Service Instruction SI-0024

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

Subject: K006 Rudder Trailing Edge Void Repair

ATA-Code: 27-20

Labor: 10.0

Effectivity: K006

Affected Model(s): E1000

Due: Before Next Flight

Compliance: Recommended ☐ Mandatory ☒

Recurrence: N0

1 BACKGROUND AND PURPOSE:

In accordance with SB-0031, ultrasonic inspection was completed on the Rudder trailing edge bond line of Serial Numbers K006. The inspection found a void 2.4" x .5" in area beginning 6.75" below the trim tab cutout as shown in the following figure.

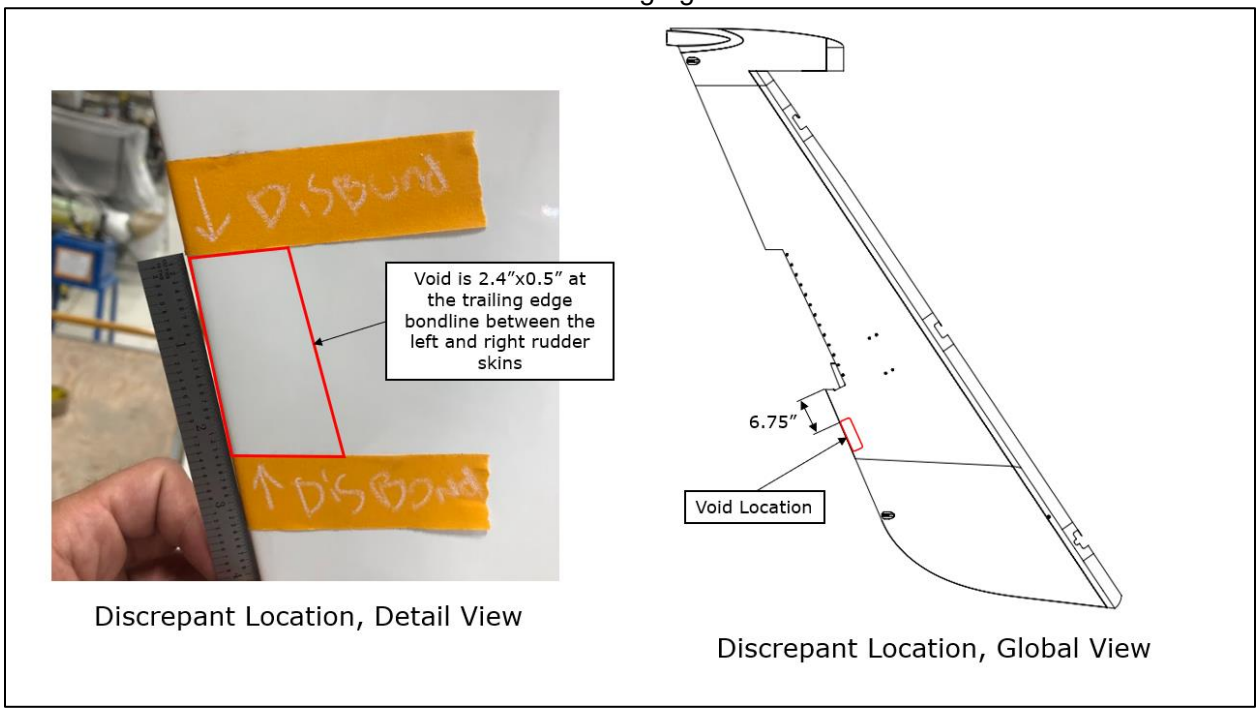


Figure 1: Void Region

This Service Instruction provides repair instructions for the condition described above.

2 REFERENCES:

Epic E1000 Airframe Maintenance Manual, PN SK05000000

3 WARRANTY:

Aircraft warranty is not affected if work is performed IAW this Service Notification. The work outlined in this service notification is covered under warranty.

4 APPROVAL:

The engineering aspects of this service document have been shown to comply with the applicable Federal Aviation Regulations and are FAA approved.

