

ACCIDENT

Aircraft Type and Registration:	Pitts S-1S Pitts Special, G-MAVK	
No & Type of Engines:	1 Lycoming IO-360-A1A piston engine	
Year of Manufacture:	1991 (Serial no: 4010)	
Date & Time (UTC):	21 October 2018 at 1130 hrs	
Location:	Near Towcester, Northamptonshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Wings damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	47 years	
Commander's Flying Experience:	268 hours (of which 12 were on type) Last 90 days - 6 hours Last 28 days - 5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

During a flight from Turweston to Sywell, the engine stopped and the pilot made a forced landing in a field, north-west of Towcester. The field was too short to complete the landing and the aircraft came to rest in a hedge, damaging the wings. Following the recent installation of a new instrument panel, no markings had been applied to the sight-level fuel gauge which made fuel quantity management difficult. Although the pilot had received aerobatic training on the Pitts Special, it was not structured type-conversion training. The LAA has released a Technical Letter explaining the rules and giving guidance when transitioning to a new type.

History of the flight

Prior to departure, the pilot checked the quantity of fuel on-board using the sight gauge in the cockpit and judged that the tank was approximately half full. In his opinion this was sufficient for the short trip to Sywell and once the weather conditions became suitable he took off. The pilot flew the aircraft out of the Turweston circuit at full power and then throttled back ready to trim the aircraft for cruise at 140 mph. He felt the engine losing power and so advanced the throttle. When the engine did not respond, he applied full throttle but there was still no response. He confirmed the fuel pressure was normal (approximately 12 psi) and then cycled the mixture control, which produced a short burst of power after which the engine stopped. The pilot selected a field to land in but there was insufficient distance to complete the landing and the aircraft struck a hedge at the far end and came to

a halt (Figure 1). The impact damaged the wings, but the pilot was able to exit the aircraft unharmed.



Figure 1

The final position of G-MAVK
(Photo used with permission)

Aircraft information

The pilot had purchased G-MAVK in October 2016 for aerobatic competition flying and had spent the intervening period preparing the aircraft. Although he was experienced on other types, he undertook several hours of aerobatic training with a qualified instructor in a similar Pitts Special, but did not receive structured type-conversion training.

The fuel tank capacity was 72 litres (20 gal US) and was fitted with a sight-level fuel gauge. The pilot had recently fitted a new instrument panel and at the time of the accident there were no quantity markings on the fuel gauge (Figure 2).

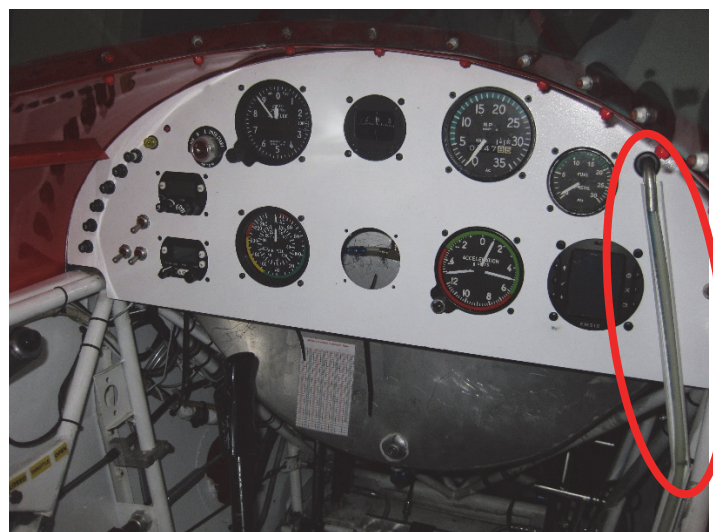


Figure 2

Cockpit of G-MAVK with the unmarked fuel gauge highlighted

Prior to takeoff the pilot used the fuel gauge to estimate the fuel quantity as approximately 35 litres ($\frac{1}{2}$ full). This would be enough for 30 minutes flying time and Turweston to Sywell takes about 10 minutes at nominal cruise speed. The engine stopped 8 minutes after takeoff which would indicate only 7 to 10 litres of fuel in the tank at departure or the fuel consumption was much higher than anticipated. During the post-accident examination, it was noted that there was no fuel remaining in the tank. The aircraft has subsequently been disassembled ready for repairs and the pilot has discovered some fuel pipe staining and a loose fuel pipe union on the carburettor.

Analysis

On a tailwheel aircraft such as the Pitts Special, the aircraft pitch attitude will affect the level of fuel shown in the sight gauge between level flight and the attitude on the ground. To mitigate this effect, sight gauges are usually dual-calibrated with on-ground and in-flight markings. At the time of the accident there were no markings to indicate the fuel quantity on G-MAVK and so the pilot could not accurately manage the onboard fuel quantity. This led to the engine stopping in flight due to fuel exhaustion. Although it has subsequently been discovered that a fuel union on the carburettor was loose, it is not possible to determine whether this was due to the accident or was a pre-existing defect.

It is opinion of the LAA that a lack of structured conversion training resulted in the pilot not performing an effective forced landing. The LAA has recently issued a Technical Leaflet '*Converting to a New Type*' as part of a mitigation to prevent similar accidents and has given advice in their magazine '*Light Aviation*' about the importance of proper fuel gauge markings.

Conclusion

Lack of fuel level markings on the fuel gauge made it difficult for the pilot to accurately manage the fuel quantity on-board, which resulted in the engine stopping due to fuel exhaustion. It has not been possible to determine whether there was a pre-existing fuel leak. The forced landing was only partially successful; although the pilot escaped with no injuries, both wings were damaged when the aircraft struck a hedge.

The LAA believes safety improvements can be made by ensuring pilots undergo structured conversion training before starting to fly a new type of aircraft. This would also assist pilots in taking effective actions in the event of emergencies, such as forced landings following an engine stoppage.