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Compañía Dominicana de Aviación, Curtiss Commando, C-46A, HI-16, crashed after taking-off from "General Andrews" Aerodrome, Ciudad Trujillo, Dominican Republic on 17 July 1958. Report released by the Directorate General of Civil Aviation, Dominican Republic

Circumstances

Flight 402 departed Ciudad Trujillo on a cargo flight to Miami, Florida, with a crew of 2 aboard and no passengers. Following take-off from Runway 23 and at a height of approximately 150 ft the aircraft fell to the left of the runway, some 300 ft from the centre line and 200 to 300 ft short of the runway end. Both crew members were killed by the impact which occurred at approximately 1016 hours GMT. The aircraft was destroyed by impact and fire.

Investigation and Evidence

The terrain at the site of the accident is covered with low rocks. A wall of cement blocks about 18 inches high marks the boundary of the airport with a private residence. The fuselage, which separated from the tail unit, came to rest in the courtyard of this residence.

The fuselage was split across at the main door. The tail unit came to rest approximately 10 ft away from the main section. The upper part of the rudder was torn off, and a fracture in the lower part of the tail unit was caused by violent collision with the terrain. The front section of the fuselage collided violently with the heap of blocks, which stopped its course and displaced both engines.

The right engine was slightly deflected from its normal position and the propeller hub pointed to the right. Only one blade remained attached; this was in high pitch. Break-off of the other three blades at the barrel guides was caused by stress contrary to propeller rotation. The hub remained intact and in an approximately normal position.

The left engine was torn free on impact, and it was displaced to the left and damaged by impact with the ground. A considerable portion of this engine was destroyed by fire. Two propeller blades remained attached, one apparently fully or nearly fully feathered. The other, which during investigation was found with the leading edge reversed, clearly struck the ground in a normal position and in full operation. As regards the two blades which fell off, one of them left its barrel guide when the latter split violently in consequence of stress contrary to propeller rotation, which shows that the causes were impact with the ground and power of the engine. The other blade left its barrel guide on impact, but there was no split of the guide, and the propeller's electric motor also fell off on impact.

Both left and right elevators were almost intact and normally positioned in relation to the tail unit, with trim tabs about 10° up.

The left mixture selector had been twisted on impact to the auto-lean position. The right one was on auto-rich. Both throttles were set to normal take-off power. The right propeller rpm selector was set to normal take-off position; the left one was one inch lower. The right engine cowl flap control was three-quarters open, the left one closed. Destruction of the rest of the control column prevented any further checking of the various controls.

The landing gear control showed that it was retracted at the time of impact.

The Flight

One hour before take-off the aircraft had been refuelled, and the pre-flight mechanical check as well as a visual inspection had been carried out by the crew.

The weather was as follows:

Ceiling and visibility unlimited; wind calm; temperature 23.2°C; pressure 1017 mb; dewpoint 23°C.

The take-off run was normal. The gear was retracted and the aircraft rose, according to witnesses, to about 150 ft before covering two-thirds of the 7 000 ft runway. It climbed rapidly with both engines operating normally until it reached a height of 150 ft. It is assumed that the port engine failed at this point. The nose went up and the aircraft yawed to port, banking about 30°, and began to lose speed and height. Apparently the crew cut the operative engine, possibly with the intention of effecting an emergency wheels-up landing on the remaining stretch of runway, but almost immediately reapplied full power in both engines, presumably in an attempt to use some remaining power in the failed engine and to continue the flight on one engine. However, as the aircraft continued to lose height it went into a stall and crashed, striking a cement block fence.

Assuming that the pilot employed the optimum technique from the beginning of the take-off run until he reached a height of 150 ft, and taking into account the distance covered on the runway and the height reached, the true airspeed would not be in excess of the minimum speed allowed for flights with one engine operative, even if maximum continuous power were used for climbing to this height. The speed loss caused by engine failure, combined with the minimum speed used in climb, apparently decided the pilot to discontinue the flight and to effect an emergency wheels-up landing on the section of runway still available. This is borne out by the fact that he cut both engines. However, imminent risk of stalling may have caused him to reapply full power in both engines when a faulty reaction in flight characteristics possibly caused him to lose control of the aircraft.

It is quite possible that the low speed involved in the high rate of climb adversely affected the single-engine performance. The destruction caused by impact and fire made it impossible to check the port engine for the cause of failure.

Probable Cause

The accident was originally caused by a mechanical defect in the port engine. The immediate cause may have been that the crew, encountering difficulties, applied an abnormal procedure, apparently attempting an emergency wheels-up landing and immediately thereafter trying to resume normal flight by applying full power to both engines, as there was no sign that either propeller had been feathered.

It is likely that propeller overspeed or excessive decrease in pitch, or difficulties in the attempt to reoperate the defective engine, combined with critical speed at the height reached on take-off, created abnormal flight characteristics which caused the aircraft to stall and crash.

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