



**NATIONAL TRANSPORTATION SAFETY BOARD**

Office of Aviation Safety  
Washington, D.C. 20594

**STRUCTURES GROUP FACTUAL REPORT**

April 9, 2009

**A. ACCIDENT      DCA09MA027**

Location:            Clarence Center, New York  
Date:                February 12, 2009  
Time:                2217 Eastern Standard Time (EST)  
Aircraft:            Colgan Air Inc. (d.b.a. Continental Connection) Flight 3407, Bombardier  
                          DHC-8-400, N200WQ

**B. STRUCTURES GROUP**

Chairman:           Clinton R. Crookshanks  
                          National Transportation Safety Board  
                          Denver, Colorado

Member:            Pedro L. Munoz  
                          Federal Aviation Administration  
                          Rochester, New York

Member:            Steve Demko  
                          Air Line Pilots Association  
                          Ashburn, Virginia

Member:            Dave Fisher  
                          Bombardier Aerospace  
                          Toronto, Ontario, Canada

Member:            Martin Tremblay  
                          Bombardier Aerospace  
                          Newark, New Jersey

Member: Steve Heigemeir  
Colgan Air, Inc.  
Albany, New York

## **C. SUMMARY**

On February 12, 2009, about 2217 eastern standard time (EST), a Colgan Air Inc., Bombardier DHC-8-400, N200WQ, d.b.a. Continental Connection flight 3407, crashed during an instrument approach to runway 23 at the Buffalo-Niagara International Airport (BUF), Buffalo, New York. The crash site was approximately 5 nautical miles northeast of the airport in Clarence Center, New York, and mostly confined to one residential house. The four flight crew and 45 passengers were fatally injured and the aircraft was destroyed by impact forces and post crash fire. There was one ground fatality. Night visual meteorological conditions prevailed at the time of the accident. The flight was a Code of Federal Regulations (CFR) Part 121 scheduled passenger flight from Liberty International Airport (EWR), Newark, New Jersey to BUF.

## **D. DETAILS OF THE INVESTIGATION**

### **1.0 Overview**

The Bombardier DHC-8-400 is a medium range, all metal, high wing, twin turbo-propeller powered passenger airplane. The airplane is equipped with tricycle landing gear and a T-tail. The accident airplane (S/N 4200) was manufactured by Bombardier Aerospace in April 2008. The airplane was designed to typically carry 74 passengers and 4 crew members. The fuselage is 107 feet, 9 inches long, with a wingspan of 93 feet, 3 inches, and a tail height of 27 feet, 5 inches. See Figure 1 for a 3-view drawing of the airplane. The maximum takeoff weight for S/N 4200 was 64,500 pounds.

### **2.0 Wreckage Site**

The airplane impacted a house located at 6038 Long Street, Clarence Center, New York. The house was a two story old style farmhouse with a basement, covered front porch, and detached two-car garage (Figure 2). The house and two cars located on the driveway in front of the garage were destroyed by the impact and post crash fire but the garage remained intact. The garage of an adjacent house to the south was also impacted by the airplane. The airplane impacted the south side of the house near ground level and pieces of the airplane traveled through the house and ended up beyond the northeast corner of the house foundation. The south basement wall was fragmented by the impact and most of the wall debris was pushed towards the northeast corner of the basement. The top of the north basement wall exhibited impact damage adjacent to the location of the left engine. There was a distinct ground scar on the south side of the house about 10 feet south of the south foundation wall. The ground scar was about 15 feet long, 5 feet wide, and 3 feet deep. Two trees along the southern property boundary were impacted and the tops were sheared off. The west tree was cut about 20 feet above ground level and the east tree was cut about 25 feet above ground level. There was some tree debris between the property boundary and the

house that exhibited clean, angled cuts consistent with propeller impact.

### 3.0 Structures

The airplane was severely fragmented and a significant post crash fire destroyed most of the airplane and house (Figure 3). About 60% of the main structural components of the airplane were conclusively identified. Numerous small pieces of airplane structure and globs of molten and re-solidified metal were recovered but not conclusively identified. Structure from the radome and both wingtips was identified in the wreckage. The empennage was intact in the wreckage. The airplane wreckage was on a heading of about 070° magnetic. See Figures 4 and 5 for schematics depicting the conclusively identified wreckage.

Almost the entire forward fuselage was consumed in the post crash fire. The right, forward cargo door was recovered in the front yard of a house across the street (east) of the accident residence with impact damage but very little fire damage. A lower section of the left airstair door and the overhead cockpit emergency exit were recovered in the forward fuselage debris. Some pieces of the cockpit and windshield post structure were recovered on the northeast side of the house. A portion of the center fuselage and attached center wing box was recovered intact on top of the wreckage pile at the northeast corner of the house with severe fire damage. The recovered fuselage had collapsed vertically downward just below the cabin windows on both the left and right sides. Almost the entire aft fuselage was recovered in the wreckage. The portion of the fuselage aft of the aft entry doors did not exhibit fire damage. The aft right entry door remained installed and the aft left entry door and aft cargo door were recovered in the wreckage separated from the fuselage.

