



# National Transportation Safety Board Aviation Accident Final Report

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<b>Location:</b>	GRIFFIN, GA	<b>Accident Number:</b>	ATL97FA057
<b>Date &amp; Time:</b>	04/04/1997, 0016 EST	<b>Registration:</b>	N83FA
<b>Aircraft:</b>	Douglas C54A-DC	<b>Aircraft Damage:</b>	Destroyed
<b>Defining Event:</b>		<b>Injuries:</b>	2 Fatal
<b>Flight Conducted Under:</b> Part 91: General Aviation - Positioning			

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## Analysis

During the airplane's takeoff roll, about 3/4 down the 3,700 foot runway, a witness reported that the color of the #1 exhaust flame changed from blue to yellow, accompanied by an audible change in the engine power level. The nose of the airplane yawed left and the left wing dipped. Directional control was regained and the takeoff continued. Skid marks were found about 650 feet before the departure end of the runway that continued about 1360 feet to an abandoned grocery store impacted by the plane. About 315 feet before the building, the left wing contacted a privacy fence, and a utility pole, resulting in a fire at the disrupted left wing main fuel tank. A pilot/mechanic who helped dispatch the airplane observed that the elevator was free as it taxied. Fire damage to all engines precluded a detailed post crash examination of essential fuel and ignition systems. The toxicological report regarding the second pilot indicated that 1.110 mcg/ml (ug/ml, ug/g) of Diphenhydramine, was detected in the blood. According to NTSB medical personnel, Diphenhydramine is a sedating antihistamine often found in over-the-counter allergy medications. A single oral dose of medication containing Diphenhydramine, at twice the recommended maximum of over-the-counter dosage, resulted in maximal blood levels of between 0.08 and 0.16 mcg/ml. The level of Diphenhydramine found during the toxicology examination of the second pilot approximated ten times the levels found following a dosage at twice the recommended strength. Diphenhydramine was also found in the urine. Additional prescription and nonprescription medications were also found during the toxicological examination of the second pilot.

## Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be: The flightcrew's inadequate procedures, during a rejected takeoff following a possible engine malfunction at a critical time in the takeoff, and the second pilot's physical impairment.

## Findings

Occurrence #1: LOSS OF ENGINE POWER  
Phase of Operation: TAKEOFF - ROLL/RUN

### Findings

1. (F) REASON FOR OCCURRENCE UNDETERMINED
  2. (C) EMERGENCY PROCEDURE - IMPROPER - FLIGHTCREW
  3. (C) CREW/GROUP COORDINATION - INADEQUATE - FLIGHTCREW
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Occurrence #2: OVERRUN  
Phase of Operation: TAKEOFF - ABORTED

### Findings

4. (C) ABORTED TAKEOFF - IMPROPER - FLIGHTCREW
  5. (C) IMPAIRMENT(DRUGS) - COPILOT/SECOND PILOT
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Occurrence #3: ON GROUND/WATER COLLISION WITH OBJECT  
Phase of Operation: TAKEOFF - ABORTED

### Findings

6. OBJECT - FENCE
  7. OBJECT - POLE
  8. OBJECT - BUILDING(NONRESIDENTIAL)
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Occurrence #4: FIRE/EXPLOSION  
Phase of Operation: TAKEOFF - ABORTED

## Factual Information

### HISTORY OF THE FLIGHT

On April 4, 1997, about 0016 eastern standard time, a Douglas C54A-DC, N83FA, collided with a commercial building during takeoff from the Griffin-Spalding County Airport, in Griffin, Georgia. The airplane was operated by Custom Air Service under the provisions of Title 14 CFR Part 91. Visual meteorological conditions prevailed. An instrument flight rules (IFR) flight plan was filed for the positioning flight. The airline transport pilot-in-command, and the commercial second pilot, were fatally injured, and the airplane was destroyed by ground fire. The flight was originating at the time of the accident, en-route to Americus, Georgia, to pick up a load of automobile parts for transfer to Rockford, Illinois.

A pilot/mechanic associated with the operation of the airplane observed its start, taxi, run up, and takeoff. He stated that he always looked at the elevator to see if the controls were locked, and noted that the elevator was "down" as the airplane taxied. He reported that the engine run up was accomplished on all four engines with no discernible problem. During the airplane's takeoff roll on runway 14, the main landing gear strut was observed to partially extend as the airplane "became light on the landing gear." Then the witness noted that the color of the #1 exhaust flame changed from blue to yellow, accompanied by an audible change in the engine power level. The nose of the airplane yawed left and the left wing dipped. This occurred when the airplane was about 3/4 down the 3,700 foot runway. When the airplane passed his position adjacent to the runway near the departure end, he heard the tires "blow." He observed that the tail of the airplane was extremely high throughout the continued takeoff roll. The witness did not recall hearing any further decrease in engine power. An explosion and fire was reported to have occurred when the airplane impacted the building. Another witness reported that he observed fire on the left side of the airplane and at the rudder about the time the airplane was at the parking lot for the building.

### PERSONNEL INFORMATION

The captain was issued an airline transport certificate on May 25, 1995. His ratings included airplane multiengine land, DC-3, and DC-4. He held commercial privileges with an airplane single engine land rating. Additionally, the captain held a mechanic's certificate with airframe and powerplant ratings. He was issued a first class medical certificate on November 25, 1996, with the limitation that the holder shall possess correcting glasses for near vision while exercising the privileges of his airman certificate. It could not be determined if the captain was wearing glasses at the time of the accident. Airman records obtained from the Federal Aviation Administration (FAA) indicated that the captain received a DC-4 rating on March 11, 1995. According to records provided by the operator, the captain successfully completed a proficiency flight check in the DC-4 aircraft on October 28, 1996.

