



Aquila 582

Manual

RECORD OF OWNERSHIP

DATE	NEW OWNERS NAME

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GENERAL

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AIRCRAFT MANUFACTURER:	Solo Wings cc
AIRCRAFT MODEL:	Aquila
AIRCRAFT SERIAL NUMBER:	WA
AIRCRAFT REGISTRATION NO:	ZU-
REGULATIONS:	As laid down by the CAA and the Air Navigation Regulations.
OPERATIONAL REQUIREMENTS:	

AQUILLA 582 SPECIFICATIONS

POWER PLANT		Rotax 582 – 64HP, 2 cylinder, 2 stroke, liquid cooled, dual ignition
WING AREA	STD MED LG	14 square metres 15 square metres 16.5 square metres
WING SPAN		10.5 metres
EMPTY WEIGHT		195 kg's
MAXIMUM ALL UP WEIGHT		450 kg's
FUEL CAPACITY		50 litres
FUEL RATING		95 / 97 octane

PERFORMANCE

CLIMB RATE	Solo Dual	6 mt/s 4 mt/s
STALL SPEED	Solo Dual	50 kph 65 kph
FUEL CONSUMPTION	Solo Dual	11 litres per hour 13 litres per hour
CRUISE SPEED		65 – 100 kph
MAXIMUM SPEED		140 kph
DESIGN LOADS – AQUILLA	- POSITIVE	4 g's
DESIGN LOADS - AQUILLA	- NEGATIVE	1.5 g's
DESIGN LOADS – TOP LASS	- POSITIVE	4 g's
DESIGN LOADS – TOP LASS	- NEGATIVE	1.0 g's

LIMITING AND RECOMMENDED AIRSPEEDS

Best angle of climb	30 degrees
Best rate of climb	70 kph
Never exceed	140 kph
Stall with full load	60 kph

FLIGHT MANUAL

INTRODUCTION

We **strongly** recommend that you study this chapter of the manual as we feel that it could increase your general awareness in the air.

Irrespective of your previous flying experience, unless that experience is already on a Trike, **do not** attempt to fly the AQUILLA without first getting some dual instruction from a qualified instructor. You must go through the process of getting your M.P.L.

TRIKE CONFIGURATION

It is controlled by weight shift on all three axes. The power is controlled by a foot throttle on the right pedal and the choke and cruise throttle levers are under the seat on the left. The two position ON / OFF switches are in the instrument pod. The front wheel brake can only be operated from the front with the left foot.

The designated flight envelope of the AQUILLA **excludes all aerobatics**. This is defined as pitch greater than 30 degrees and roll greater than 60 degrees. **Pilots are urgently warned to ensure that they fly the AQUILLA within the specified flight envelope.**

SECURING YOUR UNATTENDED AQUILLA

We suggest you always carry extra bungee, rope and tie down pegs, you may not always land next to your hangar, and it could prevent one of those “if only” stories. If your Trike is left unattended, even for a short time, it should be parked side on to the wing with the windward wingtip resting on the ground.

OPERATIONAL REQUIREMENTS

POINTS TO REMEMBER

- The pilot must have his/her pilots licence with him in the aeroplane.
- You must have an “Authority to Fly Certificate” (this document has different names in different countries – such as “Microlight Flight Certificate” issued by the Civil Aviation Authority of the country in which you reside and fly.
- You cannot fly in controlled airspace or within the circuit area of any licensed airfield, or above 1,000 ft agl unless the microlight is equipped with an approved VHF radio, a sensitive altimeter, an air speed indicator, a compass and the pilot is in contact with ATC and other air traffic.
- Your aircraft needs to be maintained in accordance with the laws governing maintenance of microlight aeroplanes.
- You cannot fly at night or in IMC, nor fly over built up areas or over an open-air assembly of persons.
- Your aeroplane must be maintained as per the Air Navigation Regulations of your country are met.
- The Aeroplane Operators Manual and Airframe logbook, as required by your country’s Aviation regulations, must be readily available at the time of operation and the pilot in command must be conversant with its contents. The pilot must also be responsible for recording the flying times in the airframe logbook after each flight.

MAINTENANCE REQUIREMENTS

Again, the following is a guide only, the requirements of your country's Civil Aviation Authority pertaining to the maintenance of microlight aeroplane takes precedence:

- The owner is responsible for the serviceability of his microlight aeroplane and has to ensure that it is in a fully serviceable condition prior to each flight.
- An annual inspection of the microlight aeroplane must be carried out in accordance with the Aeroplane Operators Manual by an appropriately licensed AMO, AME or Approved Person at intervals not exceeding 12 months. The maintenance records of the microlight aeroplane must be endorsed in the Airframe logbook and a signed form detailing the inspection and maintenance record sent to the Civil Aviation Authority.
- In addition to the annual inspection, microlight aeroplanes in the training category must have inspections equivalent to annual inspections, every 50 flying hours.

