SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Section/division **Accident and Incident Investigations Division** Form Number: CA 12-57

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10562						
Classification	Accident	**Date**	12 March 2025		**Time**	1425Z	
Type of Operation	Private (Part 141)						
Location							
Place of Departure	Lanseria International Airport (FALA), Gauteng Province	Place of Intended Landing	Lanseria International Airport (FALA), Gauteng Province				
Place of Occurrence	Runway 25 at Lanseria International Airport (FALA), Gauteng Province						
GPS Co-ordinates	Latitude	25°55′51″S	Longitude	27°56′11″E	Elevation	4 521ft	
Aircraft Information							
Registration	ZS-SNR						
Make; Model; S/N	Piper Seneca II; PA-34-200T (Serial Number: 34-7970428)						
Damage to Aircraft	Substantial	Total Aircraft Hours	4 920.5				
Pilot-in-command							
Licence Type	Commercial Pilot Licence (CPL)	Gender	Male	Age	32		
Licence Valid	Yes	Total Hours	2 760	Total Hours on Type	21.3		
Total Hours 30 Days	55	Total Flying on Type Past 90 Days	6.7				
People On-board	2+0	**Injuries**	0	**Fatalities**	0	**Other (on the ground)**	0

What Happened

On Monday afternoon, 12 March 2025, a flight instructor (FI) and a pilot on-board a Piper Seneca PA-34-200T aircraft with registration ZS-SNR were conducting a type conversion training from Lanseria International Airport (FALA) in Gauteng province with the intention to land at the same airport. The pilot had a Private Pilot Licence (PPL). The flight was conducted under visual meteorological conditions (VMC) by day and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011 as amended.

The FI stated that they conducted a pre-flight inspection of the aircraft and no anomalies were identified. The pilot, who had a Private Pilot Licence (PPL), was the pilot flying (PF) at departure. The aircraft departed from FALA at approximately 1400Z. After take-off, the aircraft climbed to 1000 feet (ft) above ground level (AGL) and the pair flew four circuits and conducted four touch-and-go landings on Runway 25. During the fifth circuit, they prepared to make a full-stop landing on Runway 25.

The FI reported that during the downwind leg, they completed the pre-landing checks and confirmed the illuminated three green lights on the instrument panel, which indicated that all landing gears were extended and locked to position. The first stage flaps were selected and the aircraft was correctly configured for landing. On final approach for Runway 25, the aircraft was approximately 400ft AGL with 80 knots (kts) indicated airspeed (KIAS). The pilot continued the approach to land and entered the landing flare, the main landing gear wheels touched down first, followed by the nose landing gear wheel which collapsed during the landing roll. Subsequently, the propellers struck the runway and the aircraft skidded on its nose cone. The aircraft came to a stop on the runway, approximately 100 metres (m) from the initial touchdown point.

The aircraft sustained substantial damage to the nose cone and propeller blades. The FI and the pilot were not injured.

The accident occurred during daylight at Global Positioning System (GPS) co-ordinates determined to be 25°55′51″South 27°56′11″East, at an elevation of 4 521ft.

Figure 1: Aerial view of Lanseria International Airport and the accident site. (Source: Google Earth)

Figure 2: The aircraft at the accident site. (Source: Pilot)

Figure 3: The damaged nose cone. (Source: Pilot)

Figure 4: The bent propeller blades. (Source: Pilot)

Post-accident Investigation

The aircraft was recovered to a SACAA-approved aircraft maintenance organisation (AMO) and was placed on jacks so that gear retraction tests can be conducted. Access panels underneath the nose section were found undamaged; they were removed to gain access to the hydraulic pipes (for the nose landing gear). It was found that the pressurised MIL-H 5606 hydraulic fluid in the hydraulic retraction pipe was leaking. It seemed as though the hydraulic retraction pipe was rubbing against an object, possibly, the clamp that was located nearest to the leak. However, upon inspection, there was no evidence to support the assumption. The hydraulic fluid leak in the hydraulic retraction pipe was concealed by the access panels. The investigation determined that the leak could not have resulted from the impact damage during the accident sequence. The hydraulic pipes for the main landing gears were undamaged; they remained intact with no anomalies observed.

