QUANTUM 15

Operator's Manual - Issue 10

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Appendix A Service Bulletins/Modifications

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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 or equivalent or under the supervision of a qualified Flying Instructor whilst undergoing training. 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 <u>in full</u> 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
Unit B,
Crawford St,
Rochdale
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OL16 5NU
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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/Ultralight 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/Ultralight flying and similar air sports are not controlled in the same way that are other forms of aviation. As a result Microlight/Ultralight 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 Quantum Microlight/Ultralight 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 Pegasus Ultralight.

Read this Operator's Manual before flying your aircraft so you will be thoroughly familiar with the proper operation of your Quantum's 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 fly this flexwing Ultralight safely. All operators of this Ultralight must qualify in a pilot training programme, to the minimum standard of the BMAA flexwing microlight pilot's licence syllabus, to attain awareness of the mental and physical requirements necessary for flexwing Microlight operation.

To ensure a long and trouble free life from your Pegasus Quantum, give it the proper care and maintenance described in this manual. For Engine Information and Service & Maintenance schedules, please refer to the relevant Engine Manufacturers Manual.

Issue 4 changes:
Issue 4 introduced the HKS 700e Beta engine, which replaces the HKS 700e v3 engine. The HKS Beta engine is 2kg heavier and has a completely redesigned oil system with twin scavenge pumps and a deeper sump. The engine temperature and pressure limits are different. The oil pressure is approximately double the HKS V3 engine. The power output and rpm remains the same.

Issue 5 changes:
This issue 5 introduces an additional paragraph and warning box under the heading *The Fuel Tank and System* on Page 16.

Issue 6 changes:
This issue 6 has been introduced for certification of the Quantum 15 to BCAR section S issue 2 at 409kg maximum all up weight. A fuel load placard is introduced, enabling the pilot to refer to the maximum fuel load for a given aircraft weight. Performance values are amended, for example the 5% weight increase from 390 to 409kg gives a 10% increase in takeoff distance.

Issue 7 changes:
This issue 7 introduces a new weather limitations table and an additional paragraph to discuss pilot experience and training requirements for flying in cross wind conditions. These changes appear on page 43.

Issue 8 Changes:
a)Introduction of the Rotax 503-1v B type gearbox with 2 blade 65" Ivoprop basic entry variant.
b)Takeoff distances are factored by 1.3 for all models as required by BCAR S issue 2.

Issue 9 Changes:
Introduction of Rotax 582/48 engine variant.
Amendments:
1) Section 12.5 Inspection & servicing schedules BMAA inspectors approved

Issue 10 Changes:
Editorial Corrections and Introduction of the following optional modifications:
108 Hydraulic Rear Brakes
112 Hand Throttle Electric Start Interrupt switch (912 model only)
130 65L tank, telescopic front suspension, rising rate rear suspension.
150 Seat Load 110kg.

1. PREPARATION FOR SAFE MICROLIGHT/ULTRALIGHT 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 Quantum aircraft is 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 Pegasus Microlight, you must hold a pilot's licence valid for microlight aircraft issued by the national or state aviation authority, or be under training and flying with the approval of a Qualified Flying Instructor. 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, or be under training and flying with the approval of a Qualified Flying Instructor. The training standards must be at least equivalent to the BMAA microlight pilot's syllabus for flexwings.

Type Conversion

Even if you are an experienced pilot of fixed wing aircraft, you should never under any circumstances attempt to fly a flexwing until you have qualified by satisfying the relevant authority or instructor/examiner following a type conversion training programme containing at least the exercises in the syllabus in Appendix A.

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. PRE-FLIGHT PLANNING

Planning is pivotal to the legal safe operation of all aircraft. Please ensure that the following conditions always apply:

Air Law

Before flight, check that your aircraft documents and pilot qualifications qualify in the states or countries in which you intend to operate. Air Law can vary from country to country and from state to state; be sure to always fly within the letter of the Air Law that operates in your state or country. Make sure you have permission to fly from both your take-off site and your intended landing site.

Weather Conditions

Flexwing Microlights should only be flown in calm conditions. The prudent pilot takes care to avoid flying in strong winds (more than 10mph), gusty, thermic conditions, crosswinds, rain and any kind of storm. (See Section 8 for more detailed weather limitations.) Remember also that the weather at your destination may be different from your starting point, so check before you set off. Detailed aviation weather reports are usually available from your local airfield, and on the internet. If the weather unexpectedly changes for the worse during a flight, then the safest option is to land at a suitable landing site at the earliest opportunity.

Route Planning

Plan your route using an appropriate pilot's map, properly folded and stowed in an appropriate map-holder which is securely fastened to the pilot/passenger or airframe. Ensure that your planned route remains within the operational Air Laws of your state/country. Always plan your route so that you fly within safe gliding distance of a suitable landing area in the event of power loss or complete engine failure. Avoid flying over mountains or large hills, seas or lakes, built-up areas, woods or forests, deserts with soft sand or anywhere else that renders a safe landing impossible in the event of an emergency. Remember that there is a greater risk of turbulence when flying near mountains. Never fly in the lee of hills or mountains if the surface wind is anything other than calm, since lee rotor can be extremely dangerous. Always plan for the possibility of having to divert to an alternate airfield because of bad weather, and make sure you carry enough fuel to reach your alternate destination with a further 60 minutes of flying time in reserve. Use the advice in this paragraph in conjunction with that obtained in your formal training. This advice must not be taken as a substitute for proper training.

Clothing

Both extreme heat and extreme cold can be dangerous to pilot and passenger, since they can affect the human brain's decision making process. Please ensure that you wear clothing appropriate to the conditions in which you fly. Crash helmets, ear defenders, gloves and a purpose-built flight suit should always be worn, irrespective of the conditions! In bright conditions, high quality unbreakable sun-glasses are also a sensible precaution. Remember that the temperature drops 2-4 degrees F per 1000 feet of altitude, so clearly if your route demands high altitude flying you should dress appropriately. Remember also that the pilot and passenger in open cockpit aircraft will suffer from wind chill, which has the effect of making the ambient temperature seem much lower than it actually is. Finally, check that neither pilot nor passenger has any objects which can fall out of their pockets since any loose objects are likely to pass through the propeller arc, destroy the propeller in doing so and seriously threaten the safety of the aircraft and its occupants.

⚠ WARNING

Articles of clothing, such as gloves and scarves that may be taken off in flight, or glasses/sun-glasses must be secured by a tie short enough to ensure that they cannot fall out of the aircraft or be blown into the propeller.

Other objects that are carried in the cockpit such as maps, knee boards and other navigation equipment must be similarly secured.

Occupants with long hair, particularly in the rear seat, must have it tied to ensure that it cannot reach moving or hot parts of the engine.

Failure to take these precautions could result in injury or death.

The Payload

The aircraft available payload is the difference between its dry empty weight (see Section 3.1) and its maximum authorised take off weight (MAUW - see Section 3.1). Before each flight you should calculate the combined weight of the aircraft, fuel, pilot and passenger and ensure that it never exceeds 900 lbs (409 kilograms).

⚠ WARNING

It is extremly dangerous to exceed the 409kg (900 lb) take off weight limit, it could cause structural failure or loss of control leading to injury or death.

Fuel

Before each flight, you should calculate your fuel requirement. (For an approximate fuel consumption guide, see Section 3.5; remember that fuel consumption can be affected by many factors including engine condition, take off weight, density altitude, speed). You should ensure that you have enough fuel and reserve for your planned flight (See paragraph on Route Planning above) by carrying out a visual check of the fuel level before you set off and calculating the endurance limit of the aircraft leaving at least a 30% reserve factor. Never rely only on fuel gauges, use them only in conjunction with your calculated fuel endurance notes. Check the fuel is of the appropriate quality (see Section 3.2), properly filtered against impurities, and in the case of 2 stroke engines, mixed in the appropriate ratio with a high quality synthetic 2 stroke oil. Drain a small quantity of fuel via the drain valve before each flight to check for water. With Rotax 2 stroke engines check the fuel filter and dual bowls daily.

Human Factors
Before flying, check the Human Factors as learnt as part of your Microlight license. Never fly with a cold, under the influence of drink or drugs, after an illness/accident without clearance from your Doctor, or when feeling depressed.

1.3. 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.

For operation at up to 409kg, the following modifications must have been carried out (standard production from
The dates below)

PG 207	introduced 27/8/98	Q2 wing tip webbing stitch pattern & UV protection patch
PG173	Introduced 17/3/98	Roll bracket flange thickened
PG138	Introduced 07/11/97	Trailing edge root retention webbing & root patch
PG124	Introduced 22/05/97	10mm leading edge/crossboom bolts
PG73	Introduced 10/05/96	TIG welded front fork trailing links

1.4. PRE-FLIGHT CHECKS

It is essential that rigorous checks are carried out daily before flight, exactly to the schedule in Section S.
In addition to the full daily inspection and preflight checks detailed in Section 6, ensure that:

SERVICING: the engine and airframe are within Service limits (see Section 12.5).

LIFED COMPONENTS: the engine and airframe are within lifing limits (see Section 12.6).

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

1.5. SAFETY HARNESSES

Pegasus 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 Section 7.2). 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.

1.6. 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.

1.7. 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.

1.8. 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. 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 siphon 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 Quantum 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 Section 6.2.
6. Do a full pre-start security check as described in Section 7.3.
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 Pegasus Quantum is an advanced weight-shift controlled aircraft. It 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 57-65 mph makes long cross-country trips quite practicable. Using appropriate airfields and the instructor control bars, it can also be used as a safe and reliable training machine.

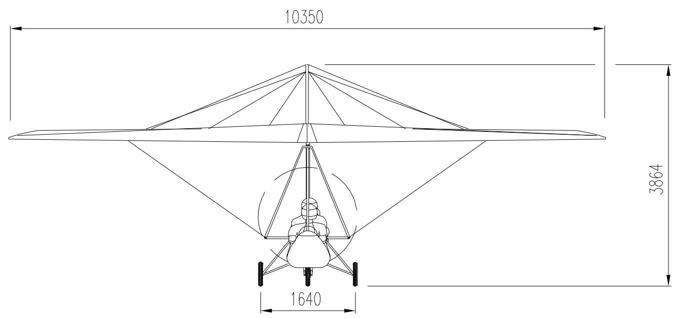
WARNING

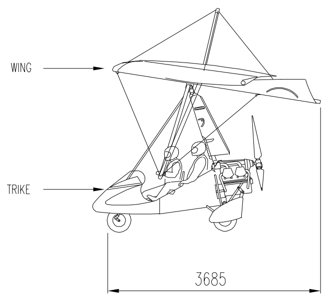
Do not attempt to act as pilot in command from the rear seat unless training bars and rear steering is fitted, and special training has been undertaken to fly from the rear seat

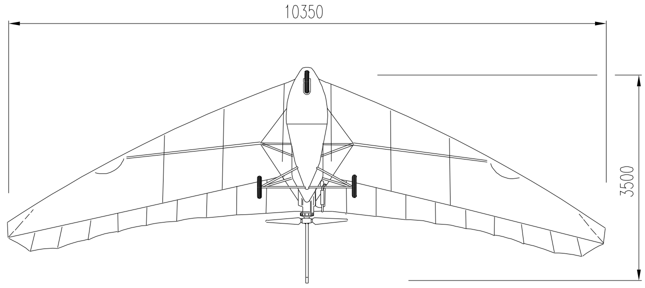
The trike design incorporates a comfortable rigid seating system, main-wheel compensated brakes which can be locked for parking or rigging, and rugged all-round suspension. The Q2 wing incorporates a pitch trimmer, so that the pilot can trim the aircraft at the best speeds for climb, cruise or approach. This feature together with a special roll linkage makes the aircraft much easier to fly than earlier generation flexwing aircraft, especially in turbulence or when maintaining steady climbing or fast cruising speeds. The trimmer also increases the pitch stability in slow flight, which is a distinct advantage for training, or when flying in turbulent conditions, particularly if lightly loaded.

The Pegasus Quantum has 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.

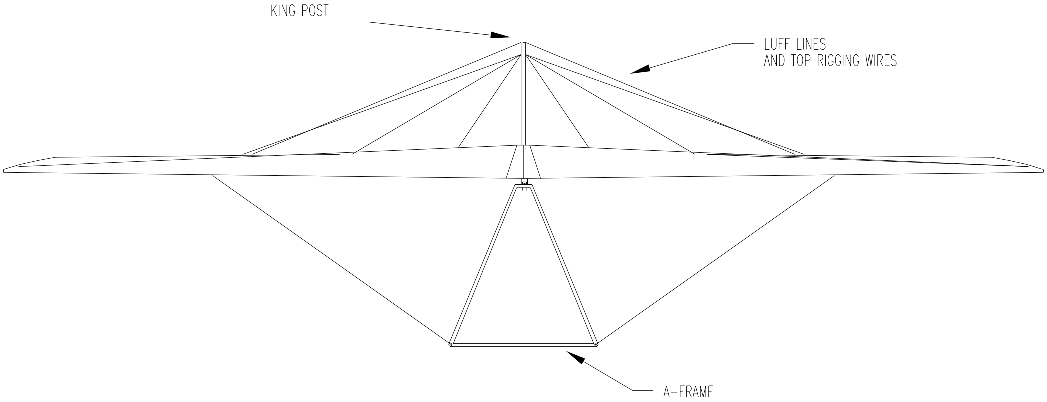
2.1. GENERAL ARRANGMENT DRAWINGS

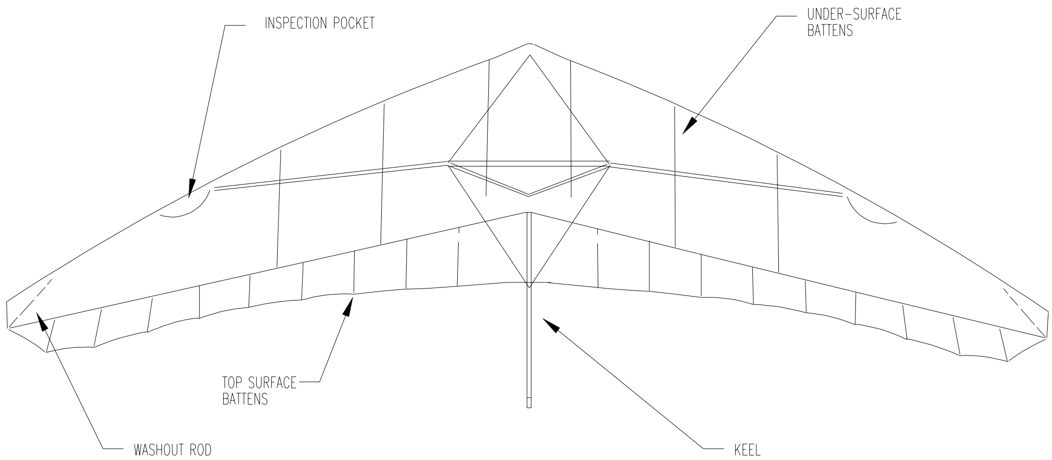






2.2. PRIMARY STRUCTURES AND SYSTEMS - THE WING





The Sail

The Q2 is the product of one the most experienced flexwing design teams in the world today. The sail fabric is cut with exacting accuracy from a stabilised polyester using a tight, virtually non-porous and tear-resistant weave construction. Double-stitched seams using a compatible thread ensure complete panel join integrity. Sail reinforcement is achieved by including extra material at high stress points. A Trilam or Ultralam sandwich or Mylar leading edge and a Kevlar trailing edge maintain the wing's performance over a long life.

