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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 20, 1977

Forwarded to:

Honorable Langhorne M. Bond
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-77-43 and 44

On August 3, 1976, a Beechcraft Baron 58 crashed after takeoff from the Chillicothe Municipal Airport, Chillicothe, Missouri. The six persons aboard the aircraft died in the crash. Investigation revealed that the left engine, a Teledyne Continental IO-520, failed after takeoff when the aircraft was between 50 and 100 feet above the runway. The engine failed when the crankshaft broke at the No. 7 short crankcheek after a fatigue crack, which had originated below the surface, had propagated almost through the section. Postaccident metallurgical examinations failed to disclose evidence of any preexisting defects in the crankcheek which could account for the fatigue.

As of August 1976, over 15,000 crankshafts, part No. 633453, had been installed in IO-520 engines since engine certification in 1963. We are aware that 12 other of these crankshafts have fractured at the No. 7 crankcheek because of a subsurface fatigue crack. The failures were randomly distributed with regard to engine operating time. The cause of fatigue was not determined in any of these occurrences.

Although none of the other failures resulted in a fatal accident, we are concerned that the repetition of this type of failure is indicative of a continuing problem. We recognize that the FAA is aware of the postaccident tests conducted by Continental and their continuing efforts to determine the cause of the fatigue failure. We believe that until such a cause can be determined and corrected, positive action is necessary to minimize the risk of future engine failures.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue a maintenance alert bulletin to advise engine overhaul and repair facilities to inspect the IO-520 series crankshafts for incipient or developed cracks, preferably using an inspection means capable of detecting subsurface cracks, in the vicinity of the short crankcheeks any time that the crankshafts are available for inspection. (Class II-Priority Followup) (A-77-43)

Conduct a directed safety investigation consisting of a review of overhaul and repair facility inspection results to determine if the frequency and distribution of detected fatigue cracks indicates a deficiency in the IO-520 engine. (Class II--Priority Followup) (A-77-44)

TODD, Chairman, BAILEY, Vice Chairman, McADAMS, HOGUE, and HALEY, Members, concurred in the above recommendation.

Kay Bailey

for By: Webster B. Todd, Jr.
Chairman