

TECHNICAL UPDATE

9

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Distributed as a free service to all Lazair owners

9.1 MORE ON TAPE

In Technical Update Item 8.2, we described a problem of inadequate tape adhesion and suggested some possible causes and solutions. As the problem has been isolated, not just to a few aircraft, but to a few small areas on those aircraft, it is difficult to find a common denominator. Samples of covering and tape from one aircraft showed excellent adhesion just a few inches away from a small area where the adhesion was unsatisfactory. This suggests a fault in the adhesive (although this appears unlikely in view of the previous statement) or, more probably, inadequate pressure when the tape was applied, or perhaps insufficient or improper cleaning of the material before the tape was applied. Regardless of the cause, our greatest concern is that a small area of poor adhesion might remain undetected by a cursory preflight inspection. Even though the probability of an undetected adhesion problem may be slight, we strongly recommend double taping the Tedlar® on the leading edge of the wing to lessen any chance of an undetected problem. To make this as financially painless as we can (and thereby encourage owners to adopt the recommendation) we are prepared to provide each owner with one 90 foot roll of 2.6 inch wide Tedlar tape, with instructions for proper application, at a special reduced price of \$15.00 CDN (\$13.00 U.S.), post paid, with a limit of one roll per aircraft. Please note that this is not just a gimmick to sell tape and this price is considerably below the regular retail price. To take advantage of this special price, the order form on page 5 must be filled in completely and returned with full payment. As present stock of tape is limited and there is a significant lead time before the next shipment, owners who wish to continue flying (rather than waiting for spring) are urged to order the tape as soon as possible. Please note that if your kit was shipped with 2.6 inch wide Tedlar tape and your Lazair was covered according to the additional instructions for application, using the tape paddle (applicable to serial numbers A833 and subsequent), the double-taping should not be required. However the tape and covering should be inspected carefully, and the double-tape should be applied if there is any indication of an adhesion problem. Also, each preflight should include visibly checking the tape seams, especially on the leading edges of the wing.

9.2 D-CELL NOSERIBS

Since publishing Technical Update No. 5 in June '82, we have had a second report of loose noseribs inside the D-cell. Because of this, owners of all Lazairs, regardless of vintage, are asked to please check your noseribs as described in Technical Update Item 5.7. If necessary, noseribs should be repositioned and bonded in place. To facilitate this procedure, we can make a repair kit available at a nominal charge. This would include rivets, tape, adhesive, tape gussets (to re-attach the Tedlar) and complete instructions. Although the repair procedure may be somewhat tedious, a pair of wings can be done in less than a day, and the added safety margin and peace of mind would certainly make it worth the trouble.

NOTE: Be sure to determine if this is necessary before double-taping your D-cells (item 9.1).

9.3 PUSHROD LUBRICATION

Most Lazair owners are well aware of those annoying squeaks that emanate from the F32 pushrod guides when someone moves the control column. We have tried many lubricants (Ref. Technical Update items 4.4 and 5.6) but until recently have not found any to be completely satisfactory. However, while attending the

International Association of Police Chiefs Convention in Detroit (where we had the new Lazair SS on display) we discovered a product called Break-Free® CLP (cleaner, lubricant, & preservative) which is sold primarily for cleaning and lubricating guns. After using this on the pushrods for about two months, it appears to be much better than anything else we have tried. It penetrates and lubricates well, does not seem to attract or trap airborne abrasives, and, based on our testing so far, it appears to last quite well. We are so impressed with it that as soon as we can get a sufficient quantity, we will be including a small bottle with each new Lazair kit, and will also make it available through authorized Ultraflight Dealers and Distributors. The list price* is \$2.25 CDN (or \$1.60 U.S.) per 20 ml. bottle.

While we're on the subject of pushrods, one owner has reported wear on his pushrods due to rubbing on the gap cover. Although there was clearance on the ground, it appeared that the gap cover tended to lift slightly in flight and contact the pushrods. Check for signs of wear on your aircraft and trim the gap cover if necessary.

