

## Spin Recovery - Ground Lesson

### **Attention**

If I put the plane into a spin will I die? What do I do?

### **Objective**

To know what causes spins then how to bring the plane back to straight and level flight.

### **Schedule**

Ground instruction – 10 minutes

### **Reference Material**

Boldmethod.com

### **Material**

#### How do I end up in stall?

Two conditions must be met at the same time:  
Cause a stall...while making an uncoordinated turn.

Therefore never fly so slow you cause the plane to stall. Know how to control the plane just above stall speed. Always use rudder pedals correctly while you are turning.

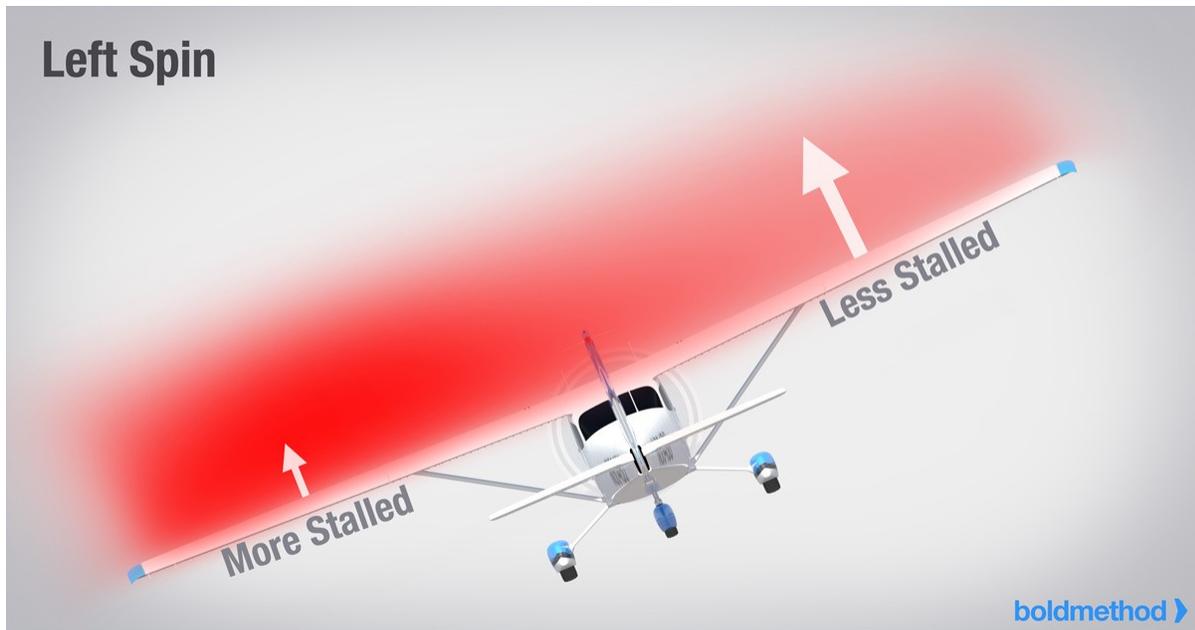
When is this most likely to happen?  
If you are going too slow turning to final while making a very bad turn.

