

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594



May 3, 2016

MATERIALS LABORATORY FACTUAL REPORT

Report No. 16-042

A. ACCIDENT INFORMATION

Place : Lake Elmo, Minnesota
Date : December 11, 2015
Vehicle : Globe GC1B, N78067
NTSB No. : CEN16LA061
Investigator : Joshua Lindberg, AS-CEN

B. COMPONENTS EXAMINED

Portion of a Marvel-Schebler MA-3SPA carburetor assembly with attached air intake housing.

C. DETAILS OF THE EXAMINATION

Overall views of the submitted components are shown in figure 1. The carburetor had a white data plate as shown in figure 2 with part number 10-2848 and serial number 3931808. No stamped "V" was present on the data plate that would have indicated that the two-piece venturi had been replaced with a one-piece venturi. According to Airworthiness Directive 98-01-06, Precision Airmotive Corporation (now Marvel-Schebler Aircraft Carburetors) MA-3SPA carburetors with a 2-piece venturi are to be inspected at each annual, 100-hour, or progressive inspection to determine if the primary venturi is loose or missing. The last inspection per AD 98-01-06 that occurred before the accident was reportedly accomplished on October 27, 2015.

The carburetor was received in the disassembled condition shown. The air intake housing was crushed, and the throttle body was fractured at the intake manifold attachment flange (see figure 3). The fracture in the throttle body extended around $\frac{3}{4}$ of the circumference, intersecting both holes for the throttle valve shaft. Fracture features had rough gray features consistent with overstress fracture of cast aluminum. One intake manifold attachment bolt was fractured and remained within the flange. Fracture features on the bolt had matte gray features consistent with ductile overstress fracture of the steel bolt.

Multiple pieces were missing from the carburetor assembly. The nozzle was not located in the nozzle installation hole in the fuel bowl piece (see figure 1), and the primary venturi portion of the two-piece venturi was missing. The main venturi portion of the two-piece venturi is indicated in figure 1. Gaskets associated with the nozzle and the gasket between the fuel bowl and the throttle body were also missing. The interior

of the crushed air intake housing was viewed through the various available ports, and none of the missing parts were found in the housing.

Closer views of the throttle body and main venturi are shown in figure 4. Sliding contact marks with a lip of material was observed at three locations on the throttle body adjacent to the main venturi, corresponding to contact with the three legs of the primary venturi. One of the sliding contact areas is shown magnified in figure 4.

