FINAL REPORT

AAIU Synoptic Report No: 2007-016
AAIU File No: 2006/0061
Published: 28/08/2007

The Inspector-on-Call (IOC) for the 1 August 2006, Mr Graham Liddy responded to this particular notification and attended the scene. In accordance with the provisions of SI 205 of 1997, the Chief Inspector of Air Accidents, on 27 March 2007, appointed Mr Leo Murray as the Investigator-in-Charge (IIC) to carry out an Investigation into this Incident and prepare a Synoptic Report.

Aircraft Type and Registration:	Grob G.115A, EI-DJY
No. and Type of Engines:	1 x Avco Lycoming O-235-H2C
Aircraft Serial Number:	8048
Year of Manufacture:	1988
Date and Time (UTC):	1 August 2006 @ 09.37 hrs
Location:	Cork Airport
Type of Flight:	Training
Persons on Board:	Crew – 2 Passengers – Nil
Injuries:	Crew – Nil Passengers – Nil
Nature of Damage:	Main landing gear and ventral fin
Commander's Licence:	JAR Commercial Pilot's Licence (Spanish)
Commander's Details:	Male, aged 24 years
Commander's Flying Experience:	550 hours, of which 60 were on type
Notification:	Cork Airport Authority
Information Source:	AAIU Incident Report Form submitted by the pilot

SYNOPSIS

Grob G.115A registration EI-DJY was engaged on a local training detail at Cork Airport. The aircraft experienced a hard landing on Runway (RWY) 35 following a '*simulated engine failure after take-off*' (EFATO) exercise. Following the hard landing, EI-DJY completed another circuit and landed on RWY 35. During the landing roll the left main landing gear leg collapsed and the aircraft sank on the runway incurring further damage. There were no injuries.

1. FACTUAL INFORMATION

1.1 History of the flight

The student pilot completed the pre-flight inspection under the supervision of the instructor at 08.55 hrs on the day of the incident. He had earlier expressed a wish to fly solo (he had completed his first solo flight the previous day), but due to the strength of the wind the instructor decided that dual instruction was more appropriate. Pre take-off checks were completed on the Club apron. Cork tower was contacted on frequency 119.3 Mhz for departure instructions.

EI-DJY took off at 09.10 hrs for a circuit training detail of 25 minutes with the student as pilot flying (PF). All circuits were flown left-hand for RWY 35. The first circuit was completed without incident, culminating in a glide approach (engine power at idle) as part of the exercise. The instructor was satisfied with the student's performance. Following a 'touch and go' EI-DJY positioned towards Ballinhassig[1] on the request of Air Traffic Control (ATC) due to other traffic inbound to Cork from the South. At 09.27 hrs EI-DJY was cleared by ATC '*touch and go 35 left hand circuit, the wind 300 degrees, 18 gusting 23* (kts)'.

At this point the instructor requested permission from ATC to perform an EFATO. The aircraft touched down slightly off the centreline, power was then applied to accelerate to take-off speed. During the climb, at about 300-350 feet above ground level (AGL) the instructor closed the throttle (reducing engine power to idle) to simulate an engine failure. The student lowered the nose of the aircraft to maintain flying speed, and descended in a power off condition towards the runway. Due to the strong headwind and idle power the aircraft descended at a high rate towards the runway. As the aircraft neared the runway, the instructor took control as it was apparent to him the student was not going to flare[2] in time. Despite this, the aircraft landed hard and bounced. The instructor applied power for climb out and returned control to the student once the aircraft was stable in the climb.

During the climb ATC enquired: '*Juliet Yankee everything okay?*', the instructor replied in the affirmative, but considered it prudent to make the next landing a 'full stop'. The student again flew a left circuit to RWY 35. The aircraft touched down normally, but with weight on the landing gear, became '*very hard to control*'. The instructor had to input hard right rudder to keep the aircraft on the runway.

Once the aircraft came to a stop, taxi instructions were issued to vacate the runway. Despite attempts to manoeuvre the aircraft, it soon became apparent that there was no steering capability or brake function remaining. ATC enquired that all on board were okay and dispatched the Airport Fire Services to the scene. The instructor confirmed to ATC there were no injuries and secured the aircraft.

