

Cessna I40, Failed Wing Fabric Patch

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An A&P mechanic stated "this Wing was previously repaired by removing the upper top center fabric between stations 58 to 176. The Ribs were repaired pursuant to 337 and the fabric was replaced using the Super Flite System II Recovering Process (Super Flite), as outlined in their D-102A Manual. This manual calls for a 2-inch minimum overlap of fabric. The mechanic completed this repair using a 3 to 4-inch overlap on the previously finished old fabric.

For further reference, AC 43-13 1B (Chapter 2; section 4; paragraph 2-45d) calls for a maximum of 4-inch overlaps on wing repairs on aircraft not exceeding VNE (velocity never exceed) of 150 MPH. The Super flite Manual states the technician can complete the repairs without removing the old finish coat. They used Cessna fabric clips to attach the fabric to the ribs.

During a flight, the fabric patch came off. The aircraft landed with some difficulty, but without incident. The mechanic speculated the air stream got under a loose tape and lifted the entire patch from the wing, including ripping the fabric clips out of the ribs. Further speculation is the pilot's preflight had failed to identify the potential problem regarding the loose tape.

The Super flite Recovering Process has changed over the years. The new System VI differs from the older process in the type of base primer and finishing paint. Further investigation determined Super Flite changed their instructions for installing fabric tapes. Under the System II instruction manual D-102A, tapes were laid in a wet bed of thinned U500 adhesive and covered with an additional coat applied with sufficient pressure to squeeze out any air bubbles. The current System VI process and manual D-102B calls for brushing a coat of thinned U-500 adhesive is applied where the tape is, the adhesive is dried and another application of the U-500, which is also dried. After the U-500 is completely dry, the technician brushes the laid down tape with Methyl Ethyl Ketone (MEK); the technician works the cement up into the weave of the tape and pays special attention to working the edges down to secure the tape.

"To prevent any future problems with this aircraft, the repair to the wing is made by applying new fabric to the entire upper surface of the wing and overlapping the fabric around the leading edge as outlined in the System VI Manual for new installations. In addition, pinked edged tapes are used in place of the straight edged tapes of the older repair and installation. This allows for better adhesion due to the increased surface area. As the left wing was repaired in a similar manner, the existing upper fabric will also be replaced. Inspection of the right wing has revealed no signs of a problem but it has been determined to proceed with this additional work in the interest of safety."

Part Total Time: (unknown).