

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: February 20, 1975

Forwarded to:

Honorable Alexander P. Butterfield
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-75- 8 and 9

On October 23, 1974, an engine failed on a Beech 99 aircraft near Jackson, Michigan. The National Transportation Safety Board's ongoing investigation of the accident has revealed a potential hazard in Pratt & Whitney PT-6 series engines.

The airplane was cruising at 8,000 feet when the left engine power turbine disk separated from the engine. Liberated parts and debris from the left engine power turbine and shroud assembly penetrated the fuselage in the vicinity of the cockpit. Although the captain and the first officer were seriously injured by the shrapnel, they were able to land the aircraft safely.

When the engine was disassembled, a worn first-stage reduction planet gear sleeve bearing was found. The worn bearing ultimately permitted the power turbine disk to uncouple from the propeller reduction gearing and the turbine to overspeed. The overspeed caused sufficient imbalance and gyroscopic forces to buckle the power turbine shaft housing, which caused the disk to separate from the engine.

Resultant disk damage could be minimized by keeping the disk within the plane of the rotor containment ring. United Aircraft of Canada Limited (UACL) has issued Service Bulletin No. 1138 to reduce deflection and buckling of the power turbine shaft housing when a disk becomes uncoupled by incorporating a reinforcing sleeve for the power turbine shaft housing.

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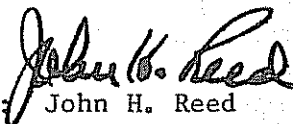
Service experience has shown that if component deterioration is detected early, through adequate and frequent inspection of the oil filters and magnetic chip detector (if installed as an elected option), the possibility of a turbine disk becoming uncoupled and overspeeding can be reduced.

The National Transportation Safety Board therefore recommends that the Federal Aviation Administration:

1. Issue an Airworthiness Directive to require that UACL Service Bulletin No. 1138 be incorporated on PT-6 engines not so modified at either the next overhaul or shop-level power section work.
2. Issue an Airworthiness Directive to require that a magnetic chip detector be installed in accordance with UACL Service Bulletin No. 1217 as a replacement for the reduction gearbox drain plug. When the magnetic chip detector has been installed, require that the detector be inspected at intervals not to exceed 25 hours and that the main oil filter be inspected at intervals not to exceed 50 hours, until a satisfactory solution to correct the failure of the bearing-sleeve is found.

REED, Chairman, McADAMS, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendations.

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By: John H. Reed
Chairman

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SAFETY BOARD
DEPARTMENT OF TRANSPORTATION
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