# Fly the Engine

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# Contents




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# 1: Preflight

For years, I performed preflight inspections in more or less the usual "checklist" fashion, as my instructors had taught me over the years, without worrying too much about things that weren't on the checklist. I figured if I followed the checklist (or my memory of it) religiously, there wasn't much else to worry about. Anything not on the checklist was out of my control.

My view of prefight inspections changed a number of years ago after an incident that almost cost the life of a dear friend. I was anxious to take my friend's plane (a Piper Turbo Arrow) on a short trip; the plane was on leaseback with the local flying club, and I decided to rent it one day. But as luck would have it, there was oil leaking from the engine compartment. I had to reject the preflight. I wrote up the oil leak and took the keys and clipboard back to the office.

A few days later, the same airplane threw a connecting rod in flight while my friend (the owner) was on a solo business trip. "Oh my God," I muttered to myself when I heard the news. "That could've been me."

That's when it finally sank in. After years of doing preflights in mindless, robotic, ritualistic fashion, it suddenly became clear to me that the whole purpose of the preflight inspection is *not* to satisfy FAA regulations or your flight instructor, or the insurance company, or the FBO; it's *not* to avoid embarrassment (because you left the gust lock in, or a wheel chock in front of the nose wheel, or a Pitot-cover on, or a fuel cap off, or the baggage door open—or maybe the towbar hanging

from the nosegear—before you started the engine); it's *not* to show respect for a time-honored aviator's ritual, or to pass time while the line boy tops off your fuel tanks. I know now what the purpose of a preflight inspection is. The purpose of the preflight inspection is *to keep the airplane from killing me needlessly.*

I learned something else from the Turbo Arrow experience. I learned that the engine compartment should get at least as much attention as flight controls, fuel sumps, or any other part of the airplane during walkaround. Particularly if the airplane is not owned and operated (and exclusively flown) by you.

Sandy's Turbo Arrow was owned by her, but unfortunately, it was leased back to a club, and an unknown number of pilots (with unknown experience levels) would routinely fly the airplane up and down the East Coast, with or without a decent preflight. My own checkout in the airplane (this still amazes me to this day) consisted of the manager of the club handing me the keys and telling me to spend a few minutes reading the Pilot's Operating Handbook! (He knew that I had plenty of previous turbocharged-engine time, but what he didn't appreciate is that the Turbo Arrow's fixed-wastegate system bears no relationship to the other, more forgiving turbo controller systems with which I was familiar)

Other club pilots were flying this airplane immediately before and not long after I wrote it up for oil in the engine compartment. The plane was dripping so much oil that it was running out the bottom of the cowl onto the top of the nosewheel tire. Why the club chose not to look into the cause of the leak is a mystery.

In any case, as I say,. a few days after I wrote the plane up for oil leakage, the Turbo Arrow was back in the air, and my friend Sandy, the plane's owner, was at the controls, IFR on top, when the oil pressure went south and the No. 1 connecting rod went north. With great piloting skill and some help from Air Traffic Control, Sandy was able to descend through a thick overcast and guide the powerless plane to a no-damage on-airport landing.

## Wake-Up Call No. 2

Another preflight experience that somewhat raised my consciousness on this whole subject happened in upstate Wisconsin a number of summers ago, when I was returning from a speaking engagement. It was a hazy, humid afternoon, and my copilot (Jeff Parnau) and I were quite anxious to fire up the Turbo 310 and get going. But as hot and sweaty and anxious-to-get-going as we were, I wasn't about to cut the preflight short by skipping the aerobics-workout portion of the preflight. I had a longstanding practice of always turning the props over by hand (through 720 degrees of rotation) as part of each and every preflight, to check for cylinder compression and listen for any unusual noises. (This requires a certain amount of upper body strength on a plane like a Turbo 310, particularly if the engines are still hot.and the cylinders have good compression.) The plane, in this particular case, was not tied down. We were on open grass.

Fortunately, *very* fortunately, the right engine did not fire as I pulled it through (the resulting kickback would probably dislocated my arm, or worse). *But it easily could have.* After reaching the runup area, we learned that the engine had a broken primary-lead (or P-lead), and therefore a "hot" mag, on the right engine. This was evident from the fact that there was *no rpm drop at all* upon switching to left-mag-only operation.

