

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10182						
Classification	Accident	Date	1 July 2022		Time	1400Z	
Type of Operation	Private (Part 94)						
Location							
Place of Departure	Potchefstroom Aerodrome (FAPS), North West Province		Place of Intended Landing		Brits Aerodrome (FABS), North West Province		
Place of Occurrence	Runway (RWY) 02 at Brits Aerodrome (FABS)						
GPS Co-ordinates	Latitude	25°32'10"S	Longitude	27°46'32"E	Elevation	3 750 ft	
Aircraft Information							
Registration	ZU-IKT						
Make; Model; S/N	Revolution Aviation Inc; RAI-6 Foxtrot (Serial number: F-014)						
Damage to Aircraft	Substantial			Total Aircraft Hours	37.7		
Pilot-in-command							
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	61
Licence Valid	Yes	Total Hours	1019.6		Total Hours on Type	11	
Total Hours 30 Days	0		Total Flying on Type Past 90 Days		232		
People On-board	1+1	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
<p>On Friday afternoon, 1 July 2022 at 1335Z, a pilot and a passenger on-board an RAI-6 Foxtrot high-performance amateur-built aircraft with registration ZU-IKT took off on a private flight from Potchefstroom Aerodrome (FAPS) in the North West province, to Brits Aerodrome (FABS) in the same province. Visual meteorological conditions (VMC) by day prevailed at the time of the flight and no flight plan was filed. The flight was conducted under the provisions of Part 94 of the Civil Aviation Regulations (CAR) 2011 as amended.</p> <p>Prior to departure at FAPS, the pilot conducted a pre-flight inspection on the aircraft, and nothing abnormal was found. The aircraft had about 150 litres (l) of Avgas 100LL fuel in the tanks. According to the pilot, take-off from FAPS proceeded as expected. The aircraft climbed to an altitude of 6500 feet (ft) and routed to FABS, cruising at 200 miles per hour (mph). Upon arrival at FABS, which is an unmanned airport, the pilot broadcasted his intention to land on frequency 124.2-Megahertz (MHz), thereafter, he joined Runway (RWY) 02 for a full-stop landing. The pilot stated that his approach was stable; and he landed the aircraft at a speed of between 65 and 70 knots (kts). However, during landing, the aircraft's nose gear strut failed. The duration of the flight was approximately 25 minutes.</p> <p>Witness marks of the failed nose gear strut were engraved on the runway surface starting from the point where the front gear was lowered. The aircraft was substantially damaged during the accident sequence. None of the occupants sustained any injuries.</p>							



Figure 1: The aircraft at the accident site. (Source: Operator)

Post-accident examination of the nose gear strut indicated the following:

The lower-end part of the nose gear, which is secured by a castellated nut and split pin, scraped against the runway surface due to the hard landing. This caused the lower-end of the nose gear as well as the castellated nut and split pin to shear and separate from the main nose gear strut.

The video footage taken by one of the pilots who was at the aerodrome at the time of the accident was sent to the manufacturer. The manufacturer stated that *“they had been using this nose gear strut type on aircraft since 2008 with no known failures.”* After the test pilot and a qualified pilot (from the manufacturer) had watched the video footage, they stated the following: *“Our impression was that the pilot dropped the plane in at a high angle-of-attack and allowed the nose to slam down, followed shortly by a nose wheel shimmy. The pitch attitude remained flat, indicating no attempt (by the pilot) to reduce weight on the nosewheel. The front gear then folded backward, and the aircraft skidded on the front of the wheel fork assembly. There appeared to be a dust cloud behind the left gear shortly after touchdown, and the aircraft finally veered off to the left of the runway and came to a full stop on the grass”.*



Figures 2 and 3: The sheared castellated nut (left) and the nose gear strut bottom area with a split pin. (Source: Operator)

to rotate the Nose Fork Assembly around the spindle. Secure the nut with the cotter pin called-out in Figure 2.

