

## *Training Wheels or Tail Wheels?*

*By Chris Davis*

Wheelies, 3-pointers, tailwheel two-stepping, and ground loop; if you are not sure what these terms mean you may still be flying with training wheels, or in a Land-O-Matic. For those of us who have experienced the joys and excitement of conventional gear (tailwheel) flying, these terms have become everyday parts of our hangar flying vocabulary.

Tailwheel aircraft by their very design are different from tricycle gear aircraft. The difference in design requires more discipline and dare I say skill from the pilots who fly them. Those pilots who have never flown a tailwheel aircraft may tend to argue with that statement, but those who have flown (or have attempted to fly) tailwheels know exactly what I am referring. The majority of pilots today have never flown a tailwheel aircraft, and over time, many of the tricks of the trade have become diluted and misunderstood. Common misconceptions concerning tailwheels that have been ingrained into the aviation community seem to cause the majority of the issues when it comes to insuring them. Let's take a look at some of these myths and try to unravel the mysteries of the tailwheel aircraft.

First, we need to understand why tailwheels are harder to handle than tricycle gear aircraft. The concept is simple; it is nothing more than the location of the center of gravity as it relates to the main gear. The center of gravity in a tricycle gear aircraft is in front of the main gear so inertia pulls the aircraft along and we can direct that momentum with the nose gear and the brakes. Picture a baseball bat being held from the top. It is easy to keep that bat vertical when gravity is working for us. In a tailwheel aircraft, the center of gravity is behind the main gear and trying to direct that momentum from in front of the center of gravity takes constant correction from the rudder and the brakes. This is often known as the tailwheel two-step. Picture the baseball bat again, only this time we are holding it from the bottom and trying to keep it vertical. If you do not constantly anticipate, feel, and react to the movements, it will swap sides on you and you will be holding it from the top. This is known as a ground loop when it happens in a tailwheel aircraft.

Tailwheel aircraft have similar flight characteristics to tricycle gear aircraft, it is the landing and ground handling that separates the men from the boys. This seems to be an issue that many underwriters do not understand. Many times an underwriter will require a pilot transitioning to tailwheel aircraft to complete X number of dual flight hours prior to flying solo. While this is an acceptable concept in tricycle gear aircraft, it is not very beneficial in tailwheel transitions. In tailwheel aircraft, the number of takeoffs and landings performed is much more important than the total number of hours in the aircraft. A dual requirement of 10 hours does not accomplish much more than giving the pilot an excuse to make a long cross country. Over the course of a 10 hour cross country, a pilot could feasibly get by with no more than 4 landings. This is a waste of time and money since the pilot has not learned the skills necessary to safely land and taxi a tailwheel aircraft in various wind and runway conditions. The best transition plan

for a tailwheel pilot is to designate X number of landings that must be completed with a qualified CFI in various wind and runway conditions. This will ensure a much safer and qualified tailwheel pilot when the dual requirement is lifted.

While we are on the topic of landings and runway conditions, let's explore runway lengths and surface types required by many underwriters. In most cases, underwriters are looking for aircraft that are operated from airstrips that are paved and at least 3,000 feet or greater. Again we see a concept that makes sense when discussing tricycle gear aircraft, but is not an accurate assessment when discussing tailwheels. Tailwheels by design sit at a higher angle of attack allowing for relatively short takeoff distances compared to many of their tri-gear cousins. Most popular tailwheel aircraft are safely off the ground in well under 1,000 feet and 50 ft obstacle clearance is achieved at or before the 1,500 ft mark on even your more anemic tailwheels. As for the paved runway requirement, this is asking for trouble when talking about tailwheels. Most tailwheel pilots will elect to land on a grass or dirt strip when given the opportunity. When landing a tailwheel, it is crucial that the aircraft nose is lined up with the direction of travel or you will have a side load on the gear at touchdown. In a tricycle gear aircraft, a side load will do little more than jerk the aircraft and straighten it out, but in a tailwheel aircraft, the potential for a ground loop is exponentially proportionate to the angle of side load at touchdown. On a paved strip, the margin for error concerning the angle of side load becomes very small since rubber does not slide very well on pavement. On a grass strip a little bit of a side load may even go unnoticed since the grass will allow the tires to slide a bit. The greater the crosswind component, the harder the pilot has to work to keep the direction of travel lined up with the runway and the nose lined up with the direction of travel. Why make things more difficult by using a paved runway having less margin for error when an unpaved strip is available? Is a paved runway really a requirement that underwriters should consider concerning tailwheel aircraft?

