



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

FUEL SERVO EXAMINATION

WPR20FA016

This document contains two embedded photos.

A. ACCIDENT

Location: Jordan Valley, Oregon
Date: October 25, 2019
Aircraft: Enstrom 280F, Registration N280F, Serial Number 1501
NTSB IIC: Elliott Simpson

B. EXAMINATION PARTICIPANTS:

Elliott Simpson
Senior Aviation Accident Investigator
National Transportation Safety Board
Western Pacific Region
Los Angeles, California

Peter Nielson
Precision Airmotive LLC
Arlington, Washington

C. SUMMARY

The examination was conducted at the Precision Airmotive facility in Arlington, Washington on December 10, 2019. No anomalies were noted to the servo unit.

Precision Airmotive Fuel Injection Servo
Model: RSA-5AB1
Serial Number: 72GH4502
Parts List Number: 252858-5

D. DETAILS OF THE INVESTIGATION

1.0 Examination

Precision Airmotive records indicated that the unit had been overhauled at the Precision Airmotive facility in March 2016. No service bulletins or airworthiness directives had been issued since overhaul.

The unit was intact and did not appear to have sustained any damage (Photo 1).

The automatic mixture control (AMC) cooling shroud was still in place, and was removed by the group for examination. The safety wire at all key fastenings was correct, was the same typed

used at overhaul, and the factory safety wire seal was present at the AMC and diaphragm housing.

The venturi inlet was clear, and the impact tubes appeared unobstructed. Both mixture and throttle control linkages remained firmly attached at their respective control levers. The center-to-center measurement of the idle mixture linkage revealed a value of 2.835 inches.

Rotation of the throttle lever resulted in appropriate full travel movement of the throttle valve. The throttle-to-idle valve linkage remained intact, and was observed to move in concert with the throttle linkage. Movement of the mixture control lever by hand resulted in unimpeded full motion travel. The plastic mixture stop bushing was partially crushed at the contact area with the mixture overtravel arm at the full rich position.

The unit was installed on an airflow bench that had been calibrated for the RSA5 servo (Photo 2). The unit was then tested in accordance with Precision Airmotive overhaul test standards. All test results fell within nominal levels, except for the zero suction test point, (zero airflow, rich mixture control, throttle wide open), which exhibited a fuel flow of 47.1 lbs/hr (Nominal 38 to 42 lbs/hr).

The unit was disassembled. The idle lever assembly appeared intact and undamaged, the valve surfaces were clear, and the contact faces had no discernable radial scoring. The mixture control assembly was removed, and the lever assembly was intact and undamaged. The valve alignment dowels were in place, and the mixture control valve along with the control plate was free of discernable scoring. All O-rings were intact and undamaged.

The AMC was disassembled; the aneroid chamber and needle assembly were unremarkable.

The regulator nut on the diaphragm assembly displayed a "G" stamp, indicating service information letter RS-87 had been complied with.

The diaphragm assembly was disassembled, the effort spring was the green type, and was intact. The outer regulator nut took one turn to bottom out. The inner regulator nut required three turns to bottom out. The regulator stem appeared undamaged and its bushings was in place. The diaphragm was pliable, intact, and did not show any evidence of leak.

The center body was removed exposing the fuel diaphragm which was likewise undamaged. The regulator seat was undamaged, along with the regulator ball valve.

2.0 Examination Photos

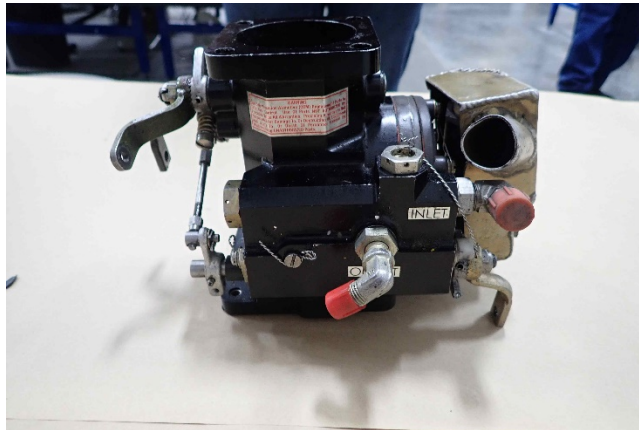


Photo 1 – Fuel Servo Unit



Photo 2 – Fuel Servo Installed in Airflow Bench

Submitted by: Elliott Simpson