Safety Hot Spot: Fuel Management Checkup

Flight planning

- **Know your airplane** — The most accurate fuel burn figures come from direct experience with the aircraft, at specific power settings. Lacking this information, be sure to consult your POH; but remember that performance chart numbers are based on a properly leaned mixture.
- **Give yourself an hour's reserve** — The FAA requires a 30-minute fuel reserve for day VFR flights, and a 45-minute reserve for IFR and night VFR flights. Think of these requirements as minimums. ASF recommends that you always **land** with at least an hour's fuel in reserve.
- **Be realistic with routing** — When planning, anticipate any major in-flight deviations you might face. Excursions around weather and airspace can add significantly to the fuel required for a trip. Headwinds can do the same.
- **Check fuel availability** — It's a good idea to call ahead and verify that fuel service will be available at your destination airport (or planned fuel stop) when you arrive.
- **Remember aircraft performance** — Particularly during the summer months, aircraft performance limitations may require you to carry less fuel than you'd like. Don't try to stretch your range in these situations. Keeping ample reserves may mean adding a fuel stop.

Preflight

- **Note color and smell** — 100LL has a blue tint, while jet fuel is clear or yellowish. Avgas also porates much more readily than jet fuel, and has a distinctive odor. If line personnel refuel your raft, observe the process to ensure that the proper fuel is used. For more tips on how to prevent fueling, read ASF's Misfueling Safety Brief. (http://www.aopa.org/asf/publications/SB04.pdf)
- **Let water settle** — Water is by far the most common contaminant in aviation fuel. Because water is denser than avgas, it will settle to the lowest part of the tank. A number of factors--among them tank construction, the amount of water and the degree to which it's diffused in the fuel--determine the time it takes for this to happen. In general, allow 15 to 20 minutes after refueling for any water to settle.
- **Sump early, sump often** — Take a sample from each fuel drain before your first flight of the day and after every refueling (or any other time you suspect that contaminants may have entered the tanks). If any contamination appears, continue draining until you get a clean sample. Of course, common sense should prevail. If you've drained a large amount of contaminated fuel, it's probably a good idea to have the fuel system inspected.
- **Dispose of fuel properly** — Why waste money or contaminate the environment? If you get a clean fuel sample, pour it back into the tank. Whenever possible, avoid dumping samples on the ground; the EPA doesn't approve, and many airports now have containers for disposal of contaminated fuel.
- **Check for leaks** — During preflight, look for fuel leaks. Sump drains are common culprits: Make sure that they seat properly and do not continue to drip after you've taken a sample. Fuel seeping from wing seams, or blue-tinted stains on paint, may indicate a ruptured tank. Fuel dripping from a vent line, however, probably indicates nothing more than heat-related expansion or overfilling.
- **Verify quantity** — It seems obvious, but make sure you know how much fuel you're carrying. Visually inspect the tanks, being sure to securely refasten the fuel caps when you're done. If you're carrying less than full fuel, it's a good idea to use a calibrated dipstick (and/or tank markings and tabs) to verify the amount aboard. Don't rely on fuel gauges; they're notoriously inaccurate. Some aircraft (such as the Cessna 210) require special procedures to ensure complete filling.

In flight

- **Check groundspeed** — Higher-than-expected headwinds can quickly cut into fuel reserves. Keep an eye on your groundspeed and be prepared to divert if the situation warrants it. GPS receivers with instantaneous groundspeed and ETE displays are particularly helpful.
- **Lean and mean** — If you haven't leaned the mixture, your engine is almost certainly consuming more fuel than it needs. Follow the recommended leaning procedures in your aircraft's POH. Some people may tell you not to lean below 5000' MSL. Don't believe them. Most aircraft engines can be leaned safely whenever at or below 75% power, regardless of altitude.
- **Switch tanks regularly** — In aircraft with tanks that feed independently, remember to switch tanks on a regular basis. This prevents lateral imbalances and serves to remind you of your fuel status.
- **Be prepared to divert** — Doubts about your fuel situation? Do yourself a favor: *Land and refuel*. Far too many pilots have passed up multiple opportunities to refuel, only to force-land a few miles short of their destination. Remember: It **can** happen to you. Hundreds have crashed when they were certain they could make it.
- **Tell ATC** — If you're in contact with ATC, don't hesitate to let them know if your fuel situation is getting critical. A "minimum fuel" declaration tells controllers that, upon reaching your destination, you cannot accept any undue delay. Be aware, however, that a minimum fuel declaration doesn't guarantee traffic priority. If you need traffic priority to ensure a safe landing, declare an emergency.