

National Transportation Safety Board

Office of Research and Engineering

Washington, DC 20594



ERA25LA062

MATERIALS LABORATORY

Factual Report 25-023

April 11, 2025

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A. ACCIDENT INFORMATION

Location: Ocean Isle Beach, North Carolina
Date: November 27, 2024
Vehicle: Alexander S Rolinski Bot Journey, N814B
Investigator: Todd Gunther

B. COMPONENTS EXAMINED

Carburetors from engine cylinders 1/3 and 2/4 from a Rotax 912 ULS engine (Figure 1)

C. EXAMINATION PARTICIPANTS

Group Chair	Joseph Panagiotou National Transportation Safety Board Washington, DC
Specialist	Edward Komarnicki National Transportation Safety Board Washington, DC

D. DETAILS OF THE EXAMINATION

The two carburetors submitted for examination were manufactured by Bing. The carburetor for engine cylinders 1/3 was model number 64/32/421A with serial number 052979. This carburetor was said to have been functioning properly and was submitted as an exemplar. The carburetor for engine cylinders 2/4 was model number 64/32/422A with serial number 053164.

Carburetor 2/4 exhibited a stuck carburetor piston (Figure 2). The piston was in the down position and seized in place. Finger pressure in the upward direction would not move the piston up. On carburetor 1/3 slight upward finger pressure would move the piston up to its fully raised position.

The screws securing the chamber top of the 2/4 carburetor were removed. The chamber top was separated from the lower portion of the chamber and the piston and diaphragm came out with it (Figure 3). The piston remained fixed in place relative to the chamber top.

Examination of the lower portion of the chamber and in particular the bore within which the piston would slide did not reveal any substantial varnish or other material that may have impeded the free movement of the piston (Figure 4). The piston bore did not exhibit any wear indicative of binding with the piston.

Examination of the cylindrical piston body (Figures 3, 5) revealed small amounts of varnish on the surface that were smooth and not sticky or built up. The cylindrical piston body did not exhibit any scratches or gouges that would impede its translation through the bore in the lower chamber. The rubber diaphragm was intact, pliable and did not exhibit any tears. The rubber diaphragm was separated from the chamber top and folded away to reveal the inside of the chamber top (Figure 6). Small specks of a greenish material were observed on the top side of the rubber diaphragm and diaphragm retaining ring.

The piston was separated from the chamber top by pulling the piston and twisting it in relation to the chamber top. Once separated (Figure 7) a greenish material was observed on the inside of the recess of the top chamber where the piston shank would recede into and extend from during operation (Figure 8). The piston shank also exhibited a similar greenish material.

A sample of the greenish material was collected from the chamber top for compositional analysis using energy dispersive X-ray spectroscopy (EDS). The resulting spectra is shown in figure 9.

The float bowl of the 2/4 carburetor was disassembled and the interior was examined (Figure 10). No evidence of debris or greenish material as observed in the chamber top was found.

The float bowl for the 1/3 carburetor was also examined and it presented similar to the bowl for carburetor 2/4. Additionally, the piston and chamber top for the 1/3 carburetor were examined and did not contain a greenish or otherwise colored material on the surfaces.

Submitted by:

