Air Accident Investigation Unit Ireland

FACTUAL REPORT

ACCIDENT

Bensen B8M Gyrocopter, EI-BSG

Near ILAS Field, Taghmon, Co. Wexford

21 June 2025

An Roinn Iompair
Department of Transport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13[1] to the Convention on International Civil Aviation, Regulation (EU) No 996/2010[2] and Statutory Instrument No. 460 of 2009[3], safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

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[1] **Annex 13**: International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.
[2] **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.
[3] **Statutory Instrument (SI) No. 460 of 2009**: Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.

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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, on 21 June 2025, the Chief Inspector of Air Accidents appointed John Owens as the Investigator-in-Charge to carry out an Investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	**Bensen B8M Gyrocopter, EI-BSG**
No. and Type of Engines:	**1 x Volkswagen Air-Cooled Automobile Engine**
Aircraft Serial Number:	**N/A**
Year of Manufacture:	**1986**
Date and Time (UTC)[4]:	**21 June 2025 @ 16:30 hrs**
Location:	**Near ILAS (Irish Light Aircraft Society) Field, Taghmon, Co. Wexford, Ireland**
Type of Operation:	**Private**
Persons on Board:	**Crew – 1** **Passengers – Nil**
Injuries:	**Nil**
Nature of Damage:	**Substantial**
Commander's Licence:	**Private Pilot Licence (PPL) Gyroplane (G) issued by the Irish Aviation Authority (IAA)**
Commander's Age:	**73 years**
Commander's Flying Experience:	**9,100 hours, of which 190 were on type**
Notification Source:	**Shannon Air Traffic Control**
Information Source:	**AAIU Report Form submitted by the Pilot** **AAIU Field Investigation**

[4] **UTC**: Co-ordinated Universal Time. All times in this report are quoted in UTC unless otherwise stated; local time was UTC + 1 hour on the date of the occurrence.

SYNOPSIS

Shortly after take-off from ILAS Field at Taghmon, Co. Wexford, Ireland, the engine of the Bensen B8M Gyrocopter lost power. This necessitated a forced landing in a nearby agricultural field from a low height, during which the Gyrocopter contacted the ground hard and bounced before coming to rest. The Gyrocopter sustained substantial damage in the impact sequence. The Pilot, who was the sole occupant, was uninjured. There was no fire.

NOTIFICATION AND RESPONSE

An off-duty Air Traffic Controller witnessed the accident and informed Shannon Air Traffic Control (ATC). Shannon ATC informed the AAIU by telephone that the accident had occurred.

1. FACTUAL INFORMATION

1.1 History of the Flight

The Bensen B8M Gyrocopter took off from Runway (RWY) 18 at ILAS field (EIIF), Taghmon, Co. Wexford, Ireland, at approximately 16:27 hrs to conduct some circuits. The Pilot was the sole occupant. He recalled that he initially climbed straight ahead to a height of approximately 200 feet (ft), before commencing a left turn. The Pilot reported that when the Gyrocopter was in the turn, the engine lost power. The Pilot said he exercised the throttle lever to no effect and elected to conduct a forced landing in an agricultural field below him. The Pilot stated that he did not have sufficient speed to flare the Gyrocopter as it neared the ground and that the landing was '*heavy*'. The Gyrocopter bounced, before coming to rest on its left side in the field (**Photo No. 1**). The Gyrocopter sustained substantial damage in the impact sequence. The Pilot, who was wearing a flight suit and helmet, and who was secured to his seat by a four-point harness, egressed, unaided, from the Gyrocopter. There was no fire.

Photo No. 1: Final resting position of Gyrocopter

1.2 Injuries to Persons

No injuries were reported to the Investigation.

1.3 Interview with the Pilot

The Pilot informed the Investigation that he transported the Gyrocopter to the airfield in a custom-built trailer on the day before the accident. He said that there was some fuel remaining in the fuel tank from a previous flight, which according to logbook records, was on 17 June 2025. The Pilot stated that he purchased fuel (automotive gasoline) locally and refuelled the Gyrocopter before conducting a flight on the day before the accident. He said that on the day of the accident he topped up the fuel tank and completed another flight, which lasted approximately 30 minutes, during which the Gyrocopter operated normally. He estimated that the Gyrocopter would have consumed seven to eight litres (L) of fuel during that flight. He said that he checked the fuel quantity before the accident flight but would not have topped it up again as he was only planning on completing a '*couple of circuits*'.

