

LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/2/3/10577						
Classification	Accident		Date	10 April 2025		Time	1507Z
Type of Operation	Training (Part 141)						
Location							
Place of Departure	Wonderboom Aerodrome (FAWB), Gauteng Province		Place of Intended Landing		Wonderboom Aerodrome (FAWB), Gauteng Province		
Place of Occurrence	On a field in Pumulani Agricultural Holdings, 3 nautical miles (nm) east of FAWB Runway 29						
GPS Co-ordinates	Latitude	25°39'27.11" S	Longitude	028°17'08.12" E	Elevation	4 072 feet	
Aircraft Information							
Registration	ZU-OIL						
Make; Model; S/N	Shadow Lite CC; Jabiru SP (Serial Number: 370)						
Damage to Aircraft	Substantial			Total Aircraft Hours		838.8	
Pilot-in-command							
Licence Type	Commercial Pilot Licence		Gender	Male		Age	41
Licence Valid	Yes	Total Hours	2 006.8		Total Hours on Type	158.3	
Total Hours Past 30 Days	23.9		Total Hours on Type Past 90 Days			4.9	
People On-board	2 + 0	Injuries	0	Fatalities	0	Other (on ground)	0
What Happened							
On Thursday afternoon, 10 April 2025, a flight instructor (FI) and a student pilot on-board a Jabiru SP with registration ZU-OIL took off on a training flight from Wonderboom Aerodrome (FAWB) in Gauteng province with the intention to land back at the same aerodrome. 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 flight instructor stated that they were airborne for approximately 30 minutes before they returned to FAWB after which they performed touch-and-go circuits on Runway 29. Shortly after rotation, the crew noted that the oil pressure indication had decayed, but the oil temperature remained constant. They turned on to right crosswind leg to join the circuit traffic whilst they monitored the oil pressure; they were number three for landing on Runway 29 as another aircraft which had experienced a radio failure was being escorted ahead of them. Whilst turning right base leg, the engine ran rough and stopped. The flight instructor broadcasted a Mayday call on FAWB tower frequency 118.35-Megahertz (MHz). At the time of the Mayday broadcast, the crew was 3 nautical miles (nm) from the threshold of Runway 29 and, thus, had to perform a forced landing on a field they had identified. The aircraft touched down on a field with overgrown grass (approximately 1 metre in height). Approximately 20m after touchdown, the nose gear collapsed, and the aircraft nosed over and came							

to rest in an inverted attitude. The aircraft sustained substantial damage. No person was injured during the accident.

The accident occurred during daylight, 3nm east of FAWB at Global Positioning System (GPS) co-ordinates determined to be 25°39'27.11" South 028°17'08.12" East, at an elevation of 4 072 feet (ft).



Figure 1: The yellow pin indicates the place where the aircraft came to rest, 3nm east of the threshold of Runway 29 at FAWB. (Source: Google Earth)



Figure 2: The landing path through the field before the aircraft nosed over.



Figure 3: The aircraft as it came to rest. (Source: Pilot)



Figure 4: A side view of the aircraft after the accident.



Figure 5: The lower fuselage and left horizontal stabiliser and elevator covered with engine oil.