The empennage was intact and attached to the aft fuselage. The empennage was rolled to the right and resting on the right horizontal stabilizer tip. The horizontal stabilizers, vertical stabilizer, elevators, and rudder were all intact and exhibited only slight impact damage to the leading edges. The APU was in the tailcone but broken from its mounts.

The left wing was entirely consumed by fire except for the aileron, outboard flap and a portion of the spoiler. These items exhibited severe fire damage and were recovered upside down, and rotated 180° from the direction of impact. The left engine mount and thrust structure was recovered in the wreckage with severe fire and impact damage. A small piece of the lower outboard wing skin was also recovered in the wreckage with severe fire and impact damage. The outboard right wing impacted the garage of the adjacent house. A section of the right wing outboard leading edge was found in the garage holding up the roof. Most of the outboard right wing structure including the engine support and thrust structure was recovered forward of the ground scar at the southeast corner of the house with no fire damage but with significant impact damage. A section of the inboard right flap was recovered and identified in the basement with moderate fire damage. Six propeller blades were recovered embedded in the ground at the ground scar location.

All three landing gear were recovered in the wreckage. The right main landing exhibited minor fire damage to the tires and the retract actuator was broken off in the almost fully retracted position. The RMLG uplock was in the open position. The LMLG was recovered

with severe fire damage and the retract actuator was broken off in the almost fully retracted position. The LMLG uplock was not conclusively identified. The NLG was recovered with severe fire damage. No conclusive evidence of the NLG position was found.

A search of the rooftops and yards surrounding the accident sight resulted only in a small section of propeller spinner being recovered.

All of the fracture surfaces examined exhibited signs consistent with overload failure.

