

Agusta 109 Mk II, VP-BQK

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Aircraft Type and Registration:	Agusta 109 Mk II, VP-BQK
No & Type of Engines:	2 Allison 250-C20R/I turboshaft engines
Year of Manufacture:	1988
Date & Time (UTC):	27 November 1997 at 0740 hrs
Location:	Birmingham International Airport
Type of Flight:	Private
Persons on Board:	Crew - 2 - Passengers - 3
Injuries:	Crew - None - Passengers - None
Nature of Damage:	Damage to underside of fuselage and tail
Commander's Licence:	Private Pilot's Licence (Helicopters)
Commander's Age:	54 years
Commander's Flying Experience:	225 hours (of which 72 were on type) Last 90 days - 13 hours Last 28 days - None
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional AAIB inquiries

The helicopter departed from the ramp at the General Aviation Terminal and ground-taxed to Hold 'F'. It then joined a taxiway to Runway 15 for a further hold behind a departing twin-engine light aircraft. The pilot completed the departure checks, and was awaiting departure clearance with the brakes applied and the speed select levers in the flight position, when the right-hand landing gear collapsed, causing the helicopter to assume an inclined attitude. The pilot was however able to manage the collective and cyclic controls in order to reduce the impact; and the rotor blades did not contact the ground. The aircraft was then shutdown and the occupants evacuated without injury.

It was subsequently found that the gear collapse had been caused by the failure of a bracket which mounted the inboard end of the right-hand gear actuator to the structure. As the downlock function is performed within the actuator, there was thus nothing to prevent the gear collapsing following the loss of the load path through the actuator. The associated bracket, Part No. 109.0502.05.6, was

attached to the structure by means of four bolts. Both upperbolts had failed, and had been significantly bent in the process. The bracket had failed across both lower corners, such that the lower bolts together with the separated corner sections of the bracket had remained attached to the structure.

The bracket and bolts were subjected to metallurgical examination which determined that all the failures were due to overload. No arrest marks could be discerned on the fracture faces, which suggested that failure had resulted from a single application of the load. Hardness and conductivity tests on the bracket material indicated that it was made from 2014 or 2024 aluminium alloy, to T6 heat treatment. Total time in service was 661 flight hours.

Subsequent inspection of the helicopter revealed that the mounting bolts on the intact left-hand actuator bracket exhibited some distortion. It was therefore concluded that the helicopter had previously experienced an event which had imposed excessive load on the landing gear. There seemed little scope for such loads to have occurred during the taxi from the ramp; it appeared more probable that there had been a heavy landing within the last few flights.