Matthew R. Fox
Senior Materials Engineer

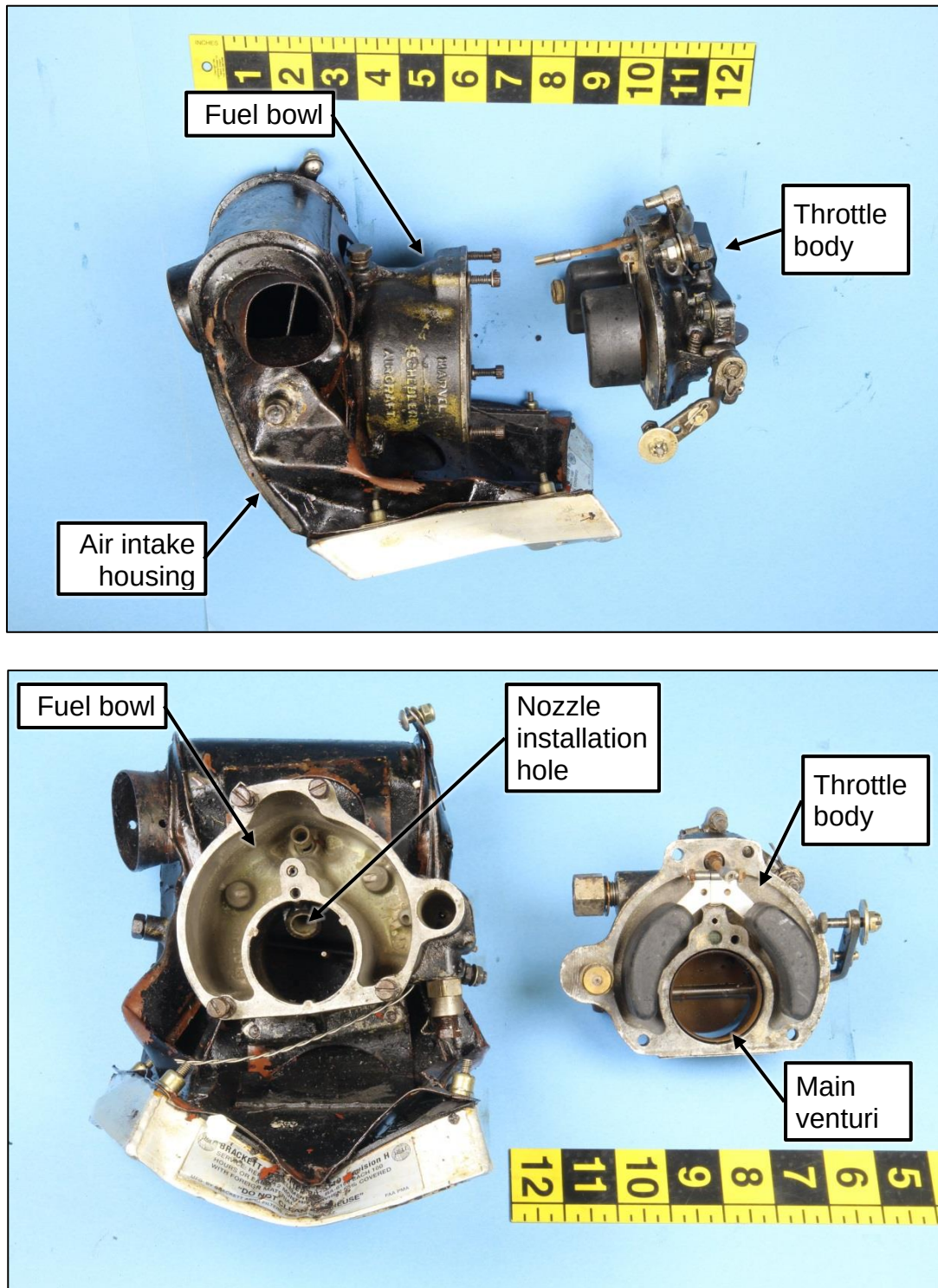


Figure 1. Overall views of the submitted components.



Figure 2. Carburetor data plate.

Figure 3. Throttle body showing the fracture in the throttle body housing.

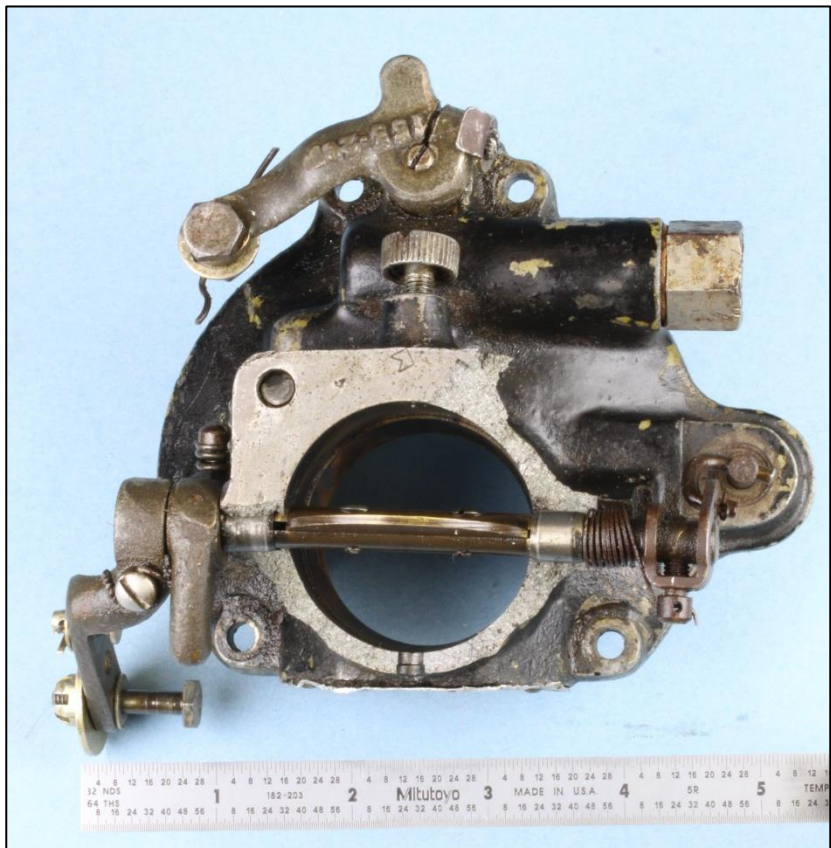




Figure 4. Contact mark in the area where legs of the primary venturi would contact the throttle body as assembled in the carburetor.