## Overcoming Denial

Low-time pilots tend to underappreciate the importance of the preflight inspection, particularly as it applies to the engine compartment. I've often thought this to be due just to inexperience, or maybe to the somewhat cavalier attitude conveyed (perhaps unintentionally) by young flight instructors. But over the years, I have witness countless older, more experienced pilots performing what I call "kneejerk preflights," oblivious to what they were doing. Consequently, I have developed a theory, which is that pilots, as a rule, are in a mental state of denial where their engines (and airframes) are concerned. Rather than assume the *worst* on walkaround, the natural inclination of many pilots is to

assume the *best*—to assume that everything will be perfectly normal (because it usually is, and it's supposed to be, after all).

The tendency to assume the best is a natural tendency—a natural coping strategy—among those who regularly take calculated risks. When one boards a roller coaster at a theme park, one does so in the belief that the coaster is going to stay on the tracks, not accidentally rip free and send passengers hurtling into space. We know that roller coasters are not 100% safe (everybody has a favorite story about an amusement-park disaster of some kind), but we trust that the theme park has adequate systems and procedures in place to ensure the safety of its equipment and we have faith that appropriately trained personnel have done their jobs properly before we step aboard the roller coaster. We step aboard, in other words, assuming the best.

Airline passengers do the same thing, of course. Anyone getting on an airline flight knows full well that airline travel is not 100% safe. But passengers also know the odds are overwhelmingly in favor of a given flight being noneventful, so when getting aboard a large passenger jet most of us check our fears at the gate.

By the time you begin your first flying lesson, you've probably been on many airline flights. Therefore it's natural to bring a certain amount of "airline passenger mentality" to the occasion. On one's first flying lessons, the preflight walkaround is closely supervised, generally speaking; the student trusts that the instructor will spot any potential problems that a student could be forgiven for not noticing. Likewise, the student is confident that FAA certified mechanics, working under the auspices of the flight school (or FBO or club), have maintained the training airplanes according to industry accepted procedures and that it is sure to be in sound working order; any defects found on walkaround are likely either to be minor, or something easily spotted, etc. In short, the student (despite the instructor's remarks, if any, about the importance of the preflight inspection) can be forgiven for going into his or her first few flying lessons with a basic assumption that things will turn out fine. If we didn't assume this, none of us would ever get onboard an airplane. None of us would ever drive cars, ride elevators, eat raw shellfish, or walk across the street. Risk is all around us. We do our best to put it out of our minds. It's necessary, at some point, to stop thinking about it. Some people prefer never to think about it at all.

People who confront serious risks on a regular basis (soldiers, law enforcement personnel, fire fighters, race-car drivers, and others in high-risk jobs) have a unique attitude toward risk. They confront risk head-on and never *assume* that things will go right. They want and expect things to go right, obviously, but safety is never *assumed*. It's something that takes deliberate effort.

Step Number One in making safety happen is to confront risks honestly and openly. Admit they exist. Take stock of them. Get to know all you can about them.

The opposite of Step One is called *denial*.

Step Number Two is to assume ownership of risks so you can manage them.

Step Three is active risk mitigation.

Risk mitigation means applying known risk reduction techniques to a given situation in a disciplined, conscientious fashion.

Professionals whose lives depend (literally) on a piece of hardware working correctly tend to spend a lot of time inspecting and maintaining that hardware. This is risk mitigation in action. A soldier, for example, spends a lot of time cleaning and inspecting his rifle. He doesn't *assume* that it will work when needed. Quite the opposite. The assumption is that the weapon will get dirty in service and jam at the worst possible moment.

Likewise, when you are preflighting an aircraft (particularly one that is not solely owned and operated by you), you should assume that today might not be your lucky day. You should assume, in fact, that today is the day bees visited your Pitot tube and plugged it with beeswax, potentially rendering the airspeed indicator inoperative (something that once happened to me). You should assume that today is the day one of your magnetos has a broken P-lead and the engine could fire as you pull the propeller through. You should assume that any oil dripping from the bottom of the engine cowl might be coming from a cracked cylinder head and that today may be the day the head decides to come off in flight.

A favorite activity of the British flying clubs (and others) is to stage mock preflights with airplanes that have purposely been altered in some mischievous fashion, in any of 10 or 20 different ways (for example, to have "crossed controls," water in the tanks, control locks in place, a spark plug wire disconnected, and so forth). A consistent