

Commander

Owners Group



Appendix A
Revision 1 (April 29, 2011)
to AMOC letter to L115W-11-315
Alternative Inspection Procedure
for
AD 2011-07-13

Submitted by: Glenn Mores
Commander Owners Group
21921 Oak Leaf Lane
Bullard, TX 75757
gmores@microdata.com

Affected models: Commander Aircraft Corporation, Gulfstream Aerospace Corporation,
and Rockwell International models 112, 112B, 112TC, 112TCA, 114,
114A, 114B, 114TC.

All serial numbers of all models would be covered by this AMOC.

AD referenced by
this AMOC: 2011-07-13

Inspection Procedure

1. Remove the attaching hardware for both outboard elevation tips per the Commander Maintenance Manual. A listing of the officially approved version of the Maintenance Manual for each model Commander aircraft may be found on the Commander Premier website at:
http://www.commanderpremier.com/documents/Technical_and_Service_documentation_levels.pdf
2. Using a 10x magnifier, visually inspect the area immediately surrounding the outboard elevator hinge fittings attached to the elevator for any cracks or signs of smoke produced by cracks in the elevator spar web. If no cracks are noted, clean the area and re-inspect.

If suspect areas are noted, clean the area and perform a Dye Penetrant Inspection (DPI) using red dye penetrant. The below guidelines provide general instructions for the use of red dye penetrant, but any red dye inspection should be in compliance with the product manufacturer's guidelines and ASTM E165 (ASTM Standard E165, 2009, "Standard Practice for Liquid Penetrant Examination for General Industry, ASTM International, West Conshohocken, PA, 2009, DOI: 10.1520/E0165-09, www.astm.org)

- a. Step 1 – PRECLEANING
 - i. Parts should be free from rust, scale, flux and other contaminants which will provide false indications. Use manufacturer's recommended cleaner for effective pre-cleaning results. Parts and materials are to be completely dry before application of penetrant.
- b. Step 2 – APPLICATION OF PENETRANT
 - i. Dye penetrants may be applied by dipping, spraying, brushing or other means which effectively covers area. After applying penetrant, position parts to allow excess to drain from surface. Refer to manufacturer's label for minimum dwell times.
- c. Step 3 – REMOVAL OF PENETRANT
 - i. After appropriate dwell time remove penetrant. For solvent based penetrants remove excess penetrant by wiping with lint free cloth. DO NOT FLUSH THE PENETRANT FROM SURFACE WITH SOLVENT. For water washable penetrants remove with steady stream of water. DO NOT FLUSH SURFACE TOO LONG OR VIGOROUSLY.
- d. Step 4 – APPLICATION OF NON-AQUEOUS WET DEVELOPER
 - i. Prior to use agitate developed thoroughly. Consult manufacturer's label for specific application instructions, but typical non-aqueous wet developer may be applied by spray or brush to surface area in a manner which provides a thin, even developer film.
- e. Step 5 – INSPECTION
 - i. Sufficient dwell time is required to allow indication to form. Consult the manufacturer's label for specific product dwell times, but the minimum dwell time for non-aqueous wet developers is TEN MINUTES. Inspection should be made before penetrant bleeds into developer (maximum dwell time SIXTY MINUTES) causing loss of definition.
- f. Step 6 – FINAL CLEANING
 - i. Once areas containing flaws have been analyzed and recorded, use manufacturer recommended cleaner to remove developer and penetrant residue from surface area. Make sure all dye penetrant product materials are thoroughly removed.
- g. If the DPI finds any cracks or cracks are suspected, proceed to Step 4.

3. Inspect the aft face of the spar web in the area of the fitting with one of the following:
- a. a rigid borescope at least 17" in length, a 42 degree field of view or less, and with a tip equipped with either a mirror or prism to allow 90 degree viewing. A head diameter of no greater than 6mm may be required to inspect certain airframes due to outboard rib configuration. Refer to AMOC photos to view both rib styles. Position within 6mm of surface for 10x viewing.

Example: Hawkeye PS17-NVK
Available from: Gradient Lens Corporation
207 Tremont Street
Rochester, NY 14608
800.536.0790

- b. a flexible fiberscope/borescope with at least 10,000 fibers and a 45 degree field of view or less. A head diameter of no greater than 6mm may be required to inspect certain airframes due to outboard rib configuration. Refer to AMOC photos to view both rib styles. Position within 3.5mm of surface for 10x viewing.

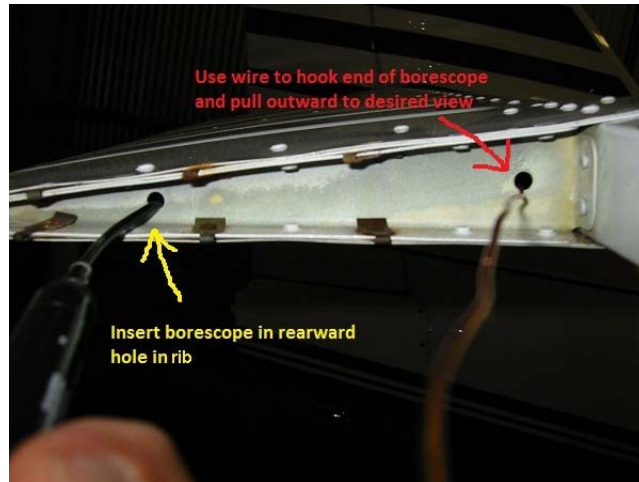
Example: Hawkeye PFB5
Available from: Gradient Lens Corporation
207 Tremont Street
Rochester, NY 14608
800.536.0790

- c. a video borescope with a resolution of at least 720x480, a 10x zoom, and focus down to 4cm. A head diameter of no greater than 6mm may be required to inspect certain airframes due to outboard rib configuration. Refer to AMOC photos to view both rib styles. If the video borescope has a built-in monitor that is not capable of displaying at full resolution, and/or does not have the ability to zoom to 10x, usage is still acceptable if images can be captured and output to a computer with image viewing software capable of displaying images at full resolution and zooming to yield a 10x view.

