FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-12-03

SUBJ: Fuel Control; Engine Performance with the Throttle Control at Idle **Date:** October 26, 2011

This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) is to inform owners and operators of an airworthiness concern on 1996 and after **Cessna Model 172R and 172S reciprocating engine powered airplanes**.

At this time, this airworthiness concern is not an unsafe condition that would warrant AD action under Title 14 of the Code of Federal Regulations (14 CFR) part 39.

Background

The FAA has been involved in issues with respect to proper performance of the engine with the throttle control at idle. There appears to be a lack of understanding of what "idle" is. Engine operation at idle can be described as operation of the engine with the cockpit throttle control pulled full aft (closed). This is where the throttle control stops moving aft, taking into account any cushion or hysteresis within the control installation, after being released. It's not a "hard" stop, nor a "soft" stop. It is the engine performance that results when the position of the fuel/air control units throttle lever is resting on the throttle stop set screw on the fuel/air control unit when the cockpit throttle control is pulled full aft and released.

There also could be a lack of understanding of what smooth, proper engine operation is with the throttle at idle. Engine fuel flow settings that are not within allowable limits and that may not be readily detected can prevent the engine from being capable of proper operation with the throttle at idle when the pilot reduces power for any reason, i.e.; approach to landing, power off stalls, etc. A typical reason for the engine's inability to operate at the idle stop is an over-rich mixture, which may also lead to the engine not restarting using published in-flight restart procedures. Over time, the engine fuel servo has been shown to have the potential to shift to an over-rich condition with the throttle at idle. This stems from the potential for the engine fuel servo to shift to an over-rich condition or be set such that an over-rich condition exists with the throttle at idle

We are concerned that operators could be circumventing poor engine performance at idle by slightly increasing the throttle setting during ground operations before takeoff. This can result in poor engine performance re-appearing as power is reduced to idle during flight operations. This can result in unexpected and serious operational consequences.

There has been FAA airworthiness directive (AD) activity and Cessna and their suppliers have published numerous operational and service documents to address, component changes, process changes, etc. dealing with idle speed, idle mixture as well as fuel injection system component performance and care. The end goal of much of this documentation is proper performance of the engine at idle. There are three key factors to the proper performance of the engine at idle:

- idle RPM
- lean rise
- understanding engine roughness

Cessna has also taken action to include information in their service documents for these models to address these three factors to further improve the operator and maintenance communities understanding of what proper engine performance should be with the throttle at idle. Cessna has also published updates to all of the pilot's operating handbook and FAA-approved airplane flight manuals and maintenance manual to further clarify proper performance of the engine with the throttle at idle and address engine roughness.

Recommendations

The FAA recommends that owners and operators of the airplanes identified above review, understand, and adhere to the limitations, operating and maintenance information defined in the latest pilot's operating handbook & FAA approved airplane flight manuals (POH/AFM) and maintenance manual for the applicable airplane model. We also recommend adherence to the procedures in the Model 172R/172S Maintenance Manual, at Revision 14 or later, contained in Section 73-00-01, pertaining to "Idle Speed and Mixture Adjustment".

For Further Information Contact

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