NOTE:

The aeroplane may not in any way be modified without the prior approval of the CAA. The approved modification or repair must be inspected and recorded in the Airframe Logbook by an appropriately licensed AMO, AME or an Approved Person.

AEROPLANES USED FOR TRAINING

The following is a guide for microlight aeroplanes to be used for training.

- The microlight is registered in the training category with the CAA.
- The insurance is valid for training.
- A suitable communication system between the instructor and the student must be provided and maintained during training flights.
- The microlight must have full dual controls.
- The aeroplane must be inspected at 50 hour intervals as per the maintenance requirements of the CAA.

ACCIDENTS AND INCIDENTS

All accidents and incidents as defined in the Air Navigation Regulations must be reported to the CAA and Microlight Association of your country.

RIGGING PROCEDURE AQUILLA I

1. Lay the wing bag on the ground with the zip facing up.
2. Assemble the trapeze control bar and then turn the wing over.
3. Now remove the wing bag.
4. Insert the centre (nose) batten.
5. Spread the leading edges.
6. Ensure that the crossbar cables are on either side of the kingpost locating plug.
7. Plug in the kingpost and hook the rear cable in place.
8. Install the fixed washout tubes. These are attached to the tip of the leading edges with bungee cord.
9. Install the four half battens. These are top battens but are inserted under the sail. The difference between these and the other curved battens are the tips which are the same, front and rear. **(Only applicable to Aquilla I wings)**
10. Install and attach the rest of the top battens.
11. Pull the crossbar retention cord rearwards and install bolt and wingnut to crossbar cable. Use the first hole i.e. the loosest setting. Make sure cord is secure in the Velcro pocket.
12. Lift the wing up and attach the nose cable
13. Insert bottom battens. (Straight battens)
14. Check over complete wing and leave nose down into the wind.
15. Wheel the undercarriage in from the rear with the nose wheel rolling over the base bar.
16. Attach Trike to the universal hang block
17. Raise the nose until the keel is level. Velcro the nose cone in place.
18. Chock rear wheels to ensure that the Trike does not roll backwards.
19. Attach top of the airfoil tube to the U bracket on the pylon.
20. Grab base bar and lift the wing up until you can position the airfoil tube into its lower U-bracket.
21. Insert attachment pin to lower airfoil mount

NOW DO YOUR PRE-FLIGHT INSPECTION

RIGGING PROCEDURE – AQUILLA II

1. Lay the wing bag on the ground with the zip facing up.
2. Assemble the trapeze control bar and then turn the wing over.
3. Now remove the wing bag.
4. Insert the centre (nose) batten from the front
5. Spread the leading edges.
6. Ensure that the crossbar cables are on either side of the kingpost locating plug.
7. Plug in the kingpost and hook the rear top cable in place.
8. Install the washout tubes. These are attached near the tip of the leading edges with bungee cord. You access them through the Velcro. You do not need to loosen the Velcro much.
9. Install and attach all of the top battens. The bungee cords are always tensioned double i.e. top and bottom.
10. Pull the crossbar retention cord rearwards and install bolt and wingnut to crossbar cable. Use the first hole i.e. the loosest setting. Make sure cord is secure in the Velcro pocket.
11. Lift the wing up and attach the nose cable
12. Insert bottom battens. (Straight battens)
12. Check over complete wing and leave nose down into the wind.
13. Wheel the undercarriage in from the rear with the nose wheel rolling over the base bar.
14. Attach Trike to the universal hang block
15. Raise the nose until the keel is level. Velcro the nose cone in place.
16. Chock rear wheels to ensure that the Trike does not roll backwards.
17. Attach top of the airfoil tube to the U bracket on the pylon.
18. Grab base bar and lift the wing up until you can position the airfoil tube into its lower U-bracket.
19. Insert attachment pin to lower airfoil mount

NOW DO YOUR PRE-FLIGHT INSPECTION

RIGGING PROCEDURE – TOP LASS

Assembling the Top Lass wing from its bag

1. Lay the wing on its back and open the bag.
2. Assemble the trapeze with the wing nut on the corner.
3. Assemble the two struts using the clevis pins on either corner of the trapeze.
4. Turn it over and stand it on the trapeze.
5. Insert the front cable at the nose
6. Spread the wings open
7. Insert the battens
8. Level the wing and tension the spreader bar cable. Connect in place at the back of the keel.
9. Swivel the sprog and washout tubes into place.