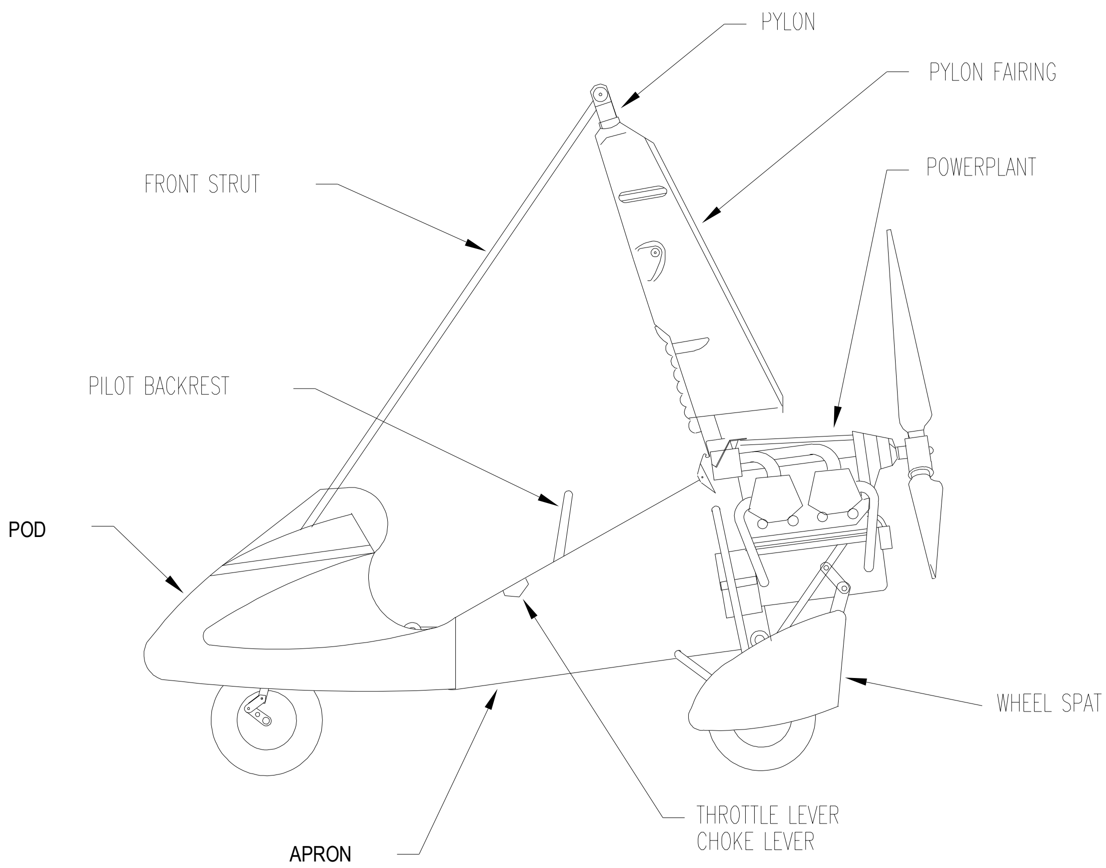
The aerofoil section is defined by pre-formed aluminium and pre-formed aluminium/composite ribs, with chordwise tension being maintained by attachment to the trailing edge. The predictable low speed stall exhibited by the Quantum is achieved mainly by the clean lines of the aerofoil's leading edge radius.

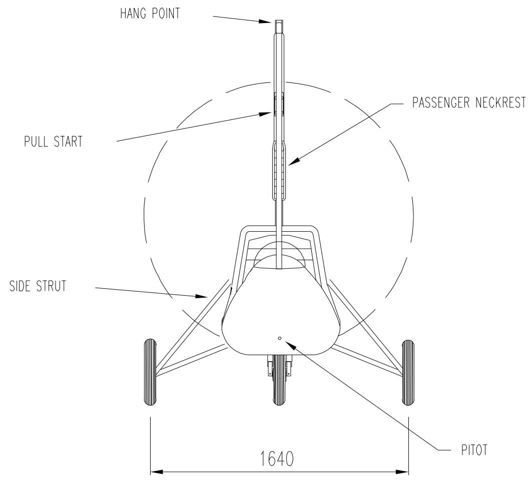
The Airframe

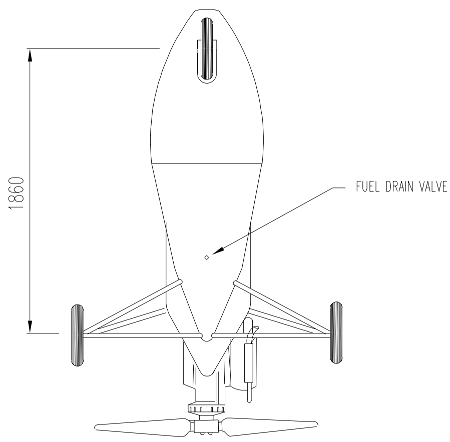
All the main tubing used in the airframe is a high quality aluminium alloy from aircraft quality billets using a special process of mandrel extrusion followed by being drawn to agreed industry specifications. All tubes and inserts are anodised to give protection against corrosion.

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

2.3. PRIMARY STRUCTURES AND SYSTEMS - THE TRIKE







The Power Units

	912	582/48	582/40	HKS 700E BETA	503-1v	503 –2v
Type	4 stroke	2 stroke	2 stroke	4stroke	2 stroke	2 stroke
CC	1211	581	581	680	496	496
Power	80bhp	64bhp	55bhp	60bhp	45bhp	50bhp
Ignition	Dual CDI	Dual CDI	Dual CDI	Dual CDI	Dual CDI	Dual CDI
Cylinders	4	2	2	2	2	2
Reduction	2.27:1	3.47:1	3.47:1	3.47:1	2.58:1	2.58:1 or 3.47:1
Fuel/oil mix	n/a	50:1	50:1	n/a	50:1	50:1
Fuel min. rating	90 RON	90 RON	90 RON	92 RON	90 RON	90 RON

CAUTION

Damage may result on CDI engines if the engines are turned over without the plug leads connected.

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 polyurethane elastomer incorporated in the tubular aluminium alloy struts. The braked main wheels are accessible by removing the quickly-detachable wheel spats.

The nose undercarriage is steerable and incorporates footrests and throttle/brake controls. A trailing link elastomer suspension system is fitted on early aircraft, whilst later aircraft have a trailing link sprung suspension.

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 (47 and 65L versions) is as follows:

% Tank Volume	Gauge Reading
0 to 15	0
16 to 27	1/8
28 to 41	¼
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.

2.4. 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.

> **⚠ 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. (503 LITE Basic only: The standard choke control is located on the carburettor: up is 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 carburettors 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.

Starter - Manual Start

The engine start system consists of a pull-start cord running from the engine up and over a pulley situated half way up the main pylon. A handle attached to the cord is pulled to start the engine. The manual start system is not used on either the Rotax 912 or HKS BETA700E engine options.

> **⚠ WARNING**
>
> Make sure the starter rope has fully recoiled before letting go of the starting handle.

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!*

2.5. 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.*

2.6. SECONDARY STRUCTURES AND SYSTEMS - FUEL SYSTEM

Rotax 912 and HKS 700E BETA Engines only
The preferred fuel is 92 RON (90 for the Rotax 912) 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 extensively, use only semi-synthetic motorcycle oil.

All 2 Stroke Engines
The preferred fuel is 83 MON or 90 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. Plugs should be checked every 10 hours if using AVGAS. The fuel must be well mixed at a ratio of 50:1 with a good quality synthetic 2 stroke oil (Rotax specify a super two stroke oil meeting ASTH/CEC Standard AP1-TC).

⚠ WARNING

1. Do not mix mineral with synthetic oils.
2. Filtered fuel only should be added to the fuel tank. Contaminated fuel may cause engine failure.

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.

2.7. 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.

2.8. SECONDARY STRUCTURES AND SYSTEMS - COCKPIT AND FAIRING

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.

2.9. 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.

The power available from the alternator is a function of engine revs 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 to reduce the likelihood of disturbing 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.

2.10. 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 Two Stroke Engines:
Cyclone Airsports have designed carburettor body heaters which may be fitted as an optional minor modification. They conduct heat to the throttle slide and hence melt the ice. The advantage of this system is that there is negligible warming of the intake air and hence no power loss. Carburettor heat can be selected by use of a tap or switch. They are anti-icing rather than de-icing systems, i.e. they must be left on whenever icing conditions are suspected. *If carburettor heat is selected after icing is detected, it may be too late.*

Two heaters are available, the coolant and electric types. The coolant type uses coolant which is permanently circulating around the engine block, i.e. If an engine thermostat is fitted, the carburettor heater must be fitted so that it is not shut off by the thermostat.

Carburettor heater systems are rarely necessary on Quantum aircraft fitted with 2-stroke engines, especially in aircraft being flown in fine weather. Only if the aircraft is to be used in severe carburettor ice conditions will it be found necessary to fit carburettor heaters to 2-stroke engines on Quantum aircraft.

WARNING

Electric carburettor heaters must be alternator AC driven only, without a regulator or battery in circuit. If the battery is allowed to discharge through the heater when the engine is off, serious overheating will occur with possible fire risk.

Rotax 912 Carburettor Heat System
The Bing CV type carburettors cannot be de-iced very effectively by body warming because it is too difficult to heat the carburettor butterfly valve. A warm intake air system is used.

Because the Rotax 912 engine is more susceptible to icing than the two stroke engines, the Cyclone 912 carburettor heat system (Pat applied for) is standard fitment for the Quantum 912. It works by using heat transferred to the intake air from engine coolant filled coils surrounding the air filters. The coils are shielded from heat loss to atmosphere by a cover. At high throttle openings where icing is less prevalent, the high air flow rate through the coils cools them down so that the intake air is not warmed so much. The result is that full throttle power is not greatly affected. Maximum carburettor heating of approximately +35°C intake air temperature is achieved at approximately 1/3 throttle. The system is an anti-icing device which must be selected “on” before takeoff by the tap on top of the engine, whenever icing conditions are suspected.

It takes a few minutes for the heat to flow through, so turning the carburettor heat on after ice is suspected may be too late. In the event of a leak, the engine will run at moderate power for a limited time without coolant; however a landing must be made as soon as possible.

The connections to the heating coils must be secure, and so must the covers. The system must be regularly inspected for chafing.

Alternatively, a carburettor body warming system supplied with heat from the coolant may be installed.

The radiator cover should be adjusted to obtain at least 80C coolant temperature for either 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.

HKS 700E BETA Carburettor Heat System.
In the HKS BETA installation the carburettors are enclosed inside a cover so that they draw warm filtered intake air from the cylinder barrels. A scoop in the top of the cover can be opened to provide cold intake air. Warm air should be selected when warming the engine on a cold day, or when icing conditions are suspected. For maximum power, cold air should be selected before takeoff.

The cover is designed to be readily removable to enable inspection of the carburettors. The cover must be checked for security before takeoff.

2.11. SECONDARY STRUCTURES AND SYSTEMS - RADIATOR COVERS

912 Oil Radiator Jacket
In accordance with **Pegasus Service Bulletin No: 0094**, in which it was noted that it was desirable for the oil temperature on aircraft equipped with the Rotax 912 four stroke engines to reach 100°C at least once per flight, Pegasus 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.*

Installation
Installation is straightforward. With the Velcro tabs upwards, pull the jacket over the radiator until the whole radiator is covered. Align the jacket so that the tabs sit just inside the oil pipes, and press the Velcro tabs firmly together. Check that the tabs do not cover the propeller pitch placard.

Usage
The oil temperature on the 912 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 140°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.

3. GENERAL INFORMATION

3.1. EMPTY WEIGHT

Typical empty weights for the Pegasus Quantum 15 range are as follows:

912	HKS BETA	582ES	582	503 C type gearbox	503 Basic 2.58:1 gearbox
203kg	198kg	188kg	183kg	175kg	161kg
447lbs	436lbs	413lbs	402lbs	385lbs	354lb

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 220kg (477lbs).

The Pegasus Quantum 15, registration mark....................., engine type.............................., has been weighed empty, including full oil, electrolyte and unusable fuel:

WEIGHT	MODIFICATION STATE	DATE

3.2. FUEL LOADS – 49L Tank

The fuel tank is 49 litres capacity, including 1.6 litres unusable, giving 47.4 litres 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 (451kg)	170kg (374lbs)	47.4 litres (full)
205kg (451lbs)	200kg (440lbs) - max. load	5 litres
220kg (484lbs) - max. empty weight	172kg (379lbs)	23 litres (1/2 full)
220kg (484lbs) - max. empty weight	154kg (340lbs)	47.4 litres (full)

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 (between $^{3}/_{4}$ and full tank).

3.2.1 FUEL LOADS – 65L tank

FUEL LOADS

The fuel tank is 65 litres capacity, including 1.6 litres unusable, giving 63.4 litres useable. The weight of the fuel is 0.718 x 65 = 46.7 kg (102lb). The larger tank is 0.5kg heavier than the 47 litre tank. 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)
205kg (451lbs)	200kg (440lbs) - max. load	5 litres
220kg (484lbs) - max. empty weight	172kg (379lbs)	23 litres (1/3 full)
220kg (484lbs) - max. empty weight	Up to 142kg (312lbs)	65 litres (full)

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.

PLACARDS:

The fuel capacity placard near the fuel filler neck must be marked with 65 litres.

A new 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. It is not advisable to add weight to the nose of the Quantum 15 (503) basic model, to ensure nosewheel ground clearance when landing. The CG of the 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 Q2 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

Wing Data	Wing Span:	33.95 ft.	10.35 m.
	Sail Area:	167.8 sq ft.	15.6 sq. m.
	Aspect Ratio:	6.86	
Trike Data	Length (erect):	111.0 ins	282.0 cm
	Length (fold down):	114.0 ins	289.0 cm
	Width:	72.0 ins	83.0 cm
	Track:	65.0 ins	165.0 cm
	Height (erect):	98.0 ins	249.0 cm
	Height (fold down):	61.0 ins	155.0 cm
	Minimum payload:	156.0 lbs	55.0 kg

3.5 POWERPLANT SPECIFICATIONS

MODEL	912	HKS 700E BETA	582/48	582/40	503	503-2v LITE	503-1v Basic
Type	4 stroke	4 stroke	2 stroke	2 stroke	2 stroke	2 stroke	2 stroke
CC	1211	680	581	581	496	496	496
Power	80 bhp	54 bhp	64 bhp	54 bhp	50 bhp	50 bhp	45 bhp
Ignition system	Dual CDI	Dual CDI	Dual CDI	Dual CDI	Dual CDI	Dual CDI	Dual CDI
Cylinders	4	4	2	2	2	2	2
Reduction ratio	2.22:1	3.47:1	3.47:1	3.47:1	3.47:1	2.58:1	2.58:1
Fuel/oil ratio	n/a	n/a	50:1	50:1	50:1	50:1	50:1
Min fuel rating	90 RON	92 RON	90 RON	90 RON	90 RON	90 RON	90 RON
Prop manufacturer	Arplast	Arplast	Arplast	Arplast	Arplast	IVO	IVO
Prop type	Eco 167L	Eco 167R	166R	166R	166R	65"/2	65"/2
Prop pitch	19°	23°	21°	19°	18°	12°	11°
Measured @ radius	21.4 INCH (53.5cm)	21.4 INCH (53.5cm)	21.4 INCH (53.5cm)	21.4 INCH (53.5cm)	21.4 INCH (53.5cm)	TIP	TIP

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.*

3.6. RUNNING GEAR

Tyre Pressures - front and rear 22.0 psi 1.5 bar

3.7. PLACARDS, DECALS AND LOCATIONS

UK specification.