The Pilot recalled that on the accident flight, following engine start-up and taxi to the runway, he was requested to hold before taking off and that he held for longer than usual, which he estimated was seven to eight minutes, to allow two other aircraft to take-off. The Pilot described the engine power loss following take-off as a '*clean reduction of power*', just as if he had '*throttled back*' and that there was no '*spluttering*'. When asked about the possibility of carburettor icing (**Section 1.13**), he said he heard it being mentioned at the airfield that other pilots had been '*getting it that day*' (when asked, the airfield owner said he had not received any reports of carburettor icing). The Pilot said that he had not previously experienced an engine run-down due to carburettor icing but had, in the past, seen the carburettor surface become white (due to its low temperature) following flights.

1.4 Personnel Information

The Pilot held a valid PPL(G) and a valid IAA Class 2 Medical Certificate, both of which were issued by the IAA. The Pilot also held a United States Federal Aviation Administration (FAA) Commercial Pilot Certificate (Rotorcraft, Helicopter and Gyroplane). The Pilot's Flying Experience is outlined in **Table No. 1**.

Total all types:	9,100 hours
Total on type:	190 hours
Last 90 days (on type):	3 hours 12 minutes
Last 28 days (on type):	3 hours 12 minutes
Last 24 hours (on type):	35 minutes

Table No. 1: Pilot's Flying Experience

1.5 Aircraft Information

1.5.1 General

A gyrocopter is a rotary wing aircraft in which a rotor provides lift. It is sometimes referred to as a gyroplane or an autogyro. In a helicopter, the rotor is engine-powered, whereas, in a gyrocopter, the rotor autorotates due to aerodynamic forces. The rotor is initially rotated by hand, or by a pre-rotator which can be mechanically, electrically, or hydraulically powered. Forward propulsion is provided by a separate, engine-driven propeller. With the rotor already rotating, the take-off roll is performed with the rotor disc tilted aft, which allows the airflow to accelerate the rotor disc to the speed required for flight. When pre-rotation is performed by hand, as is the case of the subject Gyrocopter, the rotor speed is initially increased by tilting the rotor disc aft and taxiing, or by utilising the prevailing wind.

The subject Gyrocopter (**Photo No. 2**) was a Bensen B8M, fitted with a two-bladed, metal rotor, with a diameter of 6.1 metres (m), and a two-bladed, wooden, fixed pitch '*pusher*' propeller. The propeller was driven by an 1,834 CC[5], Volkswagen horizontally opposed, air-cooled, four-cylinder automobile engine, which was started by hand-swinging the propeller. A cyclic control stick was fitted to control pitch and roll by varying the tilt of the rotor disc. Yaw was controlled by a pedal-operated rudder. The engine operated on MOGAS (unleaded automotive gasoline). The empty weight and maximum gross weight of the Gyrocopter were recorded in its weight and balance report as 393 pounds (178.3 kg) and 598.4 pounds (271.4 kg) respectively.

Photo No. 2: EI-BSG – Bensen B8M Gyrocopter

The engine's ignition system was powered by a stand-alone (i.e. charged off-wing and then installed for flight) 12-volt (V) battery and comprised an ignition switch, an ignition coil, a distributor fitted with contact breaker points, a capacitor, a rotor arm, and a distributor cap and leads. One spark plug is fitted to each of the engine's four cylinders. The high-voltage spark required by the spark plugs is generated by the ignition coil when the 12 V circuit from the battery through the coil and contact breaker points is interrupted when the contact breaker points are opened by the rotating camshaft in the distributor. To prevent arcing when the contact breaker points open and to ensure a rapid interruption of the 12 V circuit, a capacitor is connected in parallel with the contact breaker points. A rotor arm fitted to the distributor camshaft supplies the high voltage required to generate a spark to each spark plug in the correct firing order.

The engine was fitted with a single carburettor. There were no engine cowlings or carburettor heating system. The Gyrocopter's single seat served as a fuel tank. A transparent fuel quantity indication hose was located on the outside of the seat back and was graduated in 5 L increments, from '*10*' (L) to '*30*' (L). Two fuel drains and a fuel outlet were located in the base of the tank/seat. The fuel line from the outlet was routed upwards via a hand-operated fuel shut-off valve, to the inlet of an engine-driven fuel pump. The outlet of the fuel pump was connected by another fuel line to the inlet of the engine's single carburettor via a transparent in-line fuel filter. There was no electrically driven fuel pump; therefore, the fuel system required manual priming before starting the engine. This is accomplished by ensuring the ignition is switched off, before rotating the engine with the propeller to a position where the engine-driven pump is being actuated and then rocking the propeller back and forth to operate the pump until fuel is visible in the in-line filter.

[5] **CC:** Cubic Centimetres (engine volume).

1.5.2 Airworthiness and Maintenance Certification

The Gyrocopter's logbook records that an Annual Inspection for '*Permit Renewa*l' was carried out on 5 June 2025. The Gyrocopter's Flight Permit and its associated Validity Certificate were issued by an IAA-authorised officer on 16 June 2025.

1.6 Damage to Aircraft

The Gyrocopter was substantially damaged during the impact sequence. The frame member on which the left-hand main wheel was mounted was broken, as was the longitudinal frame member leading to the nose of the Gyrocopter. The two main rotor blades and the vertical stabiliser sustained substantial damage. Both propeller blades were fractured and the nature of the fracture surfaces indicated that the propeller was not operating under power at the time of impact.

1.7 Other Damage

There was minor impact damage to the surface of the field.

1.8 Accident Site

The accident site, which had an elevation of approximately 40 m (131 ft) Above Mean Sea Level (AMSL), was located in an agricultural field, which was approximately 180 m east of the end of RWY 18 at EIIF. Ground markings indicated that following an initial ground contact, the Gyrocopter bounced, before coming to rest on its left side, approximately 10 m from the initial contact point. Overhead electric lines ran in a north-easterly/south-westerly direction approximately 7 m to the north of the wreckage. These were measured by the Investigation with a cable height meter to be 8.93 m high. The Pilot said that he was aware of the overhead lines but that they did not affect the forced landing.

1.9 Wreckage Examination

1.9.1 General

When the Gyrocopter was examined at the accident site, it was observed that the electrical wire from the ignition coil to the contact breaker points and capacitor had detached from the electrical terminal on the coil but remained loosely connected due to it being secured with lacing wire (**Photo No. 3**). The engine's distributor cap was found to have partially dislodged from the distributor.

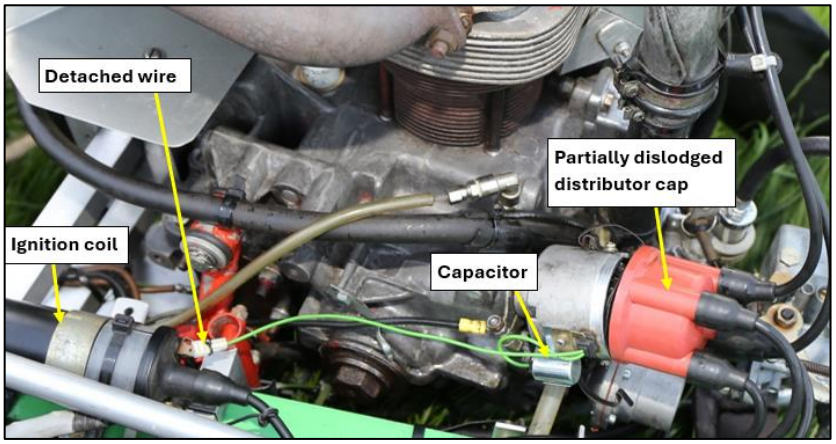

Photo No. 3: Detached wire and partially dislodged ignition cap

A person at the airfield, who witnessed the Gyrocopter taking off, provided the Investigation with photographs he had taken of the take-off roll. The distributor cap and ignition coil wire appear to be secure in the photograph (**Figure No. 1**).

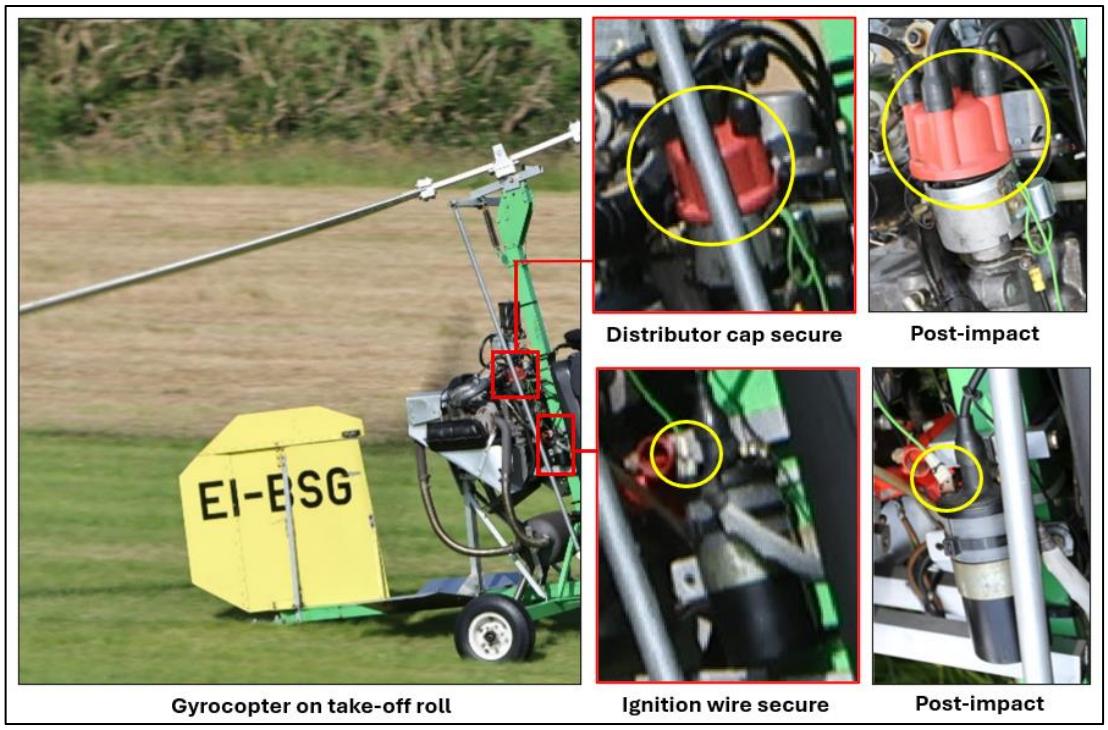

Figure No. 1: Distributor cap and ignition coil wire pre and post impact (*witness photo*)

When the AAIU response team was enroute to the accident site, a member of An Garda Síochána advised the AAIU by telephone that there was a smell of fuel at the accident site. Following the Investigation's on-site examination, the wreckage was repositioned right-way-up to facilitate recovery. Once the wreckage was repositioned, the Investigation was able to drain approximately 7 L of fuel from the fuel tank through a fitting on the bottom of the tank. The sample had a clear and bright appearance.

1.9.2 Engine Testing

Following on-site examination, the Gyrocopter was transported under escort to the AAIU's wreckage examination hangar at Gormanston, Co. Meath, where further examination was carried out.

To facilitate an engine test, the owner of the Gyrocopter supplied a replacement propeller, which the Investigation fitted to the engine. The partially dislodged distributor cap and detached ignition coil wire were refitted. The clips securing the distributer cap were found to function satisfactorily and when the wire was refitted to the terminal on the ignition coil, it was found to be secure, i.e. not loose. The fuel pipes from the fuel tank outlet were inspected and found to be unobstructed. The in-line fuel filter was found to be clear. The voltage of the Gyrocopter's battery, which was only used for the engine's ignition system and had no means of being recharged while in use, was measured to be 12.59 V (i.e. charged). The fuel system was replenished and primed, the battery was reconnected, and the ignition/master switch was switched on. The propeller was hand-swung, and the engine started.

The throttle lever and linkage operated correctly and the engine was found to run and accelerate smoothly as the throttle lever was exercised. The engine was then shut down, and the ignition coil wire was placed in the position it was found in at the accident site. The engine was re-started; however, when the wire was moved, the engine speed reduced, and the engine ran roughly, as expected.

1.9.3 Examination of Ignition and Fuel Systems

Following the engine run, the ignition system, including the spark plugs and contact breaker points, was examined and appeared to be in a serviceable condition. The electrical resistance of the contact breaker points was found to be negligible (0.1 ohms). The ignition timing was checked and found to be set at a typical position (a few degrees before top dead centre). The top of the carburettor was removed to facilitate an examination of the float chamber. No debris was observed. The fuel tank/seat was disconnected from its mountings and visually inspected. There was no evidence of debris inside the fuel tank or at the fuel tank outlet. The fuel remaining in the tank was drained through a cloth filter to check for debris in the tank and none was found.

1.10 Fuel Testing

The Investigation provided a specialist laboratory with a sample of fuel that had been obtained from the Gyrocopter's fuel tank at the accident site and requested that it be analysed. The associated test report noted that '*water content is not regulated in the specification* [for the fuel] *except for the visual presence of water*'. The sample was found to be '*clear and bright*', which indicates no visible water. The report stated that '*the water content was 842 ppm* [parts per million]'. The report concluded that '*the sample passes the EN228*[6] *specification for unleaded petrol that is of summer grade quality*'[7].

For comparison purposes, specific to water content, as part of an investigation completed in 2022 (Report No. 2022-003), the Investigation obtained a sample of E5[8] unleaded petrol (MOGAS), which was in use in Ireland at the time. This sample, which was obtained from a petrol station, was analysed in a laboratory on the same morning it was obtained. The laboratory found that the sample in that case had a water content of 202 ppm.

E10[9] petrol was introduced in Ireland in 2023 and is now the standard petrol sold at petrol stations in Ireland. Ethanol is hygroscopic and therefore, petrol containing ethanol attracts and absorbs moisture from the atmosphere. To determine a typical water content of E10 petrol, on 13 August 2025, the Investigation obtained a sample from a petrol station and immediately had it analysed in a laboratory. The laboratory identified that it had a water content of 334 ppm.

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[6] **EN228:** The European Standard for unleaded automotive petrol (gasoline), which specifies requirements and test methods for unleaded petrol.

[7] The grade of automotive gasoline (winter or summer) sold at motor vehicle fuel stations depends on the time of year. Summer grade has a lower volatility than winter grade to limit evaporative losses due to expected higher ambient temperatures.

[8] **E5:** Automotive gasoline containing 5% ethanol.

[9] **E10:** Automotive gasoline containing 10% ethanol.

1.11 Airfield Information

ILAS Field, from where the Gyrocopter took-off, is located in Taghmon, Co. Wexford, in the south-east of Ireland. According to the airfield's information sheet, which is available on the ILAS website, the airfield's single grass runway is orientated in the 36/18 direction and the airfield elevation is '*140 ft* [feet]*: 43 m*' AMSL. The Take-Off Distance Available (TODA) for RWY 18, which was used during the subject take-off, is quoted as 600 m. The Landing Distance Available (LDA) is noted to be 540 m.

1.12 Meteorological Information

The estimated meteorological conditions for Taghmon at the time of the accident, as provided by *Met Éireann*, the Irish meteorological service, are outlined in **Table No. 2**.

Meteorological Situation:	Ireland lies in a moderate south to south-west airflow between high pressure over central Europe and low pressure near Iceland.
Surface Wind: **Wind at 2,000 ft:** **Between Surface and 300 ft:**	South-westerly, 10-14 knots (kt), with gusts up to 18-20 kt South-westerly, 20 kt Similar to surface
Visibility:	20+ kilometres (km)
Weather:	Dry and warm with sunny spells
Cloud:	Scattered (3-4/8ths) fair weather clouds with bases around 1,500 ft
Surface Temperature/Dew Point:	19/15 degrees Celsius
Mean Sea Level (MSL) Pressure:	1013 hPa (Hectopascals)
Freezing Level:	11,000 ft

Table No. 2: Estimated meteorological conditions at Taghmon at the time of the occurrence

1.13 Carburettor Icing

Carburettor ('*carb*') icing is discussed in depth in numerous AAIU reports and other publications, including a Safety Sense Leaflet (No. 14)[10] on '*Piston Engine Icing*', published by the UK Civil Aviation Authority (CAA) (updated in June 2023) and a Safety Promotion Leaflet (GA 5)[11] on the same subject, which was published by the European General Aviation Safety Team (EGAST) and is available on the European Union Aviation Safety Agency (EASA) website. Carburettor icing affects aircraft in which the fuel and air mixture is delivered to the engine via a carburettor, as is the case with the subject Gyrocopter, and has been identified as the probable cause in several occurrences.

[10] https://www.caa.co.uk/media/j5omfigm/ssl-14_piston-engine-icing.pdf (Accessed November 2025).
[11] https://www.easa.europa.eu/en/document-library/general-publications/egast-leaflet-ga-5-piston-engine-icing (Accessed November 2025).

Probability charts for carburettor icing published by the UK CAA and by the Australian Civil Aviation Safety Authority (CASA) indicate that for the temperature and dew point on the day of the occurrence, there was a potential for moderate icing at cruise power and serious icing at descent power. In the notes attached to the CASA chart, it is stated that '*Carburettor icing is more likely at partial power settings because of the cooling effect of a partly-closed throttle butterfly*'.