Assembling the Top Lass wing from trailer

1. Remove wing bags



2. Open out wings



3. Insert all the battens



4. Insert washout tubes and attach the sprog tubes with velcro straps.



5. Tension the spreader bar cable.



6. Insert the front airfoil tube into the top U-bracket with its pin and lift the wing.



7. Place the airfoil tube in the bottom U-bracket position and insert the pin.



8. Insert the locating bolt through the lower pylon.

9. Wheel off the trailer



NOW DO YOUR PRE-FLIGHT INSPECTION

PRE-FLIGHT INSPECTION

The pre-flight or visual exterior inspection is done before each and every flight. Spectators as well as other pilots like to look, feel, touch your aircraft, usually when you are not around! During the pre-flight inspection you need to make sure that nothing is missing or out of place and that no-one has tampered with the aircraft.

To conduct the inspection in a manner that ensures that nothing is left out, get into a habit of following a fixed routine. First break down the components or sections of the pre-flight into small logical units and do a hands – on “touch and feel” check.

Checking out your aircraft is as important as checking out the weather. PLEASE don't ever become complacent about pre-flights.

NOSE WHEEL

1. Check the tyre for wear and cuts also for proper inflation.
2. Check foot throttle and foot brake assemblies for freedom of movement and cable wear.
3. Check axle nut for security.
4. Check if mudguard is secure.
5. Check proper installation of pin and safety ring at the base of the airfoil upright.
6. Check shock absorbers.
7. Check brake

SEAT

1. Check front and rear seat belts for security and also check mechanism.
2. Check all seat attachment straps for security, wear and proper placement.
3. Check front seat attachment clamps for security and wear.
4. Check security of all nuts and bolts.
5. Check hand throttle for friction and cable wear
6. Check choke lever for friction and cable wear.

REAR WHEELS AND UNDERCARRIAGE

1. Check the wheel nuts for security.
2. Check tyres for proper inflation, wear and tear.
3. Check all cables – those attached to the axles as well as the bolt.
4. Check main axle tubes.
5. Check mudguards for security and freedom of tyre movement.

PYLON

1. Check the general condition of the pylon, look for cracks and elongation of hole.
2. Check the front support attachment pin and ring.
3. Check for free movement of hang point assembly and elongation of hangbolt hole.
4. Check hinge point area for security, wear and tear – Brackets, bolts, locking bolt etc.
5. Check that the safety cable between the pylon and the keel goes around the wing keel twice and is in front of the wing hangblock. It must pass underneath the crossbar tensioning cables.

WING

1. Check front of nose batten is correctly located.
2. Open the inspection zips and check that bolts and cables are secure.
3. Run your hands down the leading edges to check for dents or irregularities.
4. Check all cables for fraying and kinks.
5. Check fixed washout tubes on wing tips are correctly located.
6. Check all luff lines are secure and kingpost is in place (Does not apply to Top Lass)
7. Check sprog tube & cable is correctly positioned with velcro secure (Top Lass only)
8. Check all batten bungee cords are in place and not worn.
9. Check crossbar tensioning rope is secure in pocket. (Does not apply to Top Lass)
10. Check struts for straightness and security (Top Lass only)
11. Open surface Velcro and check crossbar hinge point and cable attachment point.
12. Check the trapeze tubes, corner fittings, attachment point and all brackets, bolts
13. and nuts.

Check that the control bar and downtubes of the trapeze are perfectly straight.

14. Check the hang point, safety cable and trapeze top joint are secure.

On the Aquilla II wing check the spreader bar restraining strap is securely velcroed in place.

This holds the spreader bar down in front of the trapeze bracket.

15. Check sail for damage.

582 ROTAX ENGINE

1. Check the engine bolts and rubbers for security and wear.
2. Check engine mount cradle as well as bolts and nuts.
3. Check fuel system. From tank to filter to carburettor. Check all tubes for wear, leaks and to make sure they are secure.
4. Check tank for water and contamination. **Do not rely on filters.**
5. Check fuel valve and breather are clear and open.
6. Check the complete electrical system, loose connections, worn wires and loose spark plugs.
7. Systematically check and feel all bolts and nuts for security and corrosion.
8. Check the propeller for general condition, dents and dings, also ensure all 6 propeller bolts are properly secured with lock nuts.
9. Check the complete exhaust system, attachment bolts, springs, exhaust gaskets (for leaks) and make sure springs are wired.
10. Check carburettors are secure by moving them up and down on their mounting rubbers. Check carburettor rubbers for perishing and cracks.
11. Check radiator and all the mounting points, also check hoses for security, wear and tear.

NOW YOU ARE READY TO GO!!