Title	Location
Flight Limitations:	On basetube
In Flight Restart Limitations:	Adjacent to pull start on pylon fairing.
Engine Limitations:	On panel
Aircraft Weights:	On basetube
Map Box Weight Limitations:	On map box
Fuel Type, Capacity and Mix Ratio:	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 airbox or carb covers
Trimmer Setting:	On starboard upright.
Tip Turn Adjusters:	On leading edge tube tips
Latch Locking:	On seat next to latch
Oil Type and Quantity:	On oil cap
Loose Hair or Clothing:	On rear of seat
Propeller Pitch:	On oil cooler
Fuel Load Limitations:	In the cockpit

Additional for US specification

Propeller Tip Covers:	On each propeller blade
Nose Cone:	On sail under nose cone
Hang Bracket Warning:	On hang bracket
Exhaust Hot:	On top of exhaust brackets
Folded Pylon:	On pylon or pylon fairing
Front Strut Pins:	On front strut by pins
Exhaust Stubs Hot:	On 912 cylinder head
Operator's Manual/Aerobatics Warning:	On panel
Rotating Parts:	On plate on top of engine

Roll and Pitch Angles:	On port upright
Tensioner Cable:	In fin pocket
Hang Bolt Warning:	On hang bracket
Propeller Arc Warning:	On lower pylon fairing
Radiator Cap Warning:	On reservoir under radiator cap
Propeller Tip Covers:	On each propeller blade

3.8. PERFORMANCE

General Performance

Performance data in mph & feet	912	HKS 700E	582/48	582/40	503 –2v*	503 –1v*
Best safe descent rate, power off, MAUW	465 fpm	465 fpm	465 fpm	465 fpm	400 fpm	400 fpm
IAS for best safe descent, power off	40 mph	40 mph	40 mph	40 mph	40 mph	40 mph
DISTANCE COVERED FROM 2000', MAUW, STILL AIR, POWER						
3.0 miles @	40 mph	40 mph	40 mph	40 mph	40 mph	40 mph
2.5 miles @	46 mph	46 mph	46 mph	46 mph	46 mph	46 mph
VNE	90 mph	90 mph	90 mph	90 mph	90 mph	90 mph
Flight manoeuvre loads	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g
Best rate of climb, MAUW (ISA)	1000 fpm	550 fpm	833 fpm	650 fpm	500 fpm	475 fpm
Airspeed for best rate of climb	45 mph	45 mph	45 mph	45 mph	45 mph	45 mph
Take off distance to 50', Max AUW**	582 ft	880 ft	695 ft	820 ft	767 ft	788 ft
Landing distance from 50', MAUW	640 ft	640 ft	640 ft	640 ft	625 ft	625 ft
Trimmed cruise @ Max/Min AUW	60mph	60mph	60mph	60mph	60mph	60mph
Trimmed slow speed @ MAUW	46mph	46mph	46mph	46mph	46mph	46mph

* MAUW for 503 engine version is limited below 409kg by approved equipment fit.
Performance is given at 390kg AUW.
** Includes a safety factor of 1.3

Performance data in km/h & metres	912	HKS 700E	582/48	582/40	503-2v *	503-1v *
Best safe descent rate, power off, MAUW	2.3 m/s	2.3 m	2.3 m/s	2.3 m/s	2 m/s	2 m/s
IAS for best safe descent, power off	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h
DISTANCE COVERED FROM 610m, MAUW, STILL AIR, POWER						
3.0 km @	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h	60 km/h
2.5 km @	74 km/h	74 km/h	74 km/h	74 km/h	74 km/h	74 km/h
VNE	144 km/h	144 km/h	144 km/h	144 km/h	144 km/h	144 km/h
Flight manoeuvre loads	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g	+4g/-0g
Best rate of climb, MAUW 390kgs (ISA)	5 m/s	2.8 m/s	4.2 m/s	3.3 m/s	2.5 m/s	2.5 m/s
Airspeed for best rate of climb	73 km/h	73 km/h	73 km/h	73 km/h	73 km/h	73 km/h
Take off distance to 15m, Max AUW**	177 m	268 m	212 m	250 m	234 m	240 m
Landing distance from 15m, MAUW	195 m	195 m	195 m	195 m	190 m	190 m
Trimmed cruise @ Max/Min AUW	96 km/h	96 km/h	96 km/h	96 km/h	96 km/h	96 km/h
Trimmed slow speed @ MAUW	74 km/h	74 km/h	74 km/h	74 km/h	74 km/h	74 km/h

* MAUW for 503 engine version is limited below 409kg by approved equipment fit.
Performance is given at 390kg AUW.
** includes a safety factor of 1.3

WARNING

Take-off and landing performance figures were measured from a short dry grass surface at maximum weight 409kgs (900lbs) at sea level @ 15° Celsius (59°F) (ISA). Temperature, air density, altitude and take off surface can severely affect take-off and landing performance. Make the appropriate calculations before take-off.

Fuel Consumption

Approx. values, 375 kgs TOW	912	HKS 700E	582/48	582/40	503
At 50 mph (80 km/h)	8 L/hr	7 L/hr	10 L/hr	10 L/hr	12 L/hr
At 60 mph (100 km/h)	11 L/hr	9.5 L/hr	15 L/hr	15 L/hr	16 L/hr
Full takeoff power	22 L/hr	14 L/hr	28 L/hr	26 L/hr	28 L/hr

WARNING

Fuel consumption figures are guide figures only. Always fly with a minimum of 1 hour's reserve fuel.

Stalls

At 409kg max AUW	All Models
Wings level stall, power off, MAUW	Mush 33 mph
Height loss during recovery, MAUW	50 ft
Max. pitch down below horizon	30°
Wings level stall, power on, MAUW	Mush 30 mph
Height loss during recovery, MAUW	0 ft
Max. pitch down below horizon, MAUW	0°
30 degree banked stalls, power on, @ Max AUW	n/a
No stall exhibited, min. possible speed is	40 mph
210kg min AUW	
Wings level stall, power off, @ Min AUW	27 mph
Height loss, power recovery @ Min AUW	30 ft
Max. pitch down below horizon @ Min AUW	30°
Wings level stall, power on, @ Min AUW	Mush 26mph
Max. pitch down, power on recovery, @ Min AUW	0°
30 degree banked stalls, power off, @ Min AUW	Mush 30 mph

NOTE

(*See also Section 8.5 paragraph on Stall Characteristics.)*

- *The aircraft is control-limited so that a true stall is not possible without an accelerated entry. The aircraft will continue to fly under control, although the roll response will be slow. Some pre-stall buffet may be felt.*

WARNING

It is important to understand that the data recorded during stall tests were ascertained using the CAA requirement of a reduction of airspeed of not more than 1 mph per second. If accelerated and therefore unauthorised stalls are undertaken, the aircraft may then lose significant height before recovery is made, or in extreme cases, may become unstable to the extent of being unrecoverable.

3.9. ELECTRICAL SYSTEM SPECIFICATION

The Alternator

All 2 Strokes: the alternator gives a nominal maximum current of 12.5 amps AC or voltages up to about 75 volts RMS with very low current. The nominal power rating is 170 Watts. The power available is a function of engine revs and electrical load characteristics.

Rotax 912: 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.

HKS BETA 700: the nominal power rating is 210 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 airworthiness requirements specify that all electrical equipment attached to the wiring system must be protected by overload protection devices and that no protective device may protect more than one circuit essential to flight safety. To this end a multiway fuseholder is provided at the front of the aircraft for the attachment of electrical equipment.

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

⚠ WARNING

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.

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. OPERATING LIMITATIONS

4.1. GENERAL LIMITATIONS

WARNING

It is extremely dangerous to attempt to fly outside the designated Flight Envelope, or outside any of the limitations detailed below.

The Pegasus Quantum must be operated in compliance with the following limitations:

- The aircraft is to be flown only under **Visual Flight Rules** (**VFR**).
- The minimum instrumentation required to operate the aircraft : ASI, altimeter, tachometer (RPM), water temp (for LC engines) or dual CHT (for aircooled engines). 4 strokes should also be fitted with oil temp & oil pressure.
- When flown solo, the aircraft must be flown from the **front seat only**.
- The aircraft must be flown such as to maintain positive normal acceleration (positive 'g') at all times.
- The aircraft must not be flown in negative 'g'.
- Do not pitch nose up or nose down more than 45° from the horizontal.
- Do not exceed more than 60° of bank.
- ALL aerobatic manoeuvres including whipstalls, wingovers, tailslides, loops, rolls and spins are prohibited.

GENERAL LIMITATIONS - ALL MODELS			
Max. Empty weight (Subject to approved equipment fit)	484 lbs	220 kgs	
Min. empty weight	335 lbs	152 kgs	
Max. take off weight	900 lbs	409 kgs	
Min. take off weight	448 lbs	208 kgs	
Min. total occupant weight	121 lbs	55 kgs	
Max. front seat weight	242 lbs	110 kgs	(See note below)
Max. number of occupants	2	2	
Max. passenger weight	242 lbs	110 kgs	(See note below)
Max cockpit load (pilot + passenger)	440 lbs	200 kgs	(See note below)
Max. useable fuel	74.9 lbs	34 kgs	47.4 litres
Manoeuvring airspeed (Va)	60 mph	96 km/h	52 kts
Max. load factor at Va	+4g	+4g	
Vne	90 mph	144 km/h	78 kts
Max. load factor @ Vne	+4g		
Max. wind operating conditions	20 mph	33 km/h	18 kts
Cross wind limitations - Min. and Max. AUW, wind @ 90°			
Taxiing	15 mph		
Take off	10 mph		
Landing	10 mph		

Note: The maximum seat loading is 110kg per seat for all Quantums with a maximum take off weight of 409kg and a Quantum 912 seat frame (13swg tube wall thickness). For two stroke engined Quantums with the original seat frame (16swg tube wall thickness) the maximum seat load is 90kg. The seat and total cockpit loadings must be correctly placarded on the aircraft. Original pilot and passenger weight was 90kg each. Modification 122 increased this to 100kg and modification 150 increased this further to 110kg. Placards must show correct pilot and passenger weights, and any changes must be entered in aircraft logbook and countersigned by BMAA Insp.

⚠ WARNING

HIGH WINDS & CROSS WIND LANDINGS AND TAKE-OFFS: the figures shown above were demonstrated by experienced factory test pilots. Lower limits apply for pilots of average ability. Low hour and student pilots must adhere to the cross wind limits set out in Section 8.1.

4.2. POWERPLANT LIMITATIONS

	912	HKS 700E BETA	582/48	582/40	503
Max RPM	5800	6200	6800	6800	6800
Max continuous RPM	5200	5800	6500	6000	6500
Min. fuel spec.	RON 90	RON 92	RON 90	RON 90	RON 90
4 stroke engine oil	SAE 20/50	SAE 20/50	n/a	n/a	n/a
Fuel/oil premix	n/a	n/a	50:1	50:1	50:1
2 stroke oil spec.	n/a	n/a	AP1-TC	AP1-TC	AP1-TC
Max. coolant temp.	150°C	n/a	80°C	80°C	n/a
Antifreeze to min.	-25°	n/a	-15°	-15°	n/a
Antifreeze mix. %	80	n/a	33	33	n/a
Max. CHT	150°C	170°C	150°C	150°C	250°C
Max. EGT	850°C	760°C	650°C	650°C	650°C
Max. oil temp.	140°C	90°C	n/a	n/a	n/a
Min. oil temp. for take off	50°C		n/a	n/a	n/a
Max. oil pressure	5 bar		n/a	n/a	n/a
Min. oil pressure	1.5 bar	85PSI @ 5,800 RPM 17PSI IDLE	n/a	n/a	n/a
Prop. pitch setting	19°	23°	21°	19°	18°
Set pitch @ radius	53.5 cms	53.5 cms	53.5 cms	53.5 cms	53.5 cms
Quantum 503 LITE & LITE BASIC with IVO 65"/2, 58:1 drive					13° @ tip

NOTE!

1 ***4 Stroke Engine Oils***: *if the engine is to be run in extremes of temperature, refer to the Engine Manual for appropriate oil viscosity. *See also engine operators manual and Pegasus service bulletin 0094 for Rotax 912, especially if using AVGAS.*

2 ***2 Stroke Engine Oils***: *Use oil to specification AP1-TC, Pegasus recommend Castrol TTS or Aviation 545LA.*

3 ***The HKS 700E BETA engine cylinder head cooling ducts*** *are designed to keep the cylinder head temperature on the exhaust side within limits. They must be left on the aircraft for this reason and are part of the design standard.*

⚠ WARNING

If any limitations are reached or abnormal readings noted in flight, land immediately and investigate the cause. Do not attempt to fly until the problem has been solved.

5. RIGGING THE AIRCRAFT

5.1. 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 Pegasus Quantum called for easy inspectability, 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 bolt secure.
7. All sail seams intact, with no frayed stitching.
8. No tears in the sail.
9. Batten elastics not frayed, knots secure, and fitted correctly.
10. **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.
    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.
    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.
    The area above the crossboom centre ball.

11. Sail tip adjuster settings correctly aligned and secure.
12. Ribs undistorted, undented, in good condition and profile as supplied batten plan.

5.2. WING RIGGING

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, Pegasus 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 spring retained kingpost and, checking that the crossboom restraint cables pass cleanly either side, locate the king post onto the spigot.

NOTE

- *Check before proceeding that the king post is properly seated on the keel spigot. This cannot be done when the wing is rigged fully.*

5. Ensure that the upper cables are free from kinks and with the over-centre lever in the open position locate the king post crown into the top of the king post.
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 out-board 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.

9. On all the upper surface ribs fit the single lower elastic (Note these should be doubled after tensioning see 11 below.). 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, unzip the keel fin access panel and remove the safety pin from the crossboom restraint cable stud. Using the left nylon cord pull back the crossboom until the keyhole tang can be located on the restraint cable stud. 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.
d) The fin access panel is zipped up - note that this process is much easier with a helper lifting one wing tip slightly (30cm).
11. With the crossboom now tensioned, ensure that the previously fitted ribs are pushed FULLY home and that the upper and lower elastics are fitted to all ribs.
12. Locate the washout tubes onto the sockets, ensuring they are seated firmly down to the limit.
13. 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.
14. 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.
15. 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, 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.

The helper can now release the keel and you can lower the wing nose 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.

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.

18. In light winds the nose can be lowered and the wing allowed to rest on the nose and control frame.

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.

19. 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.
20. Proceed to the rear of the wing and tension the overcentre lever in the rear top rigging.

5.3. 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.

5.4. 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. 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.
2. Remove the front strut pins and safety rings, at the lower end. Release the over centre lock and then lift its lugs out of engagement, 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 keeping an eye on the over centre lock to ensure that it doesn't get caught up, 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.

3. Take the hang bolt and remove the nut. Get a helper to lift the wing nose a couple of feet off the ground, or lift it up and rest it on a chair or trestle. 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: connecting the trike to the wing is facilitated if you place the nose of the wing on an object (fuel can, chair etc.). This gives you more room to manoeuvre the trike inside the control bar.

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 before flight.

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. Go to the front of the wing and 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.

Position the propeller so that blades will not foul the wing keel: 3 blade prop - lowest blade vertical, 2 blade prop - both blades horizontal. 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.

5. 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 110 lb (49 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.

6. 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 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 with the small cut away at the top end facing forward, first attaching it at the top with a pin and safety ring and then at the bottom with two pins and safety rings.

⚠ WARNING

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

7. 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.

6. PRE-FLIGHT INSPECTION

6.1. WING

Action	Done?
Nose catch secure, locking washer fitted	
Leading-edge spar undented, shape correct	
Crossboom junction secure (zip flap closed), restraint webbing ok	
Sail secure on tip, tip settings correct	
Washout tube secure and undamaged	
Reflex retention lines secure & untangled, pulley working	
Crossboom tensioner secure & not twisted, safety pin fitted	
Reflex and trimmer lines straight & secure	
Keel pocket and fin components undamaged	
Top rigging over centre lever is tensioned	
Hang-point secure and freely rotating, hang bolt secure	
Control frame safety rings	
Trimmer friction set and functioning properly	
Control frame cables secure	
Condition and security of composite flexible ribs	
All other ribs secure, elastics fitted correctly & undamaged	
Nose rib and nose cone secure and correctly fitted	
Top rigging secure.	
King post fully home on spigot	

6.2. TRIKE

Action	Done?
Ignition off; engine controls closed	
Front strut secure, safety rings attached	
Pylon catch locked	
Front tyre inflated and in good condition	
Front forks and suspension in good condition	
Axles secure	
Rear tyres inflated and in good condition	
Seat secure; seat back tube secure, harness straps secure, buckles functioning	
Throttle, choke, brake control cables - condition OK, no kinks	
Engine mounting secure	
Exhaust secure	
Carburettor(s) secure, check for water or debris in float bowl	
Gearbox - 2 strokes and HKS BETA, check for oil leaks	
Propeller secure and undamaged	
Plugs and leads secure	
Fuel contents adequate, check drain valve for water	
Brakes functioning correctly, parking brake lever ok	
Throttles - check both hand and foot for correct operation then set closed	
Steering functioning correctly	
Radiator coolant full, cap secure, overflow bottle pipe secure 912, 582	
Coolant level overflow bottle approx. 1/3rd 912, 582	
Oil level on Rotax 912 and HKS BETA engines	
Oil radiator cover secure (if fitted) and set appropriately for ambient temp.	
Hang bolt secure and tight as possible using hand	
In addition carry out pre-flight checks in engine operators manual	

WARNIN

You should never, under any circumstances, consider flying the aircraft before you have completed a thorough pre-flight check!

7. PREPARATION FOR FLIGHT

7.1. GENERAL

> **⚠ WARNING**
>
> An inexperienced, inappropriately dressed or panic-stricken passenger could jeopardise the safety of the aircraft and crew. Ensure that you give all passengers the following briefing.