Joseph Panagiotou
Fire Protection Engineer

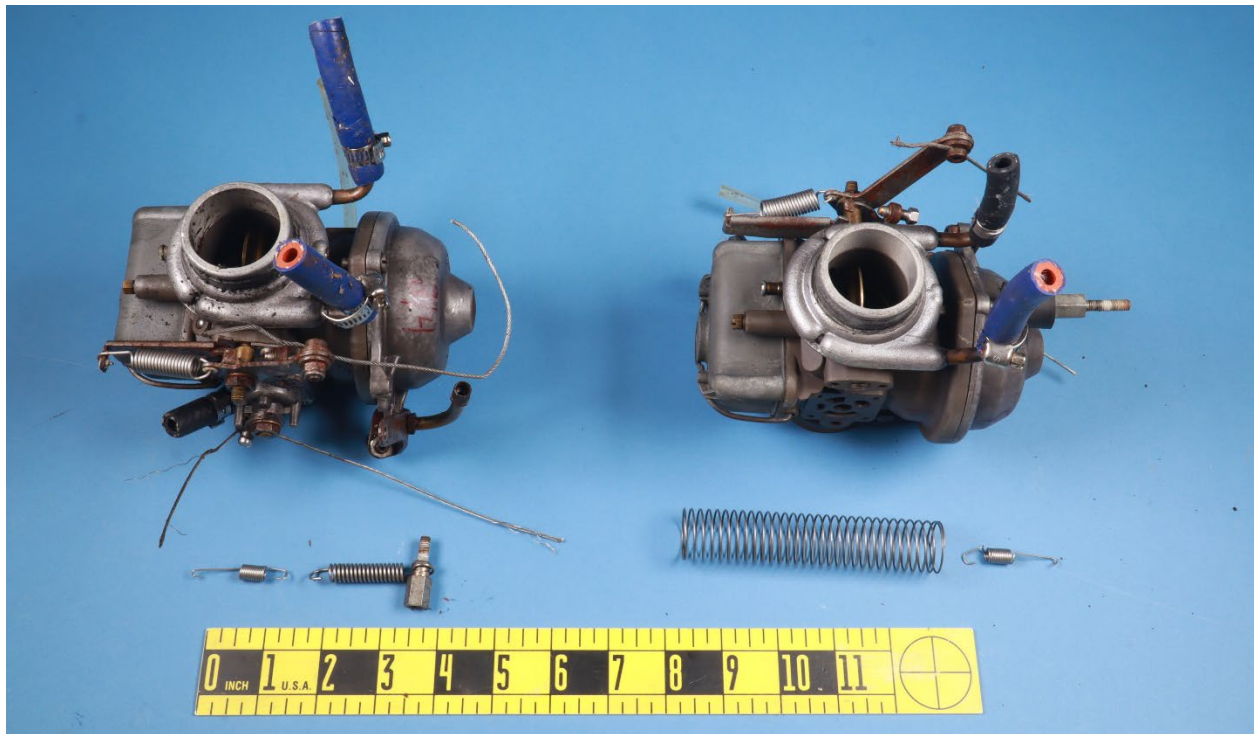


Figure 1. Carburetors as received. Carburetor 1/3 on the right and carburetor 2/4 on the left.

