ACCIDENT

Aircraft Type and Registration:	Piper PA-28R-180 Cherokee Arrow, G-AVWN
No & Type of Engines:	1 Lycoming IO-360-B1E piston engine
Year of Manufacture:	1967
Date & Time (UTC):	30 August 2008 at 1320 hrs
Location:	On mudflats near Topsham, Devon
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 2
Injuries:	Crew - None Passengers - None
Nature of Damage:	Wings extensively damaged, landing gear detached, propeller bent, engine shock loaded
Commander's Licence:	Private Pilot's Licence
Commander's Age:	51 years
Commander's Flying Experience:	798 hours (of which 447 were on type) Last 90 days - 23 hours Last 28 days - 7 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and telephone enquiries by the AAIB

Synopsis

Whilst in the cruise at Flight level (FL) 55, the engine lost power and a forced landing in a field was required. A late sighting of power lines in the chosen field required a rapid change to a field which was traversed by drainage ditches. The aircraft struck one of these, incurring major damage.

History of the flight

The aircraft was returning to Jersey from Caernarfon airport, having flown there with two passengers earlier in the day. The passengers had not flown in a light aircraft before so the pilot had briefed them on the emergency procedures, including the procedure to be followed in the event of ditching. Prior to takeoff, he had refuelled with 53 litres of fuel, with 30 litres being put into the right tank and the remainder in the left giving a total, the pilot recalled, of 130 litres on board. He also performed what he terms "an abbreviated Check A" including fuel contents check and a fuel sample. During the takeoff and the initial part of the cruise, all engine indications were normal and the aircraft was performing normally.

The pilot later stated that, in flight, he had followed his normal policy of avoiding changing tanks over water. He had therefore been running on the right tank but

had changed to the left tank during a 'FREDA' check about 10 minutes before the incident. His procedure was to select the electric fuel pump ON, look at the selector, make the selection and then switch off the pump.

The aircraft was cruising at FL55, having passed Exeter, when the engine "surged" slightly, followed about 5 seconds later by a series of more dramatic surges. Placing the propeller lever to fully fine and switching the electric pump ON, the pilot suspected that he may have lost control of the propeller and requested radar vectors for a precautionary landing at Exeter Airport. The surging stopped and the engine appeared to continue running, albeit at much reduced power. The pilot realised that he was going to be unable to reach Exeter, and so trimmed the aircraft to best glide speed and briefed his passengers for a forced landing. He then informed Exeter ATC that he was going to have to land in a field and was directed towards the Exe estuary where suitable fields would be found. The pilot selected a field but, as he got closer, he saw power cables running across it so he lowered the nose to increase airspeed and turned left towards a field which he could see was divided by drainage ditches. He had intended to land wheels-up but believes that the automatic override may have operated to extend them at least partially. The impact and deceleration were comparatively gentle and the aircraft slid across one drainage ditch and came to rest on the edge of another, close to a herd of cows which dispersed rapidly. All three landing gears had been torn from the aircraft; the main gears at least had clearly detached upon impact with the first drain.

The pilot admits he had omitted to shut down the engine just before impact but there was no fire and the three occupants evacuated normally and without injury. He transmitted a message informing Exeter ATC that he had landed and was evacuating before he shut off fuel and electrical power. After checking that his passengers were all right he returned to retrieve his personal locator beacon and hand-held radio. As he was about to establish contact with Exeter again, a police helicopter arrived.

Analysis

The team from a nearby maintenance organisation who were tasked with recovering the aircraft reported that the left fuel tank was nearly full but the right tank was virtually empty – less than a litre being recovered and with no leaks evident. In a detailed written analysis of the events the pilot is at a loss to explain this and questions whether it was the initial reason that the engine lost power. As far as he was concerned, the aircraft was flying on the left tank when the power loss occurred and he only selected the right tank in an attempt to recover the situation. He also believes that the engine did not stop but rather lost power. He raised the possibility that the initial cause of the surging may have been a propeller control unit malfunction, as he at first believed, but in switching to the right tank as a diagnostic action, he may have been responsible for the engine failing. He observed that he had no experience of a windmilling engine and did not know whether he could tell the difference between that and an engine turning under low power. In either event, he considered that the right tank should still have held 10-20 minutes of fuel and was not empty.

He admitted that he did not check the engine or fuel gauges during the emergency and candidly suggested that, despite performing practice forced landings regularly, when the emergency was real, apart from concern for his passengers' welfare he found his attention almost entirely focussed outside the cockpit

and on handling the aircraft. He also commented that the 'constant aspect' method of judging forced landings had worked well for him and he was confident that, had it not been for the power cables, the landing would have been entirely successful.