

Cawthra Joshua

From: Toms, Jerry L (FAA) [REDACTED]
Sent: Tuesday, October 29, 2019 1:13 PM
To: Cawthra Joshua
Subject: Carburetor Evaluations

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Greetings Joshua:

The evaluations and flow bench testing was completed on the MA3SPA involved in the Cessna 140 forced landing in the Snake River.

I will give some preliminary notes now and complete a detailed report later with photos and Marvel Schebler is working on their report which will likely take a week or so depending on their schedule.

The initial inspection of the carburetor indicated that the throttle shaft was loose in its bushings or mounting to the casting. Moving the throttle indicated that the accelerator pump was not sealing against the wall of its chamber which would not provide fuel needed to increase power with throttle movement.

When on the flow bench, immediate leaks were noted audibly, one at the throttle shaft seals and one in the area of the accelerator pump. Indications of blockage on the readings in the idle chambers of the carburetor were consistent with the physical mechanical items noted.

At idle ranges, the flows were significantly out of spec and would likely not run, the changes in the readouts during the throttle changes, were consistent with blockage in the idle path.

When removing the metal float, it was noted that the safety at its attachment hinge was not the proper part and was in backwards.

This carburetor still had the 2 piece venture installed.

Removal of the idle tube resulted in seeing significant corrosion and contaminants in that area, likely the blockage indicated by the flow bench readings.

The floats were not setup correctly, and had very little gap on one side of one float, with chaffing marks on the float itself.

Removal of the accelerator pump revealed the seal material was flattened against its piston end, and not contacting the wall of the chamber enough to force additional fuel required for accelerating the engine.

This carburetor was not maintained properly in my opinion, and was neglected in the areas of routine maintenance.

When installed on the carburetor flood rack, it clearly demonstrated that at idle this carburetor was flooding, and fuel pouring through the unit. The fuel flow at full throttle appeared to be about 3pph higher than spec.

The fuel flow, given the faulty elements, maintenance and setup issues within the carburetor appeared to be consistent with the stated flight sequence:

1. Idle problems are consistent with the improper fuel mixture at idle range and low speed.

2. Flooding is consistent with the inability to start the engine
 3. Despite the reference to cleaning the mixture metering sleeve; the condition internally clearly shows it was contaminated and not cleaned thoroughly. Photos will show this later.
 4. The flooding and idle system problems seem consistent with the starting problems and the inability to get the engine to run at low speed.
 5. The inability to accelerate past 1800 rpm is consistent with the improperly setup accelerator pump.
 6. The main jet was within the proper range permitted for this carburetor.
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Summary.... Routine maintenance was apparently not being done to the carburetor. Parts were not upgraded as recommended... old style venture, old type floats, some pieces in backwards, and the contaminants and what appeared to be corrosion in areas that had never been apart for cleaning likely resulted in the inability to accelerate and maintain power.

Do you know what the aircraft was like up to the flight before this? Had it been sitting? When was the most recent annual inspection? Any logbook entries for work on the carburetor?

From my perspective, we continually have findings that indicate more education is needed concerning the simple carburetor, which has precision requirements in its assembly and setup to work properly. They are historically very reliable when properly cared for and setup.