

Tri-Gear or Tail Wheel?

Differences between the two

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Wheelies, three-pointers, ground loops, and tail-wheel two-stepping; if you're unfamiliar with these terms, you may still be flying a tricycle-gear airplane. For those of us who have experienced the joy and excitement of conventional-gear (tailwheel) flying, these terms are common in our hangar-flying vocabulary.

Dare I say it; in my opinion, flying tailwheels requires more pilot skill and discipline than flying tricycle-gear aircraft. Those who have never flown a tailwheel aircraft may argue that statement, but those who have flown (or attempted to fly) tailwheels know exactly what I mean. The majority of pilots today have never

flown a tailwheel, and over time many of the tricks of the trade have become diluted and misunderstood. Common misconceptions concerning tailwheels have caused issues in learning to fly them and, consequently, in getting them insured.

To clarify the misunderstandings, we need to first 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. 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 its movements, it will swap sides and you will be holding it from the top. This is known as a ground loop. For most tricycle-gear pilots, just hearing the words ground loop sends a chill up the spine. Truth be told, in most cases a ground loop will hurt the ego more than the pilot, but it won't be cheap to repair your wingtips and props either.

Tailwheel and tricycle-gear aircraft have similar flight characteristics. It's the landing and ground-handling characteristics that differ. Many times, a pilot transitioning to tailwheel aircraft will complete a number of dual flight hours prior to flying solo. This is often a requirement handed down from an insurance company or from


an inexperienced tailwheel instructor. While this is an acceptable training concept in tricycle-gear aircraft, it is not 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. This can be a waste of time and money since the pilot may not learn 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 a number of landings that must be completed with a qualified certificated flight instructor (CFI) in various wind and runway conditions. This will ensure a much safer and qualified tailwheel pilot when the dual requirement is lifted. Safer tailwheel pilots benefit us all when it comes time to renew our insurance policies.

While we are on the topic of landings and runway conditions, let's explore runway lengths and surface types that are ideal for tailwheel pilots. In many cases, tricycle-gear pilots and insurance companies are looking for airstrips that have at least 2,500 feet of paved surface in which to take off and land. Again, we see a concept that seems reasonable when discussing tricycle-gear aircraft, but this is not an accurate assessment when discussing tailwheels.

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Most popular tailwheel aircraft are safely off the ground in well under 1,000 feet, and a 50-foot obstacle clearance is achieved at or before the 1,500-foot mark on most tailwheels.

Practice on a paved runway is important, but it is equally important to become proficient with landings on other surfaces. 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 small since rubber does not slide 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.

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 tricycle-gear aircraft, momentum is pushing the nose gear over the chuckhole and oftentimes 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.

Insuring a Tailwheel

Why is tailwheel insurance harder to get and more expensive than tricycle gear? The answer to that question is simple: Underwriting companies spend more in claims for tailwheel aircraft per number of aircraft insured than they do for tri-gear aircraft. This is caused by 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 many tailwheel pilots submit their aircraft to. Tailwheels have sort of a nostalgic and adventurous draw 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-gear aircraft into farmer Johnson's fresh-cut pasture for the local Fourth of July barbecue, or land on a 1,000-foot gravel bar in their favor-

ite trout fishing river. This is the world of flying that is available to the tailwheel pilot, and some of the catalyst for higher insurance costs.

A growing problem in the tailwheel community is the lack of truly qualified tailwheel instructors. As you may have realized, tailwheel flying is a skill that is different from any other types 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 instructors never put their feet on the rudder pedals of a tailwheel aircraft. There are a few at local flight schools who have time in Citabrias used for unusual attitude training, but the majority of 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 hard to find, but they're out there.

Bug Caught—Now What?

Now you've caught the bug and want to fly a tailwheel aircraft. What should you expect from your instructor, and what can you do to help with the insurance cost? First, 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. Just because you are a high-time pilot does not mean that you can fly a tailwheel if given the landing and maneuvering speeds. While this may be true of many tri-gear aircraft, you will be eating a big slice of humble pie if you take that approach in a tailwheel. Second, find a well-qualified tailwheel instructor and get your tailwheel rating. Don't settle for the first instructor you come across who "happens" to have a tailwheel rating. Find a pilot who flies tailwheels on a routine basis and also happens to be a CFI.

With regard to insurance, a good agent who knows the underwriting industry and who 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 tailwheel flying experience will not be able to represent a tailwheel risk to an underwriter with nearly the same effectiveness as an agent who flies tailwheels on a routine basis.

Do your homework before you buy. Join a free bulletin board community such as SuperCub.org, MaulePilots.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.

Some of the hardest tailwheel pilots to transition are

the student pilots who want to fly a Maule or another similar high-powered, short-coupled aircraft. If you fit into this category, expect to see some stiff “dual only” flight requirements from your instructor and your insurance company, if it’s willing to insure the risk at all. The annual insurance 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 reflected in the insurance rate.

Tailwheel flying has been some of the most fun and rewarding flying I have been blessed to participate in. 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 who want to see what it’s all about. If you’re interested, take

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the time to learn it from those who have the experience to teach it. As with most of aviation, shortcuts can be dangerous and costly. It’s up to all of us to do our part in making it as safe and enjoyable as possible. *EAA*

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LOOKING FOR TAILWHEEL INSTRUCTION?

The National Association of Flight Instructors (NAFI), an affiliate of EAA, maintains a listing of flight instructors by state (and also internationally). That list is available on NAFI’s website, www.NAFINet.org. Click on Find an Instructor, and search for an instructor in your area.

ARE YOU A TAILWHEEL INSTRUCTOR?

If so, NAFI invites you to provide that information to them so they can include that in your listing. If you’re not a NAFI member, they’ll be delighted to welcome you.

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