NATIONAL TRANSPORTATION SAFETY BOARD
Office of Aviation Safety-Eastern Region
Ashburn, Virginia 20147
November 6, 2015

CARBURETOR EXAMINATION FIELD NOTES

A. ACCIDENT:

Location: Morrisville, New York
Date: September 20, 2015
Time: 1251 EDT
Aircraft: N22721, Cessna 150H

B. COMPONENT GROUP:

Chairman: Timothy W. Monville
National Transportation Safety Board (NTSB)
Senior Air Safety Investigator, Office of Aviation Safety
Ashburn, Virginia

C. SUMMARY

On September 20, 2015, about 1251 eastern daylight time, a Cessna 150H, N22721, registered to and operated by Bargabos Earthworks, Inc., dba Eagle View Flight, experienced a loss of control in-flight and collided with trees then terrain near Morrisville, New York. Visual meteorological conditions prevailed at the time and no flight plan was filed for the 14 Code of Federal Regulations (CFR) Part 91 personal, local, flight from Hamilton Municipal Airport (VGC), Hamilton, New York. The airplane was destroyed by impact forces and the private pilot and one passenger were fatally injured. The flight originated from VGC about 1217.

D. DETAILS OF THE INVESTIGATION

Following recovery of the airplane, the engine was inspected by the NTSB investigator-in-charge (NTSB-IIC), and during that inspection, the carburetor was retained for further examination. The carburetor was shipped on September 30, 2015, via UPS airbill

1ZA3978T0390789280 to the NTSB-IIC and was delivered on October 6, 2015.

On October 22, 2015, the NTSB-IIC travelled with the carburetor to AVStar Fuel Systems, Inc., located in Jupiter, Florida, (Figure 1).

The carburetor was identified by its red colored data plate as model MA-3SPA, Manufacture Part Number 10-4894-1, Code Number KA C 12110, Manufacturer Serial Number BE 14 9909, marked with "MF", "V", and "92" (Figure 2). Visual external inspection revealed one body to bowl screw was broken from the bowl to the right of the data plate (Figure 3), and the Pump Discharge Check Valve Assembly was separated (Figure 4). The stop was broken off of the mixture control lever and an impact mark was noted on the boss of the throttle body adjacent to the "R" mark stamped in the carburetor bowl assembly (Figure 5). An impact mark was noted on the Pump Screen Housing (Figure 6). The carburetor bowl assembly was cracked on the back side of the bowl adjacent to the boss of the "L" and "R" marks stamped in the bowl assembly (Figure 7). Additionally, the throttle body assembly was not aligned with the carburetor bowl assembly (Figure 8). The mixture control valve and mixture control lever were bent, but the mixture control lever remained attached to the mixture control valve by the remaining section of mixture lever screw and mixture control shaft lock wire (Figure 9). The fuel inlet fitting was noted to have remains of anti-slippage material. The inlet strainer was removed and found to be clean (Figure 10).

In preparation for bench testing, a different inlet fitting was installed. In addition, it was noted the float would not move with movement of the carburetor. The carburetor was placed on the test bench as received (Figure 11), and with 6 psi applied at the inlet, leakage was noted at the parting surfaces of the throttle body and bowl assemblies, and from the missing pump discharge check valve assembly (Figure 12). The carburetor was removed from the test bench for disassembly.

The throttle valve did not move freely, but the pump plunger remained connected to the throttle shaft (Figure 13). After separation of the pump plunger from the throttle shaft, the throttle valve was noted to move freely. Inspection of the body to bowl screws was performed which revealed all 4 had 4 of the tabs of the body to bowl screw washer against a flat of the body to bowl screw. A tightening torque check was performed on 2 of the 4 body to bowl screws; the 3rd body to bowl screw to the right of the data plate exhibited missing screw boss, and the 4th body to bowl screw adjacent to the "L" was noted to be sheared at the parting surface of the carburetor bowl assembly. The remaining 2 body to bowl screws were found to move 30 inch pounds less than the minimum value specified. The carburetor bowl and throttle body assemblies were separated, and the outboard sides of both pontoons of the float were noted to be crushed in (Figure 14). The interior of the carburetor bowl assembly was clean, and the distance between the bowl gasket and the tip of each float pontoon was within limits. Further inspection of the carburetor bowl interior and the bottom of each pontoon of the float revealed no evidence of contact by either pontoon or the stud bosses. Additionally, there was no evidence of contact with the either pontoon and the sides of the carburetor bowl. The pump plunger was noted to be bent (Figure 15).