5 TOOLS:

No.	Description	Qty	Epic Aircraft Supplied	Customer Supplied
1.	Common Hand Tools	A/R	☐	☒
2.	Thermocouples J or K Type	1	☐	☒
3.	Portable Bonding and repair controller and heaters	1	☐	☒

6 PARTS/MATERIALS:

No.	Part Number	Description	Qty	Epic Aircraft Supplied	Customer Supplied
1.	Sandpaper	Aluminum Oxide, 80-220 Grit	A/R	☐	☒
2.	Scotch-Brite	General Purpose Pad 7447	A/R	☐	☒
3.	White Cotton Flock - W200		A/R	☐	☒
4.	Loctite EA 9360 Aero	Type 1 Bonding paste	A/R	☐	☒
5.	Imron AF740	Clearcoat	A/R	☐	☒
6.	Imron AF700, color Epic White 4192016	Basecoat	A/R	☐	☒
7.	8989S	Accelerator	A/R	☐	☒
8.	13100S	Activator	A/R	☐	☒
9.	-	Isopropyl Alcohol, 99%	A/R	☐	☒
10.	Hermitex 300 or Kimtech P2 or DuPont Sontara AC9165A	Wiping Cloth	A/R	☐	☒
11.	-	Paper, non-lined or plastic mixing cups	A/R	☐	☒
12.	1220S	Primer	A/R	☐	☒
13.	-	Stir sticks	A/R	☐	☒
14.	416	Metal Glaze	A/R	☐	☒

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

15.	Plastic Syringe	2” long, 0.187” Diameter plastic Syringe, McMaster-Carr number 7519A47	A/R	☐	☒

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

7 INSTRUCTIONS:

7.1 Repair Instructions

1. Set the BATT 1 and BATT 2 switches to OFF.
2. Remove all external electrical power from the airplane (refer to Epic E1000 Aircraft Maintenance Manual, PN SK05000000, chapter 24-40).
3. Remove the rudder (refer to Epic E1000 Aircraft Maintenance Manual, PN SK05000000, chapter 55-40).
4. Place the rudder on a suitable work surface.
5. Remove the paint from the indicated area at the Rudder trailing edge.
6. Working from the trailing edge, carefully remove the adhesive and damaged material in the discrepant region. Adhesive removal is to extend 0.125" above and below the discrepant area until all void area is removed. It is acceptable to trim laminate from the trailing edge to expose the discrepant area, but do not trim past leaving 0.050” of laminate on each side of the trailing edge. See Figure 2 for material removal limits and region.

