



AA5 Elevator Failure

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As many of you are aware, a 1972 AA5's elevator attachment system failed in flight. While there

is significant damage to the aircraft, neither occupant is known to have suffered any injury. I would consider elevator detachment a "fail fatal" failure mode, so the two individuals are very lucky.

Both the Traveler and the Cheetah/Tiger utilize a torque tube bonded into the leading edge of the elevator. These left and right torque tubes are inserted into a central bellcrank. Each elevator is pinned to the bellcrank with a single

bolt and nut. The bellcrank is rotated by cables connected to the control yoke in the cabin.

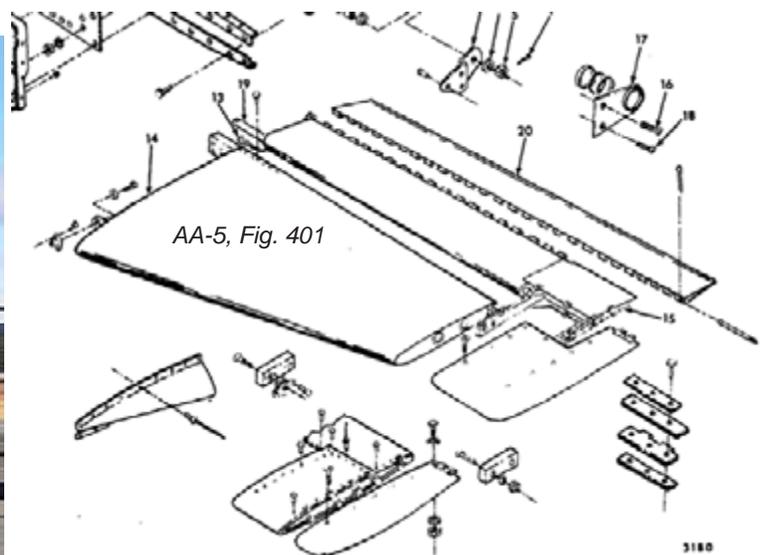
The left and right horizontal stabilizers and elevators of the AA5 Traveler are considerably smaller than those of an AA5A Cheetah or AA5B Tiger. Each side, left or right, is the same mirror image of the other.

There are also differences in the method of attaching the elevators to the horizontal stabilizers. Each of the Traveler's elevators is secured by the bolt through the bellcrank and the end of the torque tube which pivots in a single outboard hinge with nylon bearing insert. This hinge is attached on the outside rear of the outboard rib of the horizontal stabilizer, by two screws (AA-5, Fig. 401, items 17, 16 and 18.) It is the area of this outermost rib, to which this hinge attaches, and is missing in the Traveler photo to the left.

The Cheetah and Tiger's elevators each rotate on two bolts in two hinges, one located mid-span and one located at the outboard end. The mid-span and outboard hinges (item 24 in Fig. 402) are secured to the trailing edge of the horizontal stabilizer by four bolts. Illustration Fig. 402 only shows one of the hinges, in the detail view at the bottom of this illustration.

While a detailed inspection of all of these elevator bearings and hinges is part of a quality annual inspection, it is

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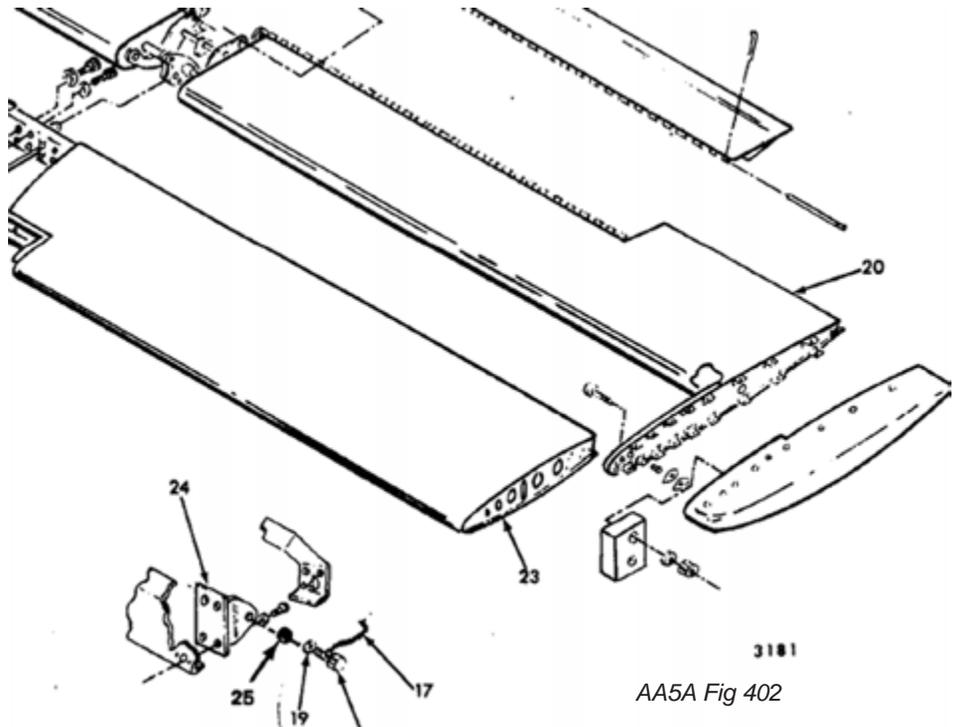
possible to include visual inspection of many of these items during a preflight inspection. You may want to use a soft cloth to hold the elevator in the full up position during inspection, as needed.

