Fear and balderdash

Maintenance decisions need to be fact- and evidence-based

BY MIKE BUSCH

THE CURRENT OWNER of the vintage J-model Bonanza had purchased the airplane just four months earlier with a fresh annual inspection, and he was already stressing out about what to do regarding his engine at the next annual eight months hence.

According to the owner, the airplane's Continental IO-470 engine was the original one that had been in the airplane when it rolled out of the factory in 1958. It had been overhauled in 1965 at its published TBO of 1,400 hours, and then overhauled nine years later when it again hit TBO. Now the engine was once again at 1,400 hours since major overhaul, but this time it had taken more than 40 years to get there.

The owner said the engine was using about a quart of oil every three hours, but was otherwise running strong and smoothly, with decent compression readings and not making metal. He wanted my opinion as to whether he should consider a major overhaul at the forthcoming annual, a top overhaul, or no overhaul.

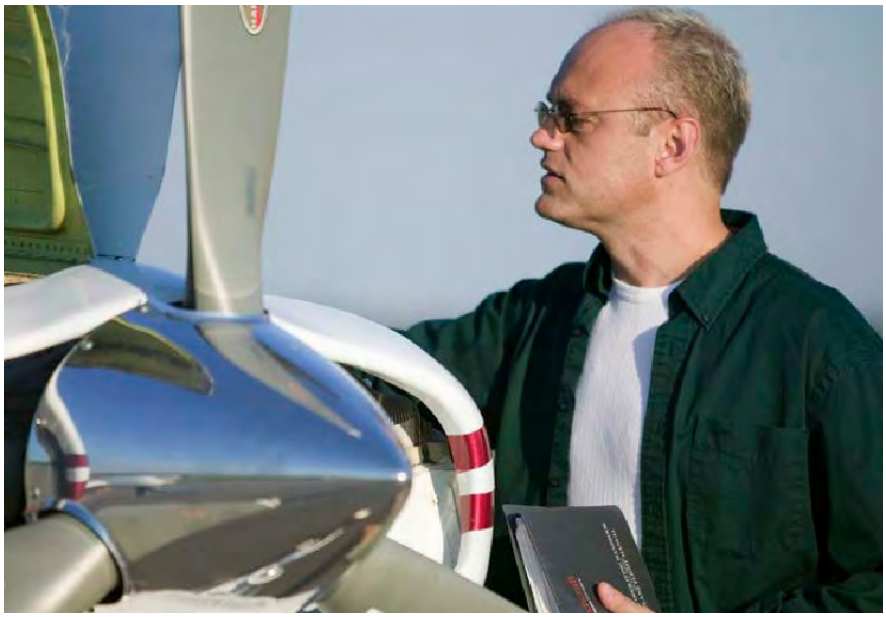
"Considering this engine is 57 years old and more than 40 years since the last overhaul, am I tempting Lady Luck?" he asked.

CALENDAR AGE

The original manufacture date of the engine is irrelevant. The fact that more than 40 years had elapsed since the prior overhaul is relevant only because it means that the aircraft wasn't very active during the past four decades, having averaged only about 35 hours a year. This naturally raises a concern about the possibility of internal corrosion.

The level of concern here was primarily a function of where the aircraft lived during those four decades. If the airplane lived in Houston or Tampa, I'd be very worried, but if it lived in Denver or Tucson I wouldn't be worried at all.

Turns out the airplane now lives in Denver, but for most of the 40 years it lived in Redlands, California. Redlands is located in the Inland Empire of Southern California and has a climate that is hot and dry, with about the same annual rainfall as Denver and Tucson. So I was not concerned about corrosion.



OIL CONSUMPTION

Further, oil consumption of a quart in three hours is not intrinsically an airworthiness issue, according to Continental's guidance. "You could continue to live with it," I said, "but it is on the threshold of concern."

Before deciding whether or not to do a top overhaul, I suggested some basic troubleshooting was in order to determine the reason for the elevated oil consumption. The problem might be confined to one or two cylinders, in which case it would be a shame to replace all six. Or it might be something unrelated to cylinders—perhaps a leaky oil filler cap gasket, or a mispositioned breather line that was pressurizing the crankcase in flight—in which case the owner probably would be upset if he did a top overhaul and it didn't cure the problem. On the other hand, perhaps the cylinders are badly worn or the oil control rings are badly fouled with lead sludge. In that case, the cylinders would need to come off.

"Seems to me some detective work is in order to diagnose the cause of the oil consumption before throwing money at it," I told the owner. "Given that this is not yet an airworthiness issue, you've got time to troubleshoot."

FEAR AND BALDERDASH

"Thanks, Mike, it's tough out there," the owner emailed me. "I spoke to a rep at Continental Motors and he just about told me

that I was nuts to fly with my engine. That can rattle you."

The Continental rep told him the crankshaft in his engine is three generations old, and the IO-470 crankcase has been upgraded three times since his was manufactured. The rep said his crankshaft is considered unairworthy "by today's standards."

I told the owner the Continental rep was technically accurate when he said the crankshaft was unairworthy "by today's standards." Airworthiness directive 97-26-17 required that if his engine was overhauled or if the crankcase was split for any reason, his old "airmelt" crank would have to be scrapped and replaced by newer-design vacuum arc remelt (VAR) crankshaft—at the cost of many kilobucks.

"But what the Continental rep didn't tell you," I said, "was that the new VAR crankshafts have suffered far more in-flight failures than the old airmelt ones ever did." In fact, there was a rash of failures of new VAR crankshafts in 1999, and another in 2000, both prompting massive recalls by Continental. "That AD was a complete boondoggle that cost owners hundreds of millions of dollars for no valid reason," I said.

The Continental rep also was technically accurate when he said the engine has an old-design crankcase that had been upgraded three times since 1958. But what he didn't say is that the old-design crankcase worked just fine in 470-series engines and only started cracking in the higher-horsepower 520- and 550-series engines, particularly the turbocharged ones.

The old IO-470 is probably the most reliable engine that Continental ever built. "So relax!" I said.

The Bonanza owner's experience is hardly an isolated case. I frequently see owners making major, costly maintenance decisions based on fear, myths, half-truths, poppycock, and balderdash. Such decisions really need to be made on the basis of facts and evidence, not emotions.

Facts and evidence make one thing clear: If it's working OK, don't try to fix it. **AOPA**

Mike Busch is an A&P/IA.

EMAIL mike.busch@savvyaviator.com