



MINISTÉRIO DAS OBRAS PÚBLICAS, TRANSPORTES E COMUNICAÇÕES
GABINETE DE PREVENÇÃO E INVESTIGAÇÃO DE ACIDENTES COM AERONAVES

FINAL INCIDENT REPORT

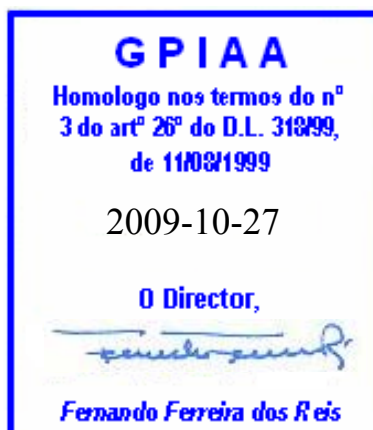
PRIVATE

Stoddard-Hamilton, Inc.
GLASAIR II RG

PH-EQV

Faro Airport

09th of June 2009



NOTE

This report states the technical findings regarding the circumstances and probable causes which led to this incident.

In accordance with Annex 13 to the International Civil Aviation Organisation Convention, Chicago 1944, Council Directive 94/56/EC, 21st NOV 1994, and article 11th n° 3 of Decree-Law n° 318/99, 11th AUG 1999, the sole purpose of this investigation is to prevent aviation accidents. It is not the purpose of any such accident investigation and the associated investigation report to apportion blame or liability.

The only aim of this technical report is to collect lessons which may help to prevent future accidents.

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SINOPSIS

On the 09th of June 2009, by 20:00 UTC¹, experimental aircraft Glaisair II RG, Dutch registration HP-EQV, on a local flight, was manoeuvring for landing on runway 28 at Faro airport, having an heavy aircraft, Boeing B-737, taking-off ahead. Precautionary, the pilot prepared a flapless approach, in order to minimize wake turbulence effects from taking-off aircraft.

During flare the pilot noticed some bumps, he considered as being wake turbulence effects, deciding to perform a missed approach and a new circuit. Coming back for second landing, the pilot experienced the same bumps but he decided to continue with landing manoeuvre, discovering later that landing gear was not down and the aircraft was doing a belly landing.

Both people on board exit the aircraft by their own means, unharmed, becoming the runway inoperative for about 80 minutes, until the aircraft has been removed.

¹ - Todas horas referidas neste relatório, salvo indicação em contrário, são horas UTC (Tempo Universal Coordenado). Nesta época do ano, em Portugal continental, a hora local era igual à hora UTC + 1.

1. FACTUAL INFORMATION

1.1 History of the Flight

On the 09th of June 2009, the owner of Glasair II RG aircraft, Dutch registration PH-EQV, temporarily parked at Faro airport (LPFR), decided to carry on a local flight, taking one passenger with him.

About 20:00 he was preparing to land on runway 28, having a transport aircraft (Boeing 737) taking off ahead, when he was advised by Tower Controller to expect some wake turbulence from heavy traffic taking off ahead.

In face of that notice, the pilot opted to perform a clean approach and landing (flapless) in order to get more effective control of the aircraft.

When he started the flare, after passing "C" interception, he felt the aircraft bumping, what he assumed was due to turbulence, so he decided to perform a missed approach and prepare a more stabilized approach. He increased engine power to Go-around and climbed for a new circuit and landing.

On second landing, the pilot noticed the same bumping but decided to continue with landing manoeuvre. Only then, when propeller tips started hitting the ground, he recognized that landing gear was retracted and the bumps were due to the lower fuselage surface contacting the runway.

The pilot informed the controller of the situation, shutdown the engine, switched off all systems and exited the aircraft, together with the passenger.

Meanwhile emergency & rescue services arrived to assist the crew and take care of the aircraft, being so promptly because during first landing attempt the ambulance crew, sited on the left of the runway, noticed some sparks coming from underneath the aircraft and informed the tower that landing gear was not down. Tower controller disagreed, saying it was turbulence, but she alerted Rescue Services, anyway.

1.2 Injuries

There were only one pilot and one passenger on board and both suffered no injuries.

Injuries	Crew	Passengers	Others
Fatal	0	0	0
Serious	0	0	0
Light/None	1	1	

1.3 Aircraft Damage

The aircraft sustained light damage on lower fuselage skin and propeller tips (*picture nr. 1*).



Picture Nr. 1

1.4 Other Damage

No third party damage was reported.

1.5 People on Board

There were two people on board the aircraft, one pilot and one passenger.

Pilot references as following table:

Personal References: Sex: M Age: 62 Nationality: Dutch Flight License: CPL(A) Validity: 09-JUL-2013 Qualifications: SEP Last Medical Examination: 22-JUL-2008 Restrictions / Limitations: VML		
	Total	On Type
Flight Experience: Total: Last 90 days: Last 28 days: Last week: Last 24 hours: Landings on last 24 hours:	N/A	N/A
N/A - In spite of being requested for some times, these elements were never provided to the Investigator in Charge.		

1.6 Aircraft

1.6.1 General

It was an experimental (*homebuilt*) type aircraft, available in kit form for personal assembly, with seating for two persons and a Maximum Take Off Mass (MTOM) of 954kgs, with following references:

Reference	Airframe	Engine	Propeller
Manufacturer: Model: Serial Number: Year of Manufacture:	Stoddard-Hamilton Glasair II RG 1072 2007	Lycoming IO-360-B1E N/D N/D	Hartzell HC-F2YR1 F-7068-2 N/D
Flight Time: Landings / Cycles: Last Inspection:	N/A	N/A	N/A
N/A - In spite of being requested for some times, these elements were never provided to the Investigator in Charge.			