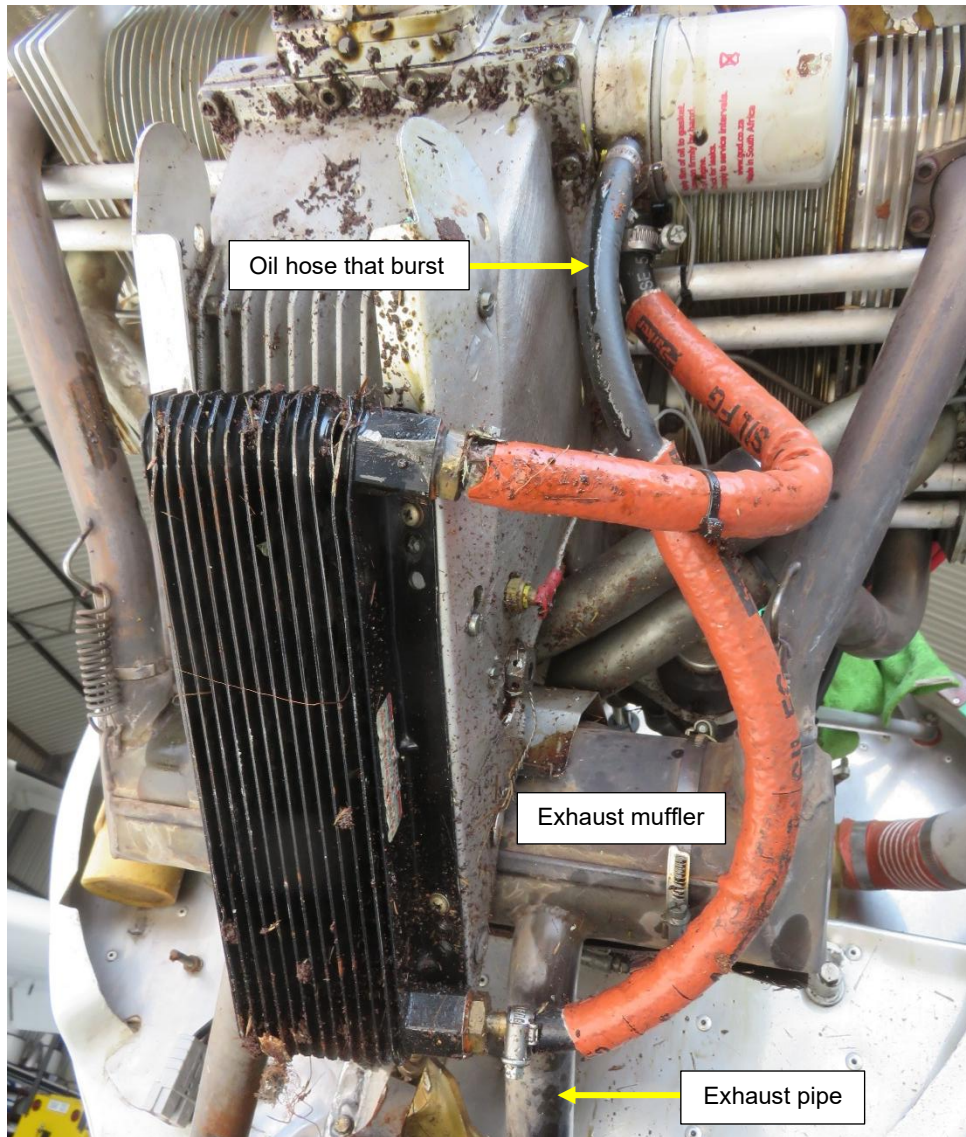
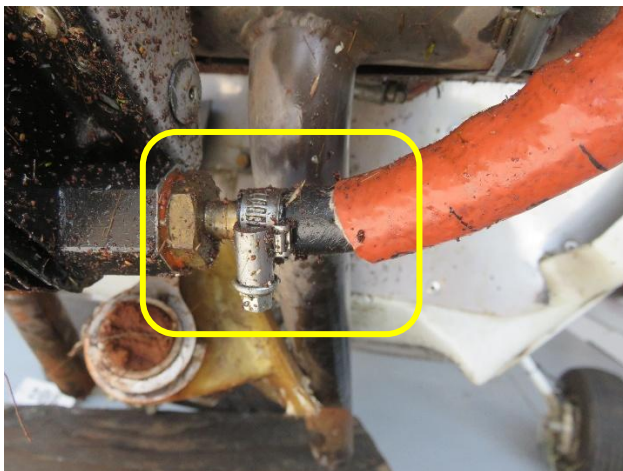


Figure 6: The burst oil hose, exhaust muffler and exhaust pipe.



(a)



(b)

Figure 7: The oil hose still connected to the oil cooler (a). The hose was found burst (b).

