



LIMITED OCCURRENCE INVESTIGATION REPORT – FINAL

Reference Number	CA18/3/2/1530							
Classification	Serious Incident		Date	10 February 2026		Time	0600Z	
Type of Operation	Training (Part 141)							
Location								
Place of Departure	Secunda Airfield (FASC), Mpumalanga Province		Place of Intended Landing	Wonderboom Airport (FAWB), Gauteng Province				
Place of Occurrence	On Runway 35 at Rand Airport (FAGM), Gauteng Province							
GPS Co-ordinates	Latitude	26° 14' 33.31" S	Longitude	28° 9' 4.54" E	Elevation	5 477ft		
Aircraft Information								
Registration	ZS-IIZ							
Make; Model; S/N	Cessna; 177RG (Serial Number: 177RG-0134)							
Damage to Aircraft	Minor			Total Aircraft Hours	3 543.7			
Pilot-in-command								
Licence Type	Private Pilot Licence (PPL)		Gender	Male		Age	22	
Licence Valid	Yes	Total Hours	133.3		Total Hours on Type	48.4		
Total Hours 30 Days	9.6		Total Flying on Type Past 90 Days	48.4				
People On-board	1 + 1		Injuries	0		Fatalities	0	
Other (on ground)								
0								
What Happened								
<p>On Tuesday morning, 10 February 2026, two pilots on-board a Cessna 177RG aircraft registered ZS-IIZ were conducting a training flight (hour building) from Secunda Airfield (FASC) in Mpumalanga province with the intention to perform a touch-and-go landing at Rand Airport (FAGM) before proceeding to Wonderboom Airport (FAWB) for a full-stop landing. Both FAGM and FAWB are in Gauteng province. The flight was conducted under visual meteorological conditions (VMC) and under the provisions of Part 141 of the Civil Aviation Regulations (CAR) 2011, as amended.</p> <p>The pilots stated that they conducted a pre-flight inspection of the aircraft and no abnormalities were noted. The aircraft had no outstanding defects or deferred items recorded in the flight folio. The pilot who was seated on the left seat was the pilot flying (PF), and the pilot who was seated on the right seat was the pilot monitoring (PM) as well as the safety officer (SO) at an Approved Training Organisation (ATO). The aircraft took off from FASC and routed to FAGM with the landing gear extended as per the ATO's instruction because the students tend to forget to extend the landing when landing. Upon reaching FAGM, the PM radioed the air traffic control (ATC) personnel on frequency 118.7 Megahertz (MHz) and requested clearance to conduct a touch-and-go landing. The aircraft was granted clearance to land on Runway 35.</p>								

The aircraft was configured for landing and, after touchdown, the main landing gear collapsed and folded into the wheel wells whilst the nose landing gear remained extended. The aircraft remained upright and came to a stop on the runway. The ATC activated the crash alarm and the Aircraft Rescue and Firefighting (ARFF) personnel swiftly responded to the serious incident scene. The active runway was closed for approximately an hour during which the aircraft was recovered to the hangar; the runway was reopened soon after. The aircraft sustained minor damage. No injuries were sustained by the occupants who were in the aircraft.



Figure 1: The airport layout and the approximate area where the serious incident occurred (yellow pin). The red arrow indicates the direction of landing. (Source: Google Earth)



Figure 2: The aircraft on the runway after the serious incident. (Source: ARFF)



Figure 3: The damaged antenna in the rear fuselage area.

Cessna 177RG Landing Gear Operation (Source: Pilot's Operating Handbook)

Retraction and extension of the landing gear is accomplished by a hydraulic system integrated with electrical control and indication circuits. There is one hydraulic actuator for the nose landing gear and one actuator that drives a gear system for both main landing gears. Hydraulic fluid is supplied to the actuators by an electrically powered reversible pump. The hydraulic reservoir is an integral

part of the pump. The electrical pump is controlled by the landing gear selector mounted in the cockpit instrument panel. As the landing gear selector is moved to either the up or down position, the pump directs hydraulic fluid through a power pack control valve assembly to the landing gear actuators. As the hydraulic fluid pressure increases at one side of the actuator pistons, the fluid at the other side of the pistons is directed back through the control valve assembly to the pump.