Before offering to take a passenger, ensure that you have ascertained that they do not suffer from any physical or mental condition that would make the flight hazardous either for the passenger and for the safety of the aircraft. Your first task before starting the engine is to seat your passenger (if applicable) in the aircraft, to check his/her harness, to check for loose objects, and then before having him/her put on a crash helmet, to give the following briefing:

PASSENGER BRIEFING:
Do not touch the ignition switches.
Do not touch the hand throttle.
Do not touch the control frame.
Fold arms, or rest them on knees.
No loose scarves, and tie up long hair.
Ensure cameras, maps etc are secure. Pockets empty and no loose objects in the cockpit.
Emergency exit from opposite side to the exhaust if possible.
Describe takeoff, landing and intention of flight.
Explain that there are hot and rotating engine parts directly behind which should not be touched in any circumstances.
VISORS: must be put down before take off, and held down if the passenger wants to look sideways or behind. This is to ensure that the passenger does not wrench their head or neck if the wind should lift the visor, and also that it is not wrenched off completely where it could go into the propeller.

> **⚠ WARNING**
>
> On Rotax 503 air-cooled engines, ensure the passenger's hair or scarf cannot get caught in the cooling fan. On Rotax 912 engines, the same applies to the magneto.

> **⚠ WARNING**
>
> 1. You should never attempt to start the aircraft before satisfying yourself that the appropriate checks and procedures have been satisfactorily carried out (see below).
> 2. Rotating propellers (which are very difficult to see), hot coolant, hot and moving engine parts can all be very dangerous if not treated with due care and respect.

On electric start models, the pilot must ***always*** start the engine when sitting in the cockpit with seatbelts secured and helmet worn. All the following checks apply except the 4th.

1. On manual start models, the engine may be started from outside the aircraft, but **DOUBLE CHECK** the following:
2. Passenger should also be strapped in, briefed and ready to turn off the ignition switches if needed.
3. Throttles both working and fully shut (never use the hand throttle for engine control on the ground).

4. Stand squarely in front of the starboard u/c leg.
5. Check ignition switch operation and be prepared to turn off rapidly if required, before starting according to paragraph 7.3 below.
6. Parking brake set. Check by pushing firmly on propeller hub (ensure that the ignition switches are in the OFF position before touching the propeller). Chock the aircraft securely.

7.2. STRAPPING IN

Lap straps should be adjusted snugly across the hips to reduce any tendency for either occupant to slide forwards under the strap. Shoulder straps should be adjusted with a little slack to allow any necessary movement during flight and to ensure that the lap straps remain in place without slipping upwards in the event of accident.

⚠ WARNING

Failure to put on safety harness and wear front seat or rear seat shoulder straps could be the cause of injury or death in the event of an accident.

Ballast for solo flight is not normally necessary, however if ballast is carried, it must be in a P&M Aviation approved container and securely strapped into the rear seat using lap and shoulder straps.

⚠ WARNING

Ballast breaking free could cause injury or death in otherwise survivable accidents.

7.3. STARTING ENGINE

All controls should be checked closed and ignition should be off. The parking brake if fitted should be applied. Check the fuel is turned on.

⚠ WARNING

Engine start-up is always a potentially dangerous time. Make sure that you have done all your checks, that you are not disturbed while doing them, and that you are entirely happy that the aircraft is in a fit state to be started-up. Finally, before start-up, ensure that the aircraft is pointing away from people/vehicles/buildings etc, and that there are no pets or other animals which could panic after start-up. Double check that the propeller is clear and hand throttle is closed before starting the engine.

2 STROKE ENGINES ONLY: unless the engine is hot, apply full choke. Set the throttles to shut. This can be checked if you listen to the click at the carburettors when closing the throttles. If you do not hear the click of the slides bottoming then check again. The choke system will not work unless the throttle is shut. Prime the engine using the primer bulb by the fuel tank.

912 & HKS BETA ENGINES: Before the first start of the day for 912 engines, it is a good idea to turn the engine over for 2 bursts of about 5 seconds, IGNITION OFF, to get the oil pumping around the engine. For the first start of the day use full choke, especially in very cold conditions. For the HKS BETA engine, the above procedure is only recommended if the engine has not been started for a couple of weeks or more. The choke system on the 4-stroke engines is progressive, unlike the 2-stroke's, and the choke system automatically raises the idle speed quite considerably, so you MUST have brakes applied. For all other starts unless hot, use about 1/3 choke. Before start-up, check that both carbs are shut.

NOTE!

- *There is no primer bulb on the 912.*

Before attempting to start, use the following mnemonic as a final check:

Security: passenger/ pilot harness attached, no loose objects
Throttles: set to SHUT, choke as required
All clear: all persons & animals clear of propeller arc to the side and prop blast behind
Ignition: contact switches set as required
Press/pull: starter action as required

MANUAL START AIRCRAFT: check visually again that the propeller area is clear and call "**Clear Prop**" loudly. Switch on the ignition when the area is clear, take hold of the starting handle, pull gently until it is felt to engage and lock, and then pull forcefully. Repeat until the engine starts.

ELECTRIC START AIRCRAFT: check visually again that the propeller area is clear and call "**Clear Prop**" loudly. Turn on the key switch, set the contacts to ON, then push the button in 5 seconds bursts. Release the button as soon as the engine fires.

If the engine refuses to start after 5 or 6 attempts, close the controls and switch OFF the ignition before investigation.

⚠ WARNING

Before touching the propeller, double check that both contact switches are set to the OFF (forward) position, failure to do so could result in injury or death.

If a 2 stroke engine will not start, it is usually through lack of fuel. However, it is possible when the engine is hot, to flood it through unnecessary use of the choke. If you suspect that this is the case, turn the ignition switches to OFF, open the foot throttle fully (hand throttles should not be used on the ground) and pull the recoil starter a few times or press the electric starter button for 5 seconds. This should clear any flooding. Carry out your checks again prior to recommencing start procedure technique to blow the fuel through. Do not attempt to start the motor with the throttles open.

⚠ WARNING

Do not attempt to start the motor with the throttles open.

⚠ WARNING

Although unlikely, it is possible that an electrical circuit fault will allow the ignition circuit to remain live with the ignition switches in the off position, it is therefore essential that before attempting to clear a flooded engine with the foot throttle set to OPEN, you ensure that the aircraft has adequate clear space forward for the operator to react to an inadvertent engine start up and to close the throttles. If in any doubt, then chock the aircraft before carrying out this procedure.

⚠ WARNING

Never attempt to hand start an engine by swinging the propeller! This practice is very dangerous and could result in injury or death.

7.4. ENGINE WARM-UP

⚠ WARNING

ROTATING PROPELLERS ARE ALMOST INVISIBLE AND CAN CAUSE INJURY OR DEATH! Extreme care must be exercised during engine warm-up. Ensure that all spectators/children/pets are kept well clear of the propeller and the propeller arc.

⚠ WARNING

When starting an aircraft engine it is essential that you keep spectators well clear of the immediate area and ensure that all spectators children and pets are totally under the control of a responsible adult. On certain surfaces stones can bounce into the propeller blades and can then become projectiles. Do not start an engine if any loose stones are in the vicinity of the aircraft with any spectators present at all. A stone picked up by a propeller can travel at high speed for hundreds of metres (yards).

2 STROKES: when the engine starts, CAREFULLY increase the RPM to a little above tickover and gradually weaken the mixture until the engine idles normally with the choke OFF. Warm the engine thoroughly and check the mag drop on both ignition circuits.

4 STROKES: the 912 & HKS 700E BETA engines need to be thoroughly warmed up before take off. In the Winter this can take up to 10 minutes. Apply the parking brake, set no more than 2500 RPM and allow the Oil temperature to climb to 50° Celsius minimum, and on 912 models see also the Engine Operators manual.

⚠ WARNING

Taking off without completing the proper warm up procedure may result in premature mechanical wear in your engine, extreme rough running on the Rotax 912, and possibly engine failure on take off. Always warm your engine thoroughly before take off.

Note: P&M Aviation have a range of oil and water radiator covers available for those who operate in cold conditions (20°C/ 66°F or less), see section 2.11 for instructions for use.

The brakes will hold against a moderate power run-up but the aircraft may slide on wet grass or slippery surfaces or indeed on more powerful options, on any surface. In this case check the engine at reduced RPM. During this operation the pilot must be mentally prepared to switch off the ignition at very short notice, particularly with the 912 versions. If the engine is stopped after a period of running, the ignition should be switched off at tickover. Switching off at high rpm floods the engine, distorts the cylinders through rapid cooling and makes restarting difficult.

⚠ WARNING

The pilot must always be in the aircraft, helmet and harness properly fitted, during run-up. Use ONLY the foot throttle during run-up, and be ready to turn off at the ignition switch. Failure to follow these instructions could result in injury or death.

⚠ WARNING

The brakes/parking brake are not designed to hold the aircraft against a full power run-up. Exercise extreme caution when ground running the engine.

The Rotax or HKS BETA Engine Maintenance Manual should be consulted for information on gear oil reservoir levels (HKS BETA only) and specifications, carburettor tuning, timing etc.

8. FLIGHT

⚠ WARNING

The Pegasus Quantum does not have a certified aircraft engine. The pilot must be prepared for the engine to stop at any time and he/she must fly the aircraft accordingly. He must also be trained and in current practice for forced landing procedures. This means the pilot should only overfly terrain where a safe landing is possible at all times. He should avoid overflying towns, forests, mountainous zones etc., and always fly with sufficient altitude to glide to the nearest safe landing area. Failure to do so could result in injury or death.

8.1. GENERAL FLIGHT CONTROL

Roll

Roll control is the action of the pilot moving the wing relative to the trike. The roll response is aided by the intentional flexing of the airframe and sail designed into the Q2 wing.

The Q2 also incorporates a floating keel and hang-point roll linkage to reduce the effort required to produce and stop a roll, especially in response to small pilot inputs. This makes the aircraft much easier to fly if the pilot inadvertently flies into turbulence.

Because the wing is only deflected a certain amount by the pilot's roll input, the roll rate achieved will be faster at high speeds than low speeds. The roll response will be typically 4 seconds to reverse a 30 degree roll at 1.3V stall, fully loaded, to 2 seconds at VNE. At minimum loading, response is approximately 0.5 seconds faster.

Pitch

The Q2 wing incorporates a pitch trimmer so that the pilot can select a range of steady trimmed speeds. This feature makes for easy cross-country cruising performance, or slow, stable flight for climbing, gliding, or when instructing.

At the slow trim setting, the pitch stability is increased.

The Q2 wing exhibits very mild stall characteristics. The aircraft may not readily stall even with the control bar pushed fully out. See Section 8.5 for stall characteristics. See also Section 3.5 for more information on stall speeds.

Weather Conditions

⚠ WARNING

Never fly the Quantum in strong thermic conditions, high winds, in or near any kind of storm. Rain is best avoided since visibility is significantly reduced and propeller damage may result. Exercise extreme care when flying in conditions which are beyond your experience level. Respect the limitations set out below.

Microlighting is, in general, a fair-weather sport. Microlight flying is most enjoyable in the calm conditions found at the beginning or the end of the day, when the wind and thermals generally die away. If you see any change in the weather approaching - this is usually quite obvious - you are advised to land at the nearest safe landing site.

Light rain will not noticeably influence flying control, although the stall speed tends to rise slightly, and take-off/landing rolls will be longer than usual. Ice, however, is more serious and can occur through icing conditions, or by flying a wing which is wet from the bag, without giving it time to dry out.

> **⚠ WARNING**
>
> Severe airframe icing can affect handling markedly. At the first sign, you should land or fly out of icing conditions.

Care should be taken in gusty or thermic conditions to maintain at least 55mph on climb-out and approach (to/from 250' minimum), to ensure good roll response and to avoid gust-stalling. Cross-wind limits must be observed. The following weather limitations apply:

	EXPERIENCED	INTERMEDIATE	BEGINNER
Wind (mph)	20	10	5
Thermic activity	Moderate	Light	None
Cross wind	10	5	0
Taxiing	20	10	5

Experienced Pilots	100 + hours pilot in command
Intermediate Pilots	10 - 100 hours pilot in command
Beginners	0 - 10 solo hours pilot in command

Where the aircraft is flown in a country where there is a formally recognised training scheme leading to a private pilots license or certificate, the wind limitations may be increased at the discretion of a student pilot's instructor, up to the maximum limitations for an experienced pilot.

Tuning

It is important that the wing is trimmed so that it will fly straight at a range of steady speeds. A wing which exhibits a constant turn when flying 'hands off' will be tiring to fly and uncomfortable in turbulence, particularly when landing or taking off. A properly tuned wing will fly completely 'hands off' throughout the whole range of power settings. *Refer to Section 11 for tuning details.*

8.2. PRIMARY CONTROLS

The Pegasus Quantum wing is controlled by standard 'weight-shift' techniques. The speed of response and lightness of action should be borne in mind for those pilots converting from other makes of aircraft.

Control Bar Movements	**Aircraft Response**
Bar pulled rearwards	Nose pitched down, aircraft speeds up
Bar pushed forwards	Nose pitched up, aircraft slows down
Bar pushed across to the right	Aircraft rolls to the left
Bar push across to the left	Aircraft rolls to the right
Trimmer wheel turned clockwise	Nose pitch up
Nose wheel push right on ground	Aircraft turns left
Foot throttle push down	Engine speeds up
Hand throttle push forward	Engine speeds up

> **⚠ WARNING**
>
> It is absolutely essential that all persons wishing to fly the Pegasus Quantum are trained to a minimum standard of the syllabus as published by the British Microlight Aircraft Association, carried out by a recognised training organisation for this type of aircraft. It is absolutely essential that all persons with experience of 3 axis aircraft undertake a flexwing conversion course on a dual-control flexwing aircraft before attempting to fly the Pegasus Quantum.

8.3. GROUND HANDLING

FLEXWING MICROLIGHTS REQUIRE SPECIAL HANDLING ON THE GROUND.

Parking
In any winds over 5 mph, always turn the aircraft until one wing is resting on the ground which will help stabilise the craft until you are ready for flight. A ground picket or weight (full $4^{1}/_{2}$ gal fuel can or similar) is very useful to tie the wing tip or side wire to in order to hold the wing steady. If you are going to leave the aircraft unattended, apply the parking brake, tie the control bar upright to the front strut, and picket the aircraft as described above. If strong thermals or dust devils are present, or the wind regularly changes direction, you are advised not to leave the aircraft parked in this way. Remove the wing and lay it flat on the ground (see Section 10.3).

Taxiing
Always taxi with great care and at a speed never greater than walking pace. For crosswinds, roll the into-wind wing downwards until you find a balanced position, and take care not to let the wind get underneath the into-wind wing when turning or taxiing. When taxiing into wind, hold the nose down. When taxiing downwind, push the nose up and taxi slightly faster than usual. See Table on previous page giving wind strength limitations.

> **⚠ WARNING**
>
> When taxiing cross wind do not make the mistake of letting the up-wind wing go up as this will greatly increase the risk of the aircraft being blown over.

Foot Operated Brake
The foot operated brake consists of a lever operated by the left foot which controls two drum brake units in the rear wheels.

There is also an incorporated parking brake which locks the brake pedal by means of a hand lever and detent system. To engage the parking brake, press the brake pedal and lift the hand lever until it engages with the hoop on the side of the steering assembly. Release occurs automatically when the brake pedal is pressed. *The parking brake locking lever should be operated by hand only.*

Note

- *Do not engage parking braking by pushing on the locking lever.*

Brake Operating Limitations
The brake system was designed to aid safe taxiing at speeds of no more than walking pace (5 mph). It is not intended for emergency braking operation, or even for use as a landing brake. If the brake is needed during landing, exercise great care and remember the following procedures:

1. Apply the brake very gently once the aircraft is stabilised after landing.
2. If the rear wheels lock and the aircraft starts to slide, release the pedal immediately and re-apply more gently once the aircraft is stable once more.

> **⚠ WARNING**
>
> If the brake is used as an emergency landing brake in wet and icy conditions, extreme care must be exercised. If the aircraft veers, or the wheels lock, release the brake pedal immediately and steer towards the direction of the veer.

Engine Run-Up

Operators should note that with the engine running above idle the aircraft may tend to creep forward with the rear wheels locked on some surfaces. See warning Section 7.4.

Inspection

The amount of wear that takes place on the tyres and drum brake shoes will vary from one aircraft to another, depending on the type of surface the aircraft normally takes off and lands on. Close inspection of the brake shoes should be made at intervals of no more than 100 hours.

8.4. TAKE-OFF

Performance

At sea level, 15° Celsius (59°F, ISA conditions), on firm ground with grass of moderate length, the take-off distance in zero wind at Max AUW (409kg. - 900lbs) to clear a 15 m (47 feet) obstacle, may be 177 metres (912) to 216 metres (HKS 700E BETA). (See take-off performance in Section 3.5). Flown solo with a 90kg pilot in the same conditions, a take-off run of as little as 100 metres is possible

These figures could be shorter if the take-off is from tarmac, but longer if from wet ground, if the ground slopes upwards, or if there is any tailwind. A significant headwind would reduce the length of the take-off run considerably; conversely, long grass or soft ground will considerably increase the take off run.