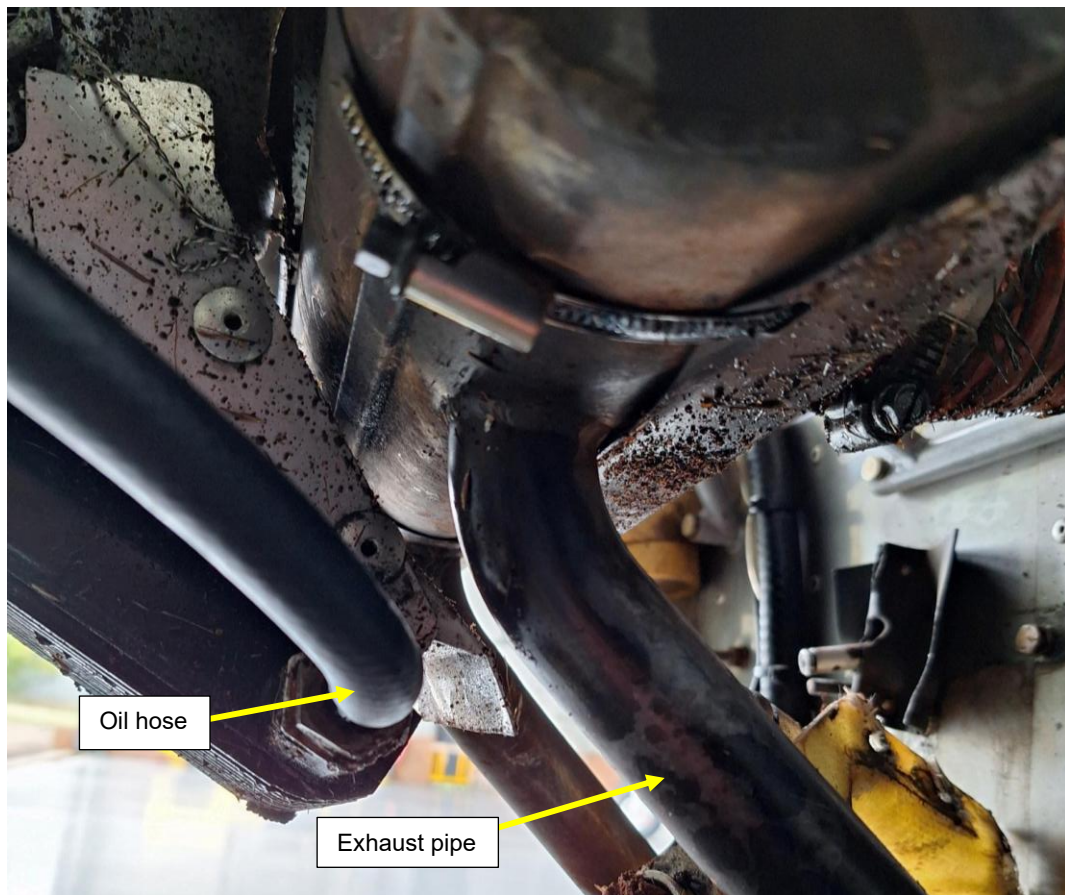


Figure 8: The oil hose connected to the oil cooler and the exhaust pipe in proximity to each other.



Figure 9: The burst hose was closed at one end; it was filled with water, and pressure was applied by blowing on the other end to identify the area where it had burst.

Requirements as per the Aircraft Technical Manual and Engine Maintenance Manual on the Inspection and Replacement of Flexible Hoses:

(Source: Aircraft Technical Manual *JTM001-14*, page 43 of 300 paragraph 5.3.3 and the Engine Maintenance Manual *JEM0002-12*, page 46 of 107 paragraph 8.4.1)

5.3.3 Engine Bay Flexible Hoses

- All flexible hoses in the engine compartment should be replaced at engine overhaul or every 2 years whichever comes first. Hoses which show visible deterioration (cracking, excessive hardening) must be replaced immediately, irrespective of age.

8.4.1 Flexible Hoses

- All flexible hoses in the engine compartment should be replaced at engine overhaul or every 2 years whichever comes first. Hoses which show visible deterioration (cracking, excessive hardening) should be replaced immediately, irrespective of age.

Aircraft Technical Manual	Jabiru Aircraft Pty Ltd	
JTM001-14	J120, J160, J170, J200/J400, J230/J430, J250/J450 Variants	

Table 5-2 – Mandatory Replacement Times

Description	Part No.	Interval
Rudder Cable	PC01404	10 000 hours
Elevator Cable	PC3A001	10 000 hours
Aileron Cable (both)	PC01614	10 000 hours
Undercarriage bolts and nuts (all)*	Various	500 hours
Engine bay Flexible hoses (all)*	Various	2 years**
Carburettor rubber mount	4691084	5 years****
Wing Attachment bolts*	Various	2000 hours

see Section 5.17.