The landing gear extension and retraction pipes serve either as pressure or return lines depending on the rotation of the reversible pump and the position of the landing gear selector in the cockpit. Mechanical overcentre locks provide up and down locks for the nose landing gear. The main landing gears utilise hydraulic pressure for positive uplock and electro-mechanical downlocks. Mounted on the control valve, through which pressurised hydraulic fluid passes during landing gear retraction, is a pressure switch. This pressure switch opens the electrical circuit to the pump solenoid when the main landing gear is fully retracted, and the hydraulic pressure has reached approximately 1500 psi. The pressure switch will hold the electrical circuit open until the hydraulic pressure in the system drops to approximately 1100 psi at which time the pressure switch closes, allowing electrical power to the hydraulic pump. The hydraulic pump will run until the pressure reaches approximately 1500 psi and the pressure switch opens the electrical circuit. This cycling of the hydraulic pressure maintains the main landing gears in their UP AND LOCKED positions whenever the landing gear selector in the cockpit is in the up position. With the landing gear selector in the down position, the pressure switch has no effect on the operation of the hydraulic system. Other valves in the hydraulic system channel fluid to the correct outlets during landing gear extension and retraction, allow return fluid into the reservoir without producing any back pressure and allow for thermal relief. An emergency hand pump, located between the two front seats, is used to extend the landing gear manually in the event of electrical or hydraulic failure.

Mounted in the instrument panel are two landing gear position indicator lights. A single amber light illuminates when the landing gear is up and locked; a single green light illuminates when it is down and locked. Each of the three landing gears has a downlock microswitch and all three microswitches have to be made to complete the electrical circuit to illuminate the green down and locked light in the cockpit. In addition to illuminating the green indicator light, the making of all three downlock microswitches opens the electrical circuit to the hydraulic pump. Mechanically connected to the main landing gear downlock mechanisms are two unlock solenoids on the back of which are mounted sequence switches. These solenoids are mounted on pivots which allow them to pivot through approximately 7°. One of the functions of the sequence switches is to open the electrical circuit to the hydraulic pump when the main landing gears are in their downlock positions. All three downlock microswitches and the two sequence switches have to be operated before electrical power to the hydraulic pump is switched off during the landing gear extension sequence. When the hydraulic pump switches off, the pressure in the down lines slowly dissipates over a period of time which is dependent upon the seal leak rates in the landing gear actuators. The hydraulic pump will switch on

when any of the downlock microswitches or sequence switches break which, providing the landing gear selector is in the DOWN position, will pressurise the down lines. When a correctly adjusted landing gear is in the DOWN AND LOCKED position no hydraulic pressure is required to maintain it in that condition.

During the landing gear retraction sequence, only the sequence switches, the pressure switch and the landing gear selector in the cockpit have a controlling function of the electrical power to the hydraulic pump.

Cessna Cardinal RG Normal Take-off Procedure (Source: POH)

