

WPR17LA102 Right rudder control examination.

The pilot reported a loss of right rudder control during takeoff. On July 20, 2017, the airplane was examined at a secure facility by an NTSB Senior Air Safety Investigator accompanied by an FAA Inspector.



Photo 1. Airplane registration number N245KW.

WRECKAGE EXAMINATION

The right rudder pedal was found full forward against the firewall, and trapped behind the cabin's front "V" brace. The control stick was trapped in the full right aileron position. Impact intrusion to the cabin was more pronounced on the right than the left.

The control stick has a floor mounted control tube between the forward and rear seat (tandem seat configuration). The control tube is retained by a fore and aft clamp. The floor was deformed at the aft clamp. Clamp pressure was removed at the aft clamp, and the control stick resumed normal operation. Control continuity was obtained for the elevator and ailerons.

RUDDER MECHANICAL OVERVIEW

Right rudder control consists of a cable attached to the right rudder pedal assembly for the front seat pilot, running along the right side of the cabin to the rear seat right rudder pedal assembly. Both ends of the cable are looped around thimbles and secured with swage sleeves crimped in place.

A second cable is attached to the rear seat right rudder pedal assembly, and proceeds aft along the inside of the fuselage, then exits to the outside of the fuselage where it is attached to the right side of the rudder horn. Both ends of the cable are looped around thimbles and secured with a swage sleeve crimped in place.

The right rudder cable, between the front and rear seat, was found detached at the rear seat connection. The thimble remained attached to the rear seat pedal assembly, and the free end of the cable was loosely threaded through the swage sleeve.

The left and right front seat rudder cables were removed and compared. The right cable was approximately the same length as the left and showed no signs of cutting, tearing or other external damage.

The right and left cables did not have the same appearance of age, condition, or patina, and the swage sleeves were of different styles and crimp patterns. However, the right rear rudder cable from the rear seat pedal to the rudder horn did have the same appearance of age, condition, and patina as the left cable assembly, as-well-as the same swage sleeve type and crimp patterns.

Comparison of the swage crimp patterns on the forward and aft ends of the right rudder pedal cable showed much deeper crimps on the forward end than the aft end.