Further inspection of the float revealed that the pontoon of the throttle side was shifted away from the inner wall of the carburetor bowl assembly (Figure 16). Inspection of the wear dimple at the float revealed it was within limits. The float which weighed 0.8 ounce, was subjected to a hot submergence test and no bubbles were noted coming from either pontoon. The float was weighed after the submergence test and again weighed 0.8 ounce. Normal wear of the seat material of the needle valve was noted (Figure 17). Inspection of the seat of the needle valve and seat and interior portion of the carburetor bowl assembly adjacent to the seat revealed slight impact damage to both components (Figures 18 and 19). A tightening torque check was performed of the seat, and it was noted to move at 70 inch pounds less than the minimum specified value. No fuel stains were noted on the carburetor bowl, and the aluminum float valve seat gasket exhibited equal crushing along its circumference (Figure 20). The main nozzle was noted to be impact damaged (Figure 21), and 2 of the 6 tabs of the nozzle tab gasket were not touching the flats of the main nozzle. A tightening torque check was done of the main nozzle and it was noted to move at 5 inch pounds less than the minimum specified value. Following removal of the main nozzle, the nozzle tab gasket was inspected and found to exhibit equal crushing along its circumference (Figure 22). A one-piece venturi was installed. The main nozzle was air checked (Figure 23) and found to be within limits.

PARTS DISTRIBUTION

At the completion of the inspection, the carburetor was retained by NTSB and will be returned to the insurance adjuster.

