

OPINION |

Tales of woe

Whoa! This isn't an inspection!

BY MIKE BUSCH

AIRFRAME AND POWERPLANT MECHANICS are trained to find things wrong with your aircraft. But there's a time and place for that, and it comes once a year.

It was the week before EAA AirVenture 2016. Normally, I would never perform any maintenance on my trusty Cessna 310 immediately before departing on an important trip, for fear I might break something. But this time I had no choice.

The FAA had issued airworthiness directive 2016-7-24 on April 26, 2016, requiring replacement of the attach hardware at both ends of the elevator trim tab push-pullrod within 90 days. As soon as the AD hit the streets, I'd ordered the required hardware, but it took a while before I received it. Once it arrived I drove to my hangar with the intention of replacing the hardware in compliance with the AD. But I was surprised to discover that there was not adequate maintenance access to the nut and bolt at the forward end of the pushrod. I couldn't figure out how the hardware could be changed without removing the whole elevator.

I checked with Paul and Phil, two A&P colleagues who I knew did a lot of Cessna maintenance, but neither had ever had occasion to perform this particular operation on a Cessna 310. Then I emailed my friend Tony Saxton, arguably the world's top expert on twin Cessna maintenance, and he replied that he'd performed this procedure nearly 100 times and gave me a detailed explanation about how he did it.

Turns out that it's necessary to unscrew the arm from the trim tab actuator in the horizontal stabilizer, carefully withdraw the push-pullrod from the elevator with the disconnected actuator arm still attached, change the hardware, then reverse the procedure by threading the assembly back through the elevator, screwing the arm back into the actuator, and then adjusting it to restore the proper trim tab travel. Clever!



By now, it was less than a week before my departure to Oshkosh. The 90-day AD compliance deadline would arrive during AirVenture week, so it was now or never to perform this minor surgery. Tony's procedure struck me as being a little scary; what if I unscrewed the arm-and-rod assembly and then couldn't get it back together?

I decided to email Tony's instructions to Phil (who owns a shop on my home field) and ask whether he was willing to help make sure I didn't do anything stupid. I explained to Phil that it was absolutely, positively essential not to break the airplane, because I had to fly it to Oshkosh on Saturday. Phil responded, "Sure, no problem, looks like a piece of cake." So I taxied the airplane to Phil's shop that afternoon, and one of Phil's senior technicians volunteered to perform

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the surgery while Phil and I assisted, supervised, and kibitzed.

WHOA! THIS ISN'T AN INSPECTION!

Phil was right. The procedure turned out to be much simpler than I feared and took only about 30 minutes to accomplish. It was pretty anticlimactic, except for one humorous moment.

Mechanics love to find aircraft defects. It's a matter of professional pride with them, deeply ingrained in their DNA. They especially love to find obscure discrepancies other mechanics have missed.

I was supporting the weight of the elevator and holding it in neutral position while Phil's technician was threading the arm-and-rod assembly back into the actuator. While this was happening, the technician pointed out a tiny quarter-inch-long crack in the paint along the trailing edge of the elevator. "Might be a crack in the elevator skin," the technician said.

"Whoa!" I replied smiling. "This isn't an inspection!"

The technician smiled back and returned to his task. The crack was never mentioned again. It was all over in the blink of an eye, but that moment bears some scrutiny because it says something important about the relationship between aircraft owners and the mechanics who work on their aircraft.

You see, mechanics love to find aircraft defects. It's a matter of professional pride with them, deeply ingrained in their DNA. They especially love to find obscure discrepancies that other mechanics have missed. In fact, I know of at least two annual maintenance competition events during which various teams of mechanics try to outdo one another, finding the most discrepancies on a specimen aircraft that has been tricked out for this purpose. (As the old mechanic joke goes, there's no such thing as an airworthy aircraft; an A&P can always find an airworthiness discrepancy if he looks hard enough.)

Aircraft owners, on the other hand,

generally are more interested in having a flyable aircraft than a perfect one. They certainly want to know about serious problems that might compromise safety of flight, and will have those corrected right away. But for less serious discrepancies, most prefer to defer action until a convenient time and place when the aircraft can be down for maintenance. For

most of us, that time and place is the annual inspection.

It's important for owners to understand that the federal aviation regulations require us to have our aircraft inspected for defects and a formal airworthiness determination made by an A&P/IA or certified repair station just once a year (at least for Part 91 operators like most of us). The other 364 days a year, the FARs require that the airworthiness determination be made by the PIC, not by a mechanic.

It's highly unlikely the aircraft can go a full year between visits to the maintenance shop. Generally, we need to have repairs, component replacement, preventive maintenance, and—occasionally—alterations performed between annual inspections.

But when we take the aircraft to the shop for such maintenance, the FARs do not require the A&P to inspect the aircraft or make any sort of airworthiness determination. The regs make it clear that a mechanic's signature in a logbook entry that covers repairs, alterations, or preventive maintenance does not signify that the aircraft is airworthy, but only that the work described in the logbook entry was performed satisfactorily.

