

Aircraft Type and Registration:	Piper PA-34-200T Seneca, G-BHYG	
No & Type of Engines:	2 Continental Motors TSIO-360-EB piston engines	
Year of Manufacture:	1980	
Date & Time (UTC):	11 February 2005 at 0747 hrs	
Location:	1.5 miles north-east of Oxford (Kidlington) Airport, Oxon	
Type of Flight:	Training	
Persons on Board:	Crew - 3	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Front baggage bay door detached, damage to left propeller	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	49 years	
Commander's Flying Experience:	3,600 hours (200 hours on type) Last 90 days - 70 hours Last 28 days - 30 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

History of the flight

The flight was intended to be an IFR training detail, with a scheduled departure time of 0740. The crew comprised the instructor and student flying, plus a supernumerary student, who was to perform the Check 'A' (daily) inspection and accompany them on the flight.

The instructor arrived at the airport at 0655 hrs and was checking the weather shortly after 0700 hrs, when he met the crew outside the flying training organisation's Operations Room. No aircraft had yet been allocated to them and so the Check 'A' was already well behind schedule. The instructor directed the students to ask for an aircraft to be allocated and suggested that if they divided the tasks between them, they could still achieve the scheduled 0800 hrs ILS slot at Cranfield, even if they were late departing from Kidlington, but that they should aim to minimise the overrun of the 0740 hrs IFR take-off slot.

The supernumerary student went ahead to begin the Check 'A' inspection, with the instructor and student flying following soon after. He was familiar with the aircraft type, having flown it during his training and was well-versed in the Check 'A' procedures.

The student flying mentioned in conversation to the instructor that the supernumerary had not gone to bed until after 0030 hrs, having collected someone from a delayed flight at London Heathrow Airport. On approaching the flight line, the instructor noticed that the supernumerary appeared to be removing the cover from the wrong aircraft and pointed this out to him. The crew then repositioned to the correct aircraft. The instructor directed the student flying to board the aircraft and carry out the initial Check 'A' actions, with the supernumerary checking the lights and pitot heaters, whilst he checked the fuel quantity and fuel drains. He then called for the battery master and magneto switches to be checked and they were confirmed to be off by the student flying. The instructor told the supernumerary student to proceed with the airframe check whilst he checked the engine oils, whilst the student flying remained in the cockpit and commenced what preparation he could for the flight, whilst ensuring that battery master switch remained off.

The oil level in both engines was below six quarts and so the instructor left the apron to collect two quarts of oil to top-up the engines. This took some time, as the oil store was locked and he had to seek assistance from a bowser driver. When he returned to the aircraft, he established that the supernumerary student had completed the Check 'A' and sought his assistance in topping up the engine oils.

The engines were started at 0736 hrs and the student flying completed the 'After Start' and 'Taxi' checks whilst the instructor taxied the aircraft to the holding point. Take-off clearance was given at 0743 hrs, with a recorded take-off time of 0747 hrs. Runway 01 was used for departure.

The take-off roll was normal, however shortly after lifting off, the nose baggage bay door, which is on the left side of the aircraft, came fully open. The instructor, seated in the right-hand seat, had a clear view of the door and noted that the handle was in the vertical (unlatched) position. He took control of the aircraft and asked the student to remove the instrument flying screens, before contacting ATC to request a circuit to land. The door then slammed shut and open several times, before becoming partially detached and flailing around in front of the student in the left-hand seat. It finally detached and the instructor contacted ATC, declaring a PAN. The aircraft was landed safely.

Damage to aircraft

On inspection, the left propeller was found to be badly damaged, having struck the departing door and the door seal was wrapped around the OAT probe. The remains of the door were recovered from a nearby golf course (Figure 1), with the latch spring still attached, but the lock, shoot bolts and other

latch components were missing, these probably having been knocked off on contact with the propeller. According to the engineer who inspected the aircraft, there was no evidence of distress to the door frame or the latch components on the aircraft. Following the incident, the nose baggage bay door key, with its high-visibility fob, was found inside the aircraft where it is normally stowed.

