Accident

Aircraft Type and Registration:	Dyn Aero MCR-01, G-TOMX	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2009 (Serial no: PFA 301-14624)	
Date & Time (UTC):	4 May 2025 at 1558 hrs	
Location:	Shenstone Hall Airfield, Staffordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - 1 (Fatal)	Passengers - N/A
Nature of Damage:	Destroyed	
Commander's Age:	60 years	
Commander's Flying Experience:	1,368 hours (of which 890 were on type) Last 90 days - 1 hour Last 28 days - 0 hour	
Information Source:	AAIB Field Investigation	

Synopsis

Shortly after takeoff the aircraft is likely to have lost power. It appears that the pilot attempted to return to the departure airfield but lost control of the aircraft whilst doing so. The aircraft struck the ground in a cultivated field close to the grass airstrip, resulting in a post-accident fire which destroyed the aircraft. The pilot was fatally injured.

In the event of a power loss shortly after takeoff pilots must make quick and difficult decisions whether to attempt a forced landing. The performance of the aircraft meant a turnback to the airfield runway was not possible. The CAA guidance is not to attempt a turnback manoeuvre and to aim for a point in front in the event of power loss shortly after takeoff. This accident serves to remind pilots that pre-briefing actions in an emergency, especially when close to the ground, taking into account the prevailing weather conditions and aircraft performance, may aid them in making quick and decisive decisions if faced with such an emergency.

The pilot had recently performed several maintenance activities on the engine and fuel system but had not had the work assessed by a Light Aircraft Association (LAA) inspector. Although the cause of the power loss could not be determined it is possible that it was associated with work carried out on the aircraft prior to the flight.

This accident also highlights the importance of following the guidance provided by the relevant regulatory bodies or sporting associations to ensure that all maintenance completed, other than that described as 'pilot maintenance', is inspected and signed off by a suitable inspector.

History of the flight

On the day of the accident, the pilot was seen removing the aircraft from its hangar at the private airstrip where it was based, by other pilots at the strip. The other pilots had left the strip before the aircraft departed and there was no witness to the aircraft's departure. CCTV captured the aircraft back tracking and subsequently departing from Runway 33 at approximately 1558 hrs. The pilot was the sole occupant onboard. CCTV further captured the aircraft downwind and then turning back towards the strip, approaching the runway at right angles. The aircraft was captured on CCTV striking the ground and bursting into flames, in a field close to the airstrip.

The wreckage of the aircraft was discovered the following morning by the landowner whilst walking his dog.

Accident site

The aircraft had come to rest in cultivated farmland to the east of the grass strip of Shenstone Hall Airfield (Figure 1).

