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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: January 24, 1992

In reply refer to: A-92-5

Honorable Barry L. Harris
Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

On September 21, 1991, a Cessna Model 172P, N65729, sustained a loss of engine power shortly after takeoff from the Dupage County Airport, West Chicago, Illinois. The pilot attempted to execute an emergency landing in an industrial park near the airport. However, he and a passenger were killed and the airplane was destroyed after it struck a light pole and a semi-trailer in a parking lot. The airplane was powered by a Textron-Lycoming O-320-H2J engine that had accumulated a total time-in-service of 3,686 hours and had been operated for 1,629 hours since major overhaul.

The National Transportation Safety Board's investigation of the accident disclosed that the engine power loss resulted from a carburetor mechanical failure. The carburetor primary venturi, normally held in place by retaining clips, had separated from the carburetor. The venturi was ingested into the engine intake manifold and became lodged between the number 2 cylinder intake valve and the valve seat. The carburetor was a Marvel-Schebler Model MA-4SPA equipped with the older two-piece venturi system, consisting of a separate primary and main venturi.

The two-piece venturi used on this and other Marvel-Schebler carburetor models has had a history of service difficulties. They primarily involve the dislodgement of the primary venturi. If the primary venturi separates from the main body of the carburetor, a loss of power or engine roughness might occur since the venturi can block the mixing chamber/throttle bore or nozzle outlet, lodge against the throttle valve, or it can be ingested into the engine intake manifold/cylinder assembly. Therefore, in 1963, the Federal Aviation Administration (FAA) issued Airworthiness Directive (AD) 63-22-03 applicable to all Marvel-Schebler Model MA4-5 carburetors not having a one-piece combination primary and main venturi. The AD stated, "The primary venturi may become loose resulting in wear of the primary venturi support legs on the ends contacting the carburetor body and at the retaining clip area. As a result, the retaining clips may become dislodged or dislocated and wear may progress to the point that the venturi becomes dislodged or dislocated. This can cause erratic engine operation or complete

engine stoppage." In order to preclude such an occurrence, the AD required the installation of a one-piece combination primary and main venturi at the next carburetor removal, or overhaul of either the carburetor or engine, whichever occurred first. However, no similar action was taken to require a one-piece venturi in other Marvel-Schebler carburetor models.

On March 8, 1985, because of accidents involving similar problems with two-piece venturis, the Safety Board issued Safety Recommendation A-85-24 which recommended that the FAA require the manufacturer to design a replacement one-piece combination primary and main venturi casting for the Model MA-4SPA and certain other Marvel-Schebler carburetors. A one-piece venturi for these carburetors was subsequently developed and in 1988 the recommendation was classified as "Closed-Acceptable Action." The Safety Board also recommended, in Safety Recommendation A-85-25, that the FAA issue an AD to replace the two-piece venturis in these carburetors. However, on December 3, 1987, the FAA advised the Safety Board that it did not plan to issue an AD at that time but that it would monitor the situation to ensure that the problem with these carburetors did not recur. As a result, the Safety Board classified Safety Recommendation A-85-25 as "Closed-Unacceptable Action."

Both the Precision Airmotive Corporation and the Facet Aerospace Products Company, the current and previous manufacturers of the carburetors, respectively, have issued service bulletins providing for the replacement of the two-piece venturi with a one-piece combination primary and main venturi casting. Service Bulletin No. MSA-2, "One Piece Primary and Main Venturi," originally issued by PAC on October 15, 1990, is classified as mandatory and applies to all MA-3A, MA-3PA, MA-3SPA, and MA-4SPA Marvel-Schebler and Facet Aerospace carburetors. In a letter to the Federal Aviation Administration (FAA) dated October 29, 1991, the Precision Airmotive Corporation requested that an airworthiness directive (AD) be issued to mandate compliance with the service bulletin, stating that "the old style two-piece venturis used in earlier carburetors constitute a significant safety of flight problem and must be removed from service." In December 1991, the bulletin was revised to indicate that the one-piece combination venturi castings should be installed immediately.

When Safety Recommendation A-85-25 was issued, the Safety Board was aware of 26 Service Difficulty Reports, seven accidents, and one incident involving loose or missing two-piece venturis. Since that time, two additional accidents (including the accident at West Chicago, Illinois) and four incidents have occurred because of similar problems.

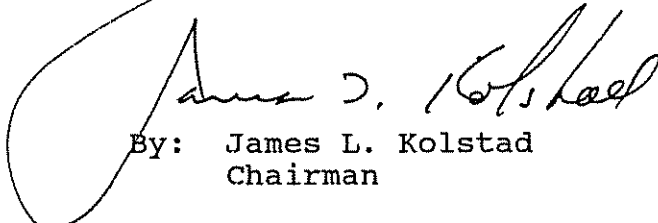
The Safety Board concurs with the remedial action taken by the FAA in 1963 in connection with Marvel-Schebler MA4-5 carburetors. However, it is clear that the problems with separated/dislodged

primary venturis identified in Marvel-Schebler MA-3A, MA-3PA, MA-3SPA, and MA-4SPA carburetors are similar to those referred to in AD 63-22-03, as previously stated in Safety Recommendation A-85-25, and as evidenced by the fatal accident at West Chicago, Illinois. The Safety Board believes that such problems are likely to increase as total time-in-service of the affected carburetors increases. As a result, the Safety Board believes that remedial action concerning Marvel-Schebler MA3 and MA4 series carburetors is imperative and should be accomplished, if feasible, within the next 10 hours of time-in-service.

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

Issue an airworthiness directive applicable to all Marvel-Schebler and Facet Aerospace MA-3A, MA-3PA, MA-3SPA, and MA-4SPA carburetors requiring the expedient replacement of two-piece venturi systems with a one-piece combination primary and main venturi casting, in accordance with Precision Airmotive Corporation Service Bulletin No. MSA-2. (Class I, Urgent Action) (A-92-5)

Chairman KOLSTAD, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.



By: James L. Kolstad
Chairman