XLRG experimental amateur-built airplane, N301EF, sustained minor damage during a hard landing to Cobb County – McCollum Field (RYY), Atlanta, Georgia. The private pilot was not injured. Night visual meteorological conditions prevailed and no flight plan was filed for the local flight which departed RYY about 2105. The personal flight was conducted under the provisions of Title 14 Code of Federal Regulations Part 91.

In a written statement, the pilot stated that he intended to perform 3 takeoffs and landings for the purpose of maintaining night currency. He said the first takeoff and landing were uneventful, and that at touchdown he used "aerodynamic braking to slow down by keeping the nose off the runway as long as possible." The pilot explained that the second landing was the same as the first, only the approach was faster and more runway was used. He said, "I started braking as I dropped the nose and it came down harder than the first landing."

The pilot stated that after the nose gear touched down, the airplane was "pulling" to the right, and developed a shimmy. He said he attempted to maintain directional control with braking as the shimmy in the front end intensified, and then the nose gear subsequently collapsed, which resulted in minor damage to the nose landing gear doors and the nose enclosure. The pilot added that he has had the nose "drop harder onto the runway in the past with no ill consequences."

The pilot held a private pilot certificate with ratings for airplane single-engine land and instrument airplane. His most recent FAA second-class medical certificate was issued December 12, 2012. He reported 926 total hours of flight experience, of which 774 hours were in the incident airplane make and model.

According to FAA records, the airplane was manufactured in 2002. Its most recent conditional inspection was completed June 26, 2014 at 321 total aircraft hours.

According to maintenance records, a refurbished nose landing gear was installed September 26, 2014.

At 2120, the weather observation at RYY included clear skies and calm winds.

Examination of the airplane by an FAA aviation safety inspector revealed minor damage to the nose landing gear doors and the nose enclosure.

On October 27, 2014, the fractured segments of the nose landing gear leg were examined in the NTSB Materials Laboratory in Washington, DC. Examination of the fracture surfaces revealed features consistent with ductile overstress fracture. The overall fracture pattern was consistent with fracture under a lateral bending load.

## Pilot Information

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| **Certificate:** | Private | **Age:** | 57 |
| **Airplane Rating(s):** | Single-engine land | **Seat Occupied:** | Left |
| **Other Aircraft Rating(s):** | None | **Restraint Used:** | 3-point |
| **Instrument Rating(s):** | Airplane | **Second Pilot Present:** | No |
| **Instructor Rating(s):** | None | **Toxicology Performed:** | No |
| **Medical Certification:** | Class 2 With waivers/limitations | **Last FAA Medical Exam:** | December 4, 2012 |
| **Occupational Pilot:** | No | **Last Flight Review or Equivalent:** | |
| **Flight Time:** | 926 hours (Total, all aircraft), 774 hours (Total, this make and model), 12 hours (Last 90 days, all aircraft) | | |

## Aircraft and Owner/Operator Information

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| **Aircraft Make:** | FUNK RALPH | **Registration:** | N301EF |
| **Model/Series:** | Velocity XLRG | **Aircraft Category:** | Airplane |
| **Year of Manufacture:** | 2002 | **Amateur Built:** | Yes |
| **Airworthiness Certificate:** | Experimental (Special) | **Serial Number:** | 3RX105 |
| **Landing Gear Type:** | Retractable - Tricycle | **Seats:** | 4 |
| **Date/Type of Last Inspection:** | June 26, 2014 Condition | **Certified Max Gross Wt.:** | 2800 lbs |
| **Time Since Last Inspection:** | 19 Hrs | **Engines:** | 1 Reciprocating |
| **Airframe Total Time:** | 330 Hrs at time of accident | **Engine Manufacturer:** | CONT MOTOR |
| **ELT:** | Not installed | **Engine Model/Series:** | IO-550 SERIES |
| **Registered Owner:** | On file | **Rated Power:** | 310 Horsepower |
| **Operator:** | On file | **Operating Certificate(s) Held:** | None |

## Meteorological Information and Flight Plan

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| **Conditions at Accident Site:** | Visual (VMC) | **Condition of Light:** | Night/dark |
| **Observation Facility, Elevation:** | RYY,1040 ft msl | **Distance from Accident Site:** | 0 Nautical Miles |
| **Observation Time:** | 21:20 Local | **Direction from Accident Site:** | 0° |
| **Lowest Cloud Condition:** | Clear | **Visibility** | 10 miles |
| **Lowest Ceiling:** | None | **Visibility (RVR):** | |
| **Wind Speed/Gusts:** | / | **Turbulence Type Forecast/Actual:** | / |
| **Wind Direction:** | | **Turbulence Severity Forecast/Actual:** | / N/A |
| **Altimeter Setting:** | 30.03 inches Hg | **Temperature/Dew Point:** | 20°C / 15°C |
| **Precipitation and Obscuration:** | No Obscuration; No Precipitation | | |
| **Departure Point:** | Atlanta, GA (RYY ) | **Type of Flight Plan Filed:** | None |
| **Destination:** | Atlanta, GA (RYY ) | **Type of Clearance:** | None |
| **Departure Time:** | 21:00 Local | **Type of Airspace:** | Class D |

## Airport Information

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| **Airport:** | COBB COUNTY-MC COLLUM FIELD RYY | **Runway Surface Type:** | Concrete |
| **Airport Elevation:** | 1041 ft msl | **Runway Surface Condition:** | Dry |
| **Runway Used:** | 09 | **IFR Approach:** | None |
| **Runway Length/Width:** | 6295 ft / 100 ft | **VFR Approach/Landing:** | Traffic pattern |

## Wreckage and Impact Information

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| **Crew Injuries:** | 1 None | **Aircraft Damage:** | Minor |
| **Passenger Injuries:** | | **Aircraft Fire:** | None |
| **Ground Injuries:** | N/A | **Aircraft Explosion:** | None |
| **Total Injuries:** | 1 None | **Latitude, Longitude:** | 34.013053,-84.596946(est) |

## Administrative Information

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| **Investigator In Charge (IIC):** | Rayner, Brian |
| **Additional Participating Persons:** | Edmundo Rolon; FAA/FSDO; Atlanta, GA |
| **Original Publish Date:** | December 14, 2015 |
| **Last Revision Date:** | |
| **Investigation Class:** | Class |
| **Note:** | The NTSB did not travel to the scene of this incident. |
| **Investigation Docket:** | https://data.ntsb.gov/Docket?ProjectID=90220 |