* see Section 5.3 Mandatory Inspections & Lifed Items

** 2 years or at engine overhaul, whichever comes first

**** 5 years or at engine overhaul, whichever comes first

Engine Maintenance Manual	Jabiru Aircraft Pty Ltd 
JEM0002-12	Jabiru 2200 & 3300 Aircraft Engines

20) Carburettor – Inspect for damage, remove bowl and check for contamination, check carburettor rubber connector for cracking or degradation (replace if required).
 With fuel bowl removed check function of fuel shut off valve per [9.19.1](#)
 Perform Fuel flow rate test per [sect 9.19](#)

P	F	Comments:	50 hourly

21) Fuel hoses, lines and fittings – Check condition, replace if hard, cracked or softened
 If replaced, double sign in the boxes below.

P	F	Comments:	50 hourly

22) Fire sleeves – Check condition and length of fire sleeves

P	F	Comments:	50 hourly

23) Oil hoses, lines and fittings – Check condition, replace if hard, cracked or softened
 If replaced, double sign in the boxes below.

P	F	Comments:	50 hourly

Annual Inspection					
Each 200 Hours					
Each 100 Hours					
Each 50 Hours					
Each 25 Hours					
9.	Carburettor air filter – Check & replace if required		*	*	*
10.	Carburettor air filter – mandatory replacement			*	*
11.	Engine baffles and air ducts		*	*	*
12.	Cylinders		*	*	*
13.	Crankcase & front crankcase seal		*	*	*
14.	Fuel hoses, lines and fittings		*	*	*
15.	Intake and exhaust systems		*	*	*
16.	Ignition harness, distributor caps & rotors			*	*
17.	Check Spark Plug Gaps		*	*	*
18.	Replace Spark Plugs			*	*
19.	Compression check or leak-down check		*	*	*
20.	Electrical wiring		*	*	*
21.	Engine-Driven Fuel pump		*	*	*
22.	Engine controls and linkages		*	*	*
23.	Engine mounts, mount structure		*	*	*
24.	Safety Wires		*	*	*
25.	Starter, solenoid and electrical connections		*	*	*
26.	Coils and electrical connections		*	*	*
27.	Carburettor heat system		*	*	*
28.	Throttle and linkage		*	*	*
29.	Carburettor		*	*	*
30.	Oil system tubes and hoses		*	*	*
31.	Firewall		*	*	*

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Findings	
1.	<u>Personnel Information</u>
1.1	The flight instructor had a valid Commercial Pilot Licence (CPL) Aeroplane that was issued by the Regulator (SACAA) on 24 August 2017 with an expiry date of 31 August 2025. The pilot had flown a total of 2 006.8 hours of which 158.3 hours were on the aircraft type.
1.2	The flight instructor had a Class 1 aviation medical certificate that was issued on 7 August 2024 with an expiry date of 31 August 2025. There were no restrictions on his medical certificate.
1.3	The student pilot had a valid Student Pilot Licence (SPL) Aeroplane that was issued by the Regulator (SACAA) on 17 December 2024 with an expiry date of 16 December 2025. The student pilot had flown a total of 15.4 hours. All the hours were flown on the aircraft type.
1.4	The student pilot had a Class 2 aviation medical certificate that was issued on 26 November 2024 with an expiry date of 30 November 2029 with no medical restrictions.
1.5	The flight instructor took control of the aircraft after the decay was detected in engine oil pressure.
1.6	The flight instructor declared a Mayday on FAWB tower frequency 118.35 MHz. The crew was unable to land back at the aerodrome.
2.	<u>Aircraft Information</u>
2.1	The last annual inspection of the aircraft was certified on 14 January 2025 at 828.7 airframe hours. The aircraft had accrued 11.1 hours since the last inspection.
2.2	The aircraft's Certificate of Registration (C of R) was issued to the present owner on 23 October 2024.
2.4	The aircraft had a valid Authority-to-fly (ATF) Certificate that was initially issued by the Regulator (SACAA) on 12 November 2020. The latest ATF had an expiry date of 30 November 2025.

