Auster 5J4/100, G-AIJT

AAIB Bulletin No: 12/2004	Ref: EW/G2004/07/01	Category: 1.3
Aircraft Type and Registration:	Auster 5J4/100, G-AIJT	
No & Type of Engines:	1 Continental Motors Corp O-200-A piston engine	
Year of Manufacture:	1946	
Date & Time (UTC):	3 July 2004 at 1900 hrs	
Location:	Whiterashes Airfield, 6nm north of Aberdeen (Dyce) Airport, Scotland	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to left main landing gear, right wing and propeller	
Commander's Licence:	Air Transport Pilot's Licence	
Commander's Age:	35 years	
Commander's Flying Experience:	3,737 hours (of which 456 were on type)	
	Last 90 days - 94 hours	
	Last 28 days - 48 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

History of the flight

The flight had originated at Longside Airfield, which is approximately 20 nm from Whiterashes Airfield. The routine weather observation made at 1750 hrs at Aberdeen (Dyce) Airport, 6 nm to the south of Whiterashes, was: surface wind from 310°(M) at 7 kt, visibility 20 km, no significant weather, scattered cumulo-nimbus at 2,000 feet and scattered cloud at 4,000 feet. The temperature was +14°C and the dew point was +11°C.

Whiterashes Airfield is configured with two grass runways, orientated north-south and east-west. The pilot completed two touch and go landings on the northerly runway before clearing the circuit area to the north east, climbing to 1,000 feet agl, intending to return to the circuit for a landing on the westerly runway. Up to this stage of the flight the engine had been fed from the auxiliary fuel tank and the pilot was aware that the contents of this tank were now low. Hearing the engine start to misfire, the pilot immediately selected the main fuel tank to ON, but the engine continued to misfire before failing completely. Although the fuel and magnetos remained ON, and the propeller continued to windmill until shortly before landing, the engine did not restart.

At this stage, the aircraft was approximately 4 nm to the east of the airfield, but the pilot was not visual with it. The terrain towards the airfield contained a number of wooded areas but the pilot was able to select a field to the south of the runway centreline in which to land. He completed his cockpit checks but did not inform Aberdeen Approach, with whom he was in contact, of the situation. Instead, he concentrated on attempts to re-start the engine, ensuring that the fuel was selected to main tank, magnetos were ON and the mixture was fully rich. He did not attempt to change back to the auxiliary tank, as he knew that the main tank was approximately three quarters full and was sure that the auxiliary was now empty.

The chosen landing field contained standing crops, was bounded by trees to one side and at the far end, and had a row of telegraph poles running from left to right at the approach end. Touchdown was achieved in the centre of the field, but during the landing roll the left main landing gear sank into the soft soil causing the aircraft to yaw to the left and the right wing and propeller to contact the ground. The pilot and passenger were able to vacate the aircraft normally and the pilot telephoned Aberdeen ATC to advise them what had happened.

The pilot considered that carburettor icing may have been a factor, as the mixture seemed excessively rich and actual icing had been experienced earlier in the day.

Examination of the engine

The pilot arranged for removal and inspection of the engine. Fuel in the carburettor bowl showed no evidence of contamination. However, the carburettor butterfly valve spindle and bushing were found to be badly worn. The carburettor heat ON detent on the airbox was also found to be worn, such that the system would not stay in the maximum heat setting, but would migrate towards a partial setting.

Aircraft fuel tanks

Fuel had been feeding normally from the auxiliary tank and the momentary faltering of the engine as the fuel tank emptied was expected. The main tank contained approximately 50 litres of fuel, and the engine should have recovered in just a few seconds. However, the tank had only recently been refuelled. For approximately three months the main tank, which was not fitted with a drain, had contained only a small amount of fuel and had not been used to supply fuel to the engine. These conditions would have allowed water to condense out in the tank, finding its way into the fuel line.

Discussion

The local weather conditions were conducive to carburettor icing, which the pilot had experienced earlier in the day whilst on the ground. The combination of temperature and dew point would expose the engine to a "moderate" risk whilst at cruise power setting and a "serious" risk whilst at descent power setting. Although the aircraft was equipped with a carburettor heat system and the pilot had been using the control to counter these conditions, the effectiveness of the system would have been reduced by the worn detent. This would have admitted a reduced warm air flow to the induction system which may even have aggravated ice accumulation. The worn butterfly valve spindle would have caused an over lean mixture at low power settings but would not have effected the engine at moderate to high power settings.

The practice of running the auxiliary fuel tank dry before selecting the main tank would cause a leaning off of the mixture as the level of fuel in the carburettor bowl dropped. This would have caused the initial faltering of the engine. It is also likely that air was introduced into the fuel system which would need to be drawn through before fuel flow from the main tank was established. Additionally, although no fuel contamination was reported, there is a possibility that water would have been present in the fuel line from the main tank.