9.4 PROPELLER MATERIALS

About a year and a half ago we began working with a glass reinforced thermoplastic polyester material which, although somewhat heavier than the carbon fibre filled nylon which was being used for propellers at that time, promised a higher "flexural modulus". In essence, this means less tendency for tip flutter, and a potential for higher thrust from a particular blade size and shape. Tests on a static test stand, and flight testing, showed that the performance improvement from using this material was small, but measurable. Structural testing, which involved intentionally overspeeding the propellers (the centrifugally developed tensile stress in a propeller at 9,000 RPM is over two and a half times as much as it is at 5,500 RPM), in addition to static pull tests, endurance tests, and notch sensitivity tests, all indicated that the new material was at least as good, and in some respects, better than the carbon fibre/nylon. Several months after we started shipping the glass/polyester propellers we began to receive occasional reports of propellers breaking in service, and a general warning was published in Technical Update Item 7.3. Since then we have been able to examine several broken propellers and have isolated the cause of breakage to three contributing factors --- (a) Propeller bolts overtightened, causing additional compression and shear stresses in the material, (b) propellers being subjected to speeds beyond their design speeds by the use of tuned exhaust systems, and (c) areas of non-homogeneity in the material. Although we can make recommendations to owners, we have no direct control over items (a) and (b). However, we do have some control over Item (c) and that control was exercised by reverting to the previously used carbon fibre/nylon material. Based on statistical data fed back from customers, the endurance of the glass/polyester propellers is significantly better (between two and three times better) than the wooden propellers used initially on the Lazair. However, since we now believe that the carbon/nylon material is significantly superior to the glass/polyester, we want to encourage owners who have glass/polyester props to replace them with carbon/nylon. For those who wish to buy carbon/nylon props and keep the glass/polyester props as spares, the regular price* of \$66.08 CDN (\$52.86 U.S.) per propeller will apply. However, anyone who returns glass/polyester propellers with an order can receive replacement carbon/nylon props for a reduced price* of \$22.00 CDN (or \$19.00 U.S.) each. To save shipping costs, you may, if you wish, saw the propeller in two places and return only the center section (containing the 15/16" hole). Determining which material your props are made from is quite easy and can be done by removing a propeller and weighing it. If it weighs more than 10 ounces, it is glass/polyester and should be replaced. If it weighs less than 10 ounces, it is carbon/nylon and need not be replaced. If you don't have a weighscale with sufficient accuracy, you can take the prop to your local supermarket or post office to have it weighed. Note that if the serial number of your kit is below A530 or above A754, (and you have not replaced the original propellers) you can assume that it was not shipped with glass/polyester propellers, and the check should not be necessary. However, before you saw the propeller into pieces, be

sure you are not destroying carbon/nylon props as the special price applies only to replacement glass/polyester propellers.

9.5 WATER IN FLOATS

Pilots flying on floats should be aware that any hollow float, regardless of the type of construction, can be cracked or punctured so that it can take on water. If the weight of the water in the float is sufficient to prevent the aircraft from taking off, it might be annoying, but probably not as serious as it can be if the aircraft is able to lift off with water in the floats. Under this condition, the water will tend to run toward the tail of the float during takeoff and climbout, then the first time the stick is pushed forward to attain a nose-down attitude, the water can run to the front of the float and increase the pitching moment significantly. Test flights have been made with over fifty pounds of water in the floats and the aircraft was quite controllable. However, with an inexperienced pilot (or even an experienced pilot who is not aware of the water in the floats) this condition could possibly initiate or at least amplify a pilot induced oscillation.

One method of detecting water in the floats is to mark the nominal waterline on the floats (when you know they are dry, the seat is unoccupied, and the fuel tank is full). Any noticeable change in the waterline will then be an indication of an abnormal condition. A more reliable method would be to put an inspection hole in the top of the float, midway between the two forwardmost crosstubes. This could then be used for a visual inspection (with a flashlight) or could be used for the insertion of a dipstick. Make sure the hole is properly plugged before using the floats so it doesn't become the source of the problem rather than the solution. A toggle-action Thermos® bottle stopper can make an excellent removeable plug.

The use of bulkheads to form watertight compartments inside the hull, to prevent sloshing, is the obvious (but not necessarily easy) ultimate solution. One float manufacturer added bulkheads to a previously acceptable float design and discovered that the stress concentration due to the bulkheads caused his floats to break in a hard landing. We are presently working on a new float design incorporating a special pre-molded bulkhead for proper stress distribution to be used on the Series III Lazair.

