

INCIDENT

Aircraft Type and Registration:	Piper PA-31-350 Navajo Chieftan, G-STHA
No & Type of Engines:	2 Lycoming LTIO-540-J2BD piston engines
Year of Manufacture:	1980 (Serial no: 31-8052077)
Date & Time (UTC):	19 November 2013 at 0645 hrs
Location:	Vicinity of Luton Airport
Type of Flight:	Commercial Air Transport (Cargo)
Persons on Board:	Crew - 2 Passengers - None
Injuries:	Crew - None Passengers - N/A
Nature of Damage:	Engine and cowling damaged extensively
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	59 years
Commander's Flying Experience:	4,950 hours (of which 600 were on type) Last 90 days - 30 hours Last 28 days - 5 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB

Synopsis

During cruise at FL80, the left engine suffered a mechanical failure. The crew shut down the engine and feathered the propeller but were unable to maintain altitude. An emergency landing was completed at Luton Airport without further incident. Inspection found the No.2 cylinder assembly of the left engine had detached from the crankcase due to an internal failure. At the time of writing a detailed examination of the engine had not taken place, so it is not possible to draw any firm conclusions as to the cause of the failure.

History of the flight

The aircraft was routing from Southend Airport to Oxford Airport at FL80. Without warning, the crew felt a large 'thump' and the aircraft yawed to the left and began to lose altitude. The crew identified that the left engine had failed and could see its top cowling had been buckled upwards. After shutting down the engine and feathering the propeller, they declared a MAYDAY with London Radar. They were still unable to maintain altitude and reported that it was difficult to maintain directional control. The crew were transferred to Luton Radar and were given vectors for Runway 26 at Luton Airport, where they landed without further incident.

Aircraft examination

A preliminary examination of the aircraft revealed that the No.2 piston and cylinder assembly on the left engine had detached from the crankcase, but had remained attached to the

aircraft by the spark plug ignition leads. The cowlings had been disrupted and pushed apart (Figure 1).



Figure 1

Disruption to left engine cowlings and No.2 cylinder detached from crankcase

Engine examination

The engine was removed by the operator and a limited inspection carried out. This indicated that the failure of the No. 2 piston and cylinder assembly had initiated internally and that the engine had continued to operate for a period of time prior to the cylinder detaching. There were indications that this cylinder had been operating at a higher than normal temperature. The No. 3 cylinder was removed and its piston showed distress marks consistent with an engine that had been unused for long periods, allowing oil to drain from the surface of the cylinder.

Engine history

Following an overhaul in February 2011, the left engine was refitted to the aircraft in March 2011. Between 12 October 2012 and 28 January 2013, the aircraft was stored at Lydd Airport and an annual inspection was completed at the end of this period. The aircraft was removed from service for a maintenance check between 31 July 2013 and 08 October 2013, where inspections included cylinder compression checks and checking the oil filters were free from debris. All engine flexible hoses were replaced at this time. The aircraft flew for a total of 80 hours in 2011, 52 in 2012 and 92 in 2013.

Discussion

The detachment of the No.2 cylinder from the crankcase disrupted the engine cowlings to a large extent. This would have caused considerably more drag and would account for the aircraft being unable to maintain altitude. The crew were able to maintain control and perform a safe landing at Luton Airport.

At the time of writing a detailed examination of the engine had not taken place, so it is not possible to draw any firm conclusions as to the cause of the failure. If any further information becomes available it will be reported as an addendum to this report.

Since the overhauled engine was refitted to the aircraft in February 2011, the aircraft history showed that the aircraft had a low utilisation and had been parked for extended periods of time. Some internal distress marks were visible in the engine that could be attributed to sporadic use.

Lycoming Service Letter L180B contains useful information on engine preservation for active and stored aircraft:

<http://www.lycoming.com/Lycoming/SUPPORT/TechnicalPublications/ServiceLetters.aspx>