- 2.5 The aircraft had a Certificate of Release to Service (CRS) that was issued on 14 January 2025 with an expiry date of 13 January 2026 or at 878.7 airframe hours, whichever comes first.
- 2.6 The aircraft was fitted with a Jabiru 2200A engine with serial number 22A 773.
- 2.7 According to the aircraft flight folio, the aircraft was flown on 11 November 2023. The next entry on the flight folio was logged on 7 March 2025 after the annual inspection was certified on 14 January 2025. The aircraft was not flown for approximately 16 months.
- 2.8 According to the aircraft logbook, page 97, the flexible oil hoses were replaced on the engine during the annual inspection that was conducted and certified on 3 November 2023 at 827.7 airframe hours.
- 2.9 The aircraft Technical Manual *JTM001-14, page 43 of 300* paragraph 5.3.3 and the Engine Maintenance Manual *JEM0002-12, page 46 of 107* paragraph 8.4.1 state:
“All flexible hoses in the engine compartment should be replaced at engine overhaul or every 2 years, whichever comes first. Hoses which show visible deterioration (cracking, excessive hardening) must be replaced immediately, irrespective of age.”
- 2.10 The oil hose with part number PH089BN that connects to the oil cooler and oil filter was found burst which led to engine oil being pumped overboard; this corresponded with the low oil pressure indication in the cockpit as reported by the crew.
- 2.11 The approved person (AP) who certified the last annual inspection of the aircraft before the accident flight had an AP Certificate that was issued by the Regulator (SACAA) on 8 December 2024 with an expiry date of 7 December 2026.
- 2.12 According to the AP, the hose that burst was purchased at a wholesale store which specialises in hydraulic hoses and associated equipment.
- 2.13 The aircraft was previously involved in two accidents and one incident:
- (1) On 11 November 2000, the engine lost power in-flight and the pilot performed a forced landing near Drakensburg Sun. The aircraft caught alight during the impact sequence and was destroyed. AIID Ref No. CA18/2/3/7196.
- (2) On 23 November 2013, the engine failed and the pilot executed a forced landing on a field near Springs Aerodrome (FASI). AIID Ref No. CA18/2/3/9111.

The aircraft was involved in an incident on 23 November 2012. The pilot performed an uneventful forced landing on Runway 03 at FASI after the engine failed in-flight. There was no damage to the aircraft.

3. Oil Hose - Original Equipment Manufacturer (OEM)

3.1 The OEM for the perished hose (oil) was contacted. This is their response:

"Our hoses are not suitable for aircraft or vehicles. The maximum temperature that a PVC hose goes is up to 60 Degrees Celsius. These multipurpose hoses are ideal for air and water applications used in the mining, construction, agriculture, and landscaping environments."

4. Meteorological Information

4.1 Routine Aerodrome Report (METAR) for FAWB on 10 April 2025 at 1500Z:

FAWB 101500Z AUTO 30005KT //// // ///// 25/10 Q1018=

4.2 Fine weather conditions prevailed at the time of the flight; the weather had no bearing on this accident.

5. Approved Training Organisation (ATO)

5.1 The ATO had a valid ATO Certificate that was issued by the Regulator (SACAA) on 4 July 2023 with an expiry date of 30 June 2028. The aircraft was duly authorised to operate under the ATO.

5.2 The training flight was accordingly authorised as per the ATO electronic system.

Probable Cause

The aircraft nosed over during a forced landing on a field after the engine had stopped operating. The cause of engine stoppage was attributed to the oil hose (P/N: PH089BN) fitted between the oil filter and the oil cooler that burst, resulting in engine oil being pumped overboard and, ultimately, the engine stoppage.

Contributing Factors

1. The oil hose was exposed to intense heat as it was in proximity to the exhaust assembly (approximately 30mm). The heat sleeve (orange in colour, which was fitted over the oil hose) did not cover the area where the hose attaches to the oil cooler (area where it burst), as presented in Figures 6 and 7.

2. The AP stated during an interview that he had bought the hose from a wholesale store that specialises in hydraulic hoses and other associated equipment. 3. The OEM of the hose (oil) indicated that the product was not suitable for use on aircraft or vehicles.
Safety Action
None.
Safety Recommendation
It is recommended that the Director of Civil Aviation (DCA) publish an article in the General Aviation Skywatch magazine emphasising the importance of authorised hoses used for various applications to be fitted according to the maintenance requirements of non-type certified aircraft (NTCA). If an approved person or any maintenance personnel working on an NTCA aircraft has doubts about the fitment and/or replacement of the hose/s, they should consult the original equipment manufacturer (OEM) or the aircraft manufacturer regarding the appropriate hose(s) to be installed for different fluid applications.
About this Report
<i>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 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> <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>
Purpose
<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 to apportion blame or liability.</i>
Disclaimer
<i>This report is produced without prejudice to the rights of the AIID, which are reserved.</i>

This report is issued by:

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