Australian Government
Civil Aviation Safety Authority

AIRWORTHINESS BULLETIN

AWB 52-004 Issue 1 – 6 August 2020

Cessna 441 in Flight Depressurisation due to Emergency Exit door bonded skin failure

An Airworthiness Bulletin is an advisory document that alerts, educates and makes recommendations about airworthiness matters. Recommendations in this bulletin are not mandatory.

1. Effectivity

All Textron/Cessna 441 aircraft.

2. Purpose

This AWB is raised following a report to CASA of an inflight depressurisation caused by the failure of the bonded skin panel on the R/H emergency exit door.

3. Background

The subject aircraft has CASA STC SVA 528 applied. This STC extended the life of the airframe from 22,500 hours, to 40,000 hours.

This failure has occurred at 27,116HR / 23,484CY, which is 4616 hours into the life extension period per STC SVA 528.

Initial investigations suggest that the bond degradation may be independent of the hours/cycles accumulated and that the primary driver may be ageing and degradation of the bond adhesive. Once degradation of the bond occurs, hours/cycles likely play a higher order role in disbond progression to failure.

Disbonded panel viewed from outside

4. Recommendations

It is strongly recommended that operators with Cessna 441 aircraft incorporating CASA STC SVA 528 and with greater than 22,500 hours accumulated, immediately carry out an interim visual inspection of the R/H emergency exit door to look for evidence of disbonding of the skin to frame structure.

For aircraft not incorporating STC SVA 528, it is also recommended that this inspection be carried out, as the root cause is undetermined and failure may be calendar time related, not just hours/cycles.

Interim Inspection Procedure:

NOTE: *This interim visual inspection can be conducted entirely in accordance with the AMM and does not require separate approval.*

Do an interim visual inspection of the emergency exit door edge as follows:

1. Remove the emergency exit door from the aperture in accordance with AMM 52-20-00/201.
    A. Handle the door carefully to avoid snagging the outer skin on the fuselage.
    B. Place the door on a work bench in a well-lit environment.
2. Using a handheld flashlight to throw light into any separated areas, carefully and slowly inspect right around the edge of the door from the angle shown in Figure 3.
3. Check for the following:
    A. Small areas of separation of the outer skin (Figure 4).
    B. Small tell-tale pressurisation leak marks.
    c. Defects of the skin edge (Figure 4).
4. Check that no sealant / filler has been applied around the edge behind the seal. This may mask the problem and hide a pressurisation leak that is signalling potential failure.
5. Carefully reinstall the emergency exit door in the aperture in accordance with AMM 52-20-00/201.

Note: If the internal structure of the emergency exit door has not been recently inspected or Cessna 441 Supplemental Inspection No. 52-20-01 (AMM 5-14-17) has not yet been completed, it is recommended to also do the following:

