

IT MAY BE SMART, BUT IS IT LEGAL?

Before your shop tackles a vacuum-less upgrade for you, they'll need to do some regulatory homework to make sure they hand you back an airplane that's airworthy without a vacuum system. The first stop in the research process should be the aircraft's type certificate data sheet, or TCDS. Thankfully, the FAA has collected all of its TCDS documents in one place and made them available on the agency's Web site, at tinyurl.com/avsafe-tcds. (Even if you're not planning to go all-electric, you should have this document in your airplane's paperwork.)

In most cases, this will take some digging and reading between the lines because you won't find a section for any given TCDS openly addressing vacuum instruments, or even vacuum systems. I've researched many popular models from Beech, Piper, Cessna and Mooney and walked away glassy-eyed in all cases but with confidence in making the correct call.

For instance, reading the original Mooney M20 data sheet shows a specific vacuum pump listing. The saving grace was a December 2010 revision saying the vacuum system can be removed if the attitude indicator was replaced with an STC'd installation of a non-vacuum-driven system and the remaining vacuum system is no longer connected to any operational system (why would you leave it installed if it's not connected to anything, anyway?)

The interpretation gets tricky when the type certificate refers to operating the aircraft per the aircraft's flight manual or POH. If the POH addresses a vacuum system under operating procedures, technically you'd be operating outside the envelope of certificated standards without it installed. But this is rare, at least for the popular models I researched. Some notable exceptions: Cessna's G1000-equipped models type certificated with a vacuum system to drive the lone attitude gyro serving as a backup to all that glass. It gets questionable for older Cirrus models, too, which were hybrids of sorts.

On the smart side, don't bet your life on backup power supplies alone to operate PFDs. The 30-minute onboard battery in the Aspen PFD (the Garmin G500/600 has no battery) is not designed to provide 30-minute operation under all foreseeable operating conditions, such as extreme cold temperatures. Backup power supplies are available; they're just not standard with the installation. Cost, size and weight considerations make them problematic in many light aircraft.

