

Service Letter

Subject:

To Replace the Tailcone Assembly of the GA8 Airvan.

Applicability:

This instruction is applicable for all GA8 aircraft.

Amendments:

Re-issued to be applicable to all Airvan aircraft.

Background:

This service letter provides detail information to accomplish the removal and replacement of the GA-8 Airvan tailcone assembly (Drawing GA8-550001).

Personnel/Labour Requirements:

With 2 experienced aircraft sheetmetal workers the tailcone removal and replacement process could be completed within 2 weeks.

Aircraft Jacks (Cessna single engine Wing Type Jacks are suitable – compressed height approx. 70 inches, extended height approx. 80 inches above ground.)

Fuselage trestles.

Plumb bob and string line.

Masking tape and white board marker.

Plastic tube type water level, 5 metres of 10mm diameter clear plastic tube.

Sheet metal tools, pistol and angle type drills, rivet gun kit.

Instructions:**1. Tailcone removal**

Remove pod assembly (if fitted), removal of the fuel drain manifold assembly is not required.

Jack the Aircraft IAW the Service Manual Chapter 7-10-00 and accurately level longitudinally and laterally IAW the Service Manual Chapter 8-10-00. Additional supports to steady the aircraft throughout the tail section replacement process should be positioned under the fuselage floor structure front and rear approximate at fuselage stations 22 and 117.

To allow checking of the alignment of the new tailcone, plumb lines can be used to accurately mark on the workshop floor the aircraft nose and wing positions. Use any undamaged points of the tailcone to mark reference points on the workshop floor. To allow checking the alignment of new tailcone, mark on the floor by some method a centreline running the full length of the aircraft.

If possible use a water level to take measurements from the fuselage level point to the tailplane pickup fittings position to allow a check of the vertical alignment of the new tailcone.

Secure the nose leg firmly in position.

Remove Rudder, Fin, Elevators and Tailplane.

Remove and retain passenger seats.

Remove and retain carpets.

Remove and retain Baggage net, Aft Luggage Locker, associated net and 2 support bars.

Remove and retain interior panels from rear of cabin.

Remove and retain insulation bags from rear of cabin.

Remove and retain access panels from Baggage shelf and rear of cabin floor.

Remove and retain 10 of Pno.40000-11 Ankra Baggage net fittings from Baggage shelf(loose nuts), walls and upper corners(anchor nuts).

Remove trim cables from forward trim drum in accordance with service manual trim cable replacement instructions. Remove trim jack assembly from tailcone while maintaining the cable firmly on the rear trim drum.

Detach elevator cables from walking beam and pull all cables back into floor, remove and retain Elevator walking beam and elevator push rods.

Remove and retain Blower fan and SCAT hose.

Remove and retain fin strobe power supply (if fitted).

Remove and retain ELT unit (if fitted), Antenna and wiring.

Remove and retain Marker beacon Antenna (if fitted).

Detach Electrical wiring and pull forward into floor.

Disconnect Trim indicator cable and retain all hardware

Note:

When drilling out rivets, The Head only should be drilled in the centre, do not drill below surface of sheet metal, use a pin punch, backing block and hammer to punch rivet tail through.

The following pictures illustrate rivets to be removed outlined in red.



Figure 1: Drill out rivets outlined from Upper L & R cornice panels.



Figure 2: Remove 2 rows of rivets below aft windows L & R.