A report of the accident on NTSB Form 6120.1/2, Pilot/Operator Aircraft Accident Report, and a copy of the crew member records required by Title 14 CFR Part 125.401 were requested from the operator. The records indicated that the captain had in excess of 12,000 total flight hours with more than 1,000 hours in the same make and model airplane. The records indicated that the captain had a total of 45.4 flight hours within the 90 days prior to the accident, with 27.7 hours in the same make and model airplane. According to the operator's report of the accident, the captain had in excess of 32 flight hours at night, and more than 10 hours of actual instrument flight hours, within the 90 days prior to the accident. Based on the records

provided by the operator, it could not be determined if the captain met the proficiency requirements of Title 14 CFR Part 125.401, specifically, the instrument flight hours and the number of instrument approaches within the previous six months. Instrument flight hours and completed instrument approaches are recorded by the operator's pilots on the "flight log." It was observed in the operator's records that this information was not recorded, consistently.

The second pilot held a commercial pilot certificate with airplane single and multiengine land, and airplane instrument ratings. He also held a flight engineer certificate, with reciprocating engine powered rating. Additionally, the second pilot held a mechanic certificate with airframe and powerplant ratings. He was issued a second class medical certificate on July 23, 1996, with the limitation that the holder shall wear glasses which correct for near and distant vision while exercising the privileges of this airman certificate. A waiver was issued to the pilot on July 16, 1993, for defective distant vision 20/200, corrected to 20/20 bilaterally. It could not be determined if the second pilot was wearing glasses at the time of the accident. Records provided by the operator indicated that the second pilot received a proficiency check as second in command in the DC-4 on July 19, 1996.

The operator's report of the accident listed the second pilot's total flight hours as greater than 5,000, with more than 1,500 hours in the same make and model airplane. According to his request for a medical certificate dated July 23, 1996, he had 3,550 total flight hours with 50 flight hours within the six months prior to the examination. The operator's report of the accident indicated that the second pilot had no pilot in command experience in the DC-4. According to records provided by the operator, the second pilot had 78.2 total flight hours within the 90 days prior to the accident, all in the same make and model airplane. The second pilot's instrument flight proficiency, required by Title 14 CFR Part 125.401, could not be determined from the records provided by the operator. In the report of the accident completed by the operator, the second pilot's night and instrument flight hours within the previous 90 days were listed as more than 45 and 15 hours respectively.

The second pilot's medical certification file was obtained from the FAA and examined. In his request for a medical certificate dated July 23, 1996, the second pilot indicated that he was not currently using any medication, that a hospital admission had been previously reported, and that there were no changes. Additionally, he indicated that he had not seen a health professional within the three years prior to the examination. His medical certificate request dated June 21, 1994, indicated that he had hernia surgery in June, 1992.

#### AIRCRAFT INFORMATION

According to FAA records, N83FA was registered to Robert D. McSwiggan, and certificated in the Transport category, as a Douglas C54A-DC. The records indicated that on November 13, 1962, the airplane conformed with Type Certificate Data Sheet No. A-762. The airplane, serial number 10365, had been modified in 1962 by Aviation Traders (Engineering) Ltd., United Kingdom, and designated by the Civil Aviation Authority as an ATL98 Carvair. (Three view drawing attached). It was operated under the provisions of Title 14 CFR Part 125, and Part 91. According to the operator, it was operated on the accident flight under the provisions of Title 14 CFR Part 91, as a positioning flight. In the operator's report of the accident, the airplane was listed as having 50,558 total flight hours, with 91 hours since the last inspection, performed on January 27, 1997. According to the operations specifications, issued to the operator by the FAA, the airplane was to be maintained in accordance with Custom Air Service's Manual and the Manufacturer's Manual. The approval for inspections in accordance with Title 14 CFR Part

125.31(b)(3) was issued by the FAA on August 1, 1996. The airplane was inspected using eight numbered inspections at intervals not to exceed 150 hours. A review of the operator's completed inspection forms for the airplane indicated this requirement had been met. The altimeter and pitot static system, and the transponder were last inspected on August 28, 1995, according to the operator's records. There were no uncorrected discrepancies found in the operator's inspection records for the airplane.

In addition to the initial review of the airplane records reported above, the records were again examined on October 20, 1998. Pink copies of the three page log form used to record flight hours and in-flight airplane discrepancies were examined. The pink copy of the form included a record of corrective actions for in-flight discrepancies that were recorded by flight crewmembers. The log pages are preprinted with sequential numbers and contain a block for entering the date and flight hours flown for each flight. The log pages examined began on 2/5/96 with preprinted number 1430408 and ran continuously through log page number 1430438 dated 7/9/96. A second set of log page numbers began with log page number 83001 dated 7/30/96 and ran continuously through log page number 83055 dated 4/2/97; except for log page number 83044, 83045, and 83047. The flight hours recorded were continuous also, except for the missing pages that accounted for a total of 17 hours. Log page 83055, dated 4/2/97, the last flight prior to the accident flight consisted only of the 1st page of the form, a half page that recorded the flight hours and the names of the flight crewmembers.