Clinton R. Crookshanks  
Aerospace Engineer

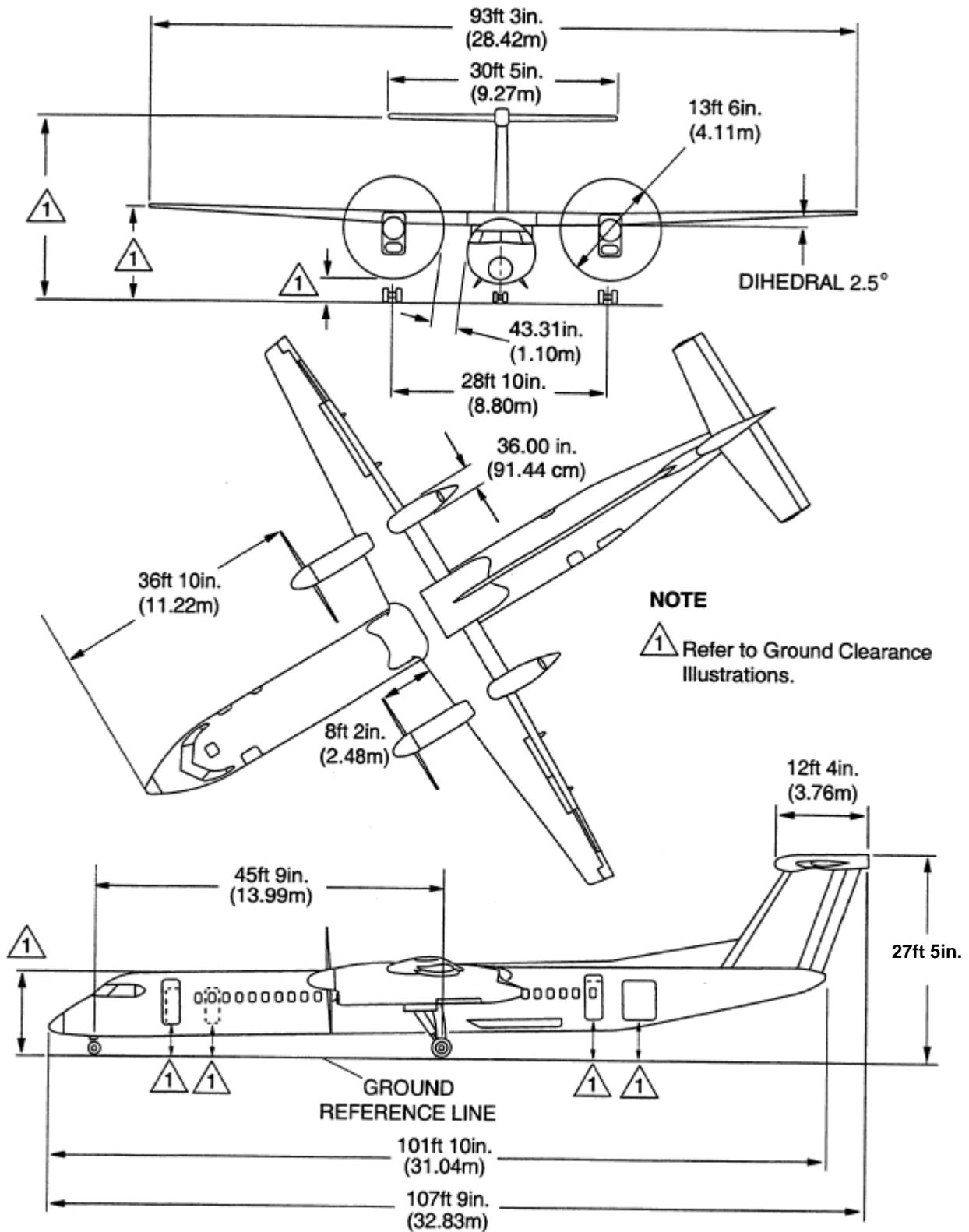


Figure 1 – Bombardier DHC-8-400 3-view Drawing



Figure 2 – 6038 Long Street, Clarence Center, New York



Figure 3 – Main Wreckage Site (Same view as Figure 2)

