



# National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

**Date:** January 16, 1986

In reply refer to: A-85-142 through -144

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

On November 3, 1984, a Cessna T210L, with a commercial pilot and a private pilot on board, was involved in a flight control malfunction incident during a takeoff ground run at Palwaukee Airport, Wheeling, Illinois. The commercial pilot stated that during the preflight and just before takeoff, the flight controls operated normally. After adding power to take off, he attempted to apply back pressure to rotate, but was unable to move the control yoke. The takeoff was aborted without further incident.

A postincident inspection of the airplane revealed that the ribbon wire, Cessna Part No. 1570308-1, for the control yoke electrical switches had jammed under the control column bearings, thus restricting the movement of the yoke. When the ribbon wire was removed from under the bearings, but while still installed in the airplane, investigators found an excessive amount of slack in the wire. When the flight controls were moved to their full extension limit, some slack still remained in the ribbon wire.

During the investigation, several avionics specialists for large operators of Cessna aircraft reported that they had removed scuffed or frayed ribbon wires from several Cessna aircraft. (The flight control column is the only object close to the ribbon wire which moves.) A search of the Federal Aviation Administration's (FAA) Analysis Center data revealed two other cases in which a ribbon wire was found to be either frayed or broken. Also, an incident similar to the November 3 incident involving a Cessna 210 was brought to the Safety Board's attention. In that incident, the ribbon wire became lodged under the control shaft bearings, but the pilot was able to land the airplane successfully by judicious use of throttle and elevator trim.

On May 14, 1979, the Cessna Aircraft Corporation issued Service Information Letter No. SE 79-26, regarding 1978 and 1979 Cessna 210 and P210 models. The letter recommended that guides be installed under two of the four bearings to prevent the ribbon wire from becoming caught under the bearings. However, the letter did not address Cessna 210 models manufactured between 1970 and 1977, serial numbers (SN's) 59200 through 62273, or four other Cessna airplanes which incorporate the same ribbon wire arrangement. These airplanes include the 182 models manufactured between 1968 and 1981, SN's 58506 through 68055; 206 models manufactured between 1970 and 1981, SN's 1445 through 6439; 207 models manufactured between 1969 and 1981, SN's 001 through 729; and 337 models manufactured between 1970 and 1980, SN's 1194 through 1951. Subsequent to the manufacture dates listed above, the manufacturer incorporated an improved design ribbon wire, installed bearing guides at the factory, or discontinued production of the model. The airplane involved in the November 3, 1984, incident was manufactured in 1974.

To date, there have been no accidents determined to have been caused by the ribbon wire jamming under the control column bearings. However, a recurrence of this problem could be catastrophic. Additionally, any mechanical damage induced in the ribbon wire from binding would be difficult to distinguish as precrash or postcrash damage if an inflight loss-of-control accident occurred and there were no survivors.

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

Require that the Cessna Aircraft Corporation incorporate specific instructions for the installation of the control wheel switch wire ribbon in the aircraft maintenance manuals for Cessna 182 model airplanes manufactured between 1968 and 1981; 206 model airplanes manufactured between 1970 and 1981; 207 model airplanes manufactured between 1969 and 1981; 210 model airplanes manufactured between 1970 and 1979; and 337 model airplanes manufactured between 1970 and 1980. (Class II, Priority Action) (A-85-142)

Require that the Cessna Aircraft Corporation amend Service Letter No. SE-79-26 to extend its applicability to all Cessna 182, 206, 207, 210, and 337 model airplanes utilizing control wheel switch wire ribbons which are not covered already by the service letter. (Class II, Priority Action) (A-85-143)

At such time as Cessna Service Letter No. SE 79-26 is amended to apply to all Cessna 182, 206, 207, 210, and 337 model airplanes utilizing control wheel switch wire ribbons, issue an Airworthiness Directive to require compliance. (Class II, Priority Action) (A-85-144)

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

By:   
Jim Burnett  
Chairman