Figure 1: Carburetor As First Viewed

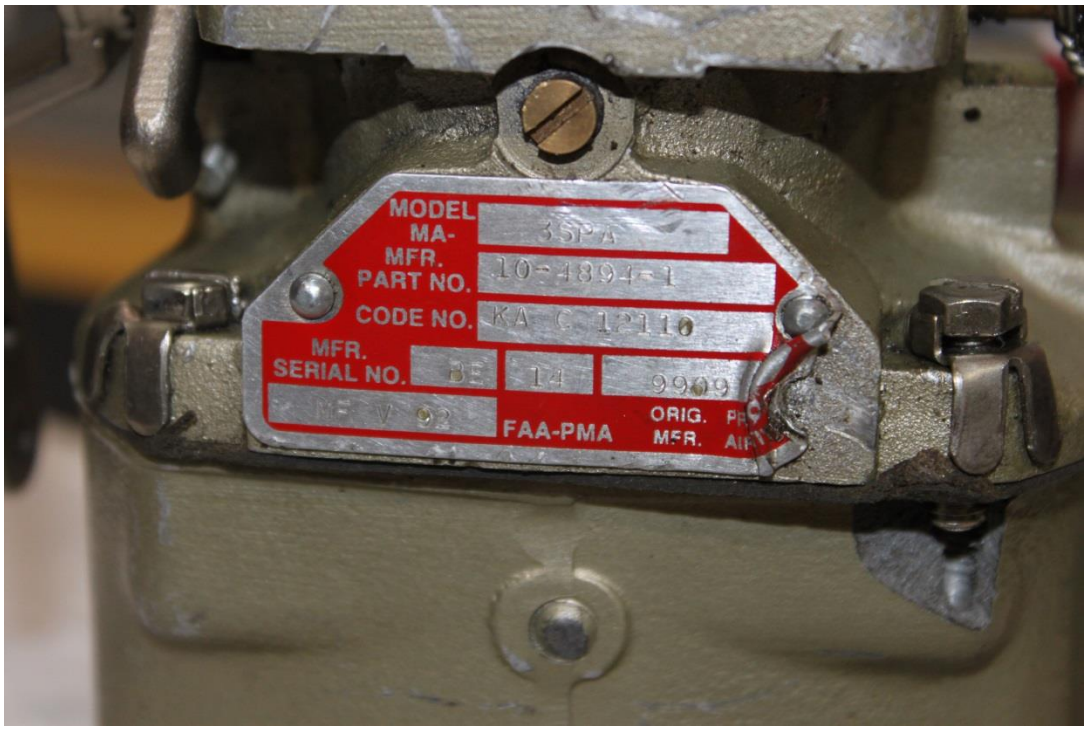

Figure 2: Data Plate of Carburetor

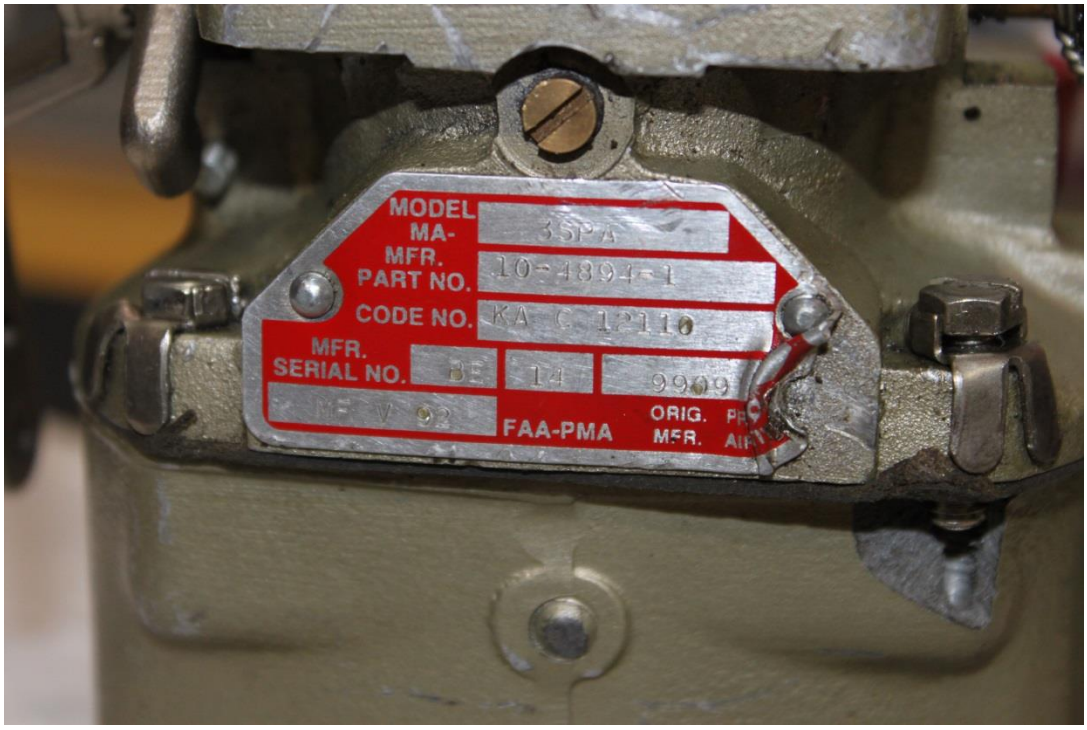

Figure 3: Data Plate and Bowl Damage Adjacent to Body to Bowl Screw

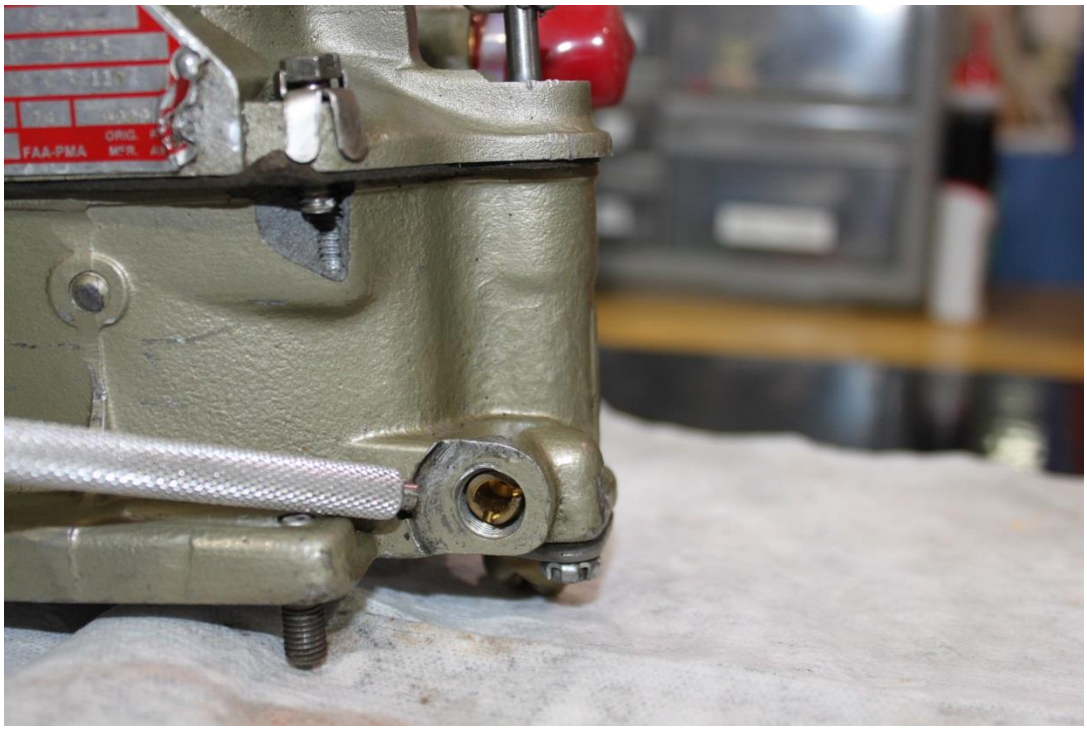
Figure 4: Missing Pump Discharge Check Valve Assembly

