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NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: July 16, 1984

Forwarded to:

Honorable Donald D. Engen  
Administrator  
Federal Aviation Administration  
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)  
A-84-7<sup>g</sup> through -81

On July 24, 1983, a Cessna Model U206G, N4661Z, crashed near Iliamna, Alaska, after sustaining an engine malfunction during takeoff. The Safety Board's investigation of the accident disclosed that the engine had ingested small pieces of aluminum that had broken away from the lower portion of the induction airbox assembly. A metallurgical analysis of the airbox disclosed that metal fatigue induced by engine vibration had caused it to break. Similar accidents involving Cessna Model U206F airplanes occurred at Springfield, Missouri, on November 10, 1978 (N9658G), and at Kemmerer, Wyoming, on September 15, 1982 (N8317Q).

About January 1981, the Cessna Aircraft Company shifted to a different material specification and increased the thickness of the induction airbox assembly to be installed on newly manufactured Models 206, 207, and the nonturbocharged Model 210. These changes were made to improve the metal fatigue characteristics of the airbox and reduce its susceptibility to vibration induced damage. The new, heavier airbox, Part No. 1250705-8, is routinely shipped as a replacement for the older, lighter type of airbox whenever the latter is ordered. Currently, there is no Service Letter announcing the availability of the new part, but Cessna has indicated that it intends to make such an announcement in the near future.

The three aforementioned accidents all involved airplanes having the older, lighter airboxes. As a result of its investigations of these accidents, the Safety Board believes that the FAA should issue an Airworthiness Directive (AD) requiring rigorous periodic inspection of these airbox assemblies at appropriate maintenance intervals. The effect of engine vibration on the airboxes is more critical if the airbox rubs against the adjacent wire-reinforced cooling hoses or hose clamps, or if the airbox is not securely fastened to the framework of the engine. Consequently, the inspections should be directed not only at detection of airbox cracks but also at the foregoing crack-inducing conditions. Further, since Cessna has a new heavier airbox available as a replacement for the older lighter airbox, we believe that the FAA should evaluate the new airbox and its installation as a potential permanent solution to the problem.

Similar circumstances could exist in relation to induction airboxes or air inlet assemblies installed on a variety of airplanes and, in conjunction with advisories of related service difficulty reports, the need for a rigorous periodic inspection should be emphasized in Advisory Circular No. 43-16, General Aviation Airworthiness Alerts.

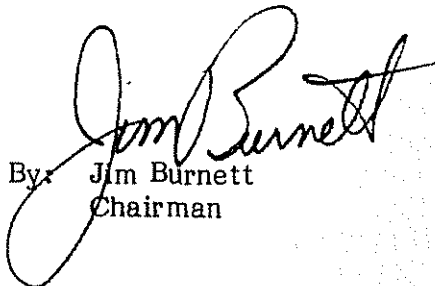
Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive applicable to Cessna Models 206, 207, and nonturbocharged Model 210, to require a periodic inspection of the induction airbox assembly for evidence of cracking, chafing, or looseness and to require that the airbox be repaired, replaced, or secured as necessary. (Class II, Priority Action) (A-84-79)

Evaluate the installation of the new, heavier Cessna induction airbox assembly, Part No. 1250705-8, as a possible alternative to the periodic inspection of the original airbox assembly for evidence of cracking, chafing, or looseness. (Class II, Priority Action) (A-84-80)

Emphasize in Advisory Circular No. 43-16, General Aviation Airworthiness Alerts, occurrences of induction airbox metal fatigue and breakage due to vibration and the importance of rigorous periodic inspections of the assemblies for evidence of cracking, chafing, or looseness. (Class II, Priority Action) (A-84-81)

BURNETT, Chairman, GOLDMAN, Vice Chairman, BURSLEY and GROSE, Members, concurred in these recommendations.

  
By: Jim Burnett  
Chairman