CALLBACK
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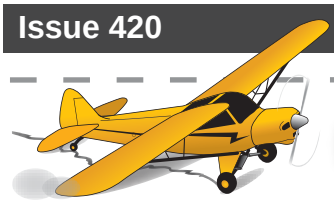

Ground Loop Lessons

By definition, a ground loop is the rotation of a fixed-wing aircraft in the horizontal plane while on the ground. It is predominantly associated with aircraft that have conventional landing gear (taildraggers) due to the center of gravity being located aft of the main gear. If horizontal rotation is all that happens, the ground loop may only affect the landing gear or cause a runway excursion. A ground loop that progresses to the point where a wingtip contacts the surface may result in extensive damage and even personal injury.

While often caused by an unfavorable wind component or adverse runway conditions, ground loops may be caused entirely by pilot error.

To avoid a ground loop, the pilot must respond to any directional change immediately while sufficient control authority is available to counteract the unwanted movement. In order to respond quickly enough, taildragger pilots have to anticipate the need for corrective control input. This means keeping ground loop countermeasures in mind whenever the aircraft is moving.

To reinforce the need for taildragger pilots to keep the nose ahead of the tail, this month's *CALLBACK* looks at three ground "oops!" incidents. Note that while these reports emphasize the particular need for vigilance in training scenarios, the basic techniques noted apply to all taildragger operations.

Errant Cub Strikes PAPI

This J3 Cub instructor's observation that, "we were comfortably in control right up to the point when it became clear…we were going to depart the runway" emphasizes the need for constant vigilance in a taildragger.

■ *I was…flying from the front seat. An ATP rated pilot was the student for tailwheel training, flying from the rear seat. We did two landings and takeoffs from a small grass field several miles from our home airport. The day was clear with very light winds, essentially calm. We returned to our airport for our final landing.*

The student had done well with his earlier landings and I felt comfortable having him make this landing also. I briefed that a pavement landing was more challenging than grass and required even more precise directional control…. We had previously discussed the center of mass location relative to the main gear and how that causes a ground loop tendency in tailwheel aircraft if the aircraft is not aligned with the direction of travel or is drifting at the time of touchdown. The approach and final approach segment were flown precisely on speed and on glide path. As we neared touchdown and were into the landing flare, I noticed that the airplane began drifting very slightly to the right. It was my impression that the degree of drift and the alignment of the aircraft for landing were within safe limits and therefore I continued to monitor the landing, letting the student maintain full control.

After we touched down, just at stall with the stick full aft, the aircraft began to turn gradually left. I began to assist the student on the flight controls and then said, "I have it" as the rate of turn increased. Despite full right rudder and brake, the turn developed into a progressive swerve to the left. I do not recall if I added left aileron. I noticed a small amount of power still on and I took this out. We left the runway between the runway lights and continued to roll onto the grass. The radius of the turn tightened and I began to see the PAPI lights to our left…. As the turn continued, we went past the first three lights and slowed, but the radius of the turn tightened despite all control inputs. We struck the fourth PAPI light.

We were moving so slowly at the time of impact that there was no discernible force felt by us. I checked the brakes, bungees, and tailwheel. All seemed to be intact and functional. I initially wondered if there could have been a mechanical problem because the degree of side movement seemed to be in an acceptable range at touchdown and I was surprised by the ground loop. We did subsequently note that the tailwheel springs and linkages were somewhat loose.

I have made thousands of tailwheel landings and felt this time that we were comfortably in control right up to the point when it became clear the swerve was increasing and we were going to depart the runway. I have to conclude this was mostly pilot error for not fully recognizing that lateral limits had been exceeded, perhaps exacerbated by a somewhat loose tailwheel steering linkage.

"Never Relax Your Vigilance"

The type of aircraft was not given in this report, but the lessons given are good for any taildragger. Also, the importance of not overestimating a student pilot's ability is good advice for instructors in any type aircraft.

