Airworthiness Concern Sheet

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Sanford B. Proveaux
Aerospace Engineer
Atlanta Aircraft Certification Office
ACE-118A
1895 Phoenix Boulevard, Suite 475
Atlanta, GA 30349
(770) 703-6049
Sanford.Proveaux@faa.gov

Make, Model, Series, Serial No.: All aircraft with carbureted reciprocating engines manufactured by Textron Lycoming, Teledyne Continental, Wytwornia Sprzetu Komunikacy Jnego "PZL-Rzeszow"-Spolka Akcy Jna, (Franklin Engines), Superior Air Parts Inc.

Reason for Airworthiness Concern: Carburetor float failures with potential for accident, damage to property, injury or death.

FAA Description of Airworthiness Concern (Who, What, Where, When, How? Attachments: RA and appropriate data)

There have been numerous accidents and incidents over the past decades resulting from engine stoppage or engine fires attributed to float-type carburetors. In the United States, numerous Service Information Letters, Service Bulletins, and Mandatory Service Bulletins have been written over the past two decades addressing float-type carburetor issues related to poor idle cut-off and fuel leaking from the carburetor after engine shutdown. The FAA issued Special Airworthiness Information Bulletin (SAIB) number CE 06-33 in March 2006 addressing poor idle cut-off and fuel leaking from the carburetor after engine shutdown. These conditions of poor idle cut-off and fuel leakage from the carburetor are the result of fuel leaking into the carburetor float, a damaged or worn float, or a damaged or worn float valve. Reports of accidents caused by float-type carburetors resulting in loss of aircraft have also been received from the Civil Aviation Authorities in the United Kingdom, France, and New Zealand over the past few years. These events have resulted in airworthiness actions by foreign Civil Aviation Authorities.

Unfortunately, in spite of these Information Letters and Bulletins issued over the past several years, accidents and incidents resulting from carburetor float anomalies continue to be reported.

Carburetor float design has had numerous iterations over the past few decades and there are many different types of floats in service today. Carburetor floats are primarily made from polymers (plastics), brass, or epoxy "foam." The floatation is typically provided by either a cavity, or cavities, that are formed by a thin outer shell of polymer, brass, or epoxy. If this thin shell is compromised by either cracking, separation at a weld seam or joint, or by the shell rubbing on the bowl of the carburetor, the result will be a breach that will permit fuel to enter the hollow floatation cavity and thereby reduce the buoyancy of the float. Floatation shell rubbing on the carburetor bowl can be caused by excessive pivot wear which affects the alignment of the float and metering components and, in extreme cases, will allow the float to contact the inner surface of the float bowl. If the float buoyancy is reduced it can lead to improper metering of fuel to the engine and/or fuel leaking from the carburetor. These conditions can then lead to complete loss of power or engine fires. There are some newer float designs that are fabricated from closed cell epoxy material. These floats are more tolerant of rubbing, chafing, and cutting since the floatation is provided by thousands of independent closed cells rather than a few closed cells.

Carburetors are now treated as "on condition" parts, and no maintenance schedule is in place to insure their continued airworthiness. Since there is no requirement, the airworthiness of the carburetor can deteriorate eventually causing a severe hazard to flight.

The FAA has a concern regarding the continued airworthiness of certain types of floatation devices used in carburetors of reciprocating engines. Many events related to the failure of carburetor floatation devices are not required to be reported to the FAA. Therefore, the FAA does not have sufficient data to make a determination on this issue (i.e. if airworthiness action is needed).

Request for Information (Proposed Alternate Inspection/Repair Procedures, **Cost Impact**, Etc. Note: Any comments or replies to the FAA need to be as specific as possible. Please provide specific examples to illustrate your comments/concerns.):

Comments and/or experiences with float-type carburetors installed on reciprocating engines are needed to determine what further actions should be taken to eliminate this risk to the fleet. Of specific interest are wear, damage, and failure experiences with float-type carburetors. Please provide as much of the following information as is known about defective carburetor floats:

- What types of floats are in service?
- How often are carburetors overhauled?
- What inspections are performed before returning to service?
- What is the service experience, for example: float wear, damage, or failure?
- Describe the wear, damage, or failure (e.g. worn float found during maintenance, excessive pivot wear found during maintenance, experienced poor idle cut-off, fuel leakage, engine failure, engine fire, etc.).
- Quantity of this type of defect (if more than one defective carburetor has been found by an individual or organization)?
- Type of float (plastic, brass, or closed cell epoxy)
- Carburetor manufacturer / model
- Float manufacturer / type / part number
- Float hours in service
- Float time (calendar) since new
- How would a mandated overhaul of the carburetor at engine overhaul affect the operator's maintenance program?

The requested information will be used to determine if any airworthiness action is warranted and what that action should be. All owners/operators are requested to provide input on this matter.

This Airworthiness Concern Sheet (ACS) is intended as a means for FAA Aviation Safety Engineers to coordinate airworthiness concerns with aircraft owner/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 an AD action or an 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 clubs comments.

Attachments: *SDR(s)☐ *A/IDS☐ *SL(s)☐ *SAIB☐ *FAASR/*NTSBSR☐ *AD☐ *AMOC☐ *RA☐

Notification: FAA ☐ *AOPA ☒ *EAA ☒ Type Club ☐ *TC Holder ☒ Other:

Response Requested 03/15/09: Emergency (10 days) ☐ Alert (30 days) ☐ Information (90 days) ☒
(Space Bar Adds "X" to Check Boxes)

*Service Difficulty Reports (SDRs); Accident/Incident Data System (A/IDS); Service Letter (SL); Special Airworthiness Information Bulletin (SAIB); Federal Aviation Administration (FAA)/National Transportation Safety Board (NTSB) Safety Recommendation (FAASR/NTSBSR); Airworthiness Directive (AD); Alternate Method of Compliance (AMOC); Risk Assessment (RA); Aircraft Owners & Pilots Association (AOPA); Experimental Aircraft Association (EAA); Type Certificate (TC)