Nevertheless, mechanics are congenitally spring-loaded to inspect any aircraft placed before them and find any defects they can. If an aircraft owner wants to avoid being grounded at an inconvenient time, he needs to keep his mechanics on

a short leash and not let them engage in fishing expeditions (except for once a year when the FARs mandate that such a fishing expedition be performed).

NOSEWHEEL SHIMMY HORROR STORY

Just a week earlier, I had received a phone call from the owner of a Columbia 350 that illustrates the risk of what can happen. The owner—let's call him Bob—was flying the airplane from his home base in the northeast United States to North Carolina, a route of flight that passed close to a well-known Columbia specialty shop where the airplane's annual inspection had been performed weeks before.

Bob decided to make a stop at this shop to have them address the nosewheel shimmy that he'd noticed after its annual. He'd spend a couple of hours at the shop and then be on his way to North Carolina.

The Columbia 350 has a free-castering nosewheel with a strut that does not employ torque links or an external shimmy damper, the way steerable nose struts do. Damping is done internally by the oleo strut. The usual reason for nosewheel shimmy is entrapped gas in the strut's hydraulic fluid. The shop explained all this to Bob, and indicated that they would service the strut with fluid and attempt to purge any entrapped gas. Bob agreed.

Awhile later, the shop's lead technician emerged to give Bob some unwelcome news: They'd performed an eddy-current inspection of the nose strut and found a small crack that rendered the nose strut unairworthy. It would be necessary to order a new strut assembly from Cessna at a cost of \$14,000. Bob was shocked. He asked to see what the shop found, and was escorted out to the shop floor where the shop's nondestructive testing (NDT) technician showed him the crack in question (which was so tiny it was only visible under considerable magnification).

Bob asked whether this crack was the cause of the nosewheel shimmy he'd asked the shop to correct, and was told it was unrelated. Bob asked why the shop had taken it upon themselves to perform an eddy-current inspection of the strut, and was told they did it because they'd found



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similar cracks in other Columbia nose struts and so felt it prudent to inspect all struts for cracks whenever they had the opportunity. Bob asked why they hadn't found the crack during his recent annual inspection at the shop, and was told that the shop didn't have time to do the eddy-current inspection at the annual so they decided to do it now instead.

Note that there is nothing in the Columbia 350 maintenance manual that

He decided to "go over the shop's head" by contacting Cessna engineering in Wichita. (Cessna owns and supports the Columbia product line.) Bob emailed photos of the nose strut crack to a product support engineer at Cessna. The product support engineer apparently wasn't too worried by what he saw, because he emailed back to Bob an official letter of "no technical objection" (NTO) stating that it would be OK to fly the aircraft provided the end of the crack

By now, Bob was livid. He was convinced this tiny crack in a low-stress area of the strut tube was inconsequential.

authorizes doing eddy-current inspections of nose struts under any circumstances. And there are no service bulletins or ADs suggesting that Columbia 350 nose struts have any history of failure because of cracks in this area.

By now, Bob was livid. He was convinced this tiny crack in a low-stress area of the strut tube was inconsequential, and he told the shop's director of maintenance (DOM) that he wanted his airplane back together immediately so he could be on his way to North Carolina.

The DOM replied that wasn't possible, and if Bob pressed the issue the shop would have to make a nasty-looking logbook entry stating that the airplane was unairworthy, and would have to contact the local FSDO to attempt to get Bob a ferry permit, which probably would not be granted. The DOM also advised Bob that if he decided to fly the airplane anyway and the nose gear collapsed, Bob's hull insurance wouldn't cover the repair because he'd knowingly flown an unairworthy aircraft.

This DOM used just about every tactic in the book to bludgeon Bob into submission. It enrages me when mechanics use such tactics against aircraft owners. Why is it so hard for some to understand that—except for once a year during the annual inspection—the responsibility for determining airworthiness rests with the PIC, not the mechanic?

Bob was still not ready to capitulate.

was marked and then re-inspected after six flights to ensure that it hadn't grown.

Bob presented Cessna's NTO letter to the shop's DOM, but the DOM would not relent, and told Bob that he would continue to consider the nose strut unairworthy unless Cessna explicitly stated that it was airworthy. NTO just didn't cut it with this guy.

Bob had now reached his breaking point. He agreed to have the nose strut replaced after negotiating the \$14,000 price down to \$8,000. The airplane was down for many weeks. It was only after Bob got his airplane back from the shop that he phoned me to relate his tale of woe. By then, of course, there was nothing I could do to help him. But I hope telling this story will help you avoid a situation like the one that befell poor Bob.

EPILOG

I had a successful flight to Oshkosh and back. My annual inspection is due at the end of the month. You can bet that I'll check out that elevator trailing edge carefully during the annual. If it turns out that there's actually a crack in the aluminum skin (and not just the paint), I'll carefully stop-drill both ends to ensure that it doesn't grow any farther.

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