Nose baggage bay door information

The upward-opening door is constructed of fibreglass and is latched and unlatched via an external rotary handle mounted in a recess in the door. The door is latched by rotating the handle from the vertical to the horizontal position. This causes two shoot bolts to extend on either side of the door and drives a hook to engage with a latch on the door frame. The mechanism is held in the closed position by spring tension. The centre of gravity of the door is located outboard of the hinge line, so that the door naturally falls shut and it is possible for the door to sit flush with the fuselage even with the handle in the unlatched position, so that at a glance, it appears to be latched.

A lock positioned adjacent to the rotary handle enables the door to be locked when it is latched. Mechanical interlocks ensure that the key can only be removed when in the locked position and that the key will only achieve the locked position if the latch is closed. Service experience shows however, that the lock and key can wear to the extent that it becomes possible to withdraw the key with the latch in the open position.

Access is required to the nose baggage bay when carrying out the Check 'A' to inspect the brake fluid and windscreen de-icing reservoirs that are located inside the bay.

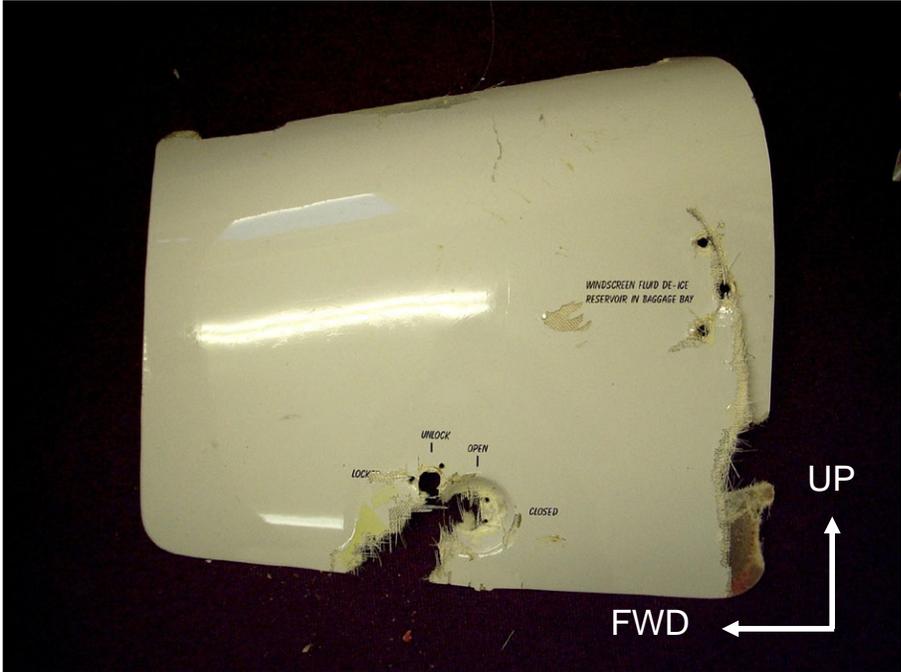
Discussion

Given that the instructor saw the handle in the unlatched position when the door came open in flight, and the lack of distress to the door frame or latch components on the aircraft, it is probable that the door was not latched prior to flight. This implies that it must have been possible to either withdraw the key from the lock with it in the unlocked position, or that it was possible to turn the key to the locked position, with the door handle in the unlatched position. However, as the lock was not recovered, it was not possible to confirm either scenario.

Possible contributory factors were the time pressure on the crew to make the takeoff and ILS slots and fatigue on the part of the supernumerary crew, who may have had insufficient rest the night before.

The operator is modifying its PA-34 fleet to paint more visible alignment marks adjacent to the door handle, to make it easier to confirm that the door is latched. The fleet is also to be inspected for

proper functioning of the nose baggage bay door key/latch interlock function. The operator's PA-34 maintenance schedule will also be expanded to include this as a recurring inspection on the '100-hour' Check. A communication has already been issued to all instructors and students within the flying training organisation to make them aware of the implications of lock/key wear and the need to confirm that the nose baggage bay door is correctly latched prior to flight.



Damaged Nose Baggage Bay Door

Figure 1