



QUIK RANGE OF AIRCRAFT

Aircraft Maintenance Manual – Issue 2

SERIAL NO:

P&M Aviation Ltd, Unit B, Crawford St, Rochdale, Lancashire OL16 5NU
Great Britain

Tel: +44 (0)1706 655134 Fax: +44 (0)1706 631561

E Mail: flying@pmaviation.co.uk

Website: www.pmaviation.co.uk

4.2. INSPECTION & SERVICING SCHEDULES

It is essential that the following Servicing & Inspection schedules be followed. In addition, it is important that your Quik, Quik GT450 or QuikR is visually inspected, assessed by an LSA Repairman with Inspection or Maintenance rating and test flown by a check pilot every 12 months. Any repairs should be carried out as outlined in Section 5 and entered in to the aircraft Technical Log. Any problems highlighted at an inspection should be dealt with immediately.

Key: Line Maintenance (LM) Heavy Maintenance (HM)

TRIKE - GENERAL	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	100 hrs	Other
ENGINE MOUNTING: Check steel sub frame for cracking and wear. Check engine rubber mounts for security. Check all bolts for security. (LM)	Inspect			Inspect		
THROTTLE & CHOKE CABLES: Check that the cables are correctly adjusted and that full throttle opening is possible. Check that the carburettors are synchronized in operation. Check the cable inner and outers for wear and damage. Any broken strands will require changing the cable assembly. (LM)		Service		Inspect		
BRAKE SYSTEM: Check for operation of the brakes. Check for fluid leaks and the level of fluid. Use only DOT 4 brake fluid. Check the brake cable for chaffing or damage. (LM)		Service		Inspect		
ELECTRICAL CONNECTIONS: Check all connections are tight and that no corrosion is visible. Check all cables for chaffing. (LM)				Inspect		
AIRFILTERS: Check the condition of the air filters. Clean and re-oil as recommended by engine manufacturer. Clean and re-oil with only with K&N fluids. (LM)				Inspect		
RADIATOR: Check coolant levels and confirm 80 – 100% antifreeze mix. (LM)				Inspect		
RADIATOR: Drain and flush the radiator. Radiator can be drained by removing lower radiator hose and draining fluid into a bucket. Refit hose then refill radiator with correct coolant mixture. (LM)						Service 200hrs
RADIATOR: Check all hose for security and condition. There should be no signs of split or perished hoses, any signs of fluid leakage around any hose should be thoroughly investigated and the cause rectified prior to flight. Check the coolant level, the coolant reservoir should be full with a small amount of fluid in the overflow bottle. (LM)	Inspect			Inspect		
General – remove pylon & seat frame, fatigue crack check & fastener inspection. Any cracking found around the bolt holes require component replacement. Any worn fasteners also require replacing. (HM)						500 hours

ENGINE: please refer to Engine Operator's Manual for full service instructions	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	100 hrs	Other
PLUGS: See Rotax Manual for instructions. (LM)				Inspect		Renew 912@ 200hrs 912s@ 100 hrs
OIL & FILTER: See Rotax Manual for instructions. (LM)					Renew	First 25 hours

