

TECHNICAL UPDATE

Number **3** September '81

Distributed as a free service to all Lazair owners

3.1 ROUTING OF MAGNETO WIRE

When you mount your engines and connect the magneto grounding wire (the one which runs back to the kill switch) make sure the wire is routed well away from the cylinder head. If it rests against the head, the insulation could melt, causing the wire to be grounded, and stop the engine.

3.2 ERROR IN AIRSPEED INDICATOR READING

If you read your copy of "Learning to Fly the Lazair" you're probably aware that the Hall Brothers airspeed indicator, when mounted on the fuselage of the Lazair, provides a good relative indication of airspeed, but does not give an accurate reading in miles per hour. At take-off speed, the reading is probably accurate within two or three miles per hour but at higher speeds, your actual airspeed will be much higher than indicated. With a reading of 40 mph, your actual airspeed will be probably about 55 mph, and this is the recommended maximum flying speed.

3.3 LEAKY FUEL FILTERS

As reported in a previous letter, most of the problems of air bubbles in the fuel lines have been traced to the primer bulb. However, we have had a couple reports of leaks in the fuel filter. To eliminate this potential problem, we recommend that the in-line filter be replaced with the submersible type.

3.4 AILERON PLUGS

One of our high time demonstrator aircraft has recently developed loose rivets in the aileron plug P4. This particular aileron had only four rivets in it rather than eight as specified in the assembly instructions, so we do not anticipate a problem on customer-built aircraft, but we do suggest that you check your aileron plugs occasionally during the walk-around.

3.5 DON'T DO IT IN THE ROCKS

Although the tail of the Lazair has been designed to withstand the loads imposed by normal and very heavy landings, it is not indestructible. We have had a report of one aircraft which was taking off from a rock-strewn field and struck the tail on a large rock at high speed just prior to take-off. The impact was sufficient to bend the rear stabilizer tube T10 and dislodge the outboard ruddervator hinge pin. Although the pilot was able to maintain control and land without incident, this situation should obviously be avoided if possible. If you have to take off from a rocky field, remember to keep the tail off the ground.

3.6 CHECK YOUR TAIL

In the last letter we mentioned the possibility of breaking the rear tail attach fitting (F4) by landing in very tall grass. Since it might be possible to break or crack an F4 without being aware of it, we suggest that you include a check of the F4 in your walk-around. The most probable location for a crack, if one should ever occur, is through the rivet hole, so this area should be checked carefully.

3.7 TIRE PRESSURE

If you're lucky enough to have the new tundra wheels, remember that they are designed for Low Pressure tires. The best tire pressure will depend on the type of field and the weight of the pilot, but should not under any circumstances, exceed 18 PSI.

3.8 BLUE MAGNETOS

A few of the engines shipped in the past couple of months have had magneto ignition units with a light blue housing. For some reason, these engines will not always run properly with the two magnetos connected to a common grounding switch. (We suspect that the older units contained a decoupling diode which has not been installed in the new blue ones, but this has not yet been confirmed by the manufacturer). In any case, the problem can be eliminated by using a separate switch for each engine (or by using a double pole switch). To save time, if you have the blue magneto units, we suggest that you obtain another switch locally, but if you can't locate one, let us know and we'll send you one.

3.9 AEROBATICS

We have heard recently that a few customers have been flying loops and other aerobatic maneuvers in their Lazairs. While there is no doubt that the Lazair is capable of executing some of these maneuvers (as demonstrated by the Ultraflight factory test pilots), this type of flying is definitely not recommended for the average Lazair pilot. The Lazair is stressed for 4 g's positive and 2 g's negative. This is quite adequate for any normal flying conditions but it is not even close to the stress requirements for fully aerobatic airplanes.

A properly executed inside loop will probably pull less than 3 g's. However, a poorly executed loop (one entered at too high an airspeed or with an abrupt movement on the control column or one with a prolonged period of vertically downward flight) could pull well in excess of the 4 g design limit for the aircraft. We don't want to hear about someone pulling the wings off in flight! Accidents of this type are very easy to avoid — just don't do it.

3.10 IN-FLIGHT RESTARTS

One of the attractive features of the Lazair is its ability to soar with the engines off, and then fly home with its engines restarted. However, restarting these engines in flight is a technique to be practised and learned only after the basic skills of flying the Lazair have been mastered. As was suggested in the first of these update letters, your first attempt to restart in flight should be made at an altitude of at least 1000 feet. It should also be made in an area where you can glide to a safe landing should your restart be unsuccessful.