But first do your Operation Check List

ENGINE START

- Before allowing your passenger into the rear seat it is advisable to first warm up the engine. Look around to ensure there are no onlookers, children, animals near to the propeller.
- Chock the rear and front wheels.
- Apply full choke.
- Make sure the throttle is properly closed.
- Switch both ignition switches on
- Loudly shout “prop clear”
- Turn the ignition key.
- Close the choke as the throttle is gently opened.
- Check the operation of both ignition switches. At 3000rpm the engine should not loose more than 300rpm when one ignition is switched off.
- Warm the engine up for until the oil temperature is at least 50 degree celsius.

BEFORE TAKE OFF

- Check that the passenger is securely strapped in and that he has no loose items that could fly into the propeller during flight. Ensure that his intercom, helmet and goggles are secure.
- Start the engine, let the aircraft move slowly forward and then check the brake.
- Taxi the aircraft to a safe operating area.
- Check the full and free movement of the universal joint between the trike and the wing by moving the wing backwards and forwards and from side to side.
- Check that the seat belts are securely fastened, including the back seat belt if there is no passenger.
- Ensure that the saddle bags are closed and that there are no other loose objects that may fall into the propeller.
- Do not move onto the runway until the engine has been running for at least 2 minutes and is warm. Do a full power engine check for at least 10 seconds. Before doing the power check look at what is behind the Aquilla so that something is not damaged or blown away by the prop blast. Check in which direction the dust from the prop blast will travel.
- Check that the approaches to the runway are clear and that there is no traffic on final approach.
- Check wind direction and strength.
- Check that the altimeter and other instruments are set correctly.
- Again check the two ignition circuits by switching one off at a time.
- Check you have sufficient fuel.

TAKE OFF

- Re-check the wind direction
- Rev the engine slowly up to full power against the brake and back down to idle.
- Release the brake and rev the engine slowly up to full power for take off.
- Keep the nose pointed straight down the runway by steering the nose wheel.
- From the beginning of the take-off run, hold the control bar approximately 90% of the way out i.e. about 8cm from the forward airfoil tube stop. This will ensure that the aircraft becomes airborne at about 50 km/h. Once airborne let the control bar move back to the neutral position and the Aquilla will climb out at approximately 70km/h. Do not climb too steeply.
- When all obstacles have been cleared, reduce the throttle setting as required.

CONTROLLING YOUR TRIKE

TAXIING

Once familiar with all the controls, your instructor will require that you become totally at home with the nose wheel fork, brake and throttle controls for ground handling. The footrests are attached directly to the nose wheel fork unit and the steering is thus similar to that of a tricycle. The wheel follows the movement of your feet, i.e. the right foot forward for a left turn and vice-versa. You need to be competent with the ground handling, as it is very important during the take off and landing roll.

FLIGHT CONTROLS

The trike unit is attached to the wing by means of a universal joint, which is free to pivot in two planes. The longitudinal movement (fore and aft) of the trike is used to control the Aquilla in the pitching plane, and lateral movement for controlling the rolling plane. To be more specific, by moving the wing control bar backwards the Aquilla's nose is towards you. By pushing the control bar away from you, the angle of attack increases with increased drag, resulting in a decrease in airspeed.

Roll control is accomplished in a very similar fashion. To roll to the right is achieved by pushing the control bar over to the left. When the required angle of bank has been established, the wing must be centralised by moving the control bar back to the middle or neutral position.

EMERGENCY PROCEDURES

ENGINE STOPS, LOSES POWER OR RUNS ROUGHLY

1. Don't panic
2. Check terrain below for the best flat field or road.
3. Check for obstacles especially power lines.
4. Check wind direction.
5. Approach with a little more speed than usual.
6. Practice these landings over a large airfield regularly.

YOU GET CAUGHT IN A CLOUD

1. Don't panic
2. Keep bar centralized and in neutral pitch
3. If there are any high obstacles around, climb.
4. If you have a compass or GPS use them to keep on a straight heading.
5. Your options are either to climb through and pop out above or find a clear area and descend. These Trikes have flown over 30 minutes in cloud on many occasions so keep your head and you'll be fine. But never voluntarily go into cloud.

FLYING SAFELY

In the previous pages of this manual there seem to have been many “dire warnings” but in the interests of your safety and because we really want to encourage fun safe flying we are including a few more tips on how to keep flying for a long, long time.