WING	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
SAIL: check for damage and wear. Visually check wing sail for any signs of wear or holes. Pay close attention to leading edge attachment and trailing edge areas. Check inside sail for wear cause by cross tubes and wing battens. Any wear needs patching, unless it is too large and will then require professional repairing. (LM)				Inspect		
SAIL & STITCHING: Betts test for UV damage. (Quik & GT450 1.2mm needle 1360 grams) (QuikR 1.2mm needle 400 grams to not rip the fine fabric within each ripstop square). Check wing top surface near centre and near tip area. Only pull through single surface. Check a sample of stitching. (LM)					Inspect	
BATTEN ELASTICS: check security and tensions. Elastics should be doubled and very tight particularly in tip region.	Inspect			Inspect		
BATTEN ELASTICS (Quik & GT450): Replace every 200 hours. Batten elastic should be doubled and very tight particularly in tip region. (LM)						Service
BATTENS: check profiles, check fibreglass for splits. Use batten templates to check profiles and ensure that all match. Take into account any battens that have been adjusted for tuning purposes. (LM)				Inspect		
ALL CABLES: check for damage, corrosion, elongation of thimbles. Check all cable for damage or broken strands. If any are found the cable must be replaced. (LM)				Inspect		
TENSIONER CABLE & STUD: check. Check cable for corrosion and broken wire strands, check stud for security. (LM)	Inspect			Inspect		
NOSE PLATE: check plates for wear & damage. Check plates are straight and that there are no signs of damage around holes. (LM)	Inspect			Inspect		
NOSE PLATE: Check fasteners for corrosion. (LM)					Inspect	
ALL WING TUBES: visual check for damage & bends. Check all tubes for signs of damage and corrosion, if anything is found the part must be removed and given a full visual check. No damage is acceptable. (LM)				Inspect		
BASE BAR: check for fatigue cracks around holes, dents & bends. If any cracking or bends are found the base bar must be replaced. (LM)	Inspect			Inspect		
UPRIGHTS and fittings: straightness, security, damage. Check the security of the fittings at the top and bottom of the uprights. Any damage to the tubes is not acceptable. (LM)	Inspect			Inspect		
FIN TUBE (Quik & GT450): check for wear at pivot end and for straightness. (LM)				Inspect		
X SPAR JOINTS: check centre pivot, check leading edge/x spar fasteners for wear. Check tubes for wear paying particular attention to wing batten areas on top and bottom surfaces. (LM)				Inspect		

LIFT STRUTS (QuikR): Inspect struts for dents, and end fittings for security and cracking. Check bearing is secure in fitting.	Inspect			Inspect		
WASHOUT ROD SETTINGS (QuikR)						500 Hours/4 years.
TIP FINS (GT450 & QuikR): Check security of tip fins for damage and mounting points.				Inspect		
HANG BRACKET: check set screws, check holes for wear. Check plates are parallel and no twisting has occurred. (LM)				Inspect		
ROLL BEARING: check bolt for security, and freedom of movement for the hang bracket. (LM)				Inspect		
WING VISUAL CHECK: a complete and thorough check should be carried out annually by a competent independent inspector. The wing should then be check flown. (LM)					Inspect Annually	
WING KEEL HANG POINT: Check hole under Roll Bracket Bearing for elongation/cracking. (LM)						200 hrs or yearly
COMPLETE WING STRIP: after any accident damage however caused or after NOT MORE THAN 500hrs/4 years (in normal use). Must be inspected by P&M Aviation or BMAA inspector or other qualified inspector. (HM) Check fly by qualified check pilot after rebuild.						500 hours/ 4 years

4.3 FATIGUE LIFE:

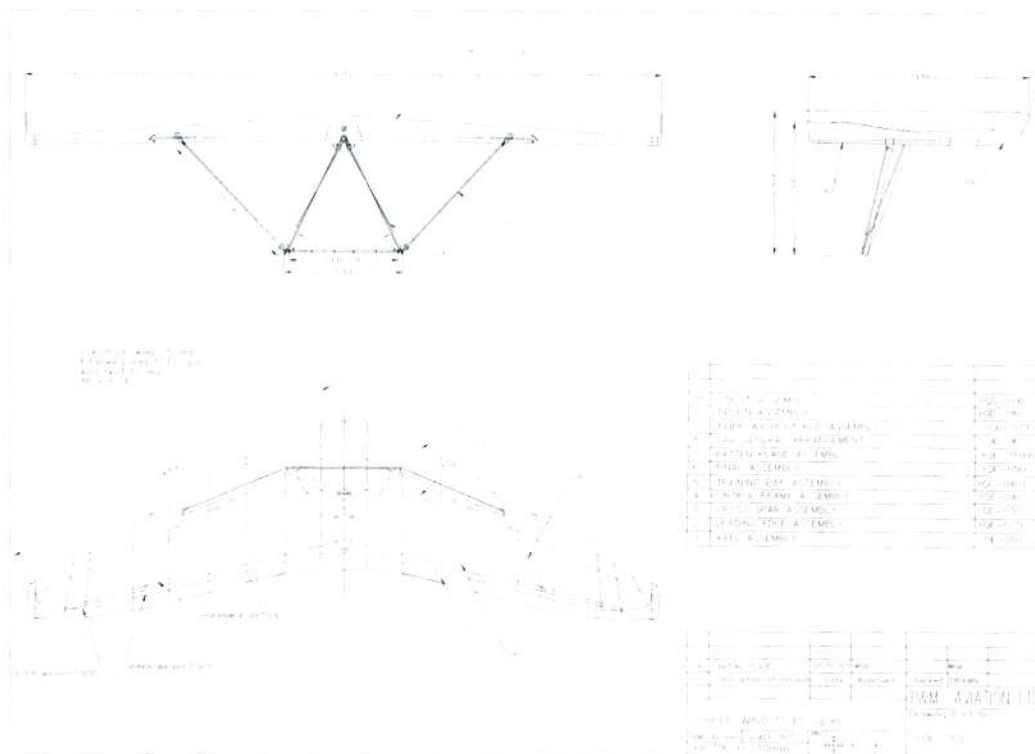
At maximum intervals of 500 hours the following components should be inspected for signs of fatigue crack damage, particularly at holes, notches and joints. The parts should be inspected in detail by a qualified inspector using dye penetrant, radiographic, or visual high magnification methods. The ideal time to do the fatigue inspections is during the wing strip-down (see servicing schedule). If no cracks/damage is found the parts may be returned to service.

