TITLE	COMPONENT LIFE EXTENSION BY INSPECTION PROCEDURES
CLASSIFICATION	OPTIONAL
COMPLIANCE	ACCORDING TO COMPONENT LIFE SCHEDULE IN OPERATORS MANUAL
APPLICABILITY	ALL PEGASUS FLEXWING AIRCRAFT

INTRODUCTION
All Pegasus microlight manuals detail lifed replacement of critical items in the airframe. With extensive service experience over 20 years, some parts have proven to be less critical than first thought, whereas other areas have produced problems. Mandatory replacement of components at the required life was the initial approach. However, with service experience and a much more extensive network of inspectors, some extension of service life of some components is now possible on condition, as follows.

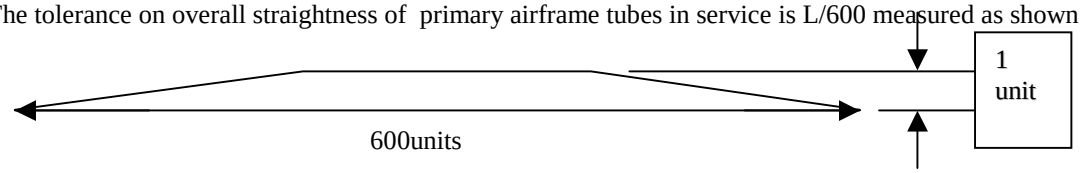
ACTION:
This service bulletin must be added to the section of the Operator's manual concerning replacement of lifed items.

Airframe Component Life:
At each scheduled component life, it may be possible to extend the life of the part by means of inspection procedures as follows. Any life extension given by such 'on condition' inspections must be entered in the aircraft technical log. On reassembly, fasteners must be inspected and new nyloc nuts used where applicable. Rivets used to locate tube assemblies must be replaced with the correct type.

Main airframe aluminium alloy tubular components:
At the required life period, all the items must be stripped out, cleaned, degreased and crack tested at holes, notches, changes of section etc. by a BMAA or Pegasus approved inspector. Dye penetrant or close visual inspection using a good quality X 5 or greater magnifying glass in good light are acceptable. Any reports of fatigue cracking must be referred to Pegasus. Following detailed inspection disclosing no cracks, life can be extended by 1/3 of the handbook new life till the next crack inspection, which must be entered in the aircraft technical log. Obviously, the part may also be rejected because of damage, corrosion or wear.

Although maximum stresses generally occur on the outer (visible) tube of a sleeved assembly, freedom from fatigue cracks in the inner sleeves cannot be guaranteed. If a sleeved assembly cannot be taken apart so as to enable crack inspection of all tubes, replacement of the assembly is the only solution.

Tolerance on Straightness:
The tolerance on overall straightness of primary airframe tubes in service is L/600 measured as shown below.



Specific Parts:

Leading Edges:
Some set on the outer leading edges is acceptable, but overall straightness must be within the limit. If the set is outside the limit, leading edge outer sections must be replaced in pairs and the wing check flown after replacement. A bent leading edge must NEVER be straightened or turned round.

Trike Pylons, Base tubes, Seatframes:
On the Quantum & Quasar main pylon, the critical areas are the connection to the wing and the trike. The rest of the pylon is most unlikely to give trouble. The attachment bush area must be inspected for cracks and loosening of the bush, especially on the top connection. Twisting of the trike relative to the wing (e.g. in a roll-over) can distort the cross section and has been known to cause cracking at the corners of the box section.
The Quantum and Quasar basetube seat frame attachment bracket holes and the rear steering hole must be checked for cracks at the time required in the manual.

The XL and Q pylon has been known to crack at the engine mount holes and the pylon top bush hole. The whole assembly must be either replaced at the required life or stripped and all tubes crack tested. The seat frame connections on the XL and Q trike are known to crack or become distorted after heavy landings, however these are readily inspectable once the fittings are disconnected.

Leading edge to crossboom bolts:
8mm bolts must be removed at the required life and replaced, or replaced with the 10mm diameter bolt modification PG123 (XL) and PG124 (Q and Q2).
Following this modification, replacement is only necessary in the case of wear, corrosion or distortion.

