FAA
Aircraft Certification Service

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: NE-10-05

SUBJ: Control/Reciprocating Engines – Float-type Carburetors **Date:** October 16, 2009

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts you, pilots, owners, operators, maintenance personnel, and certificated repair facilities of **reciprocating aircraft engines with float-type carburetors**, of potential hazards associated with those carburetors. At this time, the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Regulations (14 CFR) part 39.

Background

This SAIB results from reports of numerous accidents and incidents over the past 20 years that resulted from an engine stoppage or engine fire involving float-type carburetors. Numerous service information letters (SILs) and service bulletins (SBs) were issued during that time to address float-type carburetor issues related to poor idle cut-off and fuel leaking from the carburetor after engine shutdown. The FAA issued SAIB CE-06-33R1 in April 2006 to address those conditions. These conditions are often the result of fuel leaking into the carburetor float, a damaged or worn float, or a damaged or worn float valve. Despite the availability of the SILs and SBs, the FAA is still receiving reports of accidents and incidents resulting from carburetor float anomalies. In comparison to the SILs and SBs previously issued, this SAIB is applicable to all aircraft with reciprocating engines with float-type carburetors installed and provides more detail and focused recommended actions.

Carburetor float design has evolved over the past 20 years, resulting in many different types of floats in service today. Carburetor floats are primarily made from polymers (plastics), brass, or epoxy "foam". The buoyancy of a float is typically provided by either a cavity, or cavities, that are formed by a thin outer shell of polymer, brass, or epoxy. If this shell is compromised, the result is a breach that permits fuel to enter the cavity, which reduces the buoyancy of the float. The shell can be compromised in several ways such as:

- Cracking
- Separating at a weld seam, soldered seam, or joint
- A hole.

A hole can be caused by the shell rubbing on the carburetor bowl. The shell might rub on the carburetor bowl due to excessive pivot wear, which affects the alignment and operation of the float and metering components. 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. Some newer float designs are fabricated from closed cell epoxy material. These floats are more tolerant to rubbing, chafing, and cutting since the buoyancy is provided by thousands of independent closed cells rather than a few closed cells.

Carburetors are commonly maintained only when problems warrant their repair or overhaul. However, it is recommended by engine type certificate holders that carburetors be overhauled at the engine's overhaul interval. If this is not done, the airworthiness of the carburetor can deteriorate and eventually cause a severe hazard to operation.

Applicable model list: All aircraft with reciprocating engines with float-type carburetors installed.

Recommendations

- **Pilot Action:**
  During preflight inspections, examine the engine area for evidence of fuel leakage. During engine start, be alert for carburetor flooding or the need for excessive leaning. Hard starting might be an indicator of a deteriorating or damaged carburetor float. During engine operation, excessive fuel consumption and/or poor idle performance might indicate a deteriorating or damaged carburetor float. Difficulty shutting down the engine with the mixture cut-off control might be an indicator of a deteriorating or damaged carburetor float. If any of these conditions are observed, the pilot should have qualified maintenance personnel inspect the aircraft before the next flight.

- **Owner, Operator, and Maintenance Personnel Action:**
  Perform routine carburetor inspections for signs of fuel leakage. Inspect for fuel stains from the bowl vents in the throat of the carburetor and/or fuel in the air box. Comply with all engine and carburetor manufacturer recommendations, including, but not limited to, maintenance procedures, SBs, Customer Bulletins, SILs, etc. Maintenance Personnel addressing these issues should inspect the carburetor for signs of fuel leakage. Remove carburetors with signs of fuel leakage and send them to a qualified repair station for overhaul, inspection, and repair.

- **Overhaul Action:**
  Overhaul the carburetor at every engine overhaul interval. The correct interval to use is whichever of the following occurs first:
    - The engine manufacturer's recommended interval
    - 12 years
    - 2,400 hours

  During overhaul, inspect the float and float valve. Replace with a new float and float valve as necessary.

For Further Information Contact

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