

ACCIDENT

Aircraft Type and Registration:	Gardan GY80-180 Horizon, G-BYME	
No & Type of Engines:	1 Lycoming O-360-A1A piston engine	
Year of Manufacture:	1967	
Date & Time (UTC):	23 August 2008 at 1750 hrs	
Location:	Easingwold, Yorkshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 3
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Collapsed nose leg, bent propeller and both wings badly damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	46 years	
Commander's Flying Experience:	141 hours (of which 20 were on type) Last 90 days - 9 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft had insufficient fuel in its main tanks for its planned flight. At 2,000 ft, approaching the intended destination, the fuel in the main tanks ran out and the engine stopped. The aircraft's auxiliary tank contained approximately 20 minutes worth of fuel, but the pilot did not select the auxiliary tank. He carried out a forced landing, but undershot his intended field and collided with a hedge. The aircraft then turned over onto its roof. The pilot and passengers were uninjured and vacated the aircraft normally.

History of the flight

The pilot planned to fly with his family from Bagby, Yorkshire, to Panshanger, Hertfordshire,

and return. The weather was suitable for the flight and he refuelled the aircraft prior to takeoff. He calculated that it was a 3 hour flight for which he required about 120 litres, which equated to the main tanks being about $\frac{3}{4}$ full. Prior to refuelling, the fuel gauges indicated that the main tanks were about $\frac{1}{4}$ full and the pilot refuelled the aircraft visually to $\frac{3}{4}$ full, adding 85 litres of fuel. The aircraft also had an auxiliary fuel tank containing about 15 litres of fuel, which the pilot considered to be his emergency reserve. He had decided not to take full fuel, as he wanted to make an allowance for some baggage and had also considered the performance consequences of wet field conditions after recent heavy rain. With

the passengers and fuel, the aircraft was within its certified weight and centre of gravity limitations.

The flight to Panshanger was uneventful and, after a short time on the ground the aircraft departed for the return flight to Bagby. During the return flight the pilot noticed the main fuel gauge readings were lower than he had expected them to be. He put this down to 'the notorious fuel gauge inaccuracies' and, since the flight time was as planned, he was not unduly concerned.

When the aircraft was approximately 6 miles from Bagby, at 2,000 ft, the engine faltered then stopped. The pilot selected a field for a forced landing and trimmed the aircraft to the glide speed. As he approached his chosen field the pilot selected the landing gear down, an action which automatically lowered the flaps. The pilot had not anticipated the effect that extended landing gear and flaps would have on the aircraft's glide angle and it descended into a hedge short of the intended field. The aircraft turned over and came to rest inverted. The pilot turned off the master switch and he and his passengers, who were all uninjured, vacated the aircraft by the pilot's door.

The pilot considered that the accident was caused by him not putting enough fuel into the main tanks when he refuelled. He added that 'he still had fuel in the auxiliary fuel tank and, had he remained calm, he could have selected that tank.'

Additional information

The Air Navigation Order requires a pilot of a flying machine to carry sufficient fuel for the intended flight together with a safe margin for contingencies.

The pilot used the fuel consumption curves from the Operating Manual (Figure 1) to calculate the fuel

required for his flight, which he planned to fly using 75% power at 2,200 rpm; he also allowed for an additional margin of approximately 20%. This complies with the advice given in the CAA publication, LASORS, where it states:

'Don't assume that you can achieve handbook fuel consumption. As a rule of thumb, due to service and wear, expect to use 20% more than the 'book' figures.'

The resultant planned fuel consumption was 38 litres per hour.

However, the fuel consumption curves in the Operating Manual contained an error, where the data 'fuel consumption in litres per hour' was incorrectly aligned with the graph. It can be seen that, for example, 10 US gallons is incorrectly aligned with 30 litres, whereas it should be aligned with 37.8 litres. The net effect of this is that whereas the pilot had calculated his consumption, including the 20% margin, to be approximately 38 litres per hour, the figure should have been approximately 46 litres per hour.

LASORS also state:

'Always plan to land by the time the tanks are down to the greater of ¼ tank or 45 minutes cruise flight, but do not rely solely on the gauges which may be unreliable.'

As the fuel tanks were at ¼ tank prior to refuelling a pilot following the CAA's advice would have added the 3 hours trip fuel to the tanks, or planned to pick up fuel from Panshanger.