[1] **Ballinhassig**: A visual holding point 2 ½ Nautical Miles southwest of Cork Airport.

[2] **Flare**: A manoeuvre prior to landing where the aircraft descent rate is arrested by applying aft control stick

1.2 Aircraft information

The G.115 is equipped with a non-retractable tricycle landing gear with steerable nosewheel, two main wheels and fairings. Shock absorption is provided by the main gear struts and the gas strut of the nosewheel. The main gear struts are of tempered flat steel with tubular steel axles. The main gear struts are each attached by four bolts to the landing gear rib, which is laminated to the wings.

The Grob G.115A has a best glide speed of 67 kts indicated airspeed (KIAS).

1.3 Damage to aircraft

Damage was caused to the left main gear strut, which subsequently failed. Hydraulic fluid from the ruptured left braking system line leaked under pressure as brakes were applied during the final landing rollout. The structure of the ventral fin was damaged due to contact with the runway surface (**APPENDIX A**).

1.4 Weather Information

An aftercast of the weather conditions at the time of the incident showed an unstable North-westerly airflow with a general surface wind from 300 degrees at 25 kts occasionally gusting to 30. Visibility was generally good in excess of ten kilometres with light rain showers. Cloud was scattered at 2,000 feet, with occasional Cumulonimbus cloud at 1,800 feet. A temperature of 16 degrees Celsius and a QNH[3] of 1011 hectoPascals (hPA). At the time of approach the wind was given by ATC as '*300 degrees, 18 gusting 23* (kts)'.

The Operator of the aircraft, as part of their Standard Operating Procedures, detail weather minima for local training flights operating under Visual Flight Rules (VFR) as follows:

> *Training flights in the circuit shall not be flown without a clearly discernable horizon and weather minima in accordance with the table below:*

FOR FLIGHT IN THE LOCAL AERODROME CIRCUIT								
	DAY				**NIGHT**			
	Min Cloudbase QFE	**Min Vis**	***X-Wind Speed**	***Max Wind Speed**	**Min Cloudbase QFE**	**Min Vis**	***X-Wind Speed**	***Max Wind Speed**
DUAL	800 ft	3 Km	17 kts	30 kts	2000 ft	8 Km	13 kts	17 kts
SOLO	1000 ft	8 Km	13 kts	25 kts	3000 ft	10 Km	10 kts	15 kts

**wind speed limits to include gusts*

TABLE A

(Reproduced from the Operator's 'Operations Manual – Part B – Technical')

[3] **QNH**: Altitude above mean sea level based on local station pressure.

1.5 Student experience

The student had completed his first solo flight the previous day. His total flight time after this flight was 32 hrs 10 min. His training record shows him to be a very capable pilot with good reports from his instructors during training. He completed at least five flights which dealt with engine failure exercises, including two with EFATO that were both handled well according to the instructor's comments. Generally on EFATO exercises when the instructor is satisfied with the initial actions and descent profile, will instruct the student to apply power and climb away, otherwise the student will continue to descend all the way to the runway and land. The student had not performed this exercise to a full landing prior to the incident flight.

2. DISCUSSION

Prior to flying solo a student must practice and become proficient at handling engine failures during all phases of flight. Probably the most critical phase to experience an engine failure in this class of aircraft is shortly after take-off where there is little time to complete the necessary drills and land the aircraft safely back on the runway remaining.

During the EFATO exercise the aircraft descended at approximately 55 KIAS, 12 kts below the best glide speed. This, together with the strong headwind, would steepen the gliding angle and make the flare more difficult to judge.

Wind conditions on the day, while within the limits set by the flying school, were not ideal. From 'TABLE A' the maximum wind speed permitted under 'dual training' is 30 Kts with a crosswind limit of 17 kts. These limits may be further reduced at the discretion of the instructor if he feels the wind/weather conditions are beyond the experience of the student. The flight was conducted within the limits of the Flight School's Operations Manual.

The instructor took control from the student, but not in sufficient time to prevent a heavy landing and damage to the landing gear.

3. SAFETY RECOMMENDATIONS

This Report does not sustain any Safety Recommendations.

APPENDIX A

Final position of EI-DJY on RWY 35

Arrow indicating damage to ventral fin assembly

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