P&M Aviation

QUIK RANGE OF AIRCRAFT

Aircraft Maintenance Manual – Issue 4

SERIAL NO:

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NOTICE

This product has been manufactured for use in a reasonable and prudent manner by a qualified operator.

The minimum qualification for flying this aircraft is a formal certificate or license following successful completion and assessment of the BMAA flexwing microlight syllabus, Sport Pilot Certificate for Weight-Shift Control or equivalent, or under authorization from a qualified Instructor whilst training for your License or certificate. In addition, it is your personal responsibility to ensure that you are qualified to fly in the state/country where you intend to operate the aircraft.

For your personal safety, the safety of others and the safe operation of the aircraft, it is very important that this operator's manual is read in full before operating or flying the aircraft for the first time, and that the relevant sections are understood before any trimming or maintenance work is undertaken. Should you not understand any of the Aviation terms to be found in this manual, then ask your instructor for clarification.

If you have just acquired this aircraft then it is important that you register as the new owner/operator with your nearest P&M Aviation Distributor, or with P&M Aviation direct at the following address:

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

www.pmaviation.co.uk
flying@pmaviation.co.uk

⚠ WARNING

Failure to register will mean that you may not get important safety information issued by the company in support of its products.

IMPORTANT!

Wherever you see the symbols shown below, heed their instructions! Always follow safe operating and maintenance procedures and practices.

⚠ WARNING

This WARNING symbol identifies special instructions or procedures which if not correctly followed, could result in personal injury or loss of life.

CAUTION

This CAUTION symbol identifies special instructions or procedures which, if not strictly observed, could result in personal injury, damage to or destruction of equipment.

NOTE

- *This NOTE symbol indicates points of particular interest for more efficient and convenient operation.*

⚠ WARNING

Microlight/Light Sport Aircraft flying and all other airsports can be dangerous even when practised under ideal circumstances. Pilot error, component failure, adverse meteorological conditions or sheer bad luck can, as in all aviation, result in injury or death. Every customer purchasing goods or services whether directly or indirectly from the Company is warned that Microlight/ Light Sport Aircraft flying and similar air sports are not controlled in the same way that are other forms of aviation. As a result Microlight/ Light Sport Aircraft components and related equipment are manufactured from commercially available materials and components and some of these materials and components are not designed specifically for aviation use. Every purchaser must ensure that he inspects fully every primary product (part or service) item upon delivery and before every flight thereafter and he must make himself aware of all trends or changes which may make a particular item unsuitable for the use for which it was originally purchased. He must also satisfy himself totally that a purchased item is suitable for the use to which he intends to employ it. The Company can offer advice but the final responsibility for the use of the goods purchased, primary product (part or service) rests solely with the purchaser (whether direct or indirect) or other user who employs such goods at his own risk. This Warning applies to every part, item or service offered by the Company and acceptance of or payment for goods is an implicit acceptance of this Warning.

The Quik range of Microlight/Light Sport Aircraft must only be flown where the following conditions apply:

1. The aircraft must not be flown over any terrain except where it may be landed safely and without harm to occupants or third parties in the event of a power reduction or failure of the engine at any stage of the flight.
2. The pilot of the aircraft is competent and has been trained to land the aircraft safely and without harm to occupants or third parties in the event of a power reduction or failure of the engine at any stage of the flight and is in current practice of forced landing procedures.

FOREWORD

We wish to thank you for choosing this P&M Aircraft.

Read this Operator's Manual before flying your aircraft so you will be thoroughly familiar with the proper operation of your P&M Aviation LSA controls, its features, capabilities and limitations. This manual offers many safe operating and flying tips, but its purpose is not to provide instruction in all the techniques and skills required to maintain and fly this flexwing weight shift controlled aircraft safely. All operators of this LSA aircraft must qualify in a pilot training programme, to the minimum standard of the Sport Pilot Certificate with weight-shift control rating, to attain awareness of the mental and physical requirements necessary for weight shift control LSA operation.

To ensure a long and trouble free life from your P&M Aviation LSA, give it the proper care and maintenance described in the Aircraft Operating Instructions, Aircraft Maintenance Manual & Flight Training Supplement. For Engine Information and Service & Maintenance schedules, please refer to the relevant Engine Manufacturers Manual.

If any questions or problems are found with the aircraft then please provide feedback to the factory at flying@pmaviation.co.uk. Please ensure that you provide full details of your aircraft and details of the problem together with any photographs which may help us to understand the issue.

Note
Manuals are liable to be revised in the future and pages or sections re-issued. Amendments will be available from the website at www.pmaviation.co.uk
Amended pages should be printed and replaced in the manual at the earliest possible time, and the amendment details entered in the amendment pages by the owner.

Issue 1 – Introduction of P&M Aviation Quik and Quik GT450 with Rotax 912 and 912-S engines.

Issue 2 - Introduction of QuikR with Rotax 912S engine.

Issue 3 – Editorial Corrections and Clarification of Light and Heavy Maintenance.

Issue 4 - Introduction of GTR Wing to Quik Range.

Amendment No	Date	Sections/Pages Changed	Date Inserted	Signature

Abbreviations:

AOI	Aircraft Operating Instructions
FTS	Flight Training Supplement
MIP	Maintenance and Inspection Procedures
PIC	Pilot In Command
C	Celsius
CAS	Calibrated air speed
F	Fahrenheit
Hg	Mercury
IAS	Indicated Air Speed
ISA	International Standard Atmosphere
Kg	Kilogram
km/hr	Kilometers per hour
MPH	Miles per hour
kt(s)	Nautical Mile per Hour (knot) (1 nautical mph = (1852/3600) m/s)
lb(s)	Pound(s) (1 lb = 0.4539 kg)
mm	Millimeter
cm	Centimeter
m	Metre
in	Inch
ft	Feet
sq. m	Square Metre
sq. ft	Square Feet
cu. in	Cubic Inches
cm^3	Centimeter Cube
mb	Millibars
N	Newton
Nm	Newton Meter
kW	KiloWatt
HP	Horse Power
RPM	Revolutions Per Minute
ft. lbs	Foot Pounds
in. lbs	Inch Pounds
psi	Pounds per Square Inch gage pressure
s	Second
min	Minute(s)
hr(s)	Hour(s)
SI	International System of units
VA	Maneuvering Speed
VC	Operating Cruising Speed
VDF	Demonstrated Flight Diving Speed
VH	Maximum Sustainable Speed in straight and level flight
VNE	Never Exceed Speed
VS0	Stalling Speed, or the minimum steady flight speed in the landing configuration
VS1	Stalling Speed, or the minimum steady flight speed in a specific configuration
Vx	Speed at which Best Angle of Climb is achieved
Vy	Speed at which Best Rate of Climb is achieved
VT	Maximum Glider Towing Speed
Wsusp	Highest Trike Carriage Weight suspended under the wing
Wwing	Wing Weight

Wtkmt Trike Carriage Empty Weight (including required minimum equipment, unusable fuel, maximum oil, and where appropriate, engine coolant, hangbolt and hydraulic fluid)
WMAX Maximum Design Weight (Wwing + Wsusp)
WSC Weight Shift Control (aircraft)
Max Maximum
Min Minimum

Units

Speed
Kts (Knots) = 1.15 mph (miles per hour) = 1.84 km/hr
1 km/hr = 1.6 MPH
Pressure
PSI = Pounds per Square Inch
in Hg = inches of Mercury
mb = millibar
Distances
in. = inches = 25.4 millimeters
ft = foot (feet) = .305 meters
Weights
Kg = kilograms = 2.2 lbs = 2.2 pounds

Misc

1 Pound (lb) = 0.4536 Kilogram (kg)
1 Pound per sq in (psi) = 6.895 Kilopascal (kPa)
1 Inch (in) = 25.4 Millimeters (mm)
1 Foot (ft) = 0.3048 Meter (m)
1 Statute mile = 1.609 Kilometres (km)
1 Nautical mile (NM) = 1.852 Kilometres (km)
1 Millibar (mb) = 1 Hectopascal (hPa)
1 Millibar (mb) = 0.1 Kilopascal (kPa)
1 Imperial gallon = 4.546 Liters (l)
1 US gallon = 3.785 Liters (l)
1 US quart = 0.946 Liter (l)
1 Cubic foot (ft^3) = 28.317 Liters (l)
1 Degree Fahrenheit (F) = (1.8 X C)+32
1 Inch Pound (in lb) = 0.113 Newton Meters (Nm)
1 Foot Pound (ft lb) = 1.356 Newton Meters (Nm)

Tooling

There are no specialised tools needed for the maintenance described in this manual, following is a list of the type of tools that may be required.

Open Ended Imperial Spanner Set
Open Ended Metric Spanner Set
Torque Wrench
Foot Pump
Screw Drivers Flat & Cross Head
Hex Key Set
Pliers
Tie Wire & Tooling

Note: This list may not be comprehensive.

1. PREPARATION FOR SAFE LSA OPERATION

⚠ WARNING

Do not attempt to operate the aircraft without having carried out the full training syllabus and having satisfied a qualified instructor/examiner of your competence to do so and having been issued with a certificate of competency. Without proper instruction the Quik range of aircraft are not safe to operate and almost certainly will cause injury or death.

1.1. TRAINING

Safety is no accident. The safe operation of an aircraft stems from many factors, but one of the most important is pilot training. Please ensure that the following conditions always apply:

Qualifications

Before taking command of your aircraft, you must hold a pilot's licence valid for microlight aircraft issued by the national or state aviation authority, or be under instruction towards your licence. You must have gained your licence on flexwing aircraft, or have passed a flexwing alternative controls test to the satisfaction of a qualified flexwing microlight instructor. The training standards must be at least equivalent to the BMAA microlight pilot's syllabus for flexwings.

Type Conversion

Conversion to the Quik range by a qualified instructor or experienced Quik range owner is essential unless you are very experienced on flexwings (200+ hours as a guide) and current. First flights must be in smooth conditions with less than 5kt cross wind and at least 400m clear unobstructed runway.
The Quik range are easy to fly, but have a very wide trimmable speed range. It is essential that proper control of speed is exercised for different phases of flight, especially landing approaches.

Currency

If you have not flown within the previous 3 months, take a refresher lesson with a Qualified Instructor before flying as Pilot in Command, and do not operate the aircraft until the Instructor is satisfied with your ability.

1.2. MODIFICATIONS

You must not carry out unauthorised modification to the aircraft. It is illegal and for the most part unsafe to carry out unauthorised modifications to your aircraft.

1.3. PRE-FLIGHT CHECKS

It is essential that rigorous checks are carried out daily before flight, exactly to the schedule in the Aircraft Operating instructions.
In addition to the full daily inspection and preflight checks detailed in the Aircraft Operating instructions ensure that:

SERVICING: the engine and airframe are within Service limits (see Section 4.2).
LIFED COMPONENTS: the engine and airframe are within life limits (see Section 4.3).

If there are any grounds for suspicion about any element of your aircraft's safe operation, do not fly.

1.4. SAFETY HARNESSES

P&M aircraft are equipped with a 3 point harness for the pilot, and a four point harness for the passenger. These should be worn at all times; it is particularly important for the safety of the pilot in an accident that the passenger should wear the shoulder straps provided. Double check that both harnesses are secure as part of the Pre-take-off check (See Aircraft Operating Instructions). If flying solo, ensure the rear seat harness is secured so that the straps and in particular the shoulder straps cannot flap around in the wind and get into the engine magneto or catch the hot exhaust pipe, which may cause them to melt and lose some or all of their strength.

WARNING

If you do not wear a harness it could be hazardous and failure to do so may result in injury or death.

1.5. GROUND HANDLING

A flight has not been successfully and safely concluded until the engine has been stopped, the aircraft has been securely parked and picketed or hangared, and the pilot and passenger have disembarked. Do not make the mistake of losing concentration just because you have landed safely. Never taxi at more than walking pace. Use the brakes gently. Remember to make sufficient allowance for the span of the aircraft when manoeuvring in confined spaces. Always be ready to switch off the engine in the event of any problem. Respect ground handling limitations and avoid taxiing in strong winds and gusty conditions. For fixed wing pilots: remember the nose-wheel steering operates in the opposite direction to that which you are used to. See section Aircraft Operating Instructions for further information

1.6 AIRSTRIP CRITERIA

Your airstrip should be smooth, flat, devoid of obstructions, clear of stones and other obstacles which may damage the aircraft and more particularly the propeller. Short cut grass or tarmac are ideal surfaces. The strip should be sufficiently long to allow for a straight ahead landing in the event of an engine failure on climb out. Both the approach and the climb out zones should be free of any high obstructions like trees, pylons & buildings, and ideally there should be some alternate landing fields in these zones to allow for safe landings in the event of engine problems when landing or taking off. Airstrips surrounded by trees or other obstacles should be avoided, particularly in windy conditions, since low-level turbulence and rotor are likely to be present. Exercise great care when visiting other airstrips for the first time, since it is quite possible that they are not suitable for safe Microlight operation.

1.7. SPECIAL HAZARDS

You should be aware of the following special hazards and it is your duty to point them out to passengers and spectators:

Propellers

Rotating, and indeed even stationary propellers pose potential dangers. Rotating propellers are very hard to see, so special attention should be made to keep persons, and especially children and pets, clear of the aircraft once it has been started. Persons should never stand either in line with the arc of the propeller or behind it since there is always a possibility that stones or other objects can be picked up and hurled at great speed in any direction. In the event of a propeller strike close down the engine immediately and do not re-start until you are satisfied that no structural damage has been done to the propeller or airframe. If any damage is visible, do not fly until the damaged blade has been repaired or replaced and the engine has been inspected for shock load damage.

WARNING

THE EXHAUST SYSTEM: Do not touch the exhaust while the engine is running or directly after it has been shut down. It will be very hot and will inflict serious burns if touched. Keep items of clothing and the aircraft's seat belts clear also. Inspect the entire exhaust system for cracks and damage before and after each flight. Do not fly if there is any damage.

⚠ WARNING

THE RADIATOR SYSTEM: The cooling system is pressurised when the engine is warm, so you should never open the cap until the engine has cooled down. The coolant in the system is very hot and will inflict serious burns if it comes into contact with human skin.

The coolant contains Ethylene Glycol which is harmful if swallowed. Do not attempt to syphon or drain the coolant system by sucking on a tube.

Failure to observe this Warning could result in injury or death.

⚠ WARNING

THE OIL SYSTEM: engine oil is stored in the reservoir underneath the left side of the engine. This becomes very hot in use and will inflict serious burns if it comes into contact with human skin.

Running up and testing the engine on the ground, with or without the wing attached

Whenever you need to perform an engine check of any sort, particular care must be taken to observe the following procedures:

1. Move the aircraft to an area clear of people, animals etc. ALWAYS LEAVE AMPLE ROOM AHEAD IN CASE THE AIRCRAFT BREAKS FREE WHILE RUNNING UP.
2. Check the ground around the propeller area for loose stones etc. and remove any such objects.
3. Tie the aircraft to a solid object - a large and sound tree, a car with its parking brake applied, a concrete post etc - using webbing or rope which is sufficiently strong to take a load of 225 kilos (500lbs) minimum. Securely attach both ends of the rope/webbing to the rear axles of the trike unit just inboard of the wheels. Then, ensuring that the V bridle is long enough to give sufficient clearance from the propeller, attach it to your chosen solid object. Make sure that the bridle can not ride up the object when under load.
4. DOUBLE CHECK all knots and attachments before starting.
5. Carry out a proper inspection before starting. See Aircraft Operating Instructions.
6. Do a full pre-start security check as described in the Aircraft Operating Instructions.
7. Make sure there is a qualified pilot on board, properly strapped in and with his/her fingers on the ignition switches at all times when the engine is running
8. Maintain an adequate look-out while conducting tests; adults, children & animals may approach from behind.
9. Wear a helmet and ear defenders when in the vicinity of an engine being tested. If you choose to wear a headset then ensure that the connecting cables cannot get near the propeller or rotating parts of the engine.

⚠ WARNING

Unprotected exposure to engine noise on test will cause long or short term hearing loss. Wear ear defenders or appropriate ear defending headset at all times when in the vicinity of a running engine. Ensure that the headset connecting cables cannot get near the propeller or rotating parts of the engine.

2. GENERAL DESCRIPTION

The Quik range are advanced weight-shift controlled aircraft. They may be flown solo or dual without ballast. The aircraft has been developed for advanced cross-country touring performance; a stable hands-off cruise of 65 to 100 mph, depending upon model, makes long cross-country trips very practicable. Using appropriate airfields and the instructor control bars, it can also be used as a safe and reliable training machine.

The Quik GT450 was introduced in 2005 with Rotax 912 and 912-S engine options and 1.72m 3 bladed Warp Drive Propeller. It features a 65L tank, disk or drum brakes and electric trim.

The GT450 is designed for up to 450kg AUW, giving approximately 232kg of payload (fuel, occupants, baggage). The total maximum seat loading is 220kg, 110kg per seat. The aircraft has been designed with a wide speed range enabling slow speed flight at very low fuel consumption, short takeoff and landing as well as cruising speeds up to 95mph. The electric trim system gives precise fingertip control of hands-off trim speeds from approximately 50 to 80 mph.

A roll augmentation system has been developed for the GT450 wing, which actuates the wing trailing edge and keel pocket when a roll input is made. The system noticeably lightens roll control. The wing planform and twist are designed to improve L/D performance. The wing is also equipped with tip fins to improve directional stability at high speed as well as low speed sink rate and glide. They are vented to control internal wing pressure.

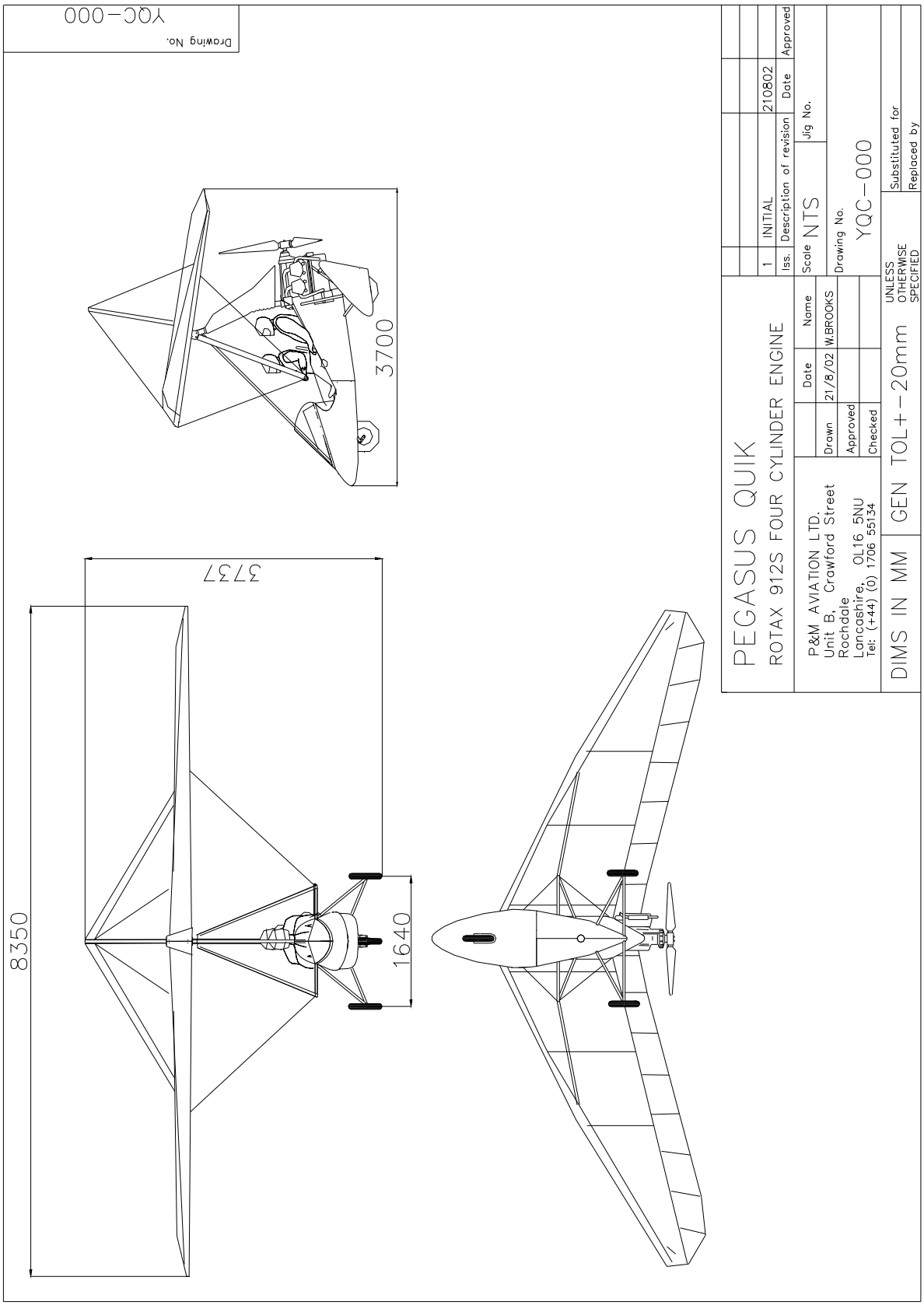
The QuikR and GTR wings are strutted wings designed for optimum performance, capable of 100mph high speed flight, whilst stalling at less than 40mph fully laden. The topless design giving enhanced drag reduction for great fuel economy whilst allowing high speeds.