Leading edges
 Keel
 Pylon
 Seat frame
 Trike base tube
 Front strut & channels
 Control frame upright top and bottom fittings
 Lift Strut End Fittings (QuikR)
 Cross Boom lifts strap fabrications. (QuikR)
 Control bar end holes.
 Control bar end knuckles.
 Leading edge/crossboom channel holes in the tube.
 Leading edge outer at the sleeve edges.
 Keel roll bearing holes.
 Trike pylon top & bottom fittings - bush must not rotate, no cracks around the bush.
 Trike pylon top & bottom end corners.
 Trike basetube at seat frame bracket holes.
 Trike basetube at rear steering pivot holes.
 Seat frame holes.

Any instance of fatigue cracking must be reported to the Factory. No cracked parts may be returned to service unless there is a P & M approved modification (e.g. drilling out and bush insertion). Unserviceable parts must be made unusable, e.g. by cutting up.

For the following small items, inspection is not practical and so replacement is strongly recommended at the following times:

Hang bolt	250 hours.
Control frame top pivot bolt	1500 hrs



The Sail

The Quik range of wings are the product of one of the most experienced flexwing design teams in the world today. The sail fabric is cut with exacting accuracy from stabilised polyester using tight, virtually non-porous and tear-resistant weave construction. Double-stitched seams using PTFE UV resistant thread ensure complete panel join integrity. Sail reinforcement is achieved by including extra material at high stress points. A Trilam sandwich leading edge, a Kevlar trailing edge and a spanwise kevlar tape maintain the wing's performance over a long life.

The aerofoil section is defined by pre-formed aluminium and pre-formed aluminium/composite ribs, with chordwise tension being maintained by attachment to the trailing edge. The predictable low speed stall exhibited by the aircraft is achieved by the clean lines of the aerofoil's leading edge radius and the spanwise kevlar tape that limits the wing washout.

The Airframe

All the main tubing used in the airframe is a high quality aluminium alloy from aircraft quality billets using a special process of mandrel extrusion followed by being drawn to agreed industry specifications. All tubes and inserts are anodised to give protection against corrosion.

There are no welded components in the wing frame, and sheet fittings are plated, anodised or stainless steel. All bolts are of high tensile steel. Rigging wires are PVC covered where necessary to afford protection to the occupants and to also serve as an anti-kink measure.

Wing tip fins

The Quik GT450 and QuikR wing is fitted with composite wing tip fins, which improve directional/lateral stability, which is most noticeable in the light weight/high power condition above 70mph. They also reduce the induced drag and increase trim speed by 5-10mph.