What about damage to gear components on unpaved strips? Unlike most tricycle gear aircraft, tailwheels are designed for unimproved strips. Let's think about a wheelbarrow for a minute. If you are pushing a wheelbarrow through the yard and you hit a chuckhole, chances are that the sudden stop on the tire is going to cause you to dump the load due to its momentum and possibly damage the wheelbarrow. On a tricycle gear aircraft the momentum is pushing the nose gear over the chuckhole and often times causes damage such as a bent nose gear or a prop strike. This is the reason for keeping the yoke full back on soft field landings. Now let's turn that wheelbarrow around and pull it over the same chuckhole. The momentum is now pulling the wheelbarrow over the chuckhole and less force is applied to the wheel. The same concept applies to the tailwheel.

So why is insurance on tailwheel aircraft harder to get and cost so much more than on their tricycle geared cousins? The answer to that question is simple...underwriting companies spend more in claims for tailwheel aircraft per number of aircraft flying than they do for tri-gear aircraft. This is due to many factors including frequency and cost of repairs for landing accidents, lack of and cost of available parts, lack of experienced pilots, lack of available training, pilot attitude, and the off airport uses to which many

tailwheel pilots submit their aircraft. Tailwheels have sort of a nostalgic and adventurous draw to them that many pilots want to experience and they are just so darn fun to fly. Let's face it, not many people would take their tricycle geared aircraft into farmer Johnson's fresh cut pasture for the local 4th of July barbeque, or land on a 1,000 ft gravel bar in their favorite trout fishing river. This is the world of flying that is available to the tailwheel pilot and part of the catalyst for the higher insurance cost. There are two common problems that we often see as aviation insurance professionals: 1) A student pilot who is learning to fly in a tailwheel aircraft such as a Maule or other temperamental model. 2) A high time pro-pilot or military trained pilot who thinks he can fly anything if given the landing and maneuvering speeds. Either of these two scenarios are recipes for an insurance claim. The more claim payments that we have on a particular model, the higher the overall insurance cost will be for all of us who fly that model.

Another big problem in the tailwheel community is the lack of truly qualified tailwheel instructors. As you may have begun to realize, tailwheel flying is a skill that is different from any other type of flying. Many instructors today are on the fast track to gaining hours while someone else picks up the tab, and since tailwheel hours don't matter to the airlines, most of them never put their feet on the rudder pedals of a tailwheel aircraft. There are a few instructors at the local flight schools that have some time in the local Citabria that is used for unusual attitude training, but again, the majority of their time is spent in the flight training portion of the instruction regimen as opposed to the landing / ground handling portion. Truly experienced tailwheel instructors who teach it because they love it and who fly tailwheels on a weekly basis are becoming harder and harder to find.

Alright, so you have caught the bug and want to fly a tailwheel aircraft. What should you expect from insurance and what can you do to help? First and foremost you must have the right attitude and a willingness to learn. This is true with most any aircraft, but especially true when transitioning into tailwheel aircraft. You will find that tailwheel aircraft demand more precision on landing as well as constant attention from the time the propeller begins to turn until the time it is shut down. Second, a good agent who knows the underwriting industry and has tailwheel experience can mean the difference between a "relatively" low premium, high premium, or no coverage at all. An agent who does not have any tailwheel flying experience will not be able to represent a tailwheel risk to an underwriter with nearly the same effectiveness as will an agent who flies tailwheels on a routine basis. It would be like a colorblind person trying to describe a rainbow to another colorblind individual. They both have a general idea of what a rainbow looks like, but they have no idea as to the true beauty and wonder it possesses. Do your homework before you buy. Find a well qualified tailwheel instructor and get your tailwheel rating. Join a free bulletin board community such as Supercub.org or BackcountryPilot.org and ask questions. Determine which aircraft best suits your mission profile and then find an instructor with as much time in that make and model aircraft as possible. Fly before you buy, and don't buy a Thoroughbred before you learn to ride the pony. The hardest tailwheel pilots to get insured are the student pilots who want to fly a Maule, or another similarly high powered, short coupled aircraft. If you fit

into this category, expect to see some very stiff “dual only” flight requirements from your underwriter if they are willing to insure the risk at all. The annual premium for pilots in this group may be as high as double the average rate for a high time tailwheel pilot. For the new tailwheel pilot, the “magic number” seems to hover around the 75 hour mark with reference to make and model time before any relief will be felt in the insurance rate.

Tailwheel flying has been some of the most fun and rewarding flying that I have experienced. It opens up an entire world of aviation that many will never see. It is up to each one of us to keep this world of aviation alive and affordable for generations to come. For those of us with experience, we need to pass on what we have learned to those looking to see what it is all about. For those wanting to see what it is all about, take the time to really learn it from those who have the experience to teach it. As with most of aviation, shortcuts can be dangerous and costly. It is up to all of us to do our part in making it as safe and enjoyable as possible. The safer we are as pilots, the cheaper and easier it will be to insure what we love to do. →

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