AWB 51-4 Issue 1, Piper PA30/39 Wing Spar Cap Corrosion

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AWB 51-4 Issue 1, 27 September 2002

Applicability

All Piper PA-30 and PA-39 Twin Comanche aircraft.

Purpose

To bring to operator's and maintainer's attention, the potential for corrosion of the wing spar and associated structure, and to highlight the existing Piper Service Manual requirement to inspect the wing internal structure for corrosion caused by exhaust gases.

Background

Corrosion has been observed on the forward flange leading edge of the left and right wing lower spar caps due to the ingress of corrosive exhaust gases through the inspection access panel number 12. (See the Piper Twin Comanche Service Manual, figure 2-8 for the panel location). The inspection access panel number 12 incorporates a fuel drain fitting in some earlier models. Corrosion caused by exhaust gas inside the wing cavity is a known problem in the PA-30 and PA-39, evidenced by the fact that there is a specific inspection for it in the Piper Service Manual. Whilst the requirement to inspect the internal wing structure for corrosion is already contained in the manual, more detail is required to direct attention to specific sites of likely corrosion, including the wing spar caps. Additionally, some Australian PA-30/39's are being maintained to CASA Schedule 5, which contains a requirement to "inspect the internal structures and spars" of the wing (Refer CASA Schedule 5 - Section 1 - The Airframe, part 2 (c)), rather than the manufacturers maintenance schedule. Irrespective of which maintenance schedule the aircraft is on, the inspection for corrosion in the wing cavity must be carried out in accordance with the aircraft's approved maintenance data (CAR 42V) which is the manufacturers maintenance or service manual. In this case, the service manual does not provide enough detail on where or how to look for corrosion that is caused by exhaust gas. The recommendations below will provide more detail on where and how to perform the inspection for corrosion.

Corrosion on the wing spar or other structural components may eventually reduce both static strength and

fatigue life, with possible structural failure being a consequence. If corrosion is allowed to progress undetected for a long period, successful and economical repair of the spar structure may not be possible.

Recommendations

Perform an inspection of the left and right wing spar caps at each scheduled aeroplane inspection (100 hourly inspection) as per the following procedure:

Remove the number 12 inspection access panels on the left and right wings (See the Piper Twin Comanche Service Manual, figure 2-8 for the panel location). It may be necessary to clean the area to be inspected so that any corrosion can be seen.

The cavity covered by panel 12 allows access to the wing spar, which is easily visible and may exhibit corrosion, especially on the lower spar cap. Pay particular attention to the spar cap forward flange leading edge, upper and lower surfaces (See Figure 1 which shows the area of likely corrosion). Use of a mirror and bright light will be necessary to see clearly, the upper and lower surface of the spar cap. If any corrosion is detected, report it to CASA via a Major Defect Report (MDR) form (as required by CAR 52). In the MDR form, the following additional information should be provided. Include the information on a separate page if there is insufficient space on the MDR report form.

1. Whether the aircraft has a wing fuel drain fitting installed (if a wing drain fitting is installed, it will be located behind the engine exhaust on the left and right wings).
2. Whether the aircraft has the retrofit extended down-swept exhaust pipes installed.
3. The exact location and extent of the corrosion, including approximate depth of corrosion.
4. Indicate if there was any build up of exhaust products or dirt within the wing cavity or deposited on the wing spar.

This additional information will allow CASA to assess the fleet-wide extent of the corrosion and develop possible future action.

Figure 1: Inspection Area - Left wing with inspection access panel number 12 removed.

Note: Figure 1 shows some missing and de-riveted skin. *It is not necessary* to remove any rivets or skin in order to accomplish this inspection. Only inspection access panel number 12 needs to be removed (See the Piper Twin Comanche Service Manual, figure 2-8 for the panel location). The skin in the photograph was only removed to confirm the extent of the corrosion after it was found during the visual inspection.