1. Remove the internal liner in accordance with AMM.

2. Check the door frame and skin structure right round for general condition, looking for cracks and disbonds (Figure 2)

3. Do Cessna 441 Supplemental Inspection No. 52-20-01 (AMM 5-14-17).

4. Reinstall the internal liner in accordance with AMM.

Figure 1: Lifted edge of skin after disbond

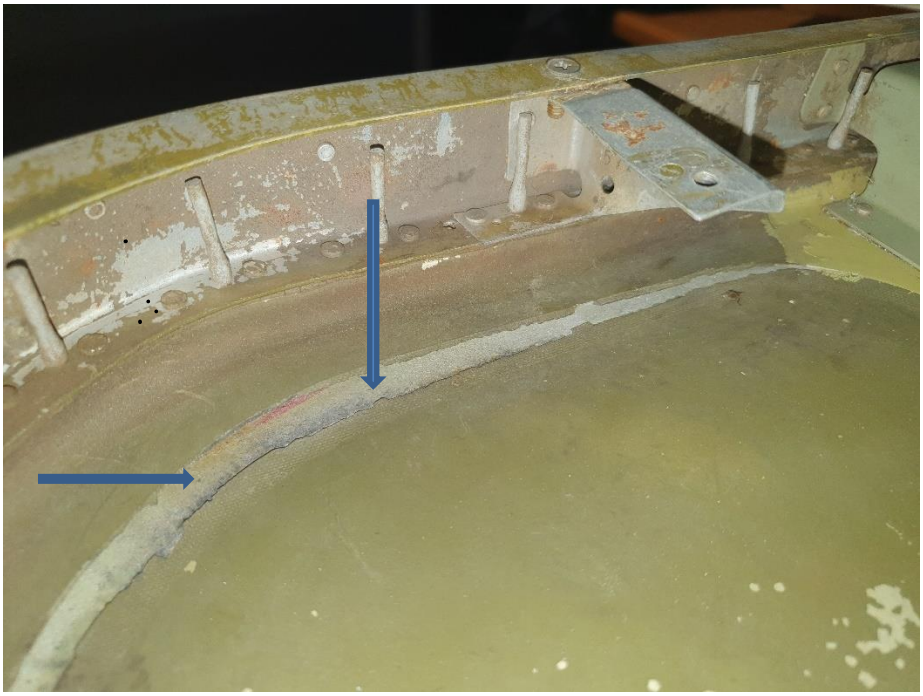

Figure 2: View from inside door with liner removed showing filler crack/disbond

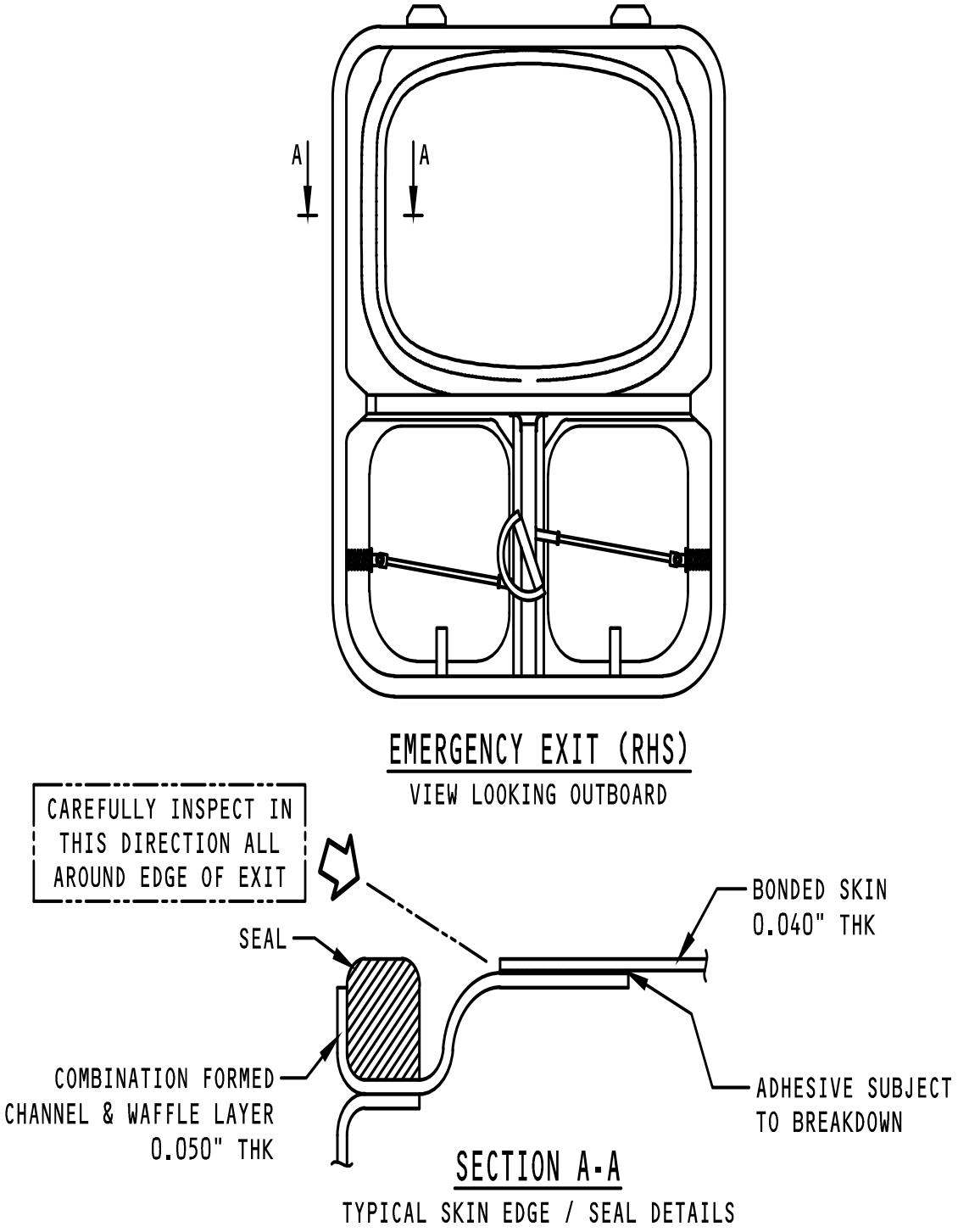

Figure 3: Schematic showing location of adhesive bond area and inspection area.

