الهيئة العامة للطيران المدني
GENERAL CIVIL AVIATION AUTHORITY

Air Accident Investigation Sector

Accident

- Preliminary Report -

AAIS Case Nº AIFN/0016/2024

Helicopter Severe Vibration Upon Touchdown

Operator: Falcon Aviation Services
Make and Model: AgustaWestland, A109E
Nationality and Registration: The United Arab Emirates, A6-ONE
Place of Occurrence: Private Helipad, Al Badayer, Sharjah
State of Occurrence: The United Arab Emirates
Date of Occurrence: 21 December 2024

Accident Brief

AAIS Report No.:	AIFN/0016/2024
Operator:	Falcon Aviation Services (FAS)
Aircraft Type and Registration:	AgustaWestland A109E, A6-ONE
MSN:	11654
Number and Type of Engines:	Two engines, PW206C Pratt & Whitney Canada
Date and Time (UTC):	21 December 2024
Location:	Al Badayer, Sharjah, the United Arab Emirates
Type of Flight:	Private operation
Persons Onboard:	1
Injuries to Passengers and Crew:	None
Other Injuries:	None
Nature of Damage:	Main rotor separation and structural damage

Investigation Objective

This Investigation is conducted pursuant to the United Arab Emirates Federal Act No. 20 of 1991, promulgating the Civil Aviation Law, Chapter VII - *Aircraft Accidents*, Article 48. It is in compliance with the *Air Accident and Incident Investigation Regulation* (*AAIR*), and in conformity with *Annex 13* to the Convention on International Civil Aviation.

The sole objective of this Investigation is to prevent aircraft accidents and incidents. It is not the purpose of this activity to apportion blame or liability.

The information contained in this Preliminary Report is derived from the data collected during the ongoing investigation of the Accident. Later Interim Statements, if any, or the Final Report may contain altered information in case of appearance of new evidence during the ongoing investigation.

Investigation Process

The occurrence involved an Agusta 109, registration marks A6-ONE, and was notified by the Safety Manager of Falcon Aviation Services (FAS) to the Air Accident Investigation Sector (AAIS) Duty Investigator (DI) hotline number +971 50 641 4667.

An Investigation team was formed in line with the *Annex 13* obligations of the United Arab Emirates being the State of Occurrence, State of Registry, and State of the Operator.

The AAIS notified the Agenzia Nazionale per la Sicurezza del Volo (ANSV) of Italy, being the State of the Manufacture and Design, and the Transportation Safety Board (TSB) of Canada,

being the State of engine manufacture. The ANSV assigned an accredited representative assisted by an adviser from Leonardo S.p.A.

This Preliminary Report is publicly available at:

https://www.gcaa.gov.ae/en/departments/airaccidentinvestigation/invigation-reports

Notes:

1 Whenever the following words are mentioned in this Report with the first letter Capitalized, it shall mean:

- (Accident) – this investigated accident
- (Helicopter) – the helicopter involved in this accident
- (Pilot) – the pilot of this accident flight
- (Investigation) - the investigation into this accident
- (Operator) – Falcon Aviation Services
- (Report) – this Preliminary Report.

2 Unless otherwise mentioned, all times in this Report are in local time of the United Arab Emirates (Local time equals coordinated universal times (UTC) plus 4 hours).

3 Photos and figures used in the text of this Report are taken from different sources and are adjusted from the original for the sole purpose to improve clarity of the Report. Modifications to images used in this Report are limited to cropping, magnification, file compression, or enhancement of color, brightness, contrast or insertion of text boxes, arrows or lines.

Abbreviations and Definitions

AAIR	*Air Accident and Incident Investigation Regulation* of the United Arab Emirates
AAIS	The Air Accident Investigation Sector of the United Arab Emirates
AIFN	Accident/incident file number
ANSV	Agenzia Nazionale per la Sicurezza del Volo of Italy
AOC	Air operator certificate
ATC	Air traffic control
ATPL-H	Air transport pilot license-Helicopter
CAR	*Civil Aviation Regulations of the United Arab Emirates*
COA	Certificate of airworthiness
COR	Certificate of registration
CSI	Cycles since installed
CSN	Cycles since new
CSO	Cycles since overhaul
CVR	Cockpit voice recorder
FDR	Flight data recorder
GCAA	The General Civil Aviation Authority of the United Arab Emirates
ICAO	The International Civil Aviation Organization
MSN	Manufacturer serial number
MLW	Maximum landing weight
MTOW	Maximum takeoff weight
MZFW	Maximum zero fuel weight
OMAA	Zayed International Airport
OMAD	Al Bateen Executive Airport
OMDW	Al Maktoum International Airport
OMFJ	Fujairah International Airport
TSB	The Transport Safety Board of Canada
TSI	Time since installed
TSN	Time since new
TSO	Time since overhaul
UAE	The United Arab Emirates
UTC	Coordinated universal time

