



**U.S. Department
of Transportation
Federal Aviation
Administration**

SAFO

Safety Alert for Operators

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http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo

A SAFO contains important safety information and may include recommended action. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO. The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.

Subject: The Improper Maintenance and/or Installation of F&M Enterprises, Inc., and Stratus Tool Technologies, LLC, Oil Filter Adapters.

Purpose: This SAFO alerts registered aircraft owners, operators, and certificated repair stations of the possible failure of F&M Enterprises, Inc., and Stratus Tool Technologies, LLC, oil filter adapters in flight due to improper maintenance and/or installation processes. The failures could result in a loss of engine power in flight due to oil starvation.

This SAFO specifically applies to airplanes equipped with Continental Motors, Inc. (CMI) O-470, IO-470, IO-520, IO-550, TSIO-520, GO-300, IO-360, TSIO-360, C-125, C-145, and O-300 model engines and affects the following oil filter adapters installed via a supplemental type certificate (STC) or in any other manner on the eligible engine models identified in Table 1 below. The parts may be stamped with either F&M Enterprises, Inc. or Stratus Tool Technologies, LLC as the manufacturer.

Table 1

STC Number	Oil Filter Adapter P/N	STC-approved Engine Model List
SE8409SW	CO-300	CMI C-125, C-145 Series
		CMI O-300 Series
	C6SC	CMI GO-300 Series
		CMI IO-360 Series
SE09356SC	C6LC-L C6LC-S	CMI O-470, IO-470 Series
		CMI IO-520, TSIO-520 Series
		CMI IO-550 Series
SE10348SC	C6LC-11/15	CMI O-470-11
		CMI O-470-15

Background: This SAFO is prompted by two recent accidents. The first was a fatal accident on May 1, 2019 involving a Cessna 182P airplane (N7302S) with a Continental Motors O-470-S engine in Mill Creek, California. The airplane experienced a muffled boom and a loss of engine power in flight. The engine was equipped with an F&M Enterprises, Inc., engine oil filter adapter (P/N C6LC-S). A second accident occurred on June 10, 2019, at Ramona Airport (KRNM) in San Diego, California. While approaching the Ramona Airport, a Cessna 210D (N3997Y) experienced a total loss of engine power and crashed with substantial airplane damage and no injuries.

Discussion: Multiple accidents documented in completed National Transportation Safety Board (NTSB) Investigation reports have identified evidence of improperly maintained and/or installed F&M Enterprises, Inc., C6LC-S and C6LC-L oil filter adapters. Signatures consistent with power loss due to oil starvation have also been present in each accident. The two recent accidents prompting this SAFO revealed similar characteristics.

STC SE09356SC permits the installation of C6LC-L or C6LC-S spin-on oil filter adapters on approved engine models in accordance with Stratus Tool Technologies, LLC, installation instructions, Document Nos. ST002 and ST003, respectively.

The holder of STC SE09356SC was F&M Enterprises, Inc., from the original issuance date of October 14, 1997. On July 13, 2015, the STC was re-issued to Stratus Tool Technologies, LLC, which remains the current holder. There are both F&M- and Stratus-manufactured oil filter adapters with part numbers (P/N) C6LC-S and C6LC-L currently installed in various Continental Motors engines in service.

In addition to the STC SE09356SC adapters, all other oil filter adapters shown in Table 1 with their corresponding STC should be considered susceptible to the same potential type of failures and maintenance issues seen with the SE09356SC adapters. Only the body and transfer cylinder features differ in geometry. All adapters have the same type gaskets (copper and fiber), along with the same torque and safety wiring requirements.

Recommended Action(s): The FAA recommends that owners, operators, maintenance personnel, and repair stations adhere to the maintenance instruction guidance in the latest FAA-accepted Stratus Tool Technologies, Inc., Instructions for Continued Airworthiness (ICA), Document No. ST001, and the installation instructions as follows:

- a. Document No. ST002 (for P/N C6LC-L),
- b. Document No. ST003 (for P/N C6LC-S),
- c. Document No. ST004 (for P/N C6SC),
- d. Document No. ST005 (for P/N C6LC-11/15), and
- e. Document No. ST006 (for P/N CO-300).

NOTE: All documents can be located via the following Web site under the Technical Publications section:

<https://tempestplus.com/technical-data/>

In conjunction with the latest FAA-accepted ICA and FAA-approved installation instructions, the following inspection and verification steps are recommended.

Occurrence	Recommended Action
Each oil change	<p>When inspecting the oil filter adapter for oil seepage per step 4.a of Stratus Tool Technologies, LLC, ICA ST001, also perform the following inspections to verify gasket integrity and installed location:</p> <p>a. Inspect the entire visible outer diameter of both the fiber gasket and copper gasket for signs of bulging, tearing, protrusion, displacement, or other abnormal wear. If any of those conditions are found, replace the fiber and copper gaskets on the transfer cylinder with new gaskets. Reinstall the adapter in accordance with the applicable Stratus Tool Technologies, LLC, installation instructions.</p> <p>b. Verify that the fiber gasket and copper gasket are installed in their correct locations. If either gasket is incorrectly installed, replace the fiber gasket and copper gasket on the transfer cylinder with new gaskets in their correct location. Reinstall the adapter in accordance with the applicable Stratus Tool Technologies, LLC, installation instructions.</p>
Each 100-hour or annual inspection	
Any time the adapter is removed and installed	
Following any oil filter installation	<p>Check and verify per step 4.c of Stratus Tool Technologies, LLC, ICA ST001 “that the body does not move (rotate around the transfer cylinder) when 10 to 20 pounds of force is applied to the body in a manner that would tend to rotate it around the cylinder...”</p> <p>If the body rotates around the transfer cylinder, replace both gaskets and reinstall the adapter in accordance with the applicable Stratus Tool Technologies, LLC, installation instructions.</p>

NOTE: Whenever tightening the adapter transfer cylinder to 65 ft-lbs of torque, ensure the gaskets and body do not rotate around the transfer cylinder, as damage may occur to either gasket. If this occurs, replace both gaskets and reinstall per the installation instructions.

Contact: Direct general questions or comments regarding this SAFO to the Aircraft Maintenance Division at (202) 267-1675. Direct specific questions or comments about the subject matter to the Atlanta ACO at 404-474-5500 or by email at 9-ASO-ATLCOS-Reporting@faa.gov.