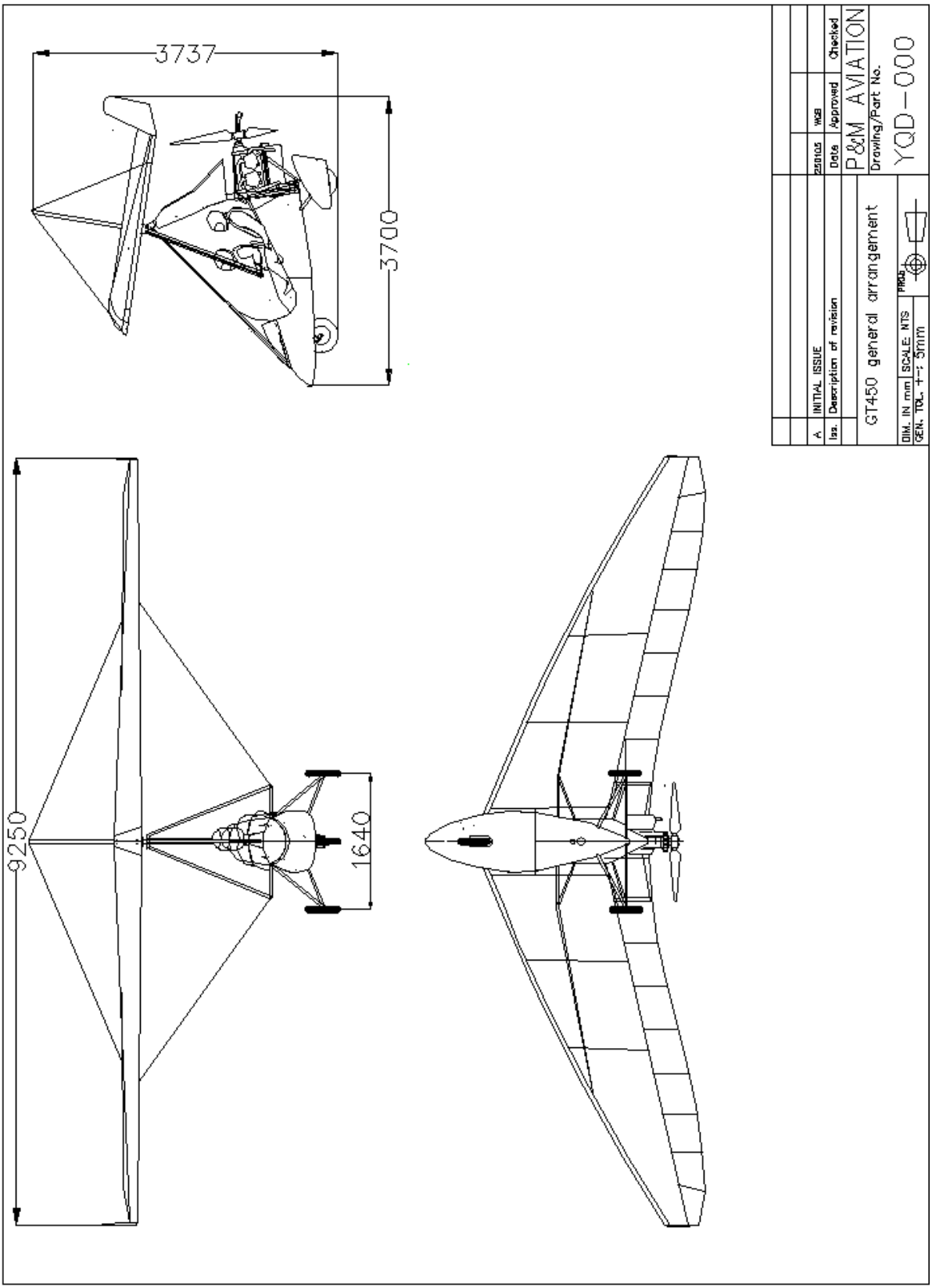
The Quik range have been designed for easy single-person rigging. The pylon hinges for folding independently of the engine and undercarriage mountings, which allows for better undercarriage geometry and structural rigidity.

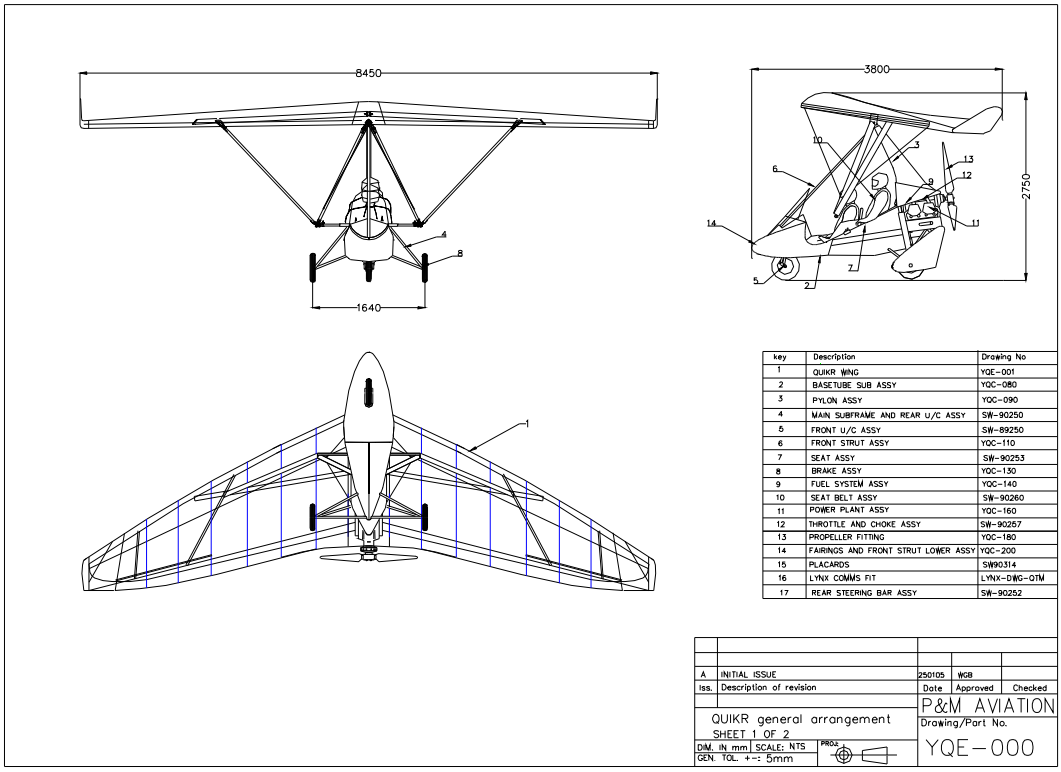
These features make the aircraft capable in a multitude of roles including long distance touring, competitions and training.

Optional equipment includes low-drag panniers, a pod bag and instructor control bars.

2.1. GENERAL ARRANGEMENT DRAWINGS




3737
3700
9250
1640
A. INITIAL ISSUE
Iss. Description of revision
Drawn WSB
Date Approved Checked
P&M AVIATION
GT450 general arrangement
Drawing/Part No.
YQD-000
DIM. IN mm SCALE: NTS
GEN. TOL. +/- 5mm
PROJ



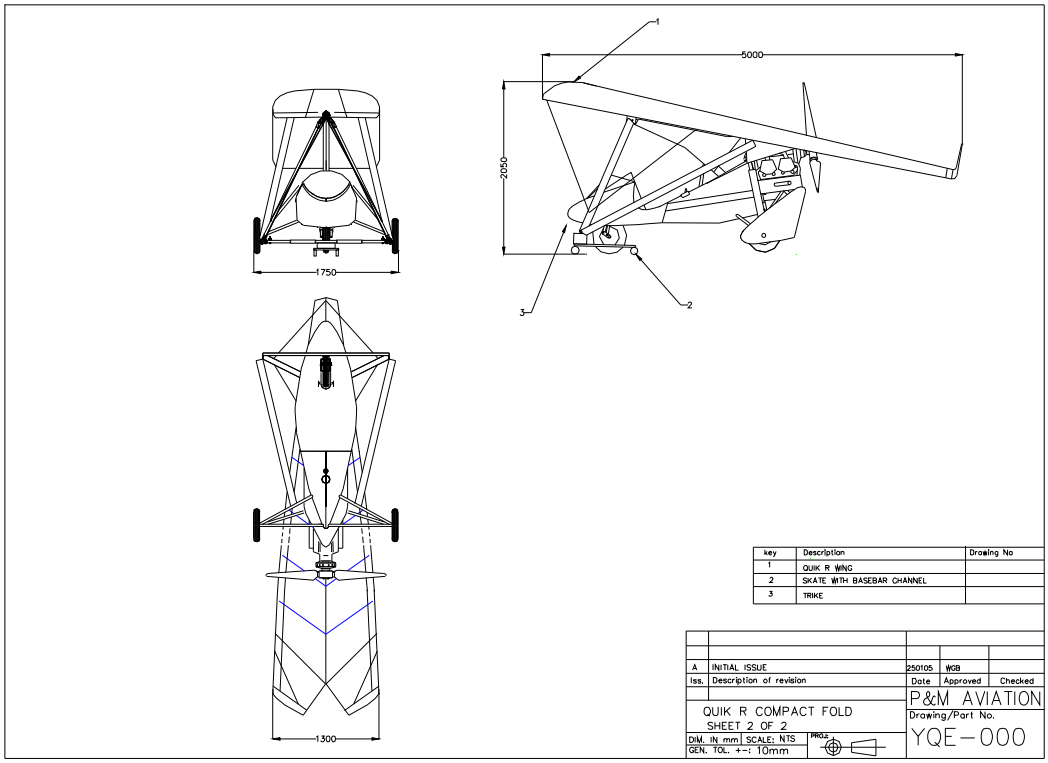
key	Description	Drawing No
1	QUIKR WING	YQE-001
2	BASETUBE SUB ASSY	YQC-080
3	PYLON ASSY	YQC-090
4	MAIN SUBFRAME AND REAR U/C ASSY	SW-90250
5	FRONT U/C ASSY	SW-89250
6	FRONT STRUT ASSY	YQC-110
7	SEAT ASSY	SW-90253
8	BRAKE ASSY	YQC-130
9	FUEL SYSTEM ASSY	YQC-140
10	SEAT BELT ASSY	SW-90260
11	POWER PLANT ASSY	YQC-160
12	THROTTLE AND CHOKE ASSY	SW-90257
13	PROPELLER FITTING	YQC-180
14	FAIRINGS AND FRONT STRUT LOWER ASSY	YQC-200
15	PLACARDS	SW90314
16	LYNX COMMS FIT	LYNX-DWG-OTM
17	REAR STEERING BAR ASSY	SW-90252

Iss.	Description of revision	Date	Approved	Checked
A	INITIAL ISSUE	250105	WGB	

QUIKR general arrangement
SHEET 1 OF 2
DIM. IN mm | SCALE: NTS
GEN. TOL. +-: 5mm
PROJ.

P&M AVIATION
Drawing/Part No.
YQE-000

QuikR general arrangement



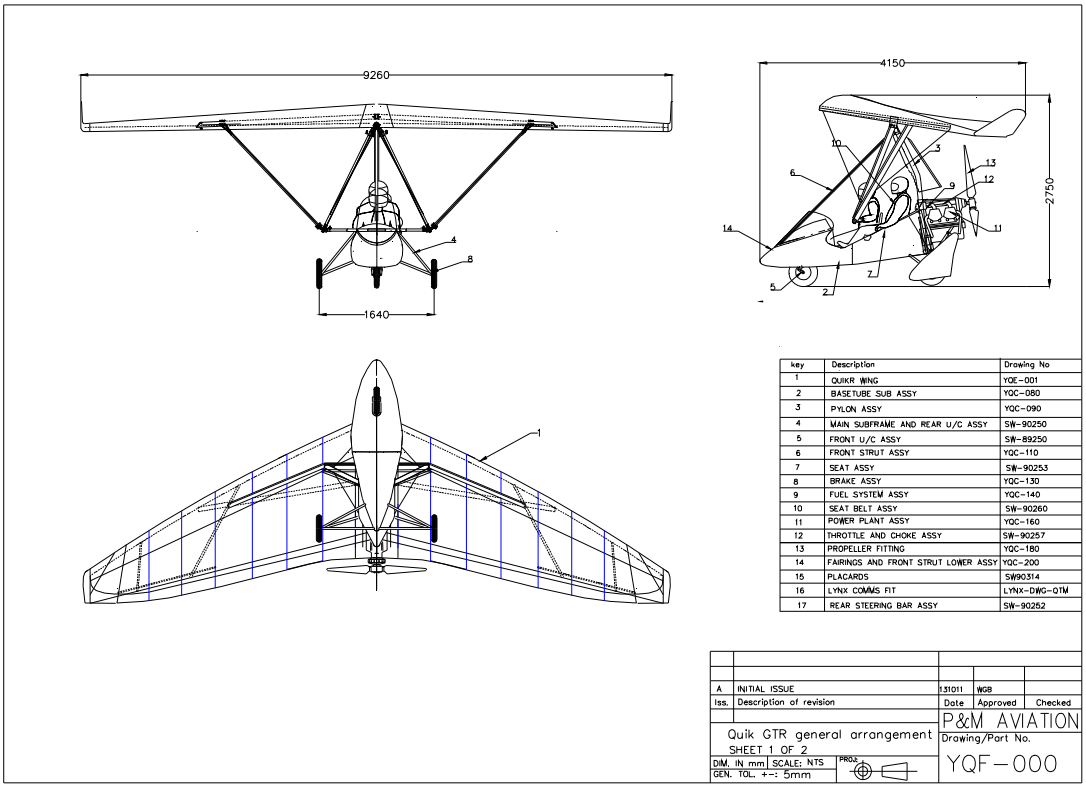
key	Description	Drawing No
1	QUIK R WING	
2	SKATE WITH BASEBAR CHANNEL	
3	TRIKE	

Iss.	Description of revision	Date	Approved	Checked
A	INITIAL ISSUE	250105	WGB	

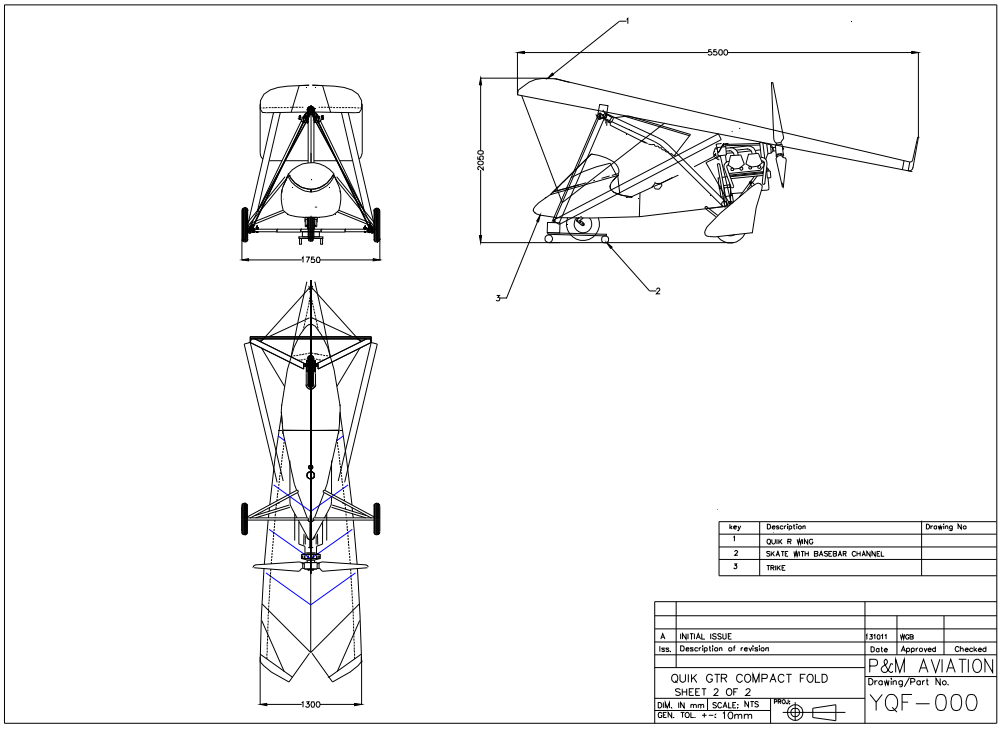
QUIK R COMPACT FOLD
SHEET 2 OF 2
DIM. IN mm | SCALE: NTS
GEN. TOL. +-: 10mm
PROJ.

P&M AVIATION
Drawing/Part No.
YQE-000

QuikR in compact folded configuration using a nosewheel skate with control bar channel.



Quik GTR General Arrangement



Quik GTR in compact folded configuration using a nosewheel skate with control bar channel.

3. GENERAL INFORMATION

3.1. EMPTY WEIGHT

Typical empty weights for the Quik and Quik GT450 are as follows:

Quik

912	912 S
206kg	207kg
453lbs	455lbs

Quik GT450

912	912 S
214kg	217kg
470lbs	477lbs

Typical empty weights for the P&M Aviation QuikR are as follows:

912	912 S
218kg	220kg
480lbs	484bs

Typical empty weights for the P&M Aviation Quik GTR are as follows:

Rotax 912	912 S
232kg	234kg
510lbs	515lbs

Following modification, repair or at any time required by the CAA or other Airworthiness Authority, the aeroplane must be weighed so that the composition of useful load can be determined. The aeroplane must be dry, clean and in calm conditions for accurate weighing. The empty weight must be recorded below and on the main cockpit placard after each weighing. The aeroplane empty weight must under no circumstances exceed 240kg (528lbs).

The Quik/GT450/QuikR/GTR 912/912S, registration mark....., engine type....., has been weighed empty, including full oil, electrolyte and unusable fuel:

WEIGHT	MODIFICATION STATE	DATE

3.2. FUEL LOADS

FUEL LOADS – QUIK

The fuel tank is 65 litres (17.2 US Gallons)capacity, including 1.6 litres (0.4 US Gallons) unusable, giving 63.4 litres (16.8 US Gallons) useable. The fuel load limitations for the range of allowable cockpit loads and aircraft empty weights are placarded in the cockpit as follows:

EMPTY WEIGHT	COCKPIT LOAD	MAX FUEL LEVEL
205kg (451lbs)	Up to 157kg (345lbs)	65 litres (full) (17.2 US Gallons)
205kg (451lbs)	200kg (440lbs) - max. load	5 litres (1.3 US Gallons)
220kg (484lbs) - max. empty weight	172kg (379lbs)	23 litres (1/3 full) (6 US Gallons)
220kg (484lbs) - max. empty weight	Up to 142kg (312lbs)	65 litres (full) (17.2 US Gallons)

Example loading problem:

Aircraft empty weight:	202kg (445lbs)
Pilot 1:	90kg (198lbs)
Pilot 2:	90kg (198lbs)
Total:	382kg (841lbs)

Max AUW = 409kg, therefore (409 - 382)kg = 27kg or (900 - 841)lbs = 59lbs
The specific gravity of fuel is taken to be 0.718 g/cc (1.58lbs/cc)
Therefore maximum fuel = 27/0.718 = 37 litres or 59/1.58 = 37 litres (9.7 US Gallons).

FUEL LOADS – QUIK GT450

The fuel tank is 65 litres (17.2 US Gallons)capacity, including 1.6 litres (0.4 US Gallons) unusable, giving 63.4 litres (16.8 US Gallons) useable. The weight of the fuel is 0.718 x 65 = 46.7 kg (102lb). The fuel load limitations for the range of allowable cockpit loads and aircraft empty weights are placarded in the cockpit as follows:

EMPTY WEIGHT	COCKPIT LOAD	MAX FUEL LEVEL
217kg (477lbs)	Up to 186kg (409lbs)	65 litres (full) (17.2 US Gallons)
226kg (497lbs)	220kg (484lbs) - max. load	5 litres (1.3 US Gallons)
265kg (583lbs) - max. empty weight	168kg (370lbs)	23 litres (1/3 full) (6 US Gallons)
265kg (583lbs) - max. empty weight	Up to 138kg (304lbs)	65 litres (full) (17.2 US Gallons)

Example loading problem:

Aircraft empty weight:	217kg (477lbs)
Pilot 1:	90kg (198lbs)
Pilot 2:	110kg (242lbs)
Total:	417kg (917lbs)

Max AUW = 450kg, therefore (450 - 417)kg = 33kg or (990 - 917)lbs = 73lbs
The specific gravity of fuel is taken to be 0.718 g/cc (1.58lbs/cc)
Therefore maximum fuel = 33/0.718 = 46 litres (12 US Gallons).

FUEL LOADS - QUIKR

The fuel tank is 65 litres (17.2 US Gallons)capacity, including 1.6 litres (0.4 US Gallons) unusable, giving 63.4 litres (16.8 US Gallons) useable. The fuel load limitations for the range of allowable cockpit loads and aircraft empty weights are placarded in the cockpit as follows:

EMPTY WEIGHT	COCKPIT LOAD	MAX FUEL LEVEL
220kg (484lbs)	Up to 183kg (402lbs)	65 litres (full) (17.2 US Gallons)
226kg (497lbs)	220kg (484lbs) - max. load	5 litres (1.3 US Gallons)
265kg (583lbs) - max. empty weight	168kg (370lbs)	23 litres (1/3 full) (6 US Gallons)

265kg (583lbs) - max. empty weight	Up to 138kg (304lbs)	65 litres (full) (17.2 US Gallons)

Example loading problem:

Aircraft empty weight:	220kg (484lbs)
Pilot 1:	90kg (198lbs)
Pilot 2:	110kg (242lbs)
Total:	420kg (924lbs)

Max AUW = 450kg, therefore (450 - 420)kg = 30kg or (990 - 924)lbs = 66lbs
The specific gravity of fuel is taken to be 0.718 g/cc (1.58lbs/cc)
Therefore maximum fuel = 30/0.718 = 42 litres (11 US Gallons).

FUEL LOADS - QUIK GTR

The fuel tank is 65 litres (17.2 US Gallons) capacity, including 1.6 litres (0.4 US Gallons) unusable, giving 63.4 (16.8 US Gallons) litres useable. The weight of the fuel is 0.718 x 65 = 46.7 kg (102lb). The fuel load limitations for the range of allowable cockpit loads and aircraft empty weights are placarded in the cockpit as follows:

EMPTY WEIGHT	COCKPIT LOAD	MAX FUEL LEVEL
232kg (510lbs)	Up to 172kg (378lbs)	65 litres (full) (17.2 US Gallons)
232kg (510lbs)	208kg (458 lbs)	13 litres (3.4 US Gallons)
265kg (583lbs) - max. empty weight	168kg (370lbs)	23 litres (1/3 full) (6 US Gallons)
265kg (583lbs) - max. empty weight	Up to 138kg (304lbs)	65 litres (full) (17.2 US Gallons)

Example loading problem:

Aircraft empty weight:	230kg (506lbs)
Pilot 1:	90kg (198lbs)
Pilot 2:	110kg (242lbs)
Total:	430kg (946lbs)

Max AUW = 450kg, therefore (450 - 430)kg = 20kg or 44lbs
The specific gravity of fuel is taken to be 0.718 g/cc (1.58lbs/cc)
Therefore maximum fuel = 20/0.718 = 27 litres (7.1 US Gallons).

PLACARDS:

The fuel capacity placard near the fuel filler neck must be marked with 17.2 US Gallons.

A pilot weight/fuel weight placard must be filled in showing the trade-off between fuel load and cockpit load, calculated according to the actual empty weight of the aeroplane.

3.3. CENTRE OF GRAVITY

Trike

The centre of gravity (CG) of the trike is not very critical - it only affects the range of pitch control movement, not the trim speed. The CG of both the rear seat occupant and the fuel are as close as possible to the hang point with the trike in the suspended attitude, so the suspended attitude is little affected with load variation. Solo flight is from the front seat only.

Wing

The CG of the wing *is* critical. Due to the materials used and the quality control in manufacture, the CG of the GT450 wing does not vary significantly in production. Items should not be attached to the wing which significantly change the CG. The hang point position on the wing keel must not be moved from the designed and tested position.

3.4. AIRCRAFT DIMENSIONS

Quik Wing Data

Wing Span:	27.4 ft.	8.35 m.
Sail Area:	114 sq ft.	10.6 sq. m.
Aspect Ratio:	6.57	

Quik GT450 Wing Data

Wing Span:	30 ft 6in	9.3 m.
Sail Area:	140 sq ft.	13 sq. m.
Aspect Ratio:	6.65	

QuikR Wing Data

Wing Span:	27 ft 9in	8.45 m.
Sail Area:	123 sq ft.	11.43 sq. m.
Aspect Ratio:	6.24	

QuikGTR Wing Data

Wing Span:	30 ft 5in	9.26 m.
Sail Area:	140 sq ft.	13 sq. m.
Aspect Ratio:	6.6	

Trike Data

Length (erect):	111.0 ins	290.0 cm
Length (fold down):	114.0 ins	290.0 cm
Width:	72.0 ins	83.0 cm
Track:	65.0 ins	165.0 cm
Height (erect):	98.0 ins	230.0 cm
Height (fold down):	61.0 ins	140.0 cm

3.5 POWERPLANT SPECIFICATIONS

The trike unit is fitted with either the Rotax 912UL or the Rotax 912ULS engine, the specifications are as shown on the table below.

MODEL	912	912S
Type	4 stroke	4 stroke
CC	1211	1352
Power	80 bhp	100 bhp
Ignition system	Dual CDI	Dual CDI
Cylinders	4	4
Reduction ratio	2.27:1	2.43:1
Overload Clutch	No	Yes
Min fuel rating	95 RON	95 RON
Prop manufacturer	Warp Drive	Warp Drive
Prop type	Warp Drive, 1.72m,90mm parallel chord	Warp Drive, 1.72m,90mm parallel chord
Prop pitch	11^{O}	16^{O}
Measured @ radius	Tip u/surface	Tip u/surface

NOTE

- *For all other engine data refer to the engine manufacturers handbook supplied as a supplement to the Aircraft Operators Handbook. See also Section 4.*
- *For 912-S engines, an overload clutch with "lost motion friction damping torsional vibration absorber" is recommended to be fitted for smoother startup/shutdown.*
- *For 912 engines, the overload clutch with special damper is not necessary, saving 1.7kg. It may be fitted as a customer option. The modification specification and empty weight of your aircraft appears in section 3.1.*

3.6. RUNNING GEAR

Tyre Pressures - front and rear	22.0 psi	1.5 bar

3.7. PLACARDS, DECALS AND LOCATIONS

Title	Location
Flight Limitations:	On port upright
Engine Limitations:	On basetube
Aircraft Weights:	On panel
Baggage Limitations:	On baggage container
Fuel Type, Capacity :	On rear suspension leg

Fuel Cock On/Off Positions:	On seat
Ignition Switch On/Off Positions:	On ignition switch bracket
Propeller Pitch Setting:	On airbox or radiator
Hand Throttle:	On throttle unit
Wiring Loom Disconnection Warning:	On Seat
Trimmer Setting:	On trim switch (electric trim) On trim display (electric trim)
Tip Turn Adjusters:	On leading edge tube tips
Latch Locking:	On seat next to latch
Oil Type and Quantity:	On adjacent leg
Loose Hair or Clothing:	On rear of seat
Propeller Pitch:	On oil cooler
Fuel Load Limitations:	In the cockpit
Warning Placard	On cockpit dash
Warning: folded pylon	On pylon fairing
Warning: Loose hair	On seat rear left
Warning: Hot Engine	On rear of cowling
Warning: hand throttle closed.	On seat next to hand throttle
Operating Instructions	On cockpit dash

4. MAINTENANCE

4.1. GENERAL

Apart from the consequences of heavy landing, or of exceeding flight limitations, the major factors for attention are corrosion, fatigue and UV light. There are no inherent fatigue problem with the Quik, Quik GT450 or QuikR, but excessive loads and vibration can weaken the structure, and a regular watch for hair-line cracks, most likely in areas under high stress, such as around bolt holes, should be carried out. All components can be replaced without difficulty. Repairs should be undertaken by a P&M Aviation Ltd. approved repair agency.

Aluminium Tubework

Care and consideration in de-rigging and transportation will pay huge dividends in airframe life. Any damage to any one of the structural members is serious and can usually only be repaired by replacement. Tubes suffer from abrasion or indentation, the first accelerating fatigue fracture and the second reducing the strength of the part. If you bend, dent or damage the tubular members in any way, seek immediate professional advice before flying again and have replacement parts fitted. See inspection schedule 4.2

⚠ WARNING

Never fly an aircraft with dented or damaged components.

Fasteners

Only fasteners purchased from P&M Aviation Ltd either direct or through an Approved Stockist should be used for replacement. Any fastener which is bent or shows sign of wear or corrosion should be immediately replaced.

⚠ WARNING

Nyloc nuts should only be used once. Re-using worn nyloc nuts could cause structural failure, injury or death.

Rigging Cables

The main danger with the rigging lies in kinking the cable, usually caused by careless rigging and de-rigging. Once a cable has a kink, the strands are damaged and replacement is the only cure. The side cables are particularly important and should receive a frequent detailed inspection. Check for cable damage along the length but the main failure area lies immediately adjacent to the swaged fitting. Look carefully for signs of strand fracture at this position. Corrosion is a serious problem particularly in coastal areas and shows itself as a white powdery deposit. Corrosion cannot be cured and replacement is the only answer. Only replacement cables supplied by P&M Aviation should be used.

⚠ WARNING

Kinked, corroded or damaged cables should be changed at once with new factory supplied items. Flying with damaged cables could cause structural failure, resulting in injury or death.

Fittings

Many fittings on P&M aircraft are manufactured from aluminium alloy and then anodised. Damage can occur through scratching or by the stress of an unduly heavy landing or crash, or by general wear. Look for elongated holes and stress lines in the aluminium. Damaged items should be replaced.

4.2. INSPECTION & SERVICING SCHEDULES

It is essential that the following Servicing & Inspection schedules be followed. In addition, it is requirement that your Quik aircraft has an annual condition inspection (Every 100hrs if used for training), by either an A&P or Light Sport Repairman with Maintenance Rating for Weight-Shift aircraft. 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) - Personnel Authorized	Owner LSA Repairman Inspection (Only if ELSA) LSA Repairman Maintenance A&P Repair Station
Heavy Maintenance (HM) – Personnel Authorized	LSA Repairman Maintenance A&P Repair Station

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 (4in wide wheels only). 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		
COOLANT RADIATOR: Check coolant levels and confirm 80 – 100% antifreeze mix. (LM)				Inspect		
COOLANT 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
OIL & COOLANT 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	Pre-	First 10	Every	Every	100 hrs	Other

Manual for full service instructions	flight	hrs	25 hrs	50 hrs		
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

FUEL SYSTEM	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
CARBURETTORS: check and clean float bowls as necessary, see Rotax Manual for instructions. (LM)		Inspect	Inspect			
TANK: drain, flush out and check vents. The tank should be drained with a siphon through the filler neck. Ensure that all bits of dirt observed inside the tank are removed. Pay particular attention for any indications of water contamination. (LM)		Service			Service	
FUEL FILTERS: check for contamination, change. Examine filter carefully for signs of dirt, if any found replace fuel filter. (LM)		Inspect		Service		
FUEL LINES: check for cracking or leaks, check torque on all connectors and clips. Check the overall condition of the fuel line. If there any signs of cracking, shrinkage or hardness of the fuel line it must be replaced. Check for rub points along the entire length. (LM)	Inspect			Inspect		

TRANSMISSION	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
PROPELLER: check for cracks & delamination. Check along entire propeller for stone chips or damage. Check the propeller tape for security. (LM)	Inspect					
PROP BOLTS: check state of bolts & torque. Check wire locking before every flight, and check the torque and re-wirelock every 50 hours. (LM)	Inspect			Service		

TRIKE FRAME	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
PYLON TUBE: check for cracks, bends & fatigue (Also after every hard landing). Check the top corners of the pylon for signs of cracking and distortion. If any is found the pylon must be replaced. Check the top bush for signs of rotation, if any is found the bush must be re-seated to stop further rotation. (LM)				Inspect		
PYLON TUBE: Check bottom pivot and bolt. Check for the security of all bolts and fasteners, check plates for distortion. (LM)				Inspect		
PYLON TUBE: Check fairing fasteners. Check fairing is secure. (LM)	Inspect					
BASE TUBE: check for cracks, bends & fatigue (Also after every hard landing). Check the base tube for damage, inparticular check the base tube in the region of the front forks for crushing/bending due to heavy landings. Any damage requires a new base tube. Check base tube/wishbone attachment points for damage. (LM)				Inspect		

FRONT STRUT: check for cracks, bends & fatigue (Also after every hard landing) Check holes for elongation and tubes for straightness. Any damage requires replacement. (LM)				Inspect		
SEAT FRAME: check for fatigue and bends. Check for security and straightness. (LM)				Inspect		
HANG POINT: Check hang point, and nylon collars. Nylon collars and small bush should be free to rotate together, inside large pylon bush. (LM)	Inspect			Inspect		
HANG BOLT: check condition of bolt & Lanyard. Hang bolt should be free of rust and straight. Lanyard should be securely attached to bolt, and pin undamaged. (LM)				Inspect		Recommend Renew 250hrs
PYLON BUSH: check security. Large steel bush should not rotate inside pylon. (LM)				Inspect		

UNDERCARRIAGE	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
TYRES: check condition of treads & sidewalls. There should be no bulges or cracking present in the sidewalls. Tread should be present on the tyres. (LM)				Inspect		
TYRE PRESSURES: 22psi. Check the inner tube valve sits properly through wheel. (LM)	Inspect					
FRONT FORKS: check for damage. Check fork legs for straightness. Check suspension for movement and security of all fasteners. Nose wheel should be parallel to forks. (LM)	Inspect			Inspect		
FRONT FORK BEARINGS AND HOLDERS: check for play in steering head. Check also for damage to bearing holder caused by heavy landings. (LM)				Inspect		
BRAKES: check shoes/pads. Check brake pads for wear. (LM)						Inspect as req
BRAKES: Check for chafing of cables or nylon tubing and pad wear, check brake fluid level and check for leaks. (LM)				Inspect		
WHEEL BEARINGS: check seals and general condition. Check for free play and listen for any rumbling when rotating wheels. (LM)				Inspect		
WHEEL HUBS: check for damage and wear after every heavy landing. Check for corrosion and denting to wheel hubs. (LM)				Inspect		
REAR STRUTS: check rose joint security, and that all nuts and tight. (LM)				Inspect		
REAR STRUTS: Grease sliders, see paragraph 4.8for details. (HM)						Service 200hrs
WISHBONES: check for damage. Check security of fasteners. Check for dents and twisting of wishbones. Check security at base tube fasteners. (LM)				Inspect		

ELECTRIC TRIM SYSTEM	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
Connected, operates correctly, full and free movement of controls, trim display (LM)	Check					
Trim cord condition. Visually check cord for fraying and other damage. (LM)				Inspect	Inspect	
Trim Bungee and pulley (remove fairing), check for damage and wear of all components. (LM)					Inspect, check forces as in 12.6.	Replace if slow trim > 60mph

Trim motor, switch, connections, display, circuit breaker check pull-off/reset. Check trim motor for security, check all electrical cables for security. (LM)					Inspect /check	

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/QuikR/GTR 1.2mm needle 1360 grams) (QuikR 1.2mm needle 400 grams to not rip the fine fabric within each ripstop square HTP Material Only). Check wing top surface near centre and near tip area. Only pull through single surface. Check a sample of stitching. (HM)					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 & GTR): Inspect struts for dents, and end fittings for security and cracking. Check bearing is secure in fitting.(LM)	Inspect			Inspect		
WASHOUT ROD SETTINGS (QuikR & GTR) (HM)						500 Hours/4 years.
TIP FINS (GT450 & QuikR); Check security of tip fins for damage and mounting points. (LM)				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 A&P or LSA Repairman with Maintenance Rating 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. (HM)

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.

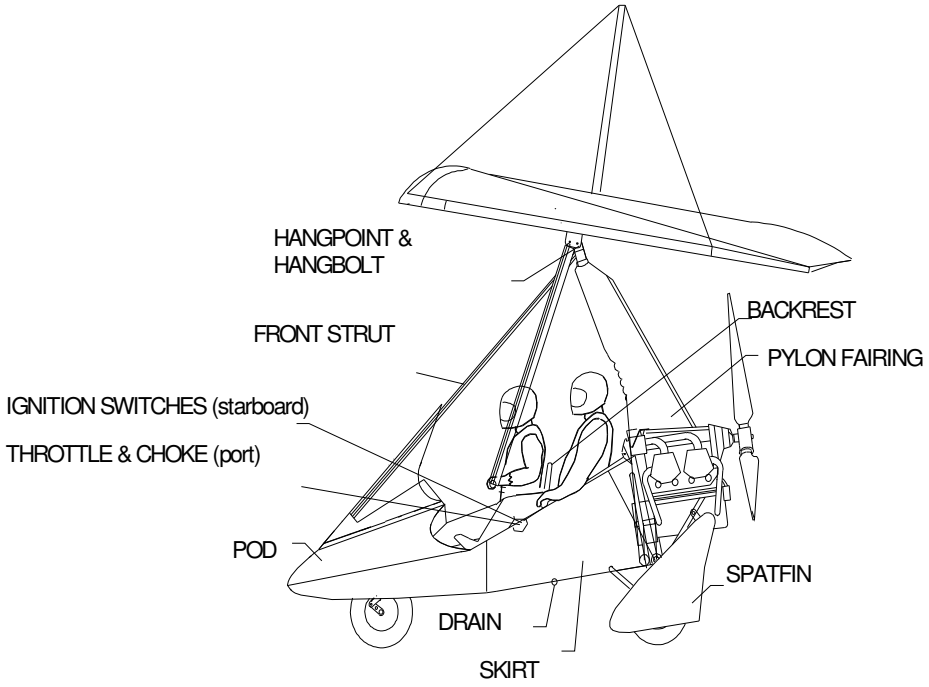
For the following small items, inspection is not practical and so replacement is strongly recommended at the following times:

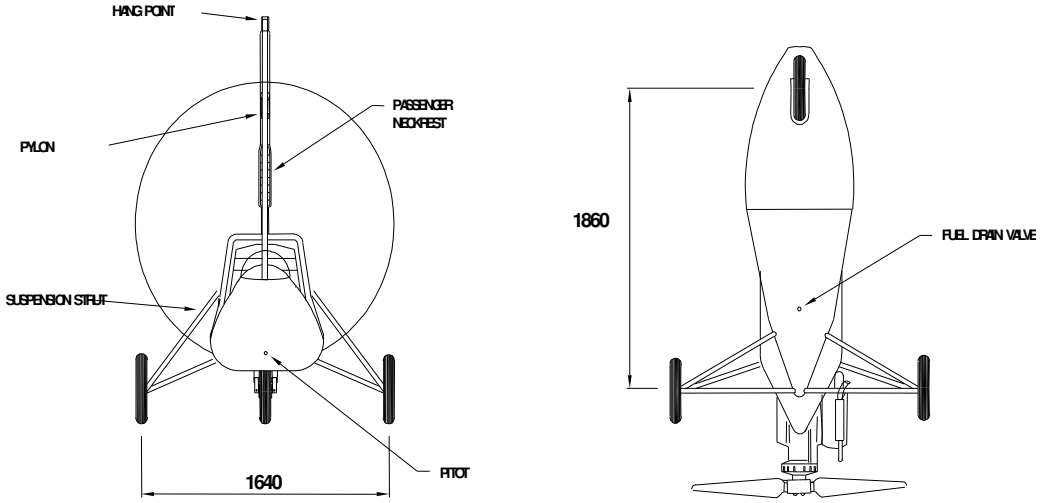
Hang bolt	250 hours.
Control frame top pivot bolt	1500 hrs

⚠ WARNING

It is vitally important that the lifing & NDT of all components is strictly observed, or serious injury or death could occur.

4.4 PRIMARY STRUCTURES AND SYSTEMS - THE TRIKE





The Rolling Chassis

The main structure of the trike is of square section high strength aluminium alloy tube. A rigid composite tandem seat is fitted which locates onto the tubular seat frame. The seat incorporates a foldable backrest for the front seat occupant.

The rear undercarriage comprises Chro-Mo steel alloy tubular wishbones with suspension by polyurethene elastomer incorporated in the tubular aluminium alloy struts. The braked main wheels are accessible by removing the quickly-detachable wheel spatfins.

The nose undercarriage is steerable and incorporates footrests and throttle/brake controls. A trailing link elastomer suspension system is fitted.

4.5 TRIKE

General (LM)

The trike has been designed to permit easy inspection and operators should have no difficulty in assessing problems or recognising damage if visual checks are carried out conscientiously.

The trike may be transported and stored fully assembled or folded down. If folded down, for transport -

a) The pylon must be supported to prevent damage to the structure.
b) A 64mm wide (21/2") spacer block must be inserted where the pylon fits into the engine mount.

General care should include:

- Washing down the tube work and composite parts with warm water and a light detergent followed by rinsing with fresh water.
- Fabric sponged with warm water and a mild detergent and rinsed with fresh water.
- The pod and wheel spatfins washed and polished using commercially obtainable shampoos and polishes.
- The cockpit area should have all litter removed.
- Winter storage: if the trike is unlikely to used for some time, lightly spray all mild steel parts with Duck Oil or similar to prevent corrosion. Spray the engine with WD40 or Silicone Spray.

4.6 LUBRICATION

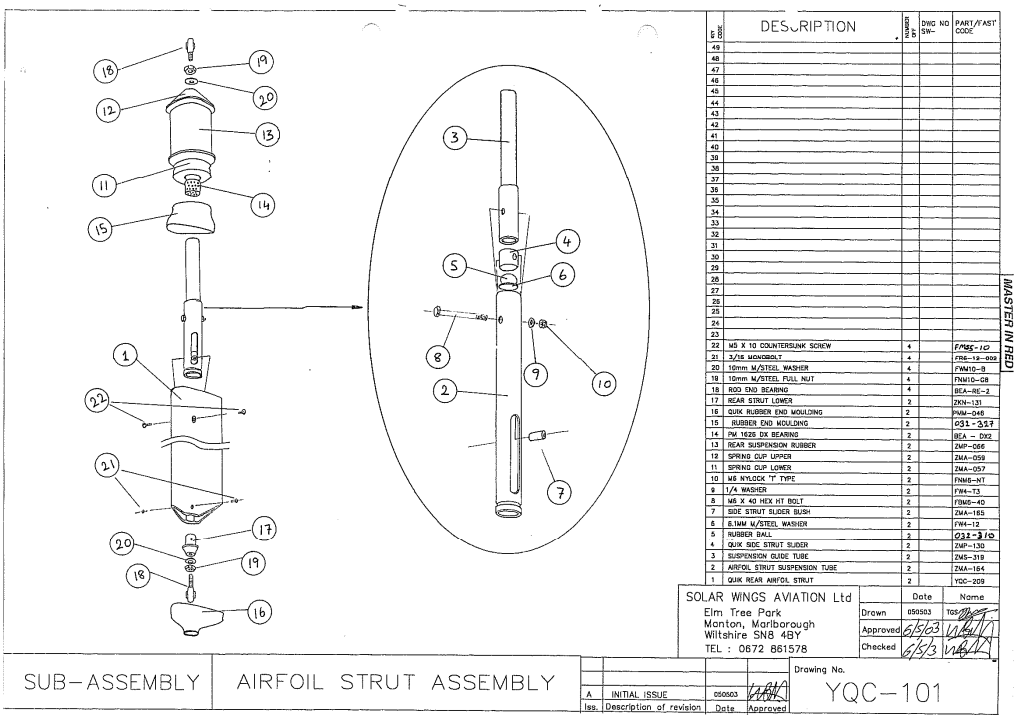
Trike

The rear steering bar, foot throttle, hand throttle and choke lever pivots should be lubricated with machine oil weekly. (LM)

Lubricate the rear suspension sliders with grease every 200 hours. To do this you will need to dismantle each suspension leg in turn as follows:

1. Remove wing from trike & place a jack under the keel towards the rear using soft wood to prevent damage.

2. Lift the trike until the weight is just off 1 wheel and support it so that the trike cannot topple when the suspension leg is dismantled, if possible tie the pylon up to a roof beam.
3. Disconnect bolt attaching lower suspension leg attachment eye, remove 2 socket screws near top of suspension leg.
4. Withdraw the lower suspension leg, leaving the top section attached to the trike.
5. Loosen the locknut at the top of the upper suspension rod & remove the upper suspension rod using a tommy bar to unscrew it.
6. Apply grease liberally to the sliders.
7. Reassemble in the reverse order, use Loctite 222 engineering adhesive on the upper suspension rod threads and locknut and also on the two socket head screws.
8. Repeat the operation on the other leg.



WARNING

It is essential that when re-assembling the suspension legs as in 10 above, you use Loctite 222 as indicated. It is better to use too much and wipe away any excess than to use too little, so apply it liberally to ensure that all the applicable threaded area is coated. Follow the instructions on the Loctite container. Failure to carry out this procedure could result in the undercarriage failing leading to injury or death.

WARNING

When dismantling the suspension legs to lubricate the sliders it is essential that the trike is supported to ensure that it cannot topple over. Failure to do so could result in injury or death.

All other bearings are life sealed and require no additional lubrication.

Engine

For engine maintenance details see Rotax Maintenance Manual (Line Maintenance) For Rotax 912 Type 912 Series Ref. No. MML-912 Edition 2 or later.

The Fuel Tank and System

Fuel is fed from a single fuel tank mounted beneath the seats. The fuel system has a fuel cock and external filter backed up by an internal strainer fitted to the end of the fuel tank pick-up pipe. External fuel pipes are fire-resistant to a specification that meets British Civil Airworthiness Requirements - Section S.

The approximate calibration of the fuel tank is as follows:

% Tank Volume	Gauge Reading
0 to 15	0
16 to 27	1/8
28 to 41	1/4
42 to 57	7/16
58 to 70	9/16
71 to 85	11/16
86 to 90	7/8
91 to 100	1

⚠ WARNING

Never rely on the fuel gauge accuracy alone when calculating flight distances left to run. A forced landing due to running out of fuel could result in injury or death.

Before you place any reliance on your fuel gauge, you will need to calibrate the fuel gauge on your particular aircraft. As is general practice in aviation, you should visually check the fuel tanks to confirm that the contents match the fuel gauge reading before flying. When flying, use your watch to time the flight against known fuel burn at a given rpm, and always leave plenty of fuel in reserve.

Propeller - Warp Drive. (LM)

The condition and torque settings of the 8mm propeller bolts should be checked with the frequency recommended in the inspection schedules laid out below. Torque should be applied by progressively tightening all the 8mm bolts to 20Nm (15 ft lbs) in the following sequence :

1 - 4 - 2 - 5 - 3 – 6

All 12 ¼" unf bolts should be tightened equally to 12Nm (10 ft lb)

Other general maintenance should include replacing any leading edge tape as required by inspection and regular wiping off of the propeller with a damp cloth to remove insect and other foreign body build-up. If left unchecked, both the condition of the tape and particle build-up can significantly reduce propeller efficiency.

If propeller leading edge tape is replaced (or added), or if any undue vibration has been noticed, or if a blade has been chipped and in any case at the recommended service intervals not to exceed 25 hours (see engine handbook) it is essential to remove the propeller and check the balance. A propeller balancing service tool kit is available from your dealer.

Do not push the aircraft by its propeller blades, or otherwise bend the blades, which could cause serious structural damage to the propeller.

⚠ WARNING

Never fly with a damaged propeller. Damage to a composite propeller could be structural with little external sign. If a propeller blade "lets go" at cruise power settings, you have less than 2 seconds before the engine tears itself off its mountings. Shut the engine down immediately if the propeller gets damaged in flight or on take-off.

Propeller Pitch Setting

For the correct pitch setting for each model, refer to Section 3.5. Refer to the propeller manufacturer's pitch setting instructions. Uneven pitch settings can cause vibration, loss of thrust and even internal damage to the engine. Incorrect pitch setting will affect performance and void the noise certification.

After resetting the pitch, check for tracking alignment, balance, and static RPM as indicated in the table below.

Engine/propeller	Rotax 912 Warp Drive 11 deg at tip	Rotax 912S Warp Drive 16 deg at tip
Max RPM Static	5200	4800

⚠ WARNING

Make sure the aircraft is properly secured and clear of persons and animals before running this test.

See Section 1.8. PREPARATION FOR SAFE MICROLIGHT/ MICROLIGHT AIRCRAFT OPERATION, Special Hazards, "Running Up and Testing an Engine on the Ground".

Rigging System (LM)

The gas strut is normally maintenance-free, but lubricate pivots occasionally. Do not subject to side-loads.

⚠ WARNING

Gas under high pressure. Do not attempt to pierce, re-pressurise or incinerate.

4.7 SECONDARY STRUCTURES AND SYSTEMS - ENGINE CONTROLS

Throttle

The primary throttle control is foot-operated (forward for full power and rearward for power off) and complemented by the friction-damped hand throttle (forward power on and rearward off) on the left side of the seat frame.

- *A cutout switch may be optionally fitted in the hand throttle to prevent starter operation unless the throttle is closed. Therefore for all starts including airborne restarts, THE HAND THROTTLE MUST BE CLOSED.*

⚠ WARNING

The hand throttle is set by means of a friction device, which means it could be left open. Always check it is fully closed before start-up.

Choke

The choke control is by means of a lever located on the left side of the seat. The lever is down for choke OFF, forward for choke ON. Normal operation is always with choke off.

⚠ WARNING

Check the choke is off before take-off. A warm engine with choke on will not develop full power and could cause serious problems in the climb and could cut out altogether if the power is reduced.

Contact Switches

Two ignition-kill switches - one for each ignition system - (up for on/down for off) are fitted, one in front of the other, on the starboard side of the seat frame. The two switches should normally be operated together by stroking with a finger or thumb.

⚠ WARNING

The switches operate in the "normally open" mode, so they have to close the circuit to kill the engine. In the unlikely event of a switch failure, kill the engine using the choke. If this fails, turn off the fuel. With the fuel turned off, the engine may take some minutes to stop, as all the fuel in the carburetters must be used up.

Ensure the contact switches are off whenever you leave the aircraft. Failure to do so could result in injury or death when the propeller is handled during the next pre-flight check procedure.

Mixture control

The optional mixture control system works by applying reduced air pressure to the carburettor float chambers, so reducing the fuel flow through the carburettor jets. The mixture leaning control is a valve on the instrument panel which applies either ambient pressure (rich) or partial carburettor venturi pressure (lean) to the float chambers. The pressure can be monitored by a gauge. Maximum leaning is limited by the size of the air vent jet.

The mixture should be set fully rich at all times except when cruising at a steady altitude, speed and throttle setting. The exhaust gas temperature (EGT) must be monitored when leaning the mixture, it must not exceed 800C. Observe all other engine limitations before and after leaning.

Starter - Electric start

The starter is operated by start button on the instrument panel. The key switch must be in the ON position for the starter button to function.

NOTE

- *The key switch only switches the power to the instruments, comms & starter. Remember to switch on the ignition switches before start-up!*
- *The hand throttle cutout switch option makes it necessary for the hand throttle to be CLOSED in order for the starter circuit to operate.*

4.8 SECONDARY STRUCTURES AND SYSTEMS - BRAKING SYSTEM

The compensated rear wheel brakes are operated by a foot pedal on the left side of the front fork steering bar. Brakes may be cable operated drum or hydraulic disc type according to aircraft specification. A brake locking device is provided for parking. To lock, press the brake pedal and, with the left hand, lift the adjacent locking lever and engage one of its slots with the hoop on the side of the steering assembly. Release occurs automatically when the brake pedal is pressed.

NOTE

- *Do not press on the end of the locking ratchet to engage parking brake. There is a risk it could bend.*
- *The travel of the hydraulic brake pedal will be such that the locking lever will engage only in the first or second notches. This is normal.*
- *Use Dot 4 brake fluid e.g. Bendix Universal Dot 4 from a sealed container. Standard Wheels*

With the "Explorer" option fitted (Black Max wheels and brakes) there is a valve provided for the parking brake. Apply brake pressure and shut the valve.

- *Use Mineral ATF (automatic transmission fluid) in the Black Max wheel brakes.*
- *Ensure the parking brake valve is OFF before taxi, takeoff and landing.*

4.9 SECONDARY STRUCTURES AND SYSTEMS - FUEL SYSTEM

Fuel is pumped from the single tank below the seat by the engine pump via the fuel filter. The 912S installation features a recirculation system which returns excess fuel to the tank. The tank is vented via a pipe to discharge clear of the aircraft. A sump with water drain is provided. The tank may be 49L or 65L, the 65L tank has a third mounting point at the centre of the tank. Fuel is supplied to the carburettors via the main shutoff cock.

Rotax 912/912S

The preferred fuel is 95 RON minimum octane rating unleaded petrol. 4 star leaded fuel (super) can also be used. 100LL AVGAS can be used, but the high lead content causes more plug fouling, so use only when necessary. Plugs should be checked at least every 25 hours if using AVGAS. If AVGAS is used more than just occasionally, then Rotax Service Instruction SI-912-016R5 or later.

Whichever type of fuel is used, use a reputable source of supply and during your daily inspection, use the water drain facility provided in the fuel tank. Push the drain mushroom upwards and sample the fuel in a transparent container before the first flight of the day. Any water present will sink to the bottom. If any water is found in the tank, check the carburettor fuel bowls for water before your next flight.

⚠ WARNING

- Gasoline is extremely flammable and can be explosive under certain conditions.
- Refuel in a well-ventilated area with the engine stopped.
- Do not smoke or allow flames and sparks in the area where the engine is refuelled or where fuel is stored.
- Turn the ignition and Master switches OFF. Earth the aircraft.
- Never fill the tank so that the level rises into the filler neck. If the tank is overfilled, heat may cause the fuel to expand and overflow through the tank vents.
- After fuelling, make sure the fuel cap is securely replaced.
- Be careful not to spill fuel when refuelling. Spilled fuel or fuel vapour may ignite. If any fuel is spilled, make sure the area is dry before starting the engine.
- Avoid prolonged or repeated contact with skin or breathing of vapour. KEEP FUEL OUT OF REACH OF CHILDREN.

4.10. SECONDARY STRUCTURES AND SYSTEMS - SEAT BELTS

Lap straps are provided for both occupants. In addition, a single diagonal shoulder restraint is provided for the front seat and twin shoulder restraints for the rear.

⚠ WARNING

Both safety harnesses must be used in full with shoulder restraints. This must be checked before take off.

4.11. SECONDARY STRUCTURES AND SYSTEMS – COCKPIT, FAIRINGS AND SCREEN (LM)

All fairings are made of lightweight composite materials and serve the dual functions of giving the pilot a degree of weather protection as well as improving the aerodynamics of the aircraft. The spat fins and wing tip fins are fitted to improve high speed yaw stability. The polycarbonate screen with deflectors protects the pilot from the slipstream, it must be kept clear using a clean cloth, soap and plenty of water

- *The screen extension must be removed when folding the pylon for rigging / de rigging.*
- *Any further modifications which add side area to the front of the pod will adversely affect high speed yaw stability and are not recommended without extensive flight testing.*

4.12. SECONDARY STRUCTURES AND SYSTEMS - ELECTRICAL SYSTEM

The aircraft is fitted with two standard wiring systems; one for transmission of electrical power derived from the engine alternator and the other for sensor signals to be used in instrumentation. Two independent sets of cables to the two separate ignition switches are provided. Ignition is independent of the battery/alternator/regulator system.

The power available from the alternator is a function of engine speed and the electrical load.

⚠ WARNING

Take care not to disturb the wiring under the pod with your feet. Do not store things under the seat that can disturb connections

Connection to the wiring is via crimp connections in rubber connector housings and, in the case of the power wiring loom, via spade terminals to a multiway fuseholder at the front of the aircraft.

All models are fitted with a regulator, which charges the battery where fitted. Electric start models have a solenoid for transmitting current to the starter motor. A safety cutout switch may be fitted to prevent starter operation with the hand throttle open.

The Alternator

Rotax 912/912S: the alternator gives a nominal maximum current of 18 amps AC or voltages up to about 75 volts RMS with very low current. The nominal power rating is 250 Watts DC.

Power Wiring

The power wiring loom consists of insulated conductors inside a woven nylon sheath with a rubber connector at the rear end and spade terminals at the front. A 2-core cable and switch for engine ignition control is also included for each ignition circuit.

Note that airworth g system must be protected by ove than one circuit essential to fligh e aircraft for the attachment of ele

Unauthorised modifications, including the fitting of optional electrical equipment, must not be carried out under any circumstances without official modification authorisation issued by the factory.

Operators wishing to fit equipment themselves must contact their dealer with a modification scheme, the dealer will obtain modification authorisation from the factory.

⚠ WARNING

Sensor Wiring

The sensor wiring system comprises a multicore cable intended for transmission of signals not involving significant power levels. No items requiring significant power with an alternating component should have their supply lines attached to this cable as electrical interference with sensor signals may occur.

CAUTION

When the aircraft is stored for an extended period of time, remove the battery and charge it fully. Then store it in a warm dry place. Never leave the battery discharged.

⚠ WARNING

The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging or using batteries in an enclosed space. The battery contains sulphuric acid (electrolyte). Contact with skin or eyes may cause severe burns, wear protective clothing and a face shield.

- If electrolyte gets on your skin, flush with water.
- If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician immediately.
- Electrolyte is poisonous, if swallowed, drink large quantities of water, follow with milk of magnesia and call a physician immediately.

4.13. SECONDARY STRUCTURES AND SYSTEMS - CARBURETTOR HEAT

Evaporation of the fuel at low pressure in the intake tract can lead to carburettor icing in humid conditions particularly between +10 and -5°C ambient temperature. Icing is generally more prevalent at part throttle settings. Symptoms include rough running, power loss and sometimes throttle sticking open. Throttle sticking may also occur through cable freezing if not correctly maintained - see Maintenance Section.

Rotax 912/912S Carburettor Heat System

A carburettor body warming system supplied with heat from the coolant is installed.

The radiator cover should be adjusted to obtain at least 80C coolant temperature for the system to work effectively. Power reduction due to intake temperature rise is small and the system can be used with carb.heat selected ON continuously. Pipes and connections should be checked regularly for condition/chafing. See maintenance section.

4.14. SECONDARY STRUCTURES AND SYSTEMS - RADIATOR COVERS

912/912S Oil Radiator Jacket

In accordance with **P&M Service Bulletin No: 0094**, in which it was noted that it was desirable for the oil temperature on aircraft equipped with the Rotax 912/912S four stroke engines to reach 100°C at least once per flight, P&M now supply a neoprene jacket which may be fitted to the oil radiator when the aircraft is operated in cool ambient temperature. The purpose of this jacket is:

1. To make it easier to reach 100°C in normal use, in order to minimise the risk of humidity building up in the oil system.
2. To speed up the warm-up procedure.

***Note**! If your aircraft regularly reaches 100°C in normal operations, there is no need to fit the cover.*

Usage

The oil temperature on the 912/912S depends on the use to which it is put. Extended periods at high RPM in hot climates will result in temperatures of 100°+C, whereas at a typical cruise of 4000rpm in an ambient temperature of 23°C or less, 75-85° is the normal oil temperature. Whether to use the jacket with 100% or 50% coverage, or indeed at all, becomes a function of how the engine is used and in what ambient temperatures. The responsibility for ensuring that the oil temperature remains within the correct limits is therefore the pilot's. Regular

in-flight checks should be made to ensure that the oil temperature remains within the desired range of 85-100°C and that the following limitations are respected:

1. Lower oil limit: 50°C
2. Upper oil limit 912 engine: 140°C 912S engine: 130°C

Adjustment

In the event that 120°C is reached in a typical climb to 2000' or 600m, it is probable that the jacket is covering too much of the radiator for the prevailing conditions. Make a precautionary landing and adjust/remove as necessary. To adjust from 100% to 50% coverage, simply pull the bottom of the cover up to the top.

The following are typical coverage settings in normal usage:

AMBIENT TEMPERATURE	RADIATOR COVERAGE
Up to 23°C	100%
24-32°C	50%
33°C+	No coverage - remove jacket

Inspection

Check the security of the installation of the jacket as part of your daily inspection, and carefully inspect the jacket for wear or damage every 50 hours.

4.15 TRIM SYSTEM

Electric trimmer

The wing is provided with fixed reflex lines and a small bracket on the wing keel. An electric winch with limit switches and position sensor is mounted at the bottom of the pylon. The winch is operated by a spring-return switch on the throttle box and the trim position is displayed by LED bar graph on the instrument panel. The winch pulls on a bungee inside the pylon fairing which pulls a cord connected via a pulley to the wing keel bracket. This system provides finger-tip control, with lighter pitch and roll forces at low speeds than the reflex trimmer. Aerodynamic efficiency is also better at slow speeds.

Normal operation

The basic operation of the trimmer is to set the desired attitude and adjust the power setting so that the aircraft is in a steady state, and then adjust the trimmer till the bar force disappears. It is *not* good practice to fight the trimmer by pulling the bar in whilst selecting slow trim.

The trimmer takes approximately 18 seconds to run through the whole range. In the cruise, there may be a delay of a few seconds when selecting nose-up trim as the trimmer takes up the slack.

Note that the takeoff trim placard is set at approximately 65mph, to avoid too much pitch-up on the initial climb. For landing approach, trim at 55 - 60 mph solo, 60 – 65 mph dual.

Abnormal operation

The trim motor only runs when the pilot holds the trim switch, it will stop as soon as it is released. It can also be stopped by pulling out the 5A circuit breaker or by turning off the main master switch.

The trim motor 5Amp circuit breaker should not trip under any normal operating condition. It may trip if the pilot pulls the bar all the way back whilst selecting full nose up trim; this practice is not recommended as it puts unnecessary load on the system. In this case it is permissible to reset the C.B. after 2 minutes. The C.B. will also trip if the trim motor should run past the normal limit microswitch and the motor is not stopped by the pilot, in which case the bungee will eventually be stopped at the top of the engine mount frame and the trim speed will be very slow, 40-45mph.

With correct inspection and maintenance, trim cord or bungee failure is unlikely. If it happens the aircraft will go to full fast trim. In the case of main electrical system failure, the trim will stay where it is. In any case, fly the aircraft at the normal approach and landing speeds, accepting the out-of-trim force.

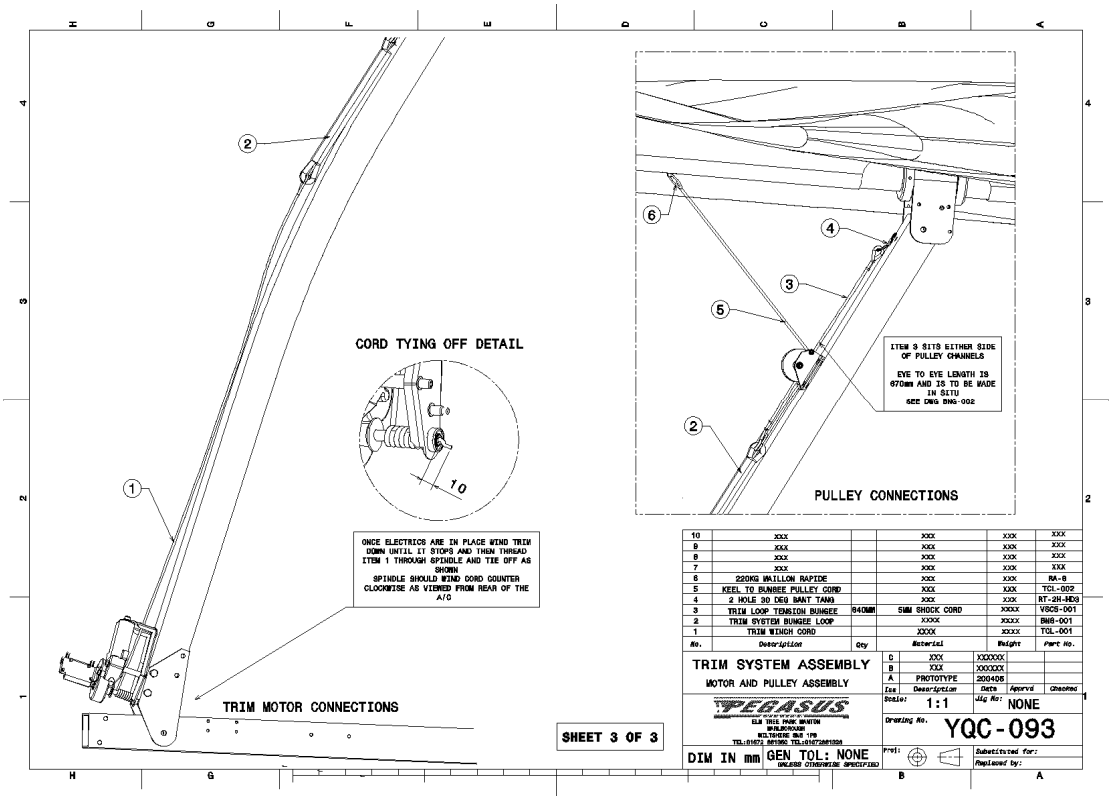
NOTE

- *The aircraft should be left with the trimmer slack (fast) to prolong the life of the system.*
- *With correct maintenance, failure is unlikely. However It is advisable to practice landing at both extremes of trim occasionally.*

⚠ WARNING

Never take off with a faulty trim system. Always check trim operation and flight controls before takeoff.

Electric Trim



No.	Description	Qty	Material	Weight	Part No.
10	XXX		XXX	XXX	XXX
9	XXX		XXX	XXX	XXX
8	XXX		XXX	XXX	XXX
7	XXX		XXX	XXX	XXX
6	220KG MAILLON RAPIDE		XXX	XXX	MA-6
5	KEEL TO BUNGEE PULLEY CORD		XXX	XXX	TCL-002
4	2 HOLE 30 DEG BANT TANG		XXX	XXX	RT-2H-HD3
3	TRIM LOOP TENSION BUNGEE	840MM	5MM SHOCK CORD	XXXX	VSC5-001
2	TRIM SYSTEM BUNGEE LOOP		XXXX	XXXX	BNG-001
1	TRIM WINCH CORD		XXXX	XXXX	TCL-001

Iss	Description	Date	Aprvd	Checked
C	XXX	XXXXX		
B	XXX	XXXXX		
A	PROTOTYPE	200405		

Jig No: NONE

The pylon must be folded down to inspect the motor assembly. The fairing must be removed to inspect the bungee etc.

The electric motor assembly and contacts should be kept protected from prolonged contact with moisture, otherwise no specific maintenance is required.

The trim cords should be checked for fraying or degradation especially at the winch drum, engine mount guide, top pulley and end connections. If required it must be replaced with genuine Dyneema 4mm cord, part no. TCL-001 and TCL-002. Note the top cord is of a fixed length with sewn ends, it must not be shortened by knotting etc. The 5mm return bungee should provide enough tension to wind the cord neatly onto the winch drum with the trim cord slack.

The pulley must turn freely and the ball bearing should be given a drop of oil.

Adjustment

With the control bar held back against the pilot's stomach, in the fast trim position, the trim cord and bungee should be just coming under tension. With the bar at the pilot's stomach, the cord should be just slack. Adjust by pulling the trim cord through the winch spindle and applying a stop knot.

With the trimmer set to the slow position, the trim bungee thimble knot must not be pulled lower than the pylon fairing spacer. Check the basebar can be pulled fully back against the bungee tension.

At slow trim, the trim bungee should provide a force of 13-16 kg measured at the control frame basebar, with the basebar against the front strut. If the force is less than 12kg and the slow trim speed is too high (above 60mph) then the trim bungee must be replaced with genuine part no. BNG-001.

Display

The display should indicate from full up to full down, in the correct sense, over the whole range of trim motor movement. It can be adjusted if necessary by preset potentiometer at the back of the display. Note display readings may be affected by over or under voltage conditions.

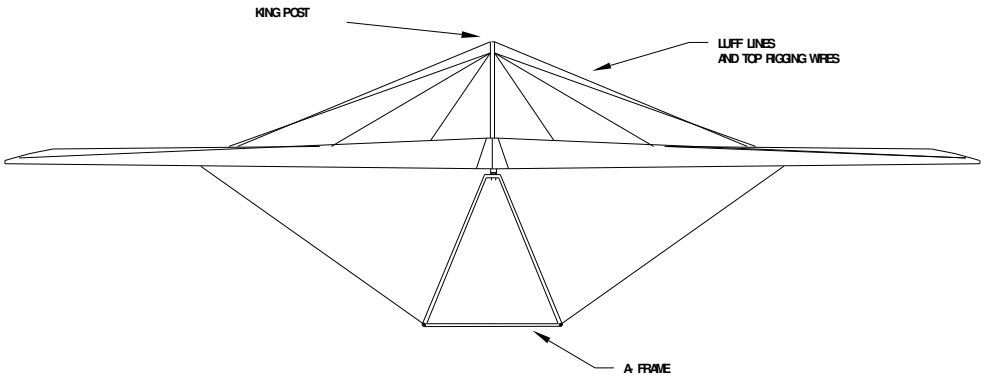
Electrical protection

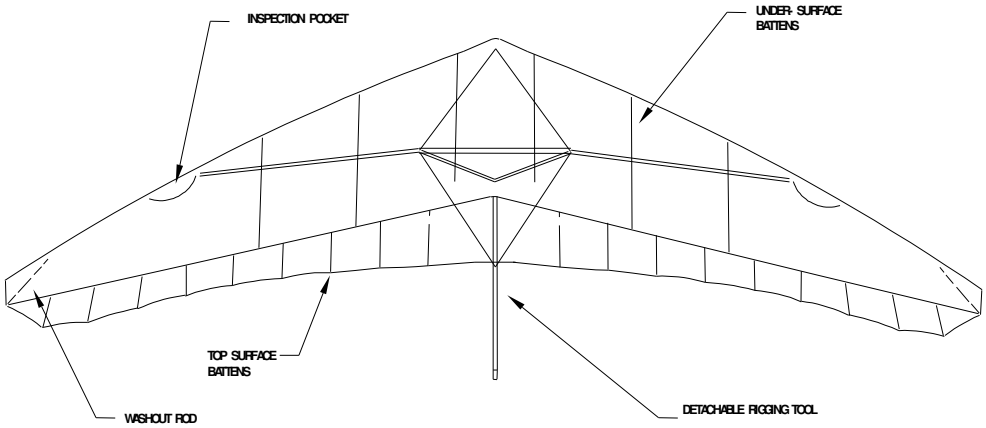
The system is protected by a 5A push on/pull off circuit breaker. This should not operate in any normal condition of use. If it operates, leave for 2 minutes before attempting a reset. If it operates again, the motor system, wiring and limit switches must be checked. The CB can be manually pulled OFF if required.

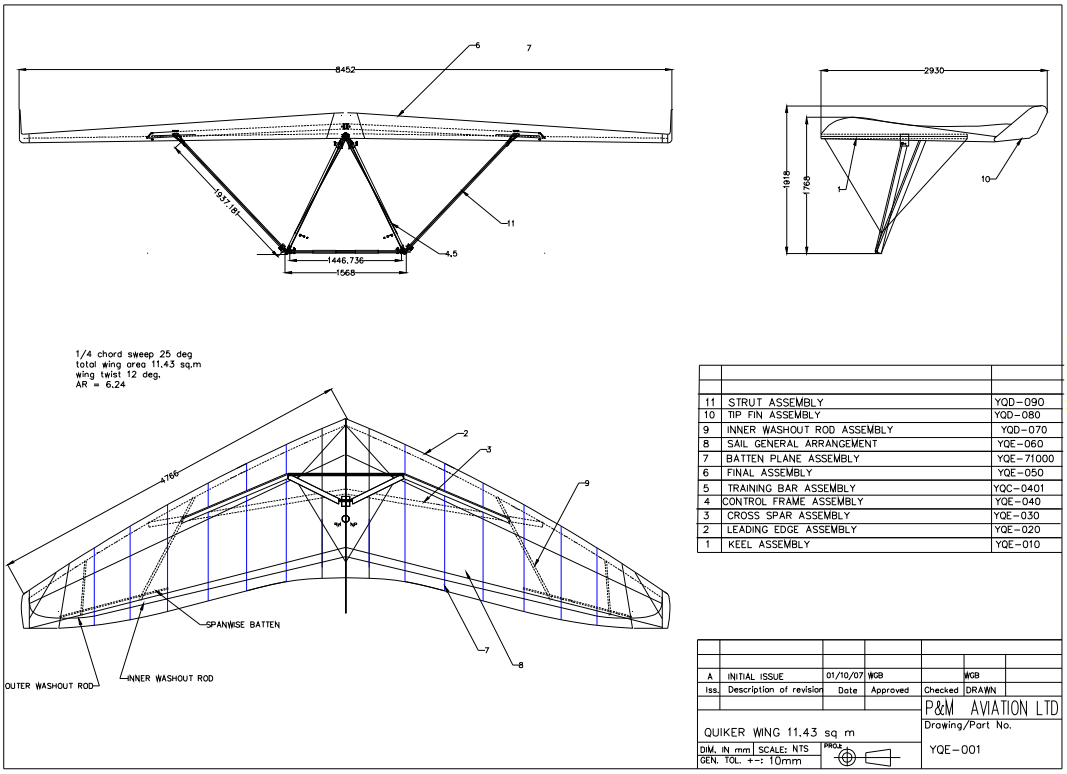
Note:

- The main charging fuse from the regulator to the battery should be 30A when electric trim is fitted.
- The main fuse from the master switch to the main electrical bus should be 20A when electric trim is fitted.

4.16. PRIMARY STRUCTURES AND SYSTEMS - THE WING







The Sail

The Quik range or wings are the product of one 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 or Technora trailing edge and a spanwise Kevlar or Technora 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 or Technora 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 limited 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, QuikR & GTR 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 aircraft rigged, check the ribs every 100 hours. The best way to reform the rib is to hold the it against your knee and, whilst applying pressure to bow the rib, slide it side to side over the area you want to bend. Direct point bending will usually

result in either a poor shape or a broken rib. If you kink a rib, do not fly with it; you should replace it before the next flight.

On the Quik & GT450 the bungees on the 5 outer most battens must be tight (10-15kg to pull each of the twin cords out of the batten end notch) to prevent trailing edge buzz.

On the QuikR & GTR the outer 5 batten spring adjusters should be wound out, inspected and lubricated sparingly with grease, annually.

Flattening of the camber in the nose and root battens will cause the stall speed to rise.

Washout Rods - QUIKR & GTR
The wing is provided with washout rods which define a twisted (washed out) profile which maintains pitch stability at low angles of attack. The inner one is mounted at the leading edge by a cable and rests over the cross boom, protected by a plastic sleeve. The outer one is attached by a universal joint and cable system. Both rods are linked together by a nylon cord which runs from the wing root. The cord pulls both rods into the correct position automatically as the wing is opened out. A bungee retracts both rods to the stowed position for transport.

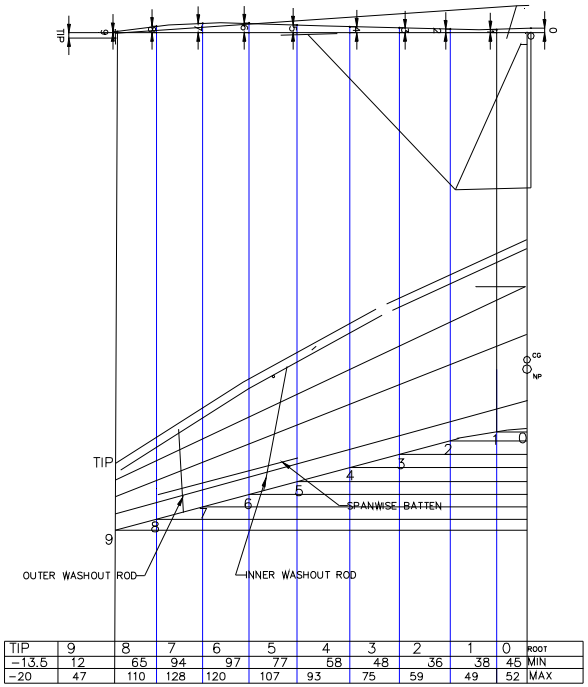
The inner washout rod is of fixed geometry and must conform to drawing YQE-0700. The outer washout rod is adjustable by detaching the cables at the 5mm bolt and rotating it in the front threaded adjuster. 1 turn = approximately 6mm of vertical travel at the rod tip.

Washout Rod Settings - QUIKR
The washout distribution must be as shown in the drawing YQE-051 below. The settings must be checked after any incident where wing damage is suspected, before wing tuning and during any wing rebuild.

⚠ WARNING

Washout rods should never be lowered from the optimised positions defined on drawing YQE-051. Dangerous pitch instability may result.

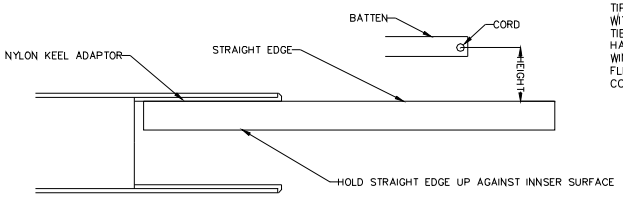
WASHOUT DISTRIBUTION AT TRAILING EDGE
HEIGHTS ARE IN MM ABOVE TOP SURFACE OF KEEL
WING RIGGED AS IF FOR FLIGHT.
MEASUREMENTS TAKEN BT TAUT CORD BETWEEN OPPOSITE WING BATTENS.



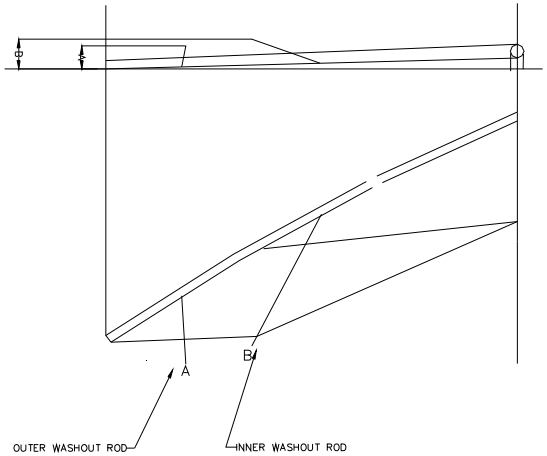
TIP	9	8	7	6	5	4	3	2	1	0	ROOT
−13.5	12	65	94	97	77	58	48	36	38	45	MIN
−20	47	110	128	120	107	93	75	59	49	52	MAX

NOTES
MIN VALUE AS PITCH TEST
MAX VALUE FOR NEW BUILD

TIP HEIGHT MEASURED WITH TIP FINS OFF, STRING TIED TO TIP PINS. HANG BRACKET STRAIGHT WING RIGGED AS IF FOR FLIGHT, STANDING ON CONTROL FRAME.



WASHOUT ROD HEIGHTS, SAIL OFF AIRFRAME, AIRFRAME RESTING ON FLAT FLOOR AS SHOWN.



A 150–200mm
B 150–200mm

MAX DIFFERENCE BETWEEN WINGS 10MM
MAX DIFFERENCE BETWEEN A AND B 25mm

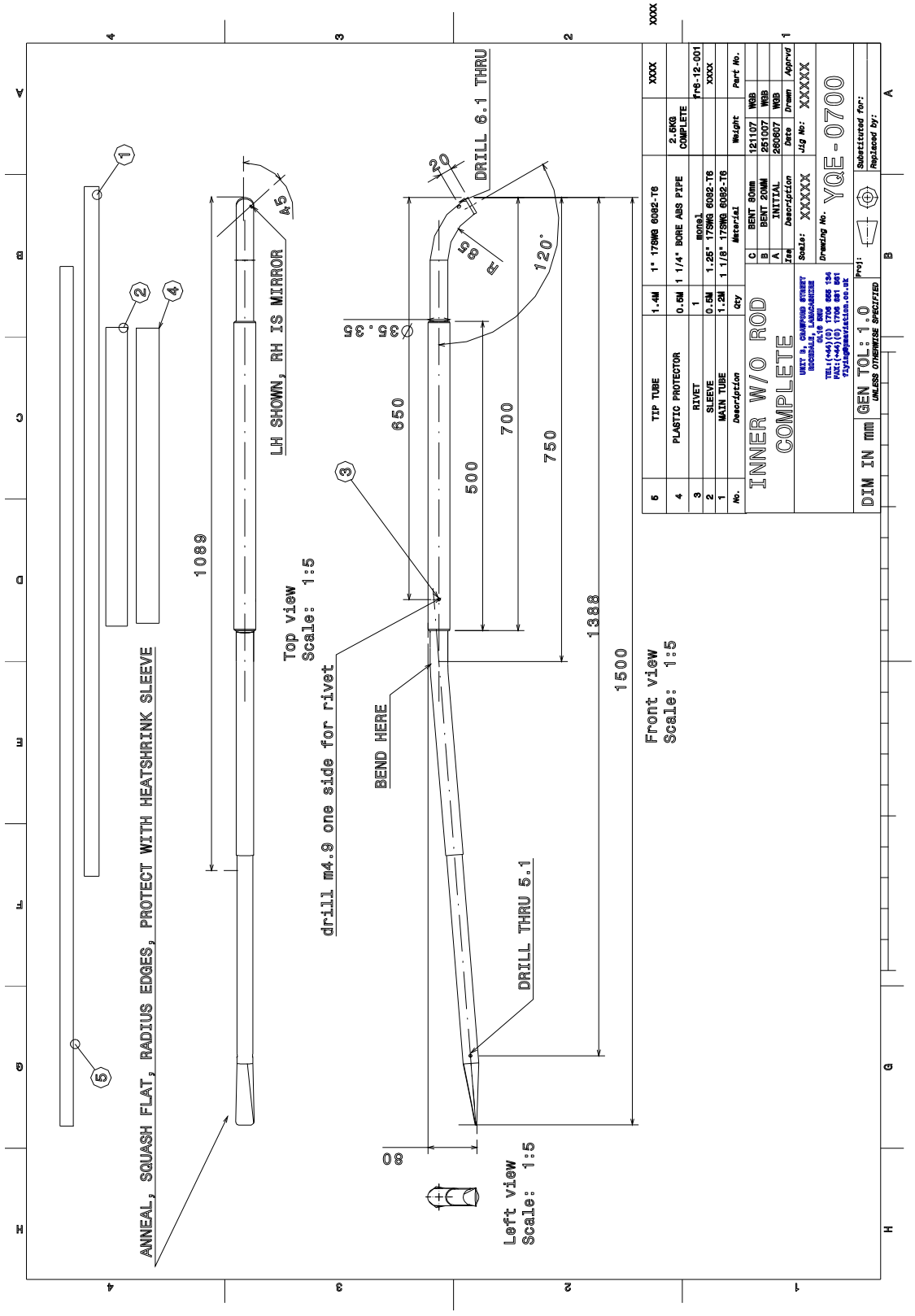
Iss.	Description of revision	Date	Approved	Checked	Drawn
C	W/O AS REBUILT	110308	WGB		
B	W/O AS PITCH TEST	131107	WGB		
A	INITIAL ISSUE	011007	WGB		WGB

WASHOUT SETTINGS

DIM. IN mm | SCALE: NTS | PROJ:
GEN. TOL. +−: 5.0 MM

P&M AVIATION
Drawing/Part No.
YQE−051

MASTER IN COLOUR

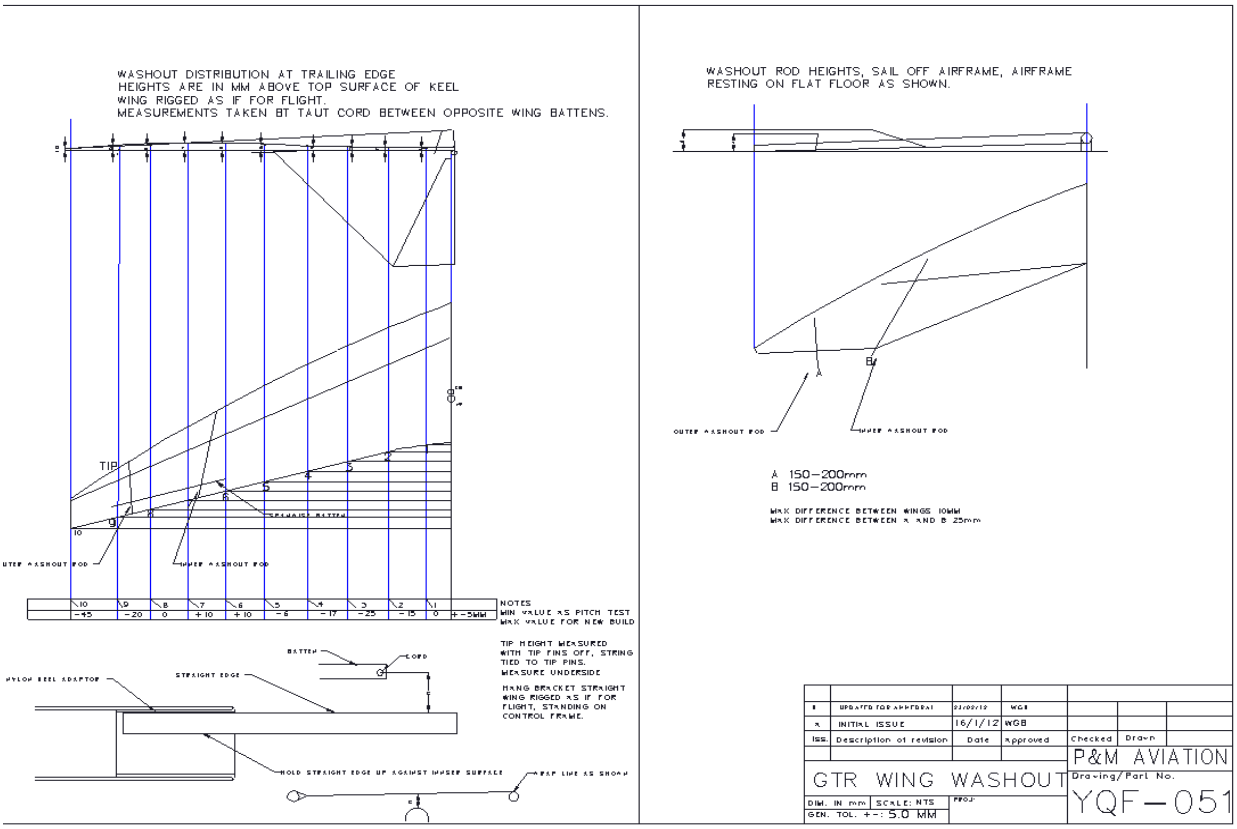


Washout Rod Settings GTR

The washout distribution must be as shown in the drawing YQF-051 below. The settings must be checked after any incident where wing damage is suspected, before wing tuning and during any wing rebuild.

⚠ WARNING

Washout rods should never be lowered from the optimised positions defined on drawing YQF-051. Dangerous pitch instability may result.



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, GTR and QukR (See below paragraph for HTP Material) 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 HTP material 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.

See Service Bulletin 133 for more information.

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.

Electric Trim and STARS system QuikR 2012 Onwards & GTR:

For the QuikR (2012 models onwards) & GTR wing a patented roll augmentation system has been introduced called STARS (stability and roll system). Flexwings generally have light handling at high speed but become progressively more stable and heavier to manoeuvre at lower speeds. The Stars system works with the trimmer so that the more nose-up (slow) trim is applied, the more the STARS system works to increase roll response. The way it works is shown schematically below.

Pitch axis

Fast trim:
In the fast trim condition the whole system is slack and has no effect on the wing. The wing trims fast because the hangpoint is set to provide the maximum hands-off trim speed (approximately 90mph). The wing is shown in the fast trim condition in figs 3 (side view) and 4 (rear view), where the sail is shown with minimum washout. The minimum washout is held in by the washout rod system so as to produce positive pitch stability.

In the fast trim condition the STARS system must be set so that it becomes just taut as the control bar approaches the pilot's stomach.

Slow trim:
Referring to fig. 1, In the slow trim condition the trim motor 1 pulls the trim spring (bungee) 2 and tightens cord 3 which is attached to the keel by pulley 4.
At pulley 4 the cord splits into two, one running to each wing around pulleys 5. The cord continues into position 6 then around pulley 7 which is attached to the outboard washout rod 9. The cord continues from pulley 7 to position 11 and is attached to the leading edge post 10.
Since the washout rods are connected to the leading edge by a universal joint and are prevented from moving inboard by cord 8, tension in the trim cord 3 causes both washout rods to be pushed upwards, so increasing washout. Increased washout improves pitch stability and also prevents the possibility of tip stalling. Tension in cord 3 also applies a direct mechanical nose-up pitch relative to the trike. The combined effect is to slow the trim speed and increase pitch stability.

FIG1

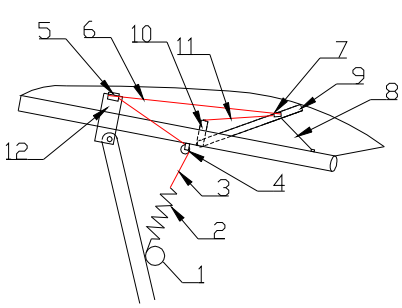
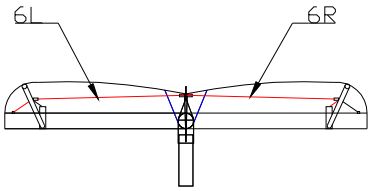


FIG2



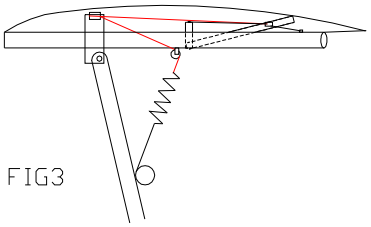


FIG3

FIG.4

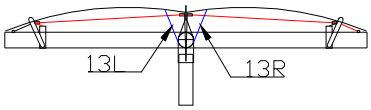
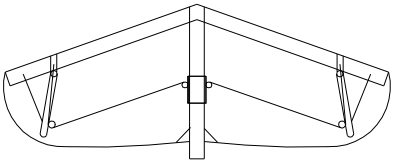


FIG.5



Roll axis

Pulleys 5 are connected to a post extending upwards from the hang bracket. Considering a right roll input, with the trim cord tight (slow trim selected) then pulleys 5 are moved to the left, which causes cord 6R to tighten and 6L to slacken. The right hand washout rod is therefore pulled up relative to the left, so reducing lift on the right hand wing. The increased tension in cord 6R also causes bending of the right hand leading edge 15R. The asymmetric tension in cords 6L and 6R causes the wing keel to swing to the right, so tightening cord 13L and slackening cord 13R. This causes sail trailing edge 14L to be pulled tight and 14R to be slackened.

The overall effect is to increase washout in the right wing and reduce it in the left wing. Typically the roll rate from 30 degrees left to 30 degrees right is reduced from 5 seconds to 3.5 seconds at 50mph. The wing remains controllable in roll right down to the stalling speed.

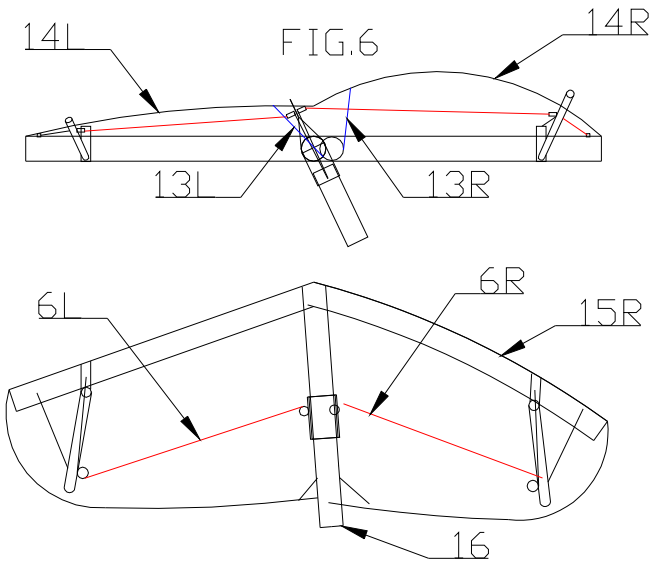


FIG.7

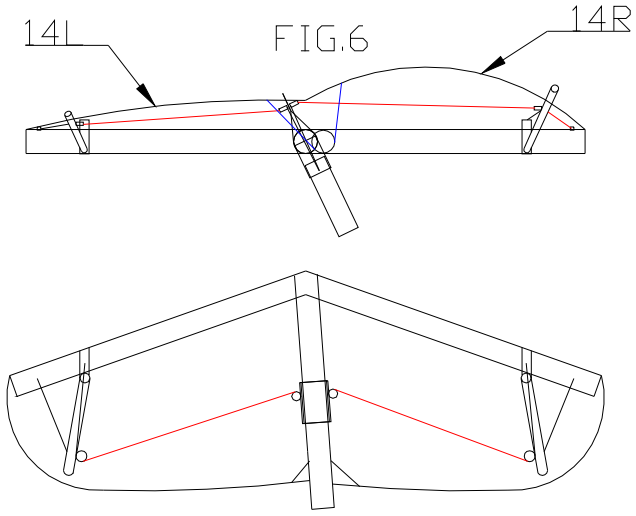


FIG.7

The STARS system is easy to inspect through the wing double surface inspection panels in the wing root, the leading edge inspection zips, the outboard washout rod Velcro panels and the wingtip apertures (with the tips removed).

It must be inspected for condition of the actuating cords especially at the pulleys. The cords must route underneath the inner washout rod cords. Check for condition and security of the pulleys. No lubrication is required as marine pulleys with delrin ballraces are used.

The STARS bracket above the hang bracket has a rubbing strip which acts on a rubbing strip on the sail – check for rubbing/chafing damage.

There are adjustment loops provided in the STARS cords each side of the keel pocket. The cords should be adjusted to have minimal slack when the trimmer is off. Assymmetric adjustment of the cords can be used for trimming out a low speed turn (see section 11).

The cords are all dyneema with a polyester braided covering. Those inside the wing are 2mm, the cord at pulley 4 on the keel is 3mm and the cords on the trike must be 4mm.

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 Light Sport Repairman with Maintenance Rating 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.

6. RIGGING THE AIRCRAFT

6.1 GENERAL

WARNING

Rigging the aircraft is a simple operation when carried out correctly. However, if you do not use the correct procedures or techniques this may result in an incorrectly rigged aircraft that could cause injury or death if operated in this condition.

As you rig your aircraft, you should always be meticulous in your inspection of each component. This is the best time to see potential faults or problem areas which may be missed when the aircraft is fully rigged. Never allow yourself to be distracted during assembly of your aircraft and always rig to a repeatable sequence. Do not rely on the pre-flight check to find faults, but look carefully at all aspects of your aircraft as you put it together. Great care should be taken with wings which are left fully rigged, for checks cannot be omitted on that account, and the full inspection procedures should be followed. The design brief for the Quik Range all called for easy inspect ability, so those components not open to view may be reached from zipped inspection panels. (See airframe parts drawings).

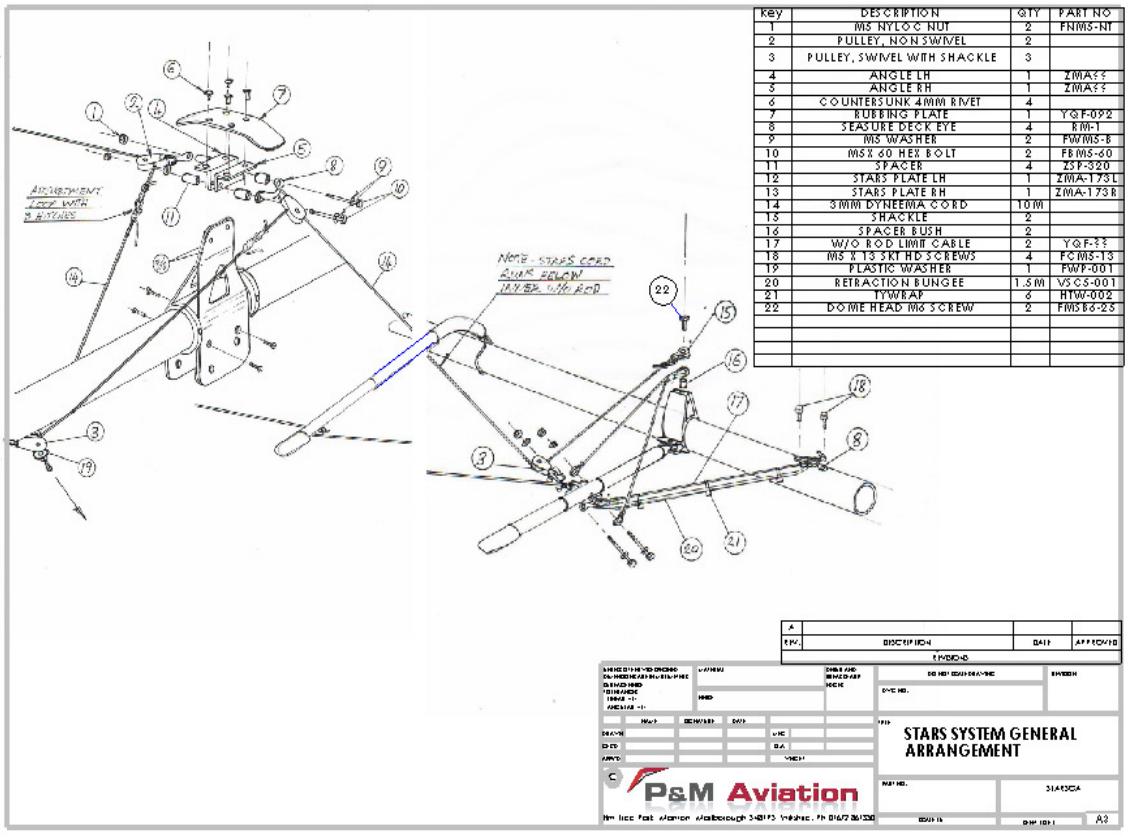
Special attention should be paid to the following:

1. The symmetry of the wing and the angle of the kingpost.
2. All tubes straight, undented and without cracks.
3. All cables unkinked, unfrayed and with undamaged sleeves.
4. All nuts and bolts secure and locked appropriately.
5. All quick-release fittings secure.
6. Hang-point and hang-bolt undamaged and secure. Hang point roll bearing adjustment bolt secure.
7. Control frame uprights straight, end fittings and fasteners secure.
8. All sail seams intact, with no frayed stitching.
9. No tears in the sail.
10. Batten elastics not frayed, knots secure, and fitted correctly.
11. **Double check** 7. and 8. in sail areas of high stress.

Particular areas of high stress are:

Both tip fabric areas including tip fastening.
Both leading edge upper surfaces.
Undersurface at the joint seam with the leading edge, towards the nose.
Around the securing screws at the nose of the wing (check that securing screws and grommets have not become detached from the sail).
The trailing edge stitching, grommets and shock cords.
Keel pocket, particularly at the point of attachment to the upper surface.
Attachment of upper surface to fin tube (Quik & GT450).
The point of attachment in the root area of the undersurface to the upper surface.
All cable entry and exit points with particular regard to the rear upper rigging cable entry. (Quik & GT450)
Strut entry and exit points (QuikR & GTR)
The area above the crossboom centre ball.

12. Sail tip adjuster settings correctly aligned and secure.
13. Ribs undistorted, undented, in good condition and profile as supplied batten plan, bungees tight and doubled on all batten ends. (Quik & GT450). Battens all over centred and locked (QuikR).
14. Lift strut end fittings secure and undamaged. (QuikR & GTR)
15. Lift strut bolts/wingnuts secure. (QuikR & GTR)
16. Lift strut strap to crossboom – check for distortion/cracking. (QuikR & GTR)
17. Inner and outer washout rods both resting under the carbon spanwise sail batten. (QuikR & GTR)
18. Carbon battens including spanwise battens not broken. (QuikR & GTR)
19. Trim cord connected, not frayed.
20. Outer washout rods STARS cords routed clear of inner washout rod cords. See drawing below. (QuikR if STARS fitted & GTR)
21. Lower rear rigging rocker assembly and cables secure, nose catch secure.
22. Nose cone fitted and secure.



6.2 WING RIGGING QUIK & GT450

WARNING

Rigging and de-rigging the aircraft is a simple and safe operation when carried out correctly. However, if you do not use the correct procedures or techniques it is possible to injure yourself. It is therefore essential that you receive formal instruction on how to rig and de-rig the aircraft by an instructor, P&M dealer or other competent person before attempting the operation on your own.

1. Select a clean, dry area and lay the wing down, opening the zip to reveal the control frame and underside of the wing.
2. Open out the control frame and attach the base bar to the corner joints. Inspect the basebar holes for damage.

WARNING

The base bar is a primary structural component. Any damage of any kind - bends, dents, deep scratch marks and signs of stress around the holes - means the base bar must be replaced before the next flight.

3. Lift the wing from the front and rotate it so that the wing is now laying on the ground with the assembled control frame flat on the ground underneath.
4. Remove all the sail ties and open each wing about a metre. Lift the kingpost to its upright position and attach the rear top rigging cable to the cable end protruding from the top of the kingpost. Tighten the shackle.
5. Ensure that the upper cables are free from kinks and that the over-centre lever is in the open position.
6. Open the wings in stages, alternating between wings to prevent damage to the crossboom and fittings. Stop and check if any undue resistance is felt.
7. Ensure that all wires are untangled, particularly at the connections.
8. Excluding the nose rib, fit all the top surface ribs starting with the outboard main ribs and working in-board towards the root. Do not force the ribs if they seem hard to push fully home.

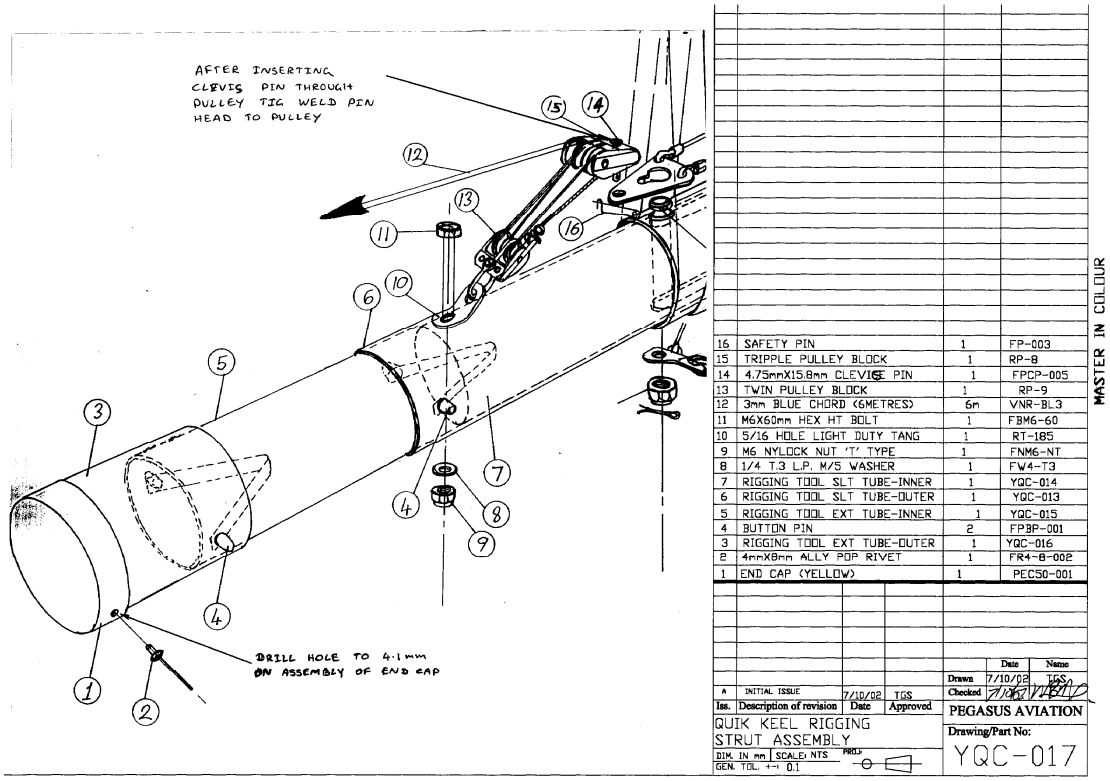
CAUTION

Damage may result to the sail and to the ribs if you force the ribs into the sail. Investigate immediately if undue resistance is felt, and if undue resistance occurs when the ribs are nearly home, leave them at this stage until after the wing has been tensioned at a later stage.

9. On all the upper surface ribs fit the single lower elastic. If the elastics appear overtight at this stage, leave them off until after the final tensioning of the crossboom when it is easier to push the ribs finally home and requires less effort to fit the elastics.
10. After fitting the upper surface ribs, remove the safety pin from the crossboom restraint cable stud just inside the rear end of the keel pocket. Make sure that the crossboom rigging tool (extension to the rear of the keel), is properly located in the keel with the slots engaged. Hook the front rigging tool pulley onto the keyhole tang and secure with a safety pin. Ensure that the cord between the two pulleys is not tangled. Using the pulley cord, pull back the crossboom until the keyhole tang can be located on the restraint cable stud. If you meet any sudden resistance during the tensioning process, stop and investigate, the pulley system multiplies the pulling force by 6:1. (The end thrust in the crossboom is multiplied a further 4.5 times). Fit the safety pin to the crossboom restraint stud.

CAUTION

Damage to airframe components, the sail and fittings may result if you tension the crossboom with rigging or airframe components caught up. Investigate immediately if undue resistance is felt. Remember, the pulley system multiplies the force applied to the cables by 6.



Rigging tool shown inserted in rear of keel.

Make sure that:

a) The tang is located in the stud recess.
b) The tensioner cables are not twisted.
c) The safety pin secures the cable onto the stud and is re-fitted correctly into restraint cable stud.

11. With the crossboom now tensioned, disconnect the rigging tool pulley from the keyhole tang and remove the rigging tool from the rear of the keel. Ensure that the previously fitted ribs are pushed FULLY home and that the upper and lower elastics are fitted to all ribs.

⚠ WARNING

The rigging tool must be removed before flight and before attempting to start the engine.
If the rigging tool is not removed, the propeller will strike it.

12. Locate the washout tubes onto the sockets, ensuring they are seated firmly down to the limit.
13. Quik GT450 wing Only: Engage each tip fin on the leading edge spigot and then attach the two clevis pins with nylon washers and safety clips.

WARNING

The aircraft becomes less directionally and laterally stable, especially at high speed/light weight/high power, if tip fins are not fitted.
Trim speed is also reduced if tip fins are omitted.
The tip fin vents must not be covered.

14. Proceed to the front of the wing, lift and support the nose of the wing on the knee. Locate, fit and push fully home the nose rib, finally locating the front end onto the spigot provided on the keel tube.
15. With the assembled wing flat on the ground, ensure that its nose is into wind (with the nose facing the direction that the wind is blowing from). Line up the trike behind the wing with its nose facing the wing, but at least ten feet away to give clearance for the wing to be raised onto its control frame.
16. Ensure that the lower (flying) wires are not tangled, and that the nose wires are laid out with the nose catch towards the front of the trike. When you are ready to raise the wing, have the rigging tool to hand and stand at the nose facing the rear, with a helper stood at the rear facing towards you. Have a final check that the wind is on the nose and not too strong. Lift the nose while the helper lifts the rear of the keel. Keep the wing level and allow the wing to rotate around the control bar as it is raised, by walking towards the trike, when sufficient height has been attained start to allow the A frame to take the weight of the wing. When fully up the rear wires will become taught, keep the wing horizontal and get the helper to keep constant pressure upwards and rearwards on the rear of the keel while you stoop to pick up the nose swan catch.

WARNING

The helper must keep the rear wires tight and the wing horizontal until the swan catch is latched in place at the nose of the wing or injury may occur.

Hook the swan catch onto the nose plate and place the securing pip pin into position with its securing washer on the ball end. Give the washer a tug to ensure that the ball is locking the washer in place.

Fit the rigging tool into the nose of the wing to provide a support foot to rest the wing on. In light winds, the helper can now release the keel and you can lower the wing nose with it's support foot to the ground.

WARNING

From now on the wing will be at the mercy of any wind gusts. Do not leave it unattended or damage, personal injury or death could result.

17. After inspecting all parts visible through the nose aperture, securely fit the nose cone upper Velcro to the wing top side Velcro and, ensuring symmetry, pull the lower part of the nose cone around the lower front rigging cables. Join the nose cone rigging cable slot edges with the Velcro's provided and attach the nose cone underside to the wing undersurface Velcro.
18. Adjust either the upper or lower wing attachment Velcro patches to give the smoothest and most symmetrical fit.

⚠ WARNING

Nose cone must be fitted before flying. Failure to do so may adversely affect stability and control.

19. In light winds the nose can again be lowered and the wing allowed to rest on the nose extension.

CAUTION

In turbulence or strong winds it is best to have an assistant hold the wings level at the nose whilst the under surface ribs are located.

20. Push fully home the undersurface ribs so that the curved aluminium section is facing rearwards and downwards. Fit the single elastic to each undersurface rib rear.
21. Proceed to the rear of the wing and tension the overcentre lever in the rear top rigging.

6.3 WING RIGGING QUIKR & GTR

⚠ WARNING

Rigging and de-rigging the aircraft is a simple and safe operation when carried out correctly. However, if you do not use the correct procedures or techniques it is possible to injure yourself and damage the wing. It is therefore essential that you receive formal instruction on how to rig and de-rig the aircraft by an instructor, P&M dealer or other competent person before attempting the operation on your own.

1. Select a clean, dry area and lay the wing down, opening the zip to reveal the control frame and underside of the wing. Remove the sail ties and padding.

2. Open out the control frame and attach the base bar to the corner joints. Inspect the basebar holes for damage.

⚠ WARNING

The base bar is a primary structural component. Any damage of any kind - bends, dents, deep scratch marks and signs of stress around the holes - means the base bar must be replaced before the next flight.

3. Connect the lower front rigging cables to the noseplate using the swan neck catch. Tension it and secure with the pip pin and washer.

Rigging stage 3

4. Lift the wing from the front and rotate it so that the wing is now laying on the ground with the assembled control frame flat on the ground underneath.

Rigging stage 4

Gently walk out the leading edges one at a time, lifting the trailing edge till the leading edges are spread about 45 degrees each side of the keel. Lifting the trailing edge will assist the washout rods to swing into position. Stop if resistance is felt and investigate. DO NOT ALLOW THE TIPS TO SCUFF THE GROUND AS EVENTUALLY THE WEBBING AND STITCHING MAY BE DAMAGED.

WARNING

From now on the wing will be at the mercy of any wind gusts. Do not leave it unattended or damage, personal injury or death could result.

Rigging stage 5

6. Fit the lift struts noting they are handed Left and Right, using the AN-5 bolts, wingnuts and rings. It may prove easiest to attach the top spherical joint first.

WARNING

Do not lever the strut joint beyond it's range of articulation or damage may occur.

Rigging stage 6

7. Pull up the crossboom tensioning cord till the wing is semi-tensioned and secure it to the cleat on the rigging tool. Stop if resistance is felt and ease the washout rods upwards by hand. This stage will bring both washout rods into their final positions.

Rigging stage 7

8. Fit all the top surface ribs (red = port, green = starboard) starting with the out-board main ribs and working in-board towards the root. Do not force the ribs if they seem hard to push fully home. To fit the root 2 ribs it will be necessary to lift the rear of the keel to avoid bending them.

CAUTION

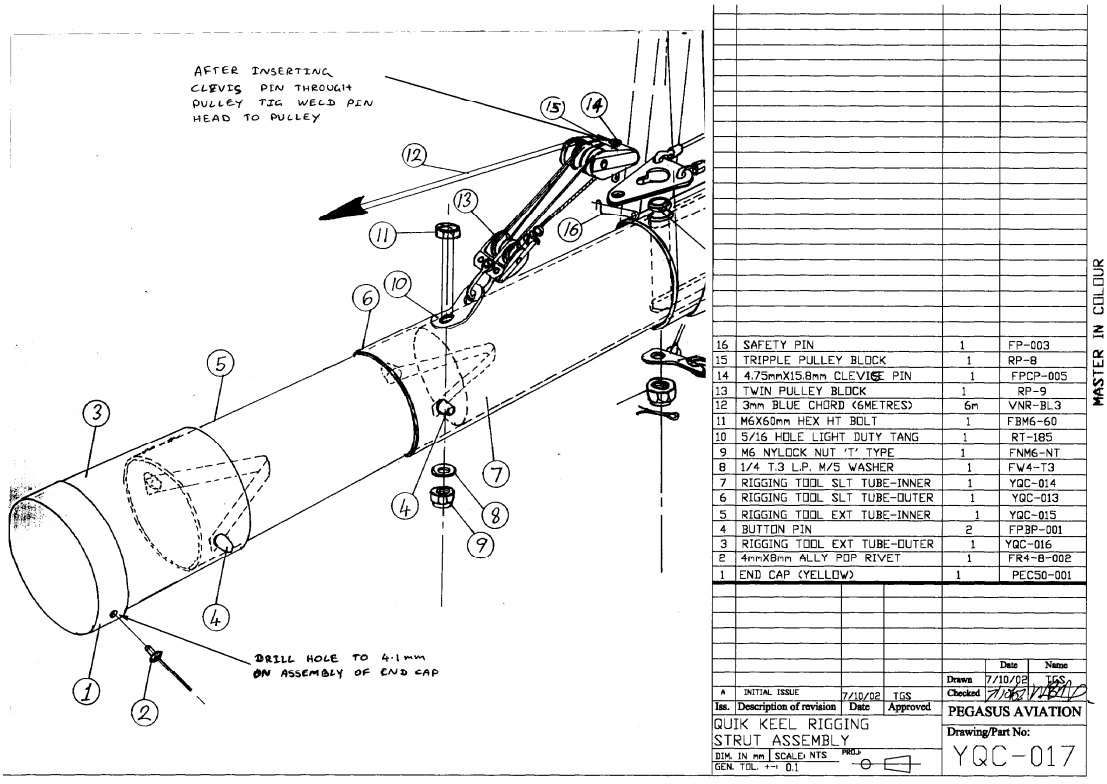
Damage may result to the sail and to the ribs if you force the ribs into the sail. Investigate immediately if undue resistance is felt, and if undue resistance occurs when the ribs are nearly home, leave them at this stage until after the wing has been tensioned at a later stage.

9. Ensure that the cord between the two crossboom tensioning pulleys is not tangled. Using the pulley cord, pull back the crossboom until the sail is just under tension. Check, by observing through the inspection zips and the outer washout rod Velcro panels, that the washout rods are moving correctly into place. If necessary, lift the sail trailing edge to assist movement.

10. Pull up the crossboom till the keyhole tang can be located on the restraint cable stud. If you meet any sudden resistance during the tensioning process, stop and investigate, the pulley system multiplies the pulling force by 6:1. (The end thrust in the crossboom is multiplied a further 4.5 times). Fit the safety pin to the crossboom restraint stud.

CAUTION

Damage to airframe components, the sail and fittings may result if you tension the crossboom with rigging or airframe components caught up. Investigate immediately if undue resistance is felt. Remember, the pulley system multiplies the force applied to the cables by 6.



Rigging tool shown inserted in rear of keel.

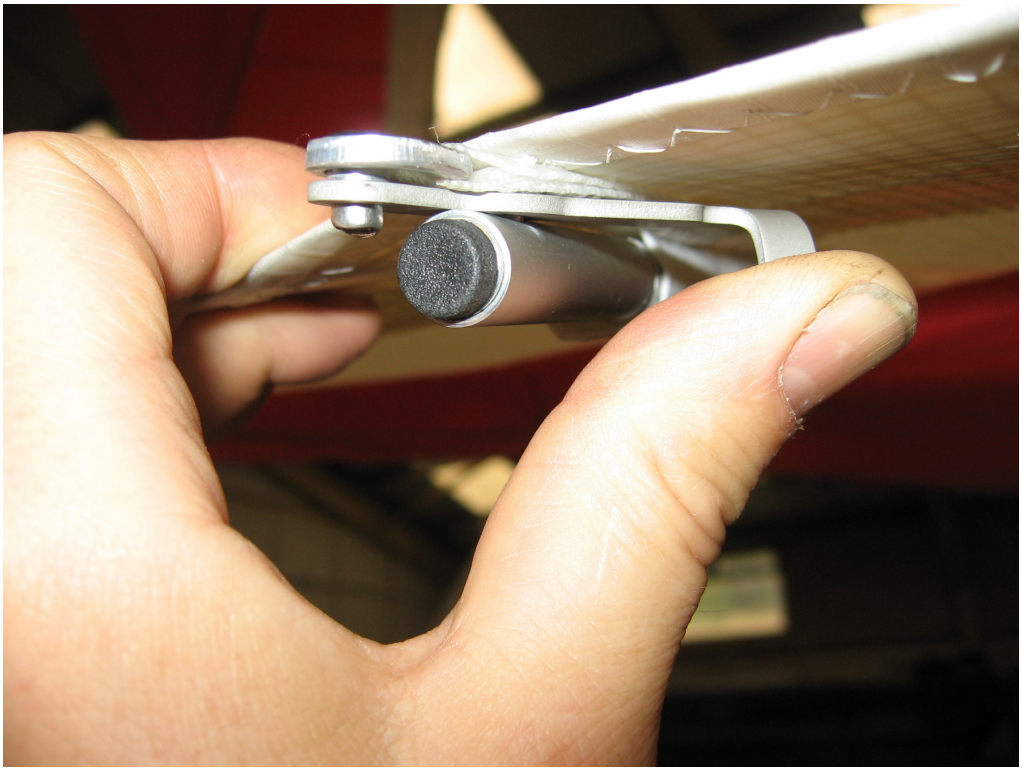
Make sure that:

a) The tang is located in the stud recess.
b) The tensioner cables are not twisted.
c) The safety pin secures the cable onto the stud and is re-fitted correctly into restraint cable stud.

WARNING

The rigging tool must be removed before flight and before attempting to start the engine.
If the rigging tool is not removed, the propeller will strike it.

Disconnect the rigging tool pulley from the keyhole tang and remove the rigging tool from the rear of the keel. Ensure that the previously fitted ribs are pushed FULLY home. Engage the over-centre levers and tension them, ensuring they lie flat against the bottom of the sail. Tip the wing carefully onto it's nose.



Rigging stage 11

12. Ensure both the inner and outer washout rods are fully home and not caught on any ribs. The inner rod can be seen through the zip access panel and the outer rod through the Velcro panel in the undersurface.

Rigging stage 12 – correct positioning of washout rods.

13. Fit the undersurface battens and secure them with the single bungees.

Rigging stage 13

14. Engage each tip fin on the leading edge spigot and then attach the two clevis pins with nylon washers and safety clips.

WARNING

The aircraft becomes less directionally and laterally stable, especially at high speed/light weight/high power, if tip fins are not fitted.
Trim speed is also reduced if tip fins are omitted.
The tip fin vents must not be covered.

15. Proceed to the front of the wing, lift and support the nose of the wing on the knee. Locate, fit and push fully home the rigging tool to support the nose in the correct position for connecting the wing to the trike.

16. After inspecting all parts visible through the nose aperture, securely fit the nose cone upper Velcro to the wing top side Velcro and, ensuring symmetry, pull the lower part of the nose cone around the lower front rigging cables. Join the nose cone rigging cable slot edges with the Velcro's provided and attach the nose cone underside to the wing undersurface Velcro.

17. Adjust either the upper or lower wing attachment Velcro patches to give the smoothest and most symmetrical fit.

WARNING

Nose cone must be fitted before flying. Failure to do so may adversely affect stability and control.

6.4. PREPARING THE TRIKE

1. Rigging the trike is the relatively simple operation of lowering and raising the pylon whilst connecting the trike to the wing.
2. To erect the trike from the folded state, the pylon should be raised and locked by means of the over-centre catch.

WARNING

The pylon is fitted with a powerful gas strut to facilitate lifting of the wing. Handle the pylon with care when in the folded position with the wing off, and make sure you and all assistants remain clear of the pylon at all times when folded.

Fit the front strut and ensure that the upper and lower securing pins and rings are fitted correctly. Now is a good time to inspect the interior of the trike including the engine mounts and fuel lines. Depress the drain valve on the underside of the fuel tank and drain off a little fuel into a container. Check for discolouration due to contamination and for water present in the fuel. If in doubt, drain off all contaminated fuel and replace it.

3. To convert the tandem seat for solo operation, it is merely necessary to secure the rear seat belt buckle and to tighten the straps so that there is no slack.

6.5. CONNECTING THE WING TO THE TRIKE

For the first few times that you rig your aircraft, ensure that the weather is calm or you have an experienced helper to take charge if the wind starts to take control from you. It is much better to be set up on grass rather than hard standing, both to avoid damage and wear to the wing and scraped knuckles as you lift the wing from the ground. Ensure that the ground is level, clear of clutter, wing bags, tools, twigs and inspect the ground for holes or any other obstacles that may trip you. While rigging the aircraft, it is important to carry out continual checks to ensure correct assembly. It is important that the pilot/operator carries out these inspections to ensure that the aircraft will be fit to fly.

1. Fit the nose extension (rigging tool) to the wing and position the wing on it's control frame and nose extension facing into wind.

2. Line up the trike behind and facing the wing, but at least ten feet away to give clearance for the wing to be raised onto its control frame.

3. Remove the two safety rings and pins at the lower end of the front strut. Release the over centre lock and then lift its lugs out of engagement and lay it aside, lay the front seat back rest down by rotating forward, lay the rear seat cushion down to expose the slot in the rear seat and lower the pylon by pulling firmly down on the inner front strut tube to overcome the resistance of the optional rigging gas strut where fitted. Remove the top front strut pin and lay the front strut on the ground, ensuring that it is not likely to cause a tripping hazard.

⚠ WARNING

Do not lean over the pylon or place any part of your body between the pylon and the wing. The gas strut (if fitted) is powerful and if the pylon inadvertently starts to raise it could cause injury.

Release the trike brake and roll the trike forward with the front wheel rolling through the A frame and over the control bar. Make sure that the trike is aligned with the centre line of the wing and the pylon top is directly under the hang bracket.

4. Take the hang bolt and remove the nut, then centre the hang bracket.

⚠ WARNING

Keep hands and fingers out from between the hang bracket and the A frame uprights as injury could result the hang bracket swinging to either side.

Note: You may find it convenient to fashion two wooden wedges and jam them one each side of the hang bracket between the hang bracket and the uprights; these will hold the hang bracket firmly in a central position. Ensure they are removed immediately after the hang bolt has been fitted.

Keeping hands and fingers clear gently lift the pylon top to engage into the hang bracket. When the holes are aligned push the hang bolt through the hang bracket and pylon top assembly from the port (left) side. Engage and fully tighten the nut onto the hang bolt and clip the safety pin onto the hole in the toggle bar attached to the nut.

4.1 Connect the electric trim cord shackle to the keel at this stage.

5. Go to the front of the wing and lift it to a horizontal position. Remove the nose extension, inspect the nose plate and cross boom hinge areas, attach the nose cone.

⚠ WARNING

The nose cone must be attached to the wing and fully in place on its Velcro fixing. The wing stability and flying characteristics are adversely affected by flight without the nose cone fitted and could cause injury or death through loss of control.

⚠ WARNING

Keep fingers and hands clear of the sides of the hang bracket at all times. The hang bracket operates on an overcentre system. If inadvertently let go, particularly in windy conditions, it could trap your fingers and cause injury.

Lift the nose further while rolling the trike rearwards until the wing keel engages with its stop. The nose wheel of the trike will now be behind the control bar. Engage the trike parking brake. Check that the over centre catch on the wing top rear wire is fully home in the closed position and take a look inside the rear keel pocket to inspect the tensioning cables securing pin, correct tensioning cable run, rear keel, king post and fin tube attachment.

6. Lay the front strut within easy reach when you are stood at the nose of the trike. Stoop under the nose of the trike, facing rearwards, and if the wind is calm firmly clasp the control bar and lift it. If the wind is above 5 mph or gusting, then get a helper(s) to assist. Where a rigging gas strut is fitted, much of the weight of the wing will be almost immediately taken from you; where not fitted you will have to lever the wing up into position while supporting most of the 95 lb (43 kg) during part of the lift.

⚠ WARNING

Do not attempt to lift the wing to its rigged position without a rigging gas strut if you have back problems or if you are slight in stature. With wind input, you could find yourself with up to 110 lb (49 kg) of dead weight to carry. If you are unfit to carry this weight in a stooped position it is essential that a gas strut be fitted, or that you get an assistant to complete this task.

7. When the pylon is fully up, while still being ready to support the wing weight if a rigging gas strut is not fitted, locate the pylon using the over centre catch, but do not overcentre lock it at this stage. Get a helper to hold the bar or strap it back using the rear seat harness; if it is at all windy it is essential to have a helper at hand. Fit the front strut, first attaching it at the top with a pin and safety ring and then at the bottom with two pins and safety rings. Secure the Overcentre Lever in its latch.

⚠ WARNING

It is particularly important to check that the two lower pins pass through both the lower and upper sections of the front strut, and that the top connection is pinned. Failure to do so could result in structural failure.

8. For the GT450 release the parking brake and turn the trike so that one wing is facing the wind, never allowing the into wind wing to get higher than horizontal. Lower the wing to the ground and attach it to an aircraft tie down point from the outer end of the lower flying wires. Apply the parking brake.
For the Quik & QuikR face the aircraft into wind and set the parking brake.. Pull the control bar back till it contacts the seat and secure it there using the rear seat belt. If thermals etc are present, the aircraft may be picketed using weights or ground anchors on the side flying cables.

7. DE-RIGGING THE AIRCRAFT

⚠ WARNING

Rigging and de-rigging the aircraft is a simple and safe operation when carried out correctly. However, if you do not use the correct procedures or technique it is possible to injure yourself. It is therefore essential that you receive formal instruction on how to rig and de-rig the aircraft by an instructor, P&M dealer or other competent person before attempting the operation on your own.

CAUTION

For the first few times that you de-rig your aircraft, ensure that the weather is calm or you have an experienced helper to take charge if the wind starts to take control from you. It is also much better to be set up on a grass than hard standing, both to avoid damage to the wing and scraped knuckles as you lower the wing to the ground. Clear the area of clutter, wing bags, tools, twigs and inspect the ground for holes or any other obstacles that may trip you.

7.1. DE-RIGGING QUIK & GT450

The de-rigging procedure is a direct reversal of that for rigging. As with the preparation before flight, it is also important when de-rigging that the pilot/operator carries out an inspection.

⚠ WARNING

The aircraft may be fitted with an optional rigging gas strut. If a gas strut is not fitted, support the weight of the wing by lifting on the control bar from the moment you unhitch the front strut, or damage/personal injury could occur.

Face the aircraft into wind and apply the parking brake. Remove the windscreen extension, if fitted. Remove the 2 rings and pins holding the front strut to the front strut lower. These can be found above the panel and behind the windscreen. Undo the pylon overcentre lever. Remove the pin at the top of the front strut and remove it.

Stand in front of, and facing the trike, with both hands firmly supporting the control bar. Gently ease the control bar towards you as you walk backwards until the keel has engaged with the keel stop and the pylon starts to move towards you. If a rigging gas strut is fitted, while keeping firm control of the descent with both hands on the control bar, you can allow the gas strut to support the weight of the wing. If no gas strut is fitted, then you will be supporting the wing weight all the way to the ground.

⚠ WARNING

Do not attempt to lower the wing to the floor without a rigging gas strut if you have back problems or if you are slight in stature. With wind input, you could find yourself with up to 97 lb (44 kg) of dead weight to carry. If you are unfit to carry this weight in a stooped position it is essential that a gas strut be fitted, or that someone else is on hand to help you.

As the control bar reaches the ground keep it level to allow both end joints to land together. This will ensure that there is no twist in the pylon that will make it difficult to remove the hang bolt later.
Release the parking brake, remove the nose cone from the wing and temporarily tuck it away between one leading edge and its Mylar, fit the rigging tool to the nose. Gently pull the nose and lower it to the ground. The trike front wheel will roll through the A frame and over the control bar as you do this. Remove the safety pin and special nut from the hang bolt and then remove the hang bolt from the hang bracket. If electric trim is fitted, disconnect the trim cord shackle from the keel. Wheel the trike back well away from the wing.

⚠ WARNING

1. Keep a firm grip on the pylon to ensure that the rigging gas strut does not shoot it into the upright position. Do not lean over the lowered pylon at any time as injury could result from it inadvertently erecting.
2. Keep hands and fingers out from between the control frame sides and the hang bracket as injury could result.

Pick the nose of the wing up until the wing is horizontal, get a helper to support the rear of the wing keel, remove the rigging tool from the nose, remove the swan catch pip-pin and unlatch it from the nose. Walk backwards as you gently lower the wing to the ground keeping the weight shared between yourself and your helper and the wing horizontal.

After detaching the wing from the trike, reverse the procedures listed in Section 6.2, 1 to 19. When preparing the wing for stowage in the bag, furl the wing fabric carefully, ensuring that the protection patches are correctly positioned at the following positions:

a) Control frame knuckle joints.
b) Roll bracket and upper control frame.
c) Washout tube plugs.

Rigging cables should be stowed carefully so as to avoid kinks and tangles.

When using the pulley system to release the crossboom tension, pay out the cord steadily to avoid rope burns to your skin.

7.2. RIGGED WING STORAGE QUIK & GT450

If storing the wing rigged, it should be parked in a sheltered location nose-down with rigging extension inserted. Undo the wing undersurface inspection zips and pass tie-down ropes around the cross-boom or side-wires. The nose cone should be removed and stowed under the leading edge Mylar.

The basebar and nose should rest on a soft, even surface; in particular avoid sharp stones which can damage the basebar. The trimmer should be left slack (fully fast).

7.3. WING OVERNIGHT PARKING QUIK & GT450

For overnight parking, the wing should be laid flat on the ground, into wind. De-tension the cross-boom, remove the kingpost top and lay the washout rods flat. Use water ballast or a tie-down stake on the nose. On thermic days, water ballast on the trailing edge will stop the sail being lifted from behind.

CAUTION

Never store a wet wing in a sealed bag. This may result in mildew on the sail or general degradation of the airframe and fittings. If possible dry the wing before de-rigging. Otherwise open the bag zip before the wing is stored.

7.4 DE-RIGGING THE AIRCRAFT QUIKR AND GTR

The QuikR strutted wing/trike configuration can be quickly folded to minimise hangarage space. Only configuration 3 is recommended for road transport.

7.5 Folding Configuration 1.

It is possible, with care, to fold the wing with the trike fully rigged as follows. 2 assistants are desirable.

1) Face the aircraft into wind. Insert the rigging tool into the back of the keel and connect it to the cross boom restraint tang. Secure it with a spring clip.
2) Secure the control frame base bar to the front strut with a tie and protection pad.
3) Fit propeller blade padded covers. Rotate the propeller (switches OFF) until one blade is nearly vertical, on one side of the keel.
4) Remove the bottom Velcro connection on the nose cone.
5) Open the Velcro panels behind the outer washout rods.
6) Unhook the cross boom restraint tang and slacken off the wing with about 0.5 metres of cord travel. Attach the rigging cord to the rigging tool cleat.

⚠ WARNING

On top of the trike, the wings tend to fold back under gravity and damage/injury may be caused if the wing is allowed to fold freely. Keep a firm hold on the rigging cord.

7) Remove at least 3 top and 3 bottom surface battens nearest the keel, on each wing
8) Taking hold of the tensioning cord, detach it from the cleat. With an assistant each side, carefully allow the wings to fold back whilst raising both wing trailing edges.
9) The trailing edge tip battens may be secured together by cords or hooks.

To rig for flight from configuration 1, use the reverse procedure. It is not possible to open the wings by pulling on the cross boom cord. 2 assistants will be needed to carefully walk the wings out. Lift the trailing edges as the wings open to assist movement of the washout rods.

Fold configuration 1

7.6 Fold Configuration 2.

A very compact folding configuration which is possible to accomplish single handed. A nosewheel skate with basebar channel is required if the folded aircraft is to be moved.

1) Face the aircraft into wind. Apply the parking brake. Put the front wheel into a skate with a channel to receive the wing basebar. Strap the nosewheel down so it cannot jump out of the skate.
2) Remove the front strut, fold the seat backrest down and rear seat cushion. Remove the screen. Carefully lower the wing down and engage the control bar in the skate channel.

⚠ WARNING

The aircraft may be fitted with an optional rigging gas strut. If a gas strut is not fitted, support the weight of the wing by lifting on the control bar from the moment you unhitch the front strut, or damage/personal injury could occur.

3) Insert the crossboom rigging tool in the rear of the keel and connect it to the restraint tang, securing it with a spring clip.
4) Fit padded propeller blade covers and rotate the propeller so one blade is vertically downwards.
5) Open the Velcro panels behind the outer washout rods.
6) Disengage the restraint tang and slacken the cord by approximately 0.5 metres, secure it to the cleat on the rigging tool.
7) Remove at least 3 top and 3 bottom battens on each wing nearest the keel.
8) Carefully fold the wings in, lifting both trailing edges if any battens are left in.
9) Secure the trailing edges with ties, or if all battens are removed, roll up each wing and secure it with sail ties.
10) Protect the sail with UV light proof covers.

Fold configuration 2 – side view. The nosewheel skate allows movement in the hangar.

Fold configuration 2 – rear view.

To rig for flight from configuration 2, use the reverse procedure. It is possible to open the wings by pulling on the cross boom cord in this position, though assistance may help. Lift the trailing edges as the wings open to assist correct deployment of the washout rods.

7.7 Fold configuration 3 – de-rigged into a bag for transport/storage.

The de-rigging procedure is a direct reversal of that for rigging. As with the preparation before flight, it is also important when de-rigging that the pilot/operator carries out an inspection.

Face the aircraft into wind and apply the parking brake. Remove the windscreen. Remove the 2 rings and pins holding the front strut to the front strut lower. These can be found above the panel and behind the windscreen. Undo the pylon overcentre lever. Remove the pin at the top of the front strut and remove it.

Stand in front of, and facing the trike, with both hands firmly supporting the control bar. Gently ease the control bar towards you as you walk backwards until the keel has engaged with the keel stop and the pylon starts to move towards you. If a rigging gas strut is fitted, while keeping firm control of the descent with both hands on the control bar, you can allow the gas strut to support the weight of the wing. If no gas strut is fitted, then you will be supporting the wing weight all the way to the ground.

⚠ WARNING

Do not attempt to lower the wing to the floor without a rigging gas strut if you have back problems or if you are slight in stature. With wind input, you could find yourself with up to 97 lb (44 kg) of dead weight to carry. If you are unfit to carry this weight in a stooped position it is essential that a gas strut be fitted, or that someone else is on hand to help you.

As the control bar reaches the ground keep it level to allow both end joints to land together. This will ensure that there is no twist in the pylon that will make it difficult to remove the hang bolt later.

Release the parking brake, remove the nose cone from the wing and temporarily tuck it away between one leading edge and its Mylar, fit the rigging tool to the nose.
Gently pull the nose and lower it to the ground. The trike front wheel will roll through the A frame and over the control bar as you do this. Remove the safety pin and special nut from the hang bolt and then remove the hang bolt from the hang bracket. If electric trim is fitted, disconnect the trim cord shackle from the keel. Wheel the trike back well away from the wing.

⚠ WARNING

Keep a firm grip on the pylon to ensure that the rigging gas strut does not shoot it into the upright position. Do not lean over the lowered pylon at any time as injury could result from it inadvertently erecting.

Keep hands and fingers out from between the control frame sides and the hang bracket as injury could result.

After detaching the wing from the trike, reverse the procedures listed in Section 5.2. When preparing the wing for stowage in the bag, furl the wing fabric carefully, ensuring that the protection patches are correctly positioned at the following positions:

a) Control frame knuckle joints and rigging cable connections.
b) Roll bracket and upper control frame.
c) Keel restraint stud area.

Rigging cables should be stowed carefully so as to avoid kinks and tangles.

When using the pulley system to release the crossboom tension, pay out the cord steadily to avoid rope burns to your skin.

7.8. RIGGED WING STORAGE QUIKR & GTR

If storing the wing alone rigged, it should be parked in a sheltered location nose-down with rigging extension inserted. Undo the wing undersurface inspection zips and pass tie-down ropes around the cross-boom or side-wires. The nose cone should be removed and stowed under the leading edge Mylar.

The basebar and nose should rest on a soft, even surface; in particular avoid sharp stones which can damage the basebar.

⚠ WARNING

Never disconnect the nose shackle when the lift struts are attached. Never attempt to fold the control frame back when the lift struts are attached.

7.9. WING OVERNIGHT PARKING QUIKR & GTR

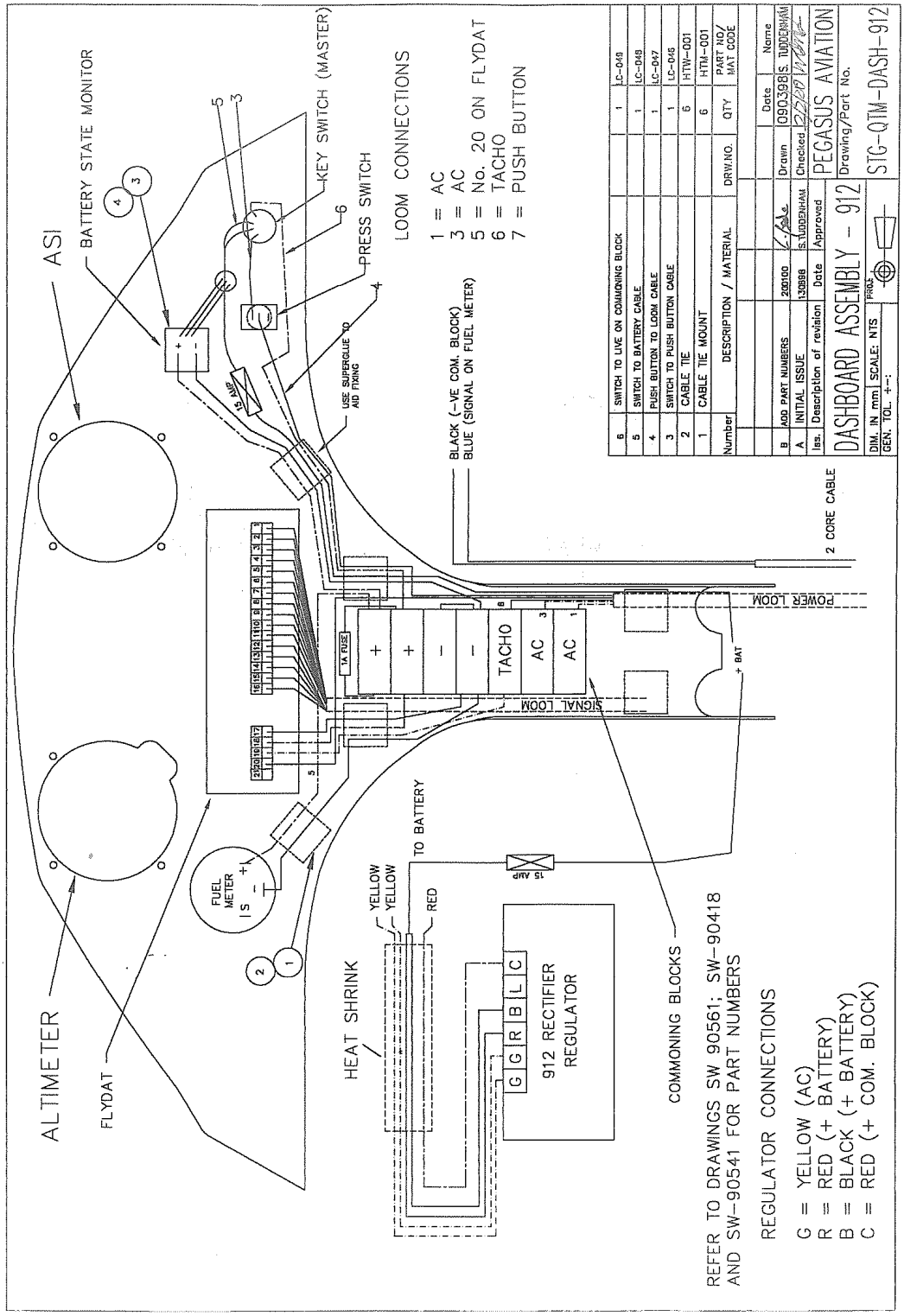
For overnight parking, unless winds are forecast to be very light, the wing should be positioned into wind and folded down as in configuration 2 but with the control bar on the ground.

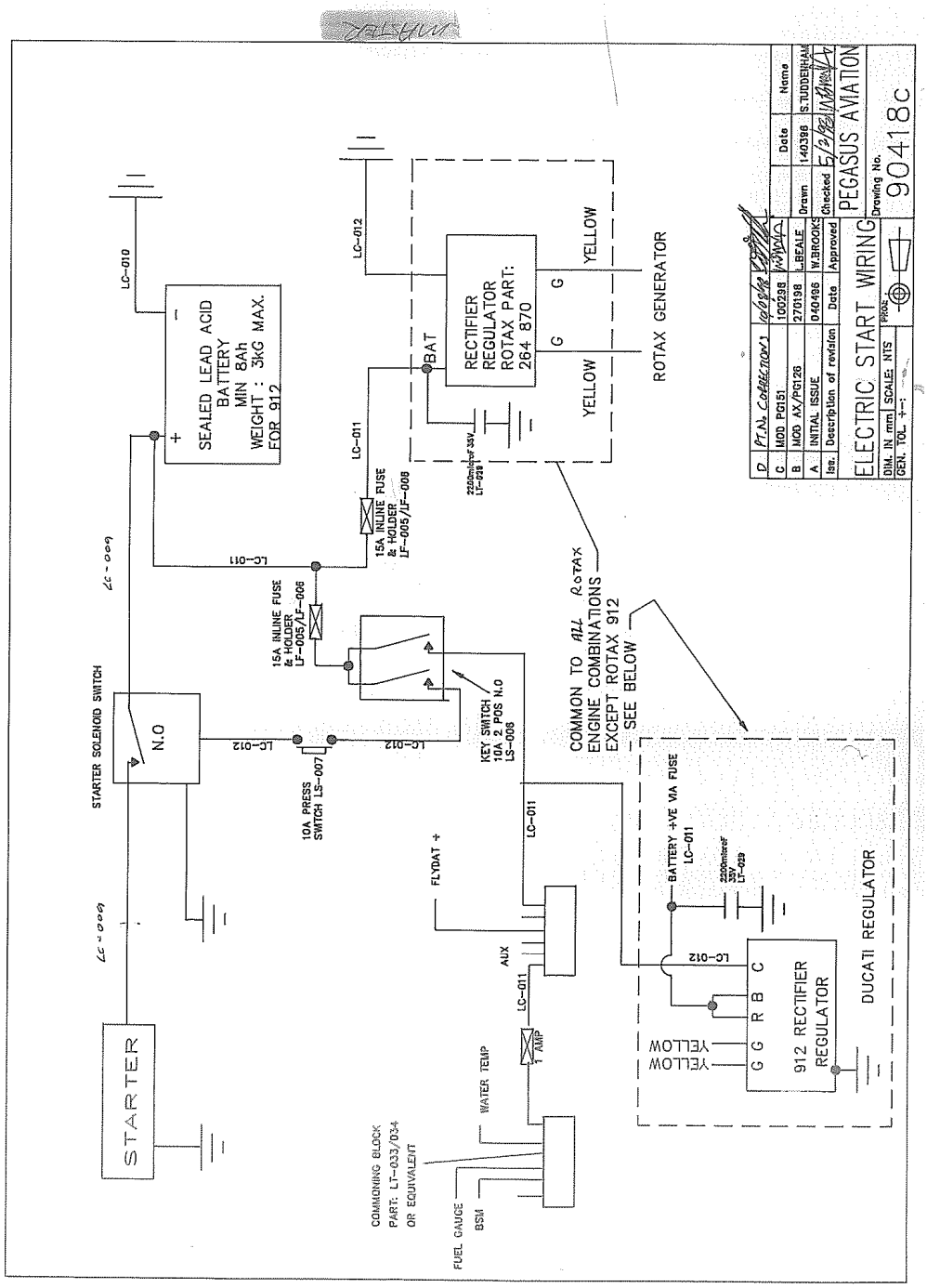
CAUTION

Never store a wet wing in a sealed bag. This may result in mildew on the sail or general degradation of the airframe and fittings. If possible dry the wing before de-rigging. Otherwise open the bag zip before the wing is stored.

Appendix A – Wiring Diagrams

Wiring Diagrams – Included as a guide only as some variation may exist due to different instrument fit.




STARTER
STARTER SOLENOID SWITCH
N.O
SEALED LEAD ACID BATTERY MIN 8Ah WEIGHT : 3kG MAX. FOR 912
RECTIFIER REGULATOR ROTAX PART: 264 870
ROTAX GENERATOR
YELLOW
YELLOW
G
G
BAT
15A INLINE FUSE & HOLDER LF-005/LF-006
10A PRESS SWITCH LS-007
KEY SWITCH 10A 2 POS N.O LS-006
COMMON TO ALL ROTAX ENGINE COMBINATIONS EXCEPT ROTAX 912 - SEE BELOW
FLYDAT +
BATTERY +VE VIA FUSE
2200microF 35V LT-029
912 RECTIFIER REGULATOR
DUCATI REGULATOR
G G R B C
YELLOW
YELLOW
AUX
WATER TEMP
1 AMP
COMMONING BLOCK PART: LT-033/034 OR EQUIVALENT
FUEL GAUGE
BSM
LC-010
LC-011
LC-012
LC-009
LC-037
D Pt.No Correction
C MOD PG151 100398
B MOD AX/PG126 270198
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Iss. Description of revision Date
Drawn L.BEALE
Checked W.BROOKS
Approved
Date Name
140398 S.TUDDENHAM
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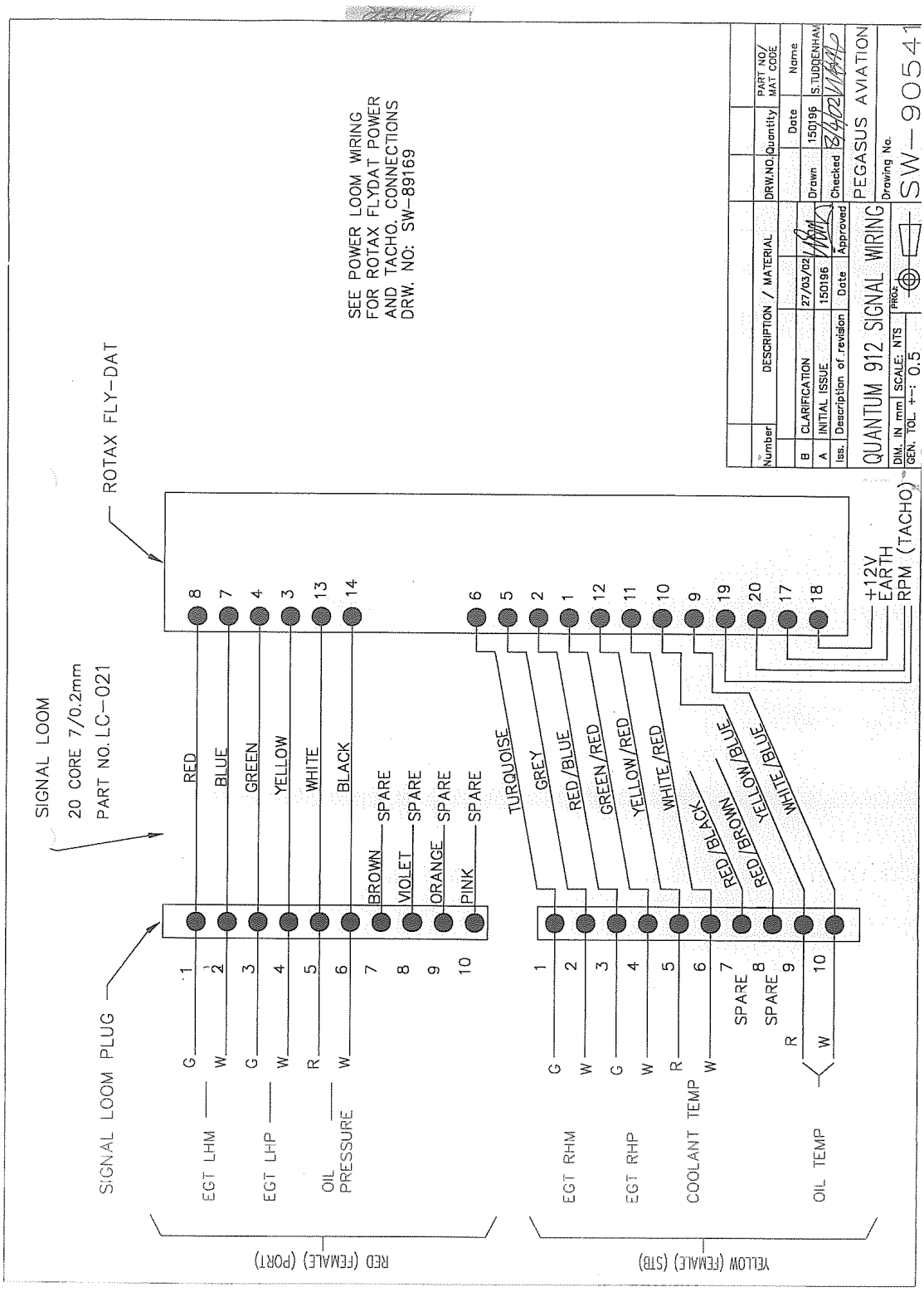
Drawing No. 90418c
DIM. IN mm SCALE: NTS
GEN. TOL +-:
PROJ.


SEE POWER LOOM WIRING
FOR ROTAX FLYDAT POWER
AND TACHO. CONNECTIONS
DRW. NO: SW-89169
ROTAX FLY-DAT
SIGNAL LOOM
20 CORE 7/0.2mm
PART NO. LC-021
SIGNAL LOOM PLUG
RED
BLUE
GREEN
YELLOW
WHITE
BLACK
BROWN SPARE
VIOLET SPARE
ORANGE SPARE
PINK SPARE
TURQUOISE
GREY
RED/BLUE
GREEN/RED
YELLOW/RED
WHITE/RED
RED/BLACK
RED/BROWN
YELLOW/BLUE
WHITE/BLUE
+12V
EARTH
RPM (TACHO)
EGT LHM
EGT LHP
OIL PRESSURE
EGT RHM
EGT RHP
COOLANT TEMP
OIL TEMP
SPARE
SPARE
RED (FEMALE) (PORT)
YELLOW (FEMALE) (STB)
Number
DESCRIPTION / MATERIAL
DRW.NO.
Quantity
PART NO/ MAT CODE
B CLARIFICATION 27/03/02
A INITIAL ISSUE 150196
Iss. Description of revision Date Approved
Date Name
Drawn 150196 S.TUDDENHAM
Checked
PEGASUS AVIATION
QUANTUM 912 SIGNAL WIRING
DIM. IN mm SCALE: NTS PROJ.
GEN. TOL +-: 0.5
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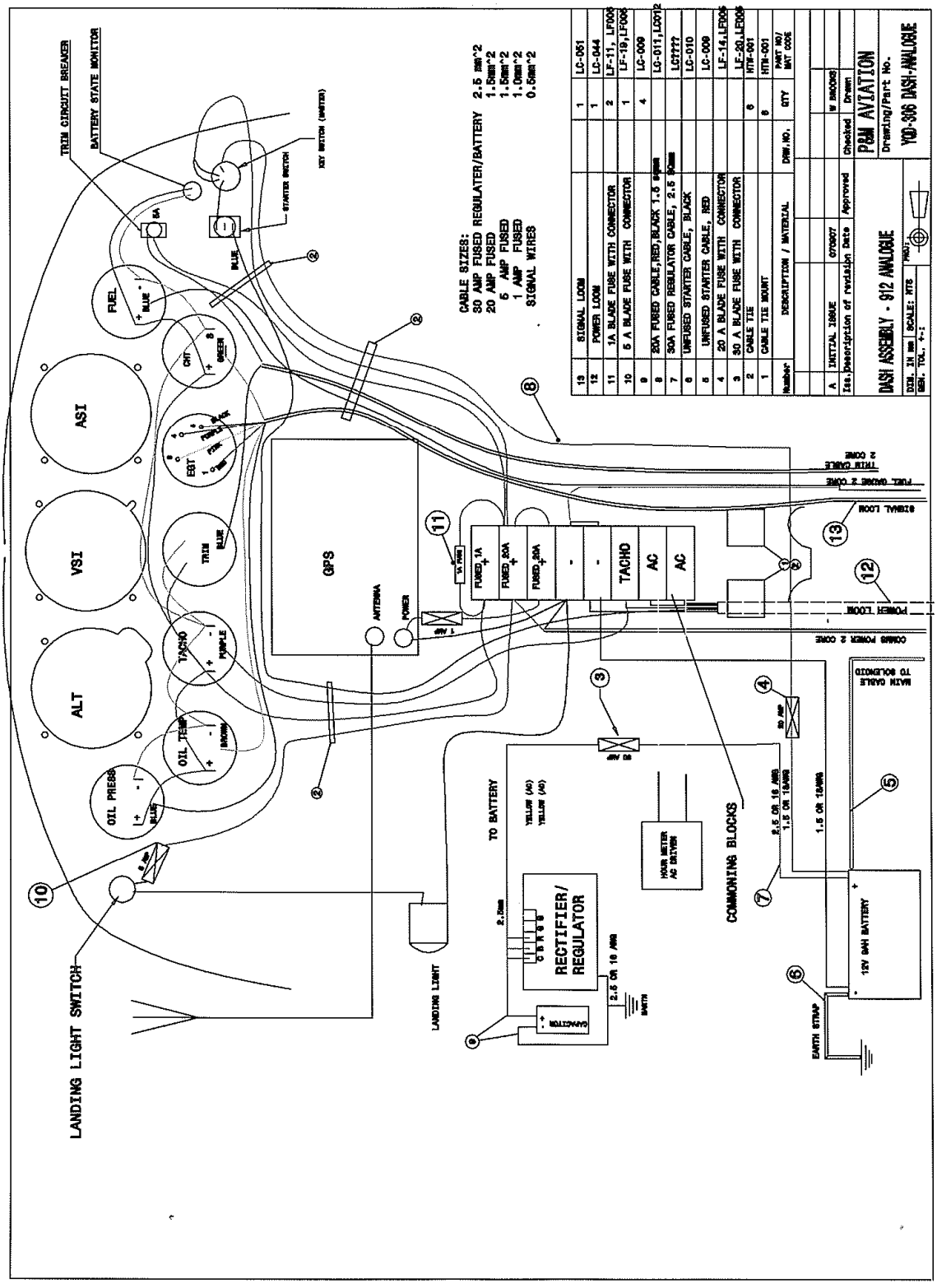
SW-90541



Item	Number	Description / Material	Drw. No.	Qty	Part No/ Mat Code
13	1	SIGNAL LOOM		1	LC-051
12	1	POWER LOOM		1	LC-044
11	2	1A BLADE FUSE WITH CONNECTOR		2	LF-11, LF008
10	1	5 A BLADE FUSE WITH CONNECTOR		1	LF-19,LF006
9	4			4	LC-009
8		20A FUSED CABLE,RED,BLACK 1.5 mm			LC-011,LC012
7		30A FUSED REGULATOR CABLE, 2.5 mm			LC????
6		UNFUSED STARTER CABLE, BLACK			LC-010
5		UNFUSED STARTER CABLE, RED			LC-009
4	2	20 A BLADE FUSE WITH CONNECTOR			LF-14,LF005
3	1	30 A BLADE FUSE WITH CONNECTOR			LF-20,LF005
2	6	CABLE TIE		6	MTR-001
1	6	CABLE TIE MOUNT		6	MTR-001

Iss.	Description of revision	Date	Approved	Checked	W BROOKS
A	INITIAL ISSUE	070907		Drawn	

DIM. IN mm SCALE: NTS PROJ:
GEN. TOL. +-: