AIRCRAFT ACCIDENT INVESTIGATION REPORT

September 25, 2025
Adopted by the Japan Transport Safety Board
Chairperson RINOIE Kenichi
Member TAKANO Shigeru
Member MARUI Yuichi
Member SODA Hisako
Member TSUDA Hiroka
Member MATSUI Yuko

Company	NPO Hanyu Soaring Club
Type, Registration Mark	Diamond Aircraft HK36R Super Dimona (Motor Glider, Two-Seater)、JA36HK
Accident Class	Aircraft damage caused by forced landing
Date and Time of the Occurrence	At about 11:28 Japan Standard Time (JST: UTC+9 hours), November 19, 2023
Site of the Accident	Hanyu Glider Port, Hanyu City, Saitama Prefecture (36° 12' 15" N, 139° 35' 44" E)

1. PROCESS AND PROGRESS OF THE ACCIDENT INVESTIGATION

Summary of the Accident	On Sunday, November 19, 2023, the glider's engine power was reduced immediately after taking off from Hanyu Glider Port. The glider then attempted a forced landing on the grass area beside the Glider Port, resulting in damage to the glider.
Outline of the Accident Investigation	On November 24, 2023, the Japan Transport Safety Board (JTSB) designated an investigator-in-charge and an investigator. Comments on the draft Final Report were invited from the parties relevant to the cause of the accident and the Relevant State.

2. FACTUAL INFORMATION

Aircraft Information

Aircraft type :	Diamond Aircraft HK36R Super Dimona
Serial number: 36349	Date of manufacture: November 6, 1991
Airworthiness certificate: No.2023-52-01	Validity: March 26, 2024
Engine type:	Rotax 912S2-01
Serial number: 9563648	Date of manufacture: November 6, 2015
Total time in service:	505 hours 45 minutes (equipped on December 5, 2015)

Personnel Information

Pilot: Age 77

Commercial pilot certificate (Motor Glider)	July 24, 1998
Pilot competency assessment	
Expiration date of piloting capable period:	June 1, 2025
Class 1 aviation medical certificate	Validity: August 11, 2024
Total flight time (Glider, Motor Glider)	4,386 hours 30 minutes
Flight time in the last 30 days	5 hours 30 minutes
Flight time on the type of aircraft	about 1,400 hours 00 minute
Flight time in the last 30 days	0 hour 40 minutes
Second class aircraft maintenance technician certificate (High Class Glider)	September 12, 1996

Mechanic A: Age 43

Second class aircraft maintenance technician certificate (Motor Glider)	February 4, 2020

Meteorological Information

Around the time of the accident, the observation values at Automated Meteorological Data Acquisition System in Tatebayashi, which is located about 9.5 km northwest of the accident site, were as follows:

11:30 Wind direction: West-northwest, Wind velocity: 4.4 m/s

Event Occurred and Relevant Information

(1) History of the Flight

About at 09:00, the pilot and the mechanic, who belonged to the same club (hereinafter referred to as "Mechanic A") moved the glider from the hangar near Hanyu Glider Port in Hanyu City, Saitama Prefecture. They installed the carburetor that had returned from maintenance overhaul in the glider and conducted the pre-flight inspection. After that, they performed an engine run-up for about 15 minutes and confirmed that there were no anomalies. About 11:20, with only the pilot on board, the glider began the first take-off from the Glider Port to the magnetic direction of 330°, in order to tow another glider (JA21HB, Alexander Schleicher ASK21). However, the pilot aborted the take-off after feeling that the engine's rotation speed had decreased during the take-off roll and observing that the required airspeed for take-off had not been reached. As the glider aborted the take-off, the towed glider floated, released the towing line, and landed.

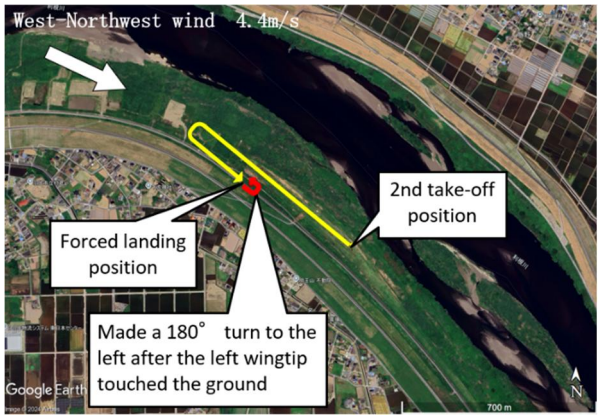

Figure 1: Estimated Flight Route

After that, the pilot returned the glider to its take-off position and ran its engine at close to the maximum RPM and found no engine anomalies. As the pilot thought that there would be no problem with the carburetor, which had just returned from the overhaul maintenance, the pilot did not inspect the engine in accordance with the engine maintenance manual (which states that the fuel filter on the fuselage should be inspected for foreign objects when the engine output is reduced) and the glider took off alone for the second time.

When the glider reached the above ground level (AGL) altitude of about 10 m, the sound of the engine changed suddenly, and the engine RPM dropped. The pilot made a left turn to return to the runway, however, as AGL altitude was reduced during the approach, the pilot decided to

make a forced landing. Just before the forced landing, the left wingtip touched the ground beside the runway, and the glider made a forced landing, (see Figure 1) while making a 180° turn to the left. According to the pilot, the glider's propellers were still rotating, and the engine had not stopped just before the forced landing.

(2) Glider Damage

Substantial damage

- The fuselage tail and horizontal stabilizer attachment were broken (see Figure 2).
- Scratch marks were found on both wing tips and the right side of the horizontal stabilizer.
- The right main wheel was detached.
- One of the two propeller blades was damaged.

Figure 2: The Glider after the Accident

(3) Fuselage and Engine

The gasoline is used to fuel the glider's engine, and Figure 3 shows its fuel system. The filter in the electric fuel pump (hereinafter referred to as "the filter") was examined during the investigation and it was found that foreign objects had adhered to the filter and inside of the electric fuel pump, blocking the fuel supply (see Figure 4). A detailed examination of the foreign objects collected from the filter using an optical microscope revealed the presence of metal powder, fibers, and others.

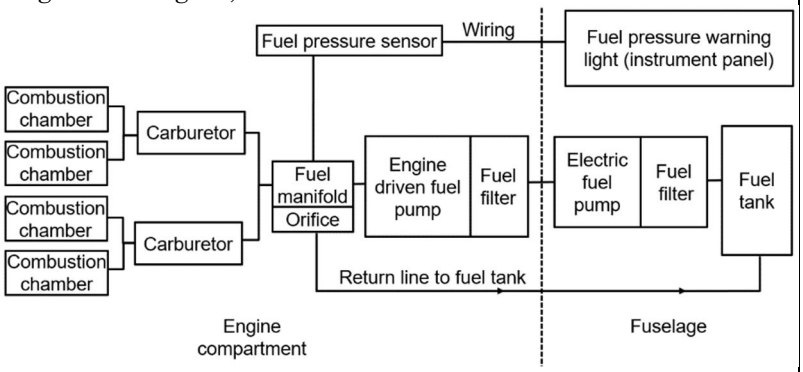

Figure 3: Fuel System

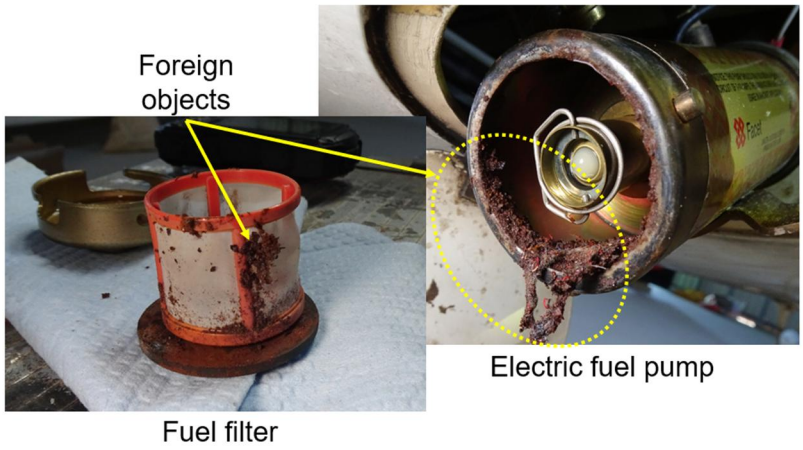

Figure 4: Foreign Objects in the Electric Fuel Pump and the Filter

The glider's fuel pressure sensor is built into the fuel manifold. As shown in Figure5, a fuel pressure warning light is mounted in the center of the instrument panel. The red fuel pressure warning light is designed to illuminate as soon as the fuel pressure falls below the specified value. However, according to the pilot's statement, during the engine replacement work on the glider on December 5, 2015, the shape of the wiring connection terminal on the glider side of the fuel pressure warning light did not match the shape of the fuel pressure sensor on the engine side, making it impossible to connect the two. As a result, the fuel pressure sensor was removed and the warning light did

Figure 5: Fuel Pressure Warning Light

not illuminate.

Besides, the orifice that adjusts the pressure of the fuel supplied from the fuel manifold by restricting the fuel flow returning from the fuel manifold to the fuel tank had been removed, instead, the fuel manifold and the return line were connected with a fitting that was not a genuine part of the glider. According to the statements of the pilot and Mechanic A, they did not remember the work involving the removal of the orifice.

Furthermore, the more than half of the fuel remained in the fuel tank, and it was confirmed that there was no moisture into the fuel system and no fuel leaking from the piping.

(4) Maintenance History of the Glider

The pilot purchased the glider second-hand in October 2006. The pilot performed most of the daily inspections and regular maintenance work on the glider. The previous mechanic reviewed the maintenance records from December 2006 to January 2020 and Mechanic A has reviewed ones since September 2020.

The aircraft maintenance manual states that the filter should be inspected every 100 flight hours. According to the pilot and Mechanic A, the filter had never been inspected or cleaned. However, the maintenance records indicated that the 100 hours regular inspection including the filter inspection had been performed. Additionally, a serious incident involving the glider occurred at Matsuyama Airport on December 21, 2019 (Report Number: AI2022-1-1). This incident was caused by the failure to perform maintenance in accordance with the engine maintenance manual.

(5) Fuel Feed

The fuel for the glider was purchased at a fueling station on the day of the flight, and any surplus fuel was stored in a fuel carrying can in the warehouse near the Glider Port to be used on the next flight. The inside of the fuel carrying can was inspected and slight corrosion was observed on its inner wall. In addition, when refueling the glider, the pilot would attach a refueling nozzle to the fuel carrying can and wrapping commercially available unwoven fabric around the nozzle's tip to prevent foreign objects from entering the fuel.

3.ANALYSIS

(1) Development of the Damage to the Glider

The JTSB concludes that among the damage to the glider, the broken fuselage tail, which would require major repairs, was more likely caused because the glider attempted to make a forced landing on the area beside the runway due to the reduced engine power during take-off, then its left wing tip touched the ground, and its fuselage tail came into hard contact with the ground while it was making a 180° turn to the left.

In addition, the glider was required to make a forced landing during take-off was probably because, despite the engine anomaly found during the first flight, the glider took off again to check the engine operation in the air, without undergoing an inspection in accordance with the engine maintenance manual on the ground. Pursuant to the confirmation before departure stipulated in Article 73-2 of the Civil Aeronautics Act, the pilot should have conducted a thorough inspection of the engine on the ground before take-off.

(2) Reduced Engine Power

The JTSB concluded that it is probable that the fuel pressure of the glider was constantly low due to the return line orifice having been removed. This investigation did not establish when the orifice had been removed. In addition, as this orifice was not subject to regularly inspection, it was highly probable that neither the pilot nor Mechanic A would have noticed that the orifice had

been removed.

