



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Western Pacific Region

October 26, 2021

FUEL SYSTEM COMPONENTS EXAMINATION

WPR21LA194

This document contains 5 embedded photos.

A. ACCIDENT

Location:	Lake Arrowhead, California
Date:	May 15, 2021
Aircraft:	Cessna, 210, N7350E
NTSB Investigator-in-Charge:	Eric M. Gutierrez

B. PARTICIPANTS

Eric M. Gutierrez
Air Safety Investigator
National Transportation Safety Board
Federal Way, Washington

Charles W. Estes
Accessories Dept. Manager
Ly-Con Aircraft Engines
Visalia, California

C. SUMMARY

The examination of the fuel flow manifold valve, throttle body/fuel control, and engine driven fuel pump revealed a malfunction of the fuel flow manifold valve plunger preventing normal operation.

D. DETAILS OF THE INVESTIGATION

1.0 Engine Driven Fuel Pump

Manufacturer: Continental
Part Number: 653135-3R
Model Number: A66A
Serial Number: J087103R

A visual examination of the recovered engine driven fuel pump revealed that fuel pump cover plate was discolored consistent with a fuel leak, no further anomalies were noted.

The fuel pump was connected to a test stand. Initial start of the fuel flow test revealed a short spike for about 5 seconds of about 35 pounds per square inch (psi) and about 30 pounds per hour (fuel flow) at 600 revolutions per minute (rpm). Further attempts to duplicate the fuel flow spike could not be produced. The fuel pump performed within manufactures specifications when tested at 600 rpm and 2625 rpm.



2.0 Throttle Body Examination

Manufacturer: Continental
Part Number: 625279-2
Serial Number: K159442AR

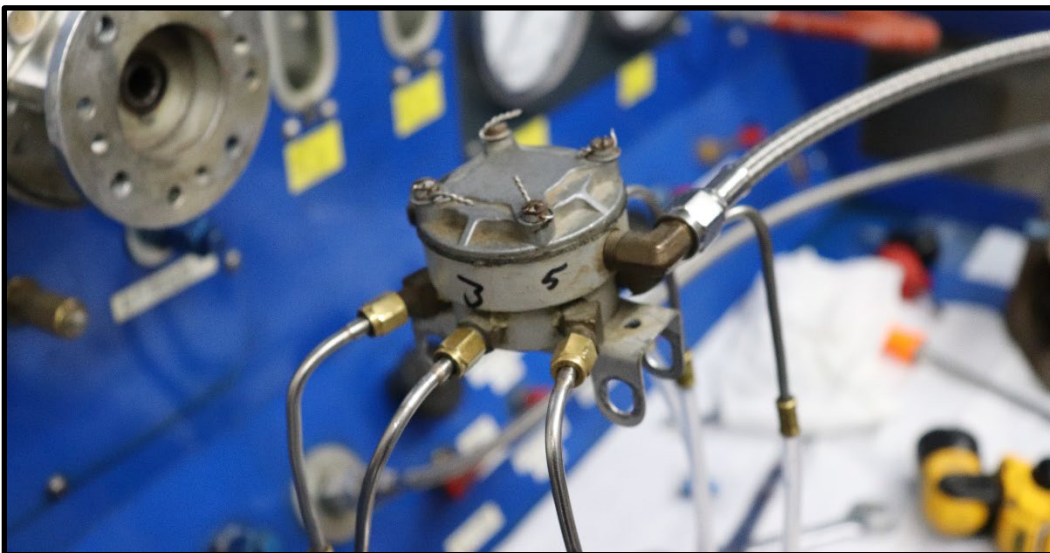
Examination of the recovered throttle body that the throttle lever was intact, moved freely from stop to stop, but the connecting linkage to the throttle cable was fracture separated, consistent with impact damage. The mixture control lever attached to the throttle body was damaged but moved freely from stop to stop. The fuel inlet fuel screen was removed, and debris was observed.