Figure 5: Impact Mark on Boss of Throttle Body Assembly Adjacent to “R” Mark

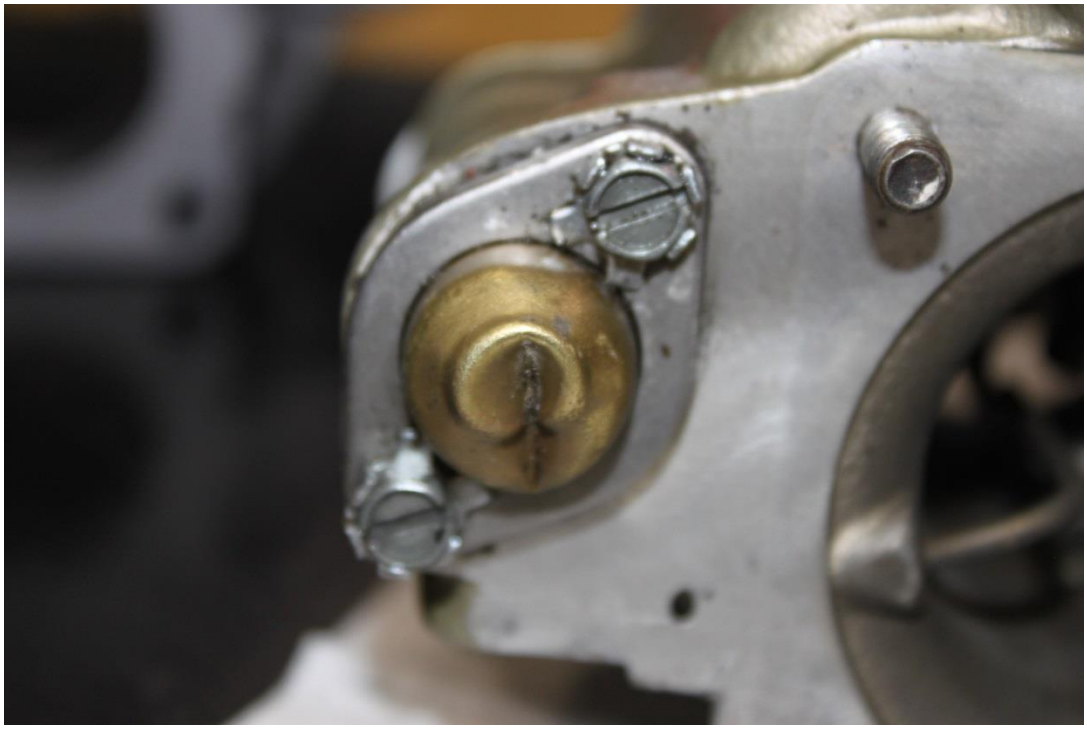
Figure 6: Impact Mark on Pump Screen Housing

Figure 7: Crack in Carburetor Bowl Assembly

Figure 8: Misalignment of the Throttle Body and Carburetor Bowl Assemblies

Figure 9: Bent Mixture Control Valve and Mixture Control Lever Assembly.