⚠ WARNING

Exercise great care in strong crosswinds and turbulent conditions.

Density altitude will affect take-off performance: for example at 4000 ft altitude the takeoff run will be 1.9 times as long, and if the temperature is 32°C at 4000 ft, the run will further increase to 2.1 times as long.

⚠ WARNING

Before take-off or landing at altitude, in hot conditions, on a short strip and particularly in the case of a combinaton of all three, do your density altitude calculations.

⚠ WARNING

If the wing is wet, take off distance can be up to 30% longer.

Before Take off Checklist

- **Performance Calculations**: (see above)
- **Wing visual check**: nose, front rigging, side rigging, tip rods, ribs, rear rigging, hang-point bolt, control frame and bolts, basebar bolts.
- **Trike**: front strut pins/rings, brake operation, steering free, baggage box lids secure, harnesses, side skirts secure, ignition switch check operation and magneto drop, intake and exhaust system secure, hand and foot throttle operation.
- **Magneto drop**: check brakes on, at engine idle turn OFF both magneto switches, check for dead cut, and turn on again. Idle speed should be set around 2000 RPM for the 2 strokes, 1600 RPM for the 4 strokes. All Engines: run engine to 3000 RPM, then turn OFF front magneto. Listen for any misfire and observe mag drop (see also Engine Operators Manual). There must be a noticeable drop, which is accompanied by a slight change in engine note. Check the other magneto in the same way. Note: Tachos supplied with some Rotax 2 stroke engines do not react strictly to engine RPM changes during mag check procedures. If one magneto shows a marked difference in the dropped RPM then listen to the engine note for a similar sound change and also note any differences from the norm.

Then use the mnemonic **CHIFWAP as follows:**

CONTROLS: full and free movement of control bar & nose wheel; set trimmer to takeoff.

HELMET & HARNESS: check both your own and particularly your passengers seat belt & harness.

INSTRUMENTS: all functioning, CHTs correct, Altimeter set, Oil temp and Oil pressure (912 & HKS BETA only) altimeter set, Intercom and Radio switched on and working.

FUEL: fuel cap on, fuel tap on and fuel sufficient for planned journey + reserve.

TRIM: set to takeoff position.

WIND DIRECTION & STRENGTH: within both aircraft and pilot limits?

ALL CLEAR: to taxi, to line up for finals, check for other aircraft in the circuit?

POWER: if possible do a full power check to check static RPM (as per table below). Exercise extreme caution during this manoeuvre - do not allow the aircraft to creep forward out of control, it is better to accept a lower RPM and ensure full RPM is achieved during take off roll. If it is not possible, check the rpm during the take-off roll and abort the takeoff if full RPM is not reached or rough running occurs.

	912	HKS 700E BETA	582/48	582/40	503
Full Power RPM	5200	6000	6500	6100	6500

Take-off Technique

The hand throttle should not be used during take-off. Set the pitch trim control to Take-off position. The correct technique on smooth surfaces is to allow the wing to trim in pitch during the initial stages of the take off run so as to reduce the drag and increase the acceleration. In smooth air conditions, push forward fully at around 20 mph (32 km/h, 18 kts) until the aircraft un-sticks and then adjust the bar pressure to maintain a steady climb at around 55 mph. When established in the climb, adjust the trimmer to remove the bar pressure. For more turbulent air conditions, keep the aircraft on the ground until around 45 mph has been achieved and then gently ease the bar forwards until the aircraft rotates. Climb at 55-60 mph for the first 200 ft. This allows a more rapid control response, and for a less radical pitch angle change in the event of a power failure.

In smooth air conditions on rougher ground, push the bar out to its fullest extent for the whole takeoff run, to get the weight off the wheels as soon as possible. The trike unit will then swing forward under the wing. Allow the control bar to float back as this happens and climb away in the manner indicated above. It follows that taking off from rough ground in turbulent air conditions could either result in a slower takeoff speed than is desirable or in greater stress to the aircraft structure during a fast takeoff run. Therefore, consider carefully the advisability of flying in such circumstances.

WARNING

DO NOT PERFORM STEEP CLIMB-OUTS. Allowing a steep climb to develop at a slow airspeed immediately after takeoff is dangerous. If the engine fails, the aircraft will pitch nose down through a large angle before taking up a glide. Roll control is also impaired at low airspeed. If at low level, there may not be enough time for recovery to landing mode, which could result in injury or death.

Solo Flight Take-off

The aircraft is only to be flown solo from the front seat. No ballast is required if the pilot weight is above 55 kg. The initial rotation of the trike to a nose-up attitude will be more pronounced when flying solo. For the initial 200 ft (61m) of climb, the attitude of the trike should be controlled to allow for the possibility of engine failure and airspeed should be maintained at 55mph. The full-power setting may have to be reduced to achieve a comfortable climb angle, particularly on the 912 and 582/48 (64hp) variants.

Climb
The speed at which maximum climb rate is achieved is 45 mph. Once established in the climb, the bar force can be eliminated with the trimmer. For the best climb rate for each model see the table in Section 3.5. All climb rate figures were taken at 409kgs (900lbs) Max AUW, sea level, 15°C (59°F) conditions (ISA). Beware of the effect of density altitude on the climb performance. The climb rate will reduce to around 0.65 of the sea level figure at 4000 ft, and if the temperature at 4000 ft is 32°C (90°F), the factor will be 0.52.

8.5. EN-ROUTE

During all aspects of flight the aircraft should be flown so that in the event of engine failure or loss of power, safe landing areas are always within reach. Providing the aircraft is being flown sensibly, the pilot has been trained and is in current forced landing practice, an engine failure should not lead to an accident and any competent and well-trained pilot will be able to cope.

The trim should be set to give the required cruise speed without any bar force.

⚠ WARNING

Every 10 minutes check fuel, engine temperatures, altitude & position.

On the HKS BETA powered Quantum the RPM with the throttle fully open approaches 6200 at 85 mph. The EIS engine instrument display flashes whenever a preset limit such as RPM is exceeded, and displays the exceeded parameter.

Descent Rate
Fully loaded, the engine-off sink rate is around 465 fpm at 40 mph and increases as speed is increased.

Pitch
Whether flown solo or dual, pitch control is very smooth and positive, progressive and damped, providing good “feel” at all times and in all manoeuvres. Pitch control is lighter when flown solo than dual. Pitch control force is also affected by the trimmer; heavier in the slow trim setting than the fast. If caught out in turbulent conditions, set trim to take-off to give more pitch feel.

⚠ WARNING

Never pitch nose up or nose down more than 45° from the horizontal.

Roll Control and Turns
At normal cruising speeds of 45 mph upwards, turns may be initiated by simply moving the control bar to the side away from the required direction of turn. As the turn develops, the control bar should be eased out to maintain the desired airspeed. As the desired bank angle is reached, the turn control input should be relaxed. Increasing bank angles requires increasing bar-out pitch control forces to coordinate the turn. Roll control becomes slower at low airspeeds, so the bar should be pulled in slightly to increase airspeed before commencing the turn. For roll-out the control bar is moved towards the lower wing tip, and the nose is lowered as the horizon levels. When the aircraft is flown solo, the roll response is faster for the same control force.

Roll response is also less damped especially at high speeds in excess of 65 mph. Small control inputs should be used. Co-ordinated turns can be achieved with a maximum bar movement of 3 inches.

⚠ WARNING

Do not exceed more than 60° of bank.

Trim

The Pegasus Q2 wing incorporates a pitch trimmer that can be readily adjusted in flight to trim anywhere between approximately 40mph and 60mph. The trimmer wheel on the right hand upright operates clockwise for nose-up, the setting of the trimmer being indicated on a scale below. The trim wheel is prevented from unwinding by friction, which should be set at a comfortable level by means of the locknuts. The trimmer works by arranging the wing to have a relatively forward hang point so that the wing trims fast with the reflex lines slack. Reflex is then introduced by the trimmer which tightens the middle pair of reflex lines, which makes the wing pitch up, giving slow flight at high pitch stability. The trimmer's basic function is to remove bar pressure, so that the aircraft can be set to climb, cruise or glide speeds as desired without tiring the pilot. Its secondary function is to allow the pilot to increase the positive pitching aerodynamics of the wing, so that the wing is more pitch stable when flying in turbulence, for example. This characteristic is also useful in the early stages of flying training. The basic operation of the trimmer is to set the desired power setting and attitude so that the aircraft is in a steady state, and then adjust the trimmer till the bar force disappears. Roll control will tend to become sluggish at very slow speeds and it is not recommended to trim at less than 48 mph on landing approaches (smooth air) or 53 mph (rough air). The aircraft will tend to be more spirally stable trimmed fast than slow.

NOTE

- *It is advisable to use the aircraft pitch trim control during flight, as without it the bar forces to maintain climbing flight or to flare on landing will be quite heavy.*

Effect of Power Adjustment on Pitch

As the thrust line is set low, the effect of reducing power is to lower the nose of the trike, and an increase in power will cause it to rise. There is no need to alter the control bar position as power is adjusted provided this is done VERY smoothly. In all other cases use the following actions:

CLIMBING	1. Power	2. Attitude	3. Trim
DESCENDING	1. Attitude	2. Power3. Trim	

⚠ WARNING

Applying or removing power suddenly when near the ground can be dangerous.

Hand Throttle (Optional on LITE)

The engine RPM can be set with the cruise control lever and then the pressure on the foot pedal may be removed until an increase in RPM is required. Thereafter, the RPM will always return to the cruise setting when foot pressure is removed. To obtain the full RPM range on the foot pedal, the hand throttle lever must be in the fully-off position.

⚠ WARNING

Do not use the hand throttle for engine control on the ground or on take-off or landing.

Stall characteristics

Fully loaded, the stall occurs at 24 mph Min. AUW, 33 mph Max. AUW, and is clean and easily handled. As the speed is reduced, aft bar pressure increases, noticeably so immediately prior to the stall. You will also notice a slight nodding tendency and a stiffening of roll response. As the wing stalls, the nose pitches down and corrective action is to bring the bar back slightly to prevent the aircraft re-entering the stall state. Pulling the bar violently in to the chest and holding it there will result in an unnecessary rapid nose-down rotation and consequent steep nose-down attitude. The quickest stall recovery will result if the bar is pulled back no further than the trim position, then as soon as the trike nose drops below the horizon, power should be applied to check the nose down rotation, and then the pitch adjusted to resume normal flight.

If the bar is held lightly enough to damp out oscillations, the aircraft will automatically recover from a stall and return to trimmed flight. Slight wing drop may be found but is easily corrected. If necessary, hold the bar firmly to counter any tendency for the nose to pitch up excessively during the recovery. The Pegasus Q2 wing is remarkably stable, and even if stalled in a turn will not spin, but pitch down, increase air speed and roll out into a shallow turn or straight flight.

Stall recovery is fastest with the trimmer set slow, as the reflex held into the wing will quickly pitch it out of the dive. It is recommended that stalling exercises are done with the trimmer in the middle position (approximately 50mph).

⚠ WARNING

Whip stalls and accelerated stalls are very dangerous and absolutely forbidden. These manoeuvres can lead to loss of control and/or in flight structural failure that could result in injury or death.

8.6. LANDING

Pre-approach checks: use the mnemonic FAWNTS

FUEL: sufficient to go around?

ALL CLEAR: long finals & runway clear?

WIND: strength & direction?

NOSEWHEEL: straight, hand throttle off?

TRIM : set (52-60mph)?

SECURITY: harnesses/helmets tight?

NOTE

- *Periodically warm the engine in the descent, particularly in cold and moist conditions.*

The hand throttle should not be used during landing. Trim your approach airspeed to 55 mph and be aware of wind gradient during strong wind days.

⚠ WARNING

Never approach at less than 50mph even lightly loaded in smooth conditions.

The flare is conventional (for a flexwing, but is of course opposite to a 3 axis aircraft), but the light pitch response can cause over correction and 'ballooning'. Allow the speed to bleed off, and once established in ground effect gradually push out until the bar contacts the front strut as the main wheels touch. Safeguard the nosewheel by keeping the bar pushed out until the speed decays and the nosewheel drops. The practice of immediately pulling the bar in once on the ground puts unnecessary load on the nosewheel and should only be used in an emergency situation where the available stopping distance is marginal; in normal landings the wing should be set at a neutral incidence and the brakes used if required.

CAUTION

Locking the brakes can cause tyre damage on tarmac and snaking on wet grass. If they do lock, release the pedal immediately and apply more gently.

⚠ WARNING

Correct airspeed on finals is of great importance for engine-off landings. The approach speed must not be allowed to decay below 55 mph, and there must be a margin to permit rotation before touchdown.

Crosswind Landing (see Table in Section 8.1)

The Pegasus Quantum copes well with cross-wind landings, but sensible pilots take great care to land exactly into wind wherever possible. If a cross-wind landing is unavoidable, approach at slightly higher speed than normal, and then bleed off the speed 1 or 2 metres (3 to 6 ft) above the ground where the cross wind is least. Be ready for the twisting of the Trike unit as soon as the rear wheels touch. Whenever possible utilise whatever into wind distance you can. Cross-wind components of upto 10 mph are within limits for pilots of average ability. Higher crosswind components have been safely demonstrated during test (see Section 5) but only experienced pilots should approach these limits. Such pilots should exercise great care in strong crosswind conditions. Because of the high torsional loads which can be imparted to the trike pylon and wing keel tube, always carry out a detailed inspection after every cross-wind landing, especially at the pylon top and bottom fittings.

8.7. EMERGENCY PROCEDURES

Engine Failure in Flight

You should always be flying within easy glide distance of a suitable forced landing area, and keep track of the wind direction. At any stage of your flight you should have your forced landing area selected. If your engine should stop, the first priority in any engine failure situation is to **FLY THE AIRCRAFT**. Set up a steady glide, trimmed at 45 mph.

The second priority is to CONFIRM YOUR SELECTED FORCED LANDING AREA. Be particularly vigilant for power lines, electric fences, slopes and lee turbulence from obstacles. Determine wind direction from smoke, water ripples, cloud shadows (remember to mentally calculate for Coriolis effect) or otherwise if there is time, make a steady 360° turn to determine drift. Refer to your map for altitude above the forced landing zone. Plan a proper approach into the area, and set up a glide towards it.

With these things in mind, if there is time to attempt a restart, check:

1) Both ignition switches on.
2) Fuel contents.
3) Fuel turned on.
4) Choke off unless cold or if suspected fuel starvation.
5) Throttle 1/4 open.

With the aircraft in a stable hands-off glide, pull the starting handle strongly or operate electric starter.

WARNING

1. Retain a grip on the handle all the way back to the pylon after pulling. Failure to do so could result in the cord catching in the propeller.
2. Stop attempting to restart if unsuccessful after 3 or 4 attempts, or if below 1000 ft agl.
3. Fly the aircraft all the way to the ground.

FORCED LANDING DRILL: Throttles SHUT.
Both ignition switches OFF.
Fuel OFF.
Brakes OFF.
Harness secure (do not overtighten pilots shoulder strap).
Plan approach.

Engine-off Landings

WARNING

Always be prepared for the engine to fail when it is least convenient and therefore always ensure that you are within gliding distance of a suitable emergency landing field. Regular practice of glide approaches on engine idle will pay dividends. Warm the engine periodically when doing this.

The Approach
The most important part of the approach is the base leg. Aim to start the base leg at approximately 800 feet agl and set up an approach speed glide of 50-55 mph. Gauge the right moment to turn onto finals at 4-500 feet as the base leg progresses. On finals, quite a lot of glide angle control can be made by varying the airspeed.

The best glide of the Quantum-Q2 is approximately 8.5:1 at 40 mph, but this can be reduced to 5:1 at 70 mph. It is inadvisable to make the final approach slower than about 50 mph unless the field is very small, as wind gradient may reduce the airspeed too much and make the final flare unsuccessful.

The best technique is to maintain 55 mph airspeed through the wind gradient to a low level, say 10 ft, and then progressively ease the bar out as the speed decays until a smooth touchdown is made.

