Transportation Safety Board of Canada | Bureau de la sécurité des transports du Canada

REASSESSMENT OF RESPONSES TO AVIATION SAFETY RECOMMENDATION A00-09

AIRWORTHINESS DIRECTIVE AND RETROFIT DESIGN CHANGE

Background

On 18 July 1998, at about 0850, Eastern Daylight Time, a flight instructor and a student took off on a local training flight from Runway 25 at Montréal/Les Cèdres Aerodrome, Quebec. The student pilot was practicing spins and recoveries. The student initiated a spin to the left, his sixth of the day, at an altitude of 3600 feet above sea level. The first 5 spins were to the right. The aircraft entered the spin normally. After 1.5 turns, the flight instructor asked the student to recover. The student applied pressure on the right rudder pedal, as taught by the flight instructor, and the rotation did not stop. The flight instructor took over the controls and applied pressure on the right rudder pedal to stop the rotation, but the rotation did not stop. The aircraft, by then, was established in a stabilized spin, rotating to the left, and continuing its descent. The flight instructor applied full power for a moment, then full flaps, to no avail. Throughout the recovery attempt, the flight instructor continued in his efforts to avoid the crash. The aircraft struck the surface of Lac Saint-François. The student pilot sustained serious injuries, but managed to evacuate the sinking aircraft through the right, rear window. He then tried to pull out the unconscious flight instructor, but without success. A fisherman close to the scene rescued the student and transported him ashore where emergency vehicles were standing by. The flight instructor did not evacuate the aircraft and died in the accident.

The Board concluded its investigation and authorized the release of report A98Q0114 on 06 July 2000.

Board Recommendation A00-09 (14 July 2000)

While stated action by Cessna to develop a service bulletin (SB) designed to prevent over-travel of the rudder is appropriate, the Board is concerned that, since the proposed SB will be voluntary, not all Canadian-registered Cessna 150 and 152 will be modified. Therefore, the Board recommends that:

> The Department of Transport issue an Airworthiness Directive to all Canadian owners and operators of Cessna 150 and 152 aircraft addressing a mandatory retrofit design change of the rudder horn stop bolt system to preclude over-travel and jamming of the rudder following a full rudder input.

Transport Canada's Response to A00-09 (10 October 2000)

In its response, Transport Canada (TC) indicated that it is responsible for regulating the airworthiness of aircraft operated in Canada. TC has been in continual discussions with the United States Federal Aviation Administration (FAA), which is the state of design airworthiness authority responsible for the Cessna 150 and 152 aircraft. The FAA informed TC that Cessna has not yet developed a retrofit design change. Cessna is, however, planning to provide a product improvement kit to modify the rudder system stops on these aircraft.

To further ensure the safety of the Canadian Cessna 150 and 152 fleet, TC has issued Emergency Airworthiness Directive (AD) CF-2000-20, dated 02 August 2000, to be effective 04 August 2000. The AD prohibits intentional spins and incipient spins until an airworthiness inspection of the rudder system is complete and imposes thereafter an inspection every 110 hours or 12 months, whichever occurs first. The FAA has not taken such a mandatory action, but is cognizant of TC's actions.

When a modification is made available by Cessna, TC, together with the FAA, will review the modification and assess whether mandatory retrofit is appropriate.

Board Assessment of Transport Canada's Response to A00-09 (21 March 2001)

In its response, TC stated that it has been in continual discussions with the FAA, the authority responsible for the design airworthiness of the Cessna 150 and 152 aircraft. The FAA informed TC that Cessna has not yet developed a retrofit design change. Cessna is, however, planning to provide a product improvement kit to modify the rudder system stops for these aircraft. TC has stated that, when a modification is made available, TC together with the FAA would review the modification and assess whether the mandatory retrofit would be appropriate.

TC reported that it has taken action to further ensure the safety of the Canadian Cessna 150/152 fleet. Specifically, TC has issued AD CF-2000-20, dated 02 August 2000, to be effective on 04 August 2000. The AD prohibits intentional spins and incipient spins until an airworthiness inspection of the rudder system is complete and imposes thereafter an inspection every 110 hours or 12 months, whichever occurs first. The FAA has not taken such mandatory action, but is aware of TC's actions.

According to a 14 January 2001 FAA letter to TC, the FAA is familiar with a Cessna SBn that should be promulgated in January 2001. On 22 January 2001, Cessna issued SB SEB01-1, which detailed a rudder stop modification "To provide an enhanced rudder stop, bumper, doubler and attachment hardware designed to assist in preventing the possibility of the rudder overriding the stop bolt during full left and/or right operation of the rudder". In its 14 January 2001 memo, the FAA further stated that it is not convinced that a rudder jam caused the accident and does not believe the number of occurrences per fleet size, approximately 1 in 25 000, justifies any action on the FAA's part. Although Cessna SEB01-1 states that compliance is "Mandatory; within the next 100 hours of operation or 12 months, whichever comes first", incorporation of a service bulletin is a manufacturer's recommendation and not mandatory for maintaining the continuing airworthiness of aircraft; only an AD by a civil aviation authority, like the FAA or TC, makes compliance mandatory.

TC's discussions with the FAA, as well as its AD requiring an airworthiness inspection and prohibiting spins unless the AD is completed, reflect TC's acceptance that a problem exists with the Cessna 150/152 rudder system, and that the airworthiness inspection requirements existing at the time of the accident were not adequate. TC's intent to review Cessna's planned rudder-system improvement kit further reflects TC's acceptance of the deficiencies that were the bases for this Board recommendation. Notwithstanding, TC has not yet committed to mandating a design change of the rudder system.

Consequently, TC's response is assessed as **Satisfactory Intent**.

Next TSB Action (21 March 2001)

The TSB staff will continue to monitor TC's future actions related to this recommendation, and will update this assessment if appropriate.

Board Reassessment of A00-09 (09 June 2004)

TC's AD CF-2000-20 was originally issued to mandate repetitive inspections of the rudder system to prevent the possible jamming of the rudder past its normal travel limit under conditions where the application of full rudder in either direction may be required. Revision 1 was issued to mandate the incorporation of the modification to replace or modify the stop bolts to eliminate the friction between the stop bolts and the rudder horn. Revision 2 was issued 10 October 2003 because the repetitive inspections were no longer valid.

Consequently, this response is considered **Fully Satisfactory**.

Next TSB Action (09 June 2004)

Nil.

This deficiency file is assigned an **Inactive** status.