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If you think that refueling is a simple process that can be taken lightly, think again. Cross-contamination, water, and various other problems can cause your engine to mis-fire when you least expect it. Be prepared and be safe by following a few simple guidelines.

Mis-fueling

Certain piston aircraft are particularly susceptible to mis-fueling incidents and you should be especially vigilant if you are flying one of these birds. Among them are the turbocharged versions of many airplanes. In the desire to be the hottest thing going, manufacturers often label their aircraft "turbo" or some other designation. And inadequately trained linemen thinking that these are kerosene burning jet airplanes of some sort often put jet fuel where avgas should have gone. This creates a lethal combination for many unsuspecting pilots. The plane would start and apparently run fine, even enough for takeoff, but would start having engine detonation problems about the time the point of no return was reached on takeoff, causing an engine failure shortly after takeoff at low altitude, resulting in a fatal crash.

This scenario has been repeated many times, usually with some pilot and passengers getting killed.

Aero Commander aircraft seem to be particularly susceptible to this sort of mis-fueling, as do Piper Turbo Arrow aircraft and other airplanes with turbo painted on them. If you suspect fuel contamination, do not fly! Check it out first.

A simple way to test for jet fuel contamination of avgas is to take a fuel sample and put a drop of fuel on a piece of white paper. If there is a 5% or more concentration of jet fuel in the avgas, it will leave a visible oily residue, turning the paper translucent. If it is avgas only, it will evaporate cleanly and leave no trace. (This test was given to the AOPA Air Safety Foundation and was later validated by NASA. You can get a copy of the report from AOPA, ASF, Frederick Airport, Frederick, MD)

Another way to avoid fueling accidents is to be present every single time when your plane is re-fueled. Never turn your back on this proceeding.

Always visually check the fuel truck to be sure you are getting the appropriate fuel yourself. Look at the fuel truck. You should also visually check the fuel level yourself after fueling (look inside the tank).

Always put the fuel cap back on yourself. Check that it is secure so it won't come loose in flight. No matter how certain you are that everything was done right, never rely on a lineman for these particular inspections.

The Most Common Cause of In-flight Engine Failure

Running out of fuel is the most common cause of in-flight engine failure. If you follow the safety procedures below you can go a long way to preventing an engine failure.

Before every flight:

(1) Watch the re-fueling. Be present while this is going on.

(2) Visually make sure they are putting the right sort of fuel in the aircraft. (The truck is marked avgas or jet fuel ... look at it.)

(3) Look in the tank after the fueling and know what the fuel level is.

(4) Always put the fuel cap back on yourself. Make sure it is aligned properly and closes properly. If it comes loose your fuel will siphon out without your being aware of what is happening.

(5) Keep a large reserve of fuel. The lower your experience level, the more important this is.

Fuel reserves give you the luxury of time to sort out a problem if you are lost, disoriented, or otherwise have a time-consuming problem in flight. If you are low on fuel, your anxiety level will increase exponentially, making it difficult to think under stress and increase your chance of an accident.

After my first experience long ago in nearly running out of gas, I have made it a practice to keep one fuel tank in reserve. I use a little bit of it in flight to confirm it is not contaminated and when I am sure it is ok, I use it for the next takeoff and keep the other tank full for the next leg. This way, I minimize further the chance of getting caught by surprise, either on takeoff or landing, with contaminated fuel. Losing an engine on takeoff, at night, or on landing is very disconcerting.

Today's navigation equipment makes it possible to navigate more precisely, but this stuff can and does fail. If you are low on fuel when an equipment failure occurs, your chances of running out of gas go way up. This is even more true at night, in haze, or VFR conditions.

Be smart and take precautions every time you refuel. Your life and the lives of your passengers depend on it.

About the author: Fred H. Quarles is an ATP-CFII with more than 3,000 hours of flight time in more than 30 aircraft.