

SOLAR WINGS LTD

SERVICE BULLETIN

no. 0033

Date 11/09/91

SUBJECT :

ARPLAST 162 DAM OR DAP PROPELLER.

MODELS AFFECTED :

PEGASUS XL-Q-LC (462LC HIGH POWER ROTAX ENGINE)

CLASSIFICATION :

OPTIONAL

PURPOSE :

1) General.

The Arplast type 162 propeller can be fitted to the Pegasus XL-Q-LC to give better performance, reduced noise, reduced vibration and better durability.

The propeller is available in two versions; type 162 DAM (standard), or type 162 DAP which has an integral polyurethane leading edge.

2) Pitch setting.

The pitch must be set correctly to comply with the noise certification and to give correct performance.

The pitch must be set at 16 degrees using the ARPLAST pitch setting gauge. The pitch setting angle is on the undersurface of each blade at a radius of 53.8cm.

The pitch setting placard must be placed on the top of the fuel tank in clear view.

3) Fitting instructions.

3.1) Place the blades in the hub such that the convex side is the same side as the casting marked F. Note that the castings are matched with a dot on one of the blade root faces.

3.2) Pass through all the bolts. Put the nuts onto the 6mm bolts and tighten very lightly.

3.3) Set the pitch gauge at 16 degrees. (The pitch gauge is marked off 12,14,16,18 degrees.)

3.4) Place the box section of the gauge against the rear hub face, engaging with one of the 8mm bolts. Maintaining a steady hand pressure against the hub, bring the setting quadrant onto the blade surface. Carefully rotate the blade until the pitch is exactly set. Repeat for all the blades.

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3.5) Tighten the 6mm bolts evenly to prevent rotation of the blades. Check the pitch.

3.6) Remove the large diameter propeller driving plate for the wooden propeller, if fitted.

3.7) Mount the propeller onto the driver, and evenly torque down the bolts to a setting of 15 ftlb for the 8mm bolts and 6ftlb for the 6mm bolts. Finally check the pitch, and scribe the setting on the blade root.

3.8) Check the torque after an initial 5 hours and every subsequent 25 hours. Always use bolts of the correct specification, and use new nyloc nuts every time the propeller is removed.

HANDBOOK

The appendix for the Arplast propeller contains all the necessary information regarding operation and performance. It must be attached to the operators handbook.

INSPECTION

The propeller installation must be inspected by a Solar Wings or BMAA approved inspector, and the modification entered in the technical log.

When the permit is renewed, the modification must also be entered on the BMAA-AW10 form.

W. G. Brooks (Chief Designer).



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cf appendix.

issue 1

APPENDIX FOR THE OPERATION OF
THE ARPLAST TYPE 162DAP OR 162 DAM
THREE BLADE COMPOSITE PROPELLER.

Fitted to the

PEGASUS XL-Q-LC (ROTAX 462 HIGH POWER LC ENGINE WITH 2.58:1 GEARBOX)

Operation and maintenance of the ARPLAST type 162DAM or DAP propeller when fitted to the Pegasus XL-Q-LC.

1) Performance.

1.1 Pitch setting.

The propeller pitch must be set at 16 degrees using the ARPLAST pitch setting gauge. The gauge sets the pitch on the undersurface of the blade at a radius of 53.8cm.

1.2. Static RPM.

The static RPM should fall within the range 5950-6150 at the engine crankshaft.

1.3. Takeoff.

The takeoff performance to clear 15m at max all up weight =365kg, on a short grass surface, sea level, at 15 degrees C, is 150 metres.

On a 30 degrees C day, at sea level, the takeoff run will be approximately 180 metres.

I the altitude is 5000 feet and the temperature is 30 degrees C, the takeoff run will be approximately 300 metres.

1.2 Climb rate.

The climb rate at maximum all up weight = 365kg is 550 ft/min up to 2000 feet asl and at 15 degrees C. The best climb speed is 44 mph.

The climb rate will drop to approximately 480 fpm on a 30 degrees C day.

At 5000 feet altitude and at 30 degrees C the climb rate will be approximately 325 fpm.

With a 55kg pilot and minimum fuel, the climb rate can be as high as 1400 fpm.

1.3 Cruise.

The absence of vibration and low throttle settings with reduced noise level make the aircraft a delight for cross country cruising.

At a trim speed of 50mph the fuel consumption will be approximately 10 litres/hour.

The aircraft will maintain altitude on very low throttle settings down to 4000 rpm or so, at 35 mph and a fuel consumption of 5 litres per hour.

At full throttle, the aircraft will maintain level flight at 70 mph, 6500 rpm and burning 22 litres per hour.

1.4 Top speed.

At VNE 90 mph, the full throttle rpm will not exceed 7000 rpm providing the pitch is correctly set.

Operation and maintenance of the ARPLAST type 162DAM or DAP propeller when fitted to the Pegasus XL-Q-LC.

2. Maintenance.

2.1) The propeller bolt torque should be checked after the initial 5 hours, and then at every 25 hour intervals. The correct settings are 15 ft/lb for the 8mm bolts and 6 ft/lb for the 6mm bolts.

2.2) The blade pitch should be checked at the same intervals. Also check the blade pitch if any unusual vibration is detected. It is important to set all the blades at the same angle within a quarter of a degree.

2.3) The blades should be kept clean using a mild detergent solution.

2.4) Blade damage:

Firstly, care must be taken to use the minimum rpm when taxiing on loose surfaces; if possible, push the aircraft clear first.

Secondly, ensure that the runway is mown short enough to avoid propeller contact.

The type 162 DAP propeller has an inset polyurethane leading edge which is very resistant to damage. Impact with heavy objects can cause delamination of the composite structure. If, when the suspect area of blade is flexed, delamination is evident, the blade should be returned to the factory.

The type 162 DAM propeller is more susceptible to leading edge damage, although it is still considerably more durable than a wooden propeller. The leading edge can be protected with 3M propeller tape to stop erosion.

The blade construction at the leading edge consists of an inner braided sock laminate, with an outer painted skin laminate. Sometimes, impacts damage the outer skin but not the inner plies. For small nicks of this type, the area can be degreased with acetone, and filled with an epoxy resin filler such as SP systems S'Fill. The repaired area should be covered with leading edge tape.

Unrepaired damage will allow water to start entering the laminate. Osmosis and delamination could eventually follow.

Separate blades can be exchanged; however, it is important that the blade is replaced with one of the same balance factor ± 5 . The balance factor is written on the blade root.