



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: March 21, 2007

In reply refer to: A-07-33

Honorable Marion C. Blakey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

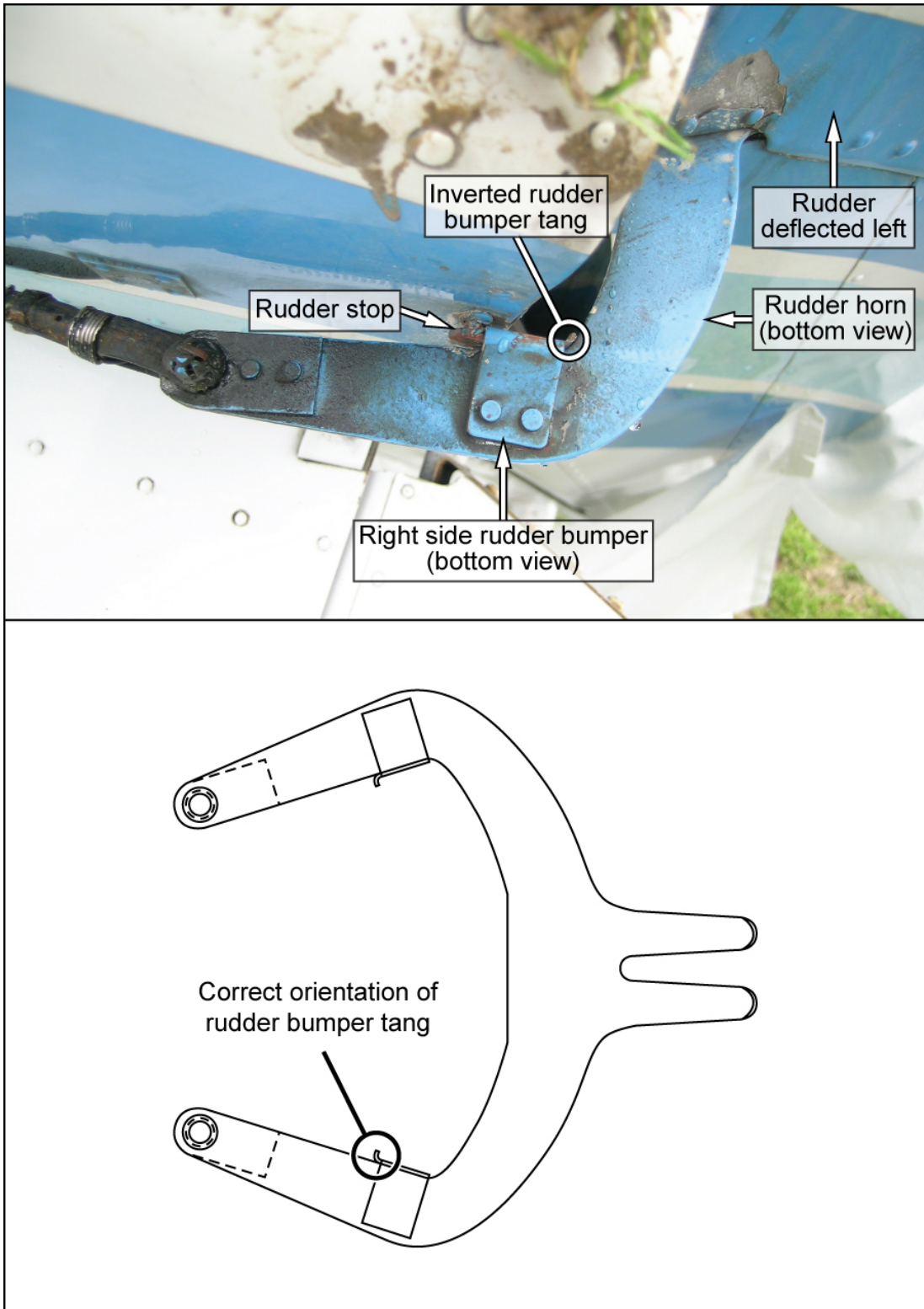
On April 11, 2005, about 1308 eastern daylight time, a Cessna 152, N24779, crashed into a field near Williamsburg, Ohio, after the rudder jammed during spin recovery training.¹ The certificated flight instructor (CFI) and the student pilot were killed, and the airplane was substantially damaged. The flight departed Clermont County Airport, Batavia, Ohio, about 1230 and proceeded to a practice area about 10 miles east of the airport. Witnesses reported that, while at an altitude of about 3,000 feet above ground level, the airplane descended in a nose-down spiral from which it did not recover and crashed into a field. Visual meteorological conditions prevailed for the local instructional flight, which was conducted under 14 *Code of Federal Regulations* (CFR) Part 91.

