ACCIDENT

Aircraft Type and Registration:	Glasair RG, G-BKHW
No & Type of Engines:	1 Lycoming O-320-D1A piston engine
Year of Manufacture:	1989
Date & Time (UTC):	26 April 2009 at 1706 hrs
Location:	Cranwell Airfield, Lincolnshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to engine cowling, propeller and landing gear
Commander's Licence:	Private Pilot's Licence
Commander's Age:	66 years
Commander's Flying Experience:	339 hours (of which 47 were on type) Last 90 days - 15 hours Last 28 days - 9 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

The aircraft developed a pilot-induced yaw oscillation during the takeoff roll. Shortly after becoming airborne the left wheel touched the ground and the right wheel reportedly struck a runway edge light. The right landing gear was damaged and became jammed in the wheel well during gear retraction. A hydraulic fitting on the right landing gear also failed, causing further difficulties in lowering the landing gear. Following an attempted free-fall emergency extension of the landing gear, the right gear remained jammed in the wheel well and the nose gear failed to lock down and collapsed on landing. Both occupants were uninjured.

History of the flight

The aircraft, a Glasair RG (Figure 1), was being flown from Humberside to Cranwell. The pilot flying was a PPL-holder with a total flying experience of 236 hours, of which 2 hours were on type. During the takeoff roll at Humberside the aircraft started to oscillate in yaw before becoming airborne. The more experienced pilot, who was the aircraft's owner, took control but was unable to prevent the left wheel from contacting the runway and the right wheel from reportedly striking a runway edge light. Landing gear retraction after takeoff appeared normal.

Whilst en-route, the landing gear in transit indication illuminated. In the circuit at Cranwell, the pilot was only able to obtain two green indications (for the nose and

Figure 1

left gear legs) after selecting the gear down. The failure of the right gear to deploy was confirmed by ATC. The pilot then recycled the landing gear, following which only the left gear locked down. A flying instructor in another aircraft provided confirmation that the right landing gear and nose gear were not fully down.

The pilot flew two circuits and liaised with ATC to ensure that the emergency services would be in attendance for the landing. He switched the alternator, battery and magnetos to off, and set the mixture to lean prior to touching down on Runway 19, close to the intersection with Runway 27. During the rollout the right wing dropped, the aircraft slewed to the right, and the nose gear collapsed. The aircraft came to a halt on the grass close to the runway.

Aircraft inspection

The aircraft was inspected by the owner and an engineer. The right gear leg was bent backwards by about 2°, so that the tyre overlapped the wheel well by approximately 2 mm, and the elbow fitting connecting the hydraulic pipe to the right landing gear actuator had fractured. The reason for this was not conclusively established. Once the hydraulic fluid was lost, the normal landing gear operating system would have been rendered inoperative.

Also of concern was the failure of the emergency nose gear deployment system to operate. The nose gear is equipped with a gas spring that is designed to force the gear down during emergency deployment. On inspection, the gas spring was found to have become ineffective due to corrosion of the chromed piston and chafing of a seal, which had allowed gas to leak out. The owner has informed the Light Aircraft Association (LAA) of these findings.

Pilot's comments

The pilot, with the benefit of hindsight, considered that the takeoff should have been aborted during the takeoff roll before the oscillation was allowed to develop. The owner has included supplemental information in the Flight Manual to highlight the dangers of Pilot Induced Oscillation during takeoff and to caution that in the event of the aircraft touching the runway abnormally, the landing gear should not be retracted until a ground check of the system has been made.