

1376

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: August 7, 1981

Forwarded to:  
Honorable J. Lynn Helms  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20594

SAFETY RECOMMENDATION(S)  
A-81-85 through -87

On July 31, 1981, a Varga Model 2150A, N8423J, crashed near Bay Bridge Industrial Airport, Stevensville, Maryland, after control of the elevator was lost because of failure of the elevator horn assembly (P/N VAC 6000K-26). Both persons aboard the aircraft were killed.

Metallurgical examination of the elevator horn assembly revealed that the failure was a result of fatigue cracking in the mounting flanges of the horn. The fatigue initiated from multiple origins in the flange radius and propagated through approximately 75 percent of the right flange and 90 percent of the left flange before final separation. Although small portions of the fracture contained characteristics typical of high cycle, low stress fatigue cracking, most of the fatigue appeared to have propagated under relatively high loads. This indicates that the elevator horn assembly could have failed a short time after crack initiation.

Two smaller, secondary fatigue cracks were found in the top of the elevator horn assembly near the mounting flanges. These cracks initiated from near the aft edge of the horn where the channel is wrapped around the shim. The longer of these cracks extended approximately 3/8 inch forward from its initiation area.

Removal of the paint layers from the flange area of the failed horn revealed multiple scratches in the metal. The alignment of these scratches indicates that the fatigue origin area had been sanded or perhaps filed.

A metallurgical examination was also conducted on five additional elevator horn assemblies from the following Varga model 2150A aircraft: N4638V, N4642V, N4617V, N4614V, and N4630V. Paint cracking in the flange radius areas was found on all of these horns except the horn from N4617V which was not painted. In addition, the horns from N4630V and N4642V contained fatigue cracks similar to the secondary fatigue cracks found on the accident aircraft horn.

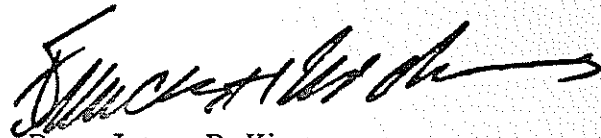
Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an emergency Airworthiness Directive to require that all P/N VAC 6000K-26 elevator horn assemblies installed on Varga aircraft be inspected before further flight and thereafter at appropriate time intervals. Horn assemblies should be removed from the aircraft and the mounting flange areas stripped of paint. The upper aft corners of the channel bends and the mounting radii should then be inspected by an appropriate nondestructive test method. Horn assemblies found cracked should be removed from service. (Class I, Urgent Action) (A-81-85)

Issue an Airworthiness Directive to require that the flange area on all P/N VAC 6000K-26 elevator horn assemblies installed on Varga aircraft be visually inspected before each flight for cracking in the upper aft corners of the channel bends and in the mounting flange radius areas. Horn assemblies found cracked should be removed from service. (Class I, Urgent Action) (A-81-86)

Evaluate the design of the P/N VAC 6000K-26 elevator horn assembly and the manner in which it is attached to the elevator. (Class II, Priority Action) (A-81-87)

KING, Chairman, DRIVER, Vice Chairman, and McADAMS and BURSLEY, Members, concurred in these recommendations. GOLDMAN, Member, did not participate.

  
By: James B. King  
Chairman  