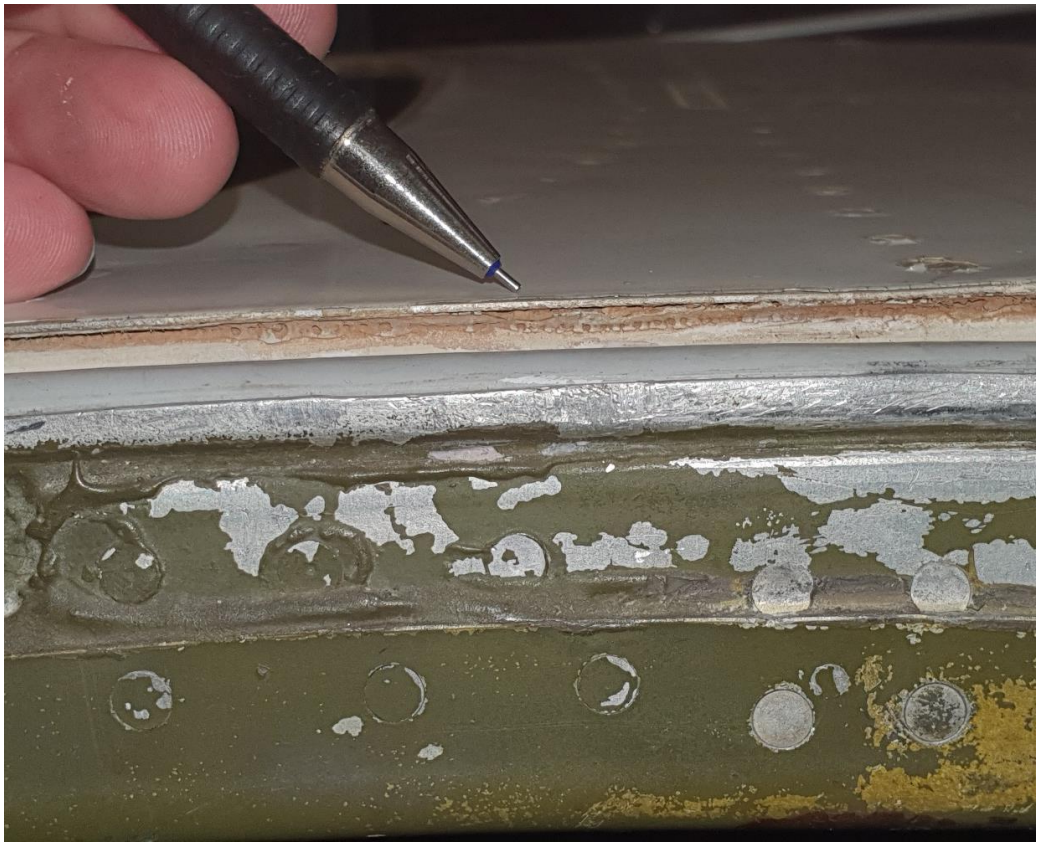

Figure 4: Edge of skin, showing evidence of initial disbond – this can be very hard to see. Any lifting or voids are cause for further investigation of overall bond integrity.

Figure 5: View of external edge of door showing skin lifted after disbond

5. Reporting

It is requested that if the visual inspection specified above detects any anomaly, then a defect report be submitted to CASA by the normal means.

6. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link email address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

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