

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

FOR RELEASE: 6:30 A.M., E.D.T., JULY 29, 1976

(202) 426-8787

ISSUED: July 29, 1976

Forwarded to:

Honorable John L. McLucas
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-76-97 through 100

The National Transportation Safety Board continues to be concerned about the number of accidents which involve light twin-engine aircraft that fail to recover from apparently unintentional spins.

On January 17, 1976, a Beechcraft Model 95 crashed at the Montgomery County Airpark, Gaithersburg, Maryland, and on January 21, 1976, a Beechcraft Model 58 crashed 3 miles south of Pearlblossom, California. Both of these accidents occurred during multi-engine instructional training flights and both resulted in fatal injuries to the instructor and student pilots on board. Our investigations disclosed that both of these accidents occurred when the airplanes entered spins during simulated engine failures.

These two accidents typify many others. Our statistics show that of 57 light twin stall/spin accidents between 1970 and 1974, 19 occurred during instruction or demonstration flights and 18 occurred after actual engine failures. We believe that even some experienced instructor pilots are not adequately familiar with their airplane's flight characteristics, particularly with the relationship between minimum control speeds and single-engine stall speeds under certain operating conditions. Consequently, the instructor pilot may cut an engine when the airspeed is dangerously close to, or below, the stall speed or may allow the student to decelerate the airplane rapidly into this region.

On August 12, 1975, the Safety Board issued Safety Recommendation A-75-64 to the Administrator on this subject. The recommendation urged the issuance of a new Advisory Circular which would supplement AC 61-67, "Hazards Associated with Spins in Airplanes Prohibited from Intentional Spinning" and which would deal solely with the spin problem as it relates to simulated and actual engine-out performance of twin engine aircraft. In a response dated September 19, 1975, the Administrator indicated that information on the subject is available in several existing FAA documents.

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While we agree that the subject of engine-out performance and demonstration is discussed in those Advisory Circulars pertaining to training or requirements for rating in multi-engine aircraft, we continue to believe that the problem is being treated inadequately.

The two recent accidents received much attention by the FAA's Wichita Engineering and Manufacturing District Office, which, in turn, coordinated several actions with the Beech Aircraft Corporation, Wichita, Kansas. These actions included a further examination of the single-engine flight characteristics of the Baron airplane. The airplane satisfied all of the "one-engine inoperative" performance and stall characteristic requirements of 14 CFR 23. The airplane does have a minimum control speed (V_{mca}) which is below the power-off stall speed for most operating weights and altitudes. While this is not an undesirable characteristic, it can lead a pilot, unaware of such a characteristic, into trouble if he attempts to demonstrate flight at V_{mca} . If the airplane is inadvertently flown into a full stall with power on one engine, immediate pilot action is required to prevent a spin from which recovery might not be possible within the existing altitude constraint.

Beech recognized the potential problem and together with the FAA Wichita EMDO, released an Executive Airplane Safety Communique which discussed the implementation of a recommended safe "one-engine inoperative" speed (V_{sse}) and the procedure for safely demonstrating V_{mca} . Beech is including this material into approved flight manuals and pilot's handbooks for their Travel Air and Baron aircraft.

Essentially, Beech has specified a minimum speed (V_{sse}) and procedures which, if adhered to during actual engine-out conditions and demonstration of engine-out performance, will preclude inadvertent entry into the stall/spin region.

We are pleased with the action taken by Beech and believe that the placement of such performance information where it will be readily available to all operators will serve to prevent accidents. We believe that similar data should be presented by all manufacturers of light twin-engine aircraft and that action should be taken by the FAA to include the terminology for safe "one-engine inoperative" speed in pertinent regulations and Advisory Circulars.

Accordingly, the National Transportation Safety Board recommends that the Federal Aviation Administration, in coordination with the General Aviation Manufacturers Association:

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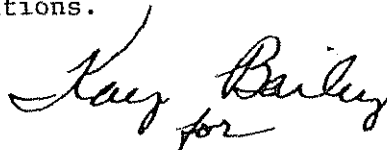
Amend 14 CFR 23.149 to require that a safe one-engine inoperative speed (V_{sse}) be specified. This speed should be sufficiently above the minimum control and single-engine stall speeds that there will be no uncontrollable yaw or roll rate when thrust is suddenly reduced to idle on the critical engine with takeoff or maximum available power on the operable engine. This speed should be demonstrated under the most adverse conditions -- gross weight, c.g., altitudes, and temperature -- within the airplane's operating envelope. (Class II - Priority Followup) (A-76-97)

Publish the safe one-engine inoperative speed, V_{sse} , and appropriate procedures in the approved flight manuals and pilots' handbooks and revise the GAMA Specifications for Pilot's Operating Handbook accordingly. (Class II - Priority Followup) (A-76-98)

Revise Advisory Circulars AC 61-4C, AC 61-98, and AC 61-21 to include a discussion of safe procedures for the demonstration of V_{mca} and note the V_{sse} limitation. (Class II - Priority Followup) (A-76-99)

Issue an Advisory Circular to supplement AC 61-67 dealing solely with simulated and actual engine-out emergencies in typical high performance multi-engine general aviation airplanes. The Advisory Circular should discuss the safe methods of demonstrating V_{mca} and should emphasize the potential hazards of asymmetrical power on stalls. The Advisory Circular should be disseminated to all multi-engine class-rated pilots, flight schools and flight instructor clinics, and safety seminars. (Class II - Priority Followup). (A-76-100)

TODD, Chairman, McADAMS, HOGUE, BURGESS and HALEY, Members, concurred in the above recommendations.



By: Webster B. Todd, Jr.
Chairman

THESE RECOMMENDATIONS WILL BE RELEASED TO THE PUBLIC ON THE ISSUE DATE SHOWN ABOVE. NO PUBLIC DISSEMINATION OF THE CONTENTS OF THIS DOCUMENT SHOULD BE MADE PRIOR TO THAT DATE.