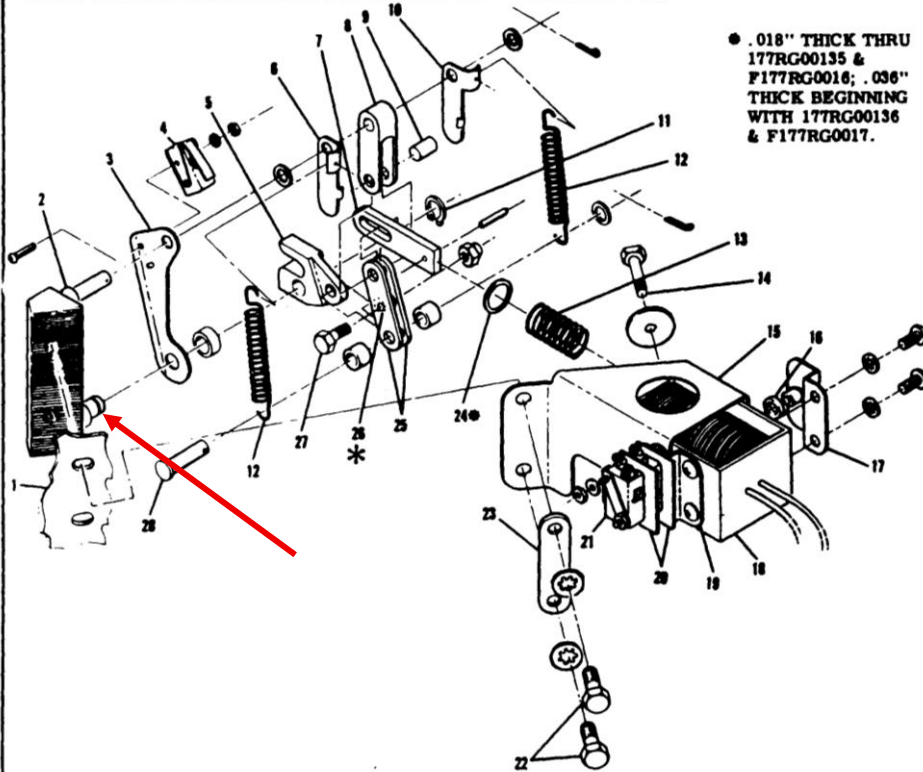
- (1) Wing Flaps -- 0°-10° (10° preferred).**
- (2) Power -- FULL THROTTLE and 2700 RPM.**
- (3) Mixture -- RICH (lean for field elevation per fuel flow placard above 3000 feet).**
- (4) Stabilator Control -- LIFT NOSE WHEEL at 55 KIAS.**
- (5) Climb Speed -- 65-75 KIAS.**
- (6) Brakes -- APPLY momentarily when airborne.**
- (7) Landing Gear -- RETRACT in climb out.**
- (8) Wing Flaps -- RETRACT (if extended).**

Post-accident Investigation

The aircraft was placed on jacks for further investigation. The engineers at the aircraft maintenance organisation (AMO) conducted inspection of the landing gear system; the landing gear retraction and extension worked properly. The landing gear's unsafe warning horn was tested, and it was found to be operating normally. The main landing gear microswitch operated correctly with no fault found. The green light in the cockpit illuminated, which showed that the landing gear was down and locked. The aircraft had adequate MIL-H-5606 hydraulic fluid in the reservoir and none of the circuit breakers (CB) popped. The landing gear hydraulic lines were inspected, and no obvious signs of hydraulic leaks were observed; all fasteners were in place and properly secured. The emergency landing gear extension procedure was conducted, and all three landing gears extended and locked into position with the green light illuminating. Further inspection found that the pin in the down-lock support assembly had sheared off, and there was a small buckle on the left main gear tunnel, indicating signs of a hard landing.

AIRCRAFT SERIALS 177RG0001 THRU 177RG0282 AND F177RG0001 THRU F177RG0062
 PRIOR TO BEING MODIFIED PER SERVICE KITS SK177-21A OR SK177-22A

● .018" THICK THRU
 177RG00135 &
 F177RG0016; .036"
 THICK BEGINNING
 WITH 177RG00136
 & F177RG0017.



- | | |
|-------------------------------|-----------------------------|
| 1. Bulkhead | 15. Solenoid Mount Bracket |
| 2. Downlock Support Assembly | 16. Spacer |
| 3. Switch Mount Plate | 17. Solenoid Attach Bracket |
| 4. Downlock Switch | 18. Solenoid |
| 5. Downlock Latch | 19. Switch Attach Bracket |
| 6. Spring Bracket | 20. Insulator |
| 7. Solenoid Plunger Extension | 21. Sequence Switch |
| 8. Swing Arm | 22. Forward Bolt |
| 9. Pin | 23. Plate |
| 10. Spring Bracket | 24. Spacer |
| 11. Retainer Ring | 25. Link |
| 12. Overcenter Spring | 26. Eccentric Spacer |
| 13. Solenoid Return Spring | 27. Bolt |
| 14. Aft Bolt | 28. Pin |

* Apply Loctite Catalog No. 87 to
 eccentric spacer (26) after unit
 has been rigged and set.

Figure 5: Main landing gear down-lock assembly (red arrow) showing the pin that sheared off.
 (Source: Cessna RG Service Manual)



Figure 4: The landing gear down-lock support assembly pin that sheared off.



Figures 5 and 6: A closer view of the sheared down-lock support assembly pin.

Meteorological Information

The following meteorological aerodrome report (METAR) was issued by the South African Weather Service (SAWS) for Rand Airport (FAGM) on 10 February 2026 at 0600Z.

