SOUTH AFRICAN CIVIL AVIATION AUTHORITY

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

LIMITED SERIOUS INCIDENT INVESTIGATION REPORT

Reference Number	CA18/3/2/1378				
Classification	Serious Incident	**Date**	13 October 2021	**Time**	0515Z
Type of Operation	Training (Part 141)				
Location					
Place of Departure	Port Elizabeth International Airport (FAPE), Eastern Cape Province	Place of Intended Landing	Port Elizabeth International Airport (FAPE), Eastern Cape Province		
Place of Occurrence	Threshold of Runway 35 at Port Elizabeth International Airport (FAPE)				
GPS Co-ordinates	Latitude 33˚59'47.21" S	Longitude 25˚37'34.90" E	Elevation 229 feet		
Aircraft Information					
Registration	ZS-RNH				
Model/Make	Robinson 22 Beta II				
Damage to Aircraft	None	Total Aircraft Hours	4 683.3		
Pilot-in-command					
Licence Type	Commercial Pilot License (CPL)	Gender	Female	Age	32
Licence Valid	Yes				
Total Hours on Type	297.5	Total Flying Hours	531.5		
People On-board	1 + 1	Injuries 0	Fatalities 0	Other (on ground)	0

What Happened

On 13 October 2021 at about 0436Z, a student pilot (SP) accompanied by a flight instructor (FI) on-board a Robinson 22 Beta II helicopter with registration ZS-RNH was conducting hover training exercises on the threshold of Runway (RWY) 35 at Port Elizabeth International Airport (FAPE) when the incident occurred. Clear weather conditions prevailed at the time of incident.

According to the FI, she took control of the helicopter to reposition it to a suitable area to allow the SP to take-off into the wind. Once the helicopter was stable in ground effect hover, the FI instructed the SP to take control of the helicopter and to continue with the lesson. Upon handing over the controls, the FI noticed that the engine's revolutions per minute (RPM) were decreasing. She then told the SP not to hold the throttle tightly as she took control of the helicopter once again. At that point, the low RPM warning was activated and the helicopter started to sink towards the ground.

The FI attempted to manipulate the throttle to increase the RPM but was unsuccessful as the helicopter continued to sink to the ground. Thereafter, the FI raised the collective to cushion the

landing. The helicopter landed safely and the FI shut down the engine The helicopter did not sustain damages during this incident and no injuries were reported.

What was found:

- The instructor was properly licensed for the training flight; her Commercial Pilot Licence was issued on 22 July 2021 with an expiry date of 31 July 2022. The instructor had a Grade 3 Instructor Licence, issued on 11 November 2020 with an expiry date of 30 November 2021.
- During post-incident inspection, the engineers found that the insert which houses the ball in the rod end of the overtravel spring had become loose and had separated from the rod end.
- According to the last mandatory periodic inspection (MPI) which was conducted on 25 October 2021 at 15874.81 airframe hours, there was no work done on the rod end with the failed insert prior to the flight. During the last MPI, a collective overtravel spring was changed in accordance with maintenance manual Revision November 2020 paragraph 6.710. The helicopter flew a further 36.34 hours before the incident occurred.
- According to the airframe logbook, there was no record of the failed insert rod end being changed since the aircraft came into the country on 27 November 2008 at 3132.8 airframe hours. The rod end seemed to be a Robinson originally supplied part. The rod end is an on-condition part and not a life-limited part.
- Post-incident, the rod end with the failed insert was removed and replaced with a serviceable part (Part number: A933-3) in accordance with Robinson R22 Maintenance Manual Revision November 2020 paragraph 6.710. Thereafter, the helicopter was tested and found serviceable.

Figure 1: The rod end with the failed insert. (Source: AMO)