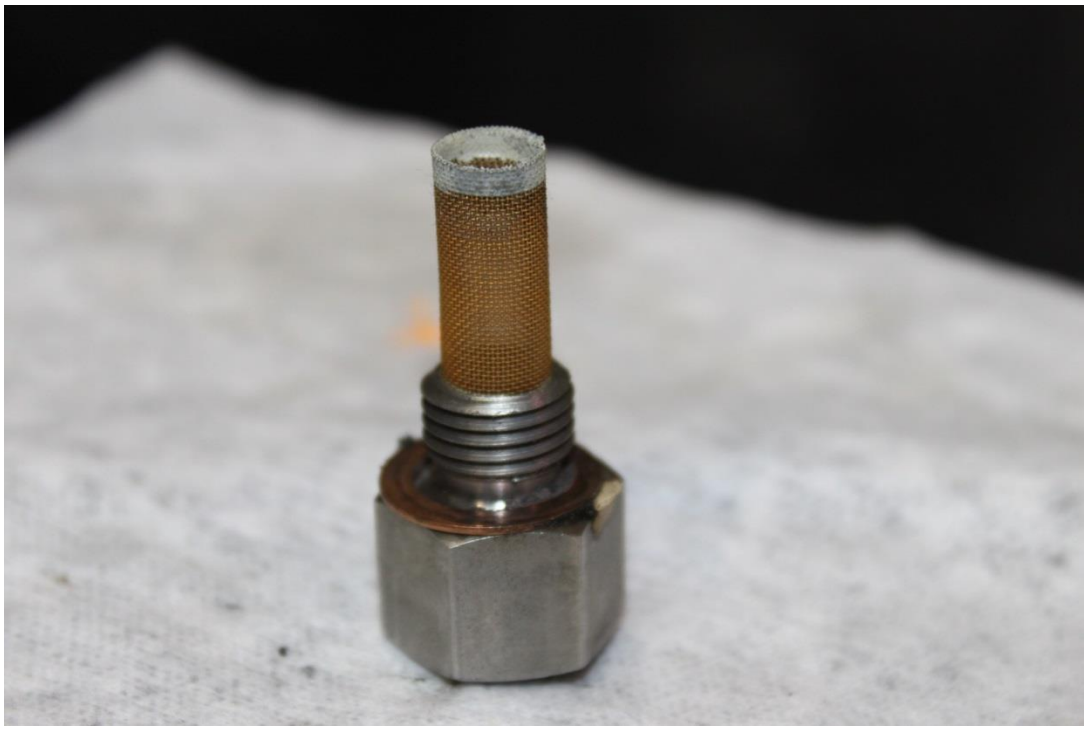

Figure 10: Fuel Inlet Strainer

Figure 11: Carburetor Before Bench Testing

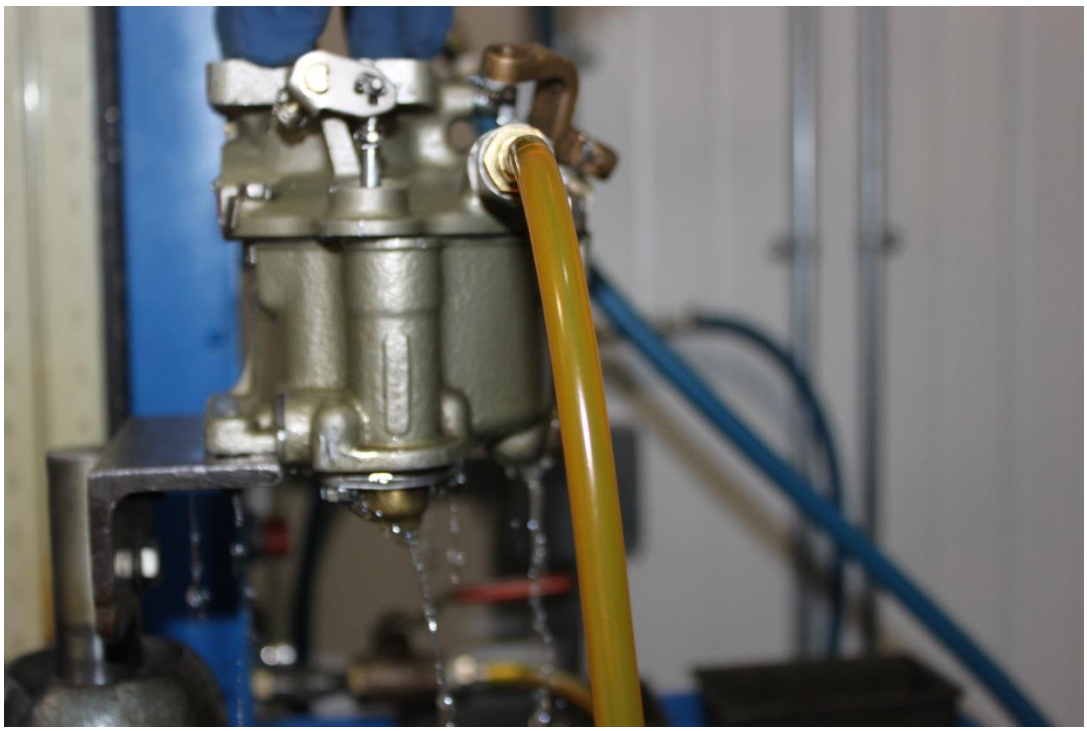

Figure 12: Leakage During Bench Testing

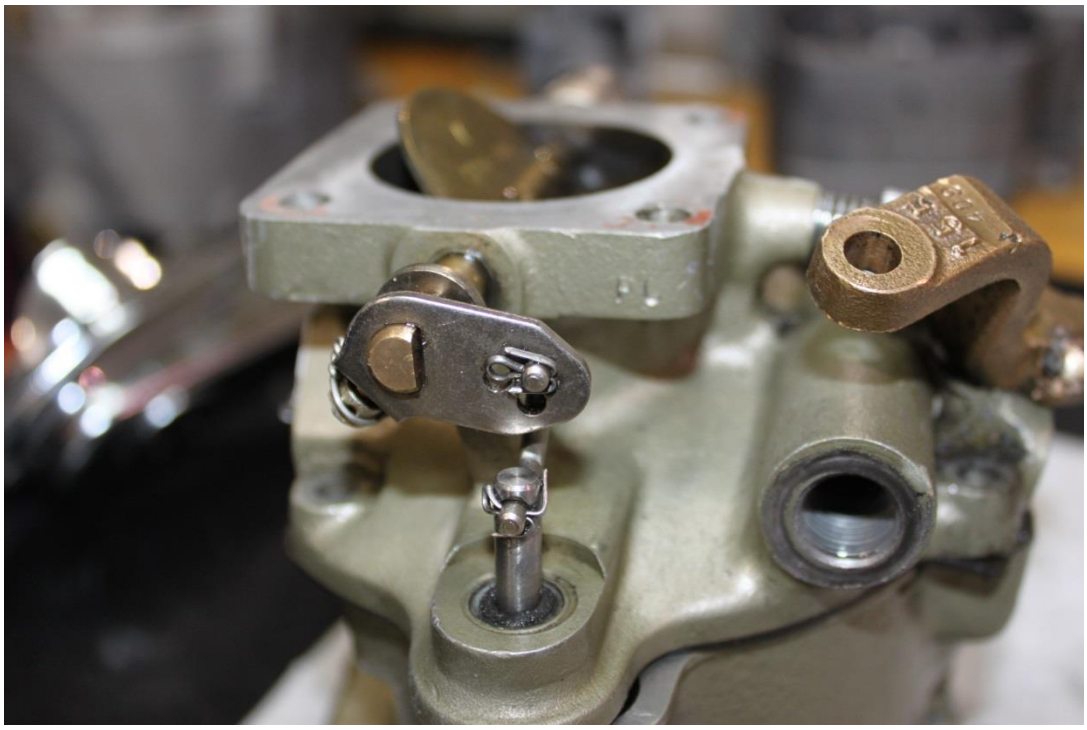

Figure 13: Pump Plunger Connected to Throttle Shaft

Figure 14: Inward Crush Damage to One of the Pontoons of the Float

Figure 15: Bent Pump Plunger

Figure 16: Displaced Pontoon of Float with Cutaway Test Carburetor Bowl Installed