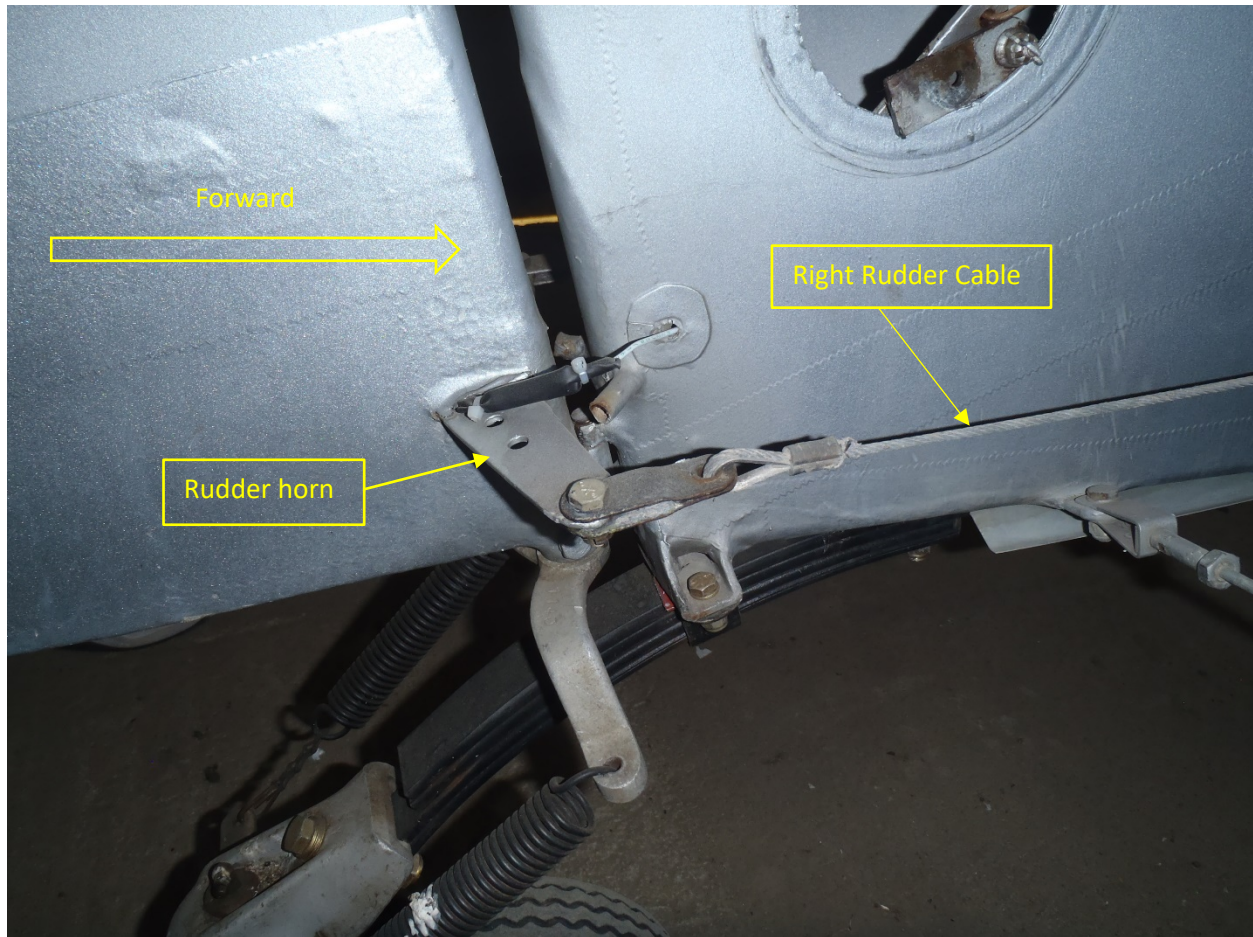


Photo 2. Right rudder cable attached at the rudder horn.