Although a restart looks easy when you're on the ground watching someone else do it, you may find it's a bit different when you're up in the air trying it yourself. First of all, it's necessary to lean forward to grasp the pull cord — this can be a difficult reach for a short-armed pilot. Leaning forward will change the trim and put the aircraft into a nose down attitude. This can be compensated for by a slight back pressure on the stick, but applying back pressure as you lean forward may not be as easy at first as you might expect.

In addition to this, you will probably experience more difficulty starting the right engine because this requires operating the control column with your left hand. This is not necessarily easy — especially if you've never done it before.

Above all, remember one thing -- Fly the Airplane. Regardless of what the engines are doing, your number one priority is to maintain some semblance of straight and level flight. When you're starting an engine, don't look at it -- watch where you're going. And one other word of advice -- don't forget to turn on the magneto switch. This may sound ridiculous, but even a very experienced pilot will forget occasionally. If you don't believe this, ask John Moody who couldn't get his engine started while demonstrating the restart capability of his Easy Riser to the crowds at Oshkosh this year.

3.11 MYLAR LIFE

The life expectancy of the mylar used to cover the Lazair is proving to be very difficult to predict. One of our demonstrators which has been hangared when not flying, has survived three years with no visible signs of deterioration, while two owners who have had their airplanes tied down in direct sunlight have reported mysterious rips in the mylar in the first year. One of these is believed to be the result of vandalism, but the other appears to be a degradation of the mylar caused by exposure to ultraviolet radiation from the sun. Another Lazair, which was left outside during most of last summer was tested for mylar deterioration by having a 180 pound man walk on the wing and it withstood this with no damage.

Obviously factors other than the duration of the exposure to sunlight will determine the life of the mylar -- the intensity of the ultraviolet radiation (a function of latitude and atmospheric conditions) the angle of incidence, and perhaps even the manner in which the heat shrinking was done, could affect the longevity of the mylar.

Based on experience gathered to date, we can offer the following suggestions:

- (a) Keep your airplane in a hangar or trailer when not in use.
- (b) If a hangar is not available and disassembling your airplane to put it into a trailer after every flight is impractical, make some wing covers from vinyl or fabric.
- (c) If your airplane is protected as suggested in (a) or (b) above, replace the mylar every two years.
- (d) If your airplane is not protected from ultraviolet radiation, recover at least the top surface of the wing every year and the rest of the mylar every two years.
- (e) Test the strength of the mylar occasionally by slapping it soundly with the flat of your hand.

Recovering your Lazair is relatively inexpensive and can easily be done in a weekend, so doing it every two years or even once a year should not be a serious burden.

3.12 CYLINDER HEAD BOLTS

We have received two reports of cylinder head bolts working loose. Considering the number of engines now in use and the total flight hours accumulated, two loose bolts would not indicate a serious problem but it does suggest that the bolts should be checked occasionally and should be re-torqued after the first five hours running time. The recommended torque is 8 foot pounds.

3.13 HOLEY MUFFLERS BATMAN!

Pilots flying Lazairs from high altitude airports can get a bit more thrust to compensate for the reduced air density by drilling four 3/8" diameter holes in the top of each muffler. This will increase the maximum propeller speed by approximately 150 RPM, but since it also produces a corresponding increase in noise, it is not recommended unless you're sure you need the extra thrust.

3.14 RE-USE OF ELASTIC STOPNUTS

Since elastic (or Nylock) nuts gradually lose their grip if they are repeatedly installed and removed, it is

recommended that the nuts on the Lazair (N3 and N4) be replaced by new ones after they have been removed three times.

3.15 CUSTOMER DESIGNED MODIFICATIONS

We have seen and been told about many modifications being made to Lazairs. Some of these are good and some are not so good. The modifications which are of greatest concern are those which involve drilling holes in tubing. The bend strength of a tube is drastically reduced by drilling a hole through it — not just as a direct function of the reduction in cross section, but much more because of stress concentration.

There is also a considerable difference in bend strength depending on the location of the hole (whether it is on the neutral or quadrature axis). Unless you are very sure that you understand the effects of drilling a hole, don't do it.

Tubes where additional holes must not be drilled under any circumstances are the wing struts and the main axle. If you have already drilled holes in the 1 1/4" axle tube, and you're not planning to install the new wheel and axle kit, let us know and we will send you a new 1 1/4" axle.* **

If you have one of the first fifty Lazairs (with the bicycle seat), there will be a hole through the centre of the axle for the seat support tube. Although there has never been a reported problem in this area, the safety factors for a high g flight or landing load are not as high as we would like after watching the way some Lazairs are flown. If you have a Lazair with the bicycle seat, please let us know and we will send you an inner sleeve** to strengthen the mid-section of the axle.

* Please specify the length.

** This part will be supplied at no charge, but will be F.O.B. Port Colborne, Ontario.