FLYING LESSONS for April 9, 2009

suggested by this week's aircraft mishap reports

FLYING LESSONS uses the past week's mishap reports as the jumping-off point to consider what *might* have contributed to accidents, so you can make better decisions if you face similar circumstances. In almost all cases design characteristics of a specific make and model airplane have little direct bearing on the possible causes of aircraft accidents, so apply these *FLYING LESSONS* to any airplane you fly. Verify all technical information before applying it to your aircraft or operation, with manufacturers' data and recommendations taking precedence.

FLYING LESSONS is an independent product of MASTERY FLIGHT TRAINING, INC. www.thomaspturner.net

This week's lessons:

We've been discussing runway directional control as a function of controlling the effects of:

1. Wind
2. Runway surface
3. Dynamic aircraft forces (propeller tendencies, tail design, tailwheel, wing loading, etc)
4. Aircraft malfunctions (tires, brakes, engines, controls)

See:
www.thomaspturner.net/2009.0312%20FLYING%20LESSONS.pdf
www.thomaspturner.net/2009.0319%20FLYING%20LESSONS.pdf
www.thomaspturner.net/2009.0402%20FLYING%20LESSONS.pdf

You can read about wind, runway surfaces and aircraft design in previous *FLYING LESSONS* reports. This week, we'll discuss how you might maintain runway directional control when faced with an aircraft malfunction.

Malfunctions leading to runway directional control problems generally fall into three categories:

- Brake, wheel and tire malfunctions, by far the greatest contributor;
- Engine issues; and
- Flight control and steering malfunctions

Brake failure, especially a brake "locking up" and making directional control almost impossible, often results if the brake pads or pucks are worn too thin and calipers come into contact with the brake disc or wheel. Avoid uncommanded brake lock-up by ensuring you have adequate brake pads or pucks during your preflight inspection.

Ice accumulation can also cause a brake or wheel to freeze in position. Minimize the amount of time retractable landing gear is exposed to ice; if you take off from a slush- or snow-contaminated runway, delay gear retraction momentarily after liftoff to blow moisture off the wheels and brakes.

Some fixed-gear airplanes are now certified for flight in icing conditions. Remember that the wheels and wheel pants of these airplanes are *not* ice-protected, so you still need to exit icing conditions into clear air long enough to melt or sublimate ice off the wheels before landing—don't fly through an icy IMC approach to near minimums, to avoid the potential for a locked wheel when you touch down.

Broken wheels can make directional control almost impossible during takeoff or landing. There's little you can do to compensate for broken wheels once you begin moving, so pay close attention to the condition of wheel halves, hubs, connections and hardware during your preflight inspection.

Locked or broken wheels often result in blown tires and lost directional control. Overly aggressive braking can quickly cause a tire to blow, as can improperly inflated tires (either over- or under-inflated). I had the unhappy distinction of closing a runway at Phoenix Sky Harbor several years ago, when the left main tire of an A36 I was flying blew on touchdown (we later found it had been overinflated before departure at a very cold, mountain location, and was under too great a pressure on landing at 70°F). All was well until the airplane was nearly at a standstill, at which time full rudder deflection could not counter the airplane's pull to the left. It spun completely around; my most vivid memory of the event is seeing an America West Boeing 757 through my windscreen performing a go-around over my head.

Avoid blown tires by:

- Checking tire pressure, especially if you'll be making a cold-to-hot transition on the upcoming flight.
- Avoiding side loads on the landing gear, either from landing with some drift remaining, or attempting to turn too sharply at too great a speed.
- Minimizing braking on touchdown. Don't accept a "land and hold short" clearance or directions to clear at the next turnoff if doing so means you'll have to clamp down hard on the brakes.

Engine failures, especially in multiengine airplanes, make directional control difficult—whether the engine failure is real or simulated. Ensure you have adequate airspeed to maintain control authority until you're at a speed where nosewheel steering is effective. Without "wheelbarrowing" or overstressing the gear, get the nosewheel/tailwheel into firm contact with the ground before airspeed is low enough control authority is lost.

