



VIRGINIA FLIGHT SCHOOL SAFETY ARTICLE – NO 06/09

AIRFRAME STRUCTURAL INTEGRITY

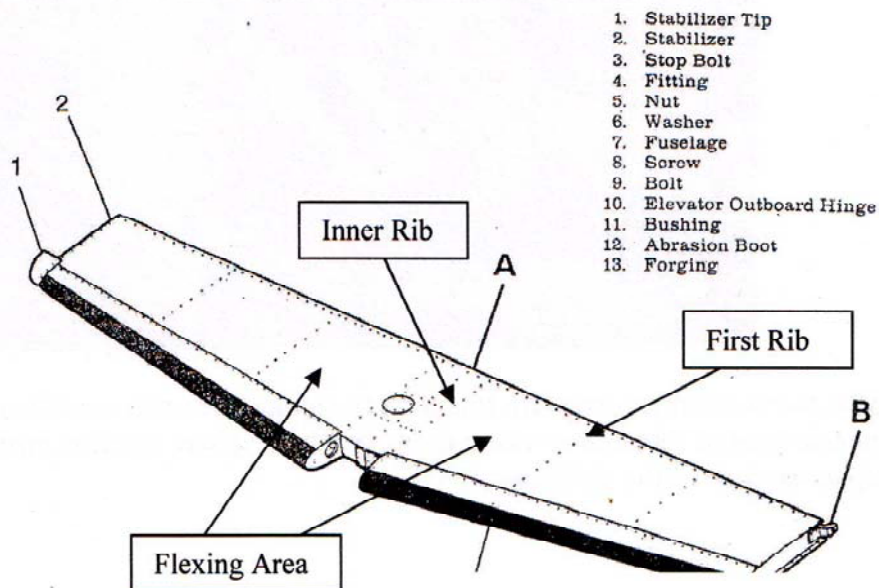
SYNOPSIS

During a session of circuit training a “metallic” creaking sound was heard at lower speeds. On after flight inspection, horizontal stabilizer was found to be “flexing”.

INVESTIGATION

There was abnormal “flexing” on both the left and right side of the horizontal stabilizer when normal “up-and-down” movement was applied to the stabilizer as would be done during a pre-flight inspection to check for component security. The “flexing” was associated with “buckling” of the upper skin between the inner and first rib area of the stabilizer on both the left and right sides.

MODEL 152 SERIES SERVICE MANUAL

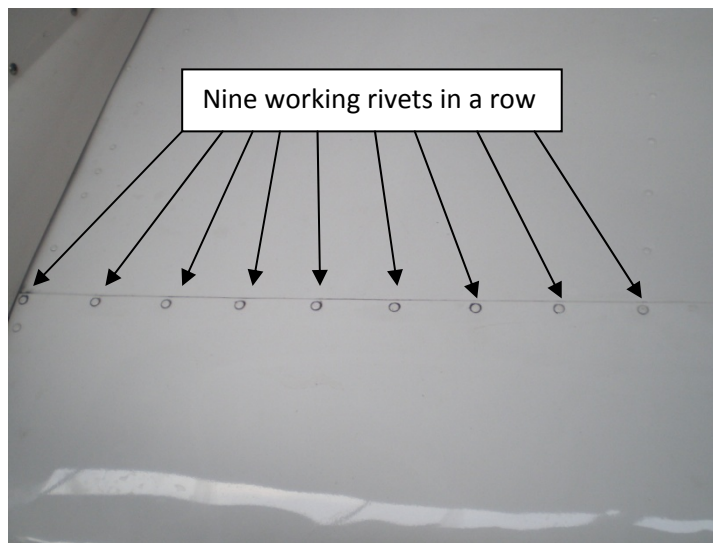


WORKING RIVETS

A “working” rivet is one that is no longer tight and secure and is identified by a dark area around the rivet head where the paint has been removed. The photograph on the following page depicts a working rivet.



One or two working rivets are not considered cause for concern but several, especially in a row, are cause for concern. More than two adjacent working rivets in a row should immediately be investigated by a qualified aircraft sheet metal worker as this indicates a potential loss of structural integrity in that area. The following photograph shows nine working rivets in a row on the horizontal stabilizer of a C 152.



This was on the line where the front pre-formed leading edge of the stabilizer is riveted to the main skin and the front stabilizer spar. In addition *five* working rivets were found on the underside of the stabilizer on the same line. This in effect gives a total of fourteen working rivets in a line. There are also further random working rivets on the upper surface of the stabilizer.

The aircraft in question here is clearly not in an airworthy state.

CONCLUSION

Thorough pre-and-after flights are vital for safety integrity. The inspection of the surface condition is as important as the rest of the inspection as for example working rivets are an indication of a possible compromise in the structural integrity of the aircraft.
