

Log 1503

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 9, 1984

Forwarded to:

Mr. Fred P. Ayres
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SAFETY RECOMMENDATION(S)
A-84-64

On June 21, 1982, the pilot of an Aero Commander S2R, an agricultural application airplane, was practicing full-stop landings on runway 13 at the Lakeland Municipal Airport, Lakeland, Florida. During climbout after the fourth takeoff, the aircraft was observed to stall and spin just southeast of the airport boundary. The pilot was fatally injured upon impact. The investigation revealed that the pilot's injuries were aggravated by his excessive forward movement, due to a change in the shoulder harness geometry when the shoulder harness loads tore the aluminum aft-cockpit bulkhead which supported the shoulder harness.

The pilot's seat in the S2R model aircraft is installed almost flush with the aft cockpit bulkhead. The shoulder harness is attached to substantial structural members in the aft fuselage about 5 feet aft of the bulkhead. The shoulder harness straps pass into the cockpit through access slots in the upper aft bulkhead above the seat frame. The distance between the upper seat frame and the shoulder harness access slots depends upon the seat's vertical height adjustment.

The pilot was 6 feet tall and the seat was adjusted so that the upper back frame was about 6 inches below the shoulder harness access slots in the bulkhead. The loads applied by both shoulder harness straps on the aft bulkhead structure during impact caused the access slots to tear the bulkhead down to the top of the seat frame. The tearing changed the shoulder harness geometry sufficiently to allow the pilot to move forward about an additional 2 inches. The pilot suffered a crushed skull and laceration/fragmentation of the brain when he hit the structure in the front of the cockpit. Although the seatbelt and shoulder harness remained intact, the additional forward movement of the pilot was a factor in the severity of the injuries to the pilot's head.

The aluminum aft cockpit bulkhead in this S2R model aircraft (S/N 1873R) apparently incorporates minimum support structure below the shoulder harness access slots and cannot withstand the downward loads of the shoulder harness straps in severe impacts. On later models (S/N 2241 and later), a large doubler is attached to the aft cockpit bulkhead to provide more support for shoulder harness inertia reels. The doubler is used with bracket assembly P/N 10544-1 and also would appear to reduce the chance of tearing the aft cockpit bulkhead. The Safety Board believes that the problem identified above can be mitigated effectively by the issuance of a mandatory Service Bulletin. The

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Board recognizes that Service Bulletins are not considered mandatory in the regulatory sense. However, manufacturers often do indicate in their Service Bulletins or instructions to the users of their products the urgency of the recommended change or repair. We recommend that the Ayres Corporation indicate in its Service Bulletin that it considers the doubler installation on the S2R aircraft a mandatory repair.

Therefore, the National Transportation Safety Board recommends that the Ayres Corporation:

Issue a mandatory Service Bulletin for Aero Commander, S2R agricultural airplanes with serial numbers preceding S/N 2241 that would require the installation of a doubler that adequately distributes shoulder harness crash loads to prevent the tearing of the aft cockpit bulkhead structure. (Class II, Priority Action) (A-84-64)

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility ". . . to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter.

BURNETT, Chairman, GOLDMAN, Vice Chairman, BURSLEY and GROSE, Members, concurred in this recommendation.

By: 
Chairman