Stalls

By Bob Wander

The Soaring Safety Foundation is concerned with the number of stall and stall-spin accidents that occur. These accidents feature high energy at impact. High impact energy translates into significant risk of personal injury or death. The 'G' forces that your body must endure, in a sudden stop, vary with the square of airspeed. Impact at 50 knots features four times the G-force than does an impact at 25 knots.

There are very few instances in flying at low altitude where pulling back on the stick increases safety of flight.

Flight at minimum controllable airspeed (MCA) is generally a very good barometer of the quality of stick-and-rudder skills that a pilot possesses. Pilots who are comfortable with flight at MCA (at safe altitudes, of course) generally have a very high level of coordination skill, and their "flying antennae" are finely tuned to the glider's flight regime and the glider's performance in that flight regime. From very long experience as a glider flight instructor, I can tell you it is a genuine pleasure to climb into a two-seat glider and fly with someone who is adept and polished at MCA flight. Pilots who consistently struggle with flight at MCA usually exhibit lesser skills in virtually all maneuvers than do those pilots who excel at MCA.

In gliding, "The Wing's the Thing." It's all we've got; there is no power or any other magic to overcome any limitations that the wing itself might possess. Put another way, if the wing ain't happy, ain't nobody happy. It's essential to learn the signs that your wing provides for you to tell you that it's not happy. The primary reason for stall study and stall maneuvers is to provide multiple instances to learn the warning signs that a stall is about to occur. These warning signs should never be permitted to arise when in flight at low altitudes where a stall would be unsafe.

Why not make this gliding season the season that you master "slow flight" - a.k.a. flight at MCA? Seek out your favorite glider flight instructor and team up to design a program of ground and flight instruction in stall warning signs and stall recognition and recovery techniques. Include in your program:

- recitation of the stall warning signs in the order that they occur (Stick back, rising nose, declining airspeed indication, decreasing wind noise, mushy controls, and eventually the pre-stall buffet - six signs that a stall is about to occur).
- stalls from straight flight path
- stalls from curving flight path at various angles of bank:
- very shallow bank (10 degrees);
- shallow bank (20 degrees);
- medium bank(30 degrees);
- medium-steep bank (45 degrees).

Make it your goal to discover the answers to these questions. Could the glider be easily stalled from straight flight? From flight at 10 degrees of bank? At 20 degrees of bank? At 30 degrees of bank? At 45 degrees of bank? Did the warning signs vary or change as the bank angle steepened? Did the indicated airspeed at point of stall vary from wings level stall to shallow bank stall to medium bank stall to steep bank stall? With airbrakes full open, did the glider stall at a higher indicated airspeed? Did the pre-stall warning signs change when stalls with full airbrakes were practiced? Is it important to close the airbrakes in stall recovery in order to minimize altitude loss? During stalls from turns, did the glider recover more quickly or less quickly from stalls conducted at medium or steep banks than it did in stalls from the sings-level, 1.0 G-load stalls?

You may be very surprised to discover just how much the stall characteristics vary as angle of bank increases. In addition, perform flight at MCA with and without airbrakes extended. There are subtle differences in how the glider provides stall warning signs when the airbrakes are opened; the turbulence they generate can mask the pre-stall buffet warning sign but will not mask the other, earlier, signs that a stall is about to occur.

Next month in this column we will study the spin. To tweak your interest, I'll ask four questions and give you a month so work up decent answers.

1. At the moment auto-rotation (the spin) begins, why does the glider nose pitch down despite the stick being held right back?
2. At the moment auto-rotation begins, why does the glider bank (roll) to the left or to the right?
3. When auto-rotation begins, why does glider yaw develop into continuing rotation?
4. What is the authoritative source regarding spin characteristics and spin recovery techniques for the glider(s) that you fly?