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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: October 23, 1981

Forwarded to:

Honorable J. Lynn Helms
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-81-148 and -149

On December 7, 1980, a Beechcraft Model E 90, N2181L, departed O'Hare International Airport, Chicago, Illinois, on an instrument flight rules flight plan to Michigan City Airport, Michigan City, Indiana. The flight was conducted under the provisions of 14 CFR 135, and there were three passengers and a pilot on board.

After departing O'Hare, control of the aircraft was transferred to Chicago Air Route Traffic Control Center (ARTCC) and then to South Bend Approach Control. When South Bend Approach Control established radar contact with the flight, both radar vectors and the current South Bend altimeter setting were given to the pilot for a nondirectional beacon (NDB) approach to the Michigan City airport. South Bend Approach Control made several transmissions to the flight which were acknowledged by the pilot. About 6 miles north of the airport, radar contact with the aircraft was lost; several additional transmissions were made to the flight but they were not acknowledged.

The aircraft wreckage was located on December 10, 1980, in Lake Michigan about 1 mile west of the Grand Beach, Michigan, pumping station. The bodies of two passengers have been recovered, but the pilot and one passenger remain missing and are presumed dead.

The maintenance records and aircraft logbooks indicated that the aircraft had accumulated about 2,913 hours and was being maintained under a progressive-type inspection program. The records also indicated that the aircraft had received a 100-hour inspection at KAL-AERO, Inc., an approved repair station on November 17, 1980. This inspection system consisted of alternate 100- and 200-hour inspections. The system was set up in such a way as to insure that all the critical elements of the aircraft were inspected within the 200-hour cycle. During a 100-hour inspection, the fuel system, oil system, air conditioning system, electrical system, landing gear, and the elevator and rudder trim systems are checked. During a 200-hour inspection, items inspected include the nose gear steering, flight control bellcranks and pulleys, aileron, rudder, and elevator cables.

A review of the aircraft logbooks indicated that the aircraft should have been given a 200-hour inspection on November 17, 1980, rather than the 100-hour inspection that was performed. Upon review of the discrepancies discovered during the 100-hour inspection, the Safety Board found that several items had been deferred on instructions of the pilot. Included among the deferred items was "elevator push pull rod at bellcrank under pilot's chair noisy."

During the examination of the wreckage, the pivot bolt for the elevator forward bellcrank was found to be missing and the bellcrank had moved forward in its attachment bracket. The elevator forward bellcrank is mounted under the cockpit floorboards. The pivot bolt was later located in the area of the bellcrank, but the nut and washer were never found. Examination of the pivot bolt, bellcrank, and attachment bracket indicated that the bolt had not been in place for some time and that the attachment bracket had retained the bellcrank in a position relatively close to its normally assembled position. Examination of the threads on the pivot bolt indicated that the nut probably had never been installed. The Safety Board could not ascertain whether the pivot bolt and nut had been removed or replaced during previous aircraft maintenance.

A test was conducted using another aircraft in which the nut was removed from the pivot bolt of the elevator forward bellcrank and the controls operated without load. The test showed that the bolt would move up and out of the attachment bracket when the elevator control was operated. The test also demonstrated that when the bellcrank was retained near its normal assembled position, limited elevator control was possible; when the bellcrank moved forward in the attachment bracket, elevator control was lost.

The mechanic who made the entry in the logbook, verifying its airworthiness and releasing the aircraft for flight, stated that he did not verify that the 100-hour inspection was the correct inspection to be performed. Had the mechanic reviewed the maintenance logbook, he would have known that the aircraft was due a 200-hour inspection. Had the 200-hour inspection been accomplished, the problem with the elevator pivot bolt might have been identified and corrected.

Our investigation indicates that the improperly secured elevator pivot bolt appears to have been an isolated occurrence. We have been advised that a General Aviation Airworthiness Alert concerning the need for a thorough inspection of the forward elevator bellcrank pivot bolt assembly will be issued. However, the Safety Board is also concerned about the discrepancies found during this investigation regarding the operation of the repair station. The aircraft was returned to service with an uncorrected discrepancy in a primary flight control system, and the repair station personnel failed to accomplish the proper 200-hour inspection.

Therefore, the National Transportation Safety Board believes that corrective action is required and recommends that the Federal Aviation Administration:

> Request that all General Aviation District Office Maintenance Inspectors review the procedures of repair stations under their jurisdiction to ensure that aircraft records are thoroughly reviewed and that the proper inspections are performed under the provisions of 14 CFR 91.217. (Class II, Priority Action) (A-81-148)

Require the Great Lakes region to conduct a thorough inspection of and a review of the procedures and practices of the involved repair station. (Class II, Priority Action) (A-81-149)

KING, Chairman, DRIVER, Vice Chairman, and McADAMS, Member, concurred in these recommendations. GOLDMAN, Member, disapproved and BURSLEY, Member, did not participate.

By: James B. King
Chairman