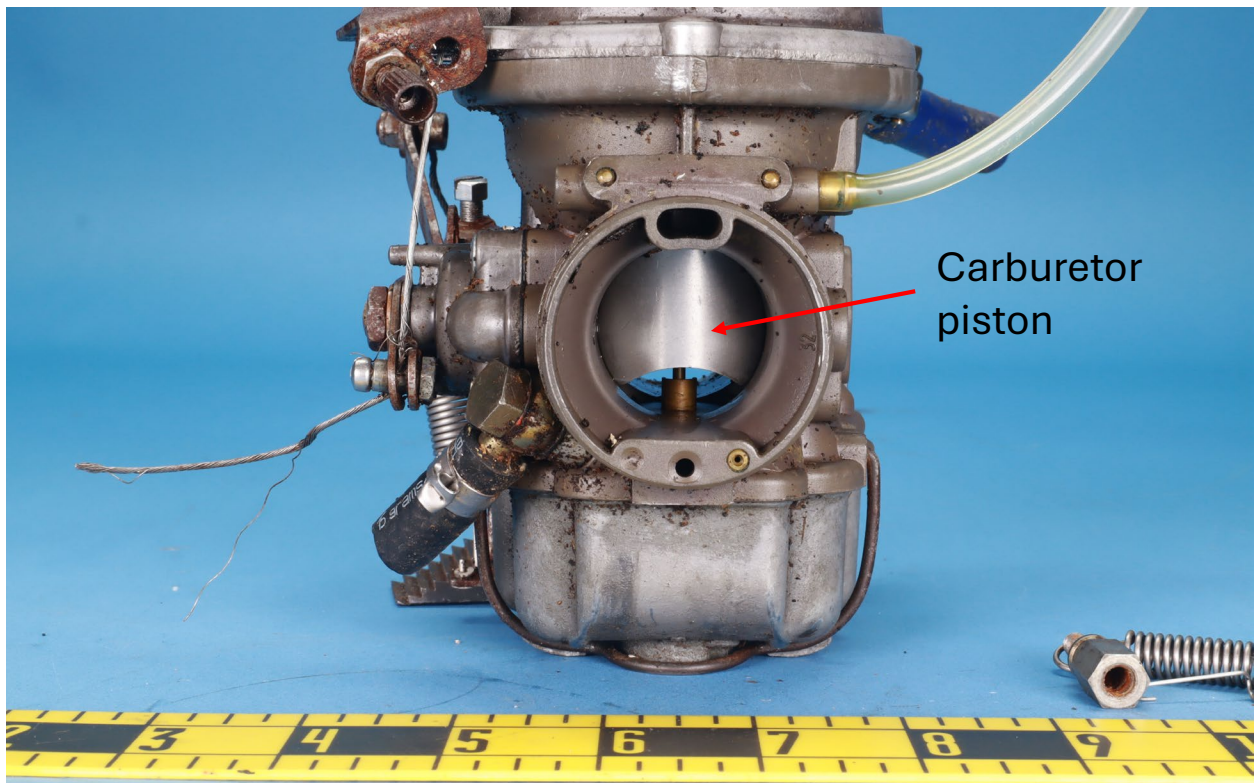


Figure 2. Carburetor 2/4 with the piston stuck in the down position.



Figure 3. Carburetor 2/4 chamber top with piston and rubber diaphragm.

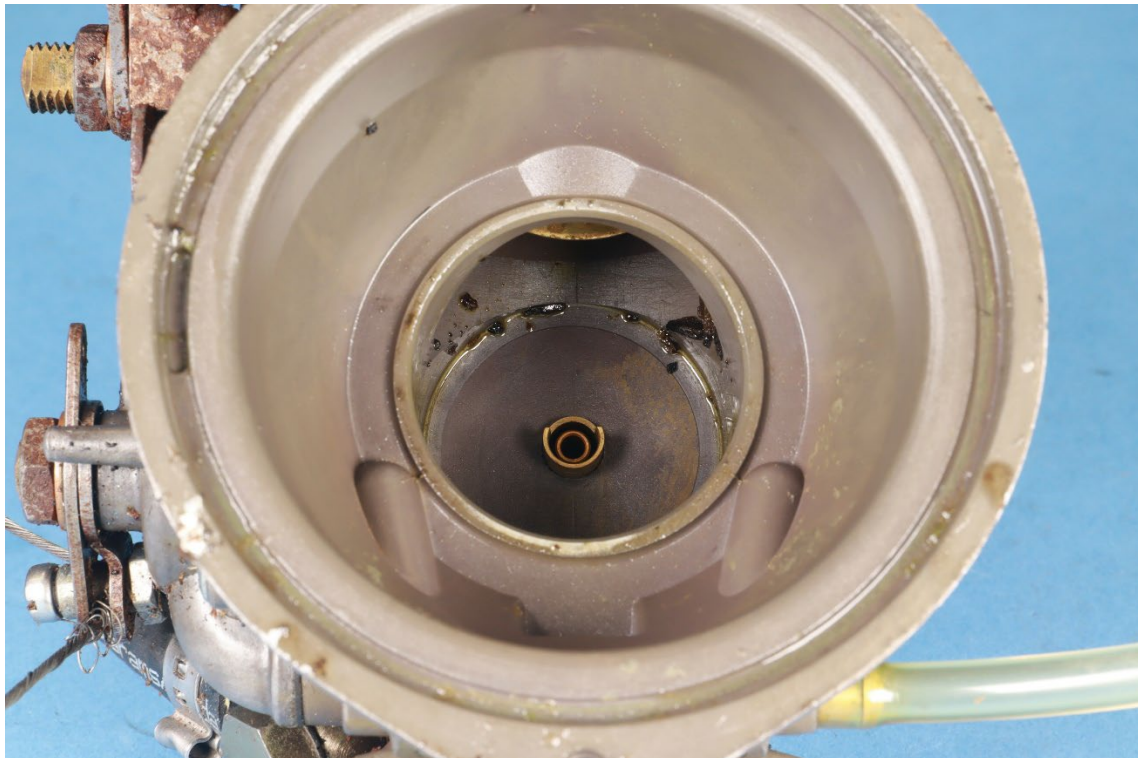


Figure 4. Carburetor 2/4 lower portion of the chamber.



Figure 5. Carburetor 2/4 chamber top with piston and rubber diaphragm.