In particular we would like to highlight what has proven to be one of the most dangerous acrobatic manoeuvres:~

The Whipstall is defined as a stall break induced from an angle above 30 degrees. At the stall break the wing will pitch down sharply and accelerate rapidly. The steeper the entry into this break, the steeper the subsequent dive. A high whipstall where airspeed decays significantly can lead to an irrecoverable situation. If the wing loses all airspeed at a high angle of attack, the nose drops sharply and it accelerates forward. It can easily fly **around** the mass of the Trike unit and occupants **completely inverting** the aircraft. If a whipstall is entered into by accident or careless piloting, **under no circumstances** must the control bar be pulled back at the break or immediately after the nose pitch – down recovery has begun. **Action of this kind may turn a survivable whipstall into a non survivable one.** The correct approach is to hold the bar out past the neutral position until the airspeed has built up, holding off the back pressure caused by the nose rotating downward. Be ready for a very high forward pressure as the airspeed goes up and the wing starts to recover. There is a chance of a second and steeper whipstall being entered at the recovery of the first.

One way to prevent a second whipstall is to bank the aircraft as the speed starts to rapidly decay after initial recovery. This will put you into a high-speed turn from which you should be able to recover normal flight.

Operating aircraft at or beyond the limits of the flight envelope has severe limitations. It can lead to loss of pilot control due to control error. (Trike inertia forces beyond the ability of the pilot to counteract) or a host of other unknowns. As the design speeds of microlights increase, so it is easier to fly outside the limits of the microlight. There is no reason why they should ever be reached in safe and normal flight. To sum up: Unacceptable steep angles of attack after shoot-ups or similar flight manoeuvres result in whipstalls and subsequent inversion of the aircraft with resultant loss of flight control and possible structural failure.

MAINTENANCE MANUAL

RUNNING IN YOUR 582 ENGINE

It is advisable to run in your engine for at least one hour, avoid long climb outs at full power and long periods of idling which will cause high temperatures. Circuit work is best for the engine at this time as you are running at various power settings.

JETTING

At sea level your Aquilla 582 will run best on standard main jet. If you are operating at higher altitudes +3 000 ft, then it is advisable to use the Rotax chart for selecting jet size.

FUEL

Use regular or premium unleaded car fuel. Avgas can be used.

OIL MIX RATIOS

Use a good quality two-stroke oil, the type recommended for high performance engines, and mix 50:1 if not fitted with a separate oil feed. Be aware that synthetic and mineral oils do not mix.

The gearbox oil we use is SAE 140.

SPARK PLUGS

We recommend NGK spark plugs – they are supplied as standard equipment by Rotax. Check your engine manual for the grade of plug used for your engine.

FUEL FILTERS

Use diesel engine types. They have a nylon mesh filter element instead of a paper filter.

Check regularly – **Dirty filters cause engine outs.**

AIR FILTERS

Air filters can be washed with a mild detergent.

TROUBLE SHOOTING

Carburettor malfunctions can be identified by the following symptoms:~

FUEL / AIR MIX TOO RICH

1. Engine noise is dull and intermittent.
2. The condition grows worse when the engine is hot.
3. The condition becomes worse when the choke is opened.
4. The condition may improve slightly when the air filter is removed.
5. Spark plugs become fouled.
6. Exhaust gas is heavy
7. Engine chokes when throttle is opened too quickly.

FUEL / AIR MIX TOO LEAN

1. The engine becomes overheated.
2. The condition improves when the choke is opened or the primer pump is operated.
3. Acceleration is poor.
4. Spark plugs burn whitish.
5. The revolutions of the engine fluctuate and a lack of power is noticed.
6. Engine backfires

If a carburettor is experiencing too rich or too lean fuel mix problems:~

1. Check to see that the throttle is working properly.
2. Disassemble and clean the carburettor.
3. Clogged air or fuel passages are the usual cause of a rich or lean mix.
4. If cleaning does not work – tuning may be necessary or new jets
5. Check to see that one or both of the fuel chokes are not sticking.

If the fuel choke is sticking the motor will start but will run very rough. At idle it will cut out, on removing plugs a quantity of fuel will run out of the plug hole and the plug will be full of fuel.

Excess play on the choke cable is an indication of which one is sticking.

ENGINE PROBLEM ISOLATION CHARTS

ENGINE DOES NOT START AND NO SPARK:~

- | | |
|--|---------------------------------------|
| 1. Switch not on or malfunction | 1. Turn switch on or replace |
| 2. Spark plugs fouled oiled or damaged | 2. Replace spark plugs |
| 3. Plug cap damaged, leaking or shorted | 3. Replace plug cap |
| 4. High tension wires loose, grounded or shorted | 4. Service high tension wires / coils |
| 5. C.D unit faulty | 5. Replace |

ENGINE DOES NOT START – NO FUEL GETTING THROUGH:~

- | | |
|---|---|
| 1. Fuel tank empty | 1. Fill tank with fuel |
| 2. Cracked, broken or pinched fuel line | 2. Replace fuel line |
| 3. Fuel filter blocked | 3. Replace fuel filter |
| 4. Obstructed or damaged fuel pump | 4. Clean or replace fuel pump |
| 5. Carburettor jets plugged or fuel pump malfunctioning | 5. Service the carburettor or fuel pump |
| 6. Impulse line is cracked, broken or pinched | 6. Replace the impulse line |
| 7. Incorrect carb adjustment | 7. Adjust carb |