The copilot on the April 2nd flight, was also the copilot on the accident flight who was fatally injured. The captain for the flight on 4/2/97 was interviewed via telephone on October 13, 1998. The captain stated that as far as he could recall there were no discrepancies with the airplane during the flight. They flew from Griffin to Americus, Georgia, then to St. Louis and returned. He stated that he and the copilot commented to each other how well the airplane, particularly the engines, were operating. Regarding the flight control lock pin, it was normally removed in sequence according to the checklist. He related one event when he pulled onto the runway and discovered that he control lock pin had not been taken out. So, they slowed down and reviewed the checklist very carefully. The captain stated that he and the copilot had discussed that the most dangerous aspect of most trips was the departure at Griffin. They had decided that with the normal takeoff weight of about 59,000 pounds from Griffin, if the airplane had a problem after 50 or 60 knots, the best course of action was to continue the takeoff rather than try to stop. If an attempt was made to stop, it would just result in smoking the tires and blowing them out. According to the captain, an accelerate-stop chart was not in the airplane manual, but the distance was the same as accelerating and clearing a 50 foot obstacle. During a normal takeoff at Griffin, the airplane would lift off about the point that the accident flight started smoking the tires where the skid marks are on the runway, about 800 to 1,000 feet from the departure end.

The airplane was powered by four Pratt and Whitney R2000-7M2 radial engines. According to the operator's report of the accident, the engine hours since overhaul were as follows: #1=688.1; #2=936.3; #3=399.1; #4=1,448.6. The engine time between overhaul is 1,600 hours.

From the flight log pink forms found in the airplane records, the airplane total time was listed as 50,558.31 hours. Component cards, Serviceable Component Tags (Yellow Tags), and log book entries were examined for the engine and propellers reflecting the following information: Number 1 engine: Component card-Pratt & Whitney (P&W) R2000-7M2 Serial Number (SN) BP700946 installed 1/16/96 at aircraft time 49,885.02 with a time between overhaul (TBO) of

1,600 hours. The yellow tag indicated the same information and indicated an overhaul had been completed on 4/26/82 on work order (WO) 399 by Genair Corp. The log book indicated the engine was repaired by Genair at 11 hours since overhaul on 11/17/87, WO 975. The engine was installed, per the log book, on N83FA on 10/9/94, with 11 hours since overhaul. The log book reflected the engine was removed for repairs at different times and reinstalled. Number 2 engine:

Component card-P&W R2000-7M2 SN BP702224 installed 8/23/95 on N83FA at aircraft time 49,615.58 hours with TBO of 1,600 hours. The yellow tag indicated the engine was overhauled on 2/13/95, WO 30628, by Precision Airmotive Corp. The log book indicated the engine was installed on N83FA on 2/13/95, at zero time since overhaul, at airplane time of 49,615.58. Number 3 engine:

Component card-P&W R2000-7M2 SN P105712 installed 1/16/96 on N83FA at airplane total time 50,170.15 with a TBO of 1,600 hours. The yellow tag reflected the same information plus overhauled by Garside's Aircraft & Engine Parts and Service, Inc, WO 5205. The log book indicated the engine was installed on N83FA on 3/16/96 at zero time since overhaul at airplane time 50,170.15. Number 4 engine: Component card-P&W R2000-7M2 SN 702373 installed on N83FA 10/21/94 at airplane time 49,109.23 with TBO of 1,600 hours. The yellow tag reflected the same information with overhaul by Precision Airmotive Corp, on 9/9/94, WO 29202. The log book reflected the same information with the engine installed on N83FA on 10/21/94 with zero time since overhaul. Number 1 propeller:

Component card-Hamilton Standard (HS) Model 23E50 SN FA4435 installed on N83FA on 5/18/94 at 48,773.12 airplane hours, with a TBO of on condition, and Airworthiness Directive due at 3/1/99. The log book reflected the same information, indicating the propeller was overhauled by Aviation Propellers, Inc. on WO 4748 on 3/31/94. AD 81-13-06R2, requiring a propeller overhaul each 3,000 hours or 60 months, was indicated as having been complied with. The yellow tag also reflected a major overhaul on 3/31/94 by Aviation Propellers, Inc, WO 4748-B. Number 2 propeller: Component card-HS 23E50 SN RRB6586 installed on N83FA on 6/19/94 at airplane time 48,8816.46 hours at zero time since overhaul, with TBO of on condition. AD due 3/30/99. The log book reflected the same designation information and indicated the propeller was overhauled by Aviation Propellers, Inc., on WO 4739-B. The yellow tag indicated the propeller was overhauled on 3/30/94.

Number 3 propeller: Component card-HS 23E50 SN NKS1845 installed on N83FA on 9/14/94 at 49009.18 airplane hours, with zero time since overhaul. TBO 3,600 hours at 52,609.18 airplane hours. AD due at 9/19/99. The logbook contained the same descriptive information and indicated the propeller was overhauled on 8/30/94 by Aviation Propellers, Inc. on WO 4873-B. The yellow tag indicated the propeller was overhauled on 8/30/94. It was noted that the Propeller AD Compliance Record, a separate page in the airplane records, recorded the #3 propeller SN as G6371. The yellow tag reflected the same SN as in the log book. Number 4 propeller: Component card-HS23E50 SN RA959 installed on N83FA, on 9/14/95 at 49,659.13 airplane hours total time, with zero hours since overhaul. The TBO was on condition, and the AD was due at 1/2000. The log book reflected the same descriptive information and listed an overhaul by Aviation Propellers, Inc. on 1/5/95 on WO 4817-B. The propeller was installed on N89FA, on 3/28/95 and was not flown. The propeller was installed on N83FA at zero time since overhaul on 9/14/95. The yellow tag indicated the overhaul was on 1/6/95 and that AD 81-13-06R2 had been complied with.