Both, the Certificate of Registration and the Certificate of Airworthiness, issued by Dutch Civil Aviation Authority, were valid.

1.6.2 Landing Gear

O Glasair II RG, as specified by its designation (RG stands for Retractable Gear), is equipped with a retractable gear that provides improved performances. Main legs retract inner side, inside the wing, while the nose gear retracts rearwards into a fuselage compartment, under the engine. All legs are provided with gear doors that enclose the gear, when retracted, leaving the wheels in sight only (*picture nr. 2*).



Picture Nr. 2

Retraction and extension operation is achieved by an electro-hydraulic pump and hydraulic actuators. In case of electric or hydraulic failure, the gear may be selected down through a pressure valve, allowing gear free fall and down locking. A manual hydraulic pump is available as an option.

Indication & warning system, inside the cockpit, is provided by one red light, three green lights and a horn. When landing gear is down & locked, three green lights are illuminated

(one for each leg). When landing gear is in transit or in disagreement, a red light comes on and, if throttle lever is retarded below a certain value or flaps are extended more than ten degrees, the horn sounds.

1.7 Meteorology

It was daylight, sky clear, good visibility and moderate to strong wind (290°/13kts), practically straight with runway.

1.8 Navigation Aids

Not applicable.

1.9 Communications

The aircraft was equipped with required communication systems and the pilot used the right phraseology.

Tower controller didn't inform of missing gear, even when advised by ambulance crew that came to assist the aircraft occupants.

1.10 Aerodrome

Faro airport is part of national airports network and it is open to all national & international traffic, except for non-resident ultra light aircrafts.

It's served by an asphalt runway, with 2490m X 45m, oriented on a 100° / 280° magnetic, supported by some landing aids (lights, PAPI, ILS), which were not used by the aircraft, operating according Visual Flight Rules (VFR).



Picture Nr. 3

1.11 Flight Recorders

The aircraft was not equipped with flight recorders, as it is not mandatory for this type of aircraft.

1.12 Wreckage & Impact

There were no separated parts. The aircraft remained complete with only some abrasion and small deformations on propeller tips, which is normal on such type of occurrences.

1.13 Medical & Pathological

Not applicable.

1.14 Fire

There was no fire.

1.15 Survivability

Not applicable.

1.16 Tests & Research

In order to check landing gear operation and indication, the aircraft has been lifted and put on jacks.

Once the system has been powered, some landing gear extension & retraction manoeuvres were performed. Actuating mechanism performed well and indication lights showed correct positioning of gear legs. Aural warning was tested and worked normal.

1.17 Organizational & Management

Not applicable.

1.18 Additional Information

There is no additional information to refer to.

2. ANALYSIS

2.1 Flight Progress

The aircraft took off for a local leisure flight and came back for landing at about 19:45.

As dictated by meteorological conditions (wind 290° / 13kts) the pilot was directed for a visual approach to runway 28 and informed of a Boeing 737 taking off ahead, on same runway, and the possibility of undesired wake turbulence encounter.

The pilot decided to perform a flapless landing (with greater speed) in order to react better to turbulence.

During flare, he felt a bump, the aircraft gained some height over the runway and touched two more times on the tarmac before the pilot initiated a go-around, believing he had been disturbed by turbulence, returning for another landing.

On second attempt the pilot felt the same bump but decided to continue with landing, assuming he had control of the aircraft to be successful. Only when propeller tips started hitting the runway he realized that he had made a belly landing.

If tower controller had transmitted to him ambulance crew information, the pilot could realise the absence of landing gear and lower it before second landing attempt.

2.2 Landing Gear Operation

On first approach (and second as well), without gear down and locked, the pilot saw a red warning light on instrument panel. With his attention distracted with other matters, he acknowledged that as a fuel low level/pressure warning (there were about 50 litres on board) and gave no more attention to it.

Because flaps were retracted, when throttle was pulled back, aural warning circuit was not energized and configuration horn didn't sound, which contributed for the pilot to be aware of missing landing gear only when propeller blades stroke the ground.

3. CONCLUSIONS

3.1 Findings

According with facts referred above, we may conclude that:

- 1st - The pilot was entitled with a flying licence that allowed him to act as pilot on that aircraft;
- 2nd - The aircraft had a valid airworthiness certificate that permitted flying inside Dutch airspace but there was no INAC permit for the aircraft to fly in Portuguese airspace;
- 3rd - Na heavy aircraft take-off ahead of PH-EQV, with the fact that the wind was aligned with runway, could create some wake turbulence that prompted the pilot to perform a flapless landing;
- 4th - The pilot didn't select gear down and didn't confirm its position by reading the appropriate checklist;
- 5th - The pilot didn't interpret correctly the lighted landing gear warning light and the aural warning was not activated due retracted flaps;
- 6th - Tower controller omitted some vital information to the pilot, which could avoid mishap;
- 7th - The aircraft made a belly landing on runway and suffered light damage;
- 8th - Both people on board disembarked unharmed.

3.2 Causes of the Incident

3.2.1 Primary Cause

The main reason for this incident was pilot's omission to select landing gear down, prior to land.

3.2.2 Contributory Factors

Factors that had a contributory role to this event are:

- 1st - The omission of checklist reading and confirmation of landing gear position;
- 2nd - Misinterpretation of landing gear warning light;
- 3rd - Missing of landing gear aural warning due flapless approach configuration;
- 4th - Failure of tower controller to pass to the pilot the ambulance crew information, regarding missing landing gear.



4. SAFETY RECOMMENDATIONS

No safety recommendations were issued.

Lisbon, 27th of October 2009

The Investigator in Charge,