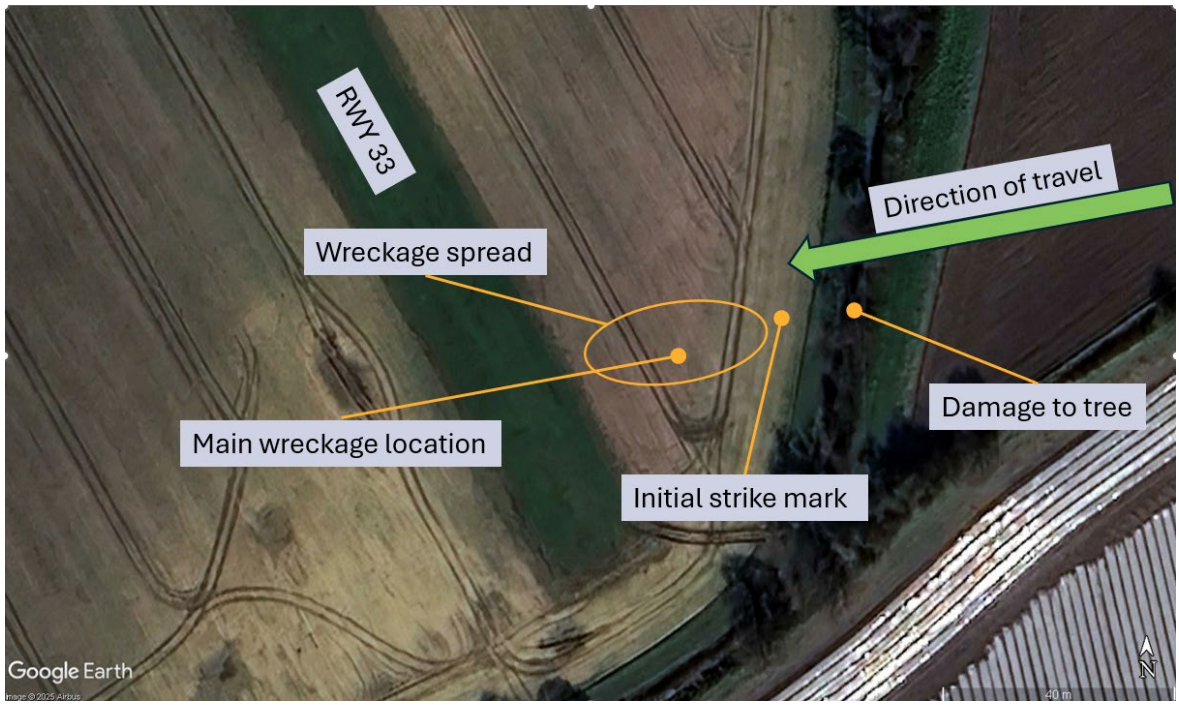

Figure 1

G-TOMX accident site location

Small fragments of tree debris were found to the west of the airfield's easterly boundary, suggesting the aircraft struck the treetops before ground contact. An initial ground scar was located 15 m from the tree line, with the main impact point being 5 m beyond that. The main wreckage was 32 m from the tree line.

The aircraft came to rest inverted with its nose pointing in the direction it had come from. The seat pan was found 10 m beyond the main wreckage. A significant fire had consumed most of the composite aircraft, with only the engine block remaining intact.

One of the three ground adjustable propeller blades remained attached to the hub. The two other blades were found in the wreckage trail. All the blades were intact with no leading-edge damage, suggesting that the propeller was not rotating, or rotating slowly at the time the aircraft struck the ground.

The ground scars suggest that the right wing contacted the ground first, before the aircraft cartwheeled and came to rest. Scorching of the ground between the main impact location and where the wreckage came to rest suggested that the composite fuel tank had ruptured when the aircraft initially struck the ground causing the fuel within it to immediately ignite.

The damage sustained by the aircraft in the subsequent fire was such that it was not possible to confirm the continuity of any of the primary flying controls to their respective control surfaces.

The forces involved in the accident sequence suggest that the accident was not survivable.

Recorded information

Two CCTV cameras, one positioned at a gateway opposite the entrance to the farm strip with a view down the runway and the other on a farm building approximately 200 m further away from the strip captured most of the accident flight (Figure 2).

Figure 2

Shenstone Hall Airfield and location of CCTV cameras

The camera positioned at the gate captured video of the aircraft taxiing from the hangar area before it backtracked the grass strip. The aircraft then turned and took off. The climb appeared to be normal. The aircraft then initiated a right turn before going outside of the camera's field of view.

Footage from the second camera showed the aircraft continue the right turn onto what was possibly a crosswind leg. The aircraft was then seen to turn right again and maintain heading before going out of view.

The gateway camera then captured footage of the aircraft as it completed its right turn and proceed away from the camera. The aircraft was then seen to turn right again and start to descend rapidly with a high angle of bank to the right before striking the ground. The subsequent fire and smoke indicated that the wind at the time of the accident was across the runway. There was no evidence to suggest that there was an in-flight fire.

The length of the flight was approximately 55 seconds.

Aircraft information

The MCR-01 VLA Sportster is a two-seat monoplane, powered by either a Rotax 912 UL or ULS engine, G-TOMX was powered by a Rotax 912 ULS. The engine and carburettors were configured in accordance with the manufacturer's installation guide. This did not require carburettor heating of any type to be fitted.

G-TOMX was built from a kit by the pilot from 2006 and completed its maiden flight in 2009. At the time of the accident the aircraft had a current Permit to Fly Certificate of Validity. According to the aircraft logbooks it had accrued 314.75 flying hours at its last permit renewal inspection in June 2024. The aircraft had flown approximately 5.5 hours[1] since the permit revalidation inspection and had not flown since February 2025.

During the aircraft's recent permit to fly revalidation check flight the stall warning operated at 69 kt with flaps UP and 64 kt with flaps FULL, the pilot recorded that buffet was observed at 63 kt and 53 kt in flaps UP and flaps FULL respectively.