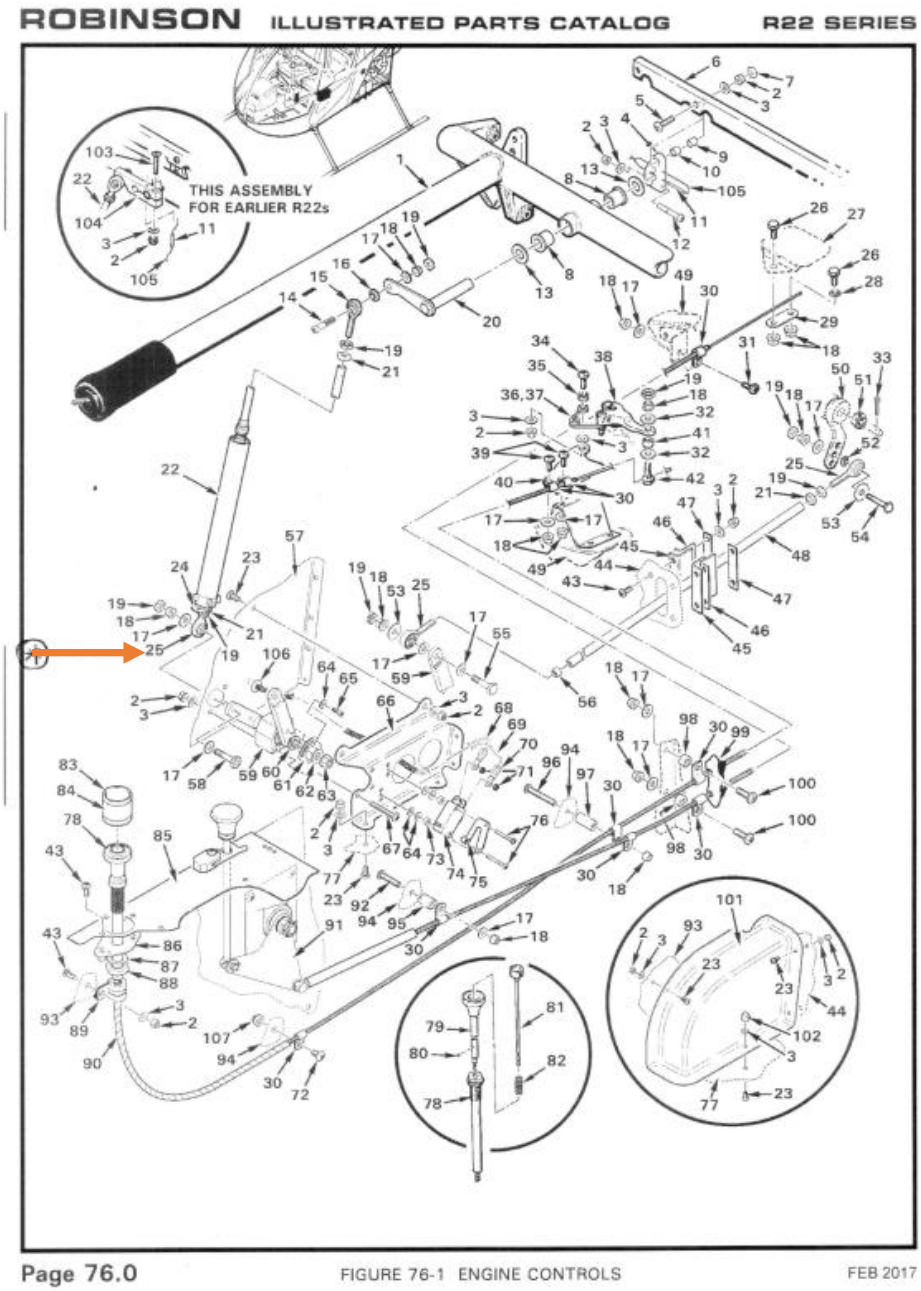

Diagram 1: The schemetic diagram of the engine controls. (Source: Illustrated Parts Catalogue)

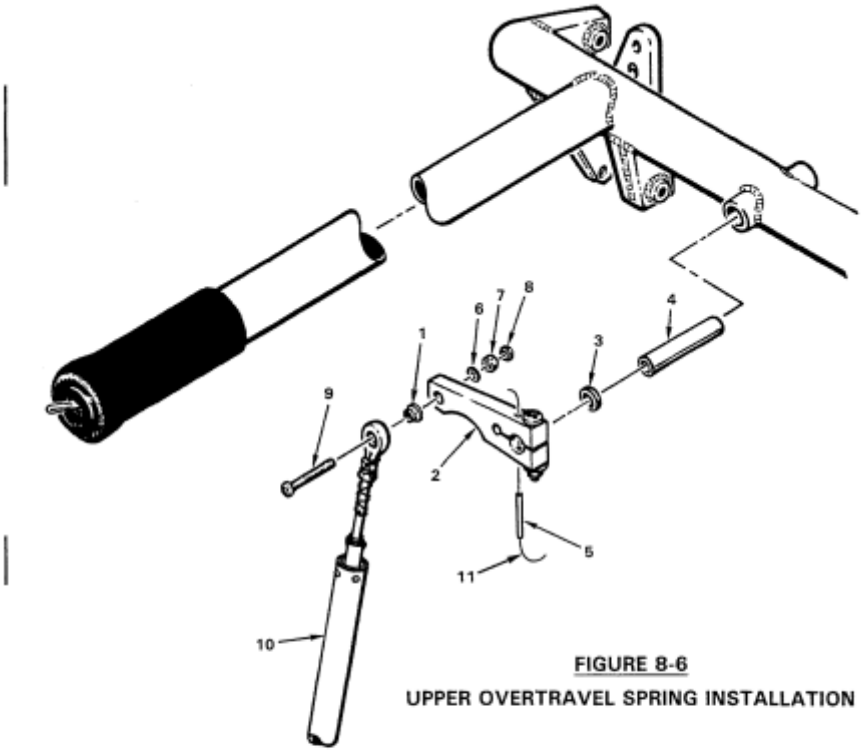

FIGURE 8-6
UPPER OVERTRAVEL SPRING INSTALLATION

NUMBER	PART NUMBER	DESCRIPTION
1	A341-1	Spacer
2	C342-1	Arm Assembly
3	A141-16	Washer
4	A335-1	Torque Tube
5	52-018-078-0750	Roll Pin
6	AN 960-10L	Washer
7	NAS 679A3	Nut
8	MS27151-7	Palnut
9	A486-1	Screw
10	A327-1	Overtravel Spring Assembly
11	MS20995C32	0.032 in. dia Safety Wire

Diagram 2: Overtravel spring diagram. (Source: Robinson Maintenance Manual)

Probable cause

Loss of engine power during hover exercises as a result of a loose insert which houses the ball in the rod end on the throttle control overtravel spring.

Safety Action/s

None.

Safety Message and/or Safety Recommendation/s

None.

Purpose of the Investigation
In terms of Regulation 12.03.1 of the Civil Aviation Regulations (CAR) 2011, 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****.*
About this Report
Decisions regarding whether to investigate, and the scope of an investigation are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, no 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 brief report. The report has been compiled using information supplied in the initial notification, as well as follow-up information 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 accident. *This report provides an opportunity to share safety message/s in the absence of an investigation.* *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.*
Disclaimer
This report is produced without prejudice to the rights of the AIID, which are reserved.

This report is issued by:

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