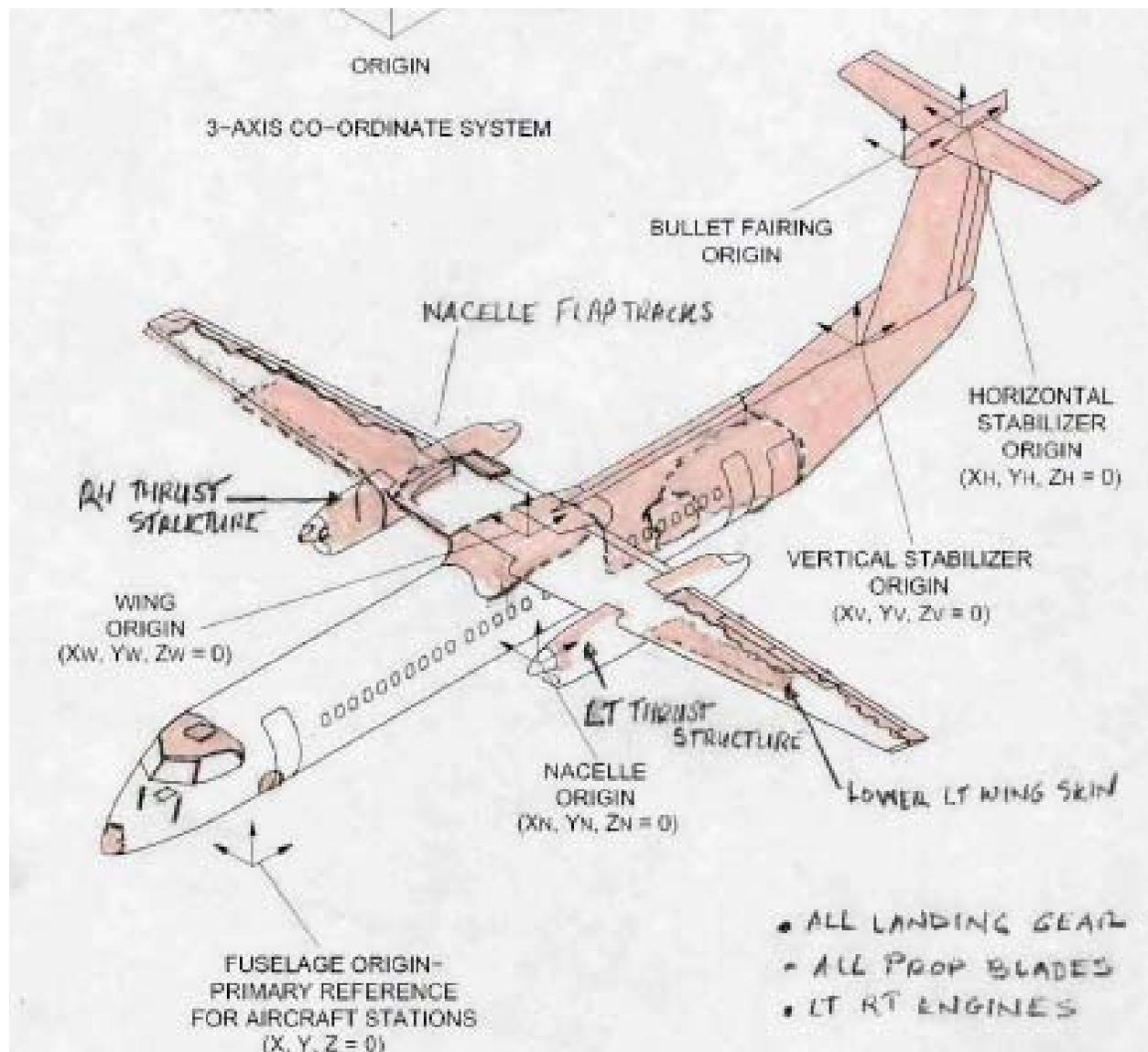


Figure 4 – Recovered Wreckage LH  
(Orange color represents conclusively identified wreckage)

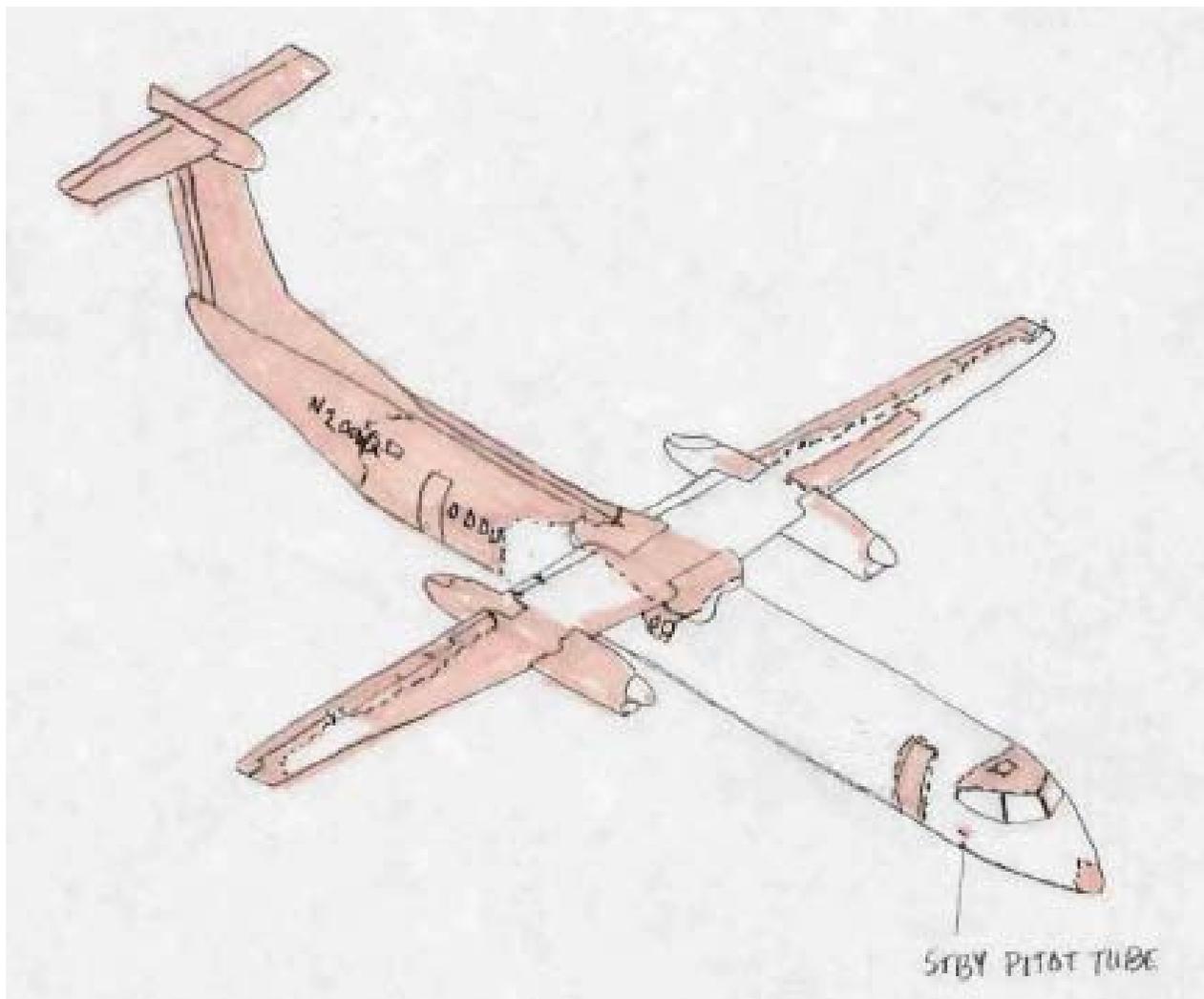


Figure 5 – Recovered Wreckage RH  
(Orange color represents conclusively identified wreckage)