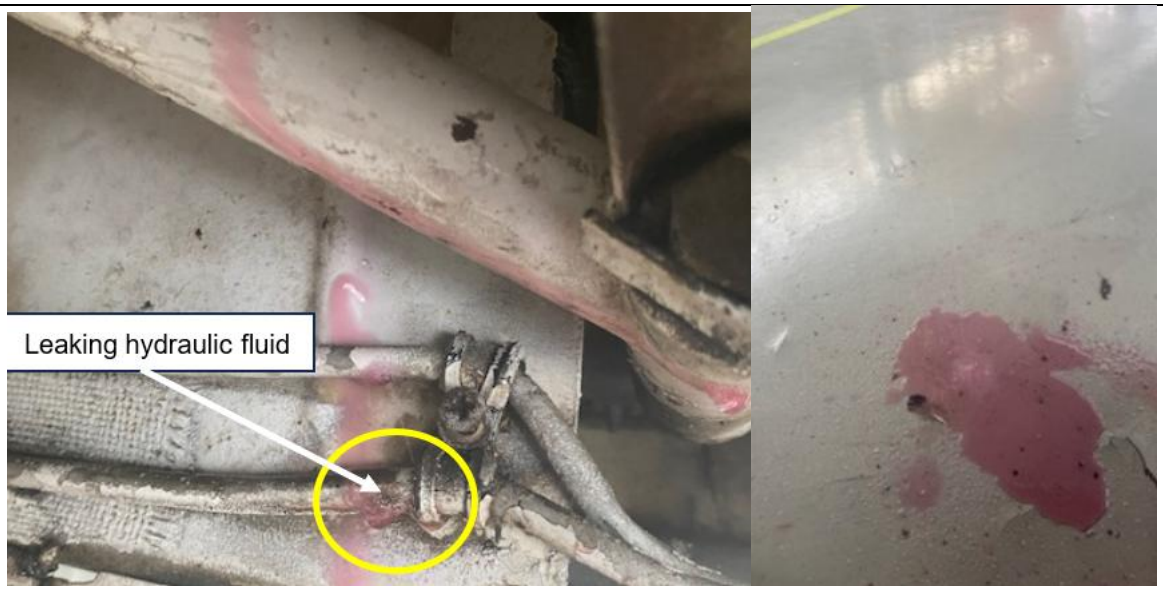

Figure 5: The yellow circle indicates a leak on the hydraulic retraction pipe.

Meteorological Information

The following official weather report was sourced from the South African Weather Service (SAWS) website.

Wind Direction	090º	Wind Speed	05 kt	Visibility	9999 m
Temperature	25ºC	Cloud Cover	Nil	Cloud Base	Nil
Dew Point	5ºC	QNH	1017hPa		

Description and Operation of the Landing Gear System (Source: Pilot's Operating Handbook)

The Seneca II aircraft is equipped with hydraulically operated, fully retractable, tricycle landing gear. Rugged gear construction and the heavy-duty braking system permit operation on a wide variety of ground surfaces. Hydraulic pressure for gear operation is furnished by an electrically powered, reversible hydraulic pump. The pump is activated by a two-position gear selector switch located to the left of the control quadrant on the instrument panel. The gear selector switch, which has a wheel-shaped knob, must be pulled out before it is moved to the "UP" or "DOWN" position. When hydraulic pressure is exerted in one direction, the gear is retracted; when it is exerted in the other direction, the gear is extended. Gear extension or retraction normally takes six to seven seconds. On take-off, when the landing gear oleo strut drops to its full extension, the safety switch closes to complete the circuit which allows the hydraulic pump to be activated to raise the landing gear when the gear selector is moved to the "UP" position. To prevent inadvertent gear retraction should the gear selector switch be placed in the "UP" position when the airplane is on the ground, a squat switch located on the left main gear will prevent the hydraulic pump from actuating if the master switch is turned on. During the preflight check, be sure the landing gear selector is in the "DOWN" position and that the

three green gear indicator lights are illuminated. On take-off, the gear should be retracted before an airspeed of 125 miles per hour (MPH) is exceeded. The landing gear may be lowered at any speed up to 150 MPH.

Maximum braking after touchdown is achieved by retracting the flaps, applying back pressure to the wheel and applying pressure on the brakes. However, unless extra braking is needed or unless a strong crosswind or gusty air condition exists, it is best to wait until turning off the runway to retract the flaps. This will permit full attention to be given to the landing and landing roll, and will also prevent the pilot's from accidentally reaching for the gear handle instead of the flap handle.