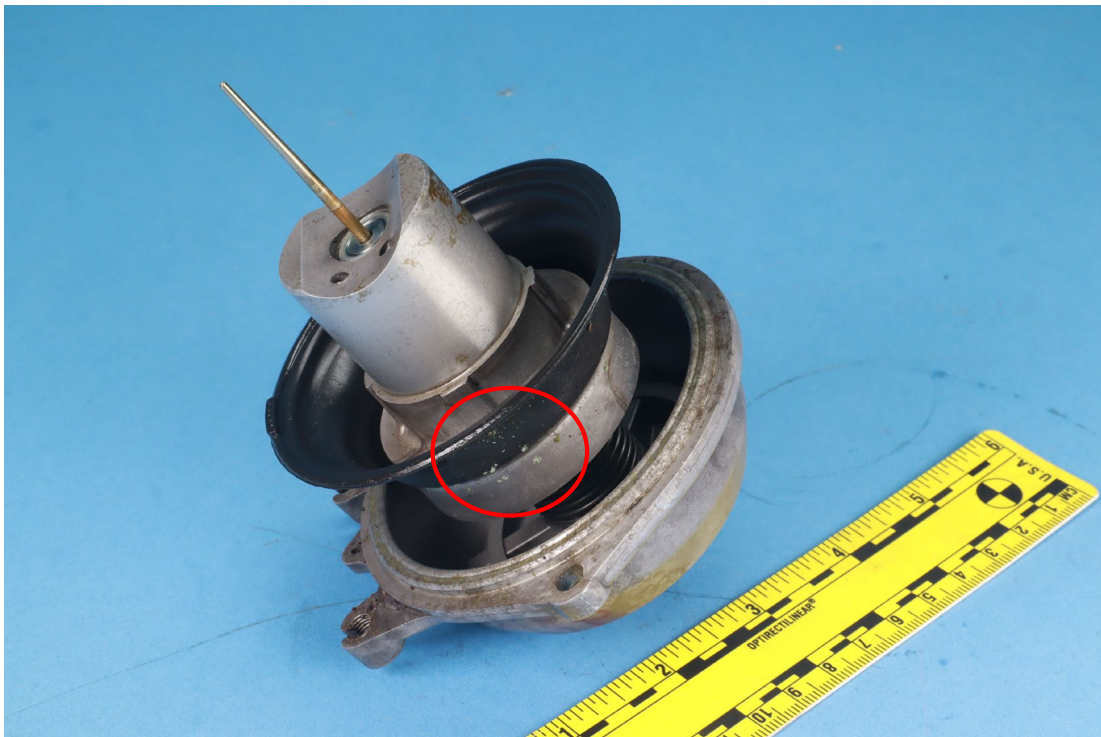


Figure 6. Carburetor 2/4 rubber diaphragm folded away from the chamber top. The area in the red circle contains some greenish particles.



Figure 7. Carburetor 2/4 with the piston separated from the chamber top.



Figure 8. Recess in the chamber top where the piston shank would be contained.

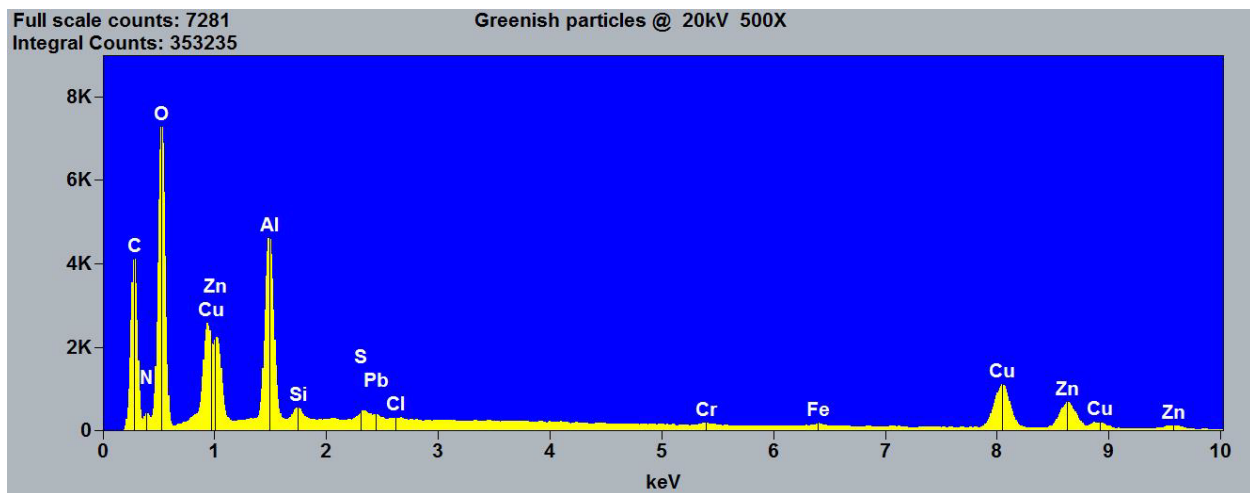


Figure 9. EDS spectra from greenish material.



Figure 10. Interior of carburetor 2/4 float bowl.