

OWING TO AN ADMINISTRATIVE ERROR
THIS REPORT WAS OMITTED FROM BULLETIN 12/89

No: 4/91

Ref: EW/G89/08/12

Category: 1c

Aircraft Type and Registration: Piper PA-34-200-2 Seneca, G-BACB

No & Type of Engines: 2 Lycoming IO-360-C1E6 piston engines

Year of Manufacture: 1972

Date and Time (UTC): 17 August 1989 at 0938 hrs

Location: Stansted Airport, Essex

Type of Flight: Private (training)

Persons on Board: Crew - 3 Passengers - None

Injuries: Crew - None Passengers - N/A

Nature of Damage: Left main landing gear, left wing and left propeller damaged

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: 40 years

Commander's Total Flying Experience: 4,504 hours (of which 266 were on type)

Information Source: Aircraft Accident Report Form submitted by the pilot and AAIB telephone inquiries and aircraft examination.

The aircraft had been used predominantly for aircrew training. It was engaged in a practice ILS approach to Runway 23 at Stansted Airport. On board were the commander, together with a student pilot who was a Canadian ATPL holder, and a supernumary crew member who was a PPL holder. The approach was flown down to the Decision Height of 270 feet agl by the student from the left pilot's seat, at which point the commander in the right pilot's seat took control for a landing. The commander confirmed that the three green landing gear down and locked indicator lights were illuminated before touchdown. The reported wind was from 240° Magnetic at 10 kt gusting to 17 kt. Cloud was reported as one okta at 1800 feet, and visibility as 40 km.

Touchdown was gentle, but the aircraft immediately settled into an abnormal left wing low attitude. Full right aileron and rudder were applied but the aircraft started to veer to the left. Flaps were raised and right wheel braking applied but the veer to the left continued and the left wing dropped further. As it was clear that directional control had been lost, the commander feathered both propellers, selected

both engine fuel cocks to closed and instructed the student to select the magneto and battery switches off. The aircraft departed the runway at approximately right angles to the runway heading, with the left wing on, or near the ground, and almost immediately came to a halt on the grass. The occupants vacated the aircraft without difficulty, uninjured.

Inspection of the aircraft revealed that a swivel pin (or stud bearing) forming part of the left main landing gear truss assembly (or side stay) had failed (see fig. 1). The truss assembly, consisting of two overcentre links, was intended to hold the landing gear leg in the downlock position by bracing the leg to a truss assembly support bracket bolted to the forward spar. The swivel pin formed the attachment between the truss and the bracket. To cater for landing gear retraction, the swivel pin was allowed to pivot in a boss formed on the bracket and was retained by a castellated nut secured with a roll pin. A steel bush was fitted in the bore of the boss and a plain washer was fitted on either side. The boss incorporated a lubricator fitting (grease nipple). The bracket, with swivel pin fitted, was listed in the Piper Parts Catalogue as a single item, Part No. 95643-06 for the left main landing gear and Part No. 95643-07 for the right gear. Similar components are used on the Piper PA-28R and PA-32R models.

The swivel pin had fractured at the point where a blending radius under the head joined the shank, corresponding approximately to the assembled position of the edge of the bracket bush. The surface of the shank normally in contact with the bush was heavily pitted. Metallurgical examination indicated that the fracture had resulted from fatigue. A multi-origin fatigue crack had grown from the inboard and outboard edges of the shank (as installed) to form two crescent shaped cracks extending across approximately 25% of the cross-sectional area of the shank. The remaining 50% of the section had failed in fast fracture fatigue, over a few cycles. Markings indicated that the primary cracks had originated from corrosion pits in the surface of the shank, and had grown over a large number of cycles. Insufficient evidence was available to enable the number to be quantified, or to establish the events that had constituted a cycle.

The maintainer undertook an inspection of the swivel pin from the right main landing gear and assessed that this was cracked on both sides, in similar positions to the failed pin from the left gear. Detailed metallurgical examination confirmed the presence of two large cracks.

The aircraft had accumulated 3895 flying hours since new, and records did not indicate that either swivel pin or truss assembly support bracket had been replaced in this time. The number of landings made by the aircraft was not recorded. The Piper Service Manual schedules lubrication of the swivel fitting at 100 hour intervals, but the landing gear was maintained 'On Condition' and there is no requirement for inspection of the fitting. It has been recommended to the Civil Aviation Authority that consideration be given to requiring a periodic check of the swivel pin. It is estimated that such a check should require approximately 2 man-hours per aircraft.