According to the operator, because the accident flight was conducted under the provisions of Part 91, a Weight-Balance Manifest Flight Release/Following Form was not required. (See Tests and Research for excerpts of Title 14 CFR Part 91.103). Additionally, the flight log page for the accident flight was not located. The operator believed it was aboard the airplane at the

time of the accident. A weight and balance form for the flight was subsequently provided by the operator indicating that the airplane's weight at takeoff was 56,345 lb., with a center of gravity (CG) at 14% mean aerodynamic chord (MAC). The Carvair flight manual provided by the operator indicated that the maximum takeoff weight for the airplane was 73,800 lb., with a CG limit of 12% MAC forward, and 29% MAC rear. According to the operator's manual and Title 14 CFR Part 125.91(b) the airplane's weight and CG must be determined by actual weighing each 36 months. According to the operator's records, the airplane was weighed on January 28, 1997, at 42,376 lb. and the CG calculated to be 366.76 inches aft of datum. The operator calculated the operating weight, by adding flight crew and non-consumable equipment and fluids, as 43,225 lb. with a CG of 365.72 and a basic index of 42.19.

Fueling records for N83FA were obtained from the operator, and the Griffin-Spalding County Airport Manager. In accordance with those records, (attached) the operator dispensed 707 gallons, and the airport dispensed 771.5 gallons of 100LL aviation gasoline into the airplane, on April 3, 1997, for a total of 8,871 lbs (1478.5 gallons X 6 lbs/gallon). Subsequently, the airport manager provided a copy of a fuel analysis report indicating that the sample of fuel taken from the airport met the requirements of 100LL aviation gasoline, including cleanliness.

Custom Air Service was authorized use of a minimum equipment list (MEL). A copy of the MEL was not found in the General Operations Manual. The director of operations stated that the MEL had been submitted to the FAA for approval, and had been returned to Custom Air Service so that corrections could be made. According to the operator, those corrections had not been completed at the time of the accident.

The airplane was equipped with four main and two auxiliary fuel tanks, located in the wings. The number 1 and 4 fuel tanks were located in the outboard leading edge of the left and right wings, respectively. Each outboard main tank had a capacity of 495 gallons. Each inboard main fuel tank had a capacity of 508 gallons. According to the operator, the airplane was dispatched with 2,000 gallons of fuel, filling the main tanks, with the auxiliary tanks containing the minimum amount of fuel, no more than 15 gallons, each. Fuel selector levers were located on the forward face of the control pedestal. Each lever had three positions, OFF, MAIN TANK ON, and AUX. TANK ON, except for number two and three, because number two and three auxiliary tanks were not installed. The flight manual stated "Pilots are warned of the need to correctly locate the fuel cock control levers by the feel of the detent in the intended position. Failure to do so even by only a small amount will allow all ports of the cock to be open to each other which may lead to feeding engine(s) from unintended tank(s) or unwanted tank-to-tank fuel transference. If not noticed and corrected, this can lead to power loss from unexpected fuel exhaustion in the tank feeding the engine(s)."

The flight manual states that elevator trim should be correctly set prior to takeoff. The chart in the manual titled "Recommended Elevator Trim Setting for Take-Off" indicated that at 14% MAC, flaps 15 degrees, the trim position should be approximately 1.5 Tab Wheel Divisions Nose Up. At 12% MAC, two (2) Tab Wheel Divisions Nose Up was the recommended setting. Additionally, the manual indicated that the flap setting for takeoff should be 15 degrees.

A cable operated mechanical gust lock control was installed in the airplane that allowed the flight controls to be manually locked. A gust lock pin was attached to a lanyard that could be reeled into a stowed position in the cockpit ceiling. When the lock pin was installed in the locked position, the lanyard extended from the stowed ceiling position, across the captain's field of view, and was inserted in the control lock lever, located in the cockpit floor to the right

of the captain's seat. According to the operator, when the control lock pin was inserted in the control lock lever, the lanyard stretched across the captain's seat preventing access to it. Company pilots normally pulled the lanyard over the back of the captain's seat in order to access the captain's seat. When the flight control mechanical gust lock was engaged, the elevator would be in a neutral position. A witness observed that the elevator was "down" as the airplane taxied.

The gust lock and flight controls, fuel tank selectors, flap position, and trim tab positions are all listed on the Before Take-Off checklist used by Custom Air Service.

During the review of the airplane records, the FAA Supplemental Type Certificate (STC) SA2IN was found in the records. The STC had been issued to Britavia to modify the Douglas C54A-DC to the ATL 98 Carvair. The STC stated that the FAA approved airplane flight manual Aviation Traders Ltd. Document AT.1.1, dated 7th September 1962 is required for the modified airplanes. The portion of the flight manual provided by the operator, referenced earlier in this report, was titled Document NO. AT. 1.1, FAA Approved Flight Manual for the ATL.98 Carvair, dated September 7, 1962. Because the operating manual for N83FA, that is required to be kept in the airplane, was not located following the accident, a copy of the Take-Off Performance Critical Engine Failure Speed chart from the airplane operating manual, Document AT.1.1, of a sister ship, was obtained. The chart contained a statement indicating that if one engine fails at critical engine failure speed, the distance to stop is equal to the distance to continue the takeoff to a 50 foot height. Under the stated weight and ambient conditions at the time of the accident, the chart indicated that the minimum take off runway length for the airplane to achieve V<sub>1</sub> (take off decision speed) was 2,750 feet. A second chart in the flight manual is used to calculate takeoff distance to the 50 foot height point, with all engines operating. The lowest weight available on this chart was 62,000 pounds, 6,000 pounds greater than the reported weight of the airplane during the accident takeoff.