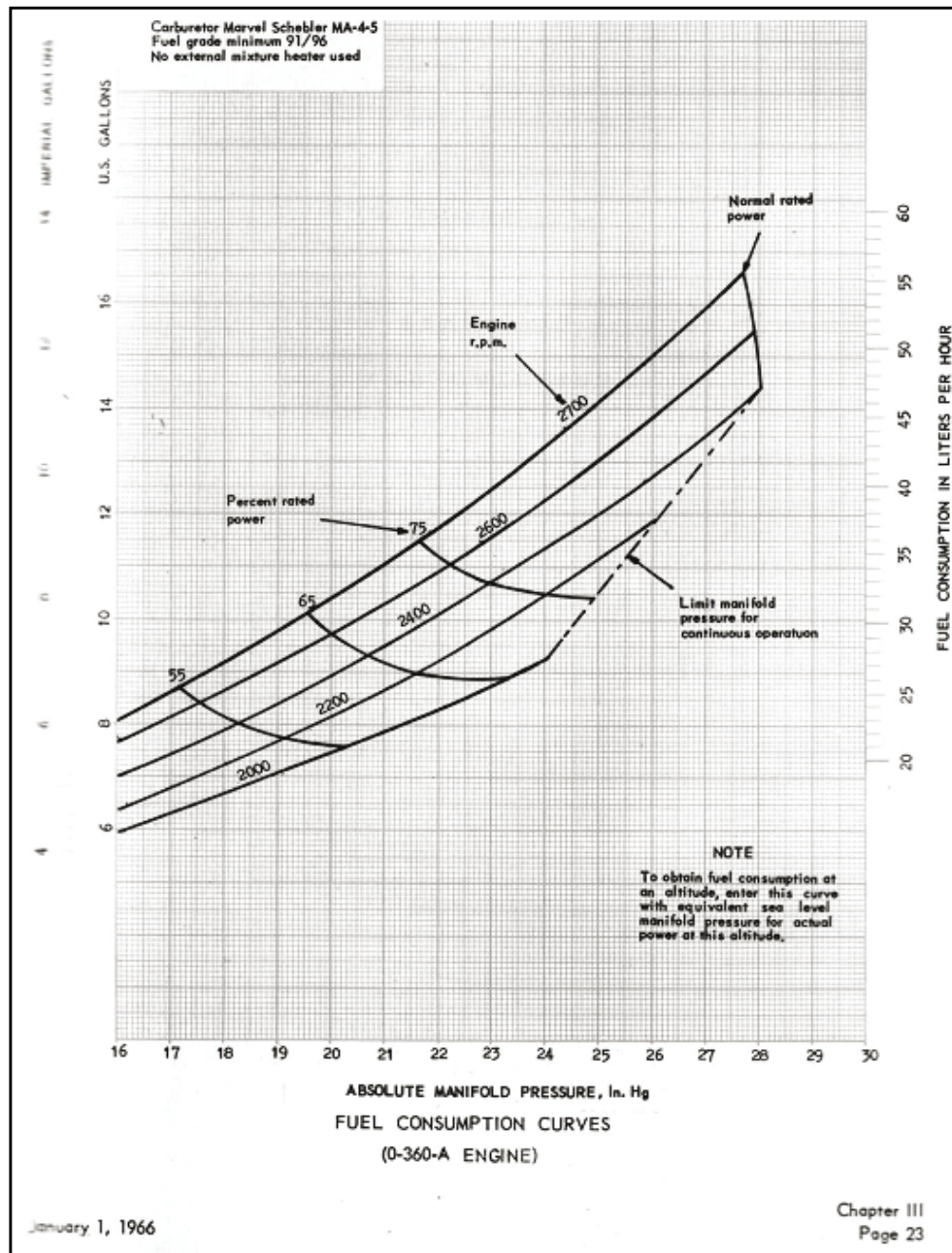


Figure 1

Comment

In an honest report the pilot acknowledged that his poor fuel planning caused the accident, although he was not helped by the incorrect conversion data that were published in the Operating Manual. In addition, had he selected the auxiliary tank when the engine started to falter, it is likely that the accident could have been averted.

Safety Action

The European Aviation Safety Agency (EASA) was advised of the error in the fuel consumption curves through the UK Civil Aviation Authority. EASA have subsequently issued an Airworthiness Directive, effective 17 November 2008, which forbids the use of the existing conversion curves and provides correct conversion data which is to be inserted into the Operating Manual.