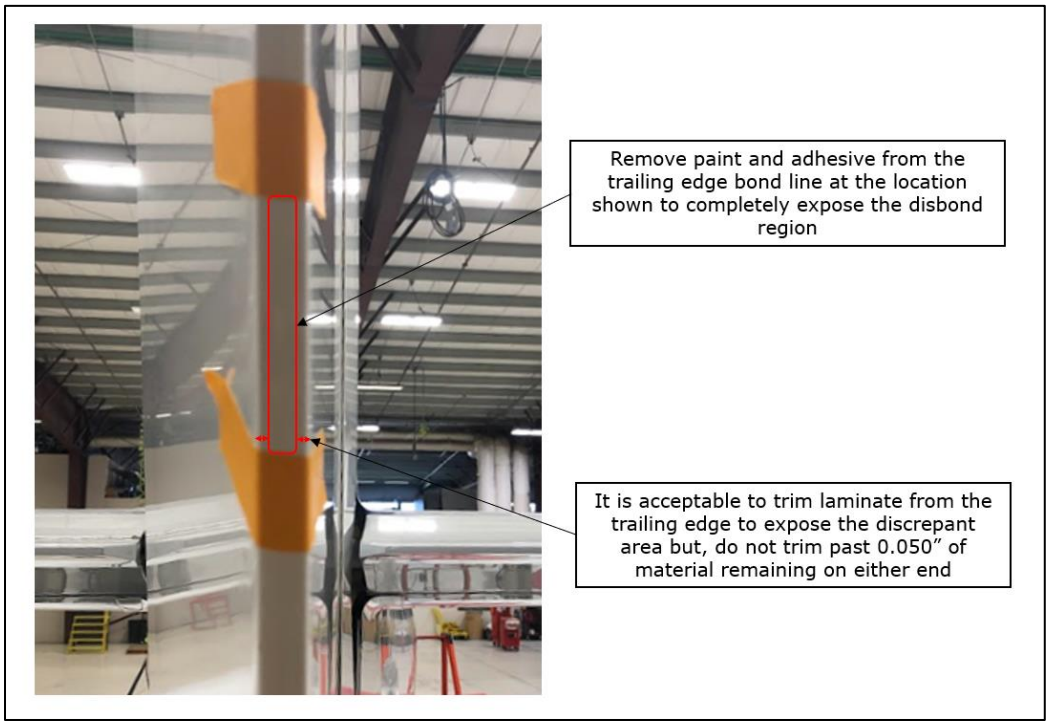


Figure 2: Material Removal Limits

7. Trim the trailing edge of the rudder in the void region as needed to provide access to the bond line. It is acceptable to trim laminate from the trailing edge but do not trim past the outward facing rudder skin thickness of 0.050" on each side. See Figure 2 for material removal region.
8. Report the location and final dimensions of the material removal region to Epic for review.

NOTE: During the trimming completed in steps 6 and 7, the Left Rudder Skin was over trimmed to a minimum thickness 0.025" as shown in the following figure 3.

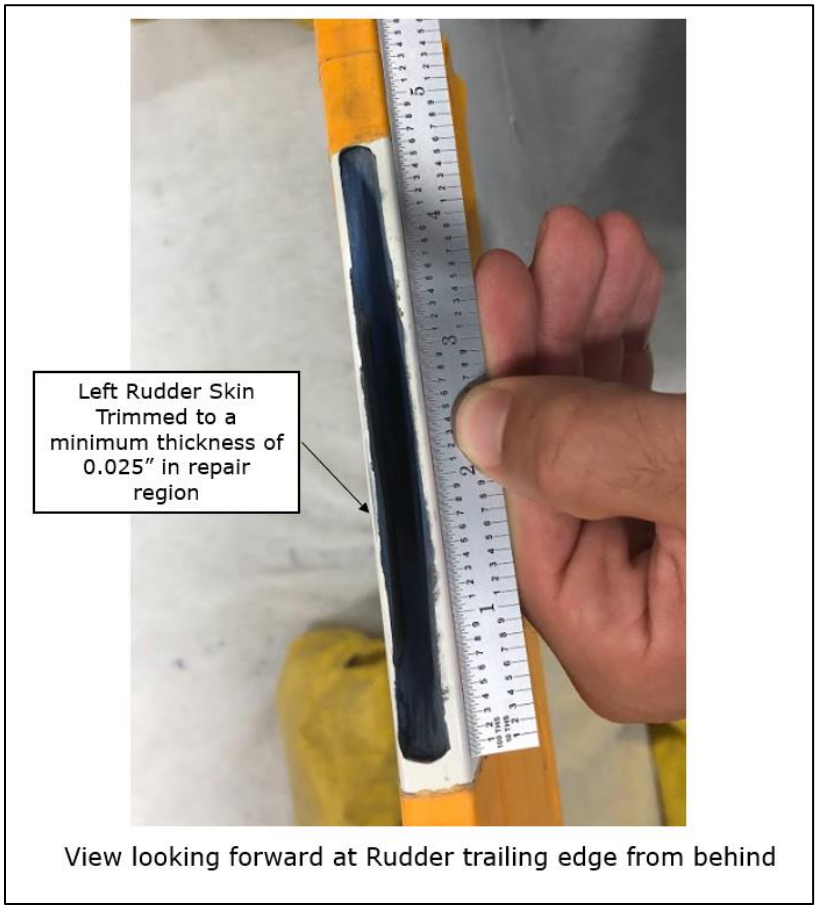


Figure 3: Left Rudder Skin Over Trim

9. Clean and surface prep the remnant adhesive and exposed inner surface of the Rudder Skin along the length of the material removal region as follows:
   a. Wash the surface with isopropyl alcohol.
   b. Abrade the surface with 80 - 150 grit sandpaper.

c. Remove abrading dust with a vacuum before dry-wiping the surface with a clean, dry, lint-free cloth.

d. Final clean the surface by thoroughly wetting the surface with isopropyl alcohol then immediately wiping with a clean, dry, lint-free cloth in a single stroke. After each wipe, turn the drying cloth to a clean surface.