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1. Factual Information

1.1 History of the Flight

On 21 December 2024, at about 0828 local time of the United Arab Emirates (0428 UTC), the Pilot of AgustaWestland A109E Helicopter, registration marks A6-ONE, contacted Al Bateen Executive Airport (OMAD) Tower to request clearance for engine start for a single-pilot private flight to Fujairah International Airport (OMFJ), the United Arab Emirates. The Tower controller acknowledged the request and provided weather information. The Pilot, who occupied the right seat, was the only person onboard.

At 0829:06, the Tower controller asked the Pilot to confirm whether the stop in Fujairah would be for a full stop or just passenger pickup. The Pilot confirmed it would be a full stop and mentioned the plan to return to OMAD, estimated at about 1400. The Tower controller then provided clearance to zone boundary join Alpha Delta 1 route at an altitude of 1,500 feet or below and to set the transponder to squawk 0473. The Pilot correctly read back the clearance.

At 0836:15, the Tower controller provided take-off clearance, navigated a route with a right turn after departure, and instructed to report at east Mangroves. Thereafter, the Helicopter flew towards Ghantoot, and upon passing south of Ghantoot, a right turn was made to join Minhad Airspace as coordinated between OMAA Approach INFO and Al Maktoum International Airport (OMDW) Approach control. The Helicopter was cleared to operate at 1,500 feet or below and to avoid Ghantoot and KIZAD airspace.

The Helicopter made an intermediate landing at a heliport located in Al Badayer area, Sharjah, about 24 nautical miles southeast of Sharjah International Airport, to pick up passengers. The Pilot stated that the landing was into a headwind and proceeded normally.

However, upon touchdown, the Helicopter experienced severe rocking oscillations for about six seconds, making control inputs impossible. The intense vibration caused the main rotor and part of the gearbox to detach, coming to rest about 29 meters away from the main body of the Helicopter. According to the Pilot, he was unable to shut down the engines and struggled to maintain grabbing the controls. One of the blades detached from the hub and was found about 14 meters from the main rotor. The Helicopter sustained structural damage and came to rest facing 228 degrees, with about 12-degree rightward tilt, caused by damage to the right main landing gear and the detachment of its wheel.

1.2 Injuries to Persons

The Pilot vacated the Helicopter safely with no injuries.

1.3 Damage to the Helicopter

The Helicopter was substantially damaged due to the severe vibration (figure 1).

1.4 Other Damage

The helipad was damaged due to a ditch caused by the helicopter's right main landing gear becoming embedded in the ground.

1.5 Personnel Information

The qualifications and experience of the Pilot at the time of the Accident were as shown in table 1.

Table 1. Pilot data	
	Pilot
Age	56
Type of license	ATPL-H (air transport pilot license for helicopter)
Valid to	24 February 2030
Rating	A109, AS350/EC130/EC134, AW169
Total flying time (hours)	6,014.1
Total command on this type (hours)	2,048.47
Total last 12 months (hours)	134.19
Total last 90 days (hours)	53.45
Total last 28 days (hours)	30.3
Total last 7 days (hours)	8.55
Total last 24 hours (hours)	2.3
Last recurrent training	4 November 2024
Last proficiency check	4 November 2024
Last line check	26 March 2024
Medical class, validity	Class 1, 15 April 2025
Medical limitation	VML[1]
English language proficiency (ELP)	Level 5

1.6 Helicopter Information

1.6.1 General data

Table 2 illustrates the Helicopter general data as of the date of the Accident.

Table 2. Helicopter data		
Manufacturer:		AgustaWestland S.p.A
Model:		A109E
MSN:		11654
Date of manufacture:		January 2006
Nationality and registration:		United Arab Emirates, A6-ONE
Name of the Operator:		Falcon Aviation Services
Certificate of airworthiness		
	Number: Issue date:	UAE-COA-0388 31 March 2016
Airworthiness Review Certificate		

[1] VML — Wear multifocal spectacles and carry a spare set of spectacles: Correction for defective distant, intermediate and near vision: whilst exercising the privileges of the license, the license holder should wear spectacles that correct for defective distant, intermediate and near vision as examined and approved by the AeMC or AME. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn.