ENGINE STOPS GRADUALLY AFTER RUNNING:~

- | | |
|--|--|
| 1. Obstruction in fuel tank or fuel filter | 1. Clean or replace fuel filter |
| 2. Fuel line obstructed or pinched | 2. Remove obstruction, clear pinch in line |
| 3. Damaged head gasket | 3. Replace head gasket |

ENGINE DOES NOT IDLE OR IDLE R.P.M FLUCTUATES:~

- | | |
|---|---|
| 1. Air screw adjusted incorrectly | 1. Adjust air screw |
| 2. Idle screw adjusted incorrectly | 2. Adjust idle screw |
| 3. Defective fuel pump / valve | 3. Service the fuel pump and check valve |
| 4. Impulse line cracked, kinked or broken | 4. Replace or repair impulse line |
| 5. Oil seals leaking | 5. Replace oil seals |
| 6. Air leak (pressure check engine) | 6. Disassemble and replace worn, defective or damaged parts |
| 7. Choke stuck | 7. Strip and clean out choke |

ENGINE WILL NOT START – FUEL WILL NOT IGNITE:~

- | | |
|--|---|
| 1. Air leak between carburettor, silencer seal or intake manifold | 1. Tighten mounting bolt and nut |
| 2. Carburettor adjusted incorrectly | 2. Re-adjust the carburettor |
| 3. Water in carburetor | 3. Disassemble and clean the carburettor |
| 4. Engine is flooded | 4. Turn switch off, remove spark plug and dry. Crank the engine over 5 to 10 times. Install spark plug and start engine, if it continues to flood, check carburettor. |
| 5. No compression: worn or broken rings, scored piston or damaged cylinder | 5. Check compression, replace worn or damaged parts |
| 6. Blown gasket head | 6. Replace head gasket |

ENGINE DEVELOPS POWER LOSS OR RUNS ONLY ON ONE CYLINDER:~

- | | |
|--|---|
| 1. Fouled or defective spark plugs | 1. Replace spark plugs |
| 2. In-line filter dirty or blocked | 2. Replace in-line filter |
| 3. Excessive carbon build-up in exhaust ports. | 3. Clean exhaust ports |
| 4. Damaged or worn rings | 4. Replace the rings |
| 5. Low crankcase pressure | 5. Check the crankcase for leaks, replace oil seal or gasket. |
| 6. Damaged piston | 6. Replace piston and related components |
| 7. Damaged head gaskets | 7. Replace head gasket |
| 8. Broken (shorted) high tension leads | 8. Replace complete ignition coil |
| 9. Defective spark plug caps | 9. Replace caps |
| 10. Cracked exhaust – low power | 10. Weld up crack |

ENGINE OVERHEATS:~

- | | |
|---|---|
| 1. Incorrect spark plugs | 1. Install correct spark plugs |
| 2. Cooling radiators obstructed | 2. Clean radiators |
| 3. Air leak between carburettor, intake manifold and cylinders | 3. Replace gaskets, tighten mounting hardware |
| 4. Carburettor adjusted incorrectly | 4. Re-adjust carburettor |
| 5. Excessive carbon deposits in combustion Chamber, exhaust port or muffler | 5. Clean affected components |
| 6. Low water levels | 6. Fill up water in radiators with clean pure water. Distilled or purified. |

ENGINE BACKFIRES, HAS IRREGULAR RUNNING CONDITION:~

- | | |
|--|---|
| 1. High tension lead wire shorting out | 1. Replace complete ignition coil |
| 2. Fouled or incorrect spark plugs
(Heat range too hot) | 2. Replace spark plugs or install spark
plugs having cooler heat range |
| 3. Air leak between intake manifold and
cylinders | 3. Check carburettor manifold
rubbers for perishing |
| 4. Air leak between intake manifold and
cylinders | 4. Install new intake manifold gaskets |
| 5. Jets – incorrect or incorrectly installed | 5. Fit correct jets |

ENGINE STOPS SUDDENLY AFTER RUNNING :~

- | | |
|--|---|
| 1. Defective C.D unit / coil | 1. Replace |
| 2. Obstruction in fuel tank or fuel filter | 2. Clean fuel tank (should be done
regularly) or replace fuel filter |
| 3. Fuel line obstructed or pinched | 3. Remove obstruction or remove pinches
in fuel line |
| 4. Spark plug bridged | 4. Replace spark plug |
| 5. Seized piston(s) | 5. Replace piston and any affected
components |
| 6. Seized crankshaft | 6. Replace crankshaft and any
affected components |

AIRFRAME MAINTENANCE

RETIREMENT LIFE OF CRITICAL COMPONENTS

Replace the following components at the hours or number of landings (whichever comes first) as indicated.