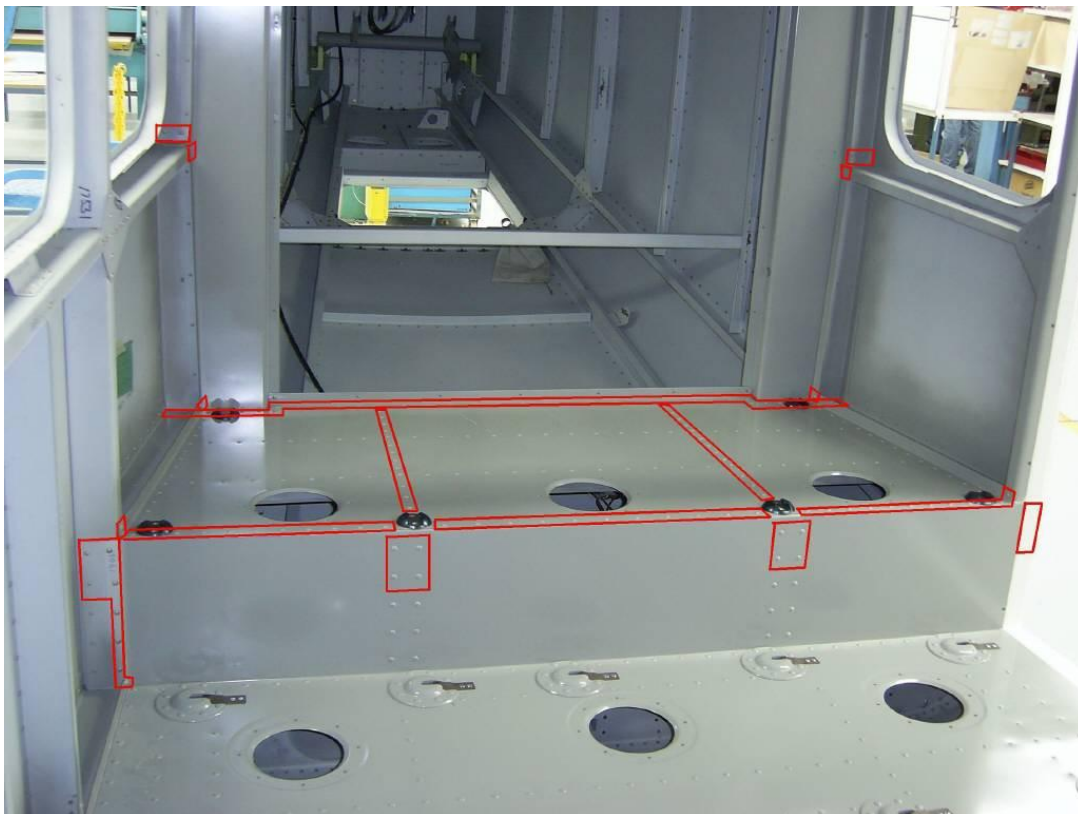


Figure 3: Remove rivets to remove Baggage shelf Floor area as per picture. Remove trim angle from forward face of Baggage shelf step starboard side (lower left of Pic).

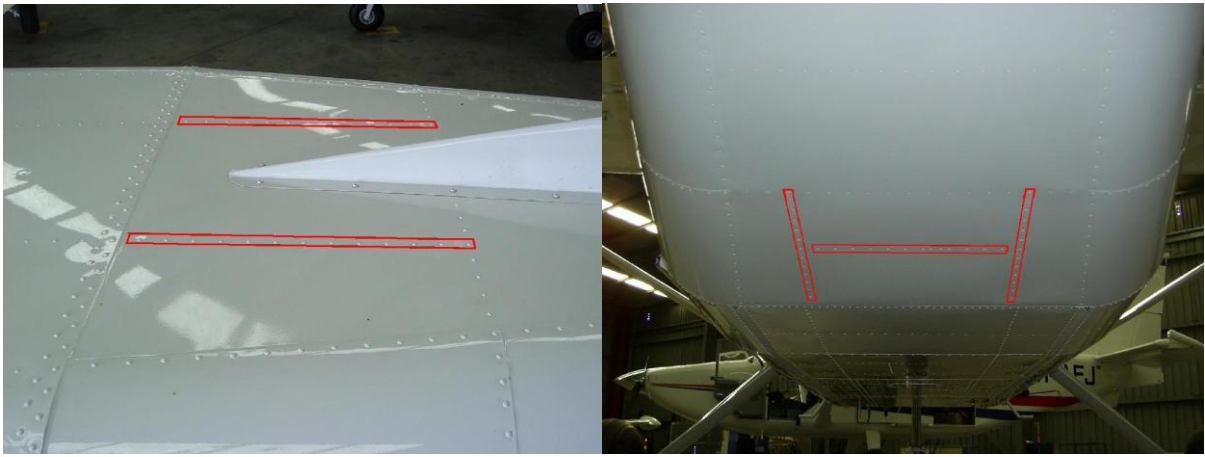


Figure 4: Remove 2 rivet rows from tailcone upper skin and 3 rows of rivets from Tailcone lower skin area below baggage shelf.

