

ACCIDENT

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| Aircraft Type and Registration: | Piper PA-34-200T Seneca II, G-BPXX | |
| No & Type of Engines: | 2 Continental Motors Corp TSIO-360-EB piston engines | |
| Year of Manufacture: | 1979 (Serial no: 34-7970069) | |
| Date & Time (UTC): | 13 October 2017 at 0800 hrs | |
| Location: | Sherburn-in-Elmet Aerodrome, West Yorkshire | |
| Type of Flight: | Private | |
| Persons on Board: | Crew - 1 | Passengers - 2 |
| Injuries: | Crew - None | Passengers - None |
| Nature of Damage: | Damaged beyond economic repair | |
| Commander's Licence: | Private Pilot's Licence | |
| Commander's Age: | 65 years | |
| Commander's Flying Experience: | 3,036 hours (of which 1,442 were on type) Last 90 days - 50 hours Last 28 days - 14 hours | |
| Information Source: | Aircraft Accident Report Form submitted by the pilot | |

Synopsis

The pilot rejected the takeoff after encountering resistance when trying to move the control column to initiate rotation. Despite maximum braking, the aircraft overran the asphalt runway and traversed a level grass area before the left main landing gear collapsed while crossing a patch of rough ground. All three occupants escaped uninjured after the aircraft stopped against a hedge.

History of the flight

At 70 kt IAS during the takeoff roll on Runway 28, the pilot applied rearwards pressure to the control column but the aircraft did not rotate as expected. At 80 kt IAS, he applied increased pressure but the aircraft still did not respond, so he selected idle power and depressed the toe brakes. He later estimated that the IAS was close to 90 kt when he started to reject his attempted takeoff.

Despite application of maximum braking, the aircraft overran the runway and then ran across approximately 200 m of short grass before encountering a patch of rough ground, where the left main landing gear collapsed. The aircraft continued moving over a disused area of concrete and the pilot kept it straight with continued, full application of the right brake pedal. It eventually came to a halt, after impacting a hedge at an estimated groundspeed of two or three knots, and the three occupants exited without injury.

After the accident the pilot photographed tyre marks left by the mainwheels on the asphalt runway during braking. These marks began approximately 100 m prior to the end of the runway and indicate that the aircraft remained on the centreline until it departed the paved surface. The pilot had earlier calculated that the factored¹ takeoff ground roll required for the aircraft, which was at maximum takeoff weight, was 600 m while the takeoff run available was 799 m.

Pilot's assessment

From experience, the pilot estimated that in similar circumstances his aircraft normally rotated after a ground run of approximately 500 m. He believed that 4-5 seconds elapsed after his initial attempt to rotate until he first acted to reject the takeoff and that he had pulled the throttle levers back and was applying brake pressure with 120 m of runway remaining.

The pilot concluded that, as this was an operation from an unbalanced runway, he should have rejected the takeoff attempt immediately he realised the control response was not normal. By allowing the aircraft to continue to accelerate, and then making a further attempt to rotate, the available stopping distance was substantially reduced.

When the pilot examined the aircraft he found that the stabilator trim tab was at the fully nose-down position but the cockpit indication suggested it was positioned slightly nose-up, as required for takeoff. However, for his pre-flight external checks the pilot had set the indicator to the takeoff position and then verified that the tab was positioned appropriately. He then recalled that, after getting into the aircraft and commencing his internal preparations, he had noticed his front seat passenger, who is also a pilot qualified on-type, exercising the trim wheel fully in both directions. He had not seen any reason to challenge the passenger at the time and had, before departure, verified that the trim indicator was at the desired takeoff position. He concluded that the mis-positioned trim tab was the cause of the unexpected resistance he encountered when he applied rearwards pressure to the control column.

Engineering inspection

A subsequent inspection by an aircraft engineer confirmed that the trim tab position indicator was de-synchronised from the trim tab position and, with a neutral position indicated, the tab was at or near to the maximum nose-down deflection. The engineer suspected that, for a reason he could not identify, the trim indicator needle had become de-synchronised from the actuator when the trim wheel had been exercised quickly through its entire range. He stated that he had occasionally seen this happen previously to other aircraft types made by the same manufacturer and noted that in the PA-34 it is difficult to view the achieved trim tab position from the cockpit.

Footnote

¹ Aircraft Flight Manuals typically contain Net Performance data and the CAA strongly recommend that appropriate Public Transport factors are applied to take account of: lack of pilot practice, aeroplane/engine wear and tear, less than favourable conditions, and use of incorrect speeds/techniques.