

Inaugural GA engine summit

Improving how ADs are dealt with

BY MIKE BUSCH

IN DECEMBER 2015, I had the privilege of attending a two-day meeting at the offices of the FAA's Engine & Propeller Directorate in Burlington, Massachusetts. The meeting was billed as the first "GA Engine Summit." The purpose was to try to improve the relationship between the FAA and the GA community, which has been strained nearly to the breaking point in recent years by a series of draconian airworthiness directives against Superior and ECi cylinders that I've referred to as the FAA's "war on jugs."

A host of FAA executives and subject matter experts from Engine and Propeller Directorate, the Small Airplane Directorate, and FAA headquarters attended the meeting. Industry was represented by delegations from AOPA, the Experimental Aircraft Association, the Aeronautical Repair Station Association, Continental Motors, Lycoming, Superior Air Parts, Danbury Aerospace (former owner of ECi), and a number of others. AOPA Vice President of Regulatory Affairs Dave Oord invited me to the meeting to brief the attendees on the current state of piston engine digital engine monitor equipment and engine monitor data analysis.

After the summit Colleen D'Alessandro, manager of the FAA's Engine and Propeller Directorate, praised the high degree of engagement from participants, which "showed much common ground when it comes to developing more efficient processes for airworthiness solutions and introducing new technologies to GA reciprocating engines." After hearing the FAA's willingness to work with industry while developing airworthiness directives and on alternative methods of compliance, I feel hopeful that the future will bring greater cooperation and less conflict between the FAA and the GA community with respect to engine-related ADs.

WHY DO PISTON ENGINES FAIL?

The Engine and Propeller Directorate gave a briefing on engine-caused accidents in piston GA airplanes. It turns out that loss of engine power is the number-three cause of GA fatal accidents (according to a study by the



General Aviation Joint Steering Committee), after loss of control and controlled flight into terrain.

The directorate analyzed 282 NTSB accident reports of GA airplanes attributed to power loss. Causes of roughly two-thirds of those could be determined by investigators. About 15 percent of them involved fatalities. As you might expect, pilot error was cited in more than half of these power-loss accidents: things like fuel starvation and fuel exhaustion and improper operation. But you might be surprised to learn that of the non-pilot-caused engine failures, improper maintenance was the principal culprit by a wide margin. Most of these maintenance-induced engine failures were caused by errors during assembly, installation, and repair work (mostly involving cylinder replacement), although a significant number involved mistakes during engine overhaul.

System-wise, the leading cause of engine failures turned out to be the fuel system, with cylinders coming in a close second. Most of the fuel system problems involved either fuel starvation or fuel contamination (both typically pilot-caused), while the cylinder problems were mainly maintenance-related. Failures due to improper manufacture or faulty components were insignificant by comparison. The main takeaway here is that if you're involved in a power-loss accident, chances are it'll either be your fault (for

mismanaging fuel) or your mechanic's fault (for bungling a cylinder change).

ORGANIZATIONAL MISMATCH?

As we reviewed these findings and discussed what might be done to reduce the incidence of these engine failures, something became painfully obvious: None of the FAA folks responsible for oversight of pilots or mechanics were in the room! Those folks work for the FAA's Flight Standards Service (AFS), while both Engine and Propeller Directorate and the Small Airplane Directorate belong to the Aircraft Certification Service (AIR).

Here's the problem: When a GA airplane falls out of the sky and a mechanical issue is suspected, it's the responsibility of the Aircraft Certification Service to determine whether an unsafe condition exists and, if so, do something about it.

If it's an engine or propeller issue, that task falls to the Engine & Propeller Directorate near Boston; otherwise, it falls to the Small Airplane Directorate in

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Kansas City. But these directorates have no ability to influence what pilots or mechanics do; that's the responsibility of Flight Standards. What the directorates may do is issue airworthiness directives.

I couldn't help but wonder whether the FAA's organizational structure results in a bias toward issuing ADs rather than addressing problems at their source. Most of the time (according to the FAA's own analysis) that seems to be "stupid pilot tricks" and "stupid mechanic tricks."

In fairness, the FAA does have some folks who serve as liaisons between AIR and AFS, and at least one of them was in the room. But before the engine summit was over, I think everybody was convinced of the urgent need for a "maintenance summit"

hosted by AFS-300, the maintenance division of Flight Standards.

AIRWORTHINESS CONCERNS

Reorganizing the FAA was obviously beyond the scope of this summit meeting. But we did achieve something that I think might be at least a minor breakthrough in the way piston-engine-related ADs will be dealt with going forward.

A little history: In 1999, the FAA issued a proposed AD regarding the exhaust systems of turbocharged twin Cessnas. Had the AD been issued as proposed, it would have been catastrophic for the owners of these aircraft. The fleet would have been grounded indefinitely and the resale value of the airplanes would have dropped to near zero.