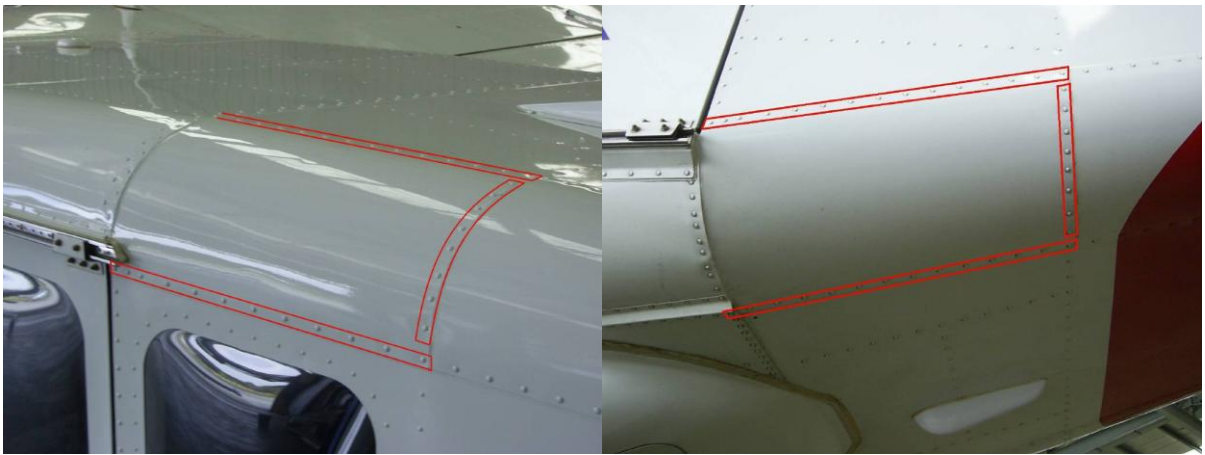


Figure 5: Remove rivets from LH Upper and lower outside corner panels.

Note:

Left side (Port) corner panels will stay with aircraft cabin section so that rivets under the sliding door track structure will not need to be removed.

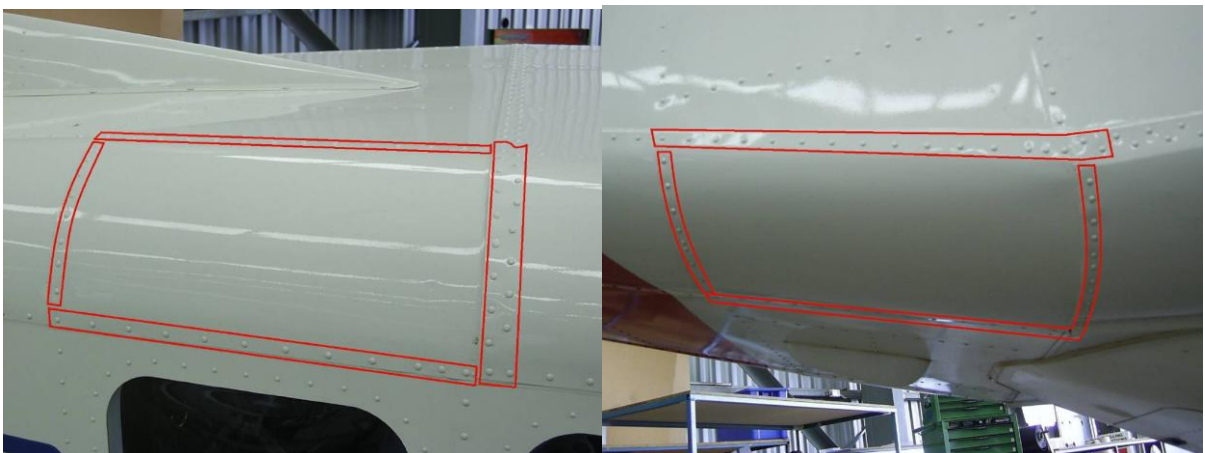


Figure 6: Remove rivets from Right (Starboard) side upper and lower outside corner panels and remove these panels ONLY.



Figure 7: To gain easy access to area under Baggage shelf release shelf skin from left and right sides by easing baggage shelf bulkhead forward, shelf skin can then be raised to allow access to rivets on aft flange of shelf ribs as above picture. The shelf will not be able to be removed from the cabin before the tailcone is removed.

Pull control and electrical cables forward over shelf bulkhead.

Remove all rivets from cleats (angle brackets) at rear ends of 4 channels and 2 ribs through luggage locker bulkhead.

Remove 16 rivets from 8 cleats securing forward ends of 'C' channels of Upper, Lower Left and Right skins to Cabin/Roof of aircraft, either side of cleat can be de-riveted .

