

Piper PA-34-200T Seneca II, G-BLWD

AAIB Bulletin No: 3/2003	Ref: EW/G2002/09/04	Category: 1.3
Aircraft Type and Registration:	Piper PA-34-200T Seneca II, G-BLWD	
No & Type of Engines:	2 Continental Motors TSIO-360-EB piston engines	
Year of Manufacture:	1980	
Date & Time (UTC):	8 September 2002 at 0848 hrs	
Location:	Elstree Aerodrome, Herts	
Type of Flight:	Private	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Right main landing gear fractured, left main landing gear and nose landing gear damaged. Damage to the right wing and underside of the aircraft.	
Commander's Licence:	Basic Commercial Pilots Licence	
Commander's Age:	63 years	
Commander's Flying Experience:	8,643 hours (of which 41 were on type) Last 90 days - 114 hours Last 28 days - 27 hours	
Information Source:	AAIB Field Investigation.	

Synopsis

A flapless approach was being carried out to Runway 26 at Elstree aerodrome. The aircraft touched down approximately 80 metres short of the runway threshold and, upon landing the right main landing gear (MLG) fork assembly fractured at the axle. Shortly after this the nose landing gear collapsed. After travelling approximately 90 metres beyond the runway threshold the left main landing gear collapsed and the aircraft slewed off the runway. The pilots shutdown the aircraft and

evacuated it unhurt. The right main landing gear failure was due to overload in bending. No pre-existing defects were identified and the fork assembly material was within the manufacturers specification.

History of Flight

The intent of the flight was a dual check ride, with an examining instructor from the local flying club at Elstree. The flight departed to the local area to carry out various upper air exercises and, on return to Elstree, a normal touch and go circuit was carried out to runway 26. The next approach was to be flapless with a touch and go landing on the same runway and, during the downwind leg of the circuit, three green down and locked lights for the landing gear were verified by the pilot and called to the tower. A left base and final approach were flown during which the approach speed was adjusted to 90 kt. The aircraft, however, touched down short of the runway threshold on a paved, but untended, area. This area consisted of a rough concrete surface, marked with a white cross, and it adjoined the first section of runway tarmac some 80 metres before the 26 threshold. This threshold is at the top of an upslope rising from the untended area.

Upon landing the right MLG failed, with a fracture occurring to the fork assembly at the wheel axle. The right main wheel was released from the landing gear and struck the right flap. The nose landing gear then collapsed, causing both the right and left propellers to strike the runway, as the aircraft continued along the runway centre line. The instructor took control but the left gear then collapsed and, at this point, the aircraft slewed to the right and left the runway. During the ground slide, the fuel drain valves, which were of the type which protrude below the wing surface, had been damaged so that fuel was leaking around the aircraft after it came to rest. There was no fire. The pilots, who were wearing lap strap and diagonal harnesses and were unhurt, shut down and exited the aircraft without incident. The airfield rescue vehicle was on site within 2 minutes of the accident.

Witnesses to the accident confirmed that the landing gear was down prior to the landing and that the landing was short of the runway threshold. One eye witness, an airfield worker, who could clearly see the final approach path to Runway 26, noticed the aircraft approach and assessed it to be flying low and fast. This caused the him enough concern to prepare the rescue vehicle.

Runway Examination

The AAIB carried out an examination of the ground marks and these were clearly visible some time after the accident. The area where the aircraft came to rest was also clearly marked by browning of the grass due to the fuel that had leaked from the fuel drains. The first mark positively identified as having been made by this aircraft was some 80 metres short of the threshold of runway 26. Just prior to this ground mark there was a large section of tarmac missing, leaving a hole some 23 cm wide, 14 cm in length and about 3-4 cm deep. This first mark was a straight line, and was consistent with ground contact of the right MLG fork assembly following loss of the MLG wheel. Close to the start of this mark was another indicating where the right MLG door had been ripped off by ground contact. Some 6 metres further on the right propeller blades had contacted the ground and, after another 8 metres, there were similar strikes produced by the left propeller indicating the point at which the nose landing gear had collapsed. Marks on the runway continued for approximately another 20 metres, after which a scar was evident where the right wing tip had made contact with the ground. The aircraft had then continued to travel along the runway supported by two of the right propeller blades and the left main gear. Some 94 metres from the runway threshold the aircraft had

veered to the right, with the left tyre leaving a skid mark, before the left MLG collapsed. The aircraft then left the runway to the right and came to a halt.

Aircraft examination

The landing gear was examined and all damage seen was consistent with overloads generated during the accident sequence. The right main landing gear was found fractured at the point where the axle attaches to the fork assembly. The right flap, which was retracted, had been damaged just aft of the right MLG leg, which was consistent with the wheel striking the flap after becoming detached. There was extensive damage to the lock link assembly for the right MLG. This assembly, which locks the gear down, was over centre and locked, and the landing gear actuator was found at maximum stroke (gear down position). The left main landing gear was intact but was not found in the locked down position. However, there was extensive damage to the lock link assembly mechanism and the landing gear actuator was also found at maximum stroke. The eye-end bearing, installed in the end of the actuator rod at the lock link, had fractured from an overload in bending.

The nose landing gear was found retracted in the bay. One door had been torn off during the accident and the remaining door was extensively damaged with bent door control rods. The nose landing gear actuator was found at maximum stroke for gear down, but the actuator rod was bent through 90°.

The right MLG wheel and fork assembly were metallurgically examined and this revealed that the fork assembly had failed in overload due to bending. There were no pre-existing defects, fatigue cracks, corrosion or other material defects identified, which could have influenced the failure. The remainder of the fork assembly was subject to material tests and was found to conform mechanically and chemically to the specifications for 2014-T6, the specified material for this component.

In May 1999, this aircraft was involved in another landing accident in which the nose landing gear collapsed. As there were no pre-existing defects identified with the right MLG it was not thought this previous event was a factor in this accident.