

**AAIB Bulletin No: 6/94**

**Ref: EW/G94/04/09**

**Category: 1.3**

**Aircraft Type and Registration:** Piper PA-34-200T Seneca II, G-BEVG

**No & Type of Engines:** 2 Continental TSIO-360-E piston engine

**Year of Manufacture:** 1975

**Date & Time (UTC):** 10 April 1994 at 1635 hrs

**Location:** Near Bournemouth Airport, Dorset

**Type of Flight:** Private

**Persons on Board:** Crew - 1                      Passengers - 1

**Injuries:** Crew - None                      Passengers - None

**Nature of Damage:** Port engine and adjacent airframe damaged

**Commander's Licence:** Commercial Pilot's Licence with Instrument and Flying Instructor ratings

**Commander's Age:** 46 years

**Commander's Flying Experience:** 2,750 hours (of which 620 were on type)  
Last 90 days - 50 hours  
Last 28 days - 25 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot and failed cylinder head viewed by the AAIB

The first twenty minutes of an Instrument Rating training flight had gone without incident. At approximately 4 miles from touchdown, the power was reduced to maintain the glideslope and shortly afterwards the left RPM gauge started to fluctuate with significant variations in thrust from the engine. Following flight manual procedures the fuel pump was turned on for the left engine and this led to a temporary improvement in performance, however, within 30 seconds to one minute, smoke was seen issuing from the engine, but there were no other indications of a problem. The instructor took control at this stage and immediately shut down the left engine which appeared to extinguish the fire in about two minutes. A non-eventful single-engined landing was carried out and the aircraft shut down prior to being towed back.

On subsequent examination it was clear that an outboard cylinder head on the left engine had come away from the cylinder (this was not visible from the cockpit), and in doing so had ruptured the fuel line, thereby causing rough running and a rapidly developing fuel fed fire when the boost pump was

turned on. It was noted that within a short period the fire had spread to a position close to the nacelle fuel tank behind the engine. The cylinder head fracture surfaces had been degraded by torching and were therefore not subjected to metallurgical examination.

Several additional factors were quoted as being relevant to this accident:

At the last engine overhaul re-conditioned parts, including the cylinder head, had been fitted.

Since that time the aircraft had been generally subject to high usage with a large variety of experience amongst the pilots.

The aircraft has an amber warning light for overboosting situated high up under coaming; this may be difficult to see if the pilot is tall, or if the sun is behind you.

SDAU statistics for 'Cylinder and Cylinder Head' failures of Lycoming and Continental engines reported as occurrences were examined for the last 18 years, these showed a significant increase in the number of failures over the last five years, particularly amongst Lycoming engines. However there was insufficient data to determine whether this trend was in part due to better reporting or other non-operational factors, and the failure figures could not be converted to a rate to allow a satisfactory comparison over the time period.