With tailcone supported and with sufficient number of temporary fasteners to secure tailcone through 4 channels in upper and side skins and 2 ribs in lower skin, carefully drill and remove rivets along forward edges of tailcone skins through the cabin roof , wall and floor skins and down the channel at the aft side of the cabin door.

Note:

Level point rivet on cabin doorway aft channel 18" above floor level will need to be carefully removed by drilling out with 2.8mm, No34 or 7/64th bit.

Cut away sealant along skin laps and release skins (Be careful not to cause scribe marks or damage the sheetmetal), remove pins, and carefully pull tailcone assembly aft and starboard to remove from fuselage/cabin section.

Clean all areas that have had rivets removed ensuring there are no rivet tails remaining.



Figure 8: Aircraft with tailcone removed.

2. Installation of New Tailcone:

The replacement tailcone can be installed by using the following process as a guide.

Position the tailcone to be installed, this can be accomplished manually with 3-4 people. Carefully guide the tailcone into position taking care to insert skins between cabin skins and structure until the pre-punched holes in the skins align with the channels and ribs remaining on the cabin section pin using 2.5mm or 3/32" temporary fasteners, Back up washers may be required for temp fasteners to hold firmly.

Note:

It is important that the Tailplane pivots are in the correct position vertically and laterally and that the pivots are Level in relation to the forward fuselage and wings.

Check position of tailcone and that all dimensions as taken in the first steps are correct, slight movement may be possible between existing 1/8th holes in fuse cabin and matching 3/32 holes in a new tailcone, when correct fit a tail stand to secure the tailcone position.

Check fit between cleats (angle brackets) on aft ends of 6 channels, the 2 baggage shelf ribs and the baggage locker bulkhead. This gap would not vary more than $\pm 1/16$ " (1.6mm) new cleats may be required to be fitted.

Drill through upper, lower and right skins, fit temporary fasteners as holes are drilled to final size. Note, care should be taken not to enlarge holes over #30. Back drill or use a hole finder to drill off Left skin to channel aft of cabin door.

Remove the tailcone to clean up after drilling off skins.

Place the Baggage shelf assembly into place and hold up with temporary fastener through lower ribs, baggage shelf will not fit into place after tailcone is fitted without further dis-assembly.

Refit the tailcone into position and recheck position of skins into fuselage cabin and the vertical position of tailplane pivots.

Note:

All rivets used for tailcone installation are MS20470AD- or MS20426AD- Type.

Rivet top skin to cabin roof along the double rivet run.

Rivet left skin to door frame aft vertical channel.

Rivet right skin to Cabin wall skin.

Rivet bottom skin to floor aft skin.

Rivet cleats at forward ends of tailcone skin "C" channels to cabin structure at 8 points.

Rivet channels to roof and both side skins at 6 places and cleats to luggage bin bulkhead at same places.

Rivet outer corner skins completely at 4 places.

Position baggage shelf panel to locate the 2 shelf ribs and drill off to Luggage bin lower bulkhead.

Rivet 2 ribs to lower skin and luggage bin bulkhead.

Rivet baggage shelf in place.

Drill and rivet anchor nut for each upper left and right baggage net Ancra plate from inside corner panel.

Rivet inside left and right corner panels.

Install cabin trim angles as per original on left right and upper forward side of luggage bin bulkhead. Fit tinnermann nut plates as original.

Install all antennae and doublers as per original.

Replace avionics equipment as per original.

Re-route electrical and control cables, Connect elevator cables to Elevator walking beam.

Seal all skin lap joints with Dinitrol 410UV Polyurethane sealant and repaint external area as required.

Re-apply the internal corrosion protection as required.

3. Vertical Fin Fitting and drill off:

Three persons and a 10 ft high stepladder/work platform are preferable for Fin Initial Installation.

Pass the Fin Assembly to person on ladder/work platform and lower the assembly down into position ensuring correct fore/aft alignment. Temporary fasteners can be used in 1/8" holes through the front and rear spars of the fin.

Fin position check, Check lateral level of aircraft, run a straight line from nose to tailcone centreline and extend through so that a plumb line from the upper fin trailing edge can be aligned to check its vertical position.

Drill through from the bolt holes in the fin, installing and tightening the bolts in each hole and re-checking the fin position before drilling the next hole until all 14 holes are drilled.

Remove the fin and clean all surfaces before installation of tailplane.