#### METEOROLOGICAL INFORMATION

At the time of the accident, night visual meteorological conditions prevailed. The Aviation Routine Report (METAR) for The William B. Hartsfield Atlanta International Airport, located about 40 Nmi north of Griffin, at 2356 on April 3, 1997, was as follows: visibility 10 statute miles; sky clear; temperature/dew point 56/37 degrees Fahrenheit; altimeter setting 30.16" Hg. Remarks indicated that an automated observation with precipitation discriminator was available, the sea level pressure was not obtained, and that the temperature was +12.8 degrees Centigrade., and the dew point was 3.3 degrees Centigrade.

Information regarding Moon illumination for April 4, 1997, was obtained from the U.S. Naval Observatory. The Moon phase was a waning crescent with 11% of the Moon's visible disk illuminated. Moon set was 1608, on April 4, 1997, with Moonrise at 0506 on April 5, 1997.

#### AIRPORT INFORMATION

The flight was departing the Griffin-Spalding County Airport, airport identification code 6A2. The airport is a public, uncontrolled facility located one mile south of Griffin, Georgia, and operated by the city of Griffin. Airport elevation is 958 feet. One runway is available designated as 14/32. The runway was equipped with medium intensity runway lighting, preset to low intensity between dusk and dawn. Higher intensity runway lighting could be activated using the common traffic advisory frequency. The airport was not certified under Title 14 CFR Part 139. The flight was departing the asphalt runway 14, which is 3,701 feet long by 75 feet wide.

There is a 200 foot displaced threshold at each end of the runway.

#### WRECKAGE AND IMPACT INFORMATION

The airplane crashed into an abandoned grocery store off the departure end of runway 14.

Skid marks and a debris trail of about 1,360 feet led from the runway to the airplane wreckage, which came to rest inside the abandoned store. The airport perimeter fence, a wooden sign constructed of 4" X 4" boards, a wooden privacy fence bordering an apartment complex, a utility pole, a fire hydrant, and a parking lot metal light pole were all found broken, along the debris trail.

Marks were found on the runway, the ground, and the asphalt parking lot that led to the airplane wreckage in the building. Black marks, consistent with skidding tires, were found on the runway beginning about 650 feet prior to the departure end of Runway 14. Looking southeast along the runway, double skid marks on the left side began earlier on the runway, and were blacker. A single skid mark between two double skid tracks was closer to the left side than the right, throughout the skid mark trail. The single skid mark and the left skid marks were heavily imprinted as the runway surface ended, and continued onto the grass overrun, about 15 feet. The ground then dropped abruptly about three feet vertically, and the skid marks were absent for about 75 feet. The left side and center single skid mark became heavy again followed by double skid marks on the right just prior to a municipal road. The single skid trail continued across the road as a mud print only, followed by the left double heavy skid mark at the far side (southeast) of the road. Skid marks continued to the impacted building. Scorched grass began about 120 feet southeast of the road, approximately adjacent to the wooden privacy fence. The scorched ground pattern continued to the building, widening as the debris trail proceeded southeast. A broken and scorched utility pole was observed, adjacent to the privacy fence, positioned nearer the centerline of the debris trail. The skid marks and debris trail were oriented to a magnetic heading of 095 degrees between the end of the runway and the impacted building.

The first piece of the airplane was a nose gear door brace, that was found at a linear curb about 25 feet before reaching the building. The number one engine, cowling, and propeller assembly was found adjacent to the outside of the northeast wall of the building. The empennage and about 30 feet of the fuselage remained outside the building, while the remainder of the airplane was found inside the building. The building's steel girders, interior ceiling, and asphalt roof were mingled among the airplane debris. The airplane and building were extensively burned.

The cockpit instruments that could be located were generally burned beyond reading. A rod was located that had the appearance of the fuel selector torsion bar. It was noted that the left actuating fixture, corresponding to the number 1 engine fuel selector, was not aligned with the other three fuel selector fixtures.

The vertical stabilizer was scorched and the rudder was burned away. The horizontal stabilizer was sooted, with the left elevator fabric burned away. The fabric skin remained on the right elevator. The elevator cable on the left side of the fuselage, that positioned the trailing edge of the elevator down, was separated at the turnbuckle located at the rear of the fuselage. The separated control cable ends were melted. The elevator cables that positioned the elevator trailing edge up were connected from the elevator to the cockpit area. Both rudder cables were separated with sooting and melting of the cable ends. The rudder cables were connected at the

rudder attachment. The empennage trim cables were connected between the flight control surfaces and the cockpit area. A burned and melted Emergency Locator Transmitter was found in the rear fuselage. The rudder trim was found in a neutral position, while the elevator trim, on the right side, was found about two degrees trailing edge down, or nose up trim. The flap actuators were found extended to a position that approximated a 15 degree flap setting. According to a witness statement (attached) the flight control lock pin was found inboard and aft of the pilot's seat, in the wreckage debris.

