SERIOUS INCIDENT

Aircraft Type and Registration:	Cessna 172M Skyhawk, G-ECON
No & Type of Engines:	1 Thielert TAE 125-01 piston engine
Year of Manufacture:	1975
Date & Time (UTC):	10 December 2009 at 1605 hrs
Location:	Bournemouth Airport
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 2
Injuries:	Crew - None Passengers - None
Nature of Damage:	Left wheel spat, hub and brake disc damaged
Commander's Licence:	Private Pilot's Licence
Commander's Age:	70 years
Commander's Flying Experience:	132 hours (of which 3 were on type) Last 90 days - 5 hours Last 28 days - 1 hour
Information Source:	Aircraft Accident Report Form submitted by the pilot and enquiries by the AAIB

Synopsis

During the landing roll the hub on the left wheel came apart, allowing the outer section of the wheel hub, the tyre and inner tube to depart the aircraft. Four of the six bolts that clamp both parts of the hub together had wound out of their locating holes in the inner section of the hub. The first two to three threads in the remaining two holes in the inner section of the hub had been stripped.

History of the flight

The pilot and two passengers had flown from Bournemouth to Dunkeswell and the incident occurred on the return flight to Bournemouth. The pilot found nothing unusual with the aircraft during the pre-flight inspection at Dunkeswell and the aircraft handled normally during the taxi to the runway. However during the takeoff run the pilot felt a bump, which he described as feeling as if one of the wheels had hit a pothole. Once airborne, the pilot and front seat passenger visually checked the mainwheels and spats, which appeared normal. The aircraft made a normal touchdown at Bournemouth, but after travelling approximately 200 m along the runway, there was a loud noise. The passenger in the rear seat then informed the pilot that the left mainwheel had departed the aircraft.

Debris found at Dunkeswell

The following morning a pilot lining up on Runway 05

at Dunkeswell informed the Air/Ground operator that there were pieces of fibreglass on the runway. These were later established as coming from the outboard section of a wheel spat, which had the same paint scheme as G-ECON. The airfield operator recovered the items and later informed the AAIB that the runway was in good condition, with no potholes.

Aircraft damage

The inner section of the wheel hub and the wheel bearing assembly had remained correctly attached to the axle by its retaining nut, but the outer section of the wheel hub, the tyre and inflated inner tube had departed the axle. The wheel spat had also broken away, in one piece, from its mounts on the landing gear and was found lying near the aircraft. Apart from some rubbing marks on the outer sidewall, the tyre was in good condition. The bottom of the inner wheel hub and brake disc had been abraded and slightly distorted as a result of rubbing along the surface of the runway.

Four of the six bolts which clamp the two parts of the hub together were recovered. The threads on all four bolts were found to be intact and undamaged. On one of the bolts the last two threads were found to contain sections of thread which had been pulled out of the holes in the inner section of the hub. Of the six threaded holes in the inner section of the hub, four were relatively undamaged and the first two to three threads had been stripped in the remaining two holes.

Maintenance

The hub was last assembled when the tyre was fitted on 10 July 2009, approximately 71 flying hours prior to the incident. The bolts clamping both parts of the hub together are required to be torqued to 190 to 200 lb-in; no locking compound or physical locking devices are used on the bolts. The wheels were last visually inspected, with the spats fitted, by the same maintenance organisation that had fitted the tyre, during the 50-hour inspection on 13 November 2009, approximately 19 flying hours before the incident.

Discussion

The condition of the bolts and threads in the inner hub suggests that either the bolts were not fitted correctly, or the torque on all the bolts released and vibration caused them to unwind until there were only two to three threads on two of the bolts clamping the hub together. G-ECON has a very distinctive colour scheme and it is highly likely that the pieces of wheel spat found at Dunkeswell came from this aircraft. This evidence is consistent with the pilot's account of feeling a bump through the landing gear during the takeoff run, which was probably the point at which the left wheel hub started to come apart. The pilot commented that it was difficult to inspect the wheels with the spats fitted (Figure 1).

Figure 1
G-ECON