U.S. Department
of Transportation

Federal Aviation
Administration

Airworthiness Concern Sheet

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Subject Line: Worn Fuel Primer Pumps Lead to Loss of Engine Events

Make: General Aviation
Model / Series: Piston/Recip
Serial Numbers: All
Reason for Airworthiness Concern: Worn manual fuel primer pump locking mechanisms

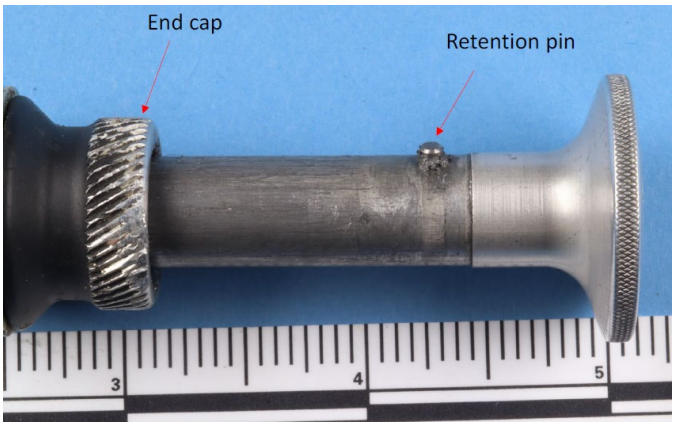
Federal Aviation Administration (FAA) Description of Airworthiness Concern

On June 21, 2023, an accident occurred on a Champion 7EC Traveler equipped with a Continental Motors C90-12F reciprocating engine. The pilot noticed a decrease in the engine rpm during the takeoff climb and eventually lost engine power. Shortly after, the pilot performed a forced landing resulting in substantial damage to the right wing and the fuselage. The probable cause of the accident, as documented in National Transportation Safety Board accident no. CEN23LA250, was a worn locking mechanism on a manual fuel primer pump, resulting in excess fuel being pulled into the engine.

The fuel primer pump used in the Champion 7EC was manufactured by Kohler, P/N K-2406-2. However, due to design similarities common to many manual fuel primer pumps, the FAA is communicating this safety concern amongst all manual fuel primer pumps found on normal category, general aviation aircraft with carburetor engines.

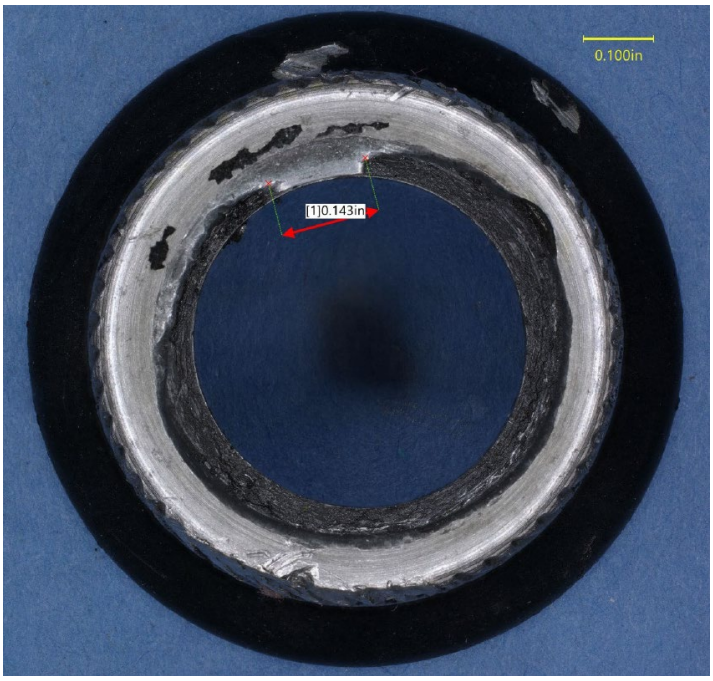
Pictures of the affected part are shown below to aid in identification of the part and the safety concern.

Fuel primer pump as received after the accident.



Piston with retention pin and pump housing end cap (piston in extended position).

To keep the pump in a locked position, the retention pin is pushed past the end cap and must be twisted either left or right There should be a retention lip at the base of the end cap, keeping the retention pin in place which locks the pump.



End cap exhibiting worn retention lip.

If the retention pin was pushed past the end cap and twisted, it may appear to be in the locked position. Given the wear of the end cap, minimal force, if any, could remove the retention pin from the lip and leave it in an unlocked position.

If the pin does not engage, and the plunger works its way out slightly, the plunger will not shut off fuel through the primer system. The primer system allows fuel to bypass the carburetor and it's metering functions. This could result in extra fuel being introduced into the cylinders that are primed. Because not all systems prime all the cylinders or prime them evenly, this can result in one cylinder burning rich and others burning lean.

The FAA is releasing this ACS to make owners and operators aware of a worn retention lip on the end cap of manual fuel primer pumps. Wear of this retention lip can cause the pump to unlock unintentionally and may lead to complete loss of engine power in flight.

Request for Information

The FAA is interested in receiving any information on circumstances surrounding worn locking mechanisms on fuel primer pumps in normal category aircraft which may lead to, or may have resulted in, loss of engine power. This includes unreported events, evidence of wear or damage of the pump, observations regarding procedures and mechanical operations which may affect securement of the locking mechanism, and any other information that may be helpful for us to consider as part of the evaluation. When citing fuel pump primer events, state whether the pump was confirmed locked prior to flight.

This Airworthiness Concern Sheet (ACS) is intended as a means for FAA Aviation Safety Engineers to coordinate airworthiness concerns with aircraft owners/operators through associations and type clubs. At this time, the FAA has not made a determination on what type of corrective action (if any) should be taken. The resolution of this airworthiness concern could involve Airworthiness Directive (AD) action or a Special Airworthiness Information Bulletin (SAIB), or the FAA could determine that no action is needed at this time. The FAA's final determination will depend in part on the information received in response to this ACS.

The FAA endorses dissemination of this technical information to all manufacturers and requests association and type club comments.

Attachments:	**Transmittal:**	**Response Requested By:**
☐ Service Difficulty Report ☐ Accident/Incident Data System ☐ Service Letter / Bulletin ☐ Special Airworthiness Information Bulletin ☐ Federal Aviation Administration or National Transportation Safety Board Safety Recommendation ☐ Airworthiness Directive ☐ Alternate Means of Compliance ☐ Risk Analysis	☒ Federal Aviation Administration ☒ Airplane Owners and Pilots Association ☒ Experimental Aircraft Association ☒ Type Club ☐ Type Certificate Holder ☐ Other:	☐ Emergency (10 days) ☐ Alert (30 days) ☒ Information (90 days)