SP-20
Log 1716

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: March 8, 1985

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-85-23 through -25

On June 28, 1984, a Cessna Model 152, N25496, experienced a loss of power and crashed during takeoff from the McComas-Lee's Summit Municipal Airport, at Lee's Summit, Missouri. The power loss occurred when the primary venturi in the Marvel-Schebler Model MA3A carburetor dislodged and jammed against the throttle valve. There were no injuries, but the airplane was substantially damaged.

Marvel-Schebler carburetors 1/ are installed in a substantial number of general aviation airplanes. The venturi system in some of the carburetors consists of a one-piece combination primary and main venturi, while other carburetors like the MA3A Model incorporate a two-piece system consisting of a separate primary and main venturi. The primary venturi in the two-piece venturi system is intended to be held in place by three retaining clips. However, the retaining clips and/or the arms of the primary venturi often break, allowing movement of the venturi within the main body of the carburetor. This movement can result in a loss of power or engine roughness since the venturi may block the mixing chamber/throttle bore or nozzle outlet, or lodge against the throttle valve.

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 the 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 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.

1/ These carburetors were manufactured by the Marvel-Schebler/Tilloton Division of the Borg-Warner Corporation until 1983. Since then, the carburetors have been manufactured by the Facet Aerospace Products Company which purchased the Marvel-Schebler product line.

From 1979 to 1984, 26 Service Difficulty Reports were submitted to the FAA's Maintenance Analysis Center regarding problems with the primary venturi in Marvel-Schebler MA3, MA4, and MA6 series carburetors. The problems identified were similar to those referred to in AD 63-22-03 and to the problem experienced in the Missouri accident. Comments from these reports included: "The main venturi came loose and lodged against throttle valve;" "lost power during takeoff, found venturi loose in carburetor throat, no sign of retainer clips;" "carburetor venturi broke loose at all three attach points, engine ran very rough;" "found venturi mount legs broken;" and "power loss due to broken primary venturi, venturi ingested in intake manifold." Moreover, since 1977, seven accidents and one incident have occurred as a result of loose, missing, or damaged primary venturis in Marvel-Schebler carburetors.

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

> Issue an Airworthiness Directive requiring that Marvel-Schebler Model MA3, MA4, and MA6 series carburetors be inspected at the next 100-hour or annual inspection, and at appropriate intervals thereafter until the two-piece venturi system is replaced with a one-piece combination primary and main venturi, to verify the integrity and proper location of the primary and the main venturis. (Class II, Priority Action) (A-85-23)
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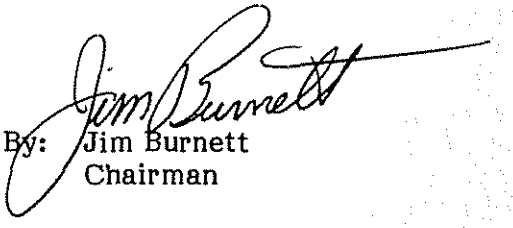
> Require the Facet Aerospace Products Company to (1) incorporate a one-piece combination primary and main venturi in all future production of Marvel-Schebler MA3, MA4, and MA6 series carburetors and (2) design a replacement one-piece combination primary and main venturi for use in retrofitting existing carburetors in the foregoing series. (Class II, Priority Action) (A-85-24)
>
> Issue an Airworthiness Directive requiring replacement of two-piece venturi systems in Marvel-Schebler MA3, MA4, and MA6 series carburetors with a one-piece combination primary and main venturi. (Class II, Priority Action) (A-84-25)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.



By: Jim Burnett
Chairman