9.6 KEEP YOUR BOLTS TIGHT

Owners of Lazairs equipped with the optional rudder pedal kit are reminded that the attachment of the P20 plug to the top of the P22 torque rod is designed as a clamp, not as a pin. To work properly and avoid the possibility of a failure of the P22 torque rod, it is essential that the nut on the 311 bolt be tightened sufficiently to clamp the P20 onto the P22. This should be checked visually and by "feel" during every preflight inspection, and occasionally by using a torque wrench (a torque of 3.0 lb. ft. is recommended). If there is any indication that the threads may be stripped, both the bolt and nut should be replaced.

9.7 CHECK YOUR FRONT FITTING

The owner of a very high time Lazair has reported a fatigue crack in the forward tab on the front fitting (the tab to which the T12 [or T312] is bolted). Although this is not expected to become a common problem, a visual inspection of this fitting should be added to your preflight checklist, and the edges of the fitting should be sanded smooth (ref. paragraph 1.4.1 of the Lazair™ Assembly Manual).

9.8 JURY STRUTS FOR YOUR SERIES II OR III LAZAIR

Those who have seen the Lazair II, the SS, or the Elite, have probably noticed that all of these models have jury struts to increase the allowable gross weight and/or negative limit-load factor. Due to numerous

enquiries from owners wanting to know if jury struts can be added to their Series II or III Lazairs, we have produced a retrofit kit which includes four jury struts, with clamps, brackets, strut fitting stabilizers, all required hardware, and instructions for a suggested list price* of \$59.00 CDN (\$48.00 U.S.). With this kit, the customer must widen the slot in the P17 upper strut plug from 1/8 of an inch to 1/4 inch. If you do not wish to do this, the P210 strut plugs as used on the two-place Lazair (which are made with a 1/4 inch slot) are available at \$16.22 CDN (\$12.98 U.S.) each. The addition of jury struts will increase the negative limit load factor for a Series III Lazair from -1.3 g's to -2.1 g's at 420 pounds gross weight. On a Series II, the limit load factor can be increased from -1.4 g's to -2.2 g's at 395 pounds gross weight. [Note that, by definition, the limit load factor is the demonstrated ultimate load factor divided by a factor of safety of 1.5, and it is the limit load factor which should be used as a criteria when selecting or flying an ultralight. Do not be misled by some published specifications which may be ultimate values].

9.9 AILERON ADJUSTMENT

When the article in AOPA's "Ultralight Pilot" magazine reported a single engine sink rate of 300 fpm, we thought it was a typographical error and should have read 30 fpm (since this is about the value most Lazair pilots have reported). However, we were told that this was not an error, and 300 fpm was what they measured. Our dealer in that area later test flew the aircraft and confirmed that the single engine performance was considerably inferior to other Lazairs he had flown. In attempting to find the cause, he noticed that with the stick in the neutral position, both ailerons were biased up about 5/8 of an inch. With the pushrods adjusted to their proper neutral position, the aircraft was test flown again, and single engine performance was excellent.

9.10 LAZAIR SERIAL NUMBERS

The serial number of your Lazair(s) is printed on the mailing label for this Technical Update. If no number is shown, this indicates that your serial number is not on file and you are not on the permanent mailing list.

To make sure you continue to receive these mailings, make sure your name, address and Lazair serial number are on file with us. If you have not already done so, write your serial number inside the cover of your Lazair Owners Manual for future reference.

9.11 TRIM TABS

Although the most efficient method of trimming a Lazair is by moving the seat, small adjustments may be made by adding trim tabs to the ruddervators. If, by flying your Lazair, you have decided that a small amount of trim adjustment is required to make it trim out "hands off" (at any safe speed you want), you can add the trim tabs and bend them as required. The tabs should be cut from .025 to .040 thick aluminum alloy and riveted to the trailing edge of both ruddervators then bent slightly, and test flown. Just be sure to bend them in the right direction. If the aircraft feels tail heavy (requires forward pressure on the stick to fly straight and level) the trim tabs should be bent up. Although the size of the trim tab and the angle of bend will depend on the amount of trimming required, a tab 3 inches wide and 12 inches long should more than be adequate for most situations. The tabs should be riveted to the ruddervators as close to the top as possible without causing interference with the ruddervators in the full down position.

* Unless otherwise noted, all prices shown are Manufacturers Suggested List Price, F.O.B. Port Colborne, Ontario, Canada, and are subject to change without notice. When ordering any of the items specified in this bulletin be sure to enclose sufficient funds to cover postage/shipping charges. This will avoid delays in the processing of your order.