NOTE: It is acceptable to perform surface prep operations listed above using a stir stick with the appropriate cloth, sandpaper or alcohol wipe attached to the end.

10. Mix Loctite EA 9360 Aero Bonding paste at a ratio of 100:43 by weight (Part A: Part B). Mix for a minimum of two minutes until a uniform color is achieved. Take care to scrape the sides of the container and mix such that air bubbles are not introduced to the paste. Transfer the Mixed resin to a separate container (aka “double cup”) prior to the addition of any fillers
11. Fill a 2” long 0.187” diameter plastic syringe (item 15) with neat (not mixed with flock) EA 9360 Aero Bonding paste for use as a sample cup. The sample cup is to be cured with the repair in all subsequent curing steps.

NOTE: Set aside a small amount of neat (not mixed with flock) EA 9360 Aero Bonding paste for use in future steps.

12. Add cotton flock filler at a ratio of 8% by weight to Loctite EA9360 Aero Bonding paste mixed in step 10.

NOTE: The pot life of Loctite EA 9360 Aero bonding paste is determined by the environmental temperature and humidity. See Section 7.2 of this document to determine pot life and complete all bonding steps within the allowable timeframe.

13. Within the pot life of the bonding paste, wet out the surface of repair region using neat EA 9360 Aero Bonding paste. Apply paste in a thin layer on the remnant adhesive and exposed laminate in the repair region.
14. Within the pot life of the bonding paste, completely fill the repair region with the bonding paste-cotton flock mix.

NOTE: Take care to apply adhesive such that no air bubbles or discontinuities are introduced to the repair region.

15. Cure as follows:

    a. Cure for 24 hours at room temperature, or

    b. Cure by applying an air temperature ramp from ambient to 95 deg F at a max rate of 3 deg per minute. Once 95 deg is reached maintain air temperature at 95 deg +/- 5 deg for 120 minutes before allowing to cool.

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

16. Visually inspect the repair region for defects and complete a UT inspection to make sure there are no voids.
17. Final cure as follows:
    a. Apply air temperature ramp from ambient (100°F or lower) to 160±10°F at a max rate of 5°F per minute.
    b. Maintain the air temperature at 160±10°F for a minimum of 90 minutes.
    c. Cool down the air temperature to 110°F or lower at a max rate of 5°F per minute before allowing to cool.
18. Return the sample cup fabricated in step 11 to Epic to verify passing adhesive Tg requirements.
19. Prep, prime and paint the repair (refer to Epic E1000 Aircraft Maintenance Manual, PN SK05000000, chapter 51-20).
20. Check the balance of the rudder (refer to Epic E1000 Aircraft Maintenance Manual, PN SK05000000, chapter 55-40).
21. Install the rudder (refer to Epic E1000 Aircraft Maintenance Manual, PN SK05000000, chapter 55-40).

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

7.2 Facility Qualifications

Mix and apply Loctite EA 9360 Aero Bonding Paste within the pot life defined in the following Figure. The pot life is shown in minutes; 50 minutes for green, 30 minutes for yellow, and no bonding allowed for red.