After the first 1000 hours and at every 500 hours thereafter, the entire undercarriage must be stripped down for a complete inspection of every part. If components are corroded, the replacement period must be shortened by 50%, and all bolts and nuts must also be replaced as soon as excessive corrosion is noticed.

UNDERCARRIAGE

PART	HOURS	LANDINGS
Hang block	1 000	10 000
Pylon	1 000	10 000
Brake cable assembly	1 000	10 000
Throttle cable assembly	1 000	10 000
All hang bolts, nuts and rubbers	1 000	10 000
Boom	1 500	10 500
Rear shock tube	1 000	10 000
Prop bolts and nuts	1 000	10 000
Engine bracket	1 500	15 000
Engine mounting plate	1 000	10 000
Exhaust rubber mounts	1 000	10 000
Engine rubber mounts	1 000	10 000
Ignition switches and wiring	1 000	10 000
Seat side tubes	2 000	20 000
Rear axle	2 000	20 000
Choke cable assembly	2 000	30 000
Radiator mount rubbers	1 000	10 000

WING

PART	HOURS	LANDINGS
Wing sail	1 500	15 000
Leading edge tube	1 500	15 000
Keel	1 500	15 000
Crossbar	1 500	15 000
Upright	1 500	15 000
Control bar	1 500	15 000
All flying and landing cables	1 000	10 000
All bolts, pins and nuts	2 000	15 000
All brackets	2 000	15 000
Side struts (Top Lass)	1500	15 000

CABLES

For safety reasons *all* cables *must* be checked regularly and changed when necessary.

ONLY MANUFACTURER APPROVED CABLES MUST BE USED.

INSPECTION

ENGINE

PART	INSPECTION FREQUENCIES
Install new plugs	Every 50 hours
Lubricate throttle assembly and check adjustments	Every 50 hours
Check fuel filter	Every 50 hours
Check fuel line & hose clamps	Every 20 hours
Check ignition timing	Every 100 hour service
Clean carburettor bowl	Every 50 hours
Tighten exhaust manifold & all other bolts & nuts	First 10 hours, thereafter every 100 hours

ANNUAL INSPECTION

AIRFRAME

1. Carefully inspect the undercarriage for general condition
2. Check installed systems and components for proper installation, security, defects and satisfactory functioning
3. Check seats, safety belts and harness for wear and tear security
4. Check engine and brake controls for correct installation, security of connections, condition and proper operation
5. Check front and rear wheels for general condition and security of attachment
6. Check brakes for condition, correct adjustment and operation
7. Check engine bracket for wear and stress
8. Check radiator bracket and mounts for wear and tear.
9. Check pylon, boom, airfoil and side brace tubes for dents and any deformities
10. Check pylon hinge point
11. Check hang point

WING

1. Check all flying wires (Top Lass) and landing wires for wear, kinks, fraying and general condition.
2. Check the leading edges, crossbar, keel, stut (Top Lass) kingpost and trapeze bar tubes for dents, cracks, corrosion, kinks and general deformities
3. Check fixed washout tubes & sprogs (Top Lass) for security, correct location and attachment
4. Check all batten tension bungees on trailing edge of sail
5. Check all brackets and plates for dents, bending and stress
6. Check all battens for correct shape, attachment of batten end fittings and condition of tubing
7. Check the wing fabric for visual signs of ageing and ultra – violet damage. Check for wear along the leading edges and especially at the tips. The wing fabric should be in good enough condition to withstand a minimum of 50 lbs: inches with a fabric tester
8. The sail trailing edge is an important structural component on the wing. There must be no tears, or weak seams anywhere in this area. Any other part of the sail can be patched with adhesive number cloth if the hole is not too big (up to 50mm long).
9. Check all bolts and nuts for security and corrosion

ROTAX 582 POWER PLANTS

1. Inspect the entire engine for evidence of oil and fuel leaks
2. Check all studs, nuts and other fasteners for security, condition and correct torqueing
3. Check the compression of all cylinders (minimum 6.0 kg/m³)
4. Check the engine shock mounts for condition, security and correct installation
5. Check the complete exhaust system for security, cracks, wiring of springs and general condition
6. Check the engine controls for correct installation, operation, condition and security
7. Check the carburettor air-intake filters for cleanliness, condition, security and correct installation
8. Check the ignition system for condition
9. Check the complete fuel system including the tank, filters and fuel lines for security, correct installation, freedom from leaks and functioning of components
10. Check the propeller for condition. Check the bolts for wear and that they are correctly locked and tightened
11. Check the track of the propeller and adjust to correct if necessary
12. Check the radiator, its mounting and hoses for correct installation, cracks and security.

