

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR22LA243

FUEL SYSTEM EXAMINATION

July 14, 2022

A. ACCIDENT

Location: Oxnard, California
Date: July 10, 2022
Airplane: Mooney M20C; N6416U

B. FUEL SYSTEM EXAMINATION

IIC Elliott Simpson
Senior Aviation Accident Investigator
National Transportation Safety Board

1.0 Examination

Both fuel caps were firmly in place, and there was no evidence on the airframe or wings of staining or streaks consistent with an inflight fuel leak. Both fuel tanks were empty, the underside of the right tank was breached by impact damage (figure 1), and the left tank appeared intact but was empty.

Within the engine compartment and wing root/footwell area, there was no evidence of fuel leakage or line breach, and all fuel lines were intact and tight at their respective fittings.

The carburetor fuel bowl was empty, along with the line from the engine driven fuel pump to the carburetor, or in the line from the fuel selector valve.

Photos taken right after the accident indicated that the fuel selector valve handle was pointing in the general direction of the right tank (figure 2).

The fuel selector handle could be moved between the detent positions but felt tight and a rasping action was felt. Once in the tank positions, the handle was loose, and no definitive locking action was noted. Further examination revealed that the handle was slipping on the selector shaft, which remained stationary. (See video attachment 1).

The fuel selector valve handle came off with ease and was held on with a single oversized stainless-steel screw, rather than the set screw and roll pin called out in Mooney drawings (figure 3).

A partial section of the roll pin was still present within the selector shaft but had not extended out into the barrel of the handle. The shaft was worn and exhibited

evidence of significant wear, along with witness signatures consistent with manual rotation, possibly with pliers (figure 4).

The outer section of the roll pin could not be located.

The dimple in the shaft that accepted the set screw was elongated and worn, and the stainless-steel screw did not extend into it (figure 5, 6).

The selector valve was removed, and one of its four case screws while not loose, was installed about 5 mm short of its full travel (figure 7).

The valve appeared to have been set to the left tank position, because air passed from the left tank inlet to the engine outlet port.

Disassembly of the valve confirmed that the left tank position was selected. There was no evidence of foreign object ingestion within the valve, and the detent ball was present, along with the drain valve ball and spring. There was no evidence of corrosion.



Figure 1 - Airplane after accident



Figure 2 - Fuel selector valve immediately after accident (courtesy of Oxnard Airport Ops).



Figure 3 - Fuel selector valve handle removed.



Figure 4 - Fuel selector valve shaft



Figure 5 - Fuel selector valve shaft



Figure 6 - Fuel selector valve handle



Figure 7 - Fuel selector valve removed with backed out screw.

Submitted by:

Elliott Simpson
Senior Aviation Accident Investigator