4. Horizontal Stabilizer/Elevator Assembly Installation:

Note:

The trim system rigging may have become incorrect and will require checking IAW Service Manual Chapter 27-30-10.

Note:

Ensure pivot bushes are installed.

With the aid of a person on either tip, lift assembly into position above rear fuselage pivot attach fittings.

Utilizing a third person, install NAS 6605-20 bolts (heads outboard) AN960 –516 washers, MS 21042-5 nuts and correctly torqued IAW Service Manual Chapter 20-10-00 and install the AN356-524 pal nuts. Check that the leading edge of stabilizer moves up and down without binding. It is required that the outer flanges of the tailplane fitting clamp tightly on inner pivot bush to ensure the bushing rotates in the rear fuselage lug.

Slide the upper end of the trim jack between front spar attach fittings ensuring that the anti rotation spacers are fitted, install the AN5-14A bolt with AN960-516 washer under the head install the MS21042-5 nut and washer, and torque IAW Service Manual Chapter 20-10-00 and install AN356-524 Pal nut ensure uniball bearing is clamped tightly.

Attach trim indicator operating cable on the forward face of the front spar. Check stabilizer and indicator rigging IAW Service Manual Chapter 27-30-10 and Type Certificate Data Sheet.

Connect both elevator push rods to the elevator operating horns torque bolts IAW Service Manual Chapter 20-10-00.

Check installation and rig of Elevators IAW Service Manual Chapter 27-30-00

5. Vertical Fin Installation:

Clean and inspect Forward and Rear Spar attach holes, faces and bolts. Apply a light coating of preferred corrosion protection (i.e. LPS3 or similar).

Loosely install 2 Bolts in front and rear Fin spars to safely hold Fin in position. One person can finish the installation and torquing of the bolts in the rear spar, two persons required to correctly torque forward spar bolts.

Note:

Ensure unthreaded portion of all bolts protrudes through spars and bulkheads and sufficient washes are used under the nut to prevent nut binding.

Correctly torque all nuts IAW Service Manual Chapter 20-10-00.

Connect the strobelight/beacon and radio coax cables at the base of the fin.

6. Rudder Installation:

Clean and Inspect Rudder, hinge pivots and Mass Balance attachments. Lubricate pivot bushes and hinge holes with grease.

Rudder can be installed with lower Mass Balance Weight fitted – Upper Balance Weight must be removed.

Note:

IPC Chapter 27 Figure 27-37 Page 27-74 shows correct installation of Rudder pivot bushes and attach hardware.

Install upper and middle hinge bushes and bolts.

Take particular notice of Note 1 regarding “Spacer” washers and lower hinge bolt length. Spacer washers should be added until just taking up the gap.

Install lower washers and MS 21042 lock nuts, tighten and ensure pivot bushes are clamped and rotate with rudder.

Connect rudder cables.

Place the upper mass balance weight in position and install the 2 x AN4 bolts and washers leaving the bolts loose enough so that the weight can be rotated to align the pop rivet holes at each end of the weight. When the holes are aligned the bolts can be tightened and the pop rivets installed.

Note:

If the pop rivet holes do not align then the weight may need to be swapped end for end.

Check complete rudder system for rig and installation IAW Service Manual Chapter 27 Page 27-8 thru 27-11.

7. Flight Controls/Empennage:

Carry out independent inspections of the following installations and systems:

- a) Installation attach fasteners and locking of empennage components.
- b) Primary Flight Control System.
- c) All Control surface attach points are correctly installed and locked.

1 st Inspection	Signature & Authority Number:	Date:
2 nd Inspection	Signature & Authority Number:	Date:

Install all Interior Trim Panels seats and carpets.

Install all Fairings.

Prepare aircraft for flight

Complete Log Book entries and certify. Check and ensure all AD's, SB etc have been carried out, complied with as required by the countries National Airworthiness Authority.

Flight Check:

During Check Flight: observe all systems for normal operation.

In smooth air @ approx. 23" MP, 2,300 RPM check lateral rigging (i.e. Does aircraft tend to roll left or right)

Note:

Skid ball should be checked prior to flight, must be centred when cabin floor laterally level.

Adjust rear spar Cam Adjuster to ensure "Hands Off", wings level flight is achieved.

Note:

If aircraft is tending to yaw, ball must be kept centred with rudder application or with installation of SB-GA8-2005-22, Rudder trim tab should be adjusted until "Hands Off" level flight with ball centred is achieved.