

Log 1793 Sp. 26



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

Date: February 11, 1986

In reply refer to: A-86-06

Honorable Donald D. Engen  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

On November 25, 1984, a Beechcraft Baron Model B55 airplane, N4308W, en route from Gainesville, Florida, to Roanoke, Virginia, sustained a complete loss of left engine power during cruise flight. However, the pilot was able to restart the engine in the air, and he maintained power by positioning the electric fuel pump to the low boost position. The pilot continued the flight to Roanoke without further difficulty.

An inspection of the airplane's fuel system following the incident, including an examination of the interior of the fuel bladder cells, disclosed that the sponge-material cores used in the fuel reservoir (anti-slosh) tanks had disintegrated. As a result, substantial amounts of the sponge core particulate matter (described as similar to coffee grounds or fine tobacco) entered and contaminated the fuel system. This material was entrapped by the screens in the main fuel filters, but as it accumulated it restricted the fuel flow and eventually caused the engine to quit. The pilot's use of the electric fuel pump enabled him to restart the engine and maintain power because the additional pressure from the pump forced fuel through the restricted filter.

In April 1985, the pilot of a Beechcraft Baron Model B-55 airplane, N29950, experienced periods of engine roughness which apparently also stemmed from similar contamination of the fuel system. The Service Difficulty Report filed in connection with the incident indicated that:

Pilot left Texas and experienced a rough engine. After landing at his home base in Alabama, the fuel system was flushed finding large quantities of red matter. Pilot departed home base and after one hour of flight, experienced a rough engine. Aircraft landed at LFT Jet, Inc. Upon investigation, found matter in finger screens, main screens and thimble screens. The matter came from the foam baffling in both reservoir tanks which were completely deteriorated.

These fuel contamination incidents prompted the Beech Aircraft Corporation (Beech) to issue a Beechcraft Safety Communique on April 11, 1985, regarding deterioration of the sponge-filled fuel reservoir tanks. The communique, sent to Beechcraft wholesalers, aviation centers, aero centers, international distributors and dealers, and aircraft owners, is applicable to Beech series 33, 35, 36, 55, 58, and 95-67 airplanes. To prevent fuel system contamination and avoid any subsequent loss-of-power problems due to such deterioration, Beech recommended the following remedial action:

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1. Within the next twenty-five (25) hours of operation remove the main fuel filter(s) and check for a brown sponge material. If no sponge material is evident then reassemble the fuel filter using new gaskets. The fuel filters should be rechecked every fifty (50) hours of operation until the improved (see below) sponge material is installed.
  - a. The Baron main fuel filters are located in each landing gear wheel well on the wing forward spar web.
  - b. The Bonanza main fuel filter is located below the fuel selector valve. Access is through the small hinged door on the lower L.H. side (belly) of the aircraft.
2. If deteriorated sponge is evident in the fuel filter then the following action should be taken:
  - a. Defuel the aircraft.
  - b. Remove the access panels at the upper inboard end of the main fuel cells.
  - c. Remove the fuel cell outlet strainers. Exercise caution when removing the outlet strainers as the screen on the strainer may become entangled in the foam material in the reservoir.
  - d. Compress the fuel reservoir and remove through the main fuel cell inboard access hole.
  - e. Remove the flapper check valve from the reservoir.
  - f. Remove the deteriorated sponge material from the reservoir tank and flush out the tank.
  - g. Install a new sponge material, P/N FCD 57203-1 L.H. and FCD 57203-2 R.H. in the reservoir tanks. The sponge should be compressed and inserted through the flapper valve hole in the reservoir tank. The sponge must be positioned throughout the tank to insure proper tank support. The two cutouts in the sponge must align with the two holes in the reservoir tank for the fuel cell outlet strainer and flapper check valve.
  - h. Reinstall the flapper check valve. Insure proper operation of the check valve and total clearance from the sponge material.
  - i. Reinstall the reservoir tanks in the main fuel cells.
  - j. Insure proper operation of the flapper check valve.
  - k. Clean the fuel screens in the fuel control unit and the distributor valve. Clean the injector nozzles and flush out all fuel lines and selector valve(s).
  - l. Install new gaskets in all components when reassembled.

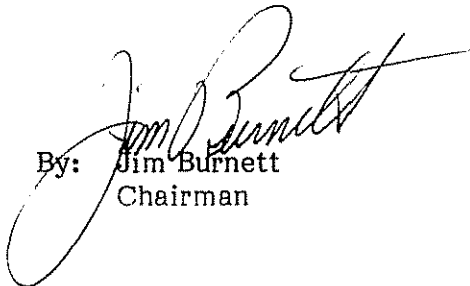
3. If the sponge material is found deteriorated and is replaced as instructed then the fifty (50) hour check of the main fuel filter will not be necessary.

In consideration of the potential hazards of fuel system contamination involving such a wide range of airplanes and the relative ease of preventing related occurrences of engine power loss, the Safety Board believes that the remedial action outlined in this safety communique should be made mandatory.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive applicable to Beech series 33, 35, 36, 55, 58, and 95-67 airplanes requiring: (a) compliance with the remedial action outlined in *Beechcraft Safety Communique* dated April 11, 1985, to prevent fuel system contamination due to deteriorated sponge-filled fuel reservoir tanks, and (b) installation of the improved fuel reservoir sponge-material core currently under development by Beech as soon as it becomes available. (Class II, Priority Action) (A-86-06)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, Member, concurred in this recommendation.

By:   
Jim Burnett  
Chairman