The aircraft was fitted with an Arplast PV50 three bladed propeller, which was the original propeller fitted to the aircraft when it was built, and had recently been re-installed to replace a Helices E Props three bladed propeller that had been installed by the pilot via a LAA approved modification. Although the Arplast PV50 propeller was the one originally fitted to the aircraft, the re-installation of the propeller had not been inspected and signed off by a LAA inspector after the re-installation. A retrospective inspection and issuance of a Permit Maintenance Release (PMR) was completed on 13 November 2024. Once completed, the LAA issued the Permit to Fly Certificate of Validity on 14 November 2024. At the time the PMR was signed off the pilot was reminded of LAA Technical Leaflet TL2.05[2], which

Footnote

[1] Aircraft hours taken from pilot's flying logbook.

[2] Pilot Authorised Maintenance TL2.05 https://www.lightaircraftassociation.co.uk/infolibrary/d1803509-aaa4-480b-a7a3-1779cee9d85a [accessed 23 December 2025].

describes what pilot maintenance can be carried out on an aircraft without inspection of a '*person authorised by the CAA'* which for LAA aircraft is a LAA inspector. The replacement of the propeller was not listed as an item of pilot maintenance that could be completed without oversight of a LAA inspector.

G-TOMX was based at Shenstone Hall Airfield and was kept in a hangar rented by the pilot. It was the only aircraft kept in the hangar. The pilot kept a note of work carried out on the aircraft on a whiteboard in the hangar. Four items were identified on the whiteboard;

> *'New fuel hose fitted: Return line, supply line from elec pump to manual pump, supply line to fuel sensor, vent line, drain line. Complete*
>
> *Lock wire carb retaining springs: DONE*
>
> *Coolant elbows on top of cylinder 2 and 4 removed & resealed: Done 29/3/25*
>
> *Fuel tank phenol novolac, failed – ethanol damage! Found 30/3/25 = Repair complete'*

In addition to the whiteboard notes, the pilot had also communicated with a friend about the issues he was encountering and confirmed that prior to the accident flight he had resealed the coolant elbows on the engine and applied phenol novolac to the internal surfaces of the fuel tank.

Phenol novolac is a high-performance thermosetting resin that can be applied to the internal surfaces of composite fuel tanks to protect the internal surfaces against erosion associated with ethanol that is found in Mogas. In 2012 a modification to line the internal surfaces of MCR-01 fuel tanks was agreed with the LAA and applied to the fuel tank of G-TOMX. The modification is a very involved process requiring the fuel tank to be removed from the aircraft. The modification specifies that multiple operatives are needed to administer it, as the chemical must be prepared and immediately poured into the tank before it is manipulated to coat all internal surfaces. Once coated the residue is poured out of the tank and the remaining chemical is left to cure. A LAA Inspector must sign off the work at multiple stages throughout the process to ensure it has been carried out correctly.

There were no records indicating that a LAA inspector had signed off any of the work recorded on the hangar whiteboard.

Aircraft examination

Due to the nature of the damage to the aircraft, it was not possible to complete any assessment of the airframe.

Although the engine block remained intact after the accident all external components including the ignition and carburation systems were destroyed. A limited examination of the engine was completed and found no abnormalities.

Although a fuel sample could not be taken from the aircraft, the owner kept a large quantity of fuel in the hangar. A sample of which was assessed under laboratory conditions and found to be consistent with E5 gasoline purchased from an automotive petrol station, which was an acceptable grade of fuel for this aircraft.

Weight and balance

With a single pilot and any fuel load the aircraft would have been within the published weight and balance limitations.

Meteorology

The conditions at the airstrip at the time of the accident were settled with an area of high pressure over the UK. There was patchy cumulus cloud with a base of 3,000 ft amsl. At Birmingham Airport, 11.5 nm south-south-east of the airstrip, the surface wind was light from the north-easterly direction, and the temperature was 13°C with a dew point of 0°C.

Airfield information

Shenstone Hall is a private unlicensed airstrip 2 nm south of Lichfield, Staffordshire. The airstrip is in a rural location and surrounded by arable fields. It has a single grass runway of 600 m in length orientated 15/33.

CAA Guidance on single engine power loss

The CAA has published guidance on engine failures during takeoff and whilst in the circuit. Safety Sense leaflet SS12 – Strip Flying gives advice on loss of power during this crucial stage of flight. This advises:

> *'You should **review the options in the event of an engine failure on takeoff.** The obstacle environment may require turning in a particular direction. Have a picture in your head of what the area in front of you will look like in the event of a low-level engine failure. Do not consider making a turn-back manoeuvre, it is always safer to aim for a point in front of you or behind.'*

The CAA provide further guidance on engine failures at low level within CAP1535, The Skyway Code. This advises:

> *'Particularly at low level, focus on maintaining speed and control. Provided you keep the aircraft at flying speed and under control, engine failures are unlikely to be fatal'*

Within The Skyway Code the CAA advocate that the following key principles should be applied to all emergency situations.