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AOPA, the Cessna Pilots Association, and some other industry groups fought hard to oppose this proposal, and I was right in the middle of the fight. Ultimately, sanity prevailed and a far more reasonable AD came to pass, but not before a lot of feathers were ruffled and blood was shed on both sides of the conflict.

Because the exhaust systems on these twin Cessnas were technically airframe parts rather than engine parts, responsibility for the AD fell to the Small Airplane Directorate. Once the AD was a done deal, industry groups met with Small Airplane Directorate leadership to discuss how future AD actions could be handled without so much turmoil.

What came out of that meeting was a new Small Airplane Directorate protocol known as the “Airworthiness Concern Sheet” (ACS) process whereby the Small Airplane Directorate agreed to notify AOPA, EAA, type clubs, and other relevant industry representatives (by sending them an ACS) before issuing a proposed AD, and

to solicit their input before rulemaking begins and rigid *ex parte* communications rules kick in that make it all but impossible for the FAA and industry folks to discuss the matter.

Over the past 15 years, this ACS process has been very effective in helping to prevent the FAA from issuing proposed ADs that are unreasonable or impractical. But here’s the rub: The ACS is strictly the brainchild of the Small Airplane Directorate, and has not been used by other AIR directorates (including the Engine and Propeller Directorate). So sadly, it was not employed in—and therefore could not mitigate—the FAA’s recent “war on jugs.”

As a result of the engine summit meeting, this appears likely to change. Industry reps made a strong appeal at the meeting for Engine and Propeller Directorate to adopt the ACS process before proposing ADs against piston aircraft engines, and the Engine and Propeller Directorate agreed to do so. While this won’t affect

ADs that have been issued (like the one affecting Superior Millennium cylinders) or are already in the pipeline (like the one against ECI cylinders), it should be of great help going forward. I think that’s real progress.

GLOBAL AMOCS

Another interesting subject discussed at the engine summit was AMOCS, FAA-speak for “alternative method of compliance.” If you read the fine print of virtually any airworthiness directive, you’ll find a sentence that says something like this:

An alternative method of compliance that provides an acceptable level of safety may be approved by the Manager, [Wherever] Aircraft Certification Office.

Historically, an AMOC is a special, negotiated “deal” between an aircraft operator and the FAA Aircraft Certification Office (ACO) responsible for an AD, in which the Aircraft Certification Office agrees to allow the operator to comply with the intent of an AD using a different

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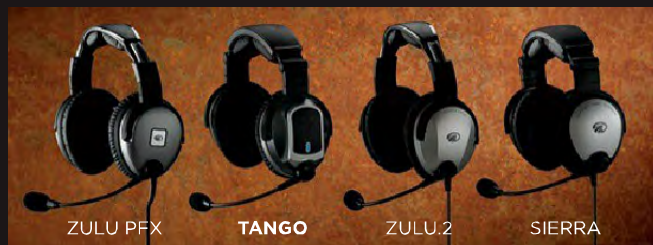
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method and/or timetable than what is set forth in the AD. According to FAA Order 8110.103A, an operator may find it desirable to request an AMOC if he (1) devises a better way to address the unsafe condition, (2) wants to accomplish AD actions in a way that better suits his operational needs, or (3) wants to adjust the compliance time of an AD. The operator requests an AMOC from the FAA Aircraft Certification Office responsible for the AD, and the Aircraft Certification Office will approve the AMOC if it is persuaded that it addresses the unsafe condition that prompted the AD in a fashion that will provide an acceptable level of safety. The airlines make extensive use of such AMOCs to make compliance with ADs affecting their fleet less burdensome and more convenient, and the FAA has historically been quite cooperative in approving such AMOCs.

At the summit, several FAA folks opined that GA was underutilizing the AMOC process. There's a good reason for this. Unlike the airlines, very few GA operators have the engineering or regulatory expertise to draft a persuasive AMOC proposal and assemble the requisite data and analysis to convince the FAA that the alternative being proposed would provide "an acceptable level of safety." Consequently, most GA operators find themselves with no practical choice but to comply with ADs as written, even if those ADs are extremely burdensome.

In 2014, however, there was an encouraging development: AOPA and Superior Air Parts sought and obtained approval of an AMOC to provide relief for operators who would otherwise have been forced by AD 2014-05-29 to retire their Superior Millennium cylinders after 12 years in service. An AMOC allowing affected cylinders to remain in service for an additional five years (to age 17) was approved by the Fort Worth Aircraft Certification Office. It saved affected owners millions of dollars and thousands of hours of downtime. Unlike most AMOCs, which are applicable to only a single operator, the Superior cylinder AMOC was a "Global AMOC" that can be utilized by any operator affected by the AD. **AOPA**

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