

Jrg 1453

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: September 29, 1982

Forwarded to:

Honorable J. Lynn Helms
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-82-130 through -132

On January 27, 1982, a Cessna Model 172M, N80963, was involved in an emergency landing incident about 8 miles east of Perry, Iowa. The pilot stated that he was cruising at 5,500 feet mean sea level (m.s.l.) and was cleared to descend to 3,000 feet m.s.l. During the descent, the engine began to run rough. Movement of the mixture control knob to the full-rich position failed to correct the problem, and the engine was unable to produce sufficient power to maintain level flight. As a result, the pilot was forced to land on a highway. Examination of the aircraft engine revealed that the mixture control wire had broken at the carburetor mixture lever and that the lever was in the idle cut-off position. When the lever was manually moved to the full-rich position, the engine could be started and it would run normally.

On December 27, 1981, a Cessna Model 172K, N79965, crashed in shallow water at Laguna Beach, California, following a complete loss of engine power at approximately 4,000 feet m.s.l. The pilot noted, while attempting to restart the engine before the crash, that the mixture control knob assembly did not feel as though it was attached to the carburetor. Subsequent investigation disclosed that the mixture control wire had broken, permitting the mixture control lever to move to the idle cut-off position.

On December 11, 1981, at Kansas City, Missouri, a Cessna Model 172I, N35672, was involved in an accident similar to the above occurrences. The aircraft was at 2,200 feet m.s.l. when the engine lost power. Again, movement of the mixture control knob to the full-rich position was not effective in restoring engine power, and the pilot was forced to land on an interstate highway. During this landing, the aircraft collided with an automobile. Investigation revealed that the mixture control wire was broken at the clamp which attaches the wire to the mixture control lever on the carburetor. The lever was in the idle cut-off position. After the lever was moved to the full-rich position, the engine could be started and it would run normally.

From 1970 to 1981 (1981 file incomplete), 54 accidents occurred from engine failures or malfunctions that were caused by problems in the mixture control assembly. Two of the accidents resulted in fatalities and five resulted in serious injuries. The probable cause in 29 accidents included inadequate maintenance and inspection. Fifty of the accidents involved small, single engine airplanes including Cessna Models C-150, C-172, C-182, and C-188, Piper Models PA-22, PA-24 and PA-25, and the Beech Model 23. In a majority of cases, there was a discontinuity in the mixture control linkage, usually caused by slippage or breakage of the mixture control wire at the carburetor. Such slippage or breakage of the wire allows the mixture control lever on the carburetor to vibrate or to move to the idle cut-off position.

The Safety Board has reviewed service reports involving mixture control assemblies obtained from the Federal Aviation Administration's Maintenance Analysis Center for the period from March 1977 to March 1982. The reports reflect service problems with mixture control assemblies similar to those problems found in the aforementioned accidents. A substantial number of the 224 reports submitted during this 5-year period involved broken or separated mixture control linkage components, including wires and cables. Some of the breaks and separations occurred at or close to the carburetor.

The Safety Board believes that the installation of a small safety spring or other type of restraint on the carburetor mixture control lever would be effective in preventing future accidents. A restraint such as a safety spring could be set to move the lever to the full-rich position, if the mixture control lever were to be accidentally disconnected from the mixture control linkage. Having the lever move to the full-rich position would be the best alternative in most cases since the majority of small, single engine airplanes operate routinely at relatively low altitudes. The Safety Board believes that the carburetor mixture control levers on aircraft certificated in the future should be required to include this type of restraining device. The Board also believes that the mixture control levers on some current aircraft certificated without this feature could be modified through installation of manufacturer developed service or accessory kits.

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

Amend 14 CFR 23.1147, "Mixture Controls," to require a means of assuring that a carburetor mixture control lever will move automatically to the full-rich position in the event it becomes disconnected from the mixture control linkage. (Class II, Priority Action) (A-82-130)

Encourage manufacturers of small, single engine airplanes to make available as service or accessory kits carburetor mixture control lever safety springs or their equivalent that will move the carburetor mixture control lever to the full-rich position in the event the lever becomes disconnected from the mixture control linkage. (Class II, Priority Action) (A-82-131)

Emphasize the importance of proper maintenance and inspection of mixture control linkage assemblies in Advisory Circular No. 43-16, General Aviation Airworthiness Alerts. (Class II, Priority Action) (A-82-132)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and McADAMS, BURSLEY, and ENGEN, Members, concurred in these recommendations.

By: Jim Burnett
Chairman

Patricia Goldman
for