

## **FUEL FILTER PROBLEM – Sharing another Experience**

By Hugo Ritzenthaler

Late 2012 I decided that it was time to recover the wings and fuselage of my Pitts S1E and have the aircraft undergo a general inspection and overhaul. The wings were recovered and painted by the end of July 2013, just in time to attend the last two Mid-America competitions that year. Before completing the remaining portion of the overhaul, I had the newly recovered wings hung back onto the Pitts. After the aircraft was inspected and signed off, I flew to Kokomo, where I competed in the Unlimited category. All went well in Kokomo, although I may have observed a noticeably lower idle RPM during the landing roll-out. Two weeks later I headed for Chatham, Canada. On landing in Sarnia, the first Port of Entry to clear customs, I noticed again during roll-out that the engine was idling lower than what I was used to. Continuing to Chatham, it was there that I encountered an anomaly related to the operation of my engine during the landing roll-out. Coming in for landing I noticed low power with the throttle partially closed. Surprisingly on roll-out, the engine quit. This was to happen during the landing after each of the 3 contest flights that weekend. The engine performed otherwise well and delivered all the power that I needed to fly the sequences. Nevertheless, it was distracting while flying the sequence, especially when setting up for spins with the throttle closed. I paid special attention not to close the throttle completely when setting up for the spin, which of course carried me out of the box before actually entering the spin. Sunday morning I decided to check the idle settings on my engine. Bill Ludwig, Contest Director, who was based at Chatham airport was kind enough to letting me use his hangar and tools. I unbuttoned the cowling and started to adjust Idle RPM and Idle Mixture. Unfortunately, my changing of the settings did not resolve the problem. The engine stopped again during roll-out following the Sunday morning flight. Fortunately, my restarting procedure for a hot engine worked well and got me off the runway and back to the staging area without further delay.

Knowing that this condition might persist on my way home, I left in a little more throttle during the landing in Port Huron, where I had to clear US Customs. All went well and I did get back safely to my home base airport in Romeo, MI.

During the following weeks I continued adjusting idle RPM and idle mixture without success, as the engine continued to stop on landing roll-out. I remember going up to 4,000 ft several times to stall and spin the airplane with the throttle fully closed. Sure enough, I got to stop the engine, ending up with a dead prop. Fortunately, I had some good experience in restarting my engine without the use of the starter by pushing the nose down some 30 degrees. I felt like a real test pilot!

Obviously, the idle RPM and mixture setting was not the problem, as none of the setting combinations had fixed the engine stoppage. Coming back from the test flights, I typically encountered erratic engine idle RPM before shutting down. Since I just had the Bendix Fuel Servo overhauled a year before, I made several calls to the service shop. They could not think of a malfunction of the fuel servo that would produce this condition. On advice of the service shop, I checked the finger screen in the Servo; it was clean.

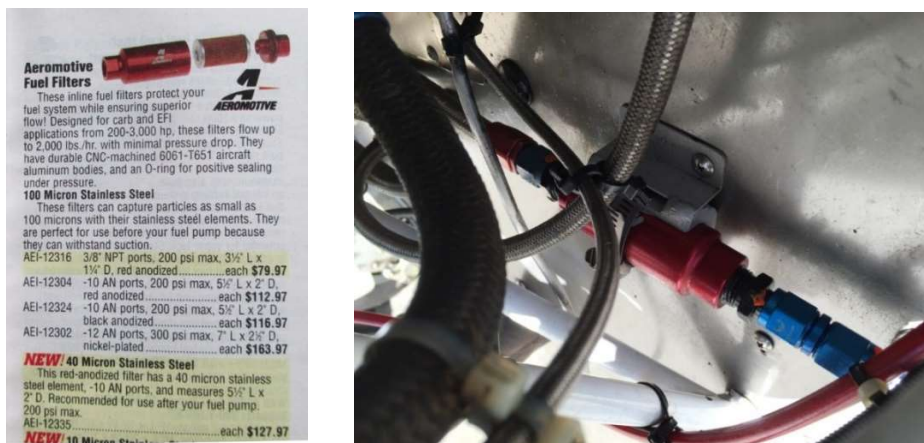
By now it was time to deliver the Pitts back to the shop in order to complete the remaining part of the general overhaul. As I kind of expected, when landing in Bay City, the engine quit again on roll-out.

As my frustration grew, I contacted some of the experts out there who I thought could help fixing my problem. I contacted Len Rulason in Arizona. He immediately pointed to the Christen wobble pump, particularly to the paper filter that is a standard automotive part. His experience with paper filters has been that, if they get wet from water in the system, they will clog up. Since it is very difficult to see if it is clogged, it is wise to simply replace the filter frequently. This condition can produce fuel starvation at low engine speeds. Perhaps changing my filter was long overdue.



Being tired of working hard bringing the airplane back onto solid ground, it was time to take a closer look at the fuel filtration. My other expert advisor, Doug Dodge, was not in favor of replacing the paper filter in the wobble pump. When he built his Machaira Pitts, he installed a fine metal filter in-line to the servo. I thought that was a good change and had him remove the paper filter from the wobble pump and instead install an Aeromotive Fuel Filter at the fire wall inside the engine compartment. This filter can be purchased from Summit Racing Equipment.

Upon completion of the overhaul late 2014, I started practicing to get ready for the 2015 competition season. During all the practice flights and four contests I never encountered this anomaly again. Idle mixture and idle RPM continued to remain very stable all through the 2015 contest season. Paying \$80 for the metal filter assembly vs. \$2.99 for a paper filter was the best money I ever spent. Case closed.



Filter attached to the fire wall in the engine compartment