	Number: Valid to:	ARC-FAS-ONE-9 11 February 2025
Certificate of registration		
	Number: Issue date:	UAE-COR-0912 29 March 2016
Date of delivery		19 May 2014
Time since new (TSN) (hours)		1,604
Cycles since new (CSN)		3,821
Cycles since last service check		26
Last major inspection check, type, date and hours/cycles		800 hours, 12 months inspection, 9 August 2024, at 1,545.83 hours / 3,806 cycles
Time since last major inspection		58.01 hours
Cycles since last major inspection		150 cycles
Last inspection, type, date and hours/cycles:		7-day-MRB lubrication, 18 December 2024, at 1,597 hours / 3,671 cycles
Maximum takeoff weight (MTOW) (kg)		2,850
Maximum landing weight (MLW) (kg)		2,850
Maximum zero fuel weight (MZFW) (kg)		2,162
Take-off fuel weight (kg) (for the Accident flight)		520
Landing fuel weight (kg) (for the Accident flight)		360

1.6.2 Engines' data

Table 3 illustrates the engine data.

Table 3. Engine data

Engine manufacturer	Pratt & Whitney	
	No.1 engine	No.2 engine
Model	PW206C	PW206C
Serial number	PCE-BCO545	PCE-BCO546
Date installed	1 September 2005	1 September 2005
Time since new (hours)	1,604	1,604
Cycles since new	2,639	2,597
Time since last inspection (hours)	145.4	145

1.7 Meteorological Information

Table 4 describes the METAR for Sharjah International Airport on 21 December 2024, at 0900 LT which was given as below.

OMSJ 210500Z 18004KT CAVOK 17/10 Q1017 NOSIG

Table 4. Description of METAR

Wind	Direction 180 degrees, speed 4 knots
Visibility	10 kilometers or more, no clouds

OAT	17°C
Dew point	10°C
Pressure (Altimeter)	1017 mbar
Condition	No significant change of weather

No weather station was available at the landing site.

1.8 Aids to Navigation

The Helicopter was fitted with the required navigational equipment, and all ground and onboard navigation systems were fully operational.

1.9 Communications

All communications between air traffic control (ATC) and the Pilot were clear and normal.

1.10 Helipad Information

The helipad was not certificated and was constructed with bricks, lacking a base or foundation underneath. It had a rectangular shape, measuring 26.2 by 10.18 meters, and was located at coordinates N 24°58’10’’ and E 55°42’24’’.

No risk assessment was carried out for the helipad.

1.11 Flight Recorders

The Helicopter was not equipped with a flight data recorder (FDR) or cockpit voice recorder (CVR), and it was not required to be equipped with these recorders according to FDR/CVR relevant provisions in *CAR-OPS 3 − Commercial & Private Air Transportation (Helicopter)*.

1.12 Wreckage and Impact Information

The Helicopter was substantially damaged as a result of ground impact. The main rotor and part of the gearbox detached and rested at a distance of 29 meters from the main body. The right main landing gear was damaged and embedded in the ground with the wheel detached (figure 1).

Figure 1. Helicopter damage and wreckage distribution

1.13 Medical and Pathological Information

To be discussed in the Final Report.

1.14 Fire

There were no signs of fire.

1.15 Survival Aspects

The Pilot did not sustain any injuries.

1.16 Tests and Research

To be discussed in the Final Report.

1.17 Organizational and Management Information

Falcon Aviation Services commenced operations in 2006 in compliance with an air operator certificate (AOC) issued by the General Civil Aviation Authority of the United Arab Emirates (GCAA).

The details of this section will be discussed in the Final Report.

1.18 Additional Information

To be discussed in the Final Report.

1.19 Useful or Effective Investigation Techniques

The techniques employed during this Investigation will be outlined in detail in the Final Report.

2. Ongoing Investigation Activities

The Investigation is ongoing and will include further examination and analysis of:

- Helicopter's performance
- Helicopter's technical and engineering, including history of the maintenance
- Uncertified landing helipad and facilities
- Operator's policy, procedure, and management, including organizational factors
- Human factors aspects
- Any other safety aspects that may arise during the course of this Investigation.

All relevant factual information and its associated analysis, conclusions, and safety recommendations will be included in the Final Report.

3. Safety Concerns and Actions

The Air Accident Investigation Sector has identified safety issues during the Investigation and communicated them with the concerned entities. The potential contribution of these safety issues to the Accident will be analyzed and included in the Final Report. However, the Investigation will also assess any Prompt Safety Recommendations that are necessary before the Final Report is released, and if so, they will be addressed to the appropriate entity.

This Preliminary Report is issued by:

The Air Accident Investigation Sector
The United Arab Emirates.

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