

The NTSB wants the FAA to issue an AD against certain retrofit oil filter adapters.

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## NTSB Warns of Engine Failures Caused by STC'd Oil Filter Adapters



In mid-July, we sent our subscribers [an email titled "Yikes! No oil pressure!"](#) that described a very close call that George (one of our clients) had while flying his Cessna 182 from Southern California to Lake Tahoe. At about halfway through the planned three-hour flight, the pilot observed that the oil pressure gauge was reading zero. He reduced power and luckily made an uneventful emergency landing at Mojave Airport.

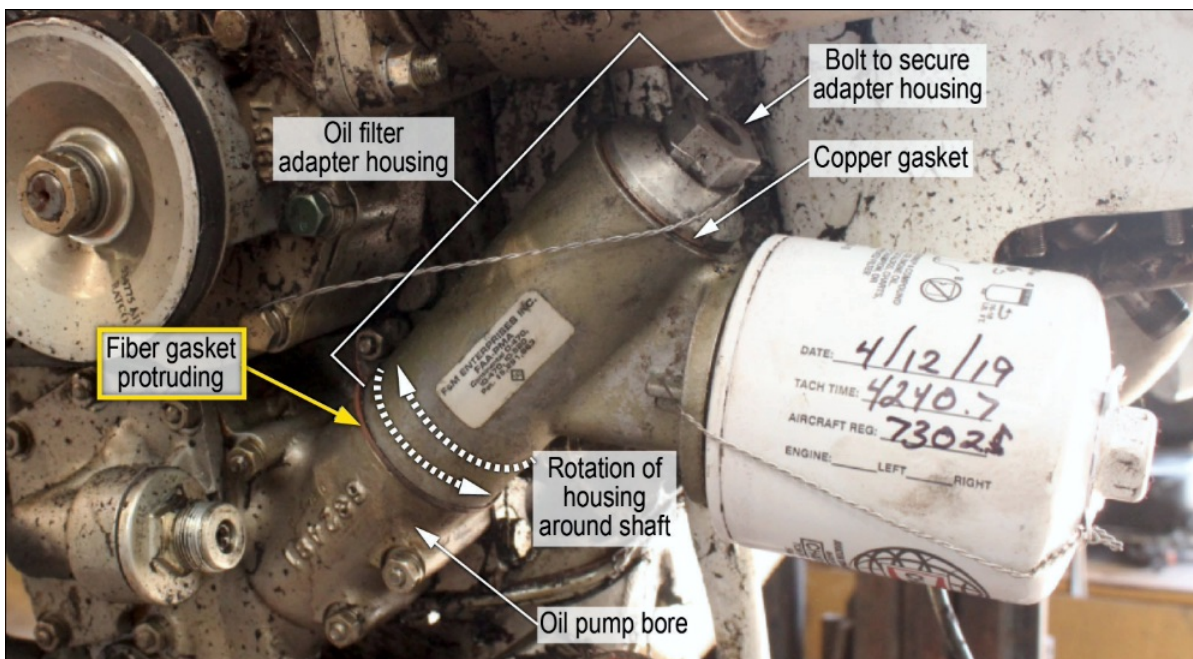
Subsequent inspection revealed that the STC'd oil filter adapter on the Skylane's Continental O-470 engine had vibrated loose, chewed up its gasket, and started letting engine oil leak overboard. Ultimately the oil level

Technologies (a subsidiary of the Tempest Aero Group) under a Supplemental Type Certificate (STC) originally issued in 1996 to F&M Enterprises, Inc. (now defunct) and was acquired by Stratus in 2015.

George was lucky. On May 1, 2019, another Cessna 182 lost oil pressure, the engine quit, and during the ensuing emergency landing the airplane collided with a power line near Mill Creek, California. One passenger was fatally injured, and the pilot and other passenger were seriously injured. About a month later on June 10, 2019, a Cessna 210D lost oil, lost power, and collided with terrain near Ramona, California. The NTSB determined that both of these crashes involved the same sort of failure of F&M/Stratus/Tempest oil filter adapters that George had.

## This now has the NTSB's attention

The National Transportation Safety Board (NTSB) is aware of at least 11 accidents and incidents that have occurred during the past 15 years caused by these F&M/Stratus/Tempest oil filters vibrating loose and chewing up their gaskets. Four of them involved fatalities or serious injuries.