METAR FAGM 100600Z 01012KT 9999 FEW010 18/16 Q1025=

Wind Direction	010°	Wind Speed	12kt	Visibility	9999 m
Temperature	18°C	Cloud Cover	Few	Cloud Base	FEW010
Dew Point	16°C	QNH	1025hPa		

Findings

1. Pilot Information

- 1.1 The pilot flying (PF) had a Private Pilot Licence (PPL) that was initially issued by the Regulator (SACAA) on 14 October 2025 with an expiry date of 30 September 2026. The PF had logged a total of 133.3 hours of which 48.4 were on the aircraft type.
- 1.2 The PF had a Class 2 aviation medical certificate that was issued on 6 December 2025 with an expiry date of 6 December 2030. The PF had no restrictions listed in his medical certificate.
- 1.3 The pilot monitoring (PM) had a Commercial Pilot Licence (CPL) that was initially issued by the Regulator (SACAA) on 24 January 2023. The licence was renewed on 25 October 2025 with an expiry date of 31 October 2026.
- 1.4 The PM had a Grade 3 Flight Instructor (FI) rating.
- 1.5 The PM had a Class 1 aviation medical certificate that was issued on 7 October 2025 with an expiry date of 31 October 2030. The PM had no restrictions listed in his medical certificate.

2. Aircraft

- 2.1 The last mandatory periodic inspection (MPI) of the aircraft was certified on 4 February 2026 at 3 533.1 total airframe hours. The aircraft had accrued 10.6 hours since the last MPI.
- 2.2 A Certificate of Registration (C of R) was issued to the present owner on 2 May 2024.

- 2.3 The aircraft had a valid Certificate of Airworthiness (C of A) that was initially issued by the Regulator on 9 December 2014. The C of A was renewed on 6 May 2025 with an expiry date of 27 June 2026.
- 2.4 The AMO which conducted the MPI was issued an AMO Certificate on 15 October 2025 with an expiry date of 30 September 2026.
- 2.5 The aircraft maintenance organisation (AMO) had issued the aircraft Certificate of Release to Service (CRS) on 4 February 2026 with an expiry date of 3 February 2027 or at 3633.1 airframe hours, whichever comes first.

3. Approved Training Organisation (ATO)

- 3.1 The Approved Training Organisation (ATO) had an ATO Certificate that was issued by the Regulator on 15 July 2024 with an expiry date of 31 July 2029.

4. Meteorological Information

- 4.1 Good weather conditions prevailed at the time of the flight; the weather conditions could not be attributed to the cause of the serious incident.

Probable Cause(s)

Hard landing on Runway 35 which caused the pin on the down-lock support assembly to shear off; consequently, the main landing gear collapsed.

Contributing Factor(s)

Poor landing technique.

Safety Action(s)

The flight school had a safety meeting in which it was determined that retractable landing gear aircraft statistically present a higher risk of wheels-up landings amongst lower hour and less experienced PPL holders, particularly during operations at busy aerodromes where workload and distractions are increased. Therefore, the school has requested all instructors to brief students accordingly, as well as ensure compliance with this procedure until further notice.

Extract from the Flight School's Policy

In the interest of safety and risk reduction, the following policy will, therefore, apply with immediate effect:

1. *Students and pilots with less than 150 hours' total flight time shall not operate the landing gear system during solo flights on the C177RG.*
2. *During such solo operations, the landing gear shall remain extended for the duration of the flight.*
3. *These pilots may operate the landing gear normally when accompanied by:*
 - *A flight instructor; or*
 - *A suitably rated commercial pilot approved by management.*
4. *The purpose of these solo flights is primarily hour building and experience accumulation rather than high-speed cruise performance. The additional drag and reduced cruise speed associated with flying with the landing gear extended is, therefore, considered acceptable for these operations.*
5. *This measure is implemented purely as a proactive risk mitigation strategy aimed at reducing the possibility of unnecessary wheels-up landings and associated operational and financial consequences.*
6. *Pilots are still required to perform all checks including gear down and locked when preparing for landing as these checks are part of their training even during ab-initio training.*

Safety Message and/or Safety Recommendation/s
None.
About this Report
<p><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 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.</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 to 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**