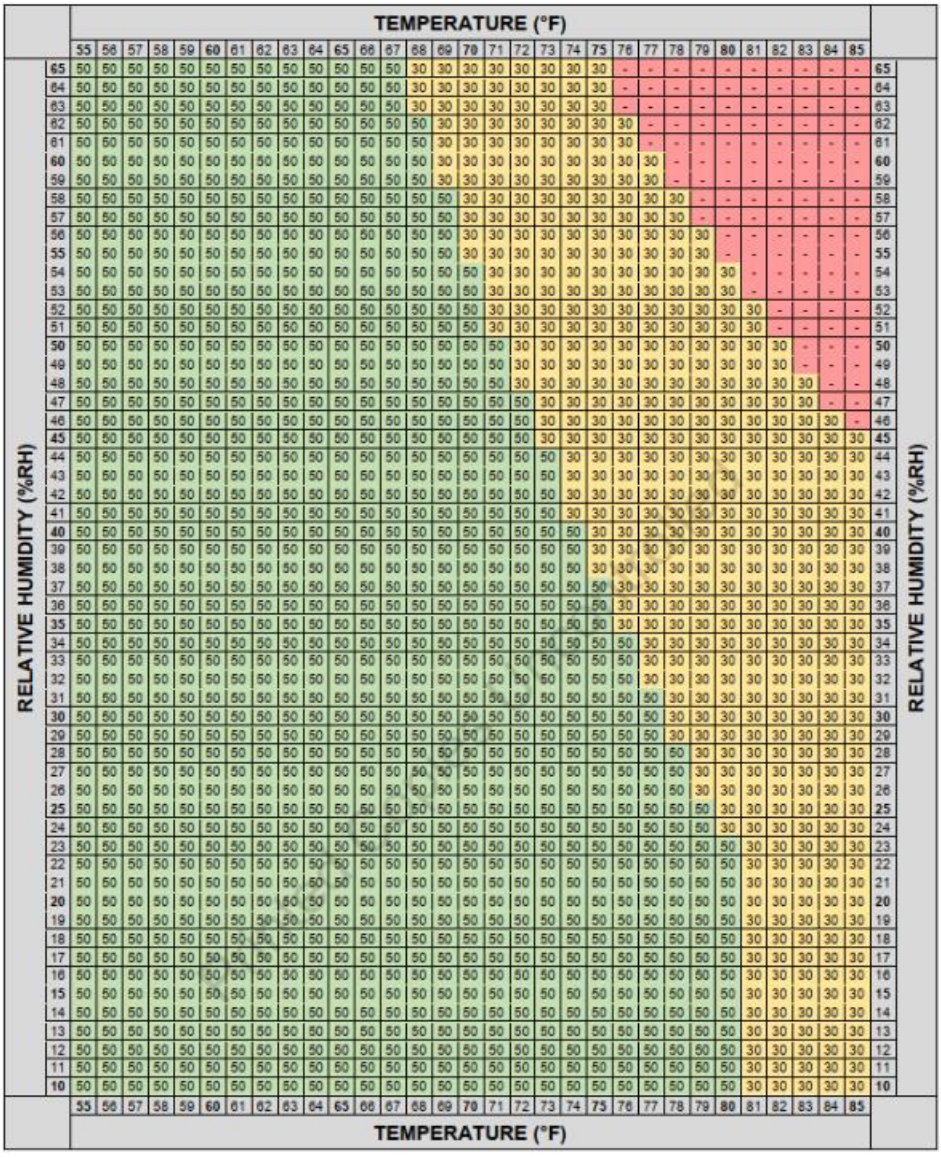


Figure 4: Loctite EA 9360 Aero Bonding Paste Pot Life Requirements

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

8 WEIGHT AND BALANCE:

Negligible

9 PUBLICATIONS AFFECTED:

N/A

10 RECORD COMPLIANCE:

Make appropriate entry in airplane maintenance records.

Epic Aircraft, LLC ◆ 22590 Nelson Road ◆ Bend OR 97701
Phone: 541-318-8849 ◆ Fax: 541-382-5125 ◆ Web: www.epicaircraft.com

Appendix A: Compliance Letter

Please complete and mail this form to Customersupport@epicaircraft.com

This is to certify that I have completed the work in accordance with the Epic Aircraft, LLC Service Instruction.

Aircraft Owner Information:
Date: _____ Aircraft Serial Number: _____ Aircraft Reg. Number: _____ Owner's Name: _____
Maintenance Entity Information
Name of Shop Performing the work: _____ Name of Person(s) Performing inspection and/or work: _____ Phone Number: _____ Email: _____