Number 1 Propeller and Engine: (Propellers and engines are numbered 1-4 beginning with the left outboard engine, continuing to the right outboard engine in sequence.) There was extensive fire damage to the number 1 engine with sooting of the number 1 propeller. One propeller blade was bent forward in a broad arc, with chordwise scrapes at the tip leading edge. The other two blades were bent aft in a broad arc. The rear of the engine was extensively burned, with the supercharger section burned away, exposing the crankshaft. The engine was moved to a hangar and partially disassembled. Rotation of the engine was difficult until most of the cylinders had been removed. No mechanical failure was found during the disassembly of the engine. Once the cylinders had been removed there was evidence of heat distress to the connecting rods and the master rod. The carburetor was burned and could not be tested. Both magnetos were removed and placed on a test bench where a spark was produced for each cylinder. The propeller pitch control mechanism was found on the low pitch, high rpm mechanical stop. An oil sample from the number one propeller was subsequently analyzed. The oil analysis report indicated the wear metals in parts per million, with lead the highest at 9,017. All other wear metal content was significantly less than the lead content.

Number 2 Propeller and Engine: The forward section of the engine cowling was burned away. The number 2 propeller was separated from the engine with the engine nose case burned away. The magnetos were fire damaged and could not be tested. The rear portion of the case was burned away exposing the accessory drive shaft which dropped away from the engine and was found beneath the engine in the building debris. Except for the top cylinders, the cylinder heads were burned away exposing the pistons. The number 2 propeller was subsequently disassembled. During the disassembly, the propeller blades were found on the low pitch, high revolutions per minute, mechanical stop.

Number 3 Propeller and Engine: As with the number 2 engine, the forward section of the engine cowling was burned away. The propeller remained attached to the engine case with the nose section of the crankcase burned away exposing the propeller gearing. The propeller dome was crushed aft and split axially. The propeller blades were sooted and exhibited evidence of melting. Most of the cylinder heads were burned away and the rear case section was burned away. The carburetor and magnetos could not be tested. The number 3 propeller was disassembled. During the disassembly the propeller blades were found on the low pitch, high revolutions per minute, mechanical stop.

Number 4 Propeller and Engine: The forward section of the engine cowling was burned away. The propeller was separated from the engine with the nose case having been burned away. Both magnetos were absent. One propeller blade was burned away from a point about six inches from the hub to the tip. The trailing blade, in order of rotation looking from the rear, was twisted in the hub and bent forward in a broad arc. The third blade was melted away from hub outboard for about 24 inches. Most of the cylinders exhibited cooling fin melting. Again the magnetos and the carburetor could not be tested. The number 4 propeller was

disassembled. During the disassembly, the propeller blades were found on the low pitch, high revolutions per minute, mechanical stop.

#### MEDICAL AND PATHOLOGICAL INFORMATION

Post mortem examinations of the pilots were conducted by the Georgia Bureau of Investigation Division of Forensic Sciences Medical Examiner's office. In his report, the medical examiner indicated the cause of death for both pilots was blunt force trauma.

Toxicological examinations of the pilots were conducted by the FAA Toxicology and Accident Research Laboratory, PO Box 25082 Oklahoma City, Oklahoma 73125. The examination of the captain was negative for ethanol and other drugs.

The report of the examination of the second pilot indicated that no carboxyhemoglobin, cyanide, nor ethanol were detected in the blood. The report also indicated that Paroxetine, at 0.148 (ug/ml, ug/g) and 0.055 (ug/ml, ug/g), was detected in the blood and urine, respectively. Paroxetine is a prescription antidepressant, that has been shown to have little effect on performance. The values found were consistent with therapeutic dosage.

The toxicological report regarding the second pilot also indicated that 1.110 mcg/ml (ug/ml, ug/g) of Diphenhydramine, was detected in the blood. According to NTSB medical personnel, Diphenhydramine is a sedating antihistamine often found in over-the-counter allergy medications. A single oral dose of medication containing Diphenhydramine, at twice the recommended maximum of over-the-counter dosage, resulted in maximal blood levels of between 0.08 and 0.16 mcg/ml. The level of Diphenhydramine found during the toxicology examination of the second pilot approximated ten times the levels found following a dosage at twice the recommended strength. Diphenhydramine was also found in the urine.

Pseudoephedrine was also found in the blood. Ephedrine, Pseudoephedrine, and Phenylpropanolamine, decongestants commonly found in over-the-counter medications, were also detected in the Urine.

#### TESTS AND RESEARCH

Title 14 Code of Federal Regulations (14 CFR) Part 91.103 states in part that each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight, to include runway lengths, and takeoff and landing distance information, and for civil aircraft for which an approved Airplane Flight Manual containing takeoff and landing distance is required, the takeoff and landing distance data contained therein.

14 CFR Part 91 Subpart F contains rules issued by the FAA for the operation of Large and Turbine-Powered Multiengine Airplanes. Part 91.501, Applicability, states that Subpart F rules do not apply to those airplanes when they are to required to be operated under Part...125.

14 CFR Subchapter G has rules applicable to the certification and operation of Air carriers, and Operators for Compensation or Hire. Part 119.1, of Subchapter G, Applicability, states this part applies to each ...commercial operator,... prescribes the types of air operator certificates issued, ...and the certification requirements an operator must meet in order to obtain and hold a certificate authorizing operations under Part 121, 125, or 135. It further prescribes the operations specifications for each kind of operation, and the requirements an operator must meet to conduct operations under Part 121, 125, or 135.

14 CFR Part 119.2(a) states that if a certificate holder is issued operations specifications in accordance with Part 119 before March 20, 1997, such certificate holder shall comply with the provisions of Part 119. On February 20, 1996, Custom Air Service submitted a Preapplication Statement of Intent proposing to operate with an Operating Certificate under 14 CFR Part 125, Cargo Only. The proposal was to operate with N83FA a Douglas DC4 with a cargo payload capacity of 17,500 pounds.