#### What Exactly Is A Spin?

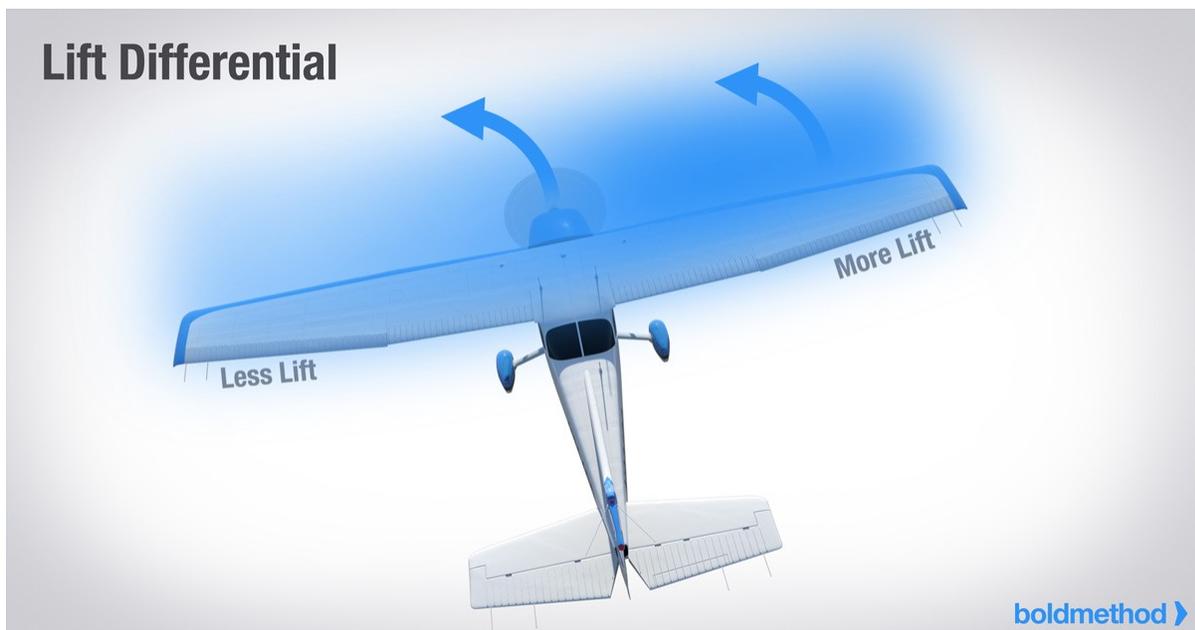
Before we jump into the spin recovery steps, let's take a quick look at what's happening in a spin. The FAA defines a spin as "an aggravated stall that results in an airplane descending in a helical, or corkscrew path."

Which brings us to spin point number one: both wings are stalled in a spin, but one is more deeply stalled than the other. The "more stalled" wing is on the inside of the spin, it flies at a higher angle-of-attack, and it generates less lift than the outside wing.

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Since your high wing generates more lift than the low wing, it rolls your aircraft into the spin.



And at the same time, your low wing produces more drag, because it's at a higher angle-of-attack. And that drag causes your plane to yaw into the spin. When you combine both forces, you wind up in a fully-developed spin.



To Recover Remember PARE

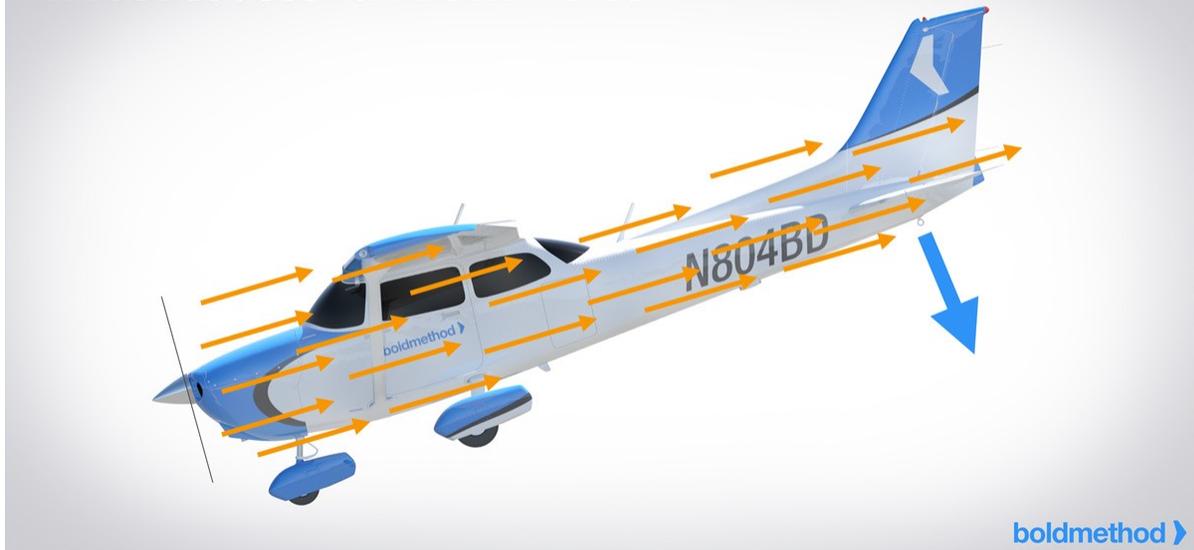
Step 1) **P**: Power To Idle

The first step in spin recovery is reducing your throttle to idle. But why would you take power out when you're already stalled?