Examination of the wreckage revealed that the rudder was jammed approximately 35°, which is beyond its left travel limit.² Further examination revealed that the two rudder bumpers had been installed inverted and that the right rudder bumper had traveled beyond the rudder stop and had locked behind it. As shown in the photograph in figure 1, the accident airplane's right rudder bumper had traveled to the right of the rudder stop when it was supposed to be to the left of the rudder stop; the drawing in figure 1 shows the rudder bumper's correct orientation. The inverted rudder bumpers may have caused the rudder jam because, when a rudder bumper is inverted, the "tang" (portion of the rudder bumper that contacts the rudder stop to prevent the bumper from further travel) points toward instead of away from the curvature of the rudder horn; thus, the rudder bumper can pass over and beyond the stop and result in a jam.

¹ The description of this accident, NYC05FA069, can be found on the National Transportation Safety Board's Web site at <<http://www.nts.gov>>.

² The rudder travel limit is 23° deflection (left or right) from the hinge line.

Figure 1. Photograph of accident airplane's rudder horn and drawing of a rudder horn showing correct rudder bumper tang orientation.



The investigation could not determine whether the incorrect installation of the rudder bumpers occurred at the time of production or during the airplane's maintenance history. Review of the maintenance records indicated no record of work having been performed on the rudder bumpers during the airplane's 28-year history. Maintenance records indicated, however, that work had been performed near the rudder bumpers on several occasions. Also, paint observed on the inverted rudder bumpers during postaccident examination was consistent with the maintenance records, which indicate the airplane was painted about 8 years before the accident. There were no maintenance records of work being performed on the rudder bumpers in at least 8 years.

The National Transportation Safety Board is aware of, but did not participate in, the investigation of a similar accident involving a Cessna 152, Canadian Registration C-GZLZ, in Quebec, Canada, on July 18, 1998. A CFI and a student pilot were practicing spins and were unable to recover from one. The CFI was killed, the student pilot sustained serious injuries, and the airplane was substantially damaged. During its investigation, the Transportation Safety Board of Canada (TSB) found that, although the rudder bumpers were installed correctly on this airplane, the rudder had deflected at 34° and had jammed beyond its left travel limit. The TSB also found that the right rudder bumper had traveled beyond the rudder stop and had locked behind it.

As a result of the accident in Quebec, Cessna Aircraft Company issued Service Bulletin (SB) No. SEB01-1 on January 22, 2001, and designated it mandatory³ for Cessna 150 and 152 models.⁴ In the SB, Cessna recommended the replacement of the bumper and stop bolts with larger ones. Depending on the aircraft make and model, the SB calls for adding a doubler plate where the stop bolt attaches to the tail. If the doubler is installed on a particular aircraft model, new attachment hardware is used to attach the new bumper and doubler. The replacement components are designed to help prevent the rudder from overriding the stop bolt during full left or right rudder operation. On October 10, 2003, Transport Canada issued airworthiness directive (AD) CF-2000-20R2, requiring that all applicable Canadian-registered airplanes comply with SB No. SEB01-1. To date, the FAA has not issued a similar AD.

The Safety Board is aware that most Cessna 150 and 152 models, like the airplane involved in the April 11, 2005, accident in Williamsburg, Ohio, are not required to comply with SBs,⁵ such as SB No. SEB01-1. The Board is concerned that, without an AD requiring compliance with Cessna's SB No. SEB01-1, many operators may not take the action

³ A manufacturer may choose to highlight the significance of an SB by referring to it as mandatory. However, 14 CFR does not recognize this characterization. Cessna considers its SBs, service news letters, supplier service notices, publications changes, revisions, reissues, and temporary revisions to be supplements and/or amendments to the approved maintenance manual for the applicable airplane(s).

⁴ Cessna 150 and 152 models have only minor differences; the Cessna 152 has a slightly bigger engine and slightly different flap system.

⁵ Title 14 CFR does not require compliance with SBs for Part 91 operators. For Part 135 and Part 121 operations, compliance with SBs may be required if an operator accepts the manufacturer's maintenance program as part of its operations specifications.

recommended in the SB. Additionally, even for airplanes that comply with SB No. SEB01-1, the Board is concerned that the new rudder bumpers may be installed/oriented incorrectly or inverted. Thus, the possibility remains that more rudders on Cessna 152s and 150s will travel beyond their rudder stops and jam, causing a loss of control in flight and resulting in more accidents and fatalities.

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

Issue an airworthiness directive requiring that Cessna 150 and 152 models comply with Cessna's Service Bulletin No. SEB01-1 and undergo a one-time inspection at the next 100-hour or annual inspection to verify that the rudder bumpers are correctly installed on the rudder horn assembly. (A-07-33)

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN, HIGGINS, and CHEALANDER concurred with this recommendation.

[Original Signed]

By: Mark V. Rosenker
Chairman