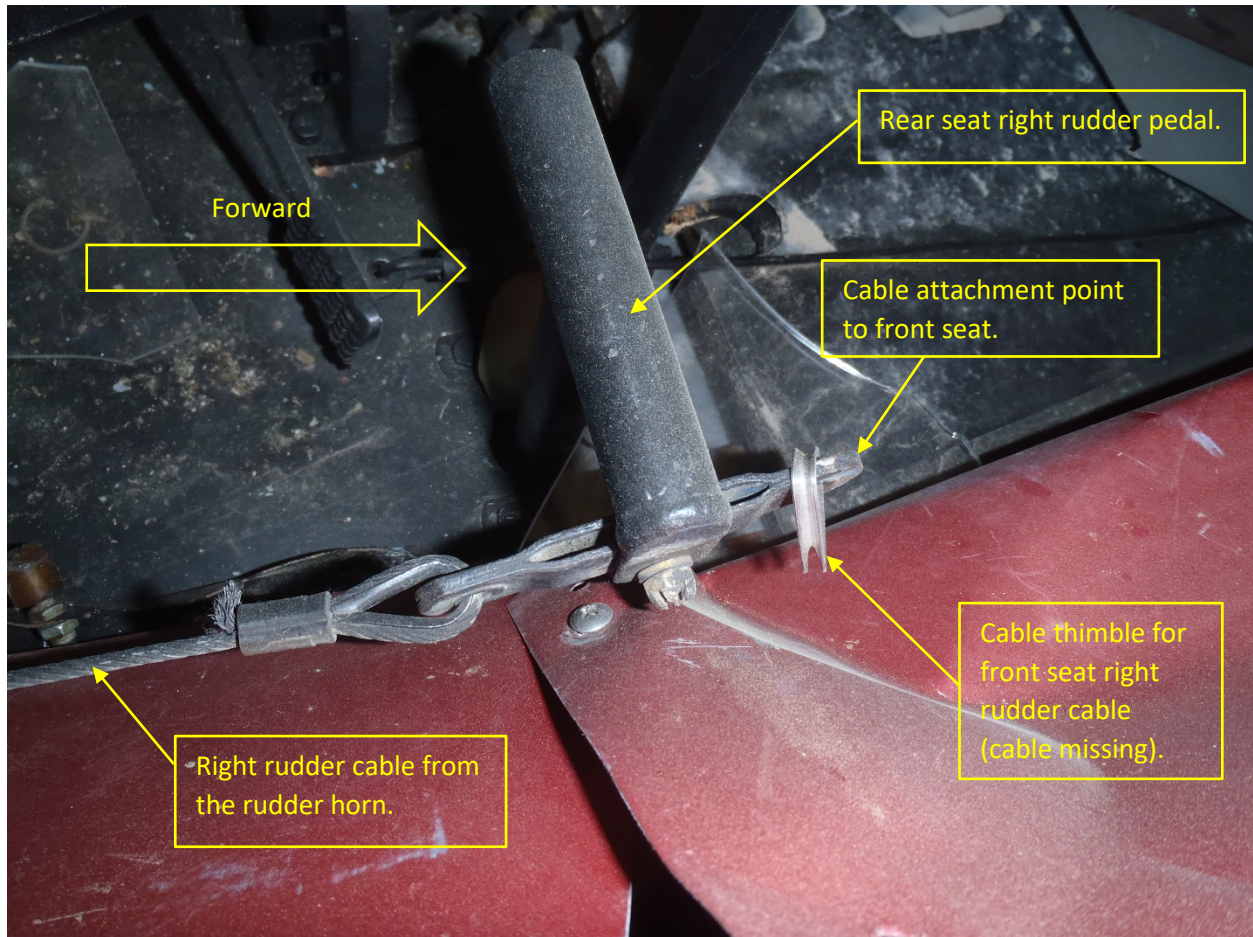


Photo 3. Right rudder cable from rudder horn intact. Cable thimble to front seat attached, cable missing.



Photo 4. Front seat right rudder cable end with swage sleeve. Cable is attached at the front seat rudder pedal.

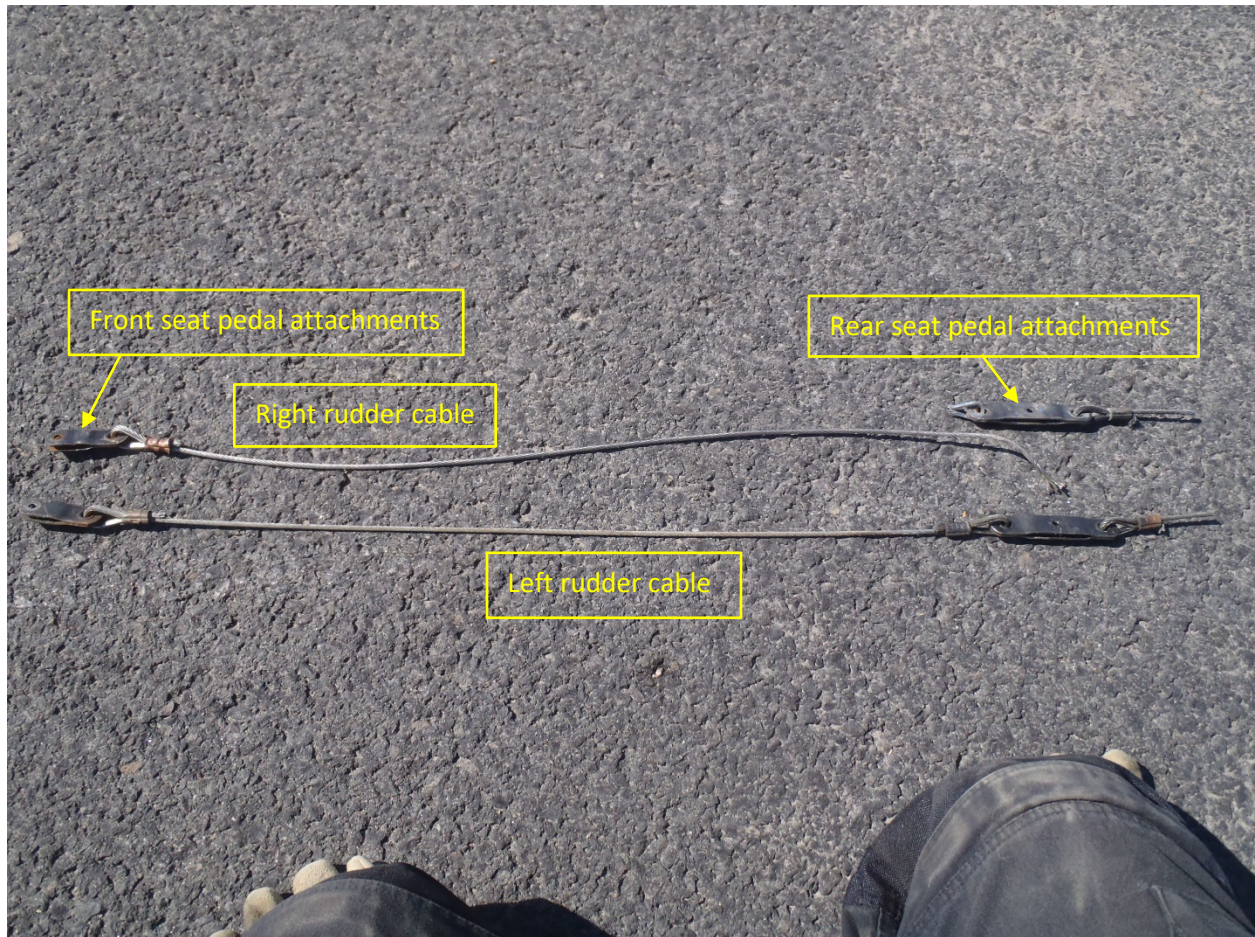


Photo 5. Front seat left (lower) and right (upper) rudder cables removed.