The UK CAA's Safety Sense Leaflet notes that '*The ice will constrict the venturi and throttle valve, reducing the amount of fuel-air mixture flowing to the engine. The mixture will also tend to become richer. Power is often lost gradually, going unnoticed until a large amount of ice is present*'.

A chart including similar information to that published by the UK CAA is contained in Transport Canada's (Canadian Airworthiness Authority) Aeronautical Information Manual (TP 14371E, 2025-1). The following warning is included on that chart: '[The] *chart is not valid when operating on MOGAS. Due to its higher volatility, MOGAS is more susceptible to the formation of carburetor icing. In severe cases, ice may form at OATs* [Outside Air Temperatures] *up to 20° C higher than with AVGAS*[12]*'*. Transport Canada's Aeronautical Information Manual notes that '*carburetor icing will occur at high power settings as well as during descents with reduced power*'.

2. AAIU COMMENT

The Pilot reported that after take-off on the accident flight, in a climbing left turn, the engine lost power and that exercising the throttle lever had no effect. Subsequent examination of the fractured propellor blades indicated that the engine was not operating under power at the time of impact.

The Pilot informed the Investigation that he topped up the fuel tank before performing a 30-minute local flight earlier on the day of the accident, and that the Gyrocopter had operated normally on that flight. The Pilot said that that he checked the fuel quantity prior to the subsequent flight (the accident flight). A smell of fuel was reported to be present at the accident site, which may indicate that due to the orientation of the wreckage, fuel had leaked from the fuel tank following the accident. On arrival at the accident site, when the wreckage was repositioned the right-way-up, the Investigation drained approximately 7 L of fuel from the tank. Therefore, the Investigation considers that the engine power loss was not due to fuel exhaustion.

It was observed during on-site wreckage examination that the electrical wire from the ignition coil to the contact breaker points and capacitor had detached from the electrical terminal on the coil but had remained loosely connected due to it being secured with lacing wire. When the wire was refitted, it was found to be secure. It was also observed that the engine's distributor cap had partially dislodged from the distributor. When the distributor cap was refitted, the clips were found to operate satisfactorily. Furthermore, a photograph taken of the Gyrocopter when it was on its take-off roll on the accident flight, indicated that the wire and distributor cap were correctly positioned and secure. It is therefore likely that the wire and distributor cap were disturbed during the impact sequence and were not factors in the engine power loss.

[12] **AVGAS:** Aviation Gasoline is a fuel specifically developed for aviation and does not contain ethanol.

Subsequent wreckage examination did not identify any anomalies with the fuel system and no further anomalies with the ignition system. Moreover, following the installation of a replacement propellor, the engine was successfully started and was found to run and accelerate smoothly as the throttle lever was exercised. Therefore, the Investigation considers it unlikely that the engine power loss was due to a technical defect.

The Pilot said that he heard mention at the airfield that other pilots had been experiencing carburettor icing on the day of the accident. Carburettor icing probability charts indicate that there was a potential for moderate icing at cruise power and serious icing at descent power in the estimated ambient temperature and dew point conditions. A warning contained on the chart produced by Transport Canada states that it is '*not valid when operating on Mogas*', which is '*more susceptible to the formation of carburettor icing*'. Therefore, when MOGAS is used carburettor icing can occur at a wider range of conditions than those indicated by the charts. The increased water content of the fuel, as identified during laboratory analysis, may have further increased the susceptibility to carburettor icing.

The Investigation considers that, as no technical defects were identified during the post-accident examination of the Gyrocopter and its engine, and because the engine was subsequently operated successfully, it is possible that the engine power loss experienced during the accident flight was due to carburettor icing. The Investigation notes that as the Gyrocopter was not fitted with a carburettor heating system, there was no facility available to proactively address the threat posed by carburettor icing.

The engine power loss occurred following take-off, in a climbing left turn, when the engine would have been at a high-power setting. While carburettor icing typically results in a gradual loss of power at lower power settings, it can also occur at high power settings. In this case, the Pilot reported holding for several minutes before take-off, and it is possible that carburettor ice began to form at that stage and only manifested itself during the subsequent take-off and climb.

The Gyrocopter sustained substantial damage in the accident sequence. However, the Pilot's use of a helmet, flight suit and four-point harness likely prevented injury.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

Produced by the Air Accident Investigation Unit

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