Custom Air Service provided a Compliance Manual to the FAA, in which it stated that it would comply with 14 CFR parts 119 and 125, under an Operating Certificate, when issued. The compliance manual detailed by paragraph how compliance was intended, stating that common carriage operations would not be conducted. Within the FAA records for Custom Air Service, attached to the Preapplication Statement of Intent, was found a partially completed inspectors checklist, referenced in the Operations Inspector's Handbook, FAA Order 8700.1, entitled Figure 72-2 Certification Job Aid Original Certification. The checklist is used by the inspector when determining if an operator has met requirements for certification.

14 CFR Part 119.3 defines noncommon carriage as an aircraft operation for compensation or hire that does not involve a holding out to others. 14 CFR part 119.5 states that a person who is not authorized to conduct direct air carrier operations, but who is authorized to conduct operations as a U.S. commercial operator, will be issued an Operating Certificate. 14 CFR Part 119.23 states that each person who conducts operations when common carriage is not involved with airplanes having a...payload capacity of 6,000 pounds or more, shall...comply with the certification and operations specifications requirements of part 125.

An Operating Certificate to conduct "FAR PART 125 OPERATIONS" was issued to Custom Air Service by the Georgia Flight Standards District Office with an effective date of July 30, 1996. The Operations Specifications attached to the Operating Certificate were compared to the requirements listed in 14 CFR Part 125. It was noted that each requirement was addressed in the Operations Specifications. Part D of the Operations Specifications stated that the airplanes, their component parts, accessories and appliances will be inspected and checked, repaired and otherwise maintained in an airworthy condition in accordance with the maintenance and inspection procedures and functions set forth in Custom Air Service's Manual and Manufacture's [sic] Manual. Additionally, the approved engine overhaul was listed as 1,600 hours. The operator's Minimum Equipment List Authorization was previously discussed in this report.

FAA Advisory Circulars (AC) 125-1, (excerpts attached) Operations of Large Airplanes Subject to Federal Aviation Regulation Part 125, dated January 22, 1981, and AC 120-12A, (attached) Private Carriage Versus Common Carriage of Persons or Property, dated April 24, 1986, were reviewed in conjunction with this investigation.

AC 120-12A states that its purpose is to provide guidelines for determining whether transportation operations by air constitute private or common carriage. The AC further states that operations that constitute common carriage are required to be conducted under Federal Aviation Regulations (FAR) Parts 121 or 135. According to the AC, "common carriage" and "private carriage" are common law terms, and that the FAA Act of 1958 uses the term "common carriage" without defining it, therefore, guidelines regarding general explanations of the terms would be helpful. The AC provides the following:

4. Guidelines: A carrier becomes a common carrier when it "holds itself out" to the public, or to

a segment of the public, as willing to furnish transportation within the limits of its facilities to any person who wants it....There are four elements in defining a common carrier: (1) a holding out of a willingness to (2) to transport persons or property (3) from place to place (4) for compensation.... a. Signs and advertising are the most direct means of "holding out" but are not the only ones. b. A "holding out" may be accomplished through the actions of agents, agencies, or salesmen who may, themselves, procure passenger traffic from the general public and collect them into groups to be carried by the operator.... c. Physically holding out without advertising where a reputation to serve all is gained is sufficient to constitute an offer to carry all customers....the expression of willingness to all customers with whom contact is made that the operator can and will perform the requested service is sufficient.... d. Private carriage for hire is carriage for one or several selected customers, generally on a long-term basis....Special adaptation of the transportation service to the individual needs of shipper is a factor tending to establish private carriage but is not necessarily conclusive.(AC 120-12A is attached)

AC 125-1 sets forth one means that would be acceptable to the Administrator to assist persons in complying with the requirements of FAR Part 125. The AC states in part that Part 125 is applicable to large airplane operations in other than common carriage. A person is considered to be engaged in "common carriage" when "holding out" to the general public or to a segment of the public as willing to furnish transportation within the limits of its facilities to any person who wants it. Advertising through telephone yellow pages, billboard, television, radio, and individual ticketing are examples that have been legally found to be holding out. The AC points out that a formal crewmember training program is not required, however, training should be provided or otherwise assure that the crewmembers will be capable of successfully completing the testing requirements of Part 125. Crewmember records are to be kept as required by Part 125.401, which requires records of each crewmember that show whether or not that crewmember complies with proficiency checks, airplane qualifications, physical examinations, and required flight time records. The AC also points out that all engines operated under Part 125 will be maintained in accordance with a specified engine overhaul period.

The Director of Operations for Custom Air Service was formally interviewed on October 12, 1998, regarding the type of carriage in which the operator was engaged. He stated that Custom Air Service does not "hold out" to the public. Additionally, there is no advertisement for Custom Air Service, and no agents for the company. Custom Air Service operates on verbal contracts, mostly with automotive industry customers moving the customers parts from one location to an assembly plant. While there are no long term contracts, Custom Air Service deals with the same customers repeatedly. His customers are Ford, GM, Chrysler, Textron, and Cummings Diesel. In the past, Custom Air Service has been contacted by agents for DHL to carry excess packages, which have been declined because it would be common carriage. Customs Air Service has transported an engine for Air Aruba, and a 747 flap for Kitty Hawk Airlines.