Photo 6. Rear seat left (lower) and right (upper) rudder cable assemblies.

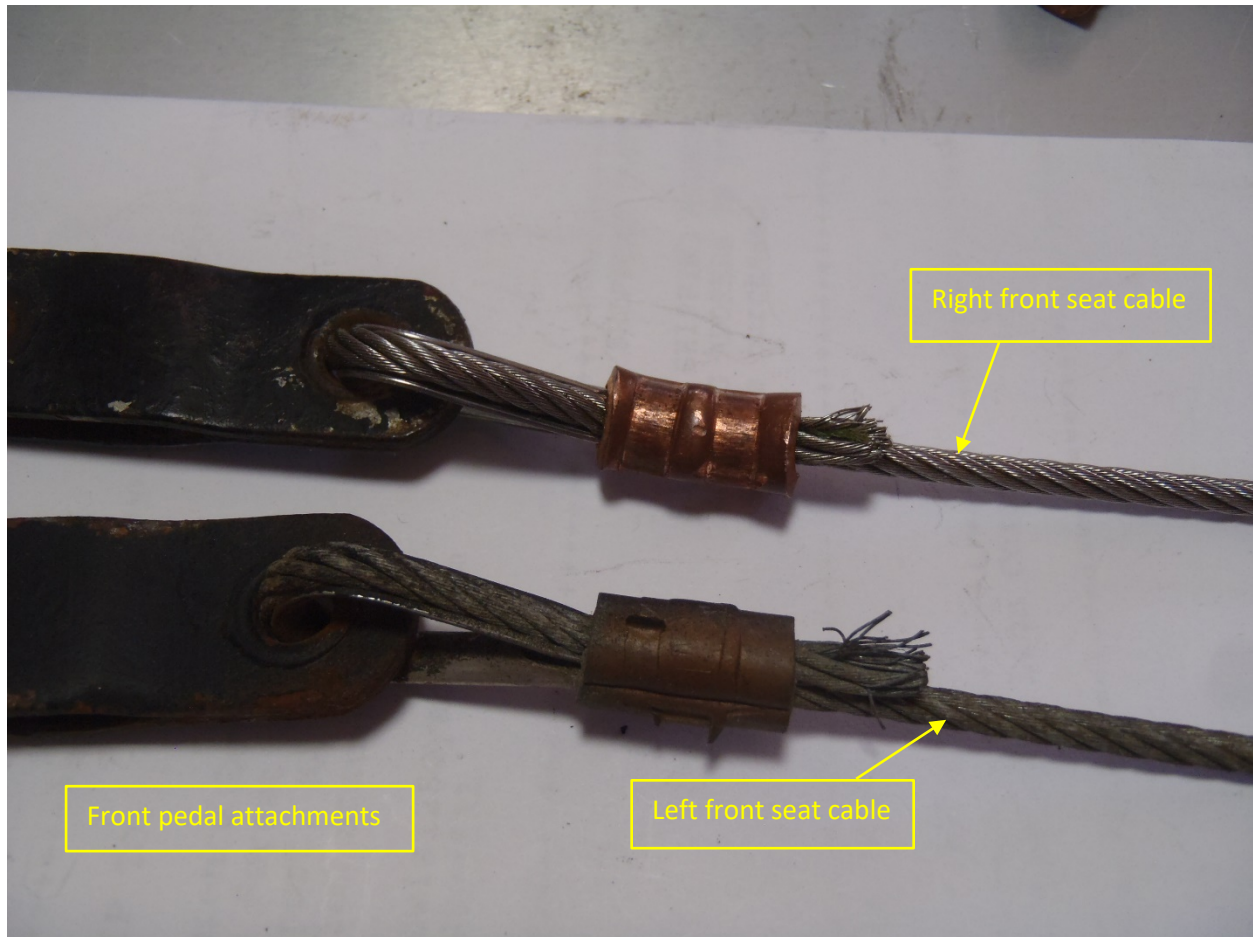


Photo 7. Left (lower) and right (upper) front seat rudder pedal attachments and cables.

Condition, patina, style (of the swage sleeve) suggests that the front, right rudder pedal cable has been replaced. There were no annotations in the maintenance logs provided, for the replacement of the cable. The right rear seat cable aft to the rudder horn has the same patina and style swage sleeves as the left rudder cable assembly.



Photo 8. Crimp pressure comparison of the front seat right rudder fore (left) and aft (right) swage sleeves.