4.17. WING

General

Careful attention to the recommended rigging and derigging sequences will protect the wing from the risk of unnecessary damage. The wing must always be transported inside its bag, and the bag zip should face downwards to minimize the entry of rainwater. Following transport of the wing through rain, open the bag and loosen the ties to dry the sail in case any damp has penetrated the bag. During transportation, or when stored on slings, the wing must be supported by at least two points not more than 2.6 metres apart. Supports

should be softly padded, and any support systems used for transport, such as roof racks, must use attachment straps which are sufficiently secure to eliminate the possibility of damage from vibration and abrasions. STRAPS SHOULD NOT BE OVERTIGHTENED.

Wing Fabric Maintenance

Despite the best care you can take, you may still have accidents with the odd wall or wire fence or your protection pads may slip and you will be faced with slight damage to the fabric. Where this takes place influences repair; high load areas such as a trailing edge being critical. Any cuts or tears through the trailing edge, sail fixing points or similar high load areas must be repaired at a P&M Aviation approved workshop. Small damage to panels, leading edge cover etc. can be repaired with self adhesive tape which is cut to size, pressed into place on the clean dry sail and warmed gently with a hair dryer to melt the adhesive, being careful not to apply too much heat. We define small damage as abraded holes no more than 10mm (3/8 inch) diameter and small cuts no larger than 15mm (5/8 inch). Anything larger, or near the trailing edge (within 150mm/ 6 inches) should be inspected by a qualified engineer.

Long term exposure to ultra violet light must be avoided - keep the wing de-rigged in the bag or rigged with wing covers. The sail should be checked with a Bettsometer



WARNING

Check your sail for ultra violet damage regularly. Flying with a damaged sail could cause structural failure, injury or death.

CAUTION

NEVER STORE THE WING IN A SEALED WING BAG WHEN WET - leave the zip open to allow the moisture to evaporate.

Stitching Damage

All the seams are firstly joined with a double sided sail adhesive tape and then double zig zag sewn. Thread damage never ever gets better and eventually runs. Since the wing is held together with stitches, its pretty obvious what will happen when the stitching fails. If you abrade a seam, then have the damage repaired before it gets worse.

Small non-loaded areas can often be repaired in-situ by the tedious but effective method of hand sewing back through the original stitch holes. Never use anything but matching spun PTFE thread which is available from P&M Aviation Ltd.

Wing Fabric Cleaning

There is no easy answer for cleaning sails; it is certainly best if possible to keep them clean! If all else fails and you need to wash your wing, then select a dry day and have access to a good hose and clean water supply. Never use strong soaps or detergents since soap residue can re-act with ultra violet light and degrade your fabric and threads. We recommend a very mild liquid soap (washing up liquid) and a soft sponge. Gently wash the fully rigged wing, frequently hosing clean. Copious amounts of clean water will not harm the wing and can be very beneficial in removing sand and grit which may get trapped inside the leading edge pocket usually in the nose or wing tip areas. Ensure the wing is completely dry before de-rigging/storing in the bag.



WARNING

Never use spirits, alcohol, thinners or any strong detergents when cleaning the sail. These may damage the cloth or threads, leading to structural failure of the sail fabric which could result in injury or death.

Ribs

The ribs form the wing shape and hence dictate the whole performance of the wing. They need treating with care, and since they are subject to constant tension both during flight and rigging, they tend to lose their shape and flatten out. It is essential that they are reformed at frequent intervals and checked against the template. If you have to rig regularly, you should check your rib profiles every 25 hours. If you leave your

Sail & Stitching inspection

The Polyester sailcloth is subject to degradation by UV light. Spun ptfe Stitches can be weakened by abrasion. The Bettsometer test gives a good indication of the capability of the sailcloth to transfer load at a stitch hole.

The sail should be checked in the root, midspan and tip areas of single thickness main body sailcloth. Enough tension should be applied to the sailcloth to prevent it puckering at the test needle.

For the Quik & GT450 the sailcloth should be tested to 1360 grammes with a 1.2mm needle in the warp direction (spanwise).

Sample stitches can be tested using a 1mm diameter wire hook through the stitch and applying 1360gr.

Failure of the sailcloth or stitches at this load indicates the sail MUST be replaced.