ENGINE OPERATION

On completion of the annual inspection the engine should be run and the following checks should be made:

1. Check the carburettor mixture by inspecting the spark plugs after running the engine at full power (for main jet check) and half power for needle height check. The correct colour of the spark plug should be light brown
2. The operation of all engine controls should be checked
3. Check the operation of the starter mechanism
4. Check security of battery and terminal connections

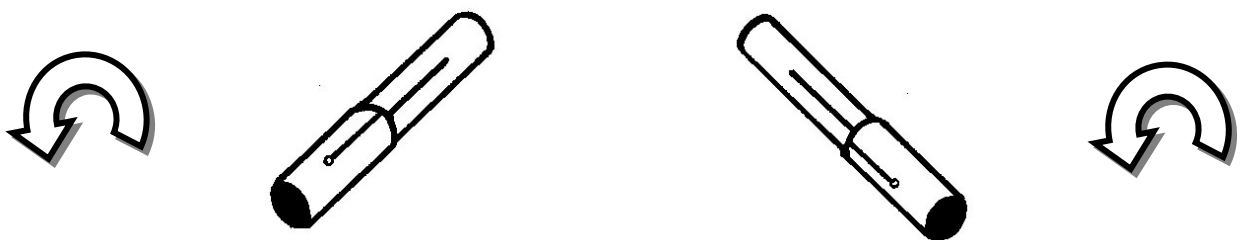
TUNING INSTRUCTION FOR AQUILLA WING

It is very important to achieve 100% trim with your wing. To check for this you need to fly level hands off for about 10 seconds. There should be no tendency for the wing to pull to either side.

You may find that in smooth air and flying solo you can't notice any turn. So to make absolutely certain you need to fly with a passenger in some slight turbulence. This will bring out any hidden turns.

To correct for a turn you will need a 10mm spanner and a 5mm allen key. On each wing tip is a cap that can swivel, this is locked in position with a 6mm bolt. There is a black line drawn from the leading edge tube to this cap.

If you find that the wing turns to the right - loosen the bolt and turn the cap anti clockwise and re-lock the bolt. Do this on both tips left and right.



If the wing turns to the left – turn the caps clockwise.



If you have turned the caps as far as they can go and the turn in the wing is still there, then try the following:~

Take the last 3 curved ribs from each wing tip. Increase the camber on the ribs on the wing side that drops and decrease the camber on the ribs of the wing that is lifted too much.

We highly recommend your trim your wing as you will enjoy your flying so much more.

TRIMMING IN PITCH

Moving your hang block gives you a wide range of trim speeds. The ideal hands off trim speed is 45 – 50 MPH (72 – 80 KPH).

If you move the block back it makes the Aircraft climb better but there is more bar pressure when pulling in and roll is slower.

Moving the block forward increases trim speed with lighter pull in and roll pressures. If you need more speed for a cross country flight this is the direction to move the hang point. It will mean higher engine revs and fuel consumption.

Try different settings to suit varying weights and conditions.

Do not move more than one position at a time.

RECOMMENDED FACTORY JETTING

	503 Single carb with intake silencer	503 Single carb w/out intake silencer	503 Twin carb with intake silencer	503 Twin carb w/out intake silencer	532/582 Twin carb with intake silencer	532/582 Twin carb w/out intake silencer
Main Jet	165	185	148	158	145	165
Idler Jet	45	45	45	45	55	55
Needle Jet	2,70	2,72	2,68	2,70	2,68	2,72
Jet Needle	15 k2	15 k2	11 k2	11 k2	15 k2	11 G2
Circlip position	3	3	2	2	3	3
Air Regulating Screw (turns out)	0,5	0,5	1	0,5	1	1

MAIN JET CORRECTION CHART

Altitude – Ft. above sea level	0	1500	3000	4500	6000	7500	9000
Ambient Temp C							
0	1.01	1.00	0.98	0.97	0.95	0.94	0.93
10	1.00	0.99	0.97	0.96	0.95	0.93	0.92
15	1.00	0.99	0.97	0.96	0.94	0.93	0.92
20	1.00	0.98	0.97	0.95	0.94	0.93	0.91
30	0.99	0.97	0.96	0.94	0.93	0.92	0.90

Example:

Your 503 twin carb has a standard main jet 158 (which is correct for sea level), if your altitude is 6000 ft. asl at an ambient temperature of 20 degree Celsius, then multiply by the constant found in the chart $158 \times .94 = 148.52$
The nearest jet available is 148.