FAA surveillance records of the operator were requested from and provided by the Georgia FSDO. The records indicated that an inspection was performed on 11/07/96 at Kansas City, Missouri, of N83FA. The inspection indicated there was no MEL on board the airplane, the nose gear actuator had a hydraulic leak, the #2 & 4 engines had oil leaks from the nose dome area, the #3 engine had a bad oil leak, both wings had fuel leaks, the right main landing gear outboard wheel had the bolts installed backwards, the left main landing gear had tires installed with different tread patterns, fasteners were missing from the #1 and #2 engine cowlings, and there was no serviceable tag for replacement of the nose wheel tire. The flight log from

November 7, 1996, log page 83030 was found in the maintenance records listing the same discrepancies. Additionally, a FAA special flight permit was found in the records authorizing a flight to Griffin, Georgia, for maintenance. The flight permit specified that the airplane be inspected and an entry placed in the aircraft records that the airplane was safe for the flight. Flight log page 83031, dated November 8, 1996, contained the inspection certification. It was noted that the inspection certification was signed by the second pilot of the accident flight.

The surveillance records indicated another inspection of N83FA on 12/05/96 stating the aircraft arrived at Miami International airport about 0800 from Aruba. A ramp inspection was completed with the following discrepancies listed: fuel leak on right wing inboard of the number 3 engine, corrosion on the right wing on the wing spar on the outer panel, navigation charts out of date, oil leaks on the number 3 engine. The same discrepancies were listed on flight log page 83039 and were signed off as within limits by one of the mechanics listed by the operator as authorized to conduct required inspections on the airplane. There were no additional discrepancies regarding fuel or engine oil leaks found in the airplane records.

#### ADDITIONAL INFORMATION

The airplane wreckage was released to R. D. McSwiggan, Director of Operations for Custom Air Service, Post Office Box 693 Griffin, Georgia 30224, on 10/25/97.

#### Pilot Information

<b>Certificate:</b>	Airline Transport	<b>Age:</b>	58, Male
<b>Airplane Rating(s):</b>	Multi-engine Land; Single-engine Land	<b>Seat Occupied:</b>	Left
<b>Other Aircraft Rating(s):</b>	None	<b>Restraint Used:</b>	
<b>Instrument Rating(s):</b>	Airplane	<b>Second Pilot Present:</b>	Yes
<b>Instructor Rating(s):</b>	None	<b>Toxicology Performed:</b>	Yes
<b>Medical Certification:</b>	Class 1 Valid Medical--no waivers/lim.	<b>Last FAA Medical Exam:</b>	11/25/1996
<b>Occupational Pilot:</b>	<b>Last Flight Review or Equivalent:</b>		
<b>Flight Time:</b>	12000 hours (Total, all aircraft), 1000 hours (Total, this make and model), 1000 hours (Pilot In Command, all aircraft), 45 hours (Last 90 days, all aircraft), 21 hours (Last 30 days, all aircraft)		

## Aircraft and Owner/Operator Information

Aircraft Make:	Douglas	Registration:	N83FA
Model/Series:	C54A-DC C54A-DC	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Transport	Serial Number:	10365
Landing Gear Type:	Retractable - Tricycle	Seats:	7
Date/Type of Last Inspection:	01/27/1997, AAIP	Certified Max Gross Wt.:	73800 lbs
Time Since Last Inspection:	59 Hours	Engines:	4 Reciprocating
Airframe Total Time:	50558 Hours	Engine Manufacturer:	P&W
ELT:	Installed, not activated	Engine Model/Series:	R-2000-7M2
Registered Owner:	ROBERT D. MCSWIGGAN	Rated Power:	1250 hp
Operator:	CUSTOM AIR SERVICE	Operating Certificate(s) Held:	
Operator Does Business As:		Operator Designator Code:	C9QB

## Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Night/Dark
Observation Facility, Elevation:	ATL, 1026 ft msl	Distance from Accident Site:	40 Nautical Miles
Observation Time:	2353 EST	Direction from Accident Site:	180°
Lowest Cloud Condition:	Clear / 0 ft agl	Visibility	10 Miles
Lowest Ceiling:	None / 0 ft agl	Visibility (RVR):	0 ft
Wind Speed/Gusts:	Calm /	Turbulence Type Forecast/Actual:	/
Wind Direction:		Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30 inches Hg	Temperature/Dew Point:	56° C / 37° C
Precipitation and Obscuration:			
Departure Point:	(6A2)	Type of Flight Plan Filed:	IFR
Destination:	AMERICUS, GA (ACJ)	Type of Clearance:	None
Departure Time:	0016 EST	Type of Airspace:	Class G

## Airport Information

Airport:	GRIFFIN-SPALDING COUNTY (6A2)	Runway Surface Type:	Asphalt
Airport Elevation:	958 ft	Runway Surface Condition:	Dry
Runway Used:	14	IFR Approach:	None
Runway Length/Width:	3701 ft / 75 ft	VFR Approach/Landing:	None

## Wreckage and Impact Information

Crew Injuries:	2 Fatal	Aircraft Damage:	Destroyed
Passenger Injuries:	N/A	Aircraft Fire:	On-Ground
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	2 Fatal	Latitude, Longitude:	

## Administrative Information

Investigator In Charge (IIC):	PRESTON E HICKS	Report Date:	04/15/1999
Additional Participating Persons:	PHILLIP POWELL; ATLANTA, GA JAMES A MEDCALF; COLLEGE PARK, GA		
Publish Date:			
Investigation Docket:	NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at <a href="mailto:pubinq@ntsb.gov">pubinq@ntsb.gov</a> , or at 800-877-6799. Dockets released after this date are available at <a href="http://dms.nts.gov/pubdms/">http://dms.nts.gov/pubdms/</a> .		

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).