No. 14

Dove aircraft ZS-BTM, crashed outside boundary of Baragwanath Airfield, South Africa on 28 February 1951 Union of S. Africa Aircraft Accident Report No. 10/51

Circumstances

The aircraft with two commercial licensed pilots as sole occupants took off from Baragwanath Airfield for the purpose of pilot familiarization with the aircraft. After a short period of single-engined flying with the starboard propeller feathered, two landings and take-offs were performed successfully. During the approach for the third landing with the landing gear extended and locked and with flaps in the 60-degree position, a noise was heard on the port side. The pilots associated the noise with the undercarriage and decided to go round again with 85 - 90 mph IAS, the throttles were opened with the propellers set in fine pitch. There was no response from the port engine. Height was being lost so the undercarriage lever was placed in the up position and the port propeller feathered. The ASI fell to 70 - 80 mph. The flaps were raised to 20 degrees and the aircraft sank and yawed to the left. Shortly after clearing some trees, the aircraft stalled and struck the ground with the starboard engine under full power.

Investigation and Evidence

The aircraft struck the ground port wing first, and then swung completely round. There was fuel in the tanks but the aircraft did not catch fire. The starboard propeller was under power and the port propeller was feathered at the time of impact. The aircraft was not overloaded but the C.G. was just forward of the forward limit. All damage was consistent with impact except that of the port engine. A large hole was found on the top cover on its starboard side just behind the rear lifting eye and also holes on the port and starboard sides of the engine. No. 6 vibration damper assembly was not in position on the crankshaft. The rear piston of the crankshaft and crank

case disc was considerably damaged due to hammering of some foreign body within the case. Marks indicated that a solid body had lodged at the camshaft rear bearing and this had forced the entire camshaft back until the cam followers were completely off the cam. This would have caused complete power failure of the engine. Markings on No. 6 main bearing web of the crank case indicated that some rotating object, probably the vibration damper assembly had been rubbing against it. One of the damper rings was found in the starboard rear corner of the crankcase and showed signs of hammering. The vibration damper roller was recovered. The headed end was broken into a number of pieces and about half of the threaded portion of the special bolt which screws into it was still in position. The bolt had unscrewed about half an inch and had then broken off at the end of the roller. This bolt is normally peened over onto the headed end of the roller to prevent unscrewing, however, the peening had not been effective in this case. The head of the special bolt was rescrewed within the engine. It had fractured half an inch from the head and the shank showed signs of heavy working such as could be caused by the heavy damper rings operating thereon instead of the roller. Both pilots had more than 5,000 hours flying experience.

Probable Cause

The probable cause of the accident was failure of the port engine caused by the vibration damper bolt partially unscrewing from the roller until the rear damper ring was operating on the bolt shank which eventually failed under excessive loading.

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