Figure 17: Needle Valve

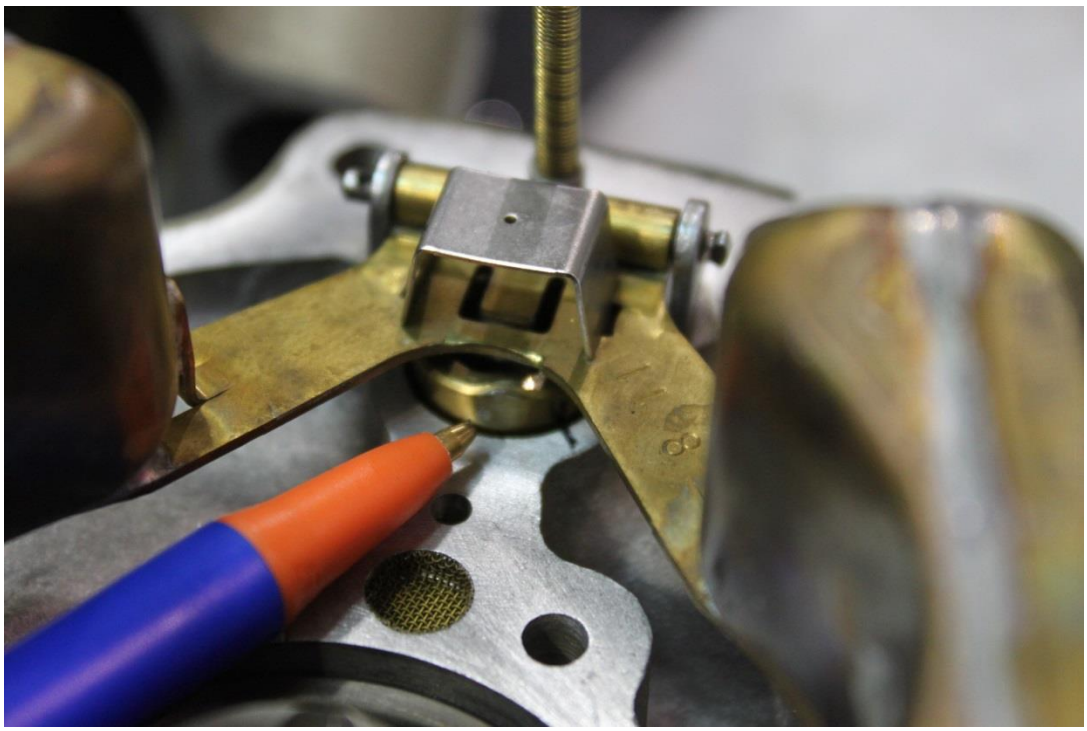

Figure 18: Impact damage to Seat of Needle Valve and Seat

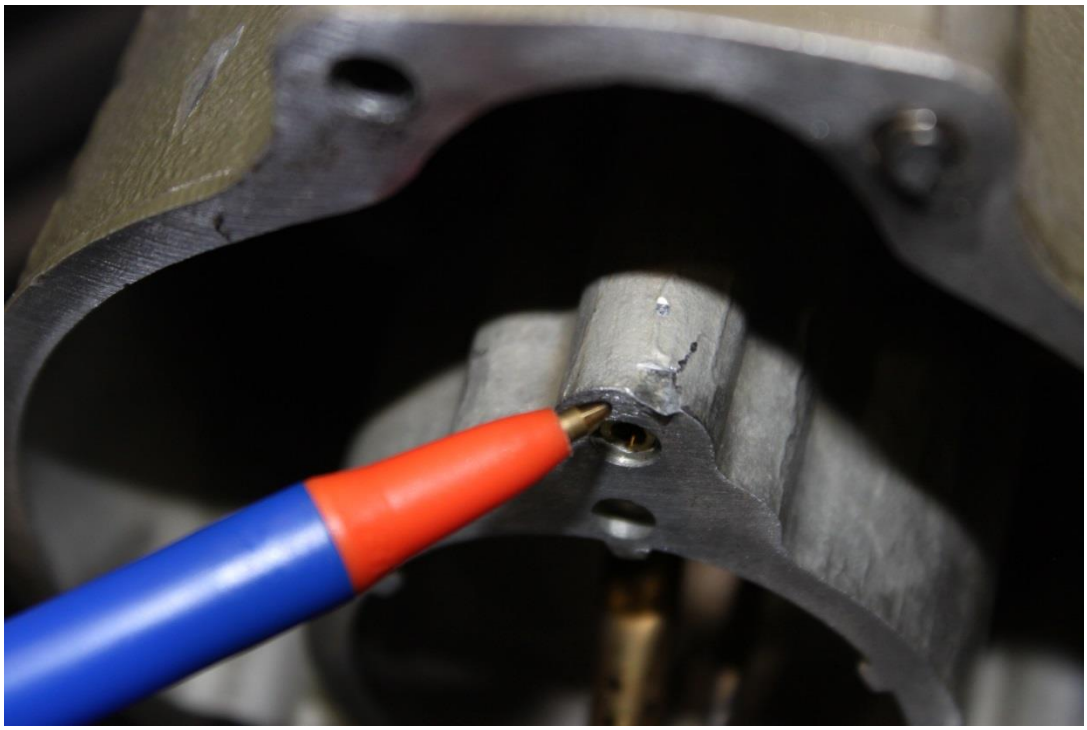

Figure 19: Impact damage to Interior of Carburetor Bowl Assembly