- *'Know the aircraft – Memorise the checklists relating to time critical emergencies.*
- *Fly the aircraft – Always adjust flight path to maintain speed.*

- *Assess the situation – Once aircraft is under control take a moment to assess the situation, do not jump to conclusions.*
- *Declare an emergency – If in doubt declare an emergency in good time'.*

Analysis

With the extensive damage sustained by the aircraft as a result of the post-accident fire it has not been possible to positively determine the reason that the pilot attempted to return to the airfield in an expeditious fashion. Possible technical causes for pilot to return to the airfield were considered, such as an engine or electrical fire, loss of primary control surface continuity and power loss. Analysis of the flight recorded in the CCTV footage did not identify evidence of an in-flight fire and the flight profile suggested that the aircraft remained in control until the final moments of the flight when attempting to turn onto the runway heading. Ruling out an in-flight fire and loss of primary control continuity.

The condition of the propeller blades and the locations in which they were found on the accident site indicates that the engine was either at low power or not rotating when the aircraft struck the ground, suggesting that the aircraft had suffered a total or partial power loss beforehand

Ambient conditions at the time of the accident indicated moderate carburettor icing was possible. Taking into account that the engine installation for the MCR type of aircraft is such that the carburettors are less prone to icing issues. The carburettors fitted to the Rotax 912 ULS engines do not use a conventional butterfly valve also making them less susceptible to icing. It is therefore considered unlikely that carburettor icing was a factor in this accident.

Assessment of the engine did not reveal an obvious cause of an engine issue; but recent maintenance to the aircraft fuel system and engine that was recorded on the pilot's whiteboard in the aircraft's hangar and discussed with a friend may have introduced an issue that caused fuel disruption to the engine.

The LAA inspector who had recently inspected the aircraft had reminded the pilot of his obligations when conducting pilot maintenance to have it signed off appropriately in accordance with TL2.05, although it appears that this was not followed.

Having built and maintained the aircraft for over 15 years, the pilot will have been assured in his work, possibly further enforcing his confidence such that he felt additional inspection by an LAA inspector was not warranted.

The purpose of the flight and intentions of the pilot are unknown; however, as the aircraft had not flown since February that year and there was evidence to suggest that the pilot had recently conducted maintenance on the aircraft it is possible that the pilot was intending to complete a post maintenance check flight.

The pilot elected to turnback towards the airfield following the power loss from a downwind position. In doing so the aircraft flew close to fields that might have offered suitable options for an emergency forced landing. The MCR-01 has a relatively high stall speed and landing

back at the airstrip would not have been achievable from the position of the power loss. Although G-TOMX did not experience power loss during the climb out, the aircraft was close to the airfield at low level, and the same principles apply. There was a field close by that could have been used for an off airfield emergency landing. At the time of the power loss the aircraft did not have the performance to return to the runway it departed from. Therefore, the safest option would be to perform a forced landing in the fields nearby.

The pilot had not informed anyone about his intentions to fly G-TOMX that evening and there were no witnesses to the accident. This resulted in the aircraft only being found the following day. Had the pilot informed someone of his intentions they may have initiated overdue action; however this is unlikely to have changed the outcome of the accident.

Conclusion

Shortly after takeoff the aircraft was seen on CCTV to attempt a return to the departure airstrip. Although it was not possible to positively confirm the reason the pilot elected to return to the airfield it is considered likely that the aircraft sustained a power loss. The cause of the power loss could not be determined, but it is possible that it was associated with recent maintenance of the fuel system. The maintenance was such that is should have been assessed and signed off by a LAA inspector, but it had not been. This observation serves as a reminder to pilots and owners of their obligations to follow the guidance provided by regulatory authorities and sporting associations in understanding the allowable limits of what maintenance can be undertaken without oversight and what must be inspected by an authorised inspector.

Having sustained an engine power loss, the pilot was confronted by a difficult decision to either attempt a return to the airfield or to make an off airfield forced landing. It is tempting for a pilot to try and return to a familiar landing area with a known landing surface. In this case, the pilot decided to return to the airfield but the aircraft did not have the height or required performance to safely do so. This accident once again highlights the need for pilots to avoid turning back to the airfield at low level following a loss of power. The advice provided by the CAA to fly the aircraft, maintaining flying speed and aim to land ahead reminds pilots of the safest option following a power loss at low height.

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