

Aircraft Type and Registration:	Cessna F177RG Cardinal RG, G-BAFI	
No & Type of Engines:	1 Lycoming IO-360-A1B6D piston engine	
Year of Manufacture:	1973	
Date & Time (UTC):	22 February 1995 at 1445 hrs	
Location:	South of Peebles, near Edinburgh	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - Minor	Passengers - N/A
Nature of Damage:	Damage to fuselage structure, landing gear, propeller and engine	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	53 years	
Commander's Flying Experience:	13,859 hours (of which 24 were on type) Last 90 days - 13 hours Last 28 days - 13 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and AAIB visits and enquiries; aircraft recovered to Farnborough for investigation	

The aircraft had been refuelled at Gloucestershire Airfield on the day before the accident; 115 litres of fuel were uplifted which, together with the fuel already on board, was adequate for the intended flight. On the day of the accident flight, the pilot reported that he had carried out a thorough check of the fuel drains since he was aware that the aircraft had, in the past, collected some water in one of the tanks. He drained a total of about two pints of fuel from the aircraft, and obtained two or three globules of water from the left wing.

The intended flight was from Gloucestershire to Edinburgh. The pilot obtained a weather forecast by telephone which indicated broken cloud clearing from the west. The aircraft departed Gloucestershire at 1255 hrs and the flight progressed normally for well over an hour. Shortly before 1425 hrs the pilot obtained clearance to descend to FL60 (the reported freezing level) and advised ATC that the engine had given "a nasty cough" but was then "OK" and he would maintain FL60. In his report the pilot stated that when the engine had coughed he had selected the electric fuel pump on and richened the fuel

mixture to restore falling fuel pressure. He stated that the fuel pressure fluctuated a number of times and he was able each time to restore power by moving the mixture control. He did not observe any fluctuations of manifold pressure. At 1439 hrs he advised ATC that he was eleven miles from Talla and unable to maintain height, but at 1441 hrs he confirmed that was able to return to FL60. However at 1443 hrs the engine lost power again and at 1445 hrs it failed completely. The pilot became visual with the ground through broken cloud at an indicated height of 3,000 feet and at 1449 hrs he reported that he had force-landed. During the final stages of the descent the aircraft had broken cloud at low level and was unable to clear the top of a hill. The ensuing forced landing occurred while the gear was still in transit. The aircraft landed heavily on its underside causing major structural damage. The pilot, who suffered only minor injury, was attended by the crew of an RAF Wessex and airlifted from the scene. The aircraft was subsequently dismantled and lifted out, initially to Carlisle Airport and then later taken by road to AAIB Farnborough. While the aircraft was on the hillside, it was confirmed that there were adequate quantities of fuel in both tanks.

Initially the aircraft was examined at Carlisle, where it was confirmed that the fuel system up to the engine driven pump was working, and that the engine was in generally good condition. The spark plugs, induction system, tanks and fuel vent system were examined and found satisfactory. The injector and manifold were taken for testing and strip examination, and these were satisfactory. Fuel samples were taken and subsequent analysis showed these to be satisfactory for 100LL Avgas, with a low water content and no free water, or contaminants. At AAIB Farnborough the engine was partially stripped and the filter and magnetos checked. No defect was found.

Discussions with Cessna and Lycoming strongly suggested that fuel vent system icing was not likely to have occurred even under significant airframe icing conditions and that the reported constant manifold pressure suggested that induction icing did not occur. The pilot considered that fuel starvation was the most likely cause and in the absence of any defect in the fuel system the possibility of undetected free water in the fuel remains. The aftercast for the flight, obtained from the Meteorological Office at Bracknell, indicated sub-zero temperatures throughout the flight with a frontal system moving east across the area, and occasional rain, hail or rain and snow, which was moderate in places.