There's not a lot you can do if a control surface breaks, or steering linkage to a nose- or tailwheel gives out. That's why it's imperative you look at connections, cables and pushrods closely and critically during your preflight inspection.

More *FLYING LESSONS*

Manifold pressure does not indicate power, only the *potential* for power—see my 2005 article "Manifold Pressure: What It Tells Us, What It Doesn't".

See www.ipilot.com/learn/article.aspx?ArticleID=987

In many retractable-gear airplanes the POH calls for retracting the landing gear once a positive rate of climb is established. In practice you'll be a hundred or more feet in the air before the gear comes up. But what if there's a need to abort the takeoff shortly after liftoff? Should the gear come up as soon as climb begins, or should the pilot delay gear retraction until no usable runway remains?

So what do you think? Do you routinely retract the gear upon establishing a positive rate of climb, or do you wait until there's no usable runway ahead of you? If taking off from a very long runway, say 10,000 feet, when would you retract the landing gear? Let us know your thoughts at mastery.flight.training@cox.net.

Questions? Comments? Email me at mastery.flight.training@cox.net

QUESTIONS OF THE WEEK

To get to know readers better, and therefore provide you a better *FLYING LESSONS* product, beginning this issue we'll being asking a short, multi-part Questions of the Week. Copy the questions below and paste them with your answers into an email to MFTsurvey@cox.net. I'll randomly select an email from those who reply and, once a month, send the selected reader a **Mastery Flight Training hat**. Your email address goes in the drawing once every week you respond in a month's. All responses will remain confidential, but I will publish a breakdown of the results.

Like PIREPs, this works best if *everyone* participates. So take a moment to answer this week's Questions…then come back to read the rest of *FLYING LESSONS.*

April Question of the Week #1

- Which type of aircraft do you most commonly fly?
- Do you own or rent the aircraft, or fly an employer's aircraft?
- Which other type(s) of aircraft do you commonly fly?

Remember, send your response to MFTsurvey@cox.net. Thanks, and good luck!

UPDATE

Last week we reviewed AOPAs Air Safety Foundation's 2008 *Nall Report*, which says:

> 2007 saw an increase in the number of fixed-wing general aviation accidents (1,385, up 6.3 percent from the prior year) but a continued decrease in both the number of fatal accidents (252, down 5.6 percent) and the number of fatalities (449, down 9.7 percent). Maneuvering flight remained the leading cause of fatalities with 51, 20.2 percent of all fatal accidents, but the number of fatal accidents in descent and approach dropped from 37 (13.9 percent) to 22 (8.7%).

Hot on the heels of this report the NTSB has published its first account of the 2008 mishap experience, excerpted here for Part 91 and 135 operations:

> "While the overall aviation safety record in the United States is among the best in the world, the 2008 accident statistics reveal a mixed picture," said NTSB Acting Chairman (and *FLYING LESSONS* reader) Mark V. Rosenker. "We are particularly concerned with the spike in fatalities in on-demand air charter operations. There's a lot of room for improvement in this area, and…we continue to do everything we can to identify the safety issues involved, and to advocate for the adoption of our recommendations that will make the skies safer."
>
> On-demand flight operations (classified by regulators as operating under the federal code 14 CFR Part 135), which include air medical, air taxi and air tour flights, logged over 3.6 million flight hours and had 56 accidents, killing 66 people - the highest number of fatalities since 2000; there were 43 fatalities in 2007. The accident rate per 100,000 flight hours (1.52) remained virtually unchanged from 2007 (1.54).
>
> In general aviation, there were 1,559 accidents, 275 of which involved fatalities, killing a total of 495 - one fewer than the previous year. The GA accident rate per 100,000 flight hours was 7.11, up from 6.92 in 2007. In the last 20 years, the highest accident rate was 9.08 in 1994; the lowest rate was 6.33 in 2006.

See
www.aopa.org/asf/publications/08nall.pdf
www.ntsb.gov/aviation/stats.htm

Questions? Comments? Send your insights to mastery.flight.training@cox.net

Fly safe, and have fun!

Thomas P. Turner, M.S. Aviation Safety, MCFI
2008 FAA Central Region CFI of the Year