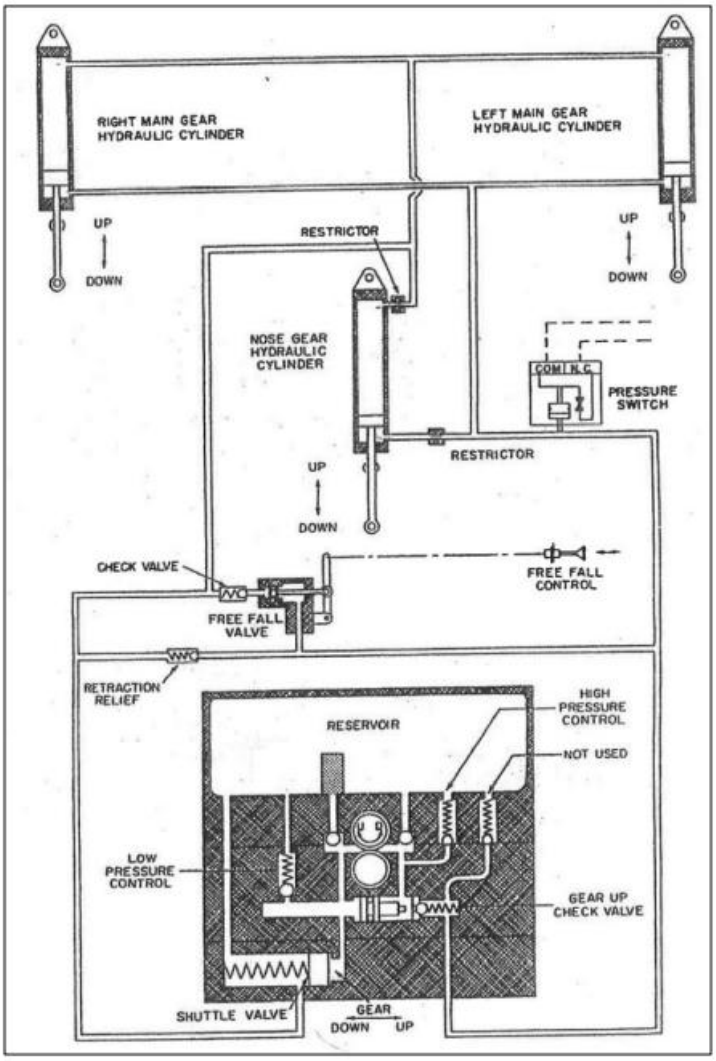

Diagram 1: Schematics of the landing gear hydraulic system.

Squat Switch Examination

The aircraft was fitted with a squat switch on the left main landing gear. The squat switch electrically isolates the landing gear hydraulics to prevent accidental gear operation when the aircraft is on the ground. The squat switch was examined and it was found serviceable.

Conclusion

A hydraulic retraction pipe for the nose gear with pressurised hydraulic fluid was found leaking. This caused the loss of hydraulic pressure required to keep the nose gear extended and locked to position, and thus, led to the collapse of the nose gear.

Findings

Personnel

1. The flight instructor (FI) had a Commercial Pilot Licence (CPL) that was initially issued on 27 September 2020. The licence was revalidated on 22 August 2024 with an expiry date of 30 September 2025. The aircraft type was endorsed on the instructor's licence.

2. The FI was issued a Class I aviation medical certificate on 20 August 2024 with an expiry date of 31 July 2025. The instructor was medically fit, qualified and authorised to conduct the flight.

3. The pilot was initially issued a Private Pilot Licence (PPL) on 29 July 2024 with an expiry date of 31 July 2025.

4. The pilot was issued a Class II aviation medical certificate on 12 April 2024 with an expiry date of 30 April 2029.

Aircraft

5. The aircraft's Certificate of Registration (C of R) was issued to the current owner on 17 December 2020. The Certificate of Airworthiness (C of A) was initially issued on 15 July 2010. The latest C of A was reissued on 16 July 2024 with an expiry date of 31 July 2025.

6. The last mandatory periodic inspection (MPI) of the aircraft was conducted and certified on 14 November 2024 at 4 837.7 total airframe hours. At the time of the accident, the aircraft had a total of 4 920.5 airframe hours. The aircraft had accrued 82.8 hours since the last MPI.

7. The aircraft was issued a Certificate of Release to Service (CRS) on 14 November 2024 at 4 837.7 airframe hours with an expiry date of 13 November 2025 or at 4 937.7 airframe hours, whichever occurs first. The aircraft was maintained by the SACAA-approved aircraft maintenance organisation (AMO). The AMO was issued an AMO Certificate on 8 August 2024 with an expiry date of 31 July 2025.

The approved training organisation (ATO) was issued an ATO Certificate on 31 March 2021 with an expiry date of 31 March 2026.

8. The aircraft's weight and balance calculations were within limits.
9. Fine weather conditions prevailed at the time of the flight; therefore, the weather was not a contributing factor in this accident.

Probable Cause

A leak in the pressurised hydraulic retraction pipe led to insufficient pressure to maintain the nose gear extension, resulting in the collapse of the nose gear.

Contributing Factors

None.

Safety Actions

None.

Safety Message and/or Safety Recommendation/s

None.

About this Report

The decision to conduct a limited investigation is 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 desk top enquiries 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.

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.

Purpose

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 to apportion blame or liability.

Disclaimer

This report is issued by:

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