

# Three Aviation Myths

© 2013 Thomas Wedderburn-Bisshop

Over our flying careers, from our first instructor to well-meaning amateurs in discussion groups, we collect a lot of aeronautical "facts." Many of these are wrong, and some are downright dangerous. These three articles will debunk three very common myths.

## Myth 3

*"Rudder causes roll because yawing makes the outside wing go faster, generating more lift."*

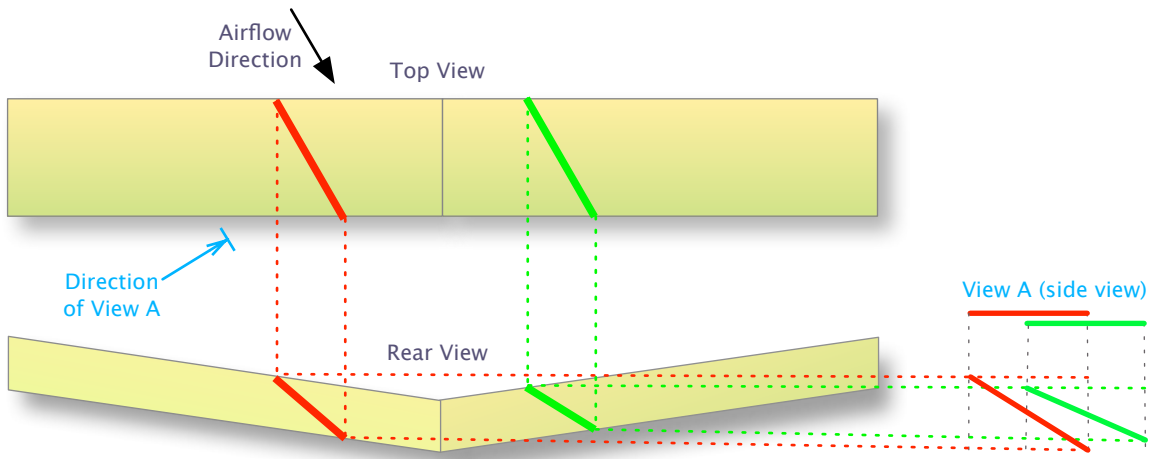
### Sanity Check

Flying strait and level, slowly apply right rudder. At all times, apply enough aileron to keep the wings level. Eventually you'll be flying in stable level flight in a forward slip. The left and right wings are now going exactly the same speed. Now quickly centre the ailerons. What happens? Unless you're flying something with anhedral or negative dihedral, you will get a rapid roll to the right.

### The Reality

You've worked it out already, haven't you? It's the dihedral. For a common-sense explanation, the leading wing is exposing more of its bottom surface to the airflow, getting more lift. The trailing wing has the opposite result.

But here's the technical explanation. In a yaw, the airflow is not in line with the longitudinal axis of the aircraft. The diagram below shows an idealised sheet-balsa wing with dihedral. Two airflow streamlines are marked on the top of the wings with the bold red and green lines, as you can see in the top and rear views. If you look at the wing from the left side, at a right angle to the airflow (view A), you can see that because of the dihedral, the top of the left streamline is higher than the top of the right streamline, and the left bottom is lower than the right bottom. Since both streamlines have the same horizontal length, this means that the leading wing has a higher angle of attack than the trailing wing. The difference in lift causes the roll. Nothing to do with the speed of the wings.



## The Author

Thomas Bisshop develops Mobile Apps for a living. He has both a PPL and an RA-Aus certificate, and is the founder and developer of iVFR.net.