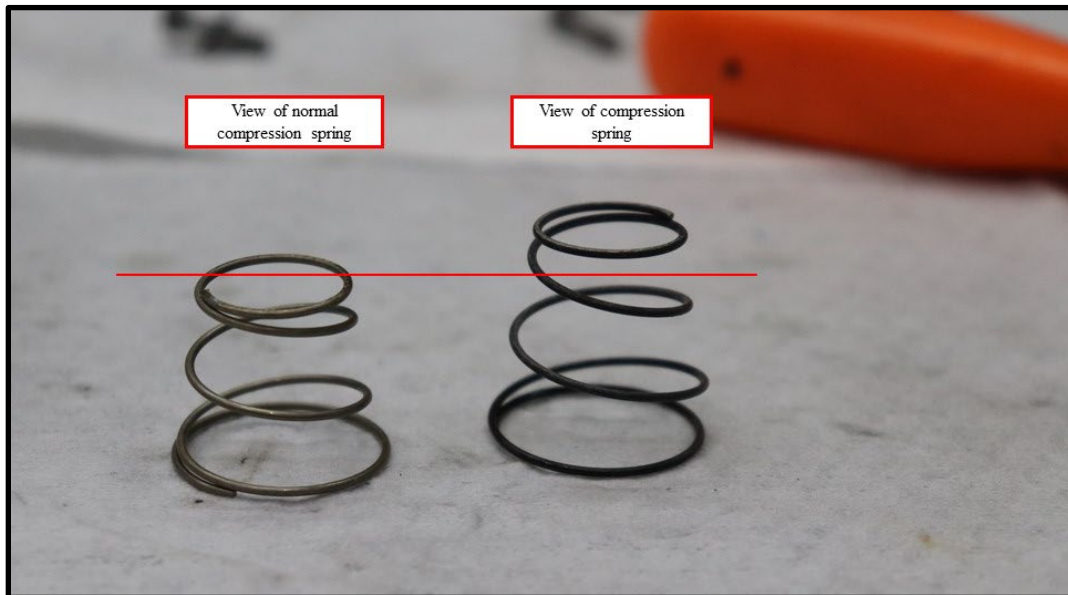
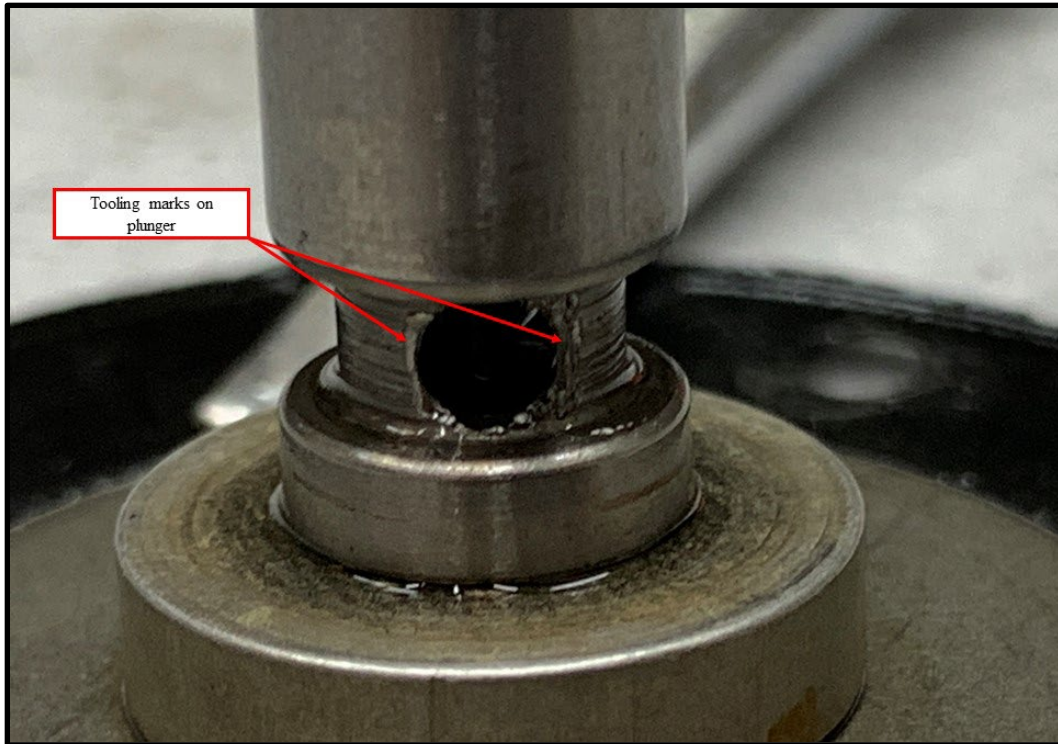
The throttle body was connected to a test stand and performed within manufactures specifications when tested. Fuel leaking near the throttle and mixture lever was observed consistent with impact damage.



3.0 Fuel Flow Manifold Valve Examination

Examination of the recovered fuel flow manifold valve was intact and undamaged. The fuel flow manifold valve was connected to a test stand, the valve failed to open when fuel pressure was applied. The fuel flow manifold valve was disassembled, tooling marks were observed on the plunger, the seal near the plunger was deformed and not seated flat on the manifold body. The diaphragm spring was longer when compared to a normal spring, consistent with stretching. The plunger assembly and diaphragm were substituted in the fuel flow manifold valve. The fuel flow manifold valve was reattached to the test stand and performed within manufactures specifications when tested. The tooling marks on the plunger are consistent with binding of the plunger preventing normal operation.





4.0 Fuel Injectors Nozzles Examination

All six fuel injector nozzles were connected to a test stand and performed within manufactures specifications when tested.

Submitted by: Eric M. Gutierrez