During the take-off roll and the take-off, the engine power of the glider had been probably reduced because foreign objects had clogged the glider's fuel filter, resulting in impeding fuel flow, reducing the amount of fuel supplied to the engine, and preventing the required amount for take-off from being provided. The pilot would have most likely failed to notice the fall in fuel pressure because the glider's fuel pressure sensor had been removed and the fuel pressure warning light would not illuminate. The case in which the fuel pressure sensor was removed, and the fuel pressure warning light did not illuminate does not comply with the airworthiness standards set out in Article 10, paragraph (4) of the Civil Aeronautics Act.

In general, aircraft users are required to undergo inspections and other procedures pursuant to the Civil Aeronautics Act after confirming the aircraft designer's opinion when making modifications that include removing parts (changes from approved design).

(3) Foreign Objects into Fuel System

The JTSB concludes that the fabric collected from the filter was most likely part of the unwoven fabric that the pilot had used by wrapping around the nozzle tip during refueling, which had then entered the fuel tank. Regarding the metal powder, it is possible that the metal powder produced by corrosion of the fuel carrying can might have flown into the fuel tank with the fuel through the frayed texture of the unwoven fabric.

When refueling using a fuel carrying can, aircraft users should regularly check the fuel carrying can for corrosion. In addition, wrapping commercially available unwoven fabric around the nozzle tip during refueling could result in the frayed unwoven fabric entering the fuel tank to be foreign objects, which should be avoided.

(4) Inspection, Maintenance and Failure Investigations

The JTSB concludes that the filter was most likely clogged because the inspection and cleaning of the filter were not conducted as specified in the aircraft maintenance manual during the regular maintenance work. However, the most recent work record had a check mark indicating that the inspection and cleaning of the filter had been done.

Aircraft users must perform inspections and maintenance in accordance with the aircraft and engine manuals, and conduct troubleshooting when malfunctions occur. The mechanics should also thoroughly confirm the aircraft's conformity to airworthiness standards pursuant to the provision of Article 19, paragraph (2) of the Civil Aeronautics Act. And when performing inspections and maintenance, the mechanics should record whether or not the inspection items were performed and whether or not they passed.

4.PROBABLE CAUSES

(1) The JTSB concludes that the probable cause of this accident was that it is probable that the glider attempted to return to the runway and make a forced landing due to the reduced engine power after take-off, then its left wing tip touched the ground beside the runway immediately before the forced landing, and the glider touched down while turning left, resulting in a broken fuselage tail. Despite the engine anomaly being found during the first flight, the glider took off again to check the engine operation in the air, without undergoing an inspection in accordance with the engine maintenance manual on the ground, which was more likely to have contributed to the accident.

(2) It is probable that the orifice of the glider's engine had been removed, and in this condition, the filter became clogged, and the fuel pressure did not increase, which prevented the required amount of fuel from being provided for take-off and caused reduced engine power. It is possible that the filter became clogged due to unwoven fabric that had wrapped around the tip of the refueling nozzle and corrosion inside the fuel carrying can. It is most likely that the filter inspections and others had not been conducted, resulting in the filter remaining clogged.

(3) The pilot would have most likely failed to notice the fall in fuel pressure because the glider's fuel pressure sensor had been removed and the warning light would not illuminate.

5. SAFETY ACTIONS

Safety Actions Considered Necessary

(1) In the event of a takeoff abort due to engine failure or other causes, appropriate inspections, maintenance, and failure investigations must be conducted in accordance with the maintenance manuals for the aircraft and engines.

In addition, when the maintenance work is performed, it must be conducted in accordance with the procedures set out in the maintenance manual. It is also necessary for the mechanics to confirm the maintenance work properly and complete the maintenance records correctly.

(2) Aircraft users must perform appropriate daily inspections and regular maintenance in accordance with the aircraft and engine maintenance manuals. When conducting maintenance or modifications that differ from the manufacturers' approved procedures, aircraft users should fully confirm that there will be no problems including by seeking confirmation from the manufacturers.

(3) Adequate management is required when refueling and storing fuel to prevent contamination by foreign objects, which includes confirming that there is no corrosion in the fuel carrying can and that there are no foreign objects adhering to the tip of the refueling nozzle.