■ *This was the first flight of a tailwheel endorsement for a previously endorsed pilot who had lost his documentation. He had approximately 100 hours of tailwheel time…. Two hours of ground school was accomplished covering tailwheel aircraft and model specific characteristics. The start and taxi, including control positioning, was normal. The takeoff was somewhat erratic in that the control yoke was "pumped" slightly; rudder control was erratic, but satisfactory. Slow flight at various flap settings and stalls were accomplished. On the first pattern, downwind to final was satisfactory, but he elected to use 30 flaps instead of 40. As the flare was initiated, he "pumped" the yoke initially, but quickly established a proper attitude. As the aircraft touched down he relaxed back pressure and over-controlled the rudder causing a minor heading change. He then reversed the rudder, adding back pressure and causing the aircraft to become airborne and change direction. At this point I commanded him to hold the yoke with a nose up attitude and center the rudder; however he relaxed back pressure, allowing the aircraft to touch down. His rudder input at this time was excessive (push and hold rather than the quick inputs required for a taildragger).*

I took control of the aircraft (at this time we were very slow), but I could not override his rudder input in a timely manner. The aircraft did a slow ground loop, exiting the runway. It was more of a quick turn than a classic ground loop. I reentered the runway and taxied back to the ramp to perform an inspection. There was nothing wrong with the aircraft or tail wheel assembly.

I have around 5,000 hours of instructor time with no incidents/accidents and have trained many pilots, but I committed a cardinal sin in having higher expectations for this pilot than warranted based upon his experience. Could this have caused me to relax my vigilance? It probably did…. When the student started pumping the yoke at the initial round-out I should have taken the aircraft and performed a go-around. I also did not demo the first landing which is usually my method of operation.

This event reiterated the fact that a demo is also appropriate for someone who has never flown a particular model and [I should] never fail to take timely control of the aircraft even though someone has extensive experience. Never relax your vigilance.

Wayward WACO

Even a very experienced instructor pilot may not be able to overcome a student pilot's error when it involves a critical action at a critical time. The situation is aggravated in an aircraft such as this WACO where the instructor was unable to see, and possibly anticipate, the student pilot's actions.

■ *The objective of the flight was to practice takeoffs and landings on a paved runway which is more difficult and challenging than operations from a turf runway in a vintage aircraft of this type…. The decision was made to practice at a nearby field where there is a 150-foot-wide runway.*

A key point in technique that had been stressed…was not to touch the brakes until the tail wheel was on the ground when making a wheel landing. Moreover one should not try to force the tail down once on the ground in the wheel landing attitude, but rather let the tail come down on its own, maintaining directional control with the rudder only; no brakes during this phase of the landing roll out.

The point had been previously stressed and understood by the student that forcing the tail down (pulling it down with the stick) prematurely was a good way to induce a ground loop because this action would dramatically increase the angle of attack on the wing when it still had enough speed remaining to generate some lift and enough lift, if helped along by any crosswind, to cause the aircraft to yaw and thereby cause the downwind wing to hit the ground and begin a ground loop event. Application of brakes while the tail was still flying could also cause enough adverse yaw to induce a ground loop or even worse, flip the aircraft over.

Conditions at the time were ideal. Wind was less than five knots. When the airplane touched down on the main wheels, directional control was good and it was tracking straight. Then it began to yaw to the right as speed decreased and the tail began to lower. This is a critical time where the pilot flying needs to immediately arrest the yaw with opposite rudder even if aggressive opposite rudder is necessary, but no brakes. Instead the student hit the left brake fairly hard.

Now the right yaw, which was only about 10 degrees, suddenly became a sharp yaw to the left at about 45 degrees. At this point the airplane was headed off the runway onto the grass and it struck a runway light where it departed the runway. The critical error was that the student stomped on the left brake when the aircraft began to yaw to the right while the tail was still flying.

This is an antique aircraft. The instructor pilot sits in the front cockpit. The instructor cannot see what the flying pilot is doing with his feet or how he has them positioned on the rudder pedals.

ASRS Alerts Issued in November 2014	
Subject of Alert	**No. of Alerts**
Aircraft or Aircraft Equipment	10
Airport Facility or Procedure	13
ATC Equipment or Procedure	7
Other	1
TOTAL	**31**

420

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November 2014 Report Intake	
Air Carrier/Air Taxi Pilots	4,458
General Aviation Pilots	1,090
Controllers	509
Flight Attendants	386
Military/Other	246
Mechanics	201
Dispatchers	118
TOTAL	**7,008**