Hang Bolt:
Bolts generally are not amenable to fatigue crack inspection so replacement is the only course. Obvious grooves more than 0.02 mm deep, or corrosion pitting, warrants replacement. A small amount of lubricant, e.g. Vaseline, can be used.

Propeller Bolts:
If these are maintained at the correct torque, no relative movement will occur and they can continue in service as long as they are free from corrosion. If the propeller bolt torque has been allowed to slacken and there are signs of fretting/relative movement in the assembly, all the bolts must be replaced. Early Pegasus XL 462 trikes with ¼" propeller bolts threaded into the driver, should have modifications 019 (8mm bolts) and 029 (10 ft/lb bolt torque) carried out.

Hang channel
This must be inspected for wear and fatigue cracks at the required time. If wear is within limits (maximum 10.5mm diameter hole on 10mm hang point bolt), there is no distortion and no cracks exist, extend life by 1/3 as per tubular parts.

Rigging Cables:
In order to extend the life, cable assemblies must be closely inspected paying particular attention to the swaged areas for corrosion, broken strands and slippage. The thimbles must not be kinked and there must be no abrasion, loose strands or kinking over the cable run. Cables sometimes break strands in the inner core of 7 strands, which is not visible till the cable lay is unwound. Following a satisfactory inspection, extension of life by 1/3 of the new value to the next detailed inspection is allowable.

Undercarriage pickup bolts and channels:
These areas have not proven to cause problems and so inspection at the lifed period is all that is necessary.

Engine mounting bolts:
¼" diameter bolts used on Lord engine mounts have been known to fail occasionally. These must be replaced at the required life of 500 hours. 10mm diameter bolts used on the HKS & Rotax 912 engines are not subject to this. Obviously the rubber engine mounts themselves can degrade and must be replaced if cracked/disbonded.

Other engine parts:
Exhaust systems and mounts are subject to thermal cycles as well as millions of fatigue cycles. In general, exhaust systems are mounted with some fail-safe features so that if one part of the mounting or exhaust cracks, the system will stay in place. Regular inspection is vital. Re-welding of exhausts by a competent aircraft welder is allowable but eventually cracks will recurr and it will be more effective to replace the assembly.

Sail:
The sail is subjected to degradation by UV light, biological attack, fatigue and abrasion. At each Permit renewal, the sail and stitching must be tested with a Bettsometer pulling 1360 grammes on a 1.5 mm diameter smooth round needle. The sail must be tested in the warp and weft directions, on one layer of sailcloth at the root, midspan and tip areas. When testing the stitching, it is acceptable to test a secondary structure seam e.g. a batten pocket seam, provided it is on the upper surface exposed to UV light. One zig-zag stitch at a time must be connected to the bettsometer and the required load exerted.

Fatigue:
On the Q2 sail fatigue failure is very unlikely. On the XL wing, if a trailing edge panel is very slack, it will 'buzz' in flight. This will eventually cause fatigue failure along the trailing edge seam. If increased bungee tension does not stop it, the trailing edge can be tightened by increasing the trailing edge scallop, in our sail loft.

Abrasion:
Abrasion of the Q & Q2 wing sail can occur at the contact with the leading edges, fin tube and battens. Abrasion at the leading edge French seam can be prevented by taping over it. This is now done in production. A taping kit is available. Up to 100mm of unravelled stitching at the leading edge seam is acceptable provided it is taped over between the leading edge and the seam. Abrasion is possible between the fin tube and the sail trailing edge. Any damaged stitches here are potentially hazardous. Abrasion of the sail undersurface batten pockets and the crossboom is not critical to the sail, but allows wear of the battens and crossboom. This contact point must be protected with a neoprene diving suit material patch. Wear of the kingpost hole reinforcing webbing sufficient to cut through the webbing must be repaired by sewing on a new webbing patch.

Abrasion of the tip webbing attachment is unacceptable and must be referred to Pegasus. The tip webbing attachment on the Q2 wing must be modified and protected according to mandatory modification PG207 & service bulletin SB97.

ISSUED BY W.G. Brooks **DATE 21/3/02**

Chief Engineer		Date
Production Manager		Date

Sales Director		Date
Managing Director		Date