Example: Snap-on BK6000 with BK5500-13 5.5mm View Imager
Available from: Snap-on Tools, Inc.
877.762.7664

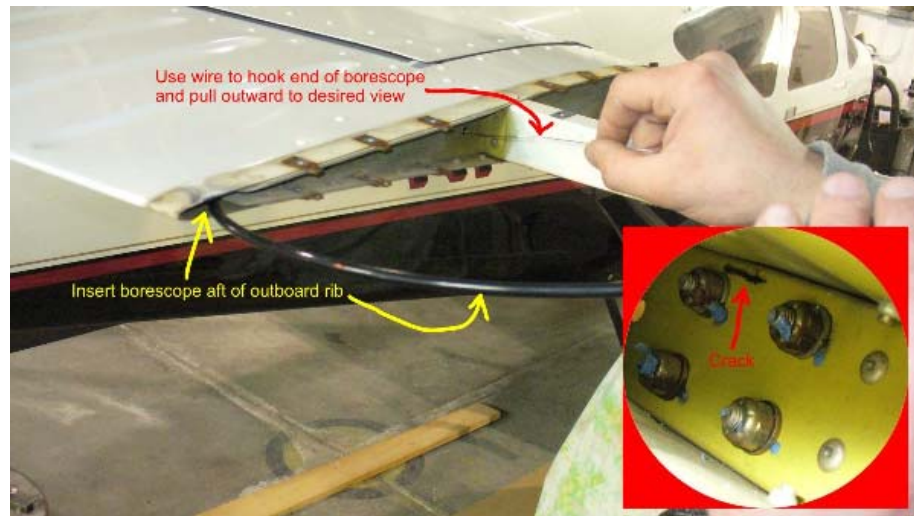
The inspection procedure varies slightly depending upon the Commander model as two different end ribs were used in production.

- d. **Full length rib used in most early models.** Insert borescope in the rear lightening hole on the outer elevator rib (see picture below). Inspection should cover the areas surrounding the four attachment nuts and extending upward and downward to the elevator skins and at least 1" inboard and outboard from the nuts. If suspect areas are noted, proceed to Step 4.



If no suspect areas are noted, this completes the inspection. Proceed to Step 5 to report results.

- e. **Shortened rib used in most later models.** Insert the borescope between the aft end of the outboard elevator rib and the trailing edge of the elevator skin (see picture below).



Inspection should cover the areas surrounding the four attachment nuts and extending upward and downward to the elevator skins and at least 1" inboard and outboard from the nuts. If suspect areas are noted, proceed to Step 4.

If no suspect areas are noted, this completes the inspection. Proceed to Step 5 to report results.

4. If any suspect areas are found removal of the elevator for further inspection will be required and this is outlined below.
 - a. Disconnect the elevator trim pushrod at the trim tab.
 - b. Remove the hinge bolts at the horizontal stabilizer points.
 - c. Remove six screws and two bolts at the inboard end of the elevator and remove the elevator.
 - d. Remove all fasteners common to the elevator outboard aft end rib, part number (P/N) 44330, and elevator skin, P/N 44323.
 - e. Remove the remaining two fasteners common to the elevator outboard aft End rib (P/N 44330) and the elevator spar, P/N 44211.
 - f. Remove the elevator aft end rib, P/N 44330, to gain access to the aft side of the elevator spar. Remove the four bolts, washers, and nuts that secure the outboard elevator hinge, P/N 44285.
 - g. Remove elevator hinge, P/N 44285, from the elevator spar.
 - h. Clean in and around the location of the outboard bracket on the elevator spar and visually inspect for cracks. Use a 10X magnifier to facilitate the detection of any crack.
 - i. If cracks are found, before further flight, do the following:
 1. Either replace the elevator spar with a serviceable spar that is found free of cracks or repair/modify the elevator spar following a procedure approved for this AD by the FAA, Wichita Aircraft Certification Office (ACO); and
 2. reassemble the elevator assembly, rebalance the elevator, and reinstall on the airplane following standard repair practices. Ensure elevator rigging is within tolerance and that the system operates with ease, smoothness. Note: Elevator rigging and rebalancing, torque values, and other general maintenance information can be found in the maintenance manual.
 - j. If cracks are not found, reassemble the elevator assembly, rebalance the elevator, and reinstall on the airplane following standard repair practices. Ensure elevator rigging is within tolerance and that the system operates with ease, smoothness. Note: Elevator rigging and rebalancing, torque values, and other general maintenance information can be found in the maintenance manual.

5. Report the results of the inspection to the FAA, Wichita ACO, FAA, Attn: T.N. Baktha, Senior Aerospace Engineer, 1801 Airport Road, Room 100; phone: (316) 946-4155; fax: (316) 946-4107; e-mail: t.n.baktha@faa.gov. Include the following information:
 - (1) Airplane model and serial number.
 - (2) Hours time-in-service at time of inspection.
 - (3) Annotate any cracking found, including the exact location and length of any cracks.
 - (4) Any installations, repairs, modifications, etc. that have been done on your airplane in the elevator spar area or that could have affected the elevator spar.
 - (5) Type of operation primarily flown in.