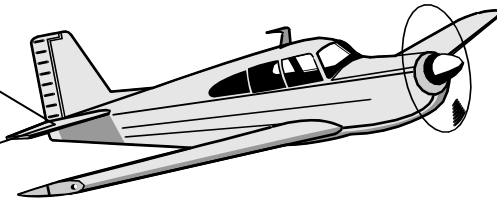


SKYWRITING



May 2011

April Flight Time

<u>Aircraft</u>	<u>Hrs</u>	<u>Last Annual</u>	<u>Fuel Surcharge</u>
N5303L	10.2	August 2010	\$5.00/hour
N80213	9.5	July 2010	\$6.00/hour
N6231F	1.7	June 2010	\$6.00/hour
N8114F	42.1	June 2010	\$7.00/hour
N2516V	8.8	September 2009	\$8.00/hour
Total Hours: 72.3			(Down from 84.6 in April)

www.flyingcc.org

Local ASOS Numbers

Moline	309-799-7096
Davenport	563-388-2154
Clinton	563-243-8934
Muscatine	563-263-0902

Dues Paying Members: 48

Spring Plane Wash

On Saturday, May 14th we will be meeting at the office in Moline at 8:00 am. This is always a good time, filled with breakfast and hanger talk, so please make sure to mark your calendars. Just as a reminder, if you do not participate, you will notice a \$50 charge on your next bill.

We will be needing a couple of volunteers to meet in Davenport at 9:00 am instead to wash N6231F. Please coordinate with Dick Kvach if you're willing to go to there instead.

CFI Corner

Christopher Wilkinson has joined the club and is pursuing his Private Pilot License

If you see him around the club, be sure to make him feel welcome!

Care of the Aircraft

Please remember to be considerate of your fellow pilots when parking the aircraft. This includes many things. The interior should be neat and tidy. The seatbelts should be fastened in such a way that they are secure and not loose. Trash should be cleaned out. Make sure you take the same care of the tidiness of the hanger, as well.

Especially important is that several of us "frequent fliers" have noticed that some pilots are forgetting to clean the bugs off aircraft. Right after a flight, the bugs come off much easier than if they've been there to dry for a day or two.

I Was Just Wondering...

Rob,

I don't think I completely understand the concept of P-factor and why it makes the airplane turn to the right.

~Prop Guy

Prop Guy,

Oh, boy. This is a tricky one on several accounts. First, it's very difficult to explain without visual aides, vectors and trigonometry. Secondly, there are some concepts that are commonly taught incorrectly, even by the training books. Before we get uptight about some things that I may say that contradicts some of the training books, let me qualify myself. My education is in aerospace engineering with an aerodynamics emphasis. With that being said, let's give this a shot.....

Ok, first thing's first. The term *P-factor* is defined to mean "asymmetric disk loading". It is an extremely significant effect for helicopters. When the helicopter is in forward flight, the blade on one side has a much higher airspeed than the other. If you tried to fly the blades at constant angle of attack, the advancing blade would produce quite a bit more lift than the retreating blade. For airplanes, the same effect can occur, although it is usually small. For the effect to occur at all, you need to have an angle between the propeller axis and the relative wind (more on this fact later).

There are two major considerations, here: Blade speed and blade angle. First, we'll touch on blade speed.

Imagine that the aircraft is in a nose-high attitude, but its direction of motion is horizontal (i.e. the relative wind is horizontal). The descending blade will be going

down and a little bit forward, while the ascending blade will be going up and a little bit backward. The descending blade will effectively have a slightly higher airspeed. Since this blade is on the right-hand side of the airplane (assuming a typical American engine) it will tend to yaw the airplane around to the left and you'll need right rudder to compensate.

There is a widespread misconception that P-factor arises because the angle of the right (descending) propeller blade is larger than the angle of the left (ascending) propeller blade. Many books erroneously call attention to the angle of the blade relative to the ground. The blade doesn't care about the ground; the only thing that matters is the angle of attack, i.e. the angle between the blade and its own motion through the air. When the propeller disk is inclined to the direction of flight (remember, I mentioned this is necessary) the ascending blade has slightly less angle of attack (compared to the descending blade). This is a much smaller part of the equation, but it IS happening out there. With the descending blade at a higher relative angle of attack and a higher relative airspeed, it produces less thrust than the ascending blade. Therefore, the slightly higher amount of thrust on the right side of the longitudinal axis tends to yaw the aircraft to the left.

This explanation, however, tends to raise some questions. I mean, you *have* felt this before, and it felt way more significant than I just made it out to be! Slow flight, high power...hold the train!

Not to fear, I will explain further. There are quite a lot of myths surrounding P-factor. For some reason, P-factor gets blamed for the fact that typical aircraft require right rudder on initial takeoff roll. This is impossible for several reasons.

Nearly everybody these days learns to fly in nose-wheel type aircraft, which means the propeller disk is vertical during the initial the takeoff roll. Since there is no angle between the relative wind and the propeller axis, P-factor obviously cannot occur (I told you it would come up again)

Now let's suppose, just for sake of argument, that you are flying a taildragger, in which the propeller disk is actually non-vertical during the initial takeoff roll. Common experience is that the most right rudder is required at the very beginning of the takeoff, before much forward speed has been achieved. The FAA **Airplane Flying Handbook** says this is because P-factor is worst at low airspeeds. But wait a minute — real P-factor is proportional to airspeed. In the initial moments of the takeoff roll, there is no relative wind, so there can't possibly be any P-factor. Of course, if you are taking off into a headwind, there could be a little bit of P-factor — but does that mean if you take off with a slight tailwind there will be a negative amount of P-factor, requiring left rudder? Don't bet on it.

The real reason that you need right rudder on initial takeoff roll is because of the helical propwash, or slipstream. P-factor exists in some circumstances, but it cannot possibly explain the behavior we observe during initial takeoff roll.

If you'd like some evidence that helical propwash is the major left turning factor and not P-factor, do this: Take your favorite aerobatic airplane (you DO have one sitting in a hanger somewhere, don't you??) and paint the starboard (right) rudder pedal green and the port (left) rudder pedal red, just so we can keep straight which is which. Now go to a safe altitude and set up for inverted slow flight. In this high-power, low-speed situation, do you need to push the port (red) pedal or the starboard (green) pedal? If P-factor is more important, the answer will be port, because that is now the descending, advancing blade. If helical propwash is more important, the answer is starboard, because the relationship between the propeller, rudder, and rudder pedals is unchanged by the inversion. For those of you without an aerobatic plane at hand, you'll just have to trust me. You would find yourself pushing the starboard pedal.

Humor in the Air

A DC-10 had an exceedingly long rollout after landing with his approach speed a little high.

San Jose Tower: "American 751 heavy, turn right at the end of the runway, if able. If not able, take the Guadalupe exit off Highway 101 and make a right at the light to return to the airport."

A Spring to FLY!

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