In a normal stall, you add power to recover, but in a spin, adding power makes recovering more difficult. And it has everything to do with your aircraft's tail.

When you're at a high power setting, airflow from your propeller strikes your horizontal stabilizer, causing a tail-down force and pitching your nose up. On top of that, if your center of thrust is lower than your center of gravity, it creates torque that pitches your nose up even further.

## Thrust Causes Tail Down Force



When you take the power out, you eliminate both of these factors, making it easier to get the nose down and fly out of the spin.

### Step 2) **A**: Ailerons Neutral

When you bring your ailerons to neutral, you help your wings reach the same angle-of-attack, which helps you reduce the rolling and yawing moments in the spin.

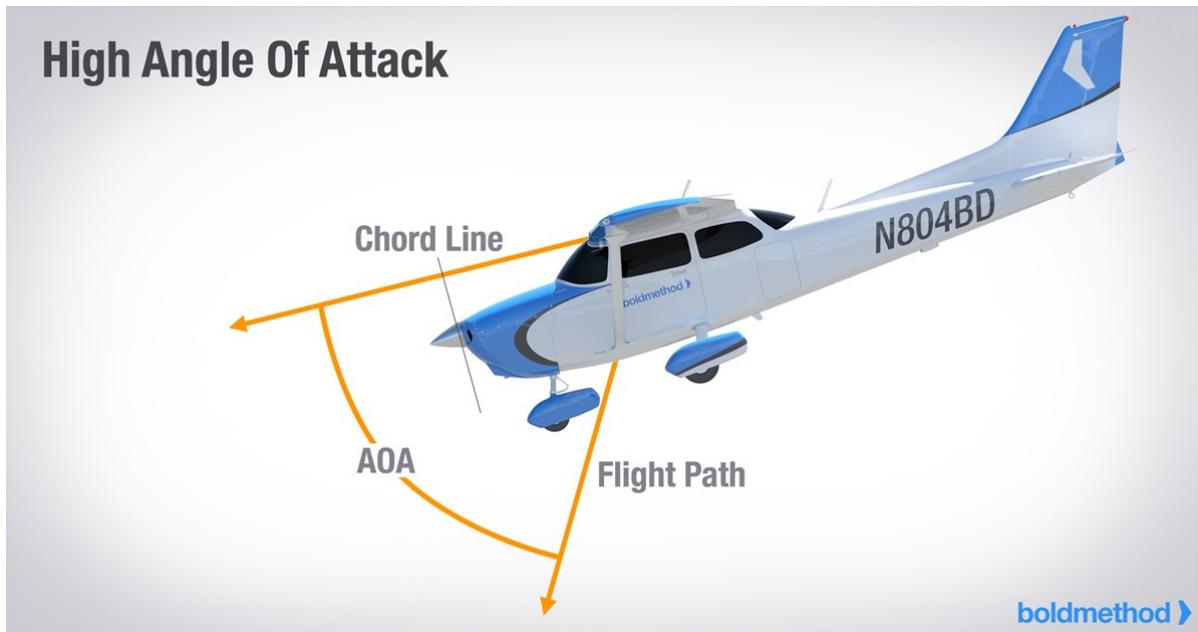
If you try to raise your inside wing using ailerons, you'll actually make the spin worse, because you increase the angle-of-attack of the inner wing. And what about rolling your ailerons into the spin? That's not a good idea either, because as you start to recover, your outside wing is at a higher angle-of-attack, and you can inadvertently start spinning in the opposite direction during recovery.

### Step 3) **R**: Rudder Opposite Spin

The next step is one of the most important ones: rudder. If you're spinning to the left, you add right rudder. And if you're spinning right? Add left rudder. When you add opposite rudder, you stop the rolling and yawing moment of the spin.

### Step 4) **E**: Elevator Forward

By quickly moving the control yoke forward, you get yourself back under the critical angle-of-attack, and you un-stall your wings. One of the hardest parts of this step is that you feel like you're going almost straight down in a spin, and it doesn't feel natural to push forward on the yoke. But it's the best (and only) way to break your stall quickly and get back to straight-and-level flight.



#### Step 5) Finish Your Spin Recovery

Once you've completed these 4 steps, your plane will fly itself out of the spin. When it does, bring your rudder to neutral, and raise the nose, and slowly add power to get as you get back to level flight.