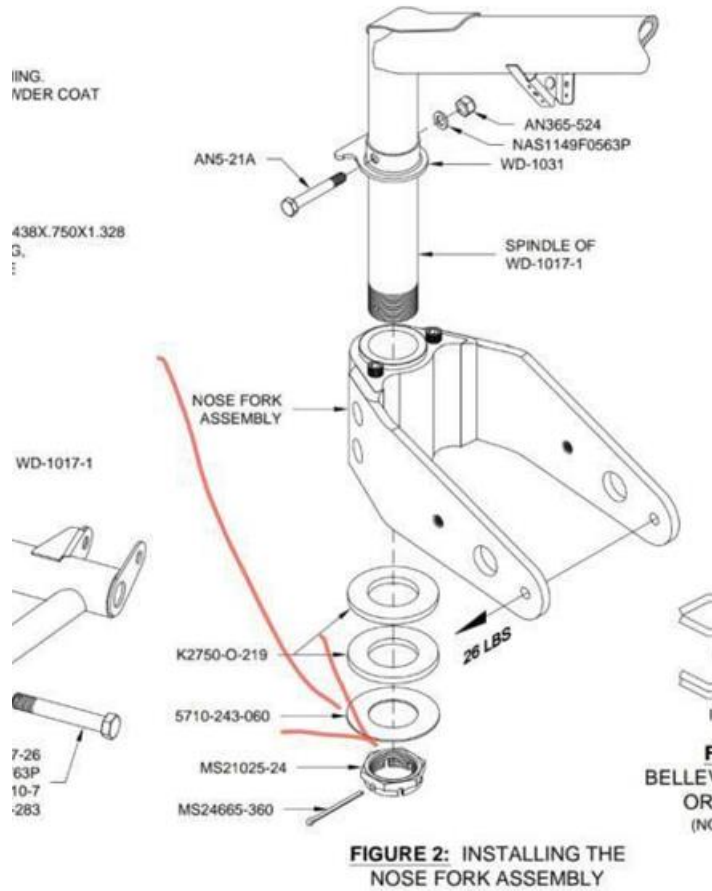


Illustration 1: The schematic diagram of the nose gear strut with the arrow showing the castellated nut. (Source: Illustrated Parts Catalogue)



Figure 4: The nose gear strut that bent backward. (Source: Operator)



Figures 5 and 6: The separated lower end part of the nose gear (left) and the skid marks on the runway surface (right). (Source: Operator)

Findings

The Pilot

The pilot was initially issued a Private Pilot Licence (PPL) on 21 May 2001. His last validation was conducted on 15 March 2022, and the licence was reissued with an expiry date of 31 March 2024. The RAI-6 Foxtrot aircraft type was endorsed on his licence. At the time of the accident, the pilot had flown a total of 1 019.6 hours, of which 11 hours were on the aircraft type. The pilot was licensed and qualified for the flight in accordance with the existing SACAA regulations.

The Aircraft

The last mandatory periodic inspection (MPI) was carried out on 20 March 2022 at 30 airframe hours. A further 7.7 hours were flown since the last MPI.

The Certificate of Registration (CoR) was issued to the current owner on 13 May 2022. The aircraft was issued an Authority to Fly (ATF) certificate on 26 April 2022 with an expiry date of 25 April 2023. The maintenance records indicated that the aircraft was equipped and maintained in accordance with Part 43 of the SACAA regulations.

There were no mechanical defects or anomalies with the aircraft's nose landing gear that could have contributed to or caused the accident.

Fine weather conditions prevailed at the time of the flight. The weather had no bearing to this accident.

Probable Cause

The aircraft descended at a high angle-of-attack, which caused the nose to slam down; this was followed shortly by a nose wheel shimmy. The pitch attitude remained flat, which indicated that no attempt was made to reduce the weight on the nose wheel. As a result, the front gear folded backward, and the aircraft skidded on its front wheel fork assembly.

Contributing Factor

Poor landing technique.

Safety Action(s)

None.

Safety Message and/or Safety Recommendation/s
None.
About this Report
<p><i>A decision to conduct a limited investigation was based on factors, including whether the cause is known and the evidence supporting the cause is clear, the level of safety benefit likely to be obtained from an investigation and that will determine the scope of an investigation. For this occurrence, a limited investigation has been conducted, and the Accident and Incident Investigations Division (AIID) has relied on the information submitted by the affected person/s and organisation/s to compile this limited report. The report has been compiled using information supplied in the initial notification, as well as from follow-up top desktop inquiries to bring awareness of potential safety issues to the industry in respect of this occurrence, as well as possible safety action/s that the industry might want to consider in preventing a recurrence of a similar occurrence.</i></p> <p><i>All times given in this report are Co-ordinated Universal Time (UTC) and will be denoted by (Z). South African Standard Time is UTC plus 2 hours.</i></p>
Purpose
<p><i>In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011 and ICAO Annex 13, this report was compiled in the interest of the promotion of aviation safety and the reduction of the risk of aviation accidents or incidents and not apportion blame or liability.</i></p>
Disclaimer
<p><i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i></p>

This report is issued by:

**Accident and Incident Investigations Division
South African Civil Aviation Authority
Republic of South Africa**