It turns out that the NTSB has been bugging the FAA for 18 months to address this problem, but to date the FAA has been non-responsive. Finally, on November 30, 2020, the NTSB issued **a formal Safety Recommendation** asking the FAA to issue an Airworthiness Directive (AD) against these F&M/Stratus/Tempest oil filter adapters requiring repetitive inspections of

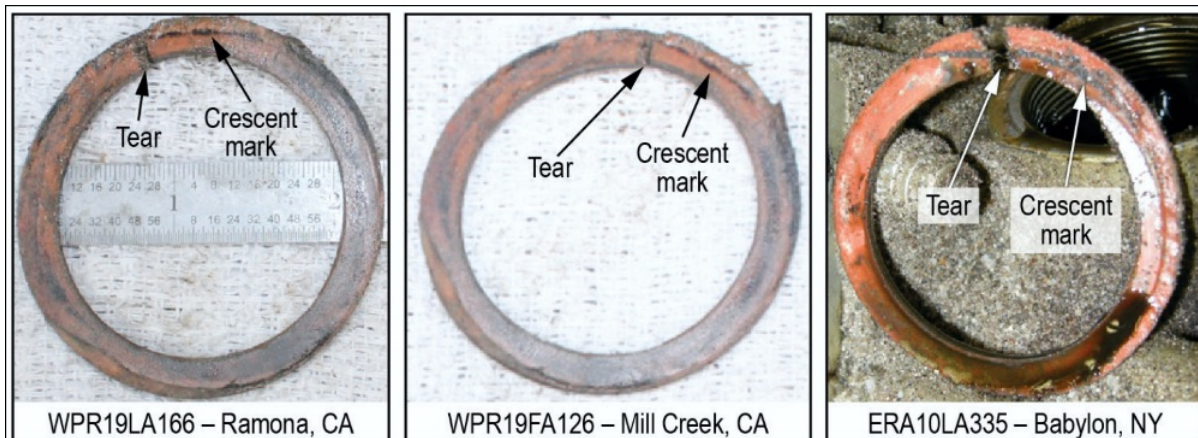
issued a [one-page NTSB Advisory](#) to bring this problem to the attention of aircraft owners and their mechanics.

There are five different variations of the F&M/Stratus/Tempest adapter, designed to retrofit full-flow spin-on oil filters for just about every model of Continental engine that came from the factory with an oil pressure screen rather than an oil filter.

## Checked history

Ironically, back in 1996 the FAA issued [Airworthiness Directive 96-12-22](#) against rather similar retrofit oil filter adapters for Continental engines that were manufactured by Cessna Aircraft Company. These adapters had a long history of vibrating loose. The AD requires that the adapter be inspected at each oil filter change to make sure that the retention nut has not lost torque and the adapter is not leaking oil. However, this AD doesn't apply to the F&M/Stratus/Tempest adapters.

Stratus/Tempest does have a “mandatory” Service Bulletin that addresses torque and gasket issues with the F&M/Stratus/Tempest adapters, but Part 91 non-commercial operators are not obligated to comply with such service bulletins unless mandated by AD. It's probably fair to say that few mechanics and aircraft owners are even aware of the service bulletin.



## Savvy's take

The NTSB doesn't say so, but we think the design of these oil filter adapters—both Cessna and F&M—is inherently problematic. The oil filter, when full of oil, constitutes a heavy weight mounted on a lever arm that is trying its

properly torqued retention nut (Cessna) or retention bolt (F&M). The problem is that the retention nut or bolt is securing a “soft joint” that has a gasket separating the parts being joined (adapter to oil pump housing). As the gasket deteriorates over time, preload is inevitably lost, allowing the adapter to twist when subject to engine vibration. This twisting causes further damage to the gasket, which causes further loss of preload, which causes increased twisting...and the assembly enters a death spiral that—unless noticed in time—inevitably results in loss of oil and possible loss of engine power.

Although frequent inspection—hopefully mandated by an AD—increases the chances of catching this problem before it becomes catastrophic, we think these adapters are fundamentally flawed. While we definitely recommend retrofitting an oil filter to any piston aircraft engine not so equipped, we would feel a lot more comfortable with a remote-mounted filter (e.g., the [Airwolf](#)) that has the filter firmly secured to the firewall and not subject to engine vibration.



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