For the QuikR the sail is of ripstop construction and the Bettsometer test is applied to the fine fabric within each ripstop square.

The sailcloth should be tested to 400 grammes with a 1.2mm needle in the warp direction (spanwise), loading the fine fabric, not the rip-stop thread. The fine fabric must not rip at 400gr load.

Bolts

Finish: Not corroded

Wear: Not above .025mm (.001")

Must not be bent or have damaged threads.

Rigging Cables

No corrosion, broken strands, kinking of cable or thimbles,

Or any sign of movement at a swage.

(Plastic boots must be slid back to inspect swages.)

Any instance of swage movement should be reported to the Factory.

Major airframe tubes

1) Straightness – maximum tolerance Length/600, for leading edge outers, Length/500. Straightness is measured from the point of maximum bend to a straight line running from each end of the tube. If both tubes have a perceptible set, leading edge outers should be replaced in pairs. Leading edges must NEVER be turned round or straightened.

2) No Fretting or corrosion, e.g. between sleeves.

3) No dents deeper than 0.2mm

4) Any scoring up to 0.1mm deep should be blended out, finishing with 1200 grit abrasive paper and coating in clear laquer.

Hang Bracket and control frame top knuckles

The hang bracket must be inspected for cracks, distortion and wear, particularly at the Hangbolt hole.

Maximum diameter for the hangbolt hole is 10.7mm.

The hangbolt is NOT intended to rotate in the bracket, and should be tightened securely by hand.

The control frame pivot bolts must be secure yet allow easy movement. The control frame uprights must be straight, the tube ends must not be distorted and the end fittings and rivets must be secure.

5. REPAIRS



WARNING

The aircraft airframe is deceptively simple, but like all aircraft requires skilled and qualified attention. We do not recommend self repair or re-assembly by other than Factory approved repair agents. No replacement parts should be fitted unless they are factory supplied and identified. All replacements & servicing should be entered into the aircraft technical log book supplied and signed off by a qualified inspector.

Incorrect servicing, maintenance or fitting of parts could result in injury or death.

5.1. WING

- Repairs must be inspected by a BMAA or P&M Aviation Ltd or other approved inspector and signed off in the technical log.
- Sail repairs are only to be undertaken by a P&M Aviation Ltd approved sail loft.
- Airframe repairs are to be by replacement only.
- Replacement parts must be obtained from P&M Aviation Ltd or their appointed agency.
- Bent aluminium tubes must never be straightened, always replaced.
- Frayed cables and cables with damaged or twisted thimbles must be replaced.

5.2. TRIKE

- Repairs must be inspected and signed off as above.
- Repairs by replacement only.
- Replacement parts must be obtained from P&M Aviation Ltd or their appointed agency.
- Bent aluminium tubes must never be straightened, always replaced.
- Frayed cables and cables with damaged or twisted thimbles must be replaced.
- Repairs to composite structures must first be assessed by P&M Aviation Ltd or their approved composites facilities.

5.3. ENGINE REPAIR AND OVERHAUL

- Repairs must be carried out using the appropriate Rotax repair manuals, parts list, tools and up to date service information. Documentation may be obtained from an authorised Rotax distributor and also on the Web:

<http://www.rotax-aircraft-engines.com/aircraft/aircraft.nsf/index?Openpage>

- Repairs must be by replacement using genuine Rotax parts or by Rotax approved repair scheme only.
- Replacement parts must be obtained from P&M Aviation Ltd or Authorised Rotax aero engine distributor.
- The repaired powerplant installation must be inspected by a BMAA or P&M Aviation Ltd or other approved inspector. It should be ground run to check all systems function correctly and to check for loose components or leaks. The work carried out must be signed off in the technical log.
- Engine malfunction is more likely in the first few hours after repair and the aircraft must be operated accordingly. Operating temperature and pressure limits must be closely monitored.
- The engine should be treated as if it were newly installed and the initial 10 hour checks should be carried out on any assembly which has been disturbed (e.g. propeller bolt torque). Any initial checks required by the Rotax engine service schedule should also be carried out, e.g. the initial oil and filter change.