Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

AVIATION INVESTIGATION REPORT

A01O0157

ENGINE STOPPAGE ON TAKE-OFF

CESSNA 172N SKYHAWK C-GMHU

TORONTO / BUTTONVILLE MUNICIPAL AIRPORT, ONTARIO,

1.4 NM WNW

17 JUNE 2001

Canada

Aviation Investigation Report

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Summary

The pilot was conducting a visual flight rules local flight from the Toronto / Buttonville Municipal Airport, Ontario. When the aircraft reached about 400 to 500 feet above ground level during the initial climb after take-off from Runway 33, the aircraft engine (Lycoming O-320-H2AD) stopped. The pilot began a forced approach and attempted unsuccessfully to restart the engine. The aircraft struck a treetop and the back of a house and came to rest on the back deck of the house. The aircraft and the house were substantially damaged. The occupants of the house were not injured; however, the pilot received serious, non–life-threatening injuries. The accident occurred at 1952 eastern daylight time during daylight.

Ce rapport est également disponible en français.

Other Factual Information

The accident occurred in visual meteorological conditions. The temperature was 22°C, the dewpoint was 11°C, the wind was 320° true at 8 knots, and visibility was 15 statute miles.

The pilot was properly licensed and qualified for the flight. He obtained his aeroplane private pilot licence in October 1996 and accumulated a total of 220 hours of flight time, all of which were on the aircraft type.

The aircraft was certified, equipped, and maintained in accordance with existing regulations and approved procedures.

During the take-off and the initial climb, the pilot did not observe any abnormalities except that the carburettor heat control knob was slightly extended. He pushed the control knob in and kept his hand on it to ensure that it stayed fully in (OFF). He did not detect any degradation of power before the engine stoppage. During the forced approach, the pilot attempted two engine restarts without success. He then moved the fuel selector to OFF before impact. The aircraft turned left toward a residential area and struck a house approximately 1.4 nautical miles west-northwest of the Toronto / Buttonville Municipal Airport, Ontario. After the aircraft came to rest on the back deck of the house (Figure 1), one of the occupants of the house assisted the pilot in exiting the aircraft. The aircraft windshield broke during the crash, and the pilot exited through the front of the aircraft. Numerous suitable forced landing sites were available off the departure end of Runway 33 had the aircraft continued straight ahead or altered course slightly to the right.

Figure 1 - Aircraft resting on deck

The aircraft was removed from the residential area and examined at the Toronto / Buttonville Municipal Airport. While documenting the aircraft cockpit, it was noted that the fuel selector was OFF. All other controls and switches (mixture, magnetos, and master switch) were in the engine operating position and had not been moved. Damage to the fuel selector mechanism indicated that the fuel selector was OFF at impact. The aircraft fuel tanks were compromised at impact, and an undetermined amount of fuel leaked onto the residential yard. The local fire department responded to the scene, and the fuel remaining in the tanks was captured and contained. The propeller bent rearward when it struck the deck; there was no indication of propeller rotation.

Records indicated that the aircraft departed with ample fuel for the intended flight. There were no indications of contaminated fuel. A preliminary inspection of the engine revealed no mechanical abnormalities. The engine air filter was clean and free of any contamination that could have blocked the airflow to the engine.

The aircraft was secured to attempt an engine start. A fuel supply and an auxiliary power cart were attached to the aircraft, and the engine was started. The engine ran at idle and various power settings for approximately 10 minutes. About 12 seconds after the fuel supply was removed, the engine stopped while at high power. The in-flight loss of engine power could not be explained by any observed engine defect. Considering the phase of flight and the sudden stoppage of the aircraft engine with no prior indications of power degradation, carburettor icing was unlikely a factor in the power loss. The engine magnetos were tested and found to be functional, thereby eliminating the ignition source as a factor in the engine stoppage.

The emergency procedure to be followed in the event of an engine failure immediately after take-off, as stated in the *Cessna Aircraft Information Manual*, is as follows:

1. Airspeed – 65 KIAS (flaps UP), 60 KIAS (flaps DOWN).
2. Mixture – IDLE CUT-OFF.
3. Fuel Selector Valve – OFF.
4. Ignition Switch – OFF.
5. Wing Flaps – AS REQUIRED.
6. Master Switch – OFF.

The pilot's actions after the engine stoppage were to slow the aircraft to between 70 and 75 knots and to turn the fuel selector switch to OFF. He did not attempt to follow the emergency procedure outlined above.

Analysis

The engine operated successfully during the post-accident engine tests; it could not be determined why the engine stopped during the initial climb. The pilot turned the fuel selector OFF before impact; physical damage confirmed that the fuel selector was OFF before impact.

After the engine stopped, directional control of the aircraft was not maintained, and the aircraft turned left and crashed in a residential area. This occurred when the pilot removed his hand from the control column during his attempts to restart the engine. Because of the low altitude at which the engine stopped, the pilot believed that he did not have sufficient time to conduct the appropriate emergency checklist. He concentrated his efforts on restarting the engine to the detriment of maintaining aircraft control, completing the appropriate checklist items, and conducting an effective forced approach and landing.

Findings as to Causes and Contributing Factors

2. It was not determined why the aircraft engine stopped during the initial climb after take-off. The engine operated successfully during the engine tests, and no mechanical abnormalities were noted.

3. The pilot did not complete the appropriate emergency checklist, but concentrated instead on attempting to restart the engine. Directional control of the aircraft was not maintained during the forced approach, and the aircraft proceeded toward and crashed in a residential area.

Other Findings

1. Power did not degrade before the aircraft engine stoppage; carburettor icing was therefore likely not a factor in the occurrence.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 28 March 2002.