On both the Traveler and Cheetah/Tiger, the hinge and elevator attachment can be viewed with a flashlight and mirror from above and below with the mirror, or by sitting on the ground. Check screws for security and check structure for cracks and/or corrosion.

Also check for delamination of the top and bottom skin from the rib, above and below the hinge attachment.

The hinges of the Cheetah and Tiger are best inspected with a mirror and flashlight from below. Use a soft rag to hold the elevator in the full up position.

A narrow flashlight and mirror allow



AA5A Fig 402



AA5 elevator outboard hinge



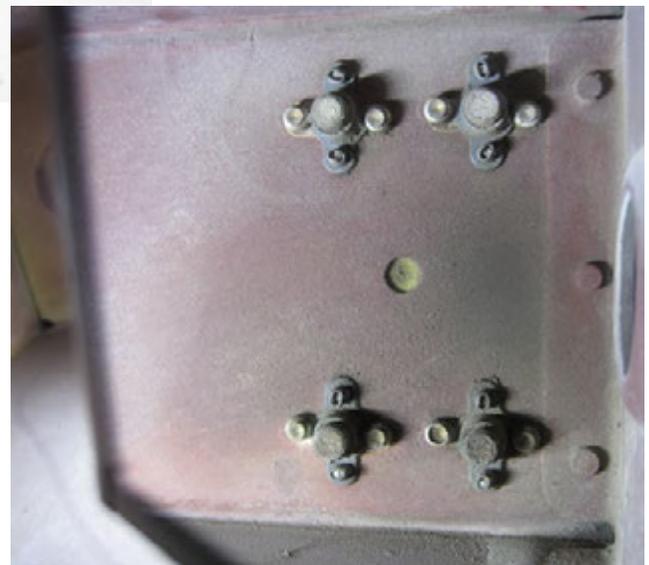
Traveler hinge

inspection of the attaching bolts and nutplates, and the interior of the trailing edge of the Cheetah and Tiger's outer hinge. The mid-span interior can only be inspected with a long flexible shaft borescope.

Hopefully we will learn what caused the elevator attachment failure of N5880L. Stay safe, add a more detailed visual inspection to your preflight!

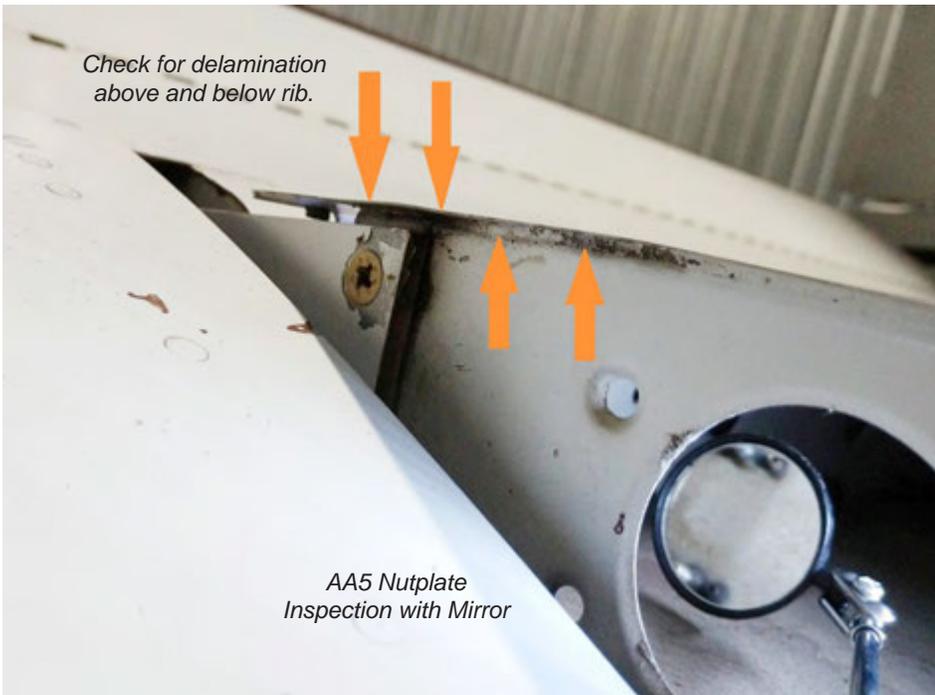
Thanks to Roger Rowlett for the AA5 elevator hinge photos!

AA5A outboard hinge
inside rib view of
nutplates in mirror.





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AA5 elevator torque tubes and bellcrank assembly.



AA5A Elevator Torque Tube and Bellcrank Assembly.



This Traveler's hinge nutplates have minor corrosion presenting on the rib, forward of the hinge, around the nutplate rivets.

Removing the upper half of the tail cone will allow inspection of the torque tubes, bellcrank, bolts, and elevator trim system. It takes about 10 minutes to remove the fairing and 10 minutes to reinstall it. It requires a Phillips screwdriver. Steps: Trim control full aft (nose up.) Remove screws. Trim control full forward (nose down.) Remove upper fairing, being careful not to scratch the paint. Inspect. Reinstall upper fairing. Reinstall all screws loosely. All installed? Lightly torque all screws. Trim control back to neutral.