Figure 20: Float Valve Seat Gasket

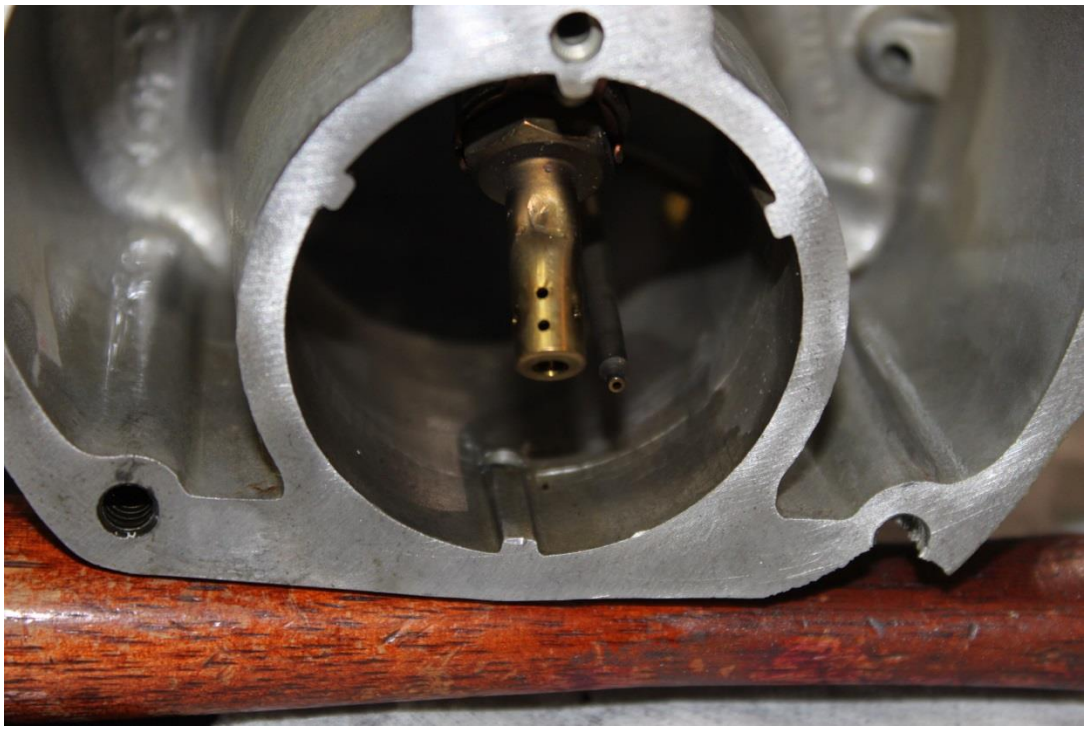

Figure 21: Impact damaged Main Nozzle

Figure 22: Nozzle Tab Gasket

Figure 23: Air Check of the Main Nozzle