Engine Failure on Take-Off (see WARNING in Section 8.4)
In order to minimise the potential safety hazard in the event of an engine failure on take-off, never climb-out at a steep angle when close to the ground (an airspeed of not less than 55 mph is recommended for the first 200ft) and always use an airfield long enough to allow a safe engine off landing straight ahead when the aircraft is too low to turn into a shortened circuit. Resist the temptation to pull the control bar violently in after such a power failure as this will produce a steep nose down attitude. Instead, let the bar assume the neutral trim position until the aircraft regains airspeed and levels out. For minimum height loss, the nose-down rotation of the aircraft can be checked by pushing out once the nose has dropped below the horizon. The bar can then be eased in again to take up a glide. From that point, treat the situation as an engine off landing.

Instrument Failure
The essential instruments required by the conditions of the Permit to Fly are an altimeter and an airspeed indicator. In the event of failure of either of these it is not permissible to continue flying and a landing should be made as soon as it is possible and safe to do so. Failure of other instruments does not constitute grounds for abandoning a flight providing safety is not dependent upon them.

Engine Overheating
With a well maintained engine, overheating should not occur. Note that in high ambient temperatures flying at high throttle settings with high cockpit loads and panniers fitted, can sometimes cause overheating. The two basic reasons are weakening of the fuel/air mixture, and cooling system failure. Condition of the fuel filter, float bowls and the fuel itself are very important. Check also the radiator, coolant level, condition of hoses or for the 503 Rotax, tautness of the cooling fan belt.

Fuel starvation may be detected by a sluggishness of the engine to respond to the throttle, a reduction in RPM, and a change in the exhaust note. If fuel starvation is suspected, then it may be possible to keep the engine running by pulling out the choke. Reducing the throttle setting may also keep the engine running. These measures should only be used to fly the aircraft to the nearest safe landing area, where a forced landing should be planned. If temperatures continue to rise, execute a forced landing as described above.

⚠ WARNING

Do not attempt to take off again without positively identifying the problem, solving it and running the engine at take off power for at least seven minutes.

⚠ WARNING

Only use genuine streamline panniers part YQC-212. Other panniers can cause overheating.

Fire
If a fire occurs on the ground, then immediately close both throttles, switch OFF the engine and exit the aircraft, turning OFF the fuel as you go.

A fire in the air is a considerably greater hazard. Two possible causes are electrical or fuel. Smoke or fire at the front of the aircraft is almost certain to be electrical in origin while occurrence at the rear could be from either cause.

In the case of an electrical fire, turn OFF all electrical equipment and land as soon as is safely possible.

In the case of a fuel fire, select a landing area, turn OFF the fuel and allow the engine to run until it stops. Turn OFF the ignition and perform an engine-off landing as described above.

9. POST FLIGHT INSPECTION

After flight, and particularly if you have had a heavy landing or suspect damage may have occurred through ground handling or cross wind landings, you must inspect the aircraft thoroughly. Check the Maintenance and Repair section in this Manual.

Even after a flight without incident you should still carry out a thorough Post-Flight Inspection, paying particular attention to:

- The exhaust system
- The propeller
- The undercarriage, tyres & wheels
- Loose objects in the cockpit
- Oil and coolant levels

NOTE

- *If leaving the aircraft rigged, the trimmer should be left slack in the high speed position..*

10. 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, Pegasus 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.

10.1. DE-RIGGING

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.

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. Face the aircraft into wind and apply the parking brake.

Undo the pylon overcentre lever.

Slide the outer front strut tube up the front strut until the join between the front strut and front strut lower has been exposed, firmly grip the control bar to support the wing, unhitch the front strut and rest it on your shoulder, or if you prefer get a helper to reach up and remove the pin and safety ring at the top of the front strut enabling the helper to remove the front strut away from the machine.

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 110 lb (50 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. 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. 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 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 5.2, 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.

10.2. RIGGED WING STORAGE

If storing the wing rigged, it should be parked in a sheltered location nose-down. 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).

10.3. WING OVERNIGHT PARKING

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.

11. TUNING THE WING

11.1. NEW AIRCRAFT

WARNING

Prior to delivery to the customer all new aircraft are flown and set up by either the Factory or by Appointed Dealers. A full check flight is carried out and adjustments made to the wing to ensure that it is properly trimmed out and flies hands off at the right speed. Owners are discouraged from making any adjustments. If you feel your new Pegasus aircraft is not performing as it should, it is essential that your dealer is immediately informed.

The following notes are for guidance only. Since tuning of flexwings is a specialised technical procedure, no adjustment should be made without a full understanding of the principles involved. Please observe the following simple guidelines:

1. Before making <u>any adjustments</u> check for correct rib profiles against the rib plan supplied. If the aircraft is not new, then also check the airframe components, particularly the outer leading edges.
2. Never exceed the adjustments specified in this Tuning Guide.
3. Make notes of every adjustment made. Only ever make one adjustment at a time, and carry out a flight test to gauge the effect before making further adjustments.
4. When the exercise is complete, you should discuss any adjustments made with your Instructor or Dealer and then enter them in the Aircraft Technical Log.
5. If you cannot get the aircraft to fly as it should, then first return all the settings to standard and reassess the situation. If this cannot be made to work, contact your Dealer immediately.

11.2. WING TRIM

A well tuned wing will fly in a straight line hands-off and will respond to control inputs equally in each direction. However, fabric can stretch slightly with age and ribs can alter shape and get bent or distorted. The most common problem with flexwings is the tendency for the wing to acquire a turn one way which can be irritating and tiring on a long flight. Turns like this can be tuned out and are invariably due to rib shape or tip setting problems. However, it may be that airframe damage has occurred so if a turn becomes apparent the first thing to do is to check the frame carefully, inspecting for bends and distortion particularly in the leading edges. If the frame is alright, you should check the ribs against the template and adjust accordingly.

11.3. TUNING GUIDE

For successful tuning, the weather conditions must be smooth, small adjustments must be made ONE AT A TIME, and notes must be made immediately any changes have been made and check flown. The loading of the aircraft must also be similar for trials to have comparable results.

WARNING

If the wing used to fly straight but has recently developed a turn, then the probability is that damage has occurred. It is necessary to strip and inspect the aircraft before your next flight. Failure to do so may result in injury or death.

Tuning turns

Example: The aircraft turns right at all speeds. The trim speed is correct.

Solution: In this case the tip turn adjusters. On the tips you will find an adjustment scale where the leading edge emerges from the sail. Rotate the starboard tip plug 1mm on the scale anti-clockwise (i.e. trailing edge down). Check in flight. If the turn persists, rotate the tip one further mm. Check fly. Rotate the left tip 1mm anti-clockwise (i.e. trailing edge up). Check results before moving the tips further.

WARNING

Do not exceed the adjustment range which is ±6mm (1/4 inch) from the initial factory setting, or the aircraft may become unstable.

Example: At high speed, the aircraft turns to the right. At low speed, the turn is not so pronounced. The trim speed is correct.

Solution: Use ribs numbers 7-10 (the tip rib is number 11 and has very little effect) on the **starboard (right wing)** side to tune out the turn. The tip ribs respond well to "tab effect", i.e. application of reflex near to the trailing edge will produce a downforce at the trailing edge which will increase the incidence of the section as a whole. The overall effect is to increase the lift on the side where reflex is applied, so correcting the turn. The effect becomes more pronounced as the speed rises. The reflex should be applied 200mm (8 inches) from the trailing edge and applied in small increments up to a maximum of 25mm (1 inch). Start with 10mm (3/8 inch) reflex, test fly, then 15 - 20 - 25mm (5/8 - 3/4 - 1 inch) as required. Do not exceed 25mm reflex!

Example: The wing flies completely straight sometimes, and turns to the right at other times!

Solution: This is happily an easy problem to solve, since it usually only happens when you have to rig everytime you fly. Then it is a question of exactly how the tension sets up on the outer leading edge webbings. Simply take hold of the leading edge cloth right out near the trailing edge and twist it anti-clockwise; you should feel it move. It will then be held there by the tension.

Tuning in pitch

The Q2 wing is designed to be stable in pitch even with the trimmer fully fast, at a trim speed of 57-65 mph. The bar force when pulling in must steadily rise to at least 7kg (15 lbs) to achieve 70mph. The trimmer operates by raising the middle pair of reflex lines to pitch the nose up and slow the aircraft to a minimum speed of 40mph at solo loading and 46mph at maximum all-up weight. When making adjustments in pitch, always tune in smooth air and climb to test altitude with the trimmer set at 51mph, before winding the trimmer gradually to the test position. The settling of the sail on the airframe generally tends to slow the wing down and make it more stable both in pitch and laterally/directionally, as the washout increases. If the wing has slowed unacceptably with the trimmer fully fast, then the tip adjusters can be rotated both together by 1mm on the scale so as to bias the trailing edges downwards. Check the result at each 1mm adjustment until the trim speed and pitch feel are correct. Do not exceed 5mm of adjustment. As a rough guide, the sail should ride approximately 25mm (1 inch) clear of the washout rods when flying solo at fast trim. If the trim speed is too fast at the fast trim setting, then the tips can be rotated both upwards until the correct speed is set. Again, use small adjustments to achieve the desired result. If the wing is very new (less than 5hrs) then it will probably settle down by 4-5mph over the next 20hrs. Once the fast trim has been set, then the slow trim can be checked by winding to the full slow position. Because the trailing edge rises higher under flight loads when at high loadings, the slow trim will be 5 mph faster at maximum all-up weight than at minimum loading. The minimum trim speed should not be lower than 40 mph at solo loading and the pitch control should feel very stable and damped at this setting. It is not desirable to trim slower than 55mph (90km/h) when on approach or when climbing from takeoff as the roll control becomes more delayed and the chances of getting gust stalled are greater. If the wing still has a slow trim speed after tuning, and it has flown more than, say, 250 hours, then the probability is that the outer (rear) leading edge tubes have developed a "set", an inwards bend that slackens the tension along the trailing edge. This is not a problem in itself, but if the slow trim speed is unacceptable then the only answer in this case is to replace the pair of outer leading edges.

Roll response
Roll response should not exceed 3 seconds at 51mph to reverse a 30 degree bank at a control force of 15kg. In addition, the response to very small inputs of 1-2kg should be good so that it is possible to fly through mild turbulence with one hand on the bar.

If the roll response is unsatisfactory, firstly check that the main roll bearing and associated control frame top joints are all moving smoothly. A silicone aerosol spray will help.

The fore and aft rigging should not be too tight. If necessary adjust the tensioner on the fin, but always leave at least 10mm of thread in the barrel and ensure that the locknut is tight.

WARNING

Those operators who wish to tune the Q2 wing should contact a P&M Aviation agency for additional advice. Before any tuning is attempted, a careful and thorough check of the airframe is essential. A sudden indication that the wing requires tuning may be the result of damage caused in an unreported accident or from a heavy landing. Unless your are an experienced flexwing pilot, you should ask your Instructor/Dealer or Inspector to assist with all tuning operations and have him/her carry out the flight tests.

12. MAINTENANCE

12.1. 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 is no inherent fatigue problem with the Pegasus Quantum, 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 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.

WARNING

Never fly an aircraft with dented or damaged components.

Fasteners

Only fasteners purchased from P&M Aviation 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.

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 Pegasus 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.

12.2. 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 must 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 at its centre and at two points not more than one metre from each end. 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 (a gauge for checking sail condition, available from Pegasus) annually. The limit is 1390g on the main top surface panels and under surface, with a 1.62 mm diameter smooth needle.

⚠ 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 polyester or spun PTFE thread which is available from P&M Aviation.

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 Quantum rigged, check the ribs every 50 hours.

The best way to reform is to hold the rib 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.

12.3. TRIKE

General
The Quantum 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 fully assembled or folded down providing the pylon is supported to prevent excessive stress being applied to the structure. The trike may also be stored either fully rigged or folded, again providing the pylon is supported and not allowed to rest on the pod fairing.

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 spats 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.

Engine
For engine maintenance details see Engine Manufacturer's Manual.

2 STROKES: If the aircraft is to be left for more than 3 weeks without being used, Pegasus strongly advises you to use an Inhibiting oil to prevent internal corrosion. It is a good idea to run the engine up to full working temperature every 3 weeks as a minimum.

CAUTION
It is essential that Rotax recommended 2 stroke oil is used in aircraft fitted with 2 stroke engines. One of the essential properties of the recommended oil is that a protective film coating remains on the steel bearing surfaces within the engine, even so corrosion can become a problem leading to catastrophic engine failure if the engine is not run up to full working temperature weekly.

Propeller
The condition and torque settings of the 8mm propeller bolts should checked with the frequency recommended in the inspection schedules laid out below. In this instance it is acceptable not to replace the Nyloc locking nuts every time you perform this operation.

Torque should be applied by progressively tightening all the bolts to 12.5 ft lbs in the following sequence :

1 - 4 - 2 - 5 - 3 - 6

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 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 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 3.2. 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.

Re-tighten the bolts at the root of each blade to 6 ft lbs and re-tighten the main mounting bolts as described above. After resetting the pitch, check for tracking alignment, balance, and static RPM as indicated in the table below.

	912	HKS 700E BETA	582/48	582/40	503
Max RPM Static	5200	6100	6300	6100	6400

⚠ 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/ ULTRALIGHT OPERATION, Special Hazards, "Running Up and Testing an Engine on the Ground".

Rigging System

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.

12.4. LUBRICATION

Trike

The rear steering bar, foot throttle, hand throttle and choke lever pivots should be lubricated with machine oil weekly. 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 the wing from the trike.

2. Place a jack under the keel towards the rear using a piece of soft wood to prevent damage.
3. 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.
4. Disconnect the bolt attaching the lower suspension leg attachment eye.
5. Remove the two socket head screws near the top of the suspension leg.
6. Withdraw the lower suspension leg, leaving the top section attached to the trike.
7. Loosen the locknut at the top of the upper suspension rod.
8. Remove the upper suspension rod using a tommy bar to unscrew it.
9. Apply grease liberally to the sliders.
10. Reassemble in the reverse order, use Loctite 221/222 engineering adhesive on the upper suspension rod threads and locknut and also on the two socket head screws.
11. 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 221/222 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.

Lubricate the throttle and choke cables with WD40 if they ever become too stiff. This is particularly important on the Rotax 912 and HKS 700E BETA powered Quantum. Work the WD40 into the cable outers by moving the pedal backwards and forwards as you spray. Lubricate the throttle splitter-box at least every 100 hours with WD40 by pulling the cable outers away from their location holes and using the WD40 extension tube inserted in each hole in turn, spray for a second or so.

Refer to the engine manufacturers handbook for gearbox lubrication details.
The brass bush at the top of the pylon should have a light application of general purpose grease to prevent corrosion against the hangpoint bolt. Lubricate the polyurethane pylon guides with Vaseline or silicone spray occasionally.

Wing

The keel tube nylon roll bracket bearing should be sprayed monthly with a commercial silicone spray.
It is a good idea to coat all the ribs with silicone spray every 3 months.

12.5. INSPECTION & SERVICING SCHEDULES

It is essential that the following Servicing & Inspection schedules be followed. In addition, it is important that your Quantum is inspected and assessed by an approved BMAA or P&M Aviation inspector every 12 months. If satisfactory, the aircraft must then be check flown by a BMAA check pilot to revalidate a UK Permit to Fly. Any repairs should be carried out as outlined in Section 13, and entered in to the aircraft Technical Log. Any problems highlighted at an inspection should be dealt with immediately. All Servicing and Inspections should be recorded in the aircraft engine & airframe log book.

TRIKE - GENERAL	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
ENGINE MOUNTING: for cracking or wear	Inspect			Inspect		
THROTTLE & CHOKE CABLES: adjust if necessary, check for fraying		Service		Inspect		
BRAKE CABLES: adjust if necessary, check for fraying		Service		Inspect		
ELECTRICAL CONNECTIONS: check for corrosion				Inspect		
AIRFILTERS: clean and re-oil with K&N fluids. Depends on environment.				Inspect		
RADIATOR: check strength of coolant				Inspect		
RADIATOR: drain, flush & refill						Service 200hrs
RADIATOR: check hoses and fasteners, check coolant level	Inspect			Inspect		
General – remove pylon & seatframe, Fatigue crack & fastener inspection						300 hours
ENGINE: please refer to Engine Operator's Manual for full service instructions	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
PLUGS: 2 stroke engines			Inspect	Service		
PLUGS: 4 stroke engines				Inspect		Replace 200 hrs
OIL & FILTER: replace				Service HKS BETA	Service 912	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		Inspect	Inspect			
TANK: drain, flush out and check vents		Service		Service		
FUEL FILTERS: check for contamination, change		Inspect		Service		
FUEL LINES: check for cracking or leaks, check torque on all connectors and clips	Inspect			Inspect		
FUEL PUMP DIAPHRAGM (not 912)				Inspect		
TRANSMISSION	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
PROPELLER: check for cracks & delamination	Inspect					
PROP BOLTS: check state of bolts & torque	Inspect			Service		
GEARBOX BEARING: check for play				Inspect		
GEARBOX OIL LEVEL: (not Rotax 912 or HKS BETA) check level				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)				Inspect		
PYLON TUBE: Check bottom pivot and bolt				Inspect		
PYLON TUBE: Check fairing fasteners	Inspect					
BASE TUBE: check for cracks, bends & fatigue (Also after every hard landing)				Inspect		
FRONT STRUT: check for cracks, bends &				Inspect		

fatigue (Also after every hard landing)						
SEAT FRAME: check for fatigue and bends				Inspect		
HANG POINT	Inspect			Inspect		
HANG BOLT: check condition of bolt & Lanyard				Inspect		Renew 250 hrs
PYLON BUSH: check security				Inspect		

UNDERCARRIAGE	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
TYRES: check condition of treads & sidewalls				Inspect		
TYRE PRESSURES: 20psi	Inspect					
FRONT FORK RUBBERS: check ride height and adjust as necessary				Inspect		
FRONT FORKS: check for damage	Inspect			Inspect		
FRONT FORK BEARINGS AND HOLDERS: check for play in steering head				Inspect		
BRAKES: check shoes						Inspect
BRAKES: Check adjustment of cables				Inspect		
WHEEL BEARINGS: check seals and general condition				Inspect		
WHEEL HUBS: check for damage and wear after every heavy landing and				Inspect		
REAR STRUTS: check rose joint security				Inspect		
REAR STRUTS: Grease sliders						Every 200 hrs.
WISHBONES: check for damage, check security of fasteners				Inspect		

WING	Pre-flight	First 10 hrs	Every 25 hrs	Every 50 hrs	Annually /100 hrs	Other
SAIL: check for damage and wear				Inspect		
SAIL & STITCHING: Betts test for UV damage. (1.2mm needle 1360 grams)					Inspect	
BATTEN ELASTICS: check security and tensions	Inspect			Inspect		
BATTEN ELASTICS: Replace every 200 hours						Service
BATTENS: check profiles, check fibreglass for splits				Inspect		
ALL CABLES: check for damage, corrosion, elongation of thimbles				Inspect		
TENSIONER CABLE & STUD: check	Inspect			Inspect		
NOSE PLATE: check plates for wear & damage	Inspect			Inspect		
NOSE PLATE: Check fasteners for wear					Inspect	
TRIM SYSTEM: Check & reset indicator		Inspect				
TRIM SYSTEM: Check cable, pulleys, bridle cable for wear				Inspect		
TRIM SYSTEM: Change bridle cable every						200

						hours
ALL WING TUBES: visual check for damage & bends				Inspect		
BASE BAR: check for fatigue cracks around holes, dents & bends	Inspect	Inspect			Inspect	
FIN TUBE: check for wear at pivot end				Inspect		
X SPAR JOINTS: check centre pivot, check leading edge/x spar fasteners for wear				Inspect		
HANG BRACKET: check set screws, check holes for wear				Inspect		
ROLL BEARING: check set screws				Inspect		
WING VISUAL CHECK: a complete and thorough check should be carried out annually by a competent inspector. The wing should then be test flown.					Inspect Annually	
COMPLETE WING STRIP: after any accident damage however caused or after NOT MORE THAN 300hrs (in normal use). Must be inspected by P&M Aviation or BMAA inspector or other qualified inspector. Check fly by qualified check pilot after rebuild.						300 hours

12.6. INSPECTION CRITERIA:

General

In the main, the safe working life of the structural components of the Pegasus Quantum is dictated by the environment in which the aircraft is used and the care taken during day to day operations. Inspection, therefore, is an essential tool in deciding the continued use of most components.
Some parts such as bolts are not amenable to fatigue crack inspection, therefore it is more practical to replace them. Nyloc nuts in primary structure should not be used more than once. At least one complete thread must protrude. Split pins should only be used once.
Unless otherwise specified, airframe bolts should be tightened so as to remove all free play without causing distortion of the parts (e.g. ovalising or denting tubes).

Sail & Stitching inspection:
The Polyester sailcloth and stitching is subject to degradation by UV light. 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.
The sailcloth should be tested to 1360 grammes with a 1.2mm needle in both spanwise and chordwise directions.
Sample stitches should 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.

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 lacquer.

Hang Bracket:
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.

12.7 FATIGUE LIFE:
At the following logged times the main airframe parts below should be replaced. Alternatively, if the parts are inspected in detail by a qualified inspector using dye penetrant, radiographic, or visual high magnification methods and no cracks are found, the life may be extended by 1/3 of the new life. Inspections and replacements must be entered in the aircraft technical log.
Any instance of fatigue cracking must be reported to P&M Aviation, ideally with a section or photograph of the affected part and the time in service.

Leading edges	1500 hours
Keel	1500 hours
Pylon	1500 hours
Seat frame	1500 hours
Trike base tube	1500 hours
Front strut & channels	1000 hours
Control frame basebar	600 hours

For the following small items replacement is strongly recommended at the following times:

¼" Lord engine mount bolts on 2 stroke engine installations	500 hours.
Hang bolt	200 hours.
Control frame top pivot bolt	1500 hrs

Fatigue inspections should be carried out at:

a) Control bar end holes.
b) Control bar end knuckles.
c) Leading edge/crossboom channel holes in the tube.
d) Leading edge outer at the sleeve edges.
e) Keel roll bearing holes.
f) Trike pylon top&bottom fittings - bush must not rotate, no cracks around the bush.
g) Trike pylon top& bottom end corners.
h)Trike basetube at seatframe bracket holes.
i) Trike basetube at rear steering pivot holes.
j) Seat frame holes.

Any instance of fatigue cracking must be reported to the Factory.

⚠ WARNING

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

13. REPAIRS

> **⚠ WARNING**
>
> The Pegasus Quantum 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 P&M Aviation or P&M Aviation nominated 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.

13.1. WING

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

13.2. TRIKE

- Repairs must be inspected and signed off as above.
- Repairs by replacement only.
- Replacement parts must be obtained from P&M Aviation or a P&M Aviation 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 the P&M Aviation factory or a P&M Aviation approved composites facility.

Appendix A – MODIFICATIONS/SERVICE BULLETINS

SB or Mod.	Issue date	Description.
SB 0082	08/12/95	Rear undercarriage Loctite.
SB 0083	13/12/95	Luff line pulley on s/n 7104 to 7122
SB 0084	18/9/96	Inspection of root stitching (superseded by mod. PG 138)
SB 0085	06/11/96	TIG welded front fork trailing links
SB 0086	20/05/97	Inspection of swages
SB 0088	15/09/97	Inspection of trim bridle
SB0089	17/09/97	Over centre pin movement
SB0090	17/09/97	Roll bearing bolt security
SB0091	06/04/98	Roll bearing flange cracking
SB0094	18/06/98	Use of AVGAS
SB0095	30/07/98	Seat belt buckle on s/n 7428-7456
SB0097	17/08/98	Q2 tip webbing stitching
SB0098	06/05/99	912 stator
SB0100	01/11/00	Fuel tank strap
SB0101	22/03/01	912 valve spring collar
SB0102	25/6/01	Crankcase crack check
SB0105	17/7/01	Pylon fretting
SB0106	17/7/01	Luffline pulley rivet up to S/N 7838
SB0109	21/3/02	Component life extension
SB0118	02/09/04	Oil suction hose wirelocking

Note: All Service Bulletins are available on www.pmaviation.co.uk/downloads.php

CAA Mandatory modifications:

PG207	27/08/98	Q2 tip webbing attachment & protection

P&M Aviation compulsory modifications for operation at 409kg:

PG138	07/11/97	Trailing edge wing root retention webbing
PG173	17/03/98	Roll bracket flange thickened
PG124	22/05/97	10mm Leading Edge bolts
PG73	10/05/96	Bronze weld change to TIG weld on front fork links

Approved Optional Modifications

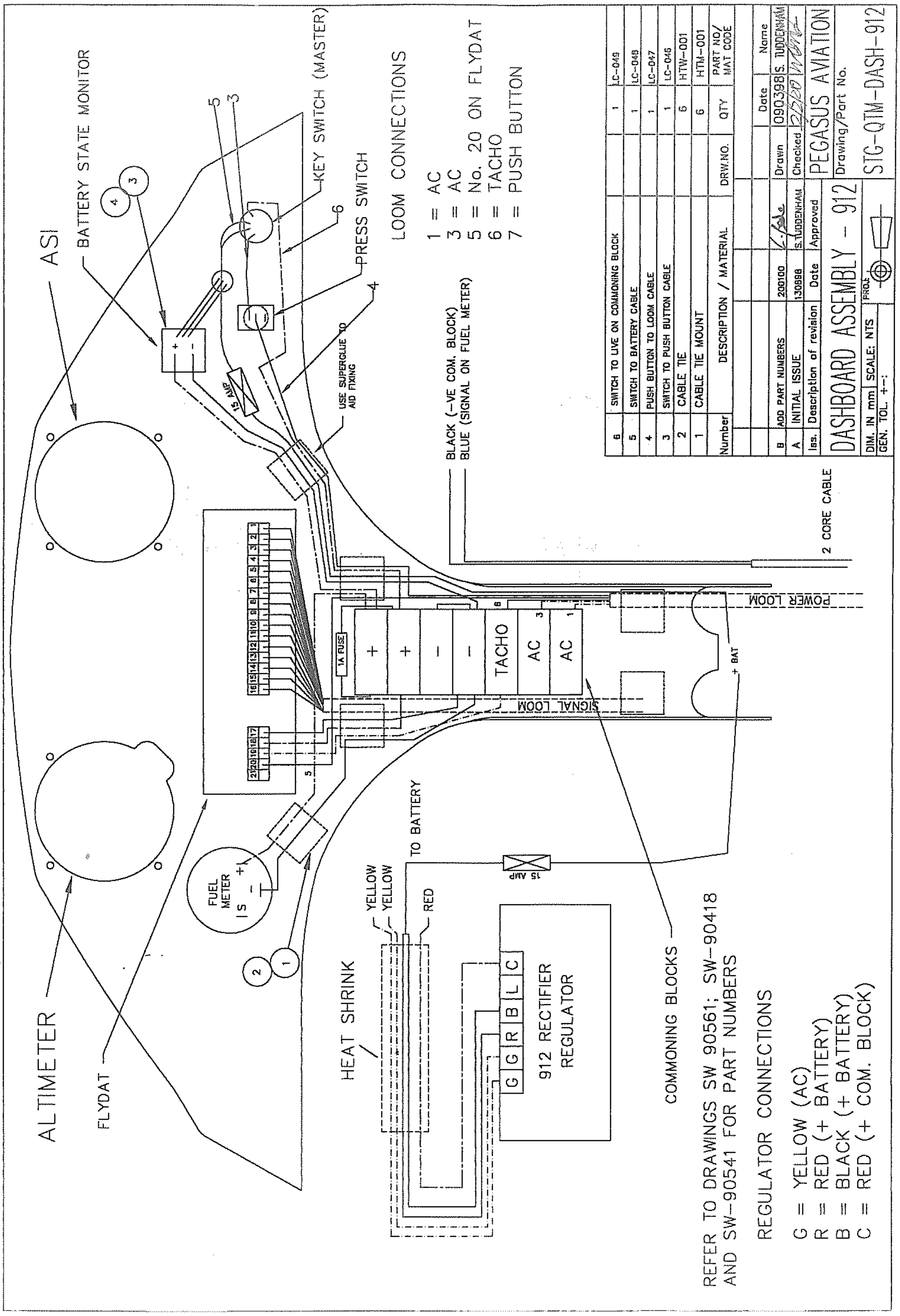
PG134	Aerotow/Banner tow
SW121	Instructor training bars with swinging links
PG177	LTS reed switch type fuel gauge
PG190	Oil radiator cover
PG346	Coolant radiator cover
PG362	Mixture control system
M103	Aerofoil suspension struts
M108	Disk brakes
M122	Increase in max seat weight to 100kg/occupant
M130/1	65L fuel tank
M130/2	Telescopic damper front suspension
M103/3	Rising rate rear suspension
M131	Overload Clutch
M137	Low drag panniers
M140	Keel nose holes bush (Std. Repair)
M141	Cross boom end hole bush (Std Repair)
M142	Leading edge front bush (Std Repair)
M148	Hang point bobbin

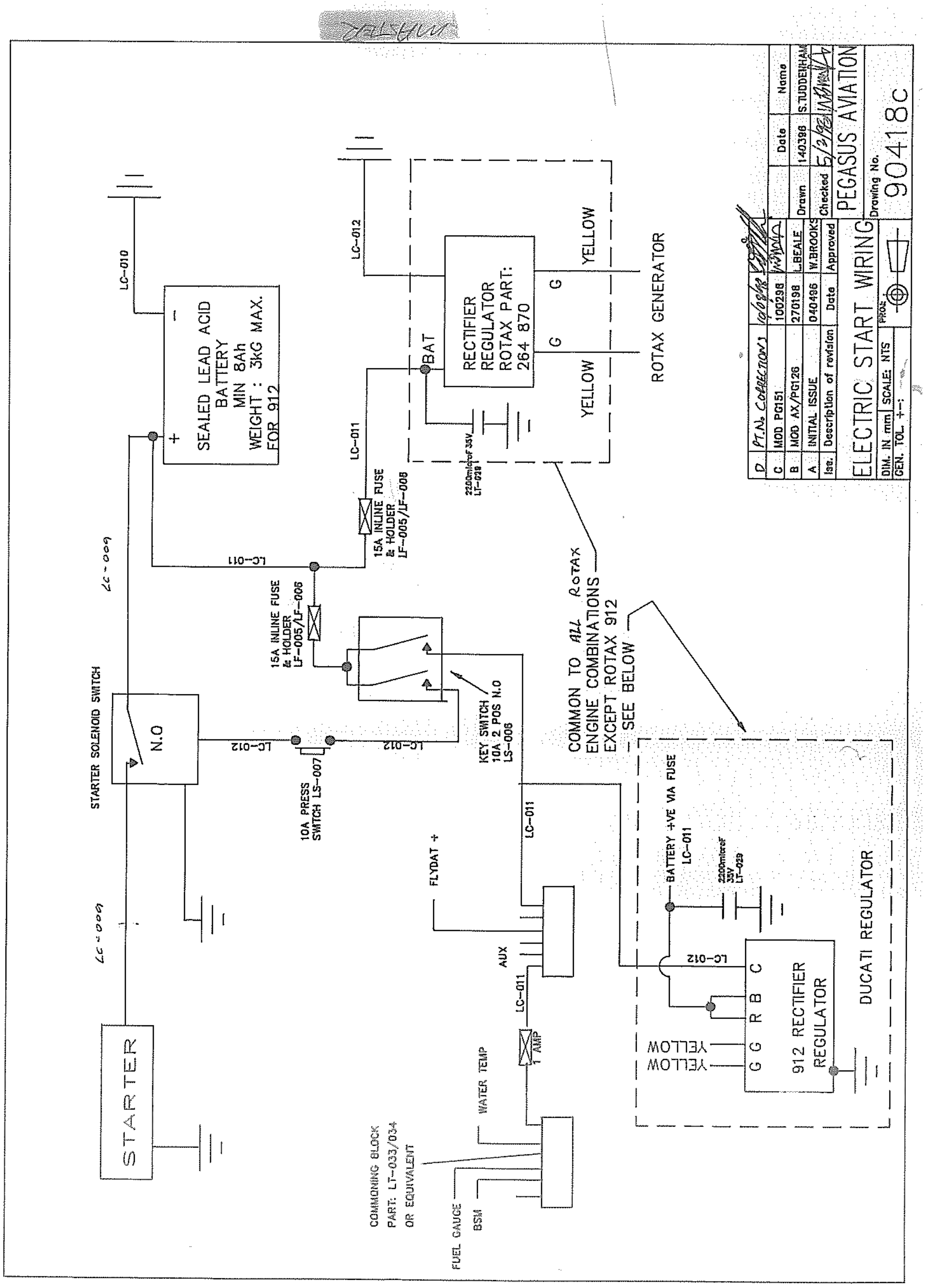
M150	110kg per seat
M152	Cranked Brake Pedal
M153	Landing light
M156	Large Radiator type ELR-003.
M157	Standard GPS & Power socket
M168	New coolant overflow bottle mounted on gearbox
M176	Oil Hose Fastened to Gearbox

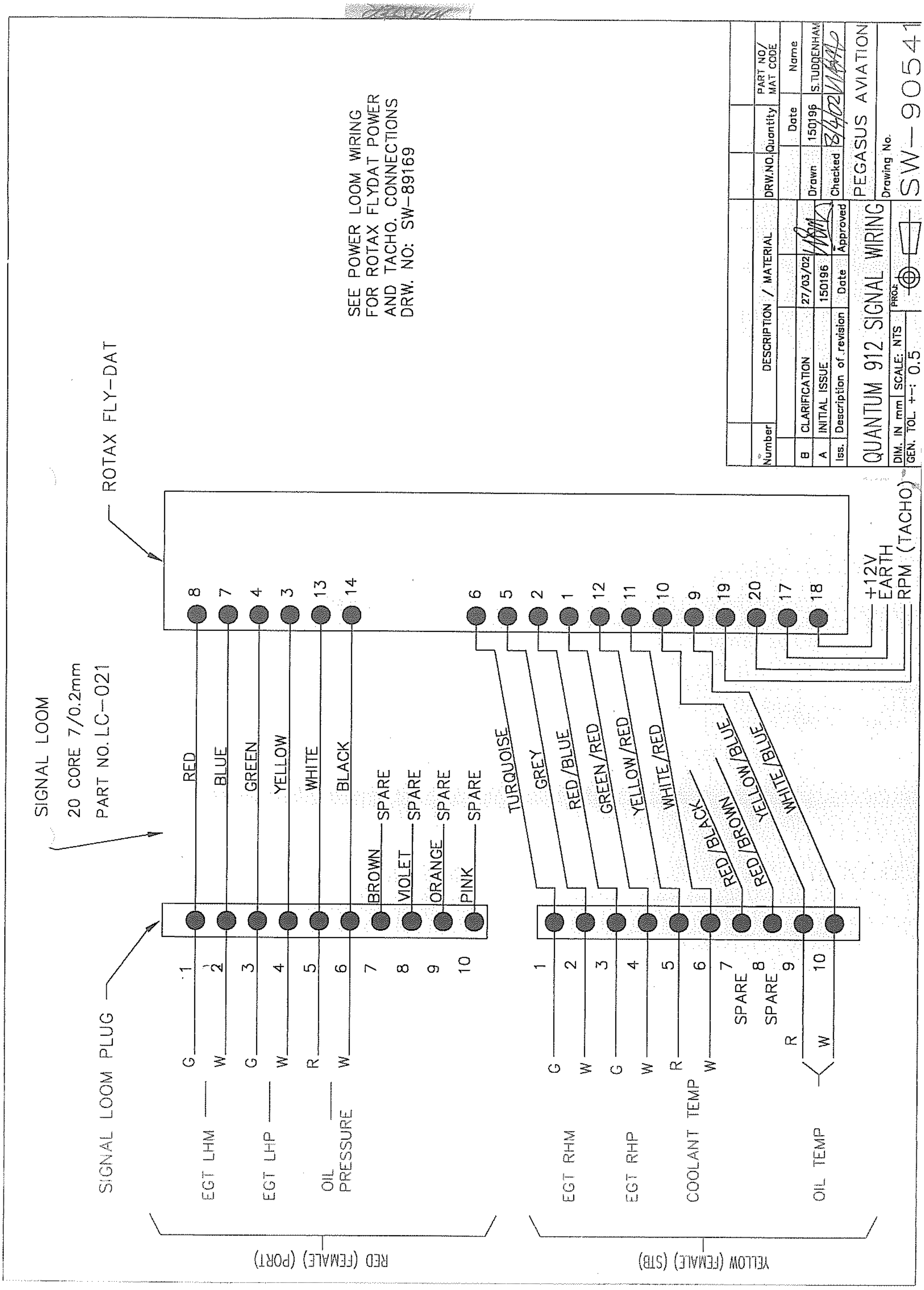
The installation of all optional modifications is to be inspected by a BMAA inspector and an entry made in the appropriate logbook(s). Note that other approved modifications may exist which are not listed here.

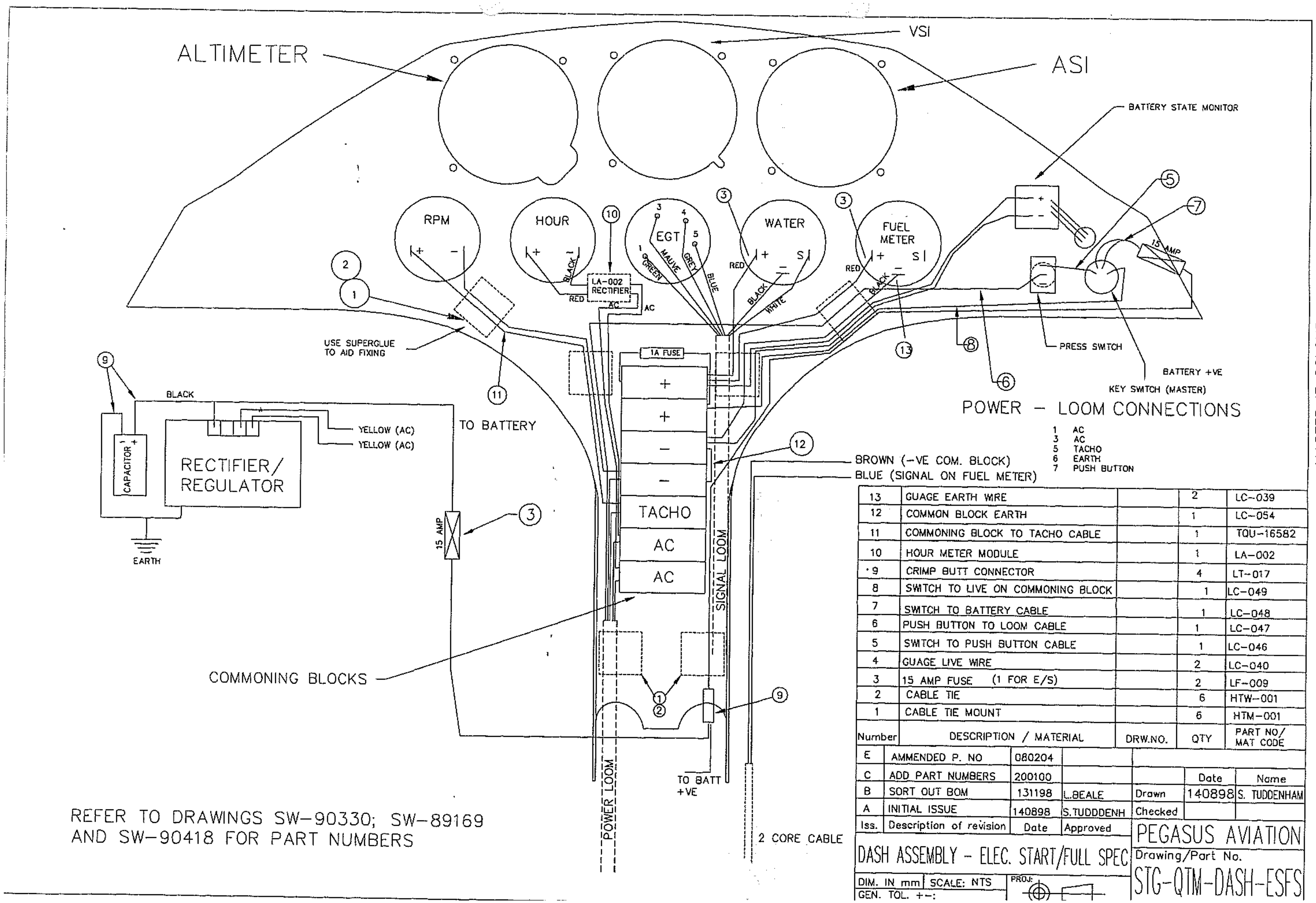
Appendix B – Wiring Diagrams

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




SEALED LEAD ACID BATTERY MIN 8Ah WEIGHT : 3KG MAX. FOR 912
LC-010
LC-011
LC-012
15A INLINE FUSE & HOLDER LF-005/LF-006
RECTIFIER REGULATOR ROTAX PART: 264 870
BAT
G
YELLOW
ROTAX GENERATOR
2200microF 35V LT-029
COMMON TO ALL ROTAX ENGINE COMBINATIONS EXCEPT ROTAX 912 – SEE BELOW
STARTER SOLENOID SWITCH
N.O
10A PRESS SWITCH LS-007
KEY SWITCH 10A 2 POS N.O LS-006
STARTER
FLYDAT +
AUX
1 AMP
WATER TEMP
COMMONING BLOCK PART: LT-033/034 OR EQUIVALENT
FUEL GAUGE
BSM
BATTERY +VE VIA FUSE LC-011
912 RECTIFIER REGULATOR
DUCATI REGULATOR
G G R B C
MOD PG151
MOD AX/PG126
INITIAL ISSUE
Description of revision
Drawn
Checked
Approved
Date
Name
100298
270198
040496
140398
L.BEALE
W.BROOKS
S.TUDDENHAM
ELECTRIC START WIRING
PEGASUS AVIATION
Drawing No. 90418C
DIM. IN mm
SCALE: NTS
GEN. TOL +-:


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



Number	DESCRIPTION / MATERIAL	DRW.NO.	QTY	PART NO/ MAT CODE
13	GUAGE EARTH WIRE		2	LC-039
12	COMMON BLOCK EARTH		1	LC-054
11	COMMONING BLOCK TO TACHO CABLE		1	TQU-16582
10	HOUR METER MODULE		1	LA-002
·9	CRIMP BUTT CONNECTOR		4	LT-017
8	SWITCH TO LIVE ON COMMONING BLOCK		1	LC-049
7	SWITCH TO BATTERY CABLE		1	LC-048
6	PUSH BUTTON TO LOOM CABLE		1	LC-047
5	SWITCH TO PUSH BUTTON CABLE		1	LC-046
4	GUAGE LIVE WIRE		2	LC-040
3	15 AMP FUSE (1 FOR E/S)		2	LF-009
2	CABLE TIE		6	HTW-001
1	CABLE TIE MOUNT		6	HTM-001

Iss.	Description of revision	Date	Approved
E	AMMENDED P. NO	080204	
C	ADD PART NUMBERS	200100	
B	SORT OUT BOM	131198	L.BEALE
A	INITIAL ISSUE	140898	S.TUDDDENH

	Date	Name
Drawn	140898	S. TUDDENHAM
Checked		

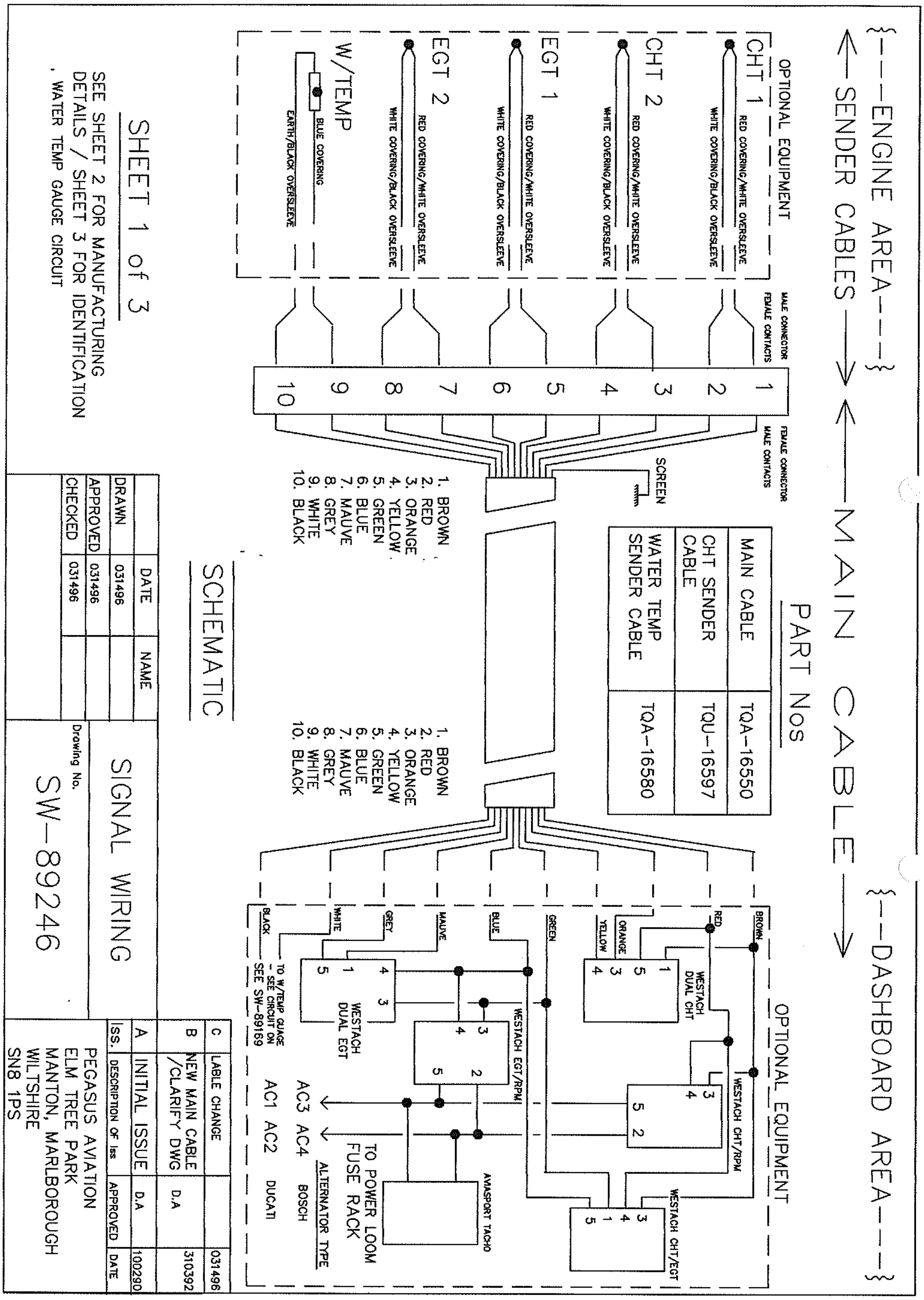
PEGASUS AVIATION

DASH ASSEMBLY - ELEC. START/FULL SPEC

Drawing/Part No. STG-QTM-DASH-ESFS

DIM. IN mm | SCALE: NTS | PROJ:

GEN. TOL. +-:



{--ENGINE AREA--}
←SENDER CABLES→
←MAIN CABLE→
{--DASHBOARD AREA--}
OPTIONAL EQUIPMENT
CHT 1
RED COVERING/WHITE OVERSLEEVE
WHITE COVERING/BLACK OVERSLEEVE
CHT 2
EGT 1
EGT 2
W/TEMP
BLUE COVERING
EARTH/BLACK OVERSLEEVE
MALE CONNECTOR
FEMALE CONTACTS
FEMALE CONNECTOR
MALE CONTACTS
SCREEN
1. BROWN
2. RED
3. ORANGE
4. YELLOW
5. GREEN
6. BLUE
7. MAUVE
8. GREY
9. WHITE
10. BLACK
PART Nos
MAIN CABLE TQA-16550
CHT SENDER CABLE TQU-16597
WATER TEMP SENDER CABLE TQA-16580
SCHEMATIC
SHEET 1 of 3
SEE SHEET 2 FOR MANUFACTURING DETAILS / SHEET 3 FOR IDENTIFICATION
, WATER TEMP GAUGE CIRCUIT
WESTACH DUAL CHT
WESTACH CHT/RPM
WESTACH CHT/EGT
WESTACH EGT/RPM
WESTACH DUAL EGT
AVIASPORT TACHO
TO W/TEMP GUAGE - SEE CIRCUIT ON SEE SW-89169
TO POWER LOOM FUSE RACK
ALTERNATOR TYPE
AC3 AC4 BOSCH
AC1 AC2 DUCATI
DRAWN 031496
APPROVED 031496
CHECKED 031496
DATE
NAME
SIGNAL WIRING
Drawing No.
SW-89246
C CABLE CHANGE 031496
B NEW MAIN CABLE /CLARIFY DWG D.A 310392
A INITIAL ISSUE D.A 100290
ISS. DESCRIPTION OF Iss APPROVED DATE
PEGASUS AVIATION
